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9. Ornithology

9.1 Introduction

9.1.1 This chapter presents the preliminary assessment of the likely significant effects of the Project with respect to Ornithology, including breeding, migratory and non-breeding birds. The preliminary assessment is based on information obtained to date. It should be read in conjunction with the Project description provided in **Chapter 4: Description of the Proposed Development** and with respect to relevant parts of the following chapters:

- **Chapter 8: Biodiversity** – which describes and assesses the likely significant effects on all other important ecology features.

9.1.2 This chapter describes:

- The legislation, policy and technical guidance that has informed the assessment (**Section Error! Reference source not found.**);
- Consultation and engagement that has been undertaken and how comments from consultees relating to Ornithology have been addressed (**Section Error! Reference source not found.**);
- The methods used for baseline data gathering (**Section Error! Reference source not found.**);
- Overall baseline (**Section Error! Reference source not found.**);
- Embedded measures relevant to Ornithology (**Section Error! Reference source not found.**);
- The scope of the assessment for Ornithology (**Section Error! Reference source not found.**);
- The methods used for the assessment (**Section Error! Reference source not found.**);
- The preliminary assessment of Ornithology effects during construction (**Section Error! Reference source not found.**) and operation (**Section 9.10**);
- Preliminary assessment of cumulative (inter-project) effects (**Section 9.11**);
- The impacts of climate change on potential effects (**Section 9.12**); and
- A summary of the preliminary significance conclusions (**Section 9.13**).

9.1.3 This chapter should be read in conjunction with the following supporting documents:

- **Appendix 9A:** Ornithology Baseline; and
- **Appendix 9B:** Collision Risk Modelling.

Limitations and Assumptions

9.1.4 The information provided in this Draft ES is preliminary, the final assessment of likely significant effects will be reported in the final ES. This Draft ES has been produced to fulfil Pennant Walters's consultation duties and enable consultees to develop an informed view of the likely significant effects of the Project.

- 9.1.5 The vast majority of ornithology surveys have been undertaken in suitable weather conditions at optimum times of year with reference to best practice guidance. All of the surveys have been completed by suitably qualified surveyors and any limitations in the survey work are detailed in full in **Appendix 9A**. Where any limitations in the collation of baseline information are identified, a precautionary approach to the consideration of potentially significant effects and mitigation is adopted.
- 9.1.6 Access to certain parts of the Study Area or surrounding landscape has not been possible in all instances due to health and safety limitations, or where access from private landowners cannot be gained. Where possible/necessary, ornithology observations were otherwise made from adjacent public rights of way or accessible land. Any such constraints are highlighted in **Appendix 9A**, and a precautionary approach adopted with regards to the presence/valuation of species.
- 9.1.7 The topography and presence of large stands of coniferous woodland presented a challenge to ensuring total coverage of the Survey Boundary and up to 500m from turbine locations from the selected Vantage Points (VPs). However, it is considered that adding additional VPs to cover these fringe areas, given the associated resource implications, would not be proportionate to the minor survey data gains. The number and locations chosen are considered to provide sufficiently robust coverage to inform this Ornithology Impact Assessment (OIA) and have been agreed through scoping.
- 9.1.8 The potential turbine layout changed over the course of the surveys; however, the Study Area was broad enough to account for such changes and provides sufficient survey coverage to inform the OIA.
- 9.1.9 The data from the January 2022 winter transect survey was lost due to equipment failure. However, the surveyor confirmed that no additional target species or significant observations were recorded on this survey.
- 9.1.10 Inclement weather meant that certain surveys had to be aborted and rescheduled during better conditions to ensure the necessary survey effort was completed. In total 23 hours were completed in sub-optimum visibility conditions (e.g., rolling low cloud, drizzle/rain showers or intermittent fog). In the context of the hours completed, this is not considered to have significantly limited the findings.
- 9.1.11 During the first year of breeding bird surveys, a full survey of passerine species was not completed, which is in line with best practice guidance for wind farm proposals. However, in year 2 and 3, comprehensive breeding bird surveys were completed to increase the robustness of the survey effort and ensure there was sufficient information to consider the passerine assemblage as well.
- 9.1.12 During a May 2021 vantage point survey, mixed flocks of herring gull and lesser black-backed gull were recorded as a collective. For the purposes of flight data collation and collision risk analysis, these flock numbers have been evenly split between these species. It is not considered that small variance in favour of either species would significantly alter the Collision Risk Modelling (CRM) however.
- 9.1.13 Species are mobile and seasonal, and surveys therefore only provide a snapshot of the conditions present across the Study Area at the time of survey. The absence of evidence of any particular species from within the Survey Boundary should therefore not be taken as conclusive proof that the species is not present, or that it will not be present in the future. However, it is considered that the results of the ornithology surveys completed in 2020, 2021 and 2022 are robust and reliable for the identification of the Important Ornithology Features (IOFs) within the Survey Boundary and wider Study Area. Furthermore, where there is uncertainty regarding the status of bird species, a precautionary approach to the OIA has been adopted.

- 9.1.14 While some of the survey data is between two and three years old at the time of submission, this is not considered to be a limitation to the assessment in the context of the scale of historic survey effort and absence of notable changes in land management practices, as set out in **Chapter 8 Ecology**. In addition, ongoing surveys relating to adjacent wind farms, including those which EDP are involved in, provide further current information suggesting that the assemblage is unchanged, or even continuing to decline, and have been reviewed as part of the desk study.
- 9.1.15 For the purposes of the assessment, all IOFs of less than 'Local' geographic value have been scoped out of the OIA, unless they require further consideration owing to their legal status and/or are considered more holistically with respect to biodiversity impacts and the delivery of enhancements.
- 9.1.16 There are therefore no limitations relating to the collation of the ornithology baseline that significantly affect the robustness of the assessment of the potential likely significant effects of the Project.

9.2 Relevant Legislation, Planning Policy and Technical Guidance

- 9.2.1 This section identifies the legislation, planning policy and technical guidance that has informed the assessment of effects with respect to Ornithology. Further information on policies relevant to the Project is provided in **Chapter 5: Legislation and Policy Overview**.

Legislation

- 9.2.2 A summary of the relevant legislation is given in Error! Reference source not found.

Table 9.9 Technical Guidance Relevant to the Ornithology Assessment.

Technical Guidance Document	Context
<i>The Conservation of Habitats and Species Regulations 2017</i> (as amended) (the 'Habitats Regulations') ^{1 2}	Transposes the Habitats Directive and elements of the Birds Directive into national law in England and Wales. The Habitats Regulations provide the legislative enforcement for the protection of European sites and protect species and habitats listed in Annex I and II of the EC Habitats Directive. The Habitats Regulations make it an offence to deliberately capture, injure, kill or disturb any European Protected Species (EPS) listed in Schedule 2, or to damage or destroy a breeding site or resting place of such an animal.
Wild Birds Directive (Council Directive 79/409/EED on the conservation of	The Wild Birds Directive provides wide ranging protection for Europe's wild birds. It identifies 194 species and sub-species of wild birds that are endangered or at risk and therefore requiring additional conservation measures and consideration. The provisions of the Wild Birds Directive are transposed into UK law by means of Part I of the <i>Wildlife and Countryside Act 1981</i> (as amended), and also under the Habitats Regulations.

¹ UK Government (2019). Conservation of Habitats and Species Regulations 2017 ("the Habitats Regulations") has been amended by (inter alia) the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (Online).

² European Commission (1992). Council Directive 92/43/EEC on the Conservation of natural habitats and wild flora and fauna. (Online) Available at: <https://www.ecolex.org/details/legislation/council-directive-9243eec-on-the-conservation-of-natural-habitats-and-of-wild-flora-and-flora-lex-faoc034772/> (Accessed October 2023).

wild birds)³

The Environment (Wales) Act 2016⁴

The Act makes provisions within Wales for the planning and managing of natural resources at the national- and local-level. Section 6 of the Act introduces the biodiversity and resilience of ecosystems duty whereby public authorities are required to seek to maintain and enhance biodiversity so far as it is consistent with the proper exercise of those functions. Section 7 of the Act introduces a list of living organisms and types of habitats in Wales, known as priority species or habitats, which in Wales are considered of key significance to sustain and improve biodiversity.

Wildlife and Countryside Act 1981 (as amended) (WCA)⁵

This Act consolidates and amends existing national legislation to implement the Bern Convention. This piece of legislation remains the primary UK mechanism for statutory sites.

Countryside & Rights of Way Act 2000⁶

This act details further measures for the management and protection of Sites of Special Scientific Interest (SSSIs) and strengthens wildlife enforcement legislation.

Planning Policy

9.2.3 A summary of the relevant national and local planning policy is given in Error! Reference source not found..

Table 9.2 Planning Policy Relevant to the Ornithology Assessment.

Technical Guidance Document	Context
National planning policy	
Future Wales; National Development Framework 2021 ⁷	The Welsh national development framework sets the direction for development in Wales to 2040. Policy 9 – Resilient Ecological Networks and Green Infrastructure outlines measures to ensure the enhancement of biodiversity, the resilience of ecosystems and the provision of green infrastructure. The enhancement of biodiversity will be considered through embedded environmental measures and mitigation measures.
Planning Policy Wales, Edition 11, February (2021) ⁸ – Revisions to Chapter 6 Distinctive and Natural	Chapter 6 of Planning Policy Wales (PPW) sets out the Welsh Government’s objectives for Distinctive and Natural Places. Planning policy topics cover the historic environment, landscape, biodiversity and habitats, coastal characteristics, air quality, soundscape, water

³ European Commission (1979). Council Directive 79/409/ EED on the conservation of wild birds. (Online) Available at: <https://www.ecolex.org/details/legislation/council-directive-79409eec-on-the-conservation-of-wild-birds-lex-faoc019113/> (Accessed October 2023).

⁴ UK Government (2016) Environment Wales Act 2016 (Online). Available at: <https://www.legislation.gov.uk/anaw/2016/3/contents/enacted> (Accessed October 2023).

⁵ UK Government (1981). Wildlife and Countryside Act 1981. (Online) Available at: <https://www.legislation.gov.uk/ukpga/1981/69/contents> (Accessed October 2023).

⁶ UK Government (2000). Countryside & Rights of Way Act 2000. (Online) Available at: <https://www.legislation.gov.uk/ukpga/2000/37> (Accessed October 2023)

⁷ Welsh Government (2021). Future Wales. The National Plan 2040. (Online) Available at: <https://gov.wales/future-wales-national-plan-2040> (October 2023).

⁸ Welsh Government (2021). Planning Policy Wales Edition 11. (Online) Available at: <https://gov.wales/planning-policy-wales> Accessed October 2023).

Places, Adopted 11 October 2023 ⁹	services, flooding and other environmental (surface and sub-surface) risks. In particular, recent revisions to Chapter 6 focus on green infrastructure; net benefit for biodiversity and the step-wise approach; protection for Sites of Special Scientific Interest; and trees and woodland. The revisions seek to clarify Wales' intentional, diverging approach to Biodiversity Net Gain in respect of the <i>Environment Act 2021</i> , with a focus instead on ecosystem resilience.
Technical Advice Note 5 (TAN5) Nature Conservation and Planning (2009) ¹⁰	Welsh Government's (WG) policy on positive planning for nature conservation and developments affecting designated sites and habitats, along with protected priority habitats and species.
Local planning policy	
Caerphilly County Borough Council (CCBC) Local Development Plan up to 2021 (Adopted November 2010) ¹¹	Policies relating to biodiversity include Policy CW4 (Natural Heritage Protection) which states development proposals within, or in close proximity to sites designated as Sites of Importance for Nature Conservation (SINC), Local Nature Reserves (LNR), Regionally Important Geological Sites (RIGS), Green Corridors, or Local Priority Habitats and Species, where proposals either: (i) Conserve and where appropriate enhance the ecological or geological importance of the designation; or (ii) Are such that the need for the development outweighs the ecological importance of the site, and where harm is minimised by mitigation measures and offset as far as practicable by compensation measures designed to ensure that there is no reduction in the overall value of the area or feature. Of further pertinence is Policy CW5 (Protection of the Water Environment) whereby development proposals will only be permitted where: (i) They do not have an unacceptable adverse impact upon the water environment; and (ii) Where they would not pose an unacceptable risk to the quality of controlled waters (including groundwater and surface water). Policy CW6 sets out the requirements in respect of trees, woodland and hedgerow protection whilst Policy NH3 sets out the specific SINC's requiring protection.
CCBC Trees and Development SPG LDP 4 up to 2021 (Adopted January 2017) ¹²	SPG prepared to give greater guidance on how the following policies will be implemented: (i) SP10 Conservation of Natural Heritage; and (ii) CW6 Trees, Woodland and Hedgerow Protection. LDP4 seeks to ensure that trees are adequately addressed throughout the development process by seeking the protection and integration of trees into the design of new development from an early stage in the development process.
Caerphilly Biodiversity Partnership Biodiversity Action	The national strategy for biodiversity is delivered at local-level via Local Biodiversity Action Plan (LBAP). CCBC LBAP is the driver to

⁹ Revisions to PPW Chapter 6 came into effect 11 October 2023 following issue of ministerial letter reference MA/JJ/2512/23 to all Local Planning Authorities by the Welsh Government. Revised Chapter 6 can be found here: <https://www.gov.wales/planning-policy-wales-net-benefit-biodiversity-and-ecosystems-resilience> (Accessed 30 October 2023)

¹⁰ Welsh Assembly Government (2009). Technical Advice Note 5 (TAN5) Nature Conservation and Planning. (Online) Available at: <https://gov.wales/technical-advice-note-tan-5-nature-conservation-and-planning> (Accessed October 2023)

¹¹ CCBC (2010). Caerphilly County Borough Council Local Development Plan up to 2021. Available at: <https://www.caerphilly.gov.uk/caerphillydocs/ldp/written-statement.aspx> [Accessed on 30 October 2023]

¹² Caerphilly County Borough Council (2017). Trees and Development Local Development Plan up to 2021. Available at: <https://www.caerphilly.gov.uk/caerphillydocs/planning/ldp4-trees-and-development.aspx> [Accessed on 30 October 2023]

Plan (2002) Volume 1¹³ and Volume 2¹⁴

protect, enhance and manage the biodiversity resource, by setting out objectives, targets and actions for the conservation of biodiversity within Caerphilly.

Technical Guidance

9.2.4 A summary of the technical guidance for Ornithology is given in **Table 9.3**

Table 9.3 Technical Guidance Relevant to the Ornithology Assessment.

Technical Guidance Document	Context
Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (2018) ¹⁵	Sets out the industry standard approach to Ecological Impact Assessment (EclA) for assessing the potential effects of a project on ecological receptors, including important ornithology features.
Recommended bird survey methods to inform impact assessment of onshore wind farms. Version 2. (SNH 2017) ¹⁶	Sets out the industry standard for the level and type of bird surveys required to robustly inform onshore wind farm assessments, including standardised methodologies such as size of survey area, frequency of visits and timing of surveys.
Windfarms and Birds: Calculating a theoretical collision risk assuming no avoiding action (SNH 2000) ¹⁷	Describes a two-stage methodology for assessing collision risk, assuming that birds fly as if the wind turbine structures and rotors were not there and take no avoiding action whatsoever.
Use of Avoidance Rates for the onshore SNH Wind Farm Collision Risk Model (SNH 2018) ¹⁸	Provides the avoidance rates for different target bird species to use when undertaking collision risk modelling.
Avoidance rates of herring gull, great black-backed gull and common gull for use in the assessment of terrestrial wind farms in Scotland (Furness 2019) ¹⁹	Updates avoidance rates for collision risk modelling for herring gull and lesser black-backed gull, based on updated evidence.

¹³ Caerphilly Biodiversity Partnership (2002). Biodiversity Action Plan for Caerphilly Borough Council. Overview and Habitat Statements Volume 1 Available at: <https://www.caerphilly.gov.uk/caerphillydocs/planning/biodiversity-action-plan-caerphilly-county-borough.aspx> [Accessed on 30 October 2023]

¹⁴ Caerphilly Biodiversity Partnership (2002). Biodiversity Action Plan for Caerphilly Borough Council. Species Action Plans Volume 2. Available at: <https://www.caerphilly.gov.uk/caerphillydocs/planning/biodiversity-action-plan-caerphilly->

¹⁵ CIEEM (2018 as amended). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, Version 1.1. [online]. Available at: <https://cieem.net/wp-content/uploads/2018/08/EClA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.1Update.pdf> (Accessed October 2023).

¹⁶ SNH (2017) Recommended bird survey methods to inform impact assessment of onshore wind farms – Version 2 (online) <https://www.nature.scot/doc/recommended-bird-survey-methods-inform-impact-assessment-onshore-windfarms>.

¹⁷ SNH (2000) WINDFARMS AND BIRDS: Calculating a theoretical collision risk assuming no avoiding action.

¹⁸ SNH (2018) Use of Avoidance Rates for the onshore SNH Wind Farm Collision Risk Model.

¹⁹ Furness, R.W. (2019) Avoidance rates of herring gull, great black-backed gull and common gull for use in the assessment of terrestrial wind farms in Scotland. Scottish Natural Heritage Research Report No. 1019.

Assessing Significance of Impacts from Onshore Windfarms on Birds outwith Designated Areas (SNH 2018) ²⁰	<p>The purpose of this guidance is to assist with the assessments of terrestrial wind farm proposals where potential impacts do not affect notified interests or qualifying features of protected sites (SSSI, SPA or Ramsar sites).</p> <p>This guidance provides a framework for assessing impacts on bird populations within an environmental assessment or an environmental statement.</p>
Assessing the Cumulative Impacts of Onshore Windfarms on Birds (SNH 2018) ²¹	Sets out methods to assess the cumulative impacts of onshore wind farms on birds.
Assessing Connectivity with Special Protection Areas (SPAs). Version 3 (SNH 2016).	This document assists with identifying whether development sites are connected to SPAs including setting out the core and maximum foraging range during the breeding and winter season for different species.
Monitoring the Impact of Onshore Wind Farms on Birds (SNH 2009) ²²	Details the purpose, benefit and scope of appropriate post consent monitoring.
Guidance on Methods for Monitoring Bird Populations at Onshore Wind Farms (SNH 2009) ²³	Provides guidance on the appropriate types and levels of monitoring required for onshore wind farms.
Bird Monitoring Methods (1998) ²⁴	This guidance sets out the standard methodologies for bird monitoring, including breeding bird surveys and species-specific surveys, such as nightjar surveys. These methods form the basis of the approach to the ornithology assessment with any deviations discussed within the baseline report.
Raptors: A Field Guide to Survey and Monitoring (3 rd Edition) (2013) ²⁵	This guidance outlines the survey techniques that should be employed to successfully survey each of the raptor species regularly occurring in Britain. These methods form the basis of the approach to the breeding raptor assessment and wider ornithology assessment, with any deviations discussed within the baseline report.
Barn Owl Conservation Handbook ²⁶	This guidance sets out reasoning and methods for safely monitoring barn owl year-round in the UK. The guidance helps to clarify breeding status and gives confidence to the approach of assessment. As barn owl is a Schedule 1 listed species, consideration must be given to the species where breeding attempts are recorded.

²⁰ SNH (2018) Version 2 Assessing Significance of Onshore Windfarms on Bids outwith Designated Areas

²¹ SNH (2018) Assessing the Cummulative Impacts of Onshore Windfarms on Birds

²² SNH (2009) Guidance Note - Monitoring the impact of onshore wind farms on birds

²³ SNH (2009) Guidance Note - Guidance on Methods for Monitoring Bird Populations at Onshore Wind Farms

²⁴ Gilbert, G, Gibbons, D.W. & Evans, J. (1998). Bird Monitoring Methods: A manual of techniques for key UK species. RSPB, Bedfordshire.

²⁵Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. & Thompson, D. (2013). Raptors: a field guide to survey and monitoring (3rd Edition). The Stationery Office, Edinburgh.

²⁶ Barn Owl Trust (2012). Barn Owl Conservation Handbook, Pelagic Publishing, Exeter.

Bird Census and Survey Techniques (2000)²⁷

Details the most widely used bird survey and counting techniques.

- 9.2.5 In addition, the assessment will take account of other relevant planning policy, legislation, and other guidance, where applicable, such as those provided under the **Chapter 8: Biodiversity**.

9.3 Consultation and Engagement

Overview

- 9.3.1 The assessment has been informed by consultation responses and ongoing stakeholder engagement. An overview of the approach to consultation is provided in **Section 3.4 of Chapter 2: Approach to Preparing the Environmental Statement**.

Scoping Opinion

- 9.3.2 A Scoping Direction was issued by the Planning Environment Decisions Wales (PEDW), on behalf of the Welsh Ministers, on 02 December 2022. A summary of the relevant responses received in the Scoping Opinion in relation to Ornithology and confirmation of how these have been addressed within the assessment to date is presented in **Table 9.4**.

Table 9.4 Summary of EIA Scoping Direction Responses for Ornithology

Consultee	Consideration	How addressed in this Draft ES
NRW	Agree with the scope of the EIA and ES and that the types of surveys undertaken appear appropriate given the nature of the site.	N/A
NRW	We agree that further consideration is needed, as stated in the Report, with regards to the Severn Estuary Special Protection Area (SPA)/Ramsar and the potential impact on lesser black-backed gulls which is a designated feature (ID.24).	Scoped into the assessment.
NRW / PEDW	Consider that Llandegfedd Reservoir SSSI, which is notified for its population of over-wintering birds, should be scoped in (ID.26).	The further survey results have supported scoping out this SSSI and further justification is provided in this chapter accordingly (see paragraph 9.5.3 and 9.5.4).
Caerphilly County Borough Ecologist	Agreed with scope of ornithology assessment proposed but recommends that passerine species which could be	Due consideration given to passerine species with respect to potential for construction impacts.

²⁷ Bibby, C., Burgess, N., Hill, D. & Mustoe, S. (2000) Bird Census Techniques. Second Edition. Academic Press.

impacted by the construction phase are scoped into the Ornithology Impact Assessment.

9.4 Data Gathering Methodology

Study Area

- 9.4.1 The OIA was informed by a desk study and field surveys covering the Study Area, designed to cover the potential Zone of Influence (Zoi) of the Survey Boundary while providing contextual information to assist with determining and evaluating the baseline. For the purposes of this assessment, hereafter ‘the Survey Boundary’ is taken to include the planning application boundary, designed to allow flexibility in the final proposal, and a core survey Study Area. The Survey Boundary is illustrated within **Appendix 9A**.
- 9.4.2 The Study Area for the desk-based assessment varied according to the importance of the feature, ranging from up to 30km from the Survey Boundary for international designations down to 2km for notable bird species records.
- 9.4.3 The Study Area for the ornithology surveys was informed by best practice guidance and ranged from targeted species surveys within the Survey Boundary up to a 2km buffer, subject to the mobility, habitat suitability and sensitivity of the species/species-group being surveyed. The survey areas are illustrated in **Appendix 9A - Plan EDP 9.1** and included:
- Moorland and Breeding Bird Surveys – Survey Boundary plus 800m buffer where suitable moorland habitat is present;
 - Raptor Surveys – Survey Boundary plus 2km buffer;
 - Winter Bird Surveys – Survey Boundary plus 800m buffer where suitable moorland habitat is present;
 - Nightjar Surveys – Suitable habitat within the Survey Boundary and surrounding 500m; and
 - Vantage Point Surveys – Survey Boundary plus 500m buffer from potential turbine locations.
- 9.4.4 The Survey Boundary was reduced in 2021 (the second year of surveys) as a result of an additional land parcel to the east being removed from the Proposed Development. Survey data pertaining to this area, notably the VP data, has not been included in the Ornithology Baseline unless relevant to the proposals or within the recommended Study Area.
- 9.4.5 Minor updates to the survey areas and associated transects were also made in 2021 to account for small changes in the turbine locations and/or to provide additional survey coverage across non moorland habitats.

Grid Connection and Access Route

- 9.4.6 The ornithology desk study and field survey Study Areas are considered sufficient to provide adequate contextual information to inform an assessment of both the grid connection, which falls inside the Survey Boundary, and access route of the Proposed Development.

Desk Study

9.4.7 An ornithology desk study was undertaken in April 2020 and updated in April 2022 and August 2023. A summary of the organisations that have supplied data, together with the nature of that data, is outlined in **Table 9.6**.

Table 9.6 Data Sources used to Inform the Ornithology Assessment

Organisation	Data Source	Data Provided
South East Wales Biological Records Centre (SEWBRc)	International statutory ornithology designations – 30km radius; National statutory ornithology designations – 15km; Non-statutory local ornithology sites – 5km; and Protected/notable bird species – 2km.	Plans, citations, and records.
Aderyn (the Biodiversity Information and Reporting Database of Local Environmental Records Centres Wales)	As above	As above.
RSPB	Protected/notable bird species – 2km.	No response.
British Trust for Ornithology	Protected/notable bird species – 2km.	Confirmed that data passed to record centres.
Gwent Ornithological Society	Protected/notable bird species – 2km.	No response.
Multi-Agency Geographic Information for the Countryside (MAGIC)²⁸	Designated ornithology sites.	Spatial context and links to citations.
Joint nature Conservation Committee (JNCC)²⁹	Designated ornithology sites.	Designated site citations and condition assessments.

9.4.8 The desk study also included a review of extant planning applications within the vicinity of the Proposed Development, including quarry workings and other wind farm proposals where the ornithology information is publicly available from the relevant planning portal. Of note, this included the Environmental Statement and appendices for the Mynydd Carn y Cefn (May 2022) and Mynydd Llanhilleth (July 2023) Wind Farm proposals, located approximately 5km north-west and 2.5km north of the Survey Boundary respectively, and the Scoping Report for Mynydd Maen Wind Farm (November 2021) located immediately north-east of the Survey Boundary. Other such projects are detailed further under **Section 9.11 Assessment of Cumulative (inter-project) Effects**.

²⁸ www.magic.gov.uk (Accessed October 2023).

²⁹ Joint Nature Conservation Committee. Available at: <https://jncc.gov.uk/> (Accessed October 2023).

Survey Work

Target Species

- 9.4.9 With reference to best practice guidance (SNH 2017), the surveys and subsequent assessment have focused on species drawn from the following four lists:
- EU Birds Directive (79/409/EEC);
 - *Wildlife and Countryside Act* (1981);
 - Red-listed and amber-listed under Birds of Conservation Concern Wales 4³⁰; and
 - Priority species under Section 7 of the *Environment Wales Act* (2016).
- 9.4.10 Species contained within these lists that by virtue of their breeding, roosting, feeding or migrating behaviour which may be sensitive to the Proposed Development have been identified as target species for survey and assessment purposes. Consideration has also been given to species identified locally as of conservation concern within the Gwent Bird Report 2019³¹.
- 9.4.11 With reference to best practice guidance, conservation concern passerine species (e.g., skylark and meadow pipit) have been scoped out as target species to be assessed within the OIA, except where significant habitat loss/disturbance impacts could potentially arise during vegetation clearance, construction and decommissioning. This is because such species are generally not considered to be at risk of impacts from the operational turbines.

Initial Scoping Exercise

- 9.4.12 With reference to best practice¹⁶ initial bird scoping exercises were completed in March 2020 to identify the suitability of the Survey Boundary and Study Area for potential target bird species and to ground-truth vantage point locations following initial desk-based data collation and viewshed analysis. These site visits, alongside the desk study, were used to identify the potential target species and the appropriate scope of survey work.

Field Surveys

- 9.4.13 The ornithology surveys commenced in April 2020 and, with reference to best practice¹⁶, continued for at least two years to collate a robust data set to inform the Proposed Development, with surveys completed by July 2023. Refinement of the survey work took place throughout this survey period, reflecting the ongoing survey findings and revisions to the Survey Boundary and Study Areas.
- 9.4.14 The scope of ornithology surveys was confirmed with NRW through the scoping process and is summarised in **Table 9.7**. Full survey details and corresponding plans are provided in **Appendix 9A**.

Table 9.7 Summary of Field Survey Methodologies and Timings

Survey Type	Survey Methodology	Timing
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³⁰Johnstone, I.G., Hughes, J., Balmer, D.E., Brenchley, A., Facey, R.J., Lindley, P.J., Noble, D.G. and Taylor, R.C. 2022. Birds of Conservation Concern Wales 4: the population status of birds in Wales. *Milvus: the Journal of the Welsh Ornithological Society*. Available at <https://tinyurl.com/BOCCW4> (Accessed October 2023).

³¹Gwent Ornithological Society. 2019. Gwent Bird Report 2019, Vol. 55.

Vantage Point Surveys	<p>In year 1 a total of 72 hours of survey was undertaken from two different VPs between April 2020 and March 2021 with reference to SNH Guidance 2017¹⁶. This included 36 hours from each VP over the course of the breeding season (April to August) and the other 36 hours spread across the migratory and winter periods. In year 2, the survey effort was increased in the migratory periods so that 54 hours of data was recorded from each VP over the non-breeding season (September 2021 to April 2022) in addition to the 36 hours during the breeding season (April 2021 to August 2021). A total of 162 hours of survey was completed from each VP.</p> <p>With reference to guidance, watches were no longer than three hours at one time, with appropriate breaks taken between watches and timings spread over the course of the day. The VP and viewsheds (including parameters used to calculate these) are provided in Appendix 9A - Plan EDP 9.2. All target species observed flying through the viewsheds were recorded using a digital tablet, with flight heights recorded at 15 second intervals, based on the following core height bands used:</p> <ul style="list-style-type: none"> ● 0-30m; ● 30-180m (Collision Risk Zone (CRZ)); and ● >180m. <p>These height bands were selected in March 2020 to give a broad range, before the final turbine dimensions were known. In March 2021, these height bands were adjusted to allow a finer granularity to closer fit any potential final dimensions, which had yet to be finalised at this point (see Appendix 9A for further details).</p>	April 2020 to April 2022
Moorland and Breeding Bird Surveys	<p>Four visits to within 100-200m of all suitable moorland habitat within an 800m radius of the Survey Boundary, where access allowed (see Appendix 9A – Plan EDP 9.3 for the indicative transect route). Surveys were completed using an adapted Brown & Shepherd (1993)³² methodology to map the breeding territories of upland waders, such as snipe, curlew and lapwing. Passerine species were also recorded.</p> <p>With reference to best practice guidance, the surveys were timed approximately between 08.30 and 18:00 and undertaken during suitable weather conditions (i.e., days/periods with strong winds and heavy or persistent rain were generally avoided). Owing to an absence of moorland bird interests in 2020, the survey times in 2021 and 2022 were moved closer to dawn to be more in accordance with common breeding bird census methodologies.</p> <p>The 2021 and 2022 surveys were also expanded to include some additional non-moorland improved grassland habitats and increase more general breeding</p>	Mid-April to early July 2020, 2021 and 2022

³² Brown, A.F. & Shepherd, K.B. (1993) A method for censusing upland breeding wader. *Bird Study*, 40, 189–195.

bird survey coverage. The moorland breeding bird survey area was also reduced during the year 2 and 3 surveys to reflect a reduction in the Survey Boundary and removal of a moorland land parcel to the north-east from the Proposed Development.

Breeding Raptor Surveys	<p>With reference to SNH Guidance (2017)¹⁶ and standard methodology²⁵, evidence for breeding goshawk within 1km and all other raptor species within 2km of the Survey Boundary was targeted using pre-determined transect routes to incorporate all identified areas of potentially suitable breeding habitat. The transect routes were walked and driven on three occasions between the start of April and July in 2020 and four occasions between March and July 2021.</p> <p>A series of pre-determined vantage points were located along the route, as illustrated in Appendix 9A – Plan EDP 9.4. Vantage point locations were selected to observe large areas of potentially key breeding habitats. At each vantage point location along the transect route surveyors stopped for approximately 1-1.5 hours to record any observed raptor behaviour, with a particular focus on birds displaying or exhibiting other behaviour indicative of breeding.</p>	<p>May – July 2020 March – July 2021</p>
Nightjar and Owl Surveys	<p>With reference to SNH guidance and standard methodology^{16 24}, the Survey Boundary and suitable habitat within c.500m was visited on three occasions during June and July, with surveyors walking along pre-determined transect routes designed to identify the presence or likely absence of breeding nightjar and owls. An additional visit was made in March 2021 to listen for calling owls.</p> <p>Due to the large size of the Survey Boundary and distances between suitable habitat, two individual transect routes were created to adequately cover the area in a reasonable amount of time, as illustrated at Appendix 9A – Plan EDP 9.5.</p> <p>The surveys either began approximately 15 minutes after sunset or three hours before sunrise and continued for three hours. All positions of target species were marked on digitally displayed OS maps using GPS-enabled devices. In addition, the surveyors carried portable speakers on certain surveys in 2020 and 2021 and periodically played territorial calls of nightjars and owls to elicit a response from any birds present.</p>	<p>June – July 2020 March and June – July 2021 June – July 2023</p>
Winter Transect Surveys	<p>Moorland habitat across the Study Area has potential to support over-wintering or passage short-eared owl and hen harrier. Six winter transect surveys were therefore completed at monthly intervals during the winter months, as indicatively illustrated in Appendix 9A – Plan EDP 9.3.</p> <p>The moorland breeding bird survey area was reduced during year 2 to reflect a reduction in the Survey Boundary</p>	<p>October 2020 to March 2021 October 2021 to March 2022</p>

and removal of a moorland land parcel to the north-east of the Proposed Development.

Barn Owl Surveys

All buildings within c.200m radius of the proposed turbine locations and trees within 130m were assessed for the presence of barn owl during their bat roost assessments, where access allowed (See **Appendix 8A** for further details). This included subsequent dusk emergence surveys of suitable buildings and aerial tree climbing inspections of trees with suitable cavities.

May, August and September 2022

July 2023

In addition, local farmers were approached wherever possible for any information they might have on the known presence of barn owl across their land. VP survey timings were also mixed up during the survey season with some three-hour sessions timed to include crepuscular periods to record foraging on-site. Incidental sightings of this species would also have been recorded whilst completing nightjar/owl and bat surveys.

If barn owl activity had been noted during other surveys that is indicative of breeding and/or greater access become available, then further investigation of potential barn owl nest and roost sites would have been completed.

- 9.4.15 In addition, certain surveys were scoped out in light of the desk study and ongoing survey findings, the quality of those habitats present, and nature of the Survey Boundary. This included black grouse surveys, hen harrier roost surveys and woodland point count surveys. Further justification for scoping out these surveys is provided in **Appendix 9A**.

9.5 Overall Baseline

Current Baseline

- 9.5.1 The full survey findings and corresponding plans are set out in **Appendix 9A Ornithology Baseline** and summarised in turn below.

Statutory Designations for Ornithology

- 9.5.2 No part of the Survey Boundary or Study Area is covered by any statutory designations. However, there are several such designations within the Survey Boundary's potential Zol that include bird species in their citations, as summarised in **Table 9.8** and further detailed within **Appendix 9A – Plan EDP 9.6** and **9.7**.

Table 9.8 Statutory Designations within the Site's Potential Zone of Influence

Designation	Distance from the Survey Boundary	Brief Description
Llandegfedd Reservoir SSSI	7km east	Llandegfedd Reservoir is the largest inland open water habitat in the County and a regionally important area for overwintering wildfowl in Wales. The site is particularly important for the overall

		numbers and variety of wintering wildfowl, with large numbers of wigeon, pochard and mallard.
Blorenge SSSI	10km north	A large upland site supporting sub-montane heath with large areas of <i>Calluna – Empetrum - Vaccinium vitis-idaea</i> , a community which is of local distribution in south Wales. Supports a locally important population of red grouse.
Nelson Bog SSSI	10km west	Nelson Bog is of interest for its range and diversity of mire communities. The SSSI is also an important ornithological site with over 90 species recorded.
River Usk (Lower Usk) SSSI	12km north-east	The River Usk (Lower Usk) is particularly important as a rare example of a large mesotrophic lowland river which has not been subject to significant manmade modification. The site is also important for its invertebrate assemblage, otter population, diverse flora, breeding bird assemblage and diverse and high-quality riparian habitats. Part of the River Usk SAC.
River Usk (Upper Usk) SSSI	12km north-east	The River Usk (Upper Usk) is considered to be a fine example of an upland river flowing in part over hard sandstones, creating steeply graded sections with rocks, cascades, boulders and cliff-bound banks. The biological diversity of the site is also of partial interest with important populations of fish, breeding, birds, otter, mosses and lichen. Part of the River Usk SAC.
River Usk (Tributaries) SSSI	12km north-east	The Usk system, comprising the River Usk and including its upper tributaries, represents a large, linear ecosystem that acts as an important wildlife corridor, an essential migration route and key breeding area for many nationally and internationally important species. The Usk tributaries support internationally important populations of otter, Atlantic salmon, bullhead, brook lamprey and river lamprey. Part of the River Usk SAC.
Severn Estuary SPA/Ramsar	14km south	The Severn Estuary is important for migratory birds with its tidal flats and associated wetlands regularly supporting over 20,000 wintering waterfowl. Internationally important populations of five species of waterfowl are regularly supported by the estuary. These include European white-fronted goose, shelduck, gadwall, dunlin and redshank. In addition, the islands of Flat Holm and Steep Holm support a nationally important breeding population of lesser black-backed gulls. The Severn Estuary also regularly supports an internationally important population of Bewick's swan, an Annex I species.
Lisvane Reservoir SSSI	14km south-west	A reservoir providing habitat to wildfowl species including mallard, teal (<i>Anas crecca</i>), tufted duck (<i>Aythya fuligula</i>), pochard, and coot (<i>Fulica atra</i>). Occasionally also divers and grebes.
Flat Holm and Steep Holm SSSI	31km and 35 km south-east	Notified for its internationally important populations of wintering and wading birds of passage, supporting estuarine habitats of ornithological significance. The estuary as a whole supports about 10.5% of the British wintering population and is the single most important wintering ground of dunlin in Britain. Nationally important lesser black-backed gull populations. Included in light of consultation with NRW and the presence of gull species commuting/migrating over the Survey Boundary.

- 9.5.3 The majority of these sites support species associated with riverine habitats and large waterbodies (e.g., Llandegfedd Reservoir SSSI). Records for such species were not recorded during the surveys, except for mallard recorded flying over the Survey Boundary on a few occasions during the breeding and winter/migratory season and landing on a small pond twice. No other species for which Llandegfedd Reservoir SSSI is designated were recorded during the surveys.
- 9.5.4 Owing to these statutory sites' spatial separation from the Survey Boundary, and in light of the desk and field-based survey findings, it is considered to be very unlikely that the proposals alone, or in combination with other proposals, will result in significant adverse effects on the designated interests of these statutory sites. As such, they can be scoped out of the OIA, with the exception of Severn Estuary SPA/Ramsar, and the constituent Flat Holm and Steep Holm SSSI. These designations are given further consideration due to the regular presence of lesser black-backed and herring gull moving over the Survey Boundary. These designations have been included as International and Nationally important features respectively.

Non-statutory Designations for Ornithology

- 9.5.5 There are four non-statutory designations which are located partly within or adjacent to the Survey Boundary that include ornithology interests in their citations. These are summarised in **Table 9.9** below and illustrated in **Appendix 9A - Plan EDP 9.8**.

Table 9.9 Summary of Non-statutory Designations Located Partly Within or Adjacent to the Survey Boundary with Birds Included in their Citations

Designation	Distance from the Survey Boundary	Brief Description
Coed Cil-Lonydd, East of Newbridge	Borders the south-west boundary of the northern parcel (ref C8)	This SINC contains an area of broad-leaved woodland with an assemblage of semi-natural indicator species, as well as a stream and scrub patches. Notable bird species observed included buzzard, raven, and song thrush (<i>Turdus philomelos</i>).
Cwm Hafod-Fach Woodlands, North of Abercarn	Located on the western border of the southern parcel (ref C5)	Mixed woodland on the slopes surrounding a quarry. Notable bird species observed included buzzard, skylark, wood warbler (<i>Phylloscopus sibilatrix</i>), willow warbler (<i>P. trochilus</i>), song thrush, and meadow pipit.
Gwydon Valley Woodlands, Abercarn	Borders the eastern boundary of central and southern parcels, and the road connecting them to the northern parcel (ref C73)	A large area of forestry plantation on the site of former ancient woodland. A few large beech trees remain, plus semi-natural indicator species as ground flora. Notable bird species observed included curlew (<i>Numenius arquata</i>), sparrowhawk, buzzard, raven, skylark, willow warbler, goldcrest (<i>Regulus regulus</i>), and meadow pipit.
Mynydd Maen, East of Newbridge	Borders the south and east of the northern parcel, and	A large area of open countryside containing semi-natural upland features, including acid grassland/heath and locally significant bryophyte species. It has the potential to support breeding waders such as curlew and lapwing.

includes part of
the road that
connects all
parcels (ref
C72)

- 9.5.6 As Mynydd Maen, East of Newbridge SINC, is only identified as having potential to support lapwing and curlew and no lapwing or curlew were recorded during the suite of ornithology surveys. This designation has been scoped out from further consideration. However, it is considered with respect to other ecology impacts under **Chapter 8 Ecology**.

Desk Study Species Records

- 9.5.7 Pertinent desk study results for target species (excluding passerines) returned from the desk study, including nearby Wind Farm ornithology findings, is provided in **Appendix 9A** and referenced where appropriate in the species accounts and evaluations.

Breeding Bird Assemblage

- 9.5.8 During the 2020 to 2022 breeding survey seasons, a total of 59 species were recorded, including 12 target species. These species were recorded during VP surveys and specific breeding bird, raptor and nightjar/owl surveys undertaken between April and August 2020, 2021 and 2022, in addition to nightjar surveys in June and July 2023. Known nest locations and indicative locations of raptor, nightjar, and moorland bird species breeding activity are provided in **Appendix 9A**.
- 9.5.9 Of the 12 target/notable species recorded, four (goshawk, kestrel, long-eared owl and nightjar) were confirmed as breeding within the Study Area, two as probably breeding (peregrine and cuckoo), and one as possibly breeding (red kite).
- 9.5.10 One Schedule 1 species (goshawk) was confirmed to have bred in, or within 2km, of the Survey Boundary. Three other Schedule 1 target species (red kite, hobby, and osprey) were also recorded within the Survey Boundary.
- 9.5.11 A number of Red listed passerine species were recorded within the Study Area including willow warbler, goldcrest, starling, spotted flycatcher, meadow pipit, tree pipit, and linnet. With the exception of starling, tree pipit, and linnet, all of these species are confirmed or probable breeding species. All of these species, bar willow warbler, goldcrest, and meadow pipit, were uncommon across the Study Area, restricted to areas of suitable habitat. Meadow pipit was abundant across the Study Area, with willow warbler and goldcrest abundant among wooded areas.
- 9.5.12 The remaining breeding bird assemblage is made up of fairly widespread and ubiquitous species typical of the Study Area's geographical location and habitats present. This includes species on the Amber List of conservation concern such as skylark, which was abundant across the Study Area.
- 9.5.13 The Study Area supports a breeding bird assemblage that reflects the location and habitats present, including a number of species of local and national conservation concern breeding in small numbers. Given the size of the Survey Boundary and wider Study Area, historic records, and SINC citations, it is likely that the area formerly supported a greater diversity and abundance of species. This is indicative of a wider decline in species associated with moorland habitats, as reflected by the target species conservation status, and is likely a result of habitat degradation and relatively high levels of recreational

disturbance. Non-target conservation concern passerine species such as skylark and meadow pipit were recorded in greater abundances.

- 9.5.14 Owing to the relatively limited diversity and abundance of priority and conservation concern species recorded, as set out in more detail under the species accounts, the breeding bird assemblage is considered to be of Local importance, with the exception of a nightjar and long-eared owl populations of up to County value.

Winter Bird Assemblage

- 9.5.15 During the migratory and winter 2020–2021 and 2021–2022 survey seasons, a total of 53 species were recorded, including 12 target species: mallard, red grouse, snipe, herring gull, lesser black-backed gull, grey heron, goshawk, hen harrier, red kite, kestrel, osprey and peregrine. As set out in the species accounts that follow, all of these species were recorded relatively infrequently and in low numbers. No significant populations beyond a local context were recorded.
- 9.5.16 Other Red list passerine species recorded across the Study Area over winter included goldcrest, starling, meadow pipit, greenfinch and linnet. The Schedule 1 listed crossbill and brambling were also occasionally recorded in association with coniferous woodland habitat. However, none of these species were regularly recorded in significant numbers with registrations predominantly limited to single birds or small flocks. The presence of these species in low numbers is considered to reflect the habitats present and not significant in terms of the value of the wintering bird assemblage.
- 9.5.17 Overall, the winter and migratory bird assemblage supported by the Survey Boundary and surrounding Study Area appears to be relatively limited in abundance with only modest species diversity given the extent of area and range of habitats. This may be a reflection of the degraded nature of the moorland habitats present and/or recreational disturbance, which remained relatively high even over the winter. Whilst conservation concern species such as red kite, hen harrier, peregrine, goshawk, and kestrel were recorded, activity of all species was low and did not indicate the presence of any notable populations. Hen harrier was not confirmed as roosting within the Study Area and a single sighting of this species is not unusual for upland sites in mid-Wales during the migration and winter season.
- 9.5.18 It is considered that no species population present in the winter bird season is valued at above Local value. The combined wintering bird assemblage is therefore considered to be of Local importance.

Target Species Accounts

- 9.5.19 A summary of the activity recorded across the suite of bird surveys grouped by species is summarised in **Table 9.10**, including the species' conservation status. Full species accounts, including information such as flightline data and reasons for the species geographic valuations, is provided in **Appendix 9A**.

Table 9.10 Summary and Valuation of Target Species

Species	Conservation/ Protected Status	Local Status	Key Survey Boundary/Study Area Recordings/Status	Importance
Mallard	Green	Resident breeder.	Non-breeding occasional winter visitor with five flyovers recorded during VP surveys and a pair recorded on a pond on Mynydd	Less than Local

Maen Common to the east of the Survey Boundary in March 2022.				
Red Grouse	Priority Red	Uncommon breeding resident with apparent decline in recent years.	Non-breeding - recorded on two occasions during winter transects and once during VPs on moorland habitat to the east of the Survey Boundary. Red grouse were also recorded in this area surveys completed to inform the Mynydd Maen Wind Farm proposals ³³ .	Local
Herring Gull	Priority Red	Fairly common all year, distinct spring passage, mainly breeding in industrial areas.	<p>Small flocks and individual birds recorded all year round flying over the Survey Boundary (52 flights). Higher numbers recorded flying over the Survey Boundary during the breeding season.</p> <p>No breeding or notable foraging or resting recorded within the Survey Boundary. Activity reflective of movements over the wider landscape and only small numbers recorded relative to the population supported by Severn Estuary SPA and Flat Holm and Steep Holm SSSI. The site is not considered to be functionally linked to these designated sites in the wider landscape.</p>	Local
Lesser Black-backed Gull	Red	Fairly common, distinct spring passage, modest but growing numbers with most breeding in industrial areas.	<p>Small flocks and individual birds recorded all year round flying over the Survey Boundary (50 flights). Higher numbers recorded flying over the Survey Boundary during the breeding season.</p> <p>No breeding or notable foraging or resting recorded within the Survey Boundary. Activity reflective of movements over the wider landscape and only small numbers were recorded relative to the population supported by Severn Estuary SPA and Flat Holm and Steep Holm SSSI. The site is not considered to be functionally linked to these designated sites in the wider landscape.</p>	Local
Grey Heron	Amber	Fairly common breeding resident.	Non breeder with five winter sightings, five breeding season sightings and five flights recorded during VPs. These sightings were primarily in association with a pond to the north-east of the Survey	Less than Local

			Boundary and within the south of the Survey Boundary.	
Goshawk	Schedule 1 Amber	Uncommon breeding resident.	Confirmed breeding (one pair) within the Study Area with a nest site located 0.95km from the Survey Boundary. Year-round resident though only recorded twice during VP surveys.	Local
Peregrine	Annex 1 Schedule 1	Resident and winter visitor..	Probable breeding pair occupies quarry to the east of the Survey Boundary. Recorded relatively regularly flying or hunting over the Survey Boundary (37 flights) throughout the year.	Local
Osprey	Schedule 1 Amber list	Scarce passage migrant	Single flyover recorded in April 2022. Non-breeding.	-
Red Kite	Annex 1 Schedule 1	Scarce visitor and passage migrant, rare breeding resident.	Possible breeding (one pair) within the Study Area and year around resident with occasional flights (31 in total) over the Survey Boundary.	Local
Kestrel	Priority Red	Fairly common (though declining) breeding resident.	Confirmed breeder within the wider Study Area (one pair) associated with moorland habitat to the north-east of the Survey Boundary, as supported by surveys completed to inform the Mynydd Maen Wind Farm proposals ³³ . Year around resident with six breeding season flights and 17 non-breeding season flights recorded during VP surveys.	Local
Hobby	Schedule 1	Breeding summer visitor.	A single hobby was recorded flying over the Survey Boundary during the 2021 breeding season. Non breeder.	-
Hen Harrier	Annex 1 Schedule 1 Priority Red	Scarce passage migrant and winter visitor.	A single female bird recorded on one occasion in November 2020 on moorland habitat to the north-east of the Survey Boundary. Anecdotal and historic records of this species associated with the moorland habitat including five winter flights in this area recorded by the Mynydd Maen Wind Farm proposals ³³ .	Local

³³ Renewable Energy Systems Ltd (November 2021) Mynydd Maen Wind Farm Environmental Impact Assessment Scoping Report.

Non breeder and infrequent passage migrant and winter visitor.

Long-eared Owl	Amber	Scarce breeding resident and winter visitor in Gwent.	Confirmed to be breeding (one pair) within coniferous woodland within the Study Area. Single recording of juvenile birds calling c.1km east of the Survey Boundary. According to The Birds of Wales ³⁴ , Gwent had 11 confirmed pairs of breeding long-eared owl in 2014, the highest of any county in Wales, and only three confirmed breeding sites in 2018.	County
Snipe	Amber	Fairly common winter visitor and an uncommon breeding species.	Recorded on 11 occasions during winter bird transects in association with moorland to the north-east of the Survey Boundary within the wider Study Area. Non-breeding.	Local
Nightjar	Annex 1 Priority	Uncommon breeding summer visitor.	Confirmed breeding within Study Area with 6-8 pairs associated with felled woodland habitat outside of the Survey Boundary.	County
Cuckoo	Priority Red	Fairly common breeding summer visitor.	Probable breeding (1-2 pairs) within both the Study Area with seven records of calling males.	Local

9.5.20 In addition to target species, a number of other notable species were recorded that have either not been included as target species owing to their favourable conservation status or because they are not considered to be at risk of adverse effects from a wind farm development. The most abundant and notable of these are provided in **Table 9.11**, with full species lists provided in **Appendix 9A**, in addition to further information on the number and nature of sightings during the survey work.

Table 9.11 Summary and Valuation of Notable Non-target/Secondary Species

Species	Conservation/ Protected Status	Local Status	Key Survey Boundary/Study Area Recordings/Status	Importance
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³⁴ Pritchard, R., Hughes, J., Spence, I.M., Haycock, B., and Brenchley, A. (editors) (2021) The Birds of Wales – Adar Cymru. Liverpool University Press, Liverpool

Buzzard		Common breeding resident.	A total of 156 buzzard flights were made across the two years of VP survey with a further 52 sightings during the raptor surveys. Confirmed breeder and recorded throughout the year hunting within the Survey Boundary.	Less than Local
Sparrowhawk		Breeding resident.	12 sparrowhawk recordings were made over the course of the bird surveys. Probable breeder within the Study Area	Less than Local
Raven		Fairly common breeding resident.	253 flights recorded during the VP surveys. Present year round and confirmed breeder.	Less than Local
Tawny Owl		Common breeding resident.	Tawny owl were recorded 20 times during the owl surveys. Confirmed breeder within suitable woodland habitats.	Less than Local
Crossbill	Schedule 1	Uncommon breeder and winter visitor in highly variable numbers.	Winter visitor recorded within suitable woodland habitats with a peak count of nine birds. Also recorded on three occasions during the 2022 breeding bird surveys and could therefore be a possible breeder.	Less than Local
Brambling	Schedule 1	Fairly common winter visitor and passage migrant.	Brambling were recorded on four occasions: twice in December 2021 and twice in March 2022. The first survey included a flock of 40 birds and the second included a count of approximately 200 birds.	Less than Local
Starling	Priority Red	Common breeding resident, passage migrant and winter visitor.	Recorded foraging or commuting within the Survey Boundary during the winter and breeding bird surveys and possible breeder within Study Area. These were mostly small flocks; however, the peak count was one larger flock of 250 during the January 2021 survey. No murmuration behaviour was noted.	Local
Skylark	Priority Amber	Fairly common to common breeding resident and passage migrant.	Confirmed abundant resident breeder (10-20 pairs) associated with the moorland habitat in wider Study Area.	Local

Meadow Pipit	Red	Common breeding resident, passage migrant and winter visitor.	Resident confirmed breeder (4-5 pairs) associated with the moorland habitat in wider Study Area.	Up to Local
Tree Pipit	Priority Red	Common passage migrant and breeding summer visitor.	Possible breeder within Survey Boundary (1-2 pairs) and probable breeder in wider Study Area.	Up to Local
Redwing	Schedule 1	Common winter visitor.	Recorded roosting and foraging in moderate numbers within the Study Area throughout winter and passage seasons. A peak count of 200 redwing was recorded in December 2021.	Less than Local
Fieldfare	Schedule 1 Amber	Common winter visitor.	Recorded roosting and foraging in moderate numbers within the Study Area throughout winter and passage seasons. A peak count of 250 fieldfare was recorded in March 2022.	Less than Local

Future Baseline

- 9.5.21 It is anticipated that if the Proposed Development did not proceed, land practices would remain the same, with the majority of the grassland areas continuing to be grazed and the adjacent coniferous plantation commercially managed. Current recreational use is largely restricted to public rights of way and is likely to also remain the same or potentially increase slightly over time, in line with population growth in the local area. Ornithology assemblages and species would therefore likely remain predominantly the same.
- 9.5.22 However, the rotational felling and planting of coniferous woodland areas is likely to influence the distribution and abundance of certain species adjacent to the Survey Boundary, including target species such as long-eared owl, nightjar and goshawk. Indeed, this is reflected by an increase in nightjar colonising newly cleared areas of forestry in 2023.
- 9.5.23 Given current population trends, it is likely that red kite numbers will increase within the Survey Boundary over time, while other species that are declining nationally and within Gwent, may continue to do so.
- 9.5.24 The changes to temperature and precipitation predicted as a result of climate change would likely change the landscape around us over time in a number of ways. However, it is unlikely that such subtle changes would lead to wholesale change to the future ornithology baseline within the lifetime of the Development. Changes could include certain ornithology species becoming more prevalent or declining as their ranges contract or expand, particularly during passage migration and over wintering. However, given that the important bird species are generally widespread, and that the Survey Boundary is not near the edge of any of their ranges, the projected change in temperature and precipitation is not anticipated to result in any significant changes to Important Ornithology Features.

9.6 Embedded Measures

9.6.1 A range of environmental measures have been embedded into the Proposed Development as outlined in **Section 4.4**. Error! Reference source not found. outlines how these embedded measures will influence the Ornithology assessment.

Table 9.12 Summary of the Embedded Environmental Measures

Receptor	Potential Changes and Effects	Embedded Measures	Compliance Mechanism
Construction			
All bird species	Production of noise or visual disturbance that has the potential to disturb or displace birds resulting in breeding failure and impacts on the local population.	<p>Construction methods and programme will consider the location of identified nest sites with the timing and duration of works managed to avoid direct conflict.</p> <p>Where works cannot be scheduled to avoid the main breeding season, additional measures such as the employment of protection zones around nest sites and visual screens/noise screens would be considered.</p> <p>The use of lighting around the proposed construction compound will be restricted.</p>	Construction Environmental Management Plan (CEMP) secured by DNS condition.
Breeding bird assemblage	Permanent or temporary land-take/changes to habitats to facilitate construction could displace birds from existing habitat and result in direct injury or damage to nest sites.	<p>Proposals have sought to minimise habitat losses and only very small areas of woodland/scrub will be lost to facilitate access track upgrades. Measures to prevent impacts on breeding birds will be set out in the CEMP and include:</p> <ul style="list-style-type: none"> • Vegetation clearance outside of the breeding bird season (i.e., between September and February); • Use of dedicated working areas and 	CEMP.

	<p>construction access routes;</p> <ul style="list-style-type: none"> • Ecological Clerk of Works (ECoW) to carry out pre-works checks and monitoring of construction areas where they cannot be completed outside of the breeding bird season (March to August inclusive); and • Any active bird nests in or immediately adjacent to working areas would be identified and provided with appropriate no working protection zones.
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Operation

Target Species	Mortality of birds due to collision with turbines during breeding and non-breeding season.	The number of turbines and their positioning has been informed by ornithological sensitivities to minimise impacts. Strategy developed to monitor the number and frequency of collisions.	A Collision Mitigation and Monitoring Strategy (CMMS) secured via DNS condition.
All birds	Displacement of birds from usual foraging and migratory routes due to visual and noise disturbance from operational turbines.	The number of turbines and their positioning has been informed by ornithological sensitivities to minimise impacts. Birds will adapt to the surroundings. Landscape and Ecology Management Plan (LEMP) setting out the long-term management and	LEMP.

enhancement of habitats, for all wildlife, including birds.

Breeding bird assemblage	Noise or visual disturbance during routine and emergency maintenance that has the potential to disturb or displace birds resulting in breeding failure and impacts on the local population.	Maintenance methodology to be adopted via CMMS that ensures major maintenance works avoid the breeding season, where possible, and/or are completed sensitively where nest sites of Schedule 1 species are known.	CMMS and LEMP
		LEMP will include ongoing long-term management measures to enhance wider opportunities for any disturbed or displaced birds.	

9.7 Scope of the Assessment

Overview

- 9.7.1 Best practice guidelines for Ecological Impact Assessment (EcIA) (CIEEM 2018)¹⁵ recognise that not every species that is potentially present at a site or affected by a development can be assessed. The guidelines advocate that the EcIA process includes an initial ‘scoping stage’ to identify ecological or ornithological features that are unlikely or likely to be significantly affected by the Proposed Development, thereby allowing the assessment to focus on those ecological or ornithological features that are pertinent to the Proposed Development and planning decision. This process is informed by the site investigations and consultation with key stakeholders, including the formal EIA Scoping response. This section summarises the approach to, and outcomes of, the OIA scoping stage, including those ornithology features that have been scoped into or out of the assessment.

The Proposed Development

- 9.7.2 The Proposed Development is described in full in **Chapter 4**. It comprises a wind farm consisting of up to four wind turbines, each with a three-bladed rotor with a diameter of up to 117m, a hub height of up to 91.5m and maximum height to blade tip of 145m.
- 9.7.3 The application also includes associated infrastructure, including: access works - improvements to the existing access together with new and improved internal wind farm tracks off the main internal access road; crane pads at each turbine location; turbine foundations; underground power cables linking the turbines and on-site substation; temporary construction compounds, laydown and storage areas; and grid connection infrastructure, including the on-site substation and control building linking the Proposed Development to the distribution network, together with construction enabling works.
- 9.7.4 The wind farm will have an operational life of 30 years. For the purposes of this assessment, it is assumed that the wind farm would be decommissioned at this point,

though there is also the option for the developer to apply for an extension or upgrades in technology.

Spatial Scope

- 9.7.5 The spatial scope of the assessment of Ornithology covers the area of the Survey Boundary which encompasses the Proposed Development, together with the Zols that have formed the basis of the Study Areas described in **Section 9.4**. This has been determined through a review of the baseline ornithology conditions relative to the project in the context of the proposed activities. It has also been informed by liaison with consultees and other specialists involved in assessing the effects in other disciplines of the project, as considered within this ES and other supporting documentation.
- 9.7.6 The scope of the desk study and survey areas reflects the sensitivity and value of potential ornithology receptors, extending to 30km and 2km from the Survey Boundary respectively. The spatial scope of the surveys was subject to small variations between the year one and year two surveys due to minor changes in the potential turbine and infrastructure locations.

Temporal Scope

- 9.7.7 The temporal scope of the assessment of ornithology is consistent with the period over which the Project would be carried out as set out in **Chapter 4**. This includes an anticipated 24 month construction period and 30 year operation. Effects during decommissioning have not been specifically assessed at this stage; however, it is considered that they will be similar or no worse than construction effects.

Potential Receptors

- 9.7.8 A number of criteria are available to determine the conservation status of those bird species recorded through the desk- and field-based studies. These criteria aid in evaluating the value of the species and combined assemblage present within the Survey Boundary during the winter, migratory and breeding seasons. The most appropriate of these are:
- Schedule 1 of the *Wildlife and Countryside Act* (WCA) 1981 (as amended) – The WCA affords greater protection to certain breeding species that are considered appropriately at risk nationally and are as such listed as specially protected under Schedule 1;
 - Birds of Conservation Concern Wales 4 (2022) – Under this approach Welsh bird populations are assessed, using quantitative criteria, to determine the population status of each species and then placed on one of three lists: Red, Amber or Green. These criteria include:
 - ▶ Red list species are of high conservation concern, being either globally threatened, having historical Welsh population declines between 1800 and 1995 or a rapid population decline or breeding range contraction by 50% or more in the last 25 years;
 - ▶ Amber list species are of medium conservation concern due to a number of factors, for example having suffered between 25% and 49% contraction of UK breeding range or a 25-49% reduction in breeding or non-breeding populations over the last 25 years. Species which have a five year mean of fewer than 30 breeding pairs or an unfavourable European conservation status, or for which the breeding or wintering population in Wales represents 50% or more of the UK population are also listed on the Amber list; and

- ▶ Green list species are those that don't fit into either of the previous two categories;
- Priority species listed under Section 7 of the *Environment (Wales) Act* 2016;
- Species status as defined in the 2019 Gwent Bird Report; and
- Criteria for the selection of Local Wildlife Sites in Caerphilly.

9.7.9 A summary of the approach taken to valuing ornithological receptors at different geographic scales is provided in **Table 9.13**.

Table 9.13 Ornithology Receptors Subject to Potential Effects

Receptor	Geographic Valuation Examples
International	<p>International nature conservation areas including any SPA, proposed SPA or Ramsar.</p> <p>Populations of internationally designated site qualifying species that depend on the Development Site (i.e., functionally linked to the designation).</p> <p>Species present in internationally important numbers (>1% of European populations).</p> <p>Species listed on Annex I of the EC Birds Directive if present in qualifying numbers/proportions of international population.</p>
National (Wales/UK)***	<p>National nature conservation areas, including any SSSI or NNR designated for ornithology features.</p> <p>Populations of national nature conservation area qualifying species that depend on the Development Site (i.e., functionally linked to the designation).</p> <p>Breeding or overwintering populations of ecologically sensitive rare bird species (<300 breeding pairs in the UK).</p> <p>Species present in nationally important numbers (>1% Welsh/UK population).</p> <p>Regularly occurring relevant migratory species, which are of rare and/or of significant conservation concern that warrant special consideration on account of the proximity of migration routes, breeding, wintering and staging areas in relation to the Development Site.</p>
County (Caerphilly)	<p>Local nature conservation areas designated for ornithology, including any LNR or SINC.</p> <p>Populations of species for which a locally designated site has been designated that depend on the Development Site.</p> <p>County-scale important population/assemblage of bird species listed on Schedule 1 of the WCA or Section 7 of the <i>Environment (Wales) Act</i> 2016</p> <p>Species present in regionally important numbers (>1% regional population).</p> <p>Significant breeding or overwintering populations of species on the Red List for Birds of Conservation Concern within the county context.</p> <p>Significant species, populations or assemblage that would meet the criteria set for SINC designation.</p>
Local	<p>Breeding or overwintering populations of bird species listed on Schedule 1 of the WCA or Section 7 of the <i>Environment (Wales) Act</i> 2016 where not captured in higher scale categories.</p>

Other species of conservation interest where a notable population is present, e.g. breeding populations of red- or amber-listed species of Birds of Conservation Concern.

Site (Less than local)	All other species not included in the above categories, such as populations of green-listed species or smaller populations of certain conservation concern species that are otherwise common and widespread. Such species are normally scoped out of the assessment process.
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- 9.7.10 It should be noted that the criteria for ornithology features set out in **Table 9.13** is used alongside the professional judgement of experienced ornithologists.
- 9.7.11 The principal ornithology receptors that have been identified as being potentially subject to effects are summarised in **Table 9.14** with further details provided in **Table 9.10**. Full explanations pertaining to their geographic valuations are provided in **Appendix 9A**.

Table 9.14 Summary of Important Ornithology Features Subject to Potential Effects

Receptor	Geographic Value	Reason for Consideration
Severn Estuary SPA/Ramsar	International	Within Zol, designated species (gull species) recorded during surveys. Consideration requested in Scoping Responses.
Flat Holm and Steep Holm SSSI	National	Part of Severn Estuary SPA/Ramsar with designated species (gulls) recorded during surveys. Consideration requested in Scoping Responses.
SINCs partially within or adjacent to the Survey Boundary	County	Coed Cil-Lonydd, East of Newbridge Cwm Hafod-Fach Woodlands, North of Abercarn Gwydon Valley Woodlands, Abercarn Partially cover or lie adjacent to the Survey Boundary and while ornithology interests are not the primary reason for designation, they include reference to birds in their citations that were also identified through the survey work. Further assessment of wider ecology effects upon these SINCs is provided in Chapter 8 Biodiversity .
Red Grouse	Local	Small wintering population associated with moorland habitat to north-east of Study Area.
Lesser Black-backed and Herring Gull	Local	Regularly recorded flying over the Survey Boundary throughout the year, with peak activity during the spring. No notable foraging, resting or breeding. The Study Area is therefore not considered to be functionally linked to the Severn Estuary SPA/Ramsar or Flat Holm and Steep Holm SSSI and only small numbers were recorded relative to the designated site populations. Furthermore, movements were reflective of those across the wider landscape and the county bird report identifies increased breeding in urban areas, many of which lie in closer proximity to the Study Area than the designated sites.

Goshawk	Local	Confirmed breeder (one pair) and resident all year within Study Area.
Peregrine	Local	Probable breeder (one pair) and resident all year within Study Area.
Red Kite	Local	Possible breeder (1-2 pairs) and resident all year within Study Area.
Kestrel	Local	Confirmed breeder (one pair).and resident all year within Study Area.
Hen Harrier	Local	Infrequent passage migrant and winter visitor to moorland to northeast of Study Area (single recording).
Long-eared Owl	County	Confirmed breeder (one pair) within woodland habitats in Study Area and likely resident.
Nightjar	County	Summer visitor and confirmed breeder (6-8 pairs) within Study Area.
Cuckoo	Local	Summer visitor and probable breeder (1-2 pairs) within Study Area.
Snipe	Local	Small wintering population associated with moorland habitat to the northeast of Study Area.
Breeding Bird Assemblage	Local to County	Reflects the location and habitats present, including a number of species of local and national conservation concern, including small breeding populations of up to County importance. Locally valuable populations of non-target passerine species such as skylark and meadow pipit recorded.
Winter Bird Assemblage	Local	Relatively limited in species diversity and abundance given the extent of area and range of habitats. No populations noted of value beyond a Local context. Includes non-target passerines such as crossbill, redwing and fieldfare.

Likely Significant Effects

- 9.7.12 The effects on ornithology receptors which have the potential to be significant and have been taken forward for detailed assessment are summarised in **Table 9.15**. This has been informed by best practice guidance and professional judgement.
- 9.7.13 The receptors/effects detailed in **Table 9.16** have been scoped out from being subject to further assessment because the potential effects are not considered likely to be significant.

Table 9.15 Summary of Effects Scoped into the Ornithology Assessment

Receptors/potential effects	Potential Changes and Effects	Justification
Construction		
Nightjar Peregrine	Noise and visual disturbance of nesting birds.	Both species hold territories in relatively close proximity (<500m) from the Survey Boundary and therefore noise and/or visual disturbance during construction has the potential to displace birds and/or lead to failed breeding attempts. Originally nightjar were scoped out with Planning Environment and Decisions Wales (PEDW) and NRW through scoping, however, owing to the identification of new territories in relatively close proximity to the turbines, this species has now been scoped in as a precaution.
Breeding Bird Assemblage	Noise and visual disturbance of nesting birds.	Noise and/or visual disturbance from the construction of turbines and associated infrastructure including the upgrading of access routes throughout the Survey Boundary has the potential to displace birds, and/or lead to failed breeding attempts, particularly open ground nesting species such as skylark and meadow pipit.
	Permanent or temporary habitat loss.	Permanent and temporary land take to facilitate the construction of turbines and associated infrastructure has the potential to reduce the availability of nesting, foraging or resting habitats used by the moorland breeding bird assemblage.
Operation		

<p>Severn Estuary SPA/Ramsar Flat Holm and Steep Holm SSSI</p>	<p>Designated gull population colliding with turbines resulting in mortality.</p>	<p>Lesser black-backed gull, for which these sites are partially or potentially designated due to the breeding colonies they support, have been regularly recorded flying over the Survey Boundary, including within the collision risk zone during the breeding season. Whilst likely significant adverse effects on these designations as a result of collisions with turbines are considered to be unlikely, in light of the Scoping Responses and Habitats Regulations considerations, further detail and assessment has been provided.</p> <p>Steep Holm and Flat Holm SSSI have also been designated for the herring gull breeding populations they support, another species recorded relatively frequently flying in the CRZ during the breeding season and therefore subject to further assessment.</p>
<p>Lesser Black-backed Gull Herring Gull Peregrine Goshawk Red Kite Kestrel Nightjar</p>	<p>Collisions with turbines resulting in mortality.</p>	<p>Sufficient recordings within the collision risk zone, or proximity of nest sites in the case of nightjar, to warrant further analysis of the mortality risk to inform the assessment of potential significant effects.</p>
<p>Peregrine Goshawk Red Kite Kestrel Nightjar Breeding Bird Assemblage</p>	<p>Disturbance and displacement from operating turbines.</p>	<p>Turbines would be within disturbance distances of suitable habitat used for foraging, resting and potentially breeding by these species.</p>

Table 9.16 Summary of Important Ornithology Features and Effects Scoped out of the Ornithology Assessment

Receptors/potential effects	Potential Changes and Effects	Justification
<p>Severn Estuary SPA/Ramsar Flat Holm and Steep Holm SSSI</p>	<p>Adverse effects on the integrity of the conservation status of designated species during construction.</p>	<p>It is not considered that construction-related temporary and permanent land take or noise and visual disturbance/displacement would have a significant adverse effect on lesser black-backed or herring gulls. These species have principally been recorded flying over the Survey Boundary and are also not considered to be particularly sensitive to human and machinery disturbance.</p>

SINCs within/adjacent to Survey Boundary	Adverse effects on conservation status of designated species during construction and/or operation.	None of the SINCs within or adjacent to the Survey Boundary are specifically designated for birds, with other habitat and species interests being the primary reasons for their designation. Potential adverse effects on these ecology designations will therefore be considered more holistically, where applicable, under the Ecology Impact Assessment (Chapter 8). Furthermore, any target species referenced in these citations, if present within the Survey Boundary or Study Area, are considered as standalone IOFs, with assemblages also collectively grouped and evaluated where applicable. In light of this, all non-statutory designations have been scoped out of the OIA.
Red Grouse Snipe Hen Harrier	Disturbance and displacement during construction and operation.	Small winter populations recorded within moorland habitat over 500m to the north-east of Turbine 1 within the wider Study Area. In the case of hen harrier, this was limited to a single sighting. The habitat within the Survey Boundary is closely grazed pasture which does not provide suitable cover and/or foraging opportunities for these species. Studies have shown that red grouse abundance and distribution does not appear to be affected by wind farm proposals, though snipe numbers may potentially be by construction activities ^{35 36} . The nearest construction activities associated with Turbine 1 are >500m from the nearest recordings of these species and therefore considered to be beyond potential disturbance distances. They are also at the outer limit of potential disturbance distances for hen harrier during the non-breeding season, which are considered to be up to 750m ³⁷ .
	Collisions with turbines during operation resulting in mortality.	These species are also not at notable risk of collisions with turbines, predominantly being either ground based and/or flying below CRZ. No flights from any of these species were recorded within the CRZ.
Herring and lesser black-backed gull	Disturbance and displacement from operating turbines.	Absence of resting and only limited foraging recorded within the Survey Boundary. The loss of this resource would not be significant to the breeding or overwintering populations and these species are adaptable foragers, with similar habitats available in the wider landscape. Furthermore, both species are not considered to be sensitive to human and machinery disturbance.
Goshawk Red Kite Kestrel	Noise and visual disturbance of nesting birds during construction.	The closest known nest site for these species is goshawk, which is located approximately 1km to the south-east of Turbine 3 and 4, and therefore considered to be sufficiently removed to not be at risk of construction-related disturbance impacts while nesting, particularly given the intervening dense forestry and changes in topography. The largest recommended disturbance protection buffers quoted in research papers are up to 500m for goshawk, 300m for red kite and 200m for kestrel ³⁷ .

³⁵Pearce-Higgins et al (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*, Volume49, Issue2 April 2012, Pages 386-394

³⁶Douglas, D.J.T., Bellamy, P.E. & Pearce-Higgins, J.W. (2011) Changes in the abundance and distribution of upland breeding birds at an operational wind farm. *Bird Study*, 58, 37–43.

³⁷ Ruddock M., & Whitfield, D.P (2007) A review of Disturbance Distances in Selected Bird Species. SNH

		Embedded mitigation measures, set out in the CEMP, such as pre-commencement surveys and sensitive construction practices, will ensure that, should any closer nest sites be identified in future, they will be protected from disturbance.
Raven and Buzzard	Disturbance and displacement during construction and operation.	While frequently recorded, owing to their common and widespread distribution and favourable conservation status it is considered that adverse effects upon such species would not be significant. Both species are known to inhabit and become habituated to anthropogenic disturbance, and they are therefore not sensitive to disturbance and displacement from noise and visual disturbance.
	Collisions with turbines during operation resulting in mortality.	CRM for these species was completed as a precaution and is presented in Appendix 9B . Collision rates for buzzard and raven are predicted to be approximately one bird every three years. In the context of the species' favourable conservation status, local abundance and background adult mortality rates, such increases in mortality would be very low and not have a significant adverse effect on the local populations.
Long-eared Owl	Disturbance and displacement during construction and operation.	As a nocturnal species roosting in dense woodland habitat during the day, this species is considered to be less at risk of visual and noise disturbance impacts during construction and routine maintenance operation than open habitat species. Furthermore, the only long-eared owl records were 1.2km from the nearest works area around Turbine 1 and therefore well beyond potential disturbance distances (100m during breeding season and up to 300m during the non-breeding season ³⁷). There is also no suitable woodland habitat within the Survey Boundary. In addition, the coniferous woodland habitat adjacent to the Survey Boundary is periodically felled and replanted as part of the commercial woodland activities within the Study Area and therefore this species is already adapted to changes in the local environment.
	Collisions with turbines during operation resulting in mortality.	Species not known to hunt in the open at collision risk heights and will also be predominantly hunting within and around woodland habitats away from the turbine locations, with closest records 1.2km from the nearest turbine location.
Cuckoo	Disturbance and displacement during construction and operation.	Adaptable parasitic breeder and therefore not dependent on specific breeding location. Often uses meadow pipit as a host, a passerine species that are abundant across the Study Area and not at risk of significant adverse effects from the Proposed Development.
	Collisions with turbines during	Not at notable risk of collisions with turbines, no flights recorded within CRZ.

operation resulting in mortality.

<p>Starling</p>	<p>Disturbance and displacement during construction and operation.</p> <p>Collisions with turbines during operation resulting in mortality.</p>	<p>Only limited foraging activity recorded within the Survey Boundary, generally by small flocks. Population small in context of county and national population.</p> <p>No significant roosting behaviour noted within the Survey Boundary that could lead to collision risk during commuting or murmuration.</p>
<p>Winter Bird Assemblage</p>	<p>Disturbance and displacement during construction and operation.</p>	<p>Construction activities will be phased over an anticipated 24 month period and therefore associated noise and visual disturbance impacts will be relatively limited in extent and duration. Disturbance during routine operation maintenance will also be temporary in nature. In the context of the wider landscape habitat availability, it is considered that any associated temporary noise and visual disturbance/displacement impacts are of insufficient magnitude or duration to have the potential to give rise to significant adverse effects.</p> <p>Disturbance and displacement of more sensitive species and breeding bird assemblage from the operating turbines has been taken forward for further assessment.</p>
<p>Other Target Species</p>	<p>Disturbance and displacement during construction and operation.</p> <p>Collisions with turbines during operation resulting in mortality.</p>	<p>Insufficient records to demonstrate the Survey Boundary or wider Study Area supports breeding or notable populations of these species and absence of flights within the CRZ.</p>

9.7.14 There are no effects that are to be scoped out of the assessment at this stage.

9.8 Assessment Methodology

Evaluation Methodology

- 9.8.1 The generic project-wide approach to the assessment methodology is set out in **Chapter 3: Approach to Preparing the Environmental Statement**, and specifically in **Sections 3.7 to 3.10**. However, whilst this has informed the approach that has been used in this Ornithology assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this Ornithology assessment.
- 9.8.2 The evaluation of IOFs will be made with reference to the guidelines published by the CIEEM¹⁵. The guidelines propose an approach to valuing ecological and ornithological features that involve professional judgement based on available guidance and information, together with advice from experts who know the locality of the project and/or the distribution and status of the species or features that are being considered. In addition, best practice guidance in relation to survey techniques and mitigation measures will also be taken into account.

Geographical Context

- 9.8.3 The Guidelines recommend that the value or potential value of the important ecological resource or feature be determined within a defined geographical context and recommends that the following frame of reference be used:
- International;
 - National (Wales);
 - County (Caerphilly); and
 - Local (considered as the 2km Study Area around the Survey Boundary).
- 9.8.4 Examples of the approach taken to valuing ornithology features is provided in **Table 9.13**.
- 9.8.5 Where a feature has value at more than one designation level, its overriding value is that of the highest level.

Valuing Species

- 9.8.6 The guidelines require consideration of all protected species as 'important' features where there is the potential for a breach in legislation. Additionally, both species and habitats should be assessed according to their biodiversity value, measured against published selection criteria where available, such as those protected under the *Conservation of Habitats and Species Regulations 2017* (as amended), or those listed as priority species or habitats under Section 7 of the *Environment (Wales) Act 2016*. In assigning value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records, as well as their legal protection, whilst using any relevant published evaluation criteria available at the time of assessment. Where habitats do not meet the necessary criteria for designation at a specific level, the guidelines recommend that the ecologist may consider the local context if appropriate. Additionally, consideration should also be given to the potential value of those habitats, particularly where habitats are in a degraded or unfavourable condition at Characterising Potential Impacts.

- 9.8.7 The guidelines state that the assessment of impacts should be undertaken in relation to the baseline conditions within the Zol that are expected to occur if the Development were not to take place. Having identified the activities likely to cause significant impacts, it is then necessary to describe the resultant changes and to assess the impact on valued ecological features as well as further consider impacts to the relevant ecosystem as a whole. The process of identifying impacts should make explicit reference to aspects of ecological structure and function on which the feature depends. Impacts must be assessed in the context of the baseline conditions within the Zol during the lifetime of the Development.
- 9.8.8 When describing changes/activities and impacts on ecosystem structure and function, it is necessary to take into account the following parameters:
- Beneficial or adverse;
 - Extent;
 - Magnitude;
 - Duration;
 - Timing;
 - Frequency; and
 - Reversibility.

Significance Criteria

- 9.8.9 The CIEEM guidance defines an ecologically significant impact as an ‘effect that either supports or undermines biodiversity conservation objectives for ‘important ecological features’ or for biodiversity in general’. Once a potential significant impact is identified as likely to affect the integrity/favourable conservation status of a potential IOF, the value of the receptor will be used to help determine the geographical scale at which the impact is significant. If an impact is not found to be significant at the level at which the resource or feature has been valued, it may still be significant at a more local level. An impact that is of significance below a local level, or is deemed not to be significant, will be scoped out of the impact assessment.
- 9.8.10 Although certain species may not constitute IOFs based upon their nature conservation value, they may still warrant consideration during the design and mitigation of the Development on the basis of their legal protection, their implications for policies and plans, or other issues such as animal welfare issues.
- 9.8.11 The guidance advocates the use of professional judgement, informed by relevant best practice guidance, in determining significant effects over the use of matrices.
- 9.8.12 Due to the application of the CIEEM Guidelines, the impact assessment presented in this chapter differs slightly in approach to the remainder of the Draft ES, with each IOF being assessed in terms of whether or not an impact (beneficial or adverse) is significant (assessment of impact), alongside the geographical scale at which this occurs (importance of feature). In each case, for consistency with the remainder of the Draft ES, a conclusion is then presented as to whether or not a significant effect will occur, with such effects being described as either adverse or beneficial. No scale is ascribed to the assessment of effects (i.e., they are either significant or not significant) except in relation to the geographic context.
- 9.8.13 The significance of the potential impacts upon IOFs will be assessed both before and after consideration of the additional mitigation measures. The latter represents the assessment

of the residual impacts of the Development. Consideration will also be given to the potential future impacts to IOFs arising as a result of global trends and climate change.

- 9.8.14 Additionally, and in accordance with *Conservation of Habitats and Species Regulations 2017* (as amended), screening will also be required to determine if likely significant effects upon pertinent designated sites comprising the National Site Network (i.e., SACs and SPAs) would arise as a result of the Development and, if this is the case, for an appropriate assessment (AA) to be undertaken. Whilst the Habitats Regulations Assessment is the responsibility of the Competent Authority, information to inform this process is included in this OIA.

9.9 Preliminary Assessment of Ornithology Effects: Construction

Peregrine, Nightjar and Breeding Bird Assemblage

Disturbance and Displacement

- 9.9.1 Potential for likely significant effects resulting from construction (or decommissioning) related noise and visual disturbance upon nightjar and the breeding bird assemblage have been scoped into the assessment owing to known nest sites within potential disturbance distances of the work. The nightjar population has been valued at a County level and the peregrine and wider breeding bird assemblage at a Local level. Nightjar is listed on Annex 1 of the EU Birds Directive and peregrine is listed on Schedule 1 of the *Wildlife and Countryside Act 1981* (as amended), meaning that they are legally protected from disturbance while nesting. While the potential for disturbance varies across species, given the similarity in their geographic value and the approach to mitigating such impacts, they have been assessed below collectively.
- 9.9.2 Construction activities that may give rise to noise or visual disturbance, as set out in **Chapter 4**, include:
- Enabling works – required prior to the main construction phase and including:
 - Geotechnical investigations (e.g., trial pits or boreholes);
 - Upgrading of existing tracks and construction of new access tracks;
 - Upgrades to public roads and junctions;
 - Establishment of site compounds; and
 - Vegetation clearance.
- 9.9.3 Site infrastructure works – required to support construction and safe, reliable operation of the wind farm, this would include:
- Wind turbine foundations;
 - Crane hard-standing (to support turbine construction and maintenance);
 - Cable trenching and routing;
 - Switch room and substation compounds;
 - Construction and storage compounds (temporary);

- Turbine installation; and
- Installation of wind turbine towers, nacelles and three blades.

- 9.9.4 It is anticipated that the construction will be phased over a 24 month period and associated noise and visual disturbance impacts will therefore be limited in extent and duration to this time period.
- 9.9.5 Peregrine - the known peregrine nesting area is located in an active quarry approximately 550m south-west of Turbine 2 and north-west of Turbine 3. The exact location of the nesting site is unknown as the quarry is in active use and therefore access wasn't available to confirm this. The quarry is on a west and south facing escarpment with an intervening knoll and tree lines providing screening from both visual, and to a lesser extent, noise disturbance. Furthermore, the quarry is in active use and therefore already a noisy disturbed environment to which the peregrines are habituated. Based on a literature review³⁸, protective buffers from disturbance are generally considered to be between 400-800m, though the study identified active disturbance to typically be below these recommended protective buffers. Peregrine is also known to occupy disturbed nesting sites such as active quarries and urban centres, once habituated. In light of this spatial separation and habituation to quarry workings, it is considered to be very unlikely for significant adverse effects to arise during construction. Embedded measures, as detailed further below, will further ensure that this breeding location is protected from construction disturbance.
- 9.9.6 Nightjar – breeding nightjar rely on cryptic plumage to escape detection and only flush nests when a potential predator is close. One study recorded a maximum upper disturbance limit of <10m during incubation and 50-100m during chick rearing³⁸. A review by Currie and Elliott³⁹ recommended a safe working distance of 250m at the nest-building stage, reducing to 50m at the nestling stage, while safe working distances of 50-200m were recommended by Forestry Commission Scotland⁴⁰ (now Scottish Forestry). Nightjar nest sites expanded in 2023 following woodland felling on the valley slopes to the east of Turbine 2, 3 and 4, creating areas of suitable habitat. The closest recorded territories were located approximately 185m and 200m to the east of Turbine 2 and Turbine 3 respectively. Based on academic research, these territories are therefore considered to be at the outer limits of potential disturbance distances and, given that the intervening habitat is dense mature coniferous woodland, there is not considered to be a significant risk of disturbance. However, it is likely that the distribution of nightjar will vary over time according to the availability of clear fell habitats and scrub, and nesting sites may therefore end up closer to potential construction works. Embedded measures, as detailed further below, will ensure that current and future breeding locations are protected from disturbance effects.
- 9.9.7 The wider breeding bird assemblage, including non-target passerine species, may also be impacted by disturbance and displacement from visual and noise disturbance during the breeding season. The majority of the assemblage is unlikely to be especially vulnerable to such impacts; indeed one study found densities of skylark to increase on wind farms during construction⁴¹. Furthermore, the habitats within the Survey Boundary that are in

³⁸ Pearce-Higgins et al (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*, Volume 49, Issue 2 April 2012, Pages 386-394

³⁹ Currie, F. & Elliott, G. (1997). *Forests and Birds: A Guide to Managing Forests for Rare Birds*. Forestry Authority, Cambridge and Royal Society for the Protection of Birds, Sandy, UK

⁴⁰ FCS Guidance Note 32: Forest operations and birds in Scottish forests – the law and good practice. November 2006. Available online at: <https://forestry.gov.scot/images/corporate/pdf/Guidancenote32Birddisturbance.pdf> (accessed October 2023)

⁴¹ Douglas, D.J.T., Bellamy, P.E. & Pearce-Higgins, J.W. (2011) Changes in the abundance and distribution of upland breeding birds at an operational wind farm. *Bird Study*, 58, 37–43.

closest proximity to the works comprise of grazed pasture with scattered trees and occasional hedges along the boundaries. As such, nesting opportunities are primarily limited to the boundary trees and hedges, with open ground nesting species such as skylark and meadow pipet only recorded breeding in moorland habitat to the east of Turbine 1 within the wider Study Area. Thus, any such impacts will be limited in extent and magnitude. There is also considered to be adequate suitable habitats away from areas of potential disturbance to absorb some level of temporary displacement, should this occur.

- 9.9.8 As set out under embedded measures, a CEMP will be secured via DNS condition that sets out measures to safeguard nesting bird interests during construction, an Outline CEMP is provided alongside this application. Such measures are set out in greater detail below:
- Sensitive timing of works within 300m of known/historic Schedule 1 bird nesting locations, unless proven unoccupied, outside of the breeding season (March to August inclusive);
 - Sensitive timing of all other works, particularly pre-commencement vegetation clearance, to avoid breeding bird season where possible; and
 - Where works are required during the breeding season:
 - Surveys of suitable habitat within 300m of proposed works prior to construction to identify potential nesting sites, with an emphasis on Schedule 1 IOFs or those potentially more sensitive to disturbance, such as goshawk, peregrine, red kite, kestrel, snipe and nightjar;
 - Ecological clerk of works where vegetation removal or potential vehicle or personnel encroachment into potential nesting habitats is required; and
 - Establishing ecological protection zones (EPZs) around identified nest sites. The size of the EPZs will be advised on by an ornithologist with reference to best practice subject to the species, topography, screening and levels of noise and visual disturbance anticipated from the works.
- 9.9.9 In light of the temporary nature of anticipated construction activities, the delivery of embedded measures via a CEMP to minimise the potential for visual and noise disturbance during the nesting season and the location of known and likely positioning of nest sites, no significant adverse effects on peregrine, nightjar or the breeding bird assemblage from disturbance and displacement are anticipated to arise during construction.

Permanent and Temporary Habitat Loss

- 9.9.10 Permanent and temporary land-take to facilitate the construction of turbines and associated infrastructure has the potential to reduce the availability of nesting, foraging or resting habitats for the breeding bird assemblage. However, the turbine locations, substation, access tracks and temporary construction compound are all within areas of closely grazed species-poor semi-improved or improved grassland. These areas are unsuitable for ground nesting species such as meadow pipit and skylark, which were only found to be breeding within moorland habitats to the east of Turbine 1 outside of the Survey Boundary. Should these fields stop being grazed and become more suitable for ground nesting, they would still be sub-optimal for such species, except for Turbine 1, owing to the cluttered environment created by adjacent woodland and tree lined boundaries.
- 9.9.11 Embedded measures delivered via a Landscape and Ecology Management Plan (LEMP) secured by condition, will include measures to mitigate for habitat losses by enhancing

retained habitats and potentially increasing their potential to support nesting (and wintering) birds.

- 9.9.12 In light of the negligible extent and magnitude of such impacts, and the embedded measures, permanent and temporary land take will not have a significant adverse effect on the breeding (or indeed wintering) bird assemblage.

9.10 Preliminary Assessment of Ornithology Effects: Operation

Designated Sites - Severn Estuary SPA/Ramsar and Flat Holm and Steep Holm SSSI

Loss of Functionally Linked Land or Harm to Designated Species Populations

- 9.10.1 As a precaution further consideration has been given to the potential for likely significant effects upon Severn Estuary SPA/Ramsar and constituent Flat Holm and Steep Holm SSSI with respect to lesser black-backed gull and herring gull populations recorded during the field surveys.
- 9.10.2 Not only do impacts on such designations need to be considered under the EIA regulations and in respect of planning policy, but in accordance with Part 6 of the *Conservation of Habitats and Species Regulations 2017* (as amended), a Habitats Regulations Assessment (HRA) is required where a plan or project may give rise to significant effects upon any European site designated to conserve natural habitats and species that are rare, endangered, vulnerable or endemic within the European Community. This includes Special Protection Areas (SPAs) classified for rare, vulnerable and regularly occurring migratory bird species. Additionally, Government policy, as set out within the Welsh Technical Advice Note 5 (TAN5), also affords the same level of protection to internationally important wetlands (Ramsar sites), requiring such sites to also be treated as European sites for planning purposes.
- 9.10.3 A HRA comprises several stages of assessment, commencing with a formal screening stage for any likely significant effects (either alone or in combination with other plans or projects) upon the European site or its qualifying features (HRA stage 1). Where likely significant effects cannot be excluded, then such effects require assessment in greater detail through an Appropriate Assessment (AA) to determine whether any adverse effects on the integrity of the European site can be ruled out (HRA stage 2).
- 9.10.4 The Conservation of Habitats and Species Regulations 2017 (as amended) states that:
“A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which (a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in combination with other plans or projects), and (b) is not directly connected with or necessary to the management of that site, must make an appropriate assessment of the implications of the plan or project for that site in view of that site’s conservation objectives”.
- 9.10.5 The Proposed Development is located 18km, 31km and 35km from the Severn Estuary SPA/Ramsar, Flat Holm SSSI and Steep Holm SSSI respectively, at its closest point.
- 9.10.6 None of the species for which the Severn Estuary SPA/Ramsar has been designated were recorded during the bird surveys and therefore the Proposed Development is not considered to be functionally linked to these designations. Whilst the potential for likely significant effects can therefore be screened out, it should be noted that lesser black-backed gull (breeding) has been identified subsequent to designation of the Severn

Estuary SPA/Ramsar as a species for possible future consideration under Criterion 6 of the *Conservation of Habitats and Species Regulations 2017* (as amended). It is also worth noting that the original SPA citation differs from the Natura 2000 Data Sheet in listing the nationally important breeding population of lesser black-backed gull as a reason for designation. As such, potential impacts upon lesser black-backed gull breeding population, principally collision with wind turbines, have been screened below as a precaution.

- 9.10.7 Bird surveys have not identified significant regular foraging or resting by lesser black-backed gull within or adjacent to the Survey Boundary. Some foraging was recorded during the breeding season within the improved grassland fields in the north-east of the Survey Boundary to the east of Turbine 1, in association with farm activities such as muck spreading. The rest of the recordings of this species were of individuals and small flocks flying over the Survey Boundary with some larger high flying mixed gull flocks recorded during the 2021 season. As set out in **Table 9.17**, the highest number of flights in the CRZ were observed over the breeding season and it is possible that this could relate to birds foraging inland from breeding colonies associated with the SPA, Ramsar and SSSIs and/or more local populations. Winter numbers were lower, with fewer flights within the CRZ.

Table 9.17 Summary of Lesser Black-backed Gull Flight Activity

Season	Number of Flights	Total number of birds	Height Band 1: 0-30m (seconds)	Height Band 2: 30-180m CRZ (seconds)	Height Band 3: >180m (seconds)	Number of flights (birds) within CRZ
2020 Breeding	13	48	90	525	165	10 (33)
2020-2021 non-breeding	1	2	0	45	0	1 (2)
2021 breeding	25	66	1485	1320	0	20 (53)
2021-2022 non-breeding	4	16	0	120	45	3 (6)

- 9.10.8 An additional seven flights (532 birds) were recorded by mixed flocks of lesser black-backed gull and herring gull in the 2021 breeding season. For the purposes of Collision Risk Modelling (CRM), these mixed flocks have been split evenly between these species. This is not considered to be a significant limitation as variations in the proportion of each species is not material to the assessment outcome in the context of the wider flight data available.
- 9.10.9 Full CRM for lesser black-backed gulls is provided in **Appendix 9B** and summarised under the species account below. Results from the CRM suggest that there would be an average of one collision every 38 years during the breeding season, with no mortalities during the non-breeding season.
- 9.10.10 A provisional total from the national Seabirds Count estimated the number of apparently occupied lesser black-backed gull nests in Wales across 2015-19 to be around 13,500, although this is probably an undercount due to difficulty in surveying urban nesting sites which are becoming increasingly utilised⁴². While the breeding population in the Severn

⁴² JNCC Seabirds Monitoring Programme (online) <https://jncc.gov.uk/our-work/seabird-monitoring/> (Accessed July 2022)

Estuary/Ramsar is unknown, Rock (2005)⁴³ suggests that “since the mid 1990s ... numbers of Herring and Lesser Black-backed Gulls at traditional colonies in the Bristol Channel have recovered, with c. 2,000 pairs now breeding on Steep Holm (A. Parsons pers. comm.) and c. 3,500 pairs on Flat Holm (Bailey 2001)’. The same paper goes on to state that ‘Flat Holm is dominated by Lesser Black-backed Gulls (Bailey 2001), but on Steep Holm, Herring Gulls are still more common (A. J. Parsons pers. comm.)’. While it was not possible to accurately ascertain current numbers of both species at Flat Holm online, it is suggested that there is a breeding colony of over 4,000 pairs of lesser black-backed gull and 400 pairs of herring gull⁴⁴, and NRW have confirmed that the populations are stable⁴⁵. It is likely that significant numbers also breed within the wider Severn Estuary SPA/Ramsar, though no population estimates were identified by the literature review. Furthermore, in recent times, this species has shown incredible adaptability, and taken to nesting in urban areas. Indeed, the Gwent Bird Report 2019 states that there are modest but growing numbers predominantly associated with industrial areas. Surveys in the city of Newport in 2017 counted 285 nesting pairs of lesser black-backed gull and 255 nesting pairs of herring gull, while 2,357 pairs and 866 pairs respectively were counted in Cardiff in the same year⁴⁶. Both of these urban locations are closer to the Proposed Development than Flat Holm and Steep Holm SSSIs.

- 9.10.11 Even if all the birds recorded flying over the Survey Boundary during each breeding season were directly from the Flat Holm colony, assuming a conservative population of 3,000 pairs, this would only constitute 1.6% (48 birds) of the population in the 2020 breeding season and 2.2% (66 birds) during the 2021 breeding season (slightly higher with mixed gull flocks factored in). In reality, the population supported by the Severn Estuary Ramsar/SPA is far greater, while the small number of birds recorded within the Survey Boundary are likely to often be the same birds passing over the area and will undoubtedly include more locally based birds breeding in industrial and urban areas between the Survey Boundary and the Severn Estuary.
- 9.10.12 In terms of potential displacement of lesser black-backed gull from the local surroundings of the Proposed Development, offshore wind farm studies have shown that lesser black-backed gull avoid the interiors of wind farms⁴⁷. However, the Survey Boundary is not considered to be significant to their foraging and associated breeding success, particularly given the abundance of farmland and urban areas available to such mobile species for opportunistic foraging.
- 9.10.13 In light of the low anticipated mortality rates in the context of the designated site and local population sizes and limited potential for displacement impacts, the Proposed Development will not result in any likely significant adverse effects on the integrity of the lesser black-backed gull population supported by the Severn Estuary Ramsar/SPA or Flat Holm and Steep Holm SSSI.
- 9.10.14 With respect to herring gull, for which Steep Holm SSSI supports a notable breeding colony, the same assessment is considered to apply, with CRM presented in **Appendix 9B** and the species subsection below. Again, it is likely that birds not associated with the Steep Holm population are flying through the Survey Boundary, with this species

⁴³ Rock, P (2005) Urban Gulls: problems and solutions British Birds 98, July 2005 pg338-355

⁴⁴ <https://www.birdingplaces.eu/en/birdingplaces/united-kingdom/flat-holm#:~:text=The%20island%20of%20Flat%20Holm%20has%20a%20significant.varying%20numbers%20of%20Eurasian%20Oystercatcher%20and%20Common%20Shelduck>. Accessed October 2023

⁴⁵ Mynydd Llanhilleth Wind Farm pre-application consultation response from NRW (01 February 2023) ref:CAS-204194-L5W1

⁴⁶ Pritchard, R., Hughes, J., Spence, I.M., Haycock, B., and Brenchley, A. (editors) (2021) The Birds of Wales – Adar Cymru. Liverpool University Press, Liverpool

⁴⁷ Vanermen, N., Courtens, W., Daelemans, R. Luc Lens, Wendt Müller, Marc Van de walle, Hilbran Verstraete, Eric W M Stienen Attracted to the outside: a meso-scale response pattern of lesser black-backed gulls at an offshore wind farm revealed by GPS telemetry

classified in Gwent as fairly common all year, with distinct spring passage and with moderate numbers mainly breeding in industrial areas. As such, the Proposed Development will not result in any likely significant adverse effects on the integrity of the populations at Flat Holm or Steep Holm SSSI.

Lesser Black-backed Gull and Herring Gull

Collisions with Turbines Resulting in Mortality

- 9.10.15 The Proposed Development includes the installation of up to four wind turbines for an operational period of 30 years. There is therefore the potential for lesser black-backed gull and herring gull to collide with turbine blades. CRM based on flight data collected from vantage point surveys undertaken between April 2020 – April 2022 (inclusive) has been carried out to determine the risk of such collisions occurring.
- 9.10.16 Full details of the CRM are provided in **Appendix 9B**, with the predicted number of collisions for lesser black-backed gull and herring gull annually and over the 30-year operation of the wind farm provided in **Table 9.18** and **Table 9.19** respectively. With reference to best practice, avoidance rates of 99.5% have been used for the CRM¹⁹**Error! Bookmark not defined.** for both species.

Table 9.18 Predicted Collision Rates for Lesser Black-backed Gull

Activity Period	Collision Scenario	Year 1	Year 2	Average
Breeding Season	Predicted collisions per year	0.01	0.04	0.02
	Predicted collision over 30 years	0.36	1.13	0.74
Non-breeding Season	Predicted collisions per year	0.00	0.00	0.00
	Predicted collisions over 30 years	0.03	0.05	0.04
Annual Total	Predicted collisions per year	0.01	0.04	0.03
	Predicted collisions over 30 years	0.38	1.18	0.78

Table 9.19 Predicted Collision Rates for Herring Gull

Activity Period	Collision Scenario	Year 1	Year 2	Average
Breeding Season	Predicted collisions per year	0.02	0.04	0.03
	Predicted collision over 30 years	0.48	1.24	0.86
Non-breeding Season	Predicted collisions per year	0.00	0.00	0.00
	Predicted collisions over 30 years	0.00	0.00	0.00
Annual Total	Predicted collisions per year	0.02	0.04	0.03
	Predicted collisions over 30 years	0.48	1.24	0.86

- 9.10.17 The effect of the loss of an individual bird on a population will depend on factors such as the life expectancy of the species, breeding success rates, population size, population densities and the level of competition for resources. Lesser black backed gull and herring gull are long lived (14 and 12 years respectively) and have a high annual survival rate (typically 91% and 88% respectively)⁴⁸. They also typically only raise one chick. As such their populations are potentially sensitive to raised mortality rates.
- 9.10.18 Population estimates are unknown in Gwent, though the Welsh lesser black-backed gull population is estimated at 13,500 apparently occupied nests³⁴, and a breeding colony of c.4,000 pairs is known to be present at Flat Holm SSSI within the wider landscape. The Welsh herring gull population was estimated to contain 7,988 apparently occupied nests across 2015-19, although this is probably an undercount due to difficulty in surveying urban nesting sites which are becoming increasingly utilised³⁴. Within Gwent, both species are fairly common, with modest but growing numbers, and with breeding mainly occurring within industrial areas.
- 9.10.19 The CRM predicts that up to one lesser black-back gull and one herring gull individual will collide with turbines over the lifetime of the development. It is also worth noting that the CRM assumes that the turbines will be active at all times. In reality, wind speeds and mechanical failures will mean that the turbines do not operate 100% of the time. In light of this and given the small collision numbers, in the context of the species wider population, no significant adverse effect upon the local population of either species is predicted.
- 9.10.20 In addition, embedded measures include provision for a Collision Mitigation and Monitoring Strategy (CMMS), secured via condition, which will determine operational collision rates and identify the need for mitigation measures if required.

Peregrine

Collisions with Turbines Resulting in Mortality

- 9.10.21 Full details of the CRM are provided in **Appendix 9B**, with the predicted number of collisions for peregrine annually and over the 30-year operation of the wind farm provided in **Table 9.20**. With reference to best practice¹⁸, avoidance rates of 98% have been used for the CRM.

Table 9.20 Predicted Collision Rates for Peregrine

Activity Period	Collision scenario	Year 1	Year 2	Average
Breeding Season	Predicted collisions per year	0.02	0.04	0.03
	Predicted collision over 30 years	0.52	1.22	0.87
Non-breeding Season	Predicted collisions per year	0.01	0.02	0.01
	Predicted collisions over 30 years	0.23	0.64	0.44
Annual Total	Predicted collisions per year	0.03	0.06	0.04

⁴⁸Viola H. Ross-Smith, Mark J. Grantham, Robert A. Robinson and Jacquie A. Clark (2014) Analysis of Lesser Black-backed Gull data to inform meta-population studies British Trust for Ornithology and Natural England. Research Report 654.

Predicted collisions over 30 years	0.75	1.85	1.30
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- 9.10.22 Within Wales in 2014, there were estimated to be 280 pairs (95% confidence: 262-301)⁴⁹, and while increasing across the UK, populations in Wales are believed to be declining. Within Gwent, 15 sites were occupied in 2018, with five pairs monitored that fledged a minimum of eight young³¹. Typically, this species lays 3-4 eggs, has a seven year life span, and an adult survival rate of 81% and juvenile survival rate of 60%⁵¹. As such, this species is not considered to be highly sensitive to small changes in adult mortality.
- 9.10.23 CRM modelling has not identified any significant risk of collision mortality (one bird every 23 years), as a result of very few flights being recorded in the CRZ despite the proximity of a known nest site and with presence confirmed all year within the Survey Boundary. This is potentially a reflection of their hunting behaviour and the availability of hunting habitats throughout the local landscape. The loss of a single bird over the operation of the wind farm would have a negligible effect on the local population in the context on the population size and annual adult and juvenile mortality rates. Such low magnitude and reversible impacts will therefore not have a significant effect on the peregrine population.
- 9.10.24 In addition, embedded measures include provision for a CMMS secured via condition that will determine operational collision rates and identify the need for mitigation measures, if required.

Disturbance and Displacement

- 9.10.25 In a review of the displacement of upland birds from operational wind farms, Madders and Whitfield (2006)⁵³ found that based on the findings of two papers peregrine were of low sensitivity to displacement and, more generally, disturbance of raptors at operational wind farms was negligible. As set out previously, the known peregrine nest site is beyond the outer range (430m) from potential operational turbine disturbance. The quarry, topography and trees/woodland, further screen the nest site from such effects. In the context of the wider hunting landscape available and the species ability to adapt and habituate to disturbed environments, combined with the CRM, such long-term but reversible adverse effects would not be significant.

Goshawk

Collisions with Turbines Resulting in Mortality

- 9.10.26 Full details of the CRM are provided in **Appendix 9B**, with the predicted number of collisions for goshawk annually and over the 30-year operation of the wind farm provided in **Table 9.21**. With reference to best practice¹⁸, avoidance rates of 98% have been used for the CRM.

Table 9.21 Predicted Collision Rates for Goshawk

Activity Period	Collision Scenario	Year 1	Year 2	Average
Breeding Season	Predicted collisions per year	0.00	0.00	0.00

⁴⁹ Wilson, M. W., Balmer D. E., Jones, K., King, V. A., Raw, D., Rollie, C. J., Rooney, E., Ruddock, M., Smith, G. D., Stevenson, A., Stirling-Aird, P. K., Wernham, C. V., Weston, J. M., and Noble, D. G. (2018) The breeding population of Peregrine Falcon *Falco peregrinus* in the United Kingdom, Isle of Man and Channel Islands in 2014. *Bird Study* (65)1, pp1-19.

	Predicted collision over 30 years	0.00	0.13	0.06
Non-breeding Season	Predicted collisions per year	0.00	0.02	0.01
	Predicted collisions over 30 years	0.00	0.52	0.26
Annual Total	Predicted collisions per year	0.00	0.02	0.01
	Predicted collisions over 30 years	0.00	0.65	0.33

- 9.10.27 Within Wales there were estimated to be 310 (95% confidence range: 260-350) breeding pairs of goshawk in 2018⁵⁴, though as a species which inhabits and hunts within dense woodland, it is likely that they are under recorded, and populations are believed to be increasing. Within Gwent, 28 nests were monitored in 2018, with 23 chicks fledging⁵⁰. Typically, this species lays 3-4 eggs, has a seven year life span, with an adult survival rate of 83%⁵¹. As such, this species are not considered to be highly sensitive to small changes in adult mortality rates.
- 9.10.28 CRM modelling has not identified any significant risk of collision mortality (0.33 bird strikes over the lifetime of the development operation), as a result of very few flights being recorded in the CRZ. This is likely to reflect the species' association with woodland and preference for hunting within such habitats, with only very limited hunting in more open areas. No long-term significant adverse effects from collision mortality are therefore predicted.
- 9.10.29 In addition, embedded measures include provision for a CMMS secured via condition that will monitor collision rates and identify the need for mitigation measures, if required.

Disturbance and Displacement

- 9.10.30 There is limited information available on the potential displacement of goshawk from operational wind farms. However, given their successful occupation of commercial forestry sites, which are subject to change, and the positioning of turbines outside of their preferred woodland habitats, such effects are considered unlikely. Furthermore, the known breeding site is outside of potential disturbance distances, located 1.2km from the nearest turbine, while only limited hunting activity has been recorded within the Survey Boundary as demonstrated by the infrequent flightline data presented in **Appendix 9A**. In light of this, such low magnitude, long-term, but reversible, adverse effects would not be significant.

Red Kite

Collisions with Turbines Resulting in Mortality

- 9.10.31 Full details of the CRM are provided in **Appendix 9B**, with the predicted number of collisions for red kite annually and over the 30-year operation of the wind farm provided in **Table 9.22**. Avoidance rates of 99% have been used for the CRM¹⁸.

⁵⁰ Welsh Ornithology Society (2019). Welsh Bird Report No.32 2018

⁵¹ <https://app.bto.org/birdfacts> - search by species – accessed October 2023

Table 9.22 Predicted Collision Rates for Red Kite

Activity Period	Collision scenario	Year 1	Year 2	Average
Breeding Season	Predicted collisions per year	0.03	0.01	0.02
	Predicted collision over 30 years	0.93	0.39	0.66
Non-breeding Season	Predicted collisions per year	0.00	0.04	0.02
	Predicted collisions over 30 years	0.00	1.30	0.65
Annual Total	Predicted collisions per year	0.03	0.06	0.04
	Predicted collision over 30 years	0.93	1.70	1.31

- 9.10.32 Red kite is typically relatively short lived (four years), and has relatively high annual mortality rates amongst juveniles (50%) and adults (61%), with typical clutch sizes of two⁴³. This species is known to have relatively high avoidance rates to turbines, which has been factored into the model (99%). The red kite population has expanded and grown across Wales and the UK over the last 20 years and the Welsh population in 2019 was estimated at 2,500 pairs⁵²Error! Bookmark not defined.. Within Gwent, they are classified as a scarce visitor and passage migrant and a rare breeding resident³¹. However, it is likely that the population has grown and expanded since the last Gwent Bird Report in 2019, with red kite regularly recorded in association with other development proposals in the wider landscape.
- 9.10.33 The nearby Mynydd Carn y Cefn Wind Farm proposal Ornithology Chapter of the Environmental Statement (October 2022) states that: *“No up-to-date population estimate for red kite in Blaenau Gwent or the former Gwent area is available, though given the number of records reported in local bird reports (Coleman et al 2018) it is likely to be at least 11 pairs and increasing across the former Gwent County boundary. A breeding population of 11 pairs represents approximately 30- 40 individual red kite (22 breeding adults plus an estimated numbers of non-breeding birds based on juvenile survival rates)”*. Based on this population assumption, and annual adult survival rates (39% mortality) for adult red kite, this represents 12-16 birds dying each year. The additional mortality predicted from the CRM, 1.31 over 30 years, represents an insignificant increase in mortality each year. In light of this negligible change and the species growing population, with expansion of birds from other territories likely to supplement the population, it is not considered that this long-term but reversible impact would have a significant adverse effect on the local population.
- 9.10.34 In addition, embedded measures include provision for a CMMS secured via condition, which will determine collision rates and identify the need for mitigation measures, if required.

Disturbance and Displacement

- 9.10.35 The operational phase of the Proposed Development could also potentially lead to the disturbance and displacement of nesting and foraging red kite and a reduction in reproductive success of the local population. While no confirmed red kite nests have been recorded in the Study Area, nesting is likely to occur and infrequent foraging has been

⁵² Welsh Kite Trust (2019) How Many Kites are there in Wales? www.welshkitetrust.wales (accessed October 2023)

recorded within the Survey Boundary. In a study of disturbance distances, including a review of other papers, Ruddock & Whitfield (2007)³⁷ found that static disturbance distances were an average of 125m at both phases of the breeding season, while median values for active disturbance distances were 30m and 75m during incubation and chick rearing respectively. Studies typically suggest tolerance ranges of 10-300m. It is also likely that over the operational lifetime of the development red kite would develop a degree of habituation to the operation, as reflected by records of successfully breeding red kite being routinely exposed to human activity without any obvious effect.

- 9.10.36 With regards to foraging, Madders and Whitfield (2006)⁵³ concluded that displacement of foraging raptors as a result of wind farms appears to be negligible. Hen harrier was the only raptor where any displacement effect is apparent, with birds only likely to be displaced from foraging habitat within 100m of turbines.
- 9.10.37 In light of the current breeding and foraging status of red kite in relation to the Proposed Development, and given their relatively limited sensitivity to the effects of wind farm disturbance and displacement, the extent and magnitude of this long-term reversible impact is low, and no significant adverse effect on the red kite population during operation is therefore predicted.

Kestrel

Collisions with Turbines Resulting in Mortality

- 9.10.38 Full details of the CRM are provided in **Appendix 9B**, with the predicted number of collisions for kestrel annually and over the 30 year operation of the wind farm provided in **Table 9.23**. Kestrel is sensitive to colliding with turbines owing to their hunting style and as such, in accordance with best practice¹⁸ avoidance rates of 95% have been used in the CRM.

Table 9.23 Predicted Collision Rates for Goshawk

Activity Period	Collision scenario	Year 1	Year 2	Average
Breeding Season	Predicted collisions per year	0.01	0.01	0.01
	Predicted collision over 30 years	0.35	0.19	0.27
Non-breeding Season	Predicted collisions per year	0.10	0.07	0.09
	Predicted collisions over 30 years	2.98	2.12	2.55
Annual Total	Predicted collisions per year	0.11	0.08	0.09
	Predicted collisions over 30 years	3.33	2.31	2.82

- 9.10.39 Within Wales, there were estimated to be 265-475 pairs of kestrel in 2020³⁴. This species typically lays 4-5 eggs and has an adult survival rate of 69% and juvenile survival rate of 32%⁵¹. Small changes in the mortality rate are therefore unlikely to impact the integrity of the local population. In Gwent, 4-5 nests and three possible pairs were recorded through the BTO bird tracking scheme. This is likely to be an under-representation of the

⁵³ Madders, M & Whitfield, D.P. (2006). Upland raptors and the assessment of wind farm impacts. *Ibis*, 148, 43–56. 9-50

population with the Gwent Bird Report 2019³¹, stating that they are a fairly common (though declining) breeding resident.

- 9.10.40 CRM modelling predicts that a kestrel will potentially collide with a turbine every 10.7 years, with 2.8 fatalities over the 30-year lifespan of the wind farm operation. This, in part, reflects the species' vulnerability to turbine collisions with lower avoidance rates (95%) compared to other species. The CRM also does not account for times when turbines are not operational due to low wind speeds or mechanical faults and therefore accounts for the worst-case scenario.
- 9.10.41 In Wales, kestrel is known to be partial and passage migrants³⁴ and a large proportion of the CRZ flights were recorded in the non-breeding season. However, it should also be noted that kestrel is considered to be a breeder within the wider Study Area (north east of Turbine 1 associated with moorland habitat) following sightings on raptor and breeding bird surveys, despite limited vantage point survey recordings at this time. The predicted collision risk therefore varies significantly between the non-breeding and breeding season, with higher rates during the breeding season perhaps reflecting the dispersal of juveniles and/or influx of additional over wintering birds from colder climes.
- 9.10.42 While the local population only appears to be relatively small, kestrel remain a relatively common species within Gwent, with some movement and influx of birds on migration and potentially over winter. The ongoing loss of one overwintering/migratory bird through collisions with turbines every 10.7 years in the context of the annual adult survival rates of 69%, is therefore considered to only be of very low magnitude, long-term, but reversible, adverse effect that would not be significant to the local population.
- 9.10.43 In addition, embedded measures include provision for a CMMS secured via condition that will determine collision rates and identify the need for mitigation measures, if required.

Disturbance and Displacement

- 9.10.44 In a review of the displacement of upland birds from operational wind farms, Madders and Whitfield (2006)⁵³ found that based on the findings of five research papers kestrel is of low sensitivity to displacement. It is also likely that kestrel would become habituated to the operation of the wind farm given this species' willingness to forage and even nest adjacent to high areas of human disturbance such as motorways. Therefore, any such long-term but reversible adverse effects, in the unlikely event that they occur, would not be significant to the success of the local kestrel population.

Nightjar

Collisions with Turbines Resulting in Mortality

- 9.10.45 The risk of nightjars colliding with turbines is uncertain with limited research in this area identified during literature review. Nightjars are ground nesting and primarily feed on invertebrates, using feeding perches and catching insects at foliage heights of 1.5 – 5m. They also use such perches for territorial calling and to attract mates. As such, their typical behaviour does not bring them into risk of potential collisions with turbines and on this basis, and an absence of woodland impacts resulting from the Proposed Development, such potential adverse impacts were originally scoped out of the OIA with consultees. However, given the identification of additional territories, the closest of which is 185m from the nearest turbine, further assessment has been completed.
- 9.10.46 Being a nocturnal species, no nightjar flights were recorded during the VP surveys and CRM could therefore not be completed. As outlined previously, typical nightjar behaviour does not bring this species into potential conflict with turbine blades. However, uncertainty

still remains around flight heights when commuting over the landscape, including through or over coniferous woodland. The woodland belt adjacent to Turbines 2, 3 and 4, along the eastern edge of the Survey Boundary is approximately 15-20m in height and the lowest sweep height of the turbines over the ground is 28m. Known nightjar territories are present within clear fell on the opposite side of this belt, with foraging activity occasionally recorded between Turbine 2 and 3 to the west of this belt. While there are potential rides that could be used to access foraging within the Survey Boundary, access may also be over the woodland. There is a minimum buffer of approximately 40-50m between Turbine 2 and 3 blade sweep and these woodland edges (See **Figure 8.1** for further analysis in relation to potential bat impacts). This buffer, and the height of the blades, is likely to be adequate to ensure that the risk of collisions by foraging nightjar is limited, except potentially where birds are commuting over the woodland or migrating/commuting through the Survey Boundary at height. It is not pragmatic or realistic to obtain such survey information and therefore professional judgement is required to assess the potential level of the risk and significance of effect.

- 9.10.47 The typical lifespan of nightjar is four years with breeding at one year, 1-2 broods with on average two eggs, and adult survival rates of c.70%⁵¹. Small changes in the mortality rate are therefore unlikely to impact the integrity of the local population within the Study Area, which is estimated at 6-8 pairs. In light of this, the species typical low flying behaviour and low suitability of habitats with the Survey Boundary for foraging/commuting (no breeding potential), although uncertain, potential adverse effects from collision mortality during operation are not significant.

Disturbance and Displacement

- 9.10.48 The habitat within the Survey Boundary is unsuitable for breeding nightjar and has low foraging suitability owing to the closely grazed nature of the grassland fields. However, foraging was observed immediately to the north of the southern parcel of the Survey Boundary in association with such grassland fields along the woodland edge. There is also a small pond in the southern parcel in close proximity to Turbine 3 that provides foraging and drinking opportunities, while insects attracted by livestock grazing the fields may provide foraging opportunities at certain times.
- 9.10.49 Based on academic research³⁷, the nearest territories (185-200m with intervening coniferous woodland belts) are considered to be at the outer limits of potential disturbance distances. However, it is possible that the operation of Turbines 2, 3 and 4 could disturb and displace any birds foraging or commuting within the Survey Boundary along the woodland edge and/or around the pond. Given the distances between the turbines (650m between Turbine 2 and 3, and 450m between Turbine 3 and 4) it is not considered that their operational presence would sever or limit potential commuting opportunities across the Survey Boundary. In terms of foraging, a study of the nightjar population in Thetford Forest found that the birds travelled a mean maximum distance of 747m from the centre of their territory every night to forage⁵⁴. However, given the presence of the turbine blades above foraging heights, it is uncertain if any disturbance will occur and/or whether nightjar would become habituated to the operational turbines. Regardless, the potential displacement from such a limited foraging resource (single foraging record and sub-optimal habitats) through operational disturbance, in the context of higher quality foraging habitats within the Study Area, would not have a significant adverse effect on the successful breeding of the County value nightjar population.

⁵⁴ Katrina Sharps, Ian Henderson, Greg Conway, Neal Armour-Chelu, Paul M. Dolman (2015) Home-range size and habitat use of European Nightjars *Caprimulgus europaeus* nesting in a complex plantation-forest landscape. IBIS Volume 157, Issue 2, April 2015 Pages 260-272.

Breeding Bird Assemblage

Disturbance and Displacement

- 9.10.50 The wider breeding bird assemblage, including non-target passerine species, also has the potential to be impacted by disturbance and displacement during the breeding season over the operational lifetime of the development. With reference to best practice guidance and research papers, passerines are not typically considered to be at risk of adverse effects resulting from wind farm proposals. Indeed, one multi-site and multi-species analysis paper concludes that there is *“little evidence for consistent post-construction population declines in any species, suggesting for the first time that wind farm construction can have greater impacts upon birds than wind farm operation²⁶”*.
- 9.10.51 The Survey Boundary contains limited opportunities for ground nesting birds owing to the closely grazed nature of the improved grassland pasture that is present. Turbine 1 is located approximately 120m from moorland habitats to the south and east, which are known to support breeding populations of the red listed meadow pipit and tree pipit and amber listed skylark. Research does not suggest that skylark densities are affected by operational turbines, however, meadow pipit breeding bird densities were found by one study to reduce by 15% within 100m of turbines. **Error! Bookmark not defined.** Given that the moorland habitats are beyond this distance from the turbines, no disturbance impacts upon these species during operation are anticipated.
- 9.10.52 Flocks of red listed starling were recorded foraging within the Survey Boundary across the grass pasture, with most activity to the east of the northern Survey Boundary in areas where no turbines are located. Furthermore, starlings are adaptable species that occupy disturbed urban environments and are therefore not considered to be at risk of disturbance and displacement impacts during operation.
- 9.10.53 Of the other conservation concern species recorded within the Survey Boundary, these are primarily associated with the woodland boundaries and hedgerows and trees around the field boundaries (e.g. gold crest, crossbill, mistle thrush, spotted flycatcher, willow warbler). The turbines have been sensitively located to provide buffers to these features and reduce potential for impacts upon birds and bats. In addition, such species are not considered to be at significant risk of disturbance or displacement from turbines and are likely to become habituated to the operational presence.
- 9.10.54 There is also considered to be adequate habitats away from these areas to absorb some level of localised displacement around turbine locations or in association with maintenance works during the breeding season, in the unlikely event they occur. Embedded measures will ensure that during operation, maintenance works are undertaken sensitively with respect to breeding birds, including avoiding any temporary impacts to surrounding habitats wherever possible and, if they do occur, ensuring that prior checks for nesting birds are completed.
- 9.10.55 Furthermore, embedded measures include habitat enhancement measures identified for the Proposed Development delivered by the LEMP, that are designed to benefit breeding bird species. This can be achieved through hedgerow gap planting and implementation of a management regime to encourage a more diverse grassland structure. The long-term approach to habitat enhancement would mitigate for any disturbance/displacement or reduction in habitat availability caused during operation and permanent loss of habitat due to the Proposed Development’s land-take.
- 9.10.56 In light of the limited sensitivity of passerine species and low magnitude of potential displacement and disturbance impacts during operation, no significant adverse long-term but reversible effects on the wider breeding bird assemblage are anticipated to arise.

Precautionary Measures for Collision Risk Modelling

- 9.10.57 As set out in **Appendix 9B**, an extra precaution, the CRM was run again with an extra buffer below the turbine height (an additional buffer of 35m was already incorporated above the turbine height). Any flight heights that were potentially mis-identified and should have been included within the CRZ will therefore be included in this precautionary model. For year 1, this entailed adding height band 1 (<30m) and for year 2, which included additional recording bands, this included adding height band 2 (15-30m). The results of these calculations did not significantly alter the collision risk of any of the species assessed and are presented in **Appendix 9B**.

9.11 Preliminary Assessment of Cumulative (Inter-project) Effects

- 9.11.1 A Preliminary Cumulative Effects Assessment (CEA) will be undertaken for the Project which considers the combined impacts with other developments on the same single receptor or resource (inter-project effects). The detailed method followed in identifying and assessing potential cumulative effects is set out in **Section 2.9** of **Chapter 2**.
- 9.11.2 Developments, principally wind farms, which are either built, consented or with submitted scoping reports or planning applications have been considered within a distance of 15km of the Proposed Development. Given the age, scale and spatial separation for a number of these developments from the Proposed Development, there is not considered to be a risk of inter-project ornithology effects. Six large wind farms that are subject to applications or imminent applications, have also been identified however, and warrant further consideration with respect to cumulative effects, as set out in **Table 9.24**.

Table 9.24 Sites Subject to Cumulative Effects Assessment

Development	Description of Development and Proximity	Proximity to the Proposed Development	Important Ornithology Features (IOFs)
Lonydd Solar Farm CAS-02446-R8X8W2	Scoping submitted August 2023 for solar farm and ancillary development.	Within the northern parcel.	Informed by a Preliminary Ecological Appraisal including desk study and an extended phase 1 habitat survey. Breeding bird surveys are recommended though only limited potential is identified.
Mynydd Maen DNS/3276725	Scoping submitted in July 2023 for up to 15 turbines with a maximum height of 150m and associated infrastructure.	0.5km to the north-east	Scoping reports identifies hobby, red kite, kestrel, hen harrier (five flights), goshawk, peregrine, red grouse and nightjar as the key ornithology receptors. Of note is a maximum count of 13 nightjar territories and frequent kestrel activity over the site. Goshawk, peregrine and red kite are all believed to breed locally to the site. While herring and lesser black-backed gull were frequently recorded flying over

the site they are not identified as receptors for further assessment and nor are associated designated sites in the wider landscape.

Mynydd Llanilleth Wind Farm DNS/3273368	Application submitted in July 2023 for up to eight turbines with a maximum blade height of 180m and associated infrastructure.	2.5km north	Comprising predominantly of moorland habitat, with surrounding coniferous woodland and moorland. Small populations of target species are present including breeding red grouse, peregrine, red kite, goshawk, long-eared owl and nightjar, occasional overwintering and migrating hen harrier and kestrel, and frequent lesser black-backed and herring gull flights over the Site. These species were scoped into the assessment, however, CRM identifying very low levels of potential mortalities and no significant residual effects.
Mynydd Carn y Cefn Wind Farm DNS/3270299	Application submitted in October 2022 for up to eight turbines with a maximum height of 180m and associated infrastructure.	5km north-west	Important ornithology features scoped into the further assessment include goshawk, red kite, peregrine, barn owl, nightjar, moorland and woodland breeding bird assemblage. No significant effects identified.
Abertillery Wind Farm DNS/3278009	Scoping submitted for up to seven turbines with a maximum blade height of 180m and associated infrastructure including a permanent anemometer mast.	6.3km north	Scoping report identifies the presence of red kite, goshawk, hobby, hen harrier and peregrine. In addition, hobby were recorded fairly regularly, though these are believed to be associated with breeding birds located in the Cwmsychan Valley.
Manmoel Wind Farm DNS/3239181	Application submitted in June 2023 for up to five turbines with a maximum height of 180m and associated infrastructure.	6.7km north-west	Only red kite, herring gull and lesser black-backed gull were scoped into the assessment and no residual effects were identified. Due to low numbers of flights and/or breeding/wintering abundance, impacts on goshawk, hen harrier, merlin, peregrine and nightjar were scoped out of the

			assessment despite being recorded during surveys. Also concludes as part of a Shadow Appropriate Assessment that the development will not have an adverse effect on the integrity of the Severn Estuary Ramsar.
Twyn Hywel Wind Farm (DNS/3272053)	Scoping submitted for the erection and operation of 20 wind turbines for a period of 45 years with a maximum blade tip height of 200m and ancillary infrastructure.	9.5km SW	Six schedule 1 species – goshawk, merlin, peregrine, red kite, hen harrier and hobby all recorded - in addition to three species of wader - golden plover, lapwing and snipe. Large numbers of gulls were also recorded flying across the site in a north-south corridor in the early and late hours of the day. Nightjar information is redacted. List of designations and species scoped in is not provided.

- 9.11.3 Given the size and relative proximity of these six wind farm proposals, and the solar farm, to the Proposed Development, and their location on similar upland farmland habitats, there is potential for *de minimis* adverse effects across the schemes to give rise to significant adverse effects upon IOFs. However, it is worth noting that the Survey Boundary does not contain any moorland habitats and by virtue of this, even minor potential adverse effects on declining target moorland species are less likely to occur than in relation to the other proposals.
- 9.11.4 The submitted applications and scoping reports suggest that these potential development sites support similar bird assemblages, reflective of their upland moorland and farmland locations. The submitted proposals do not identify any residual adverse effects and while the full results from the other wind farm proposals, and solar farm, are unknown, the proposals will also seek to mitigate potentially significant adverse effects to insignificant levels, thereby reducing the risk of cumulative effects arising.
- 9.11.5 In terms of statutory designations, given these other proposals are predominantly further removed from the Severn Estuary SPA/Ramsar and Flat Holm and Steep Holm SSSI, it is considered to be very unlikely that there is potential for cumulative effects with respect to impacts on the associated breeding populations of lesser black-backed gull and herring gull through collisions with turbines. The possible exception to this is Mynydd Maen Wind Farm, which lies adjacent to the east of the Survey Boundary, in closer proximity to these designations. However, the scoping report for this proposal scopes out potential designated site and gull impacts, stating that *"Gulls were recorded during 31 watches, with a maximum count of 71 herring gull on 12 December 2020 (feeding / loafing over Hafod-yr-Ynys valley beyond the north-western boundary of the Site). Flights by gulls were typically observed over valleys south and north of the Site"*. Given these species' collision avoidance rates, their population sizes and that the CRM only predicts up to one collision per species over the operational lifetime of the Proposed Development, no significant cumulative effects are anticipated.

- 9.11.6 With respect to species, red kite, peregrine, goshawk and hen harrier have all been recorded in association with the other sites. Based on the submitted Mynydd Carn y Cefn, Mynydd Llanilleth and Manmoel ES, and other proposals' scoping reports, activity levels and seasonal use of the other sites is similar or slightly higher than that recorded within the Study Area. The highest levels of activity and greatest potential for impacts were identified by the Mynydd Carn y Cefn OIA. This concluded that there would be no significant effects on the important ornithology features identified, however, it does identify that certain species, notably red kite, would be subject to insignificant increases in collision mortality (1-2 deaths per year). Should this be reflected across all of the developments (CRM for the Proposed Development, Manmoel and Mynydd Llanilleth proposals only predict an additional 0.04, 0.13 and 0.25 deaths per year respectively), then there is potential for the cumulative effect to become significant at a Local level. However, given this species' ongoing recovery in numbers and range expansion across Wales, it is considered unlikely that this would amount to a significant effect without similar or higher levels of collision fatality to Mynydd Carn y Cefn predicted as a result of each of the other proposals.
- 9.11.7 The same consideration, though unlikely to give rise to significant adverse effects, should be given to kestrel given the heightened collision risk for this species, though only low levels of potential mortality were identified through CRM (a fatality every 10.7 years) for the Proposed Development. The same pair of kestrel was recorded in association with moorland habitat within the Mynydd Maen proposal site. Subject to the level of collision risk, there is greater potential for cumulative impacts to therefore occur. However, it is considered unlikely that this would be the case unless similar or much higher levels of collision risk are identified across the other proposals, given kestrels fairly common (though declining) status in Gwent.
- 9.11.8 Should all seven proposals be consented, alongside already approved turbines, there will be a considerable turbine presence across upland and moorland habitats over the wider landscape in Caerphilly, Blaenau Gwent and Torfaen. It is considered therefore that while no significant effects from displacement of IOFs have been identified by the four fully assessed proposals (the Proposed Development, Mynydd Llanhilleth, Manmoel and Mynydd Carn y Cefn), there is potential for cumulative effects on sensitive species, principally waders. Based on the information available, it appears that the upland moorland habitats in the proposed wind farms and surroundings do not support notable wader assemblages (with the possible exception of Twyn Hywel Wind Farm where lapwing, golden plover and snipe have been recorded), with only small populations recorded, such as the over wintering snipe within the wider Study Area. As such, and subject to the full survey findings from the unsubmitted proposals, no significant cumulative effects are likely to arise. However, it should be noted that it may reduce the suitability of these areas for recolonisation by these species in future should their populations recover. It is likely that certain waders (e.g., curlew, lapwing, golden plover and snipe – all mentioned in wider landscape SINC citations), would formerly have overwintered, been passage migrants, and bred, in these areas, prior to intensification of farming, increased recreational activities and wider population declines.
- 9.11.9 Hen harrier appears to be a passage migrant and infrequent over-wintering species across all of the wind farm sites where suitable moorland habitat is present. While their low flying nature means they are not considered to be at notable risk of collisions with turbines, they are potentially more susceptible to displacement. Some research studies have identified no displacement of hen harrier from operational wind farms; others have identified low level displacement including a 53% reduction in flight activity within 250m of operational turbines⁵⁵³⁶. Due to the small number of hen harrier recordings and relatively

⁵⁵ Guidance note: Distribution of breeding birds in relation to upland wind farms December 2009. RSPB/ConSci guidance note/Benedict Gove/16-12-09

limited extent and magnitude of potential displacement from turbines relative to available habitat, it is considered unlikely that all of the proposals combined would give rise to significant long-term cumulative displacement effects on hen harrier.

- 9.11.10 The Proposed Development site, by contrast to other wind farm sites within the wider landscape, does not contain any moorland habitats, albeit such habitat lies adjacent to the west within the wider Study Area. With moorland target species declining within Gwent, this therefore means that the Project is less likely to contribute towards cumulative effects upon these species than the other wind farm proposals identified.
- 9.11.11 Subject to the outcome of further surveys at the other proposed wind farms and the identification of residual effects (significant or *de minimis*), it is considered unlikely that significant adverse cumulative effects on IOFs will arise.

9.12 Impact of Climate Change

- 9.12.1 Future monitoring of the IOFs within the Survey Boundary will be delivered by embedded measures, namely the CMMS and the LEMP. This will allow an opportunity for management prescriptions to be reviewed and amended to reflect any impacts as a result of climate change. This will further safeguard the habitat and ornithology interests at the Survey Boundary over the long term.

9.13 Preliminary Significance Conclusions

- 9.13.1 A summary of the results of the preliminary Ornithology assessment is provided in **Error! Reference source not found.**

Table 9.25 Preliminary Summary of Significance of Effects

Receptor	Summary of Predicted Effect	Importance of Receptor ¹	Magnitude of Change ²	Significance ³	Summary Rationale
Construction					
Peregrine Nightjar Breeding Bird Assemblage	Noise and visual disturbance	Local to County	Adverse, temporary, short-term, low magnitude and extent.	Not significant	Temporary nature and limited extent of anticipated construction activities. Location of known and potential nesting sites predominantly outside of potential disturbance distances. Delivery of embedded measures via a CEMP to minimise the potential for visual and noise disturbance during the nesting season, including sensitive timing and ecological monitoring and supervision.
Breeding Bird Assemblage	Permanent and/or temporary land take	Local	Adverse, permanent and temporary, low magnitude and extent.	Not significant	Limited extent and magnitude of higher quality nesting habitat loss in context of available habitats across the rest of the Survey Boundary and wider landscape. Those open ground nesting species potentially impacted are typically of lower importance and abundant across the Survey Boundary (e.g., meadow pipit and skylark). Delivery of embedded measures, principally the LEMP, will ensure wider habitats are enhanced for nesting bird species to mitigate for habitat losses.
Operation					
Severn Estuary SPA/Ramsar	Designated gull population colliding with	International and national	Adverse, long-term, reversible, negligible magnitude and extent.	Not significant	Designated sites not functionally linked to the Survey Boundary area. Designated species recordings limited to lesser black-backed gull and herring gull activity, which is

Flat Holm and Steep Holm SSSI	turbines resulting in mortality				largely restricted to birds flying over the Survey Boundary with only limited foraging and resting. CRM suggests that collision risk to these species is not of sufficient magnitude to have a significant adverse effect on the breeding population of either species. The integrity of the breeding populations would not be impacted and no likely significant effects on these designations is therefore anticipated.
Lesser Black-backed Gull Herring Gull Peregrine Goshawk Red Kite Kestrel Nightjar	Collisions with turbines resulting in mortality	Local to County	Adverse, long-term, reversible, low magnitude and extent.	Not significant	CRM outputs have confirmed that there is not a risk of fatalities in an order of magnitude to impact the success of the breeding, migrating or overwintering populations, particularly in the context of background survival rates. Delivery of embedded measures, principally CMMS secured via condition, will ensure collision rates are monitored and identify the need for any additional mitigation measures, if required.
Peregrine Goshawk Red Kite Kestrel Nightjar Breeding Bird Assemblage	Disturbance and displacement from operating turbines	Local to County	Adverse, long-term, reversible, low magnitude and extent.	Not significant	Positioning of all turbines in relatively low suitability habitats (improved and species-poor grassland) for foraging and breeding. Little evidence of species sensitivity to notable disturbance and displacement from operational wind farms, particularly in the context of the population sizes, distribution, and availability of suitable habitat within the Study Area. Delivery of embedded measures, principally LEMP, will ensure wider habitats are enhanced for nesting bird species to mitigate for any small and localised displacement.

9.13.2 The importance of a receptor is defined using the criteria set out in **Table 9.13** according to its geographic scale of importance (Local, County, National and International).

9.13.3 Impacts have been characterised with reference to CIEEM Guidelines (2018)¹⁵ with due consideration to whether they are beneficial or adverse; extent; magnitude; duration; timing; frequency; and reversibility.

- 9.13.4 The significance of the environmental effects is based on the combination of the importance of a receptor and the nature of impacts and is expressed at a geographic scale of reference in accordance with best practice.

9.14 Additional Measures

- 9.14.1 The assessment set out above has concluded that it will be necessary to implement additional measures. These have been identified and would be in addition to those embedded measures outlined and assessed in **Section** Error! Reference source not found.. Error! Reference source not found. outlines how these additional measures will influence the Ornithology assessment.

9.15 Further Work to be Undertaken

- 9.15.1 The information provided in this Draft ES is preliminary, the final assessment of likely significant effects will be reported in the final ES. This section describes the further work to be undertaken to support the Ornithology assessment presented in the ES.