

Chapter 7

Ornithology

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Glossary

Term	Definition
Abnormal indivisible load (AIL) access areas	The areas of the proposed development that lie outside of the forested sections and encompasses the AIL routes that lie to the west of the south section and which link the north and south section.
Baseline	The existing conditions that prevail against which the effects of the proposed development are compared.
Birds of Conservation Concern (BoCC)	A five-yearly assessment of ornithological conservation priorities, provided by a review of the population status of birds regularly found in the UK, Channel Islands and the Isle of Man conducted by the UK’s leading bird conservation organisations.
Collision Risk Zone (CRZ)	The area derived by applying a buffer around each turbine, with a radius equal to the length of the turbine blades plus an additional precautionary 200 m.
Ecological Impact Assessment (EcIA)	Ecological Impact Assessment is a process of identifying, quantifying and evaluating potential effects of development-related or other proposed actions on habitats, species and ecosystems.
Environmental Impact Assessment (EIA)	EIA is a means of carrying out, in a systematic way, an assessment of the likely significant environmental from a development.
Environmental Statement (ES)	A document reporting the findings of the Environmental Impact Assessment (EIA) and produced in accordance with the EIA Regulations.
Habitat	The area or environment where a species naturally occurs.
Infrastructure	This is used to describe all parts of Y Bryn Wind Farm that require construction activities, both temporary and permanent, including turbines, hard standings, borrow pits and tracks (where new or widened).
Mitigation	Measures, including any process, activity or design to avoid, reduce, remedy or compensate for potential negative effects of a development.
North section	Section of development located north of Bryn settlement, within Penhydd forestry block.
Protected Species	Animals or plants protected by legislation.
Ramsar Site	A Ramsar Site is a wetland site of international importance designated under the Ramsar Convention, where waterfowl or waterfowl habitat are described as ecological features.
Schedule 7 species	A list of species of ‘principal importance’ for maintaining and enhancing biodiversity, as named under the Environment (Wales) Act 2016.
Site boundary	Includes the wind farm areas and AIL access areas.
Site of Special Scientific Interest (SSSIs)	Sites of Special Scientific Interest are protected areas that represent the UK’s most important wildlife and/or geological sites.
South section	Section of development located south of Bryn settlement, within Bryn forestry block.
Special Protection Area (SPA)	Special Protection Area, an internationally important area for nature conservation, specifically birds, classified under the Birds Directive.
Survey area	The area within which ornithological baseline surveys were carried out. This refers to the proposed development plus a surrounding buffer, the size of which is determined

Term	Definition
	by the specific survey being described. Details of the area covered are described in the methodology provided for each field survey (See Section 7.3).
The proposed development	Y Bryn Wind Farm development.
Turbine development area	The areas of the wind farm in which the proposed turbines are located.
Wind farm areas	All ground within the north and south sections of forestry.
Y Bryn site boundary	The area within which the proposed development will be located.
Zone of Influence (Zol)	The area over which ornithological features may be subject to significant effects as a result of the proposed project or associated activities.

List of Abbreviations

Abbreviation	Description
AA	Appropriate Assessment
AIL	Abnormal Indivisible Load (vehicles)
BBS	Breeding Bird Survey
BoCC	Birds of Conservation Concern
BCBC	Bridgend County Borough Council
BTO	British Trust for Ornithology
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CRM	Collision Risk Modelling
CRZ	Collision Risk Zone
ECoW	Environmental Clerk of Works
EcIA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
ES	Environmental Statement
GBC	Glamorgan Bird Club
GOS	Gower Ornithological Society
HMP	Habitat Management Plan
HRA	Habitats Regulations Assessment
IUCN	International Union for Conservation of Nature
IOF	Important Ornithological Feature
JNCC	Joint Nature Conservation Committee
km	Kilometre
LBAP	Local Biodiversity Action Plan
LNR	Local Nature Reserve
LSE	Likely Significant Effect
m	Metres
Natural Power	Natural Power Consultants Ltd
NNR	National Nature Reserve
NPT	Neath Port Talbot
NPTCBC	Neath Port Talbot County Borough Council
NRAP	Nature Recovery Action Plan
NRW	Natural Resources Wales
OEMP	Operational Ecological Monitoring Plan
PCH	Potential Collision Height
RBBP	Rare Breeding Birds Panel
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation

Abbreviation	Description
SEWBreC	South-East Wales Biodiversity Records Centre
SINC	Site of Important for Nature Conservation
SNH	Scottish Natural Heritage (now NatureScot)
SPA	Special Protected Area
SPP	Species Protection Plan
SSSI	Sites of Special Scientific Interest
UK	United Kingdom
VP	Vantage Point
WCA	The Wildlife and Countryside Act
WeBS	Wetland Bird Survey
WFA	Wind Farm Area
WOS	Welsh Ornithological Society
WTR	Wildlife Trust Reserve
Zol	Zone of Influence

7.1 INTRODUCTION

Summary of Chapter

- 7.1.1 A programme of baseline ornithology surveys was undertaken between October 2019 and August 2021. The following surveys were undertaken:
- Desk based study;
 - Vantage Point (VP) surveys in two breeding seasons (2020 and 2021) and two non-breeding seasons (2019/20 and 2020/21), utilising eight VP locations;
 - Walkover breeding bird surveys in 2020 and 2021;
 - Breeding raptor surveys in 2020 and 2021;
 - Breeding honey buzzard surveys in 2020 and 2021; and
 - Breeding nightjar surveys in 2020 and 2021.
- 7.1.2 All surveys were undertaken following the most relevant industry guidelines and incorporated relevant scoping responses.
- 7.1.3 The proposed development is not located within any statutory sites designated for ornithological interests; however one Site of Special Scientific Interest (SSSI) is located within 10 kilometres (km) of the proposed development (Eglwys Nynydd Reservoir) and one Special Protection Area (SPA)/Ramsar is within 25 km of the proposed development (Burry Inlet). Both have designations for non-breeding birds.
- 7.1.4 Vantage point surveys recorded flight lines from a total of 15 target species, most of which were raptors or gulls. Breeding raptor surveys identified a goshawk nest in both survey years (in different locations). Both nests lay outside the area of the proposed development. Honey buzzards were not recorded on the dedicated surveys in either year, with the only record being one flight recorded on a VP survey. Breeding nightjars were confirmed in both years, with an estimate of 20 probable territories in 2020 and 18 in 2021. Few nightjar records came from within the area of the proposed development.
- 7.1.5 The main ways in which a wind farm may affect ornithological features are via habitat loss due to land-take; disturbance and/or displacement; and collision with turbines. Following survey and assessment, species considered to be important ornithological features in the context of the proposed development, and subject to further impact assessment following guidance, were nightjar (disturbance/displacement, collision), herring gull (collision only), goshawk (disturbance/displacement, collision), and passerines of conservation concern (disturbance/displacement only). Following such further assessment (including collision risk modelling (CRM) for appropriate species), no significant effects are anticipated upon ornithological features. However, additional controls will be put in place during construction through creation of a site-specific Construction Environment Management Plan (CEMP), Species Protection Plan and appointing an Environmental Clerk of Works (ECOW) to monitor adherence to such plans.

- 7.1.6 In addition, a Habitat Management Plan (HMP) is proposed as a benefit of the project in alignment with the principle of Biodiversity Net Benefit and enhancements required within the Environment (Wales) Act.

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- 7.1.7 The ornithological chapter of the Environmental Statement (ES) has been prepared by Natural Power Consultants Ltd (Natural Power) on behalf of Y Bryn Wind Farm Ltd (the ‘applicant’) in respect of the proposed Y Bryn Wind Farm (also referred to in this chapter as ‘the proposed development’). The proposed development comprises up to 18 wind turbines and associated infrastructure on Natural Resources Wales (NRW) land near Maesteg, south Wales. The proposed development is situated within two forestry blocks known as Penhydd (henceforth the ‘north section’) and Bryn (henceforth the ‘south section’). Y Bryn site boundary is mostly within the Neath Port Talbot County Borough Council (NPTCBC) area, though part of the development extends into the Bridgend County Borough Council (BCBC) area.
- 7.1.8 For the purposes of assessing the potential impacts of the proposed development, the surveyed area allows for micro-siting of up to 50 metres (m) in any direction for all infrastructure and assumes the creation of new tracks as well as the upgrading of existing tracks.
- 7.1.9 This chapter provides details of the baseline ornithological conditions within the proposed development and the surrounding environment. Baseline ornithological conditions have been established for avian fauna, through a programme of rigorous field surveys, in addition to a desk-based review to obtain additional relevant ornithological data. The identified bird species comprising the ornithological baseline are described, evaluated and assessed using recognised criteria, in accordance with industry guidelines (e.g. that produced by the Chartered Institute of Ecology and Environmental Management: CIEEM, 2018¹).
- 7.1.10 This ES chapter has been prepared following a scoping process which led to a Scoping Report issued to consultees in January 2021, followed by Scoping Direction in March 2021.
- 7.1.11 In line with the principles of proportionate Environmental Impact Assessment (EIA), embedded mitigation is considered at the outset of the assessment (see Section 7.7). Furthermore, to ensure proportionality based on the likelihood of potential effects, only ornithological features for which it is considered there may be significant effects in the absence of mitigation are identified as Important Ornithological Features (IOFs) and are taken forward for a full Ecological Impact Assessment (EcIA).
- 7.1.12 The potential for avian ecological impacts as a result of the proposed wind farm development during the construction, operational and decommissioning phases have been identified and assessed, with particular attention paid to ornithological features of high vulnerability, conservation concern and those afforded a high level of legal protection. These impacts are then assessed in terms of their significance to each IOF. Where potentially adverse ornithological impacts have been identified and/or predicted for an IOF, appropriate mitigation to avoid or reduce the effects of such impacts are proposed. For IOFs for which greater than negligible residual effects are predicted

¹ CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal*. Chartered Institute of Ecology and Environmental Management, Winchester.

after the application of this mitigation, cumulative impacts with other nearby developments have also been considered within the EclA.

7.1.13 The Ornithology chapter is complemented by Chapter 6: Ecology.

7.1.14 Ornithological baseline conditions have been assessed through a combination of desk study and the results of baseline ornithological surveys carried out between October 2019 and August 2021 (see Section 7.3, Appendix 7.1 in Volume 3 of the ES and a separate Appendix 7.2: Ornithology Confidential Appendix for further details).

7.1.15 All Latin names for species mentioned in this chapter are listed in Appendix 7.1: Ornithological Technical Appendix. Summaries of survey times and dates are also provided in the appendix.

7.2 LEGISLATION, POLICY AND GUIDANCE

7.2.1 The ornithological baseline surveys and subsequent assessment have been carried out with reference to a number of international, national and local legislation, planning policy documents, which are listed. See also Chapter 2: Legal and Policy Context and Chapter 6: Ecology Assessment, of this ES.

Legislation

- Directive 2009/147/EC on the Conservation of Wild Birds (the Birds Directive)²;
- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive)³;
- The Wildlife and Countryside Act 1981 (as amended), which transposes the Birds Directive into law in England and Wales⁴;
- The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (the Habitats Regulations), which transposes the Habitats Directive into law in England and Wales⁵;

² Directive 2009/147/EC. Available at: <https://www.legislation.gov.uk/eudr/2009/147/contents> [Accessed 08/12/2023]

³ Council Directive 92/43/EEC. Available at: <https://www.legislation.gov.uk/eudr/1992/43/contents> [Accessed 08/12/2023]

⁴ The Wildlife and Countryside Act (1981). Available at: <https://www.legislation.gov.uk/ukpga/1981/69> [Accessed 08/12/2023]

⁵ The Conservation (Natural Habitats, &c.) Regulations (1994). Available at: <https://www.legislation.gov.uk/uksi/1994/2716/contents/made> [Accessed 08/12/2023]

⁶ Conservation of Habitats and Species regulations (2019). Available at: <https://www.legislation.gov.uk/ukdsi/2019/9780111176573> [Accessed 08/12/2023]

⁷ The Environment (Wales) Act (2016). Available at: <https://www.legislation.gov.uk/anaw/2016/3/contents/enacted> [Accessed 08/12/2023]

⁸ Wellbeing of future generations act (2015) Available at: <https://www.legislation.gov.uk/anaw/2015/2/contents/enacted> [Accessed 08/12/2023]

⁹ Planning Policy Wales (2009) Advice Note. Available at: <https://gov.wales/sites/default/files/publications/2018-09/tan5-nature-conservation.pdf> [Accessed 08/12/2023]

¹⁰ Planning Policy Wales (2021). Available at: https://gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11_0.pdf [Accessed 08/12/2023]

- Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, which ensures domestic implementation of the Birds Directive and Habitats Directive continues from 1 January 2021⁶;
- The Environment (Wales) Act 2016⁷; and
- Well-being of Future Generations (Wales) Act 2015⁸.

Policy

- Technical Advice Note 5: Nature Conservation and Planning (2009)⁹;
- Planning Policy Wales: Edition 11 (2021)¹⁰;
- Future Wales – the National Plan 2040 (2021)¹¹;
- UK Post 2010 UK biodiversity framework¹²;
- NPTCBC Local Development Plan 2011-2026 (2016)¹³; and
- BCBC Local Development Plan 2006-2021 (2011)¹⁴.

The Welsh Biodiversity Strategy comprising:

- The Nature Recovery Plan for Wales (2015)¹⁵; and
- The Nature Recovery Action Plan (NRAP) for Wales 2020-2021¹⁶.

Guidance

7.2.2 The approach to the collection of baseline ornithological data is based on industry standard guidance wherever this is available and applicable to the proposed development. Particular attention has been given to the guidance documents listed, that are applicable to assessing the effects of wind farm developments on ornithological features.

- Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland¹;
- Recommended bird survey methods to inform impact assessment of onshore wind farms¹⁷;

¹¹ Future Wales: The National Plan 2040 (2021). Available at: <https://gov.wales/future-wales-national-plan-2040-0> [Accessed 08/12/2023]

¹² JNCC and Defra (on behalf of the Four Countries' Biodiversity Group). 2012. UK Post-2010 Biodiversity Framework. July 2012. Available at: <https://jncc.gov.uk/our-work/uk-post-2010-biodiversity-framework/> [Accessed 08/12/2023]

¹³ NPTCBC Local Development Plan 2011-2026 (2016) Available at: <https://www.npt.gov.uk/7328> [Accessed 08/12/2023]

¹⁴ BCBC Local Development Plan 2006-2021 (2011). Available at: https://www.bridgend.gov.uk/media/8184/ldp_text.pdf [Accessed 08/12/2023]

¹⁵ Nature recovery action plan (2015). Available at: <https://gov.wales/sites/default/files/publications/2019-05/nature-recovery-action-plan-2015.pdf> [Accessed 08/12/2023]

¹⁶ Nature recovery action plan (2021). Available at: <https://gov.wales/sites/default/files/publications/2020-10/nature-recovery-action-plan-wales-2020-2021.pdf> [Accessed 08/12/2023]

¹⁷ SNH (2017) Recommended bird survey methods to inform impact assessment of onshore wind farms. Scottish Natural Heritage (now NatureScot), Battleby.

- Birds and Wind Farms: Risk Assessment and Mitigation¹⁸;
- Developing field and analytical methods to assess avian collision risk at wind farms¹⁹;
- Windfarms and birds: calculating a theoretical collision risk assuming no avoidance action²⁰;
- Assessing significance of impacts from onshore windfarms on birds outwith designated areas²¹;
- Monitoring the impacts of onshore wind farms on birds²²;
- Guidance on methods for monitoring bird populations at onshore wind farms²³;
- Avoidance rates for the onshore Scottish National Heritage (SNH) wind farm collision risk model²⁴;
- Assessing the cumulative impact of onshore wind energy developments²⁵
- Assessing connectivity with Special Protection Areas (SPAs)²⁶;
- A Review of Disturbance Distances in Selected Bird Species²⁷;
- Wildlife Sites Guidance Wales: a guide to develop local wildlife systems in Wales²⁸;
- Bird Monitoring Methods²⁹;
- A method for censusing upland breeding waders³⁰;
- Raptors: A Field Guide to Survey and Monitoring³¹;
- Good Practice during Wind Farm Construction³²;
- Birds of Conservation Concern (BoCC)³³: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man³³; and
- Birds of Conservation Concern in Wales 4: the population status of birds in Wales³⁴.

¹⁸ De Lucas, M., Janss, G. & Ferrer, M. (eds.) (2007) *Birds and Wind Power*. Quercus, Madrid.

¹⁹ Band, W., Madders, M. & Whitfield, D. (2007) *Developing field and analytical methods to assess avian collision risk at wind farms*. Scottish Natural Heritage, Natural Research Ltd.

²⁰ SNH (2000) *Windfarms and birds: calculating a theoretical collision risk assuming no avoidance action*. Scottish Natural Heritage (now NatureScot), Edinburgh.

²¹ SNH (2018) *Assessing significance of impacts from onshore windfarms on birds outside designated areas*. Scottish Natural Heritage (now NatureScot), Inverness.

²² SNH (2009) *Monitoring the impact of onshore wind farms on birds (Guidance note)*. Scottish Natural Heritage (now NatureScot), Edinburgh.

²³ SNH (2009) *Guidance on methods for monitoring bird populations at onshore wind farms*. Scottish Natural Heritage (now NatureScot), Edinburgh.

²⁴ SNH (2018) *Avoidance rates for the onshore SNH wind farm collision risk model*. Scottish Natural Heritage (now NatureScot), Battleby.

²⁵ SNH (2018) *Assessing the cumulative impacts of onshore wind farms on birds: guidance*. Scottish Natural Heritage (now NatureScot), Inverness.

²⁶ SNH (2016) *Assessing connectivity with Special Protection Areas (SPAs) (Guidance note: Version 3)*. Scottish Natural Heritage (now NatureScot), Edinburgh.

²⁷ Goodship, N.M. & Furness, R.W. (2022) *Disturbance Distances Review: an Updated Literature Review of Disturbance Distances of Selected Bird Species*. A report from MacArthur Green to NatureScot (Research Report 1283).

7.2.3 In addition, particular attention has been paid to the lists of species of principal importance, as given in Section 7 of the Environment (Wales) Act 2016³⁵. Local biodiversity interests have been assessed using the species listed by the Neath Port Talbot (NPT) Nature Partnership³⁶ and those on the Bridgend Local Biodiversity Action Plan (LBAP)³⁷ lists.

7.2.4 Although the guidance referred to as standard for assessing impacts for birds is provided by NatureScot (formerly SNH, this is accepted as standard across the UK nations, including by NRW.

7.3 DATA COLLECTION

Desk Study

7.3.1 A desk study has been undertaken to collate relevant existing ornithological data from public domain survey data, data not in the public domain from third-party bodies, and the outcome of consultations. The purpose of the desk study was to provide information on bird populations in and around the proposed development. Combined with the results of the ornithological field surveys, this information has been utilised to provide a comprehensive baseline on which to base the EcIA.

Statutory, National and Locally Designated Sites of Nature Conservation

7.3.2 A search was made for all sites with an international and national designation for ornithological interests in the vicinity of the proposed development. This included SPAs, Ramsar sites and SSSIs. National Nature Reserves (NNRs) and Local Nature Reserves (LNRs) were also included in the search. Sites of Importance for Nature Conservation (SINCs), which are non-statutory sites that are predominantly designated for their habitat or overall biodiversity assemblage (and not specifically for their ornithological interest) were identified as part of the search for ecological features (See Chapter 6: Ecology).

²⁸ Wales Biodiversity Partnership (2008). *Wildlife Sites Guidance Wales: A Guide to Develop Local Wildlife Systems in Wales*. Available at: <http://biodiversitywales.org.uk> [Accessed 08/12/2023]

²⁹ Gilbert, G., Gibbons, D.W. & Evans, J. (1998) *Bird Monitoring Methods*. RSPB, Sandy.

³⁰ Brown, A. F. & Shepherd, K. B. (1993) A method for censusing upland breeding waders. *Bird Study*, 40: 189-195.

³¹ Hardey, 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.

³² Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency, Forestry Commission Scotland (2010) *Good practice during windfarm construction*.

³³ Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114: 723-747

³⁴ Johnstone, I.G., Hughes, J., Balmer, D.E., Brenchley, A., Facey, R.J., Lindley, P.J., Noble, D.G. & Taylor, R.C. (2022) *Birds of Conservation Concern in Wales 4: the population status of birds in Wales*. Milvus: the journal of the Welsh Ornithological Society.

³⁵ *Environment (Wales) Act (2016)*. Available at: <https://www.biodiversitywales.org.uk/environment-wales-act> [Accessed 08/12/2023]

³⁶ *NPTCBC special species list*. Available on: <https://www.npt.gov.uk/5406> [Accessed 08/12/2023]

³⁷ *Bridgend local Biodiversity Action Plan (2014)*. Available at: https://www.bridgend.gov.uk/media/8721/bridgendlbapandes_v2-1.pdf [Accessed 08/12/2023]

7.3.3 The search area utilised was a 10 km radius of the proposed development site boundary or, in the case of designated sites with gulls or geese listed as a designated feature, a 25 km radius. This is due to these species ranging more widely between roosting and foraging areas.

7.3.4 The search was carried out using the online Defra MAGIC Map application tool³⁸, the NRW website³⁹ and the South-east Wales Biodiversity Records Centre (SEWBRc).

Ornithological Features of Conservation Concern

7.3.5 A data search from SEWBRc, undertaken in November 2020 to inform the Scoping Report, requested all ornithological records held for the wind farm areas and a 2 km buffer. An updated data search was requested in November 2021 to cover a 2 km search area around the Y Bryn site boundary and to incorporate the most up to date records available at that time. The SEWBRc data search returned all historic records with no restriction on the age of the records. However, except where needed for context, only records from 2015 onwards (to cover five full years) are reported upon in this chapter.

7.3.6 In addition, The NPT Nature Partnership was contacted in 2021 for any further data that might not be available via SEWBRc.

7.3.7 An NRW environmental advisor with knowledge of the Y Bryn site boundary was consulted during the process, including the sharing of data between NRW (as land managers) and Natural Power.

7.3.8 The Royal Society for the Protection of Birds (RSPB) Cymru were approached to request any ornithological data they hold for the wind farm areas and a 5 km radius. They confirmed that they do not hold any records for this area.

7.3.9 The Gower Ornithological Society (GOS) (who record birds within the City and County of Swansea, and NPTCBC area) were contacted for any ornithological records not held by SEWBRc. A request put out to members for relevant bird records did not return any data. It is understood that sensitive records of Schedule 1 species are not usually disclosed. The four most recent bird reports produced by GOS, covering 2018⁴⁰ and 2019⁴¹, 2020⁴² and 2021⁴³ were purchased and these have been consulted for any records of interest in relation to the area around the proposed development.

7.3.10 The GOS recommended that for bird records in the part of the wind farm areas outside their own recording area, the British Trust for Ornithology (BTO) representative for East Glamorgan should be contacted. On doing so it was confirmed that records of interest would be available through SEWBRc. In addition, the most recent bird reports published by Glamorgan Bird Club (GBC) (which includes the county of Bridgend in its recording area), covering 2020⁴⁴ and 2019⁴⁵, were also consulted.

³⁸ DEFRA Magic Map to demonstrate 25 km radius of development site boundary. Available at: <https://magic.defra.gov.uk/MagicMap.aspx> [Accessed 08/12/2023]

³⁹ Natural Resources Wales, (2022). Available at: <https://naturalresources.wales/> [Accessed 08/12/2023]

⁴⁰ Tallack, R.E. & Taylor, R.H.A. (2019) *Gower Birds for the Recording Year 2018*. Gower Ornithological Society.

⁴¹ Tallack, R.E. & Taylor, R.H.A. (2020) *Gower Birds for the Recording Year 2019*. Gower Ornithological Society.

⁴² Tallack, R.E. & Taylor, R.H.A. (2021) *Gower Birds for the Recording Year 2020*. Gower Ornithological Society.

⁴³ Tallack, R.E. & Taylor, R.H.A. (2022) *Gower Birds for the Recording Year 2021*. Gower Ornithological Society.

7.3.11 The ornithology chapters of other projects in the vicinity of the proposed development were obtained where possible for any relevant information. Additionally, the HMP for Mynydd Brombil Wind Farm, which overlaps with Y Bryn site boundary, was also consulted. The annual monitoring reports for Mynydd Brombil Wind Farm were sought but could not be obtained. Instead, specific ornithological information was shared by the operator's Asset Manager.

Ornithological Survey Programme

7.3.12 In order to assess the potential effects of a wind farm on birds, both the value of the land area proposed for the wind farm itself to birds and the level of flight activity within and around the Y Bryn site boundary should be determined. In view of the species identified as potentially occurring within the vicinity of the proposed development and following scoping responses after the first year of baseline recording, the surveys listed were undertaken (in line with NatureScot guidance¹⁷).

- Non-breeding season VP surveys in 2019/20 and 2020/21 (September to February, inclusive);
- Breeding season VP surveys in 2020 and 2021 (March to August inclusive);
- Walkover breeding bird surveys in 2020 and 2021;
- Breeding raptor surveys in 2020 and 2021;
- Additional breeding honey buzzard surveys in 2020 and 2021; and
- Breeding nightjar surveys: June and July 2020 and 2021.

7.3.13 In line with guidance¹⁷ the baseline ornithology data are valid for five years from collection.

7.3.14 A summary of each of the baseline ornithology survey methods is given. Further survey method details, along with dates of survey visits and analysis methods are given in Appendix 7.1: Ornithology Appendix.

Vantage Point Surveys (Flight Activity Survey)

7.3.15 Flight activity surveys were undertaken to cover two breeding seasons and two non-breeding seasons, thus completing two years of baseline surveys in total. Surveys were completed from a total of eight VP locations in order to adequately cover the turbine development area plus a 500 m buffer (see Figure 7.1 in Volume 2 of the ES).

7.3.16 For the purposes of the flight activity surveys, which split the year into two six-month periods, the breeding season is considered to be from March to August inclusive⁴⁶ and the non-breeding season is considered to be September to February inclusive, in accordance with survey guidance¹⁷. The VP surveys aimed to complete 36 hours per VP per season. This was typically completed by undertaking six hours per month at each VP to spread survey coverage throughout the season.

⁴⁴ Eastern Glamorgan Bird Report (2020). Available at: https://drive.google.com/file/d/1pmx-QHZQu3jT_kOPEHii6oEiRj26trro/view [Accessed 08/12/2023]

⁴⁵ Eastern Glamorgan Bird Report (2019). Available at: https://drive.google.com/file/d/1-tLwezEYBeehfnIXiDV3Y40_i4shX92f/view [Accessed 08/12/2023]

⁴⁶ Although species such as goshawk may show breeding behaviour in February, ahead of nesting, and non-breeding wading birds may be recorded into May on passage, the period March to August best summarises the breeding season for the range of target species considered likely to be present at the proposed development.

However, in the first year of baseline recording, VP surveys did not commence until October 2019 and in the March/April 2020 breeding season surveys were impacted by the restrictions in movement that were initially put in place as a result of the COVID-19 pandemic. However extra survey hours were completed over subsequent months to bring survey coverage up to the threshold stated in guidance. This was achieved in all seasons except for a three-hour shortfall at some VPs in the first non-breeding season (see Appendix 7.1: Ornithology Appendix, for details of the survey hours completed).

- 7.3.17 The flight activity survey focuses on identifying flight lines and flight heights of target species, such as raptors and wildfowl, and allows any regular patterns of flight lines to be identified, allowing turbine locations to be designed to minimise collision risk to birds. The data generated can also be used to estimate the theoretical collision risk of a particular species. This is achieved by noting the flight heights at which the birds are recorded during the period of observation. The altitude of the target bird(s) was recorded at the start of the observation and at 15 second intervals thereafter into one of several specified height bands. Initially four height bands were used: (1) <20 m, (2) 20 m - 40 m, (3) 40 m - 140 m and (4) >140 m. These generic height bands were updated in November 2020 to reflect the proposed development and to aid the associated CRM, with the following five height bands: (1) 0 m - 30 m, (2) 30 m - 80 m, (3) 80 m - 200 m, (4) 200 m - 250 m and (5) >250 m. This change is accounted for in the CRM. Further details of the CRM are given in Paragraph 7.3.31 and in Appendix 7.1: Ornithology Appendix.
- 7.3.18 The ornithological features recorded during the VP surveys (classed as 'target' species) are described in paragraph 7.3.39. 'Secondary' species were also recorded in accordance with NatureScot guidance.
- 7.3.19 All incidental records of target species (i.e. birds that were not in flight, birds that were heard but not seen, birds that were observed well beyond the survey area and records outside of the formal VP surveys) were also recorded to provide context, although these records do not contribute to any analysis of flight activity.

Walkover Breeding Bird Survey

- 7.3.20 The walkover breeding bird survey (BBS) (also known as a moorland, or upland, breeding bird survey) was based upon the standard methodology for assessing upland wader populations, as described by Brown and Shepherd (1993)³⁰, but utilising the four survey visit methodology advocated in guidance¹⁷.
- 7.3.21 In 2020 the breeding bird survey covered the wind farm areas plus a 500 m surrounding buffer (see Figure 7.2). Land outside the boundary was surveyed by walking the edge of the north and south sections and regularly scanning the surrounding area. The survey covered open ground only, i.e. those habitats that were considered suitable as breeding areas for those species stated in guidance¹⁷ as being the target for these surveys: waders, red grouse, gulls, (skuas) and some wildfowl species. However, open-ground passerines were also recorded, as were birds in the woodland edge; although these were not the focus of the surveys.

- 7.3.22 Current guidance¹⁷ does not require surveys of woodland passerines nor does it require winter walkover surveys. However, following consultation (see Section 7.5) which recommended the inclusion of woodland passerines in the breeding bird survey, the 2021 methodology was adapted.
- 7.3.23 In 2021, using the site layout at that time, infrastructure within the wind farm areas, plus a 750 m buffer, was surveyed. In addition to this the AIL access areas (plus a 400 m buffer) was also included (see Figure 7.2), which allowed access to open ground areas that were not accessible in 2020. Woodland passerines were also fully incorporated into the methodology in 2021. The surveyor recorded all species encountered within the plantation, and clear-felled areas, producing species lists, for each compartment within the forest. Four survey visits were carried out between April and July, as recommended by Calladine *et al.* (2009)⁴⁷.
- 7.3.24 After the last survey visit, records that had been mapped during the four surveys were combined and analysed to estimate the location of breeding territories. Territories were identified using a cluster analysis method, as outlined in Bibby *et al.* (2000)⁴⁸. Territory mapping was not undertaken for birds breeding within the interior of the forest; for these species a total number of territories was estimated by summing the totals for each compartment covered during the surveys. Note that the same approach was also used for the AIL access area that is located to the north of the south section.

Breeding Raptor Surveys

- 7.3.25 Dedicated breeding raptor surveys were undertaken within the wind farm areas and a 2 km buffer during both 2020 and 2021 (see Figure 7.2). The focus of the surveys was to identify any evidence of breeding by raptor species, particularly target species such as goshawk and red kite that had been identified as having potential to be present on, or close, to the proposed development. Surveys in 2020 took place between April and July, with surveys earlier in the season curtailed by the COVID-19 pandemic. In 2021, dedicated raptor surveys were undertaken between February and July.
- 7.3.26 Surveys were informed by the species-specific methods described in Hardey *et al.* (2013)³¹. A combination of VP watches and walkover surveys in suitable breeding habitat was undertaken. VP surveys were carried out with the aim of identifying courtship displays and territorial behaviour, whilst walkover surveys were to check for signs of breeding raptors and, where relevant, to locate and monitor nest sites. Potential breeding birds recorded during the flight activity VP surveys were also followed up during the dedicated raptor surveys. All surveys were carried out under a Schedule 1 Licence by experienced surveyors.
- 7.3.27 Surveys covered both the north and south forestry sections, as well as time being spent scanning beyond the Y Bryn site boundary to overlook suitable habitat in the surrounding area. As with the viewsheds used in the flight activity surveys, it was considered that raptors in at least a 2 km radius around the wind farm areas would be detected in this way.

⁴⁷ Calladine, J., Garner, G., Wernham, C. & Thiel, A. (2009). *The influence of survey frequency on population estimates of moorland breeding birds*. Bird Study, 56: 3, 381-388.

⁴⁸ Bibby, C.J., Burgess, N.D., Hill, D.A & Mustoe, S. (2000). *Bird Census Techniques*. Second edition. Academic Press, London.

Honey Buzzard Surveys

- 7.3.28 Due to honey buzzard being known to breed within the wider area, and in similar habitat to that present at the proposed development, dedicated surveys to locate honey buzzards were also undertaken. As this species can be secretive and are best detected late in the breeding season, survey efforts for honey buzzard were in addition to that undertaken for the breeding raptor survey. Dedicated honey buzzard surveys were undertaken following methods in Hardey *et al.* (2013)³¹ and more recent guidance regarding survey timings (e.g. from the Rare Breeding Birds Panel (RBBP, 2020)⁴⁹). Surveys were undertaken by skilled surveyors with experience of surveying honey buzzards in south Wales, and who hold a Schedule 1 Licence. See Appendix 7.1: Ornithology Appendix for further details. Surveys were carried out in 2020 and 2021, between May and August, with most survey effort being focused in July and August in both years.

Nightjar Surveys

- 7.3.29 Dedicated surveys to record any nightjars present in the vicinity of the proposed development, were carried out in 2020 and 2021. Survey methods followed those outlined in Gilbert *et al.* (1998)²⁹. The surveys covered the wind farm areas with all suitable habitat within the north and south sections covered by the surveys (see Figure 7.2). The nightjar surveys were carried out at dusk over multiple nights, in suitable weather conditions. Two survey visits were made, in June and July, in both years, to record all nightjars encountered, including any behaviour indicative of breeding, such as churring, displaying and pairs of birds seen together. Surveys were undertaken by skilled surveyors with experience of surveying nightjars in south Wales, and who hold a Schedule 1 Licence. See Appendix 7.1: Ornithology Appendix, for further details.

Collision Risk Modelling

- 7.3.30 CRM is often used for proposed wind farm developments to predict the number of individuals of target bird species that might collide with the wind turbine rotors. The method recommended by NatureScot²⁰ is the Band *et al.* (2007)¹⁹ collision risk model, and this approach was followed in this assessment.
- 7.3.31 Where there was sufficient flight activity within the Collision Risk Zone (CRZ) at Potential Collision Height (PCH), CRM was used to predict the number of individuals per target species that might collide with the wind turbine rotors. The CRZ was defined as a 286 m buffer of the proposed turbine locations, representing the longest rotor blade length to be used at Y Bryn site boundary (86 m), plus a 200 m precautionary buffer zone.
- 7.3.32 From October 2019 to October 2020 four height bands were used during flight activity surveys and from November 2020 to August 2021 five height bands were used for recording flight heights. In the case of the proposed development PCH was considered to fall within height bands 2, 3 and 4 of both recording scenarios and therefore only flights within these height bands were considered to be at collision risk. This is a precautionary approach in which all flights recorded within the height range 36 m - 250 m were assumed to be at risk height. In reality, height bands 2-4 included all flights of ≥ 20 m altitude (October 2019 to October 2020) and all flights in the range 30 m -250 m

(November 2020 to August 2021) and so some flights regarded as being at risk of collision may not have actually been at rotor swept height.

- 7.3.33 In the interests of proportionality, species rarely present, and for which significant collision impacts are considered to be highly unlikely, were excluded from CRM. Sufficient flight activity to qualify for CRM was defined as ≥ 3 flights or ≥ 10 individuals at PCH in the CRZ in either the breeding or non-breeding season. Following the seasons set out in guidance¹⁷ for the VP surveys, the breeding season was defined as March to August (inclusive) and the non-breeding season was defined as September to February (inclusive).
- 7.3.34 For species that usually fly in approximately straight lines ('directional approach'), such as transiting gulls, flights observed were extrapolated up in order to estimate the number of individuals likely to pass through the CRZ at PCH per season or year. For species that generally fly non-directionally ('random approach'), such as raptors, the observed time spent flying within the risk area was calculated and similarly extrapolated up per season or year across the whole risk area. During random approach modelling, average flight activity per unit effort (measured in minutes of survey time and hectares of area surveyed) was calculated. This metric was then used to extrapolate flight activity across time and across the entirety of the CRZ to estimate the total flight activity across Y Bryn site boundary per season/year. The underlying assumption behind this is that the surveys provide a representative sample of flight activity over time and in space.
- 7.3.35 The number of flights, or flight activity, was then used to estimate the number of birds expected to pass through the rotor swept area or volume respectively and, combined with the probability of a bird colliding with a blade if it does pass through the rotor swept area, to give a predicted number of collisions in the absence of avoidance behaviour. This was then combined with a parameter representing avoidance behaviour likely to be displayed by birds flying towards turbine blades. Collision estimates were then calculated based on a range of avoidance rates including the species-specific avoidance rates recommended by NatureScot²⁴.
- 7.3.36 A default avoidance rate of 98% is normally recommended, unless otherwise provided by guidance: for example, for red kite an avoidance rate of 99% is used, and for kestrel an avoidance rate of 95% is used²⁴. It can be expected that most birds flying towards a turbine will take action to avoid a collision, with an avoidance rate of 98% meaning that 98 out of 100 flights would result in the bird successfully avoiding the turbine. This data is informed and updated by monitoring at operational wind farms.
- 7.3.37 For each species, the risk of collision for an individual was calculated by estimating the likelihood of collision based on the characteristics of the birds and of the turbines. Wind farm specifications and bird characteristics used in the model are provided in Appendix 7.1: Ornithology Appendix.

Survey Limitations

- 7.3.38 The following limitations were experienced:
- Due to the hill and valley terrain within the proposed development area and the forested nature of the site, the siting of VPs was not straightforward. However, the viewsheds of the eight VPs

⁴⁹ RBBP, (2020). Honey-buzzard survey 2020-21. Available at: <https://rbbp.org.uk/honey-buzzard-2020/> [Accessed 08/12/2023]

that were chosen were able to adequately cover the locations of the proposed turbines, with only very small gaps in coverage of the surrounding 500 m buffer. These gaps were such that it is not considered possible for a target species to have passed through the 500 m buffer without being detected. It is considered that the coverage provided by the VPs was more than sufficient for recording ornithological features within the collision risk zone of the proposed turbines;

- No access was permitted outside the wind farm areas (2020) or outside Y Bryn site boundary in 2021. Therefore, where required, these areas were surveyed from within Y Bryn site boundary or from public highways. This applies to the BBS (survey area of wind farm areas plus 500 m) and the raptor surveys (survey area of wind farm areas plus 2 km). It is considered that most target species in the BBS (breeding waders) would have been recorded displaying at a distance of 500 m. Some species (especially passerines) will not have been recorded in the buffer, however, the large majority of the area that is within 500 m of proposed turbines is located within the accessed survey area. For raptors, the distance beyond the proposed development that should be covered¹⁷ is 2 km (1 km for goshawk), with the exception of eagles (not applicable to south Wales). As a 2 km viewshed is accepted as suitable for detecting raptors during flight activity surveys, it is also considered that scanning 2 km beyond the wind farm areas was sufficient for undertaking the raptor surveys;
- Guidance recommends 36 hours of survey effort per VP per survey season. This was achieved in all seasons, except for the 2019/20 non-breeding season in which five of the eight VPs fell three hours short. Surveys did not begin until October 2019 and though extra survey effort was undertaken, unsettled weather over the winter prevented full 'catch-up' of the missing hours. The second non-breeding season achieved the full complement of 36 hours of surveys per VP and both breeding seasons, when activity was greatest, also both achieved, or exceeded, the guidance recommended 36 hours. Given the large number of VPs, and the considerable overlap in their viewsheds, the favourable weather conditions in which surveys were undertaken, and the relatively low ornithological activity over the non-breeding season, it is considered that VP survey effort has not been negatively affected. In their scoping response, NRW agreed that survey effort in the 2019/20 non-breeding season was sufficient; and
- The early breeding season period of 2020 was affected by the COVID-19 pandemic and the associated restrictions on movement that temporarily came into place. Survey effort for the flight activity surveys achieved 36 hours over the breeding season so were unaffected. However, the breeding bird survey, despite achieving the required four survey visits, did not begin until early May. Similarly, no raptor surveys were undertaken in March, a period of high detectability for goshawk. The data collected in 2020 does not appear to have been negatively impacted upon as a result but both surveys were repeated in 2021, with this time period suitably covered on this occasion.

7.4 APPROACH TO IMPACT ASSESSMENT

Key Issues

- 7.4.1 It is widely accepted that wind turbines present three main areas of potential risk to birds⁵⁰:
1. Direct habitat loss resulting from the construction of a wind farm and associated infrastructure;
 2. Displacement of birds from wind farms due to disturbance during the construction and operational phases; this may be temporary or permanent. Displacement can include barrier effects in which birds alter their migration flyways or local flight paths to avoid a wind farm; and
 3. Death due to collision or interaction with rotating turbine blades, overhead wires, guy lines and fencing. Collision risk depends on a range of factors related to bird species, numbers and behaviour, weather conditions, and topography, and the nature of the wind farm itself, but is generally considered to be of particular relevance for sites located in areas known to support raptors or large concentrations of wildfowl.
- 7.4.2 These issues are considered in this assessment (Section 7.7).

Target Species

- 7.4.3 NatureScot guidance¹⁷ suggests that assessment of the effects of wind farms on birds should, in most circumstances, be limited to those protected species and other species of conservation concern that, as a result of their flight patterns or response behaviour, are likely to be affected by or subject to significant and adverse impacts from wind farms. The guidance states that there are three overarching lists describing protected species and species of conservation concern:
1. Species listed in Annex I of the Council Directive 2009/147/EC on the Conservation of Wild Birds (Annex I species);
 2. Species protected under Schedule 1 of the Wildlife & Countryside Act 1981 (as amended) (Schedule 1 species); and
 3. Red-listed Birds of Conservation Concern as identified in BoCC^{33,34} (Red listed species).
- 7.4.4 In addition, consideration should be given to LBAP species (taken here to also include Section 7 listed bird species³⁵) and any other species for which a proposed development site hosts a particular concentration.
- 7.4.5 Within these lists, NatureScot recommends that the greatest attention should be paid to those species which as a result of their flight patterns or response behaviour, may be subject to impact from wind farms (such as raptors) and any species that are not particularly manoeuvrable in flight (e.g. geese and swans). Such species are termed 'target species' and are recorded in detail during flight activity surveys.
- 7.4.6 Proposed wind farm sites may differ considerably in their ornithological sensitivity; NatureScot guidance¹⁷ therefore recommends that survey programmes and the level of survey effort should be tailored to an individual site's needs.

⁵⁰ Drewitt, A.L. & Langston, R.H.W. (2006) *Assessing the impacts of wind farms on birds*. Ibis, 148: 29-42 (and references therein).

- 7.4.7 In accordance with NatureScot guidance¹⁷, surveys focused on the following target species:
- All raptors and owls listed in Annex I of the EC Birds Directive and/or Schedule 1 and 1A of The Wildlife and Countryside Act (WCA) 1981 (as amended);
 - All species of wildfowl (with the exception of Canada goose and mallard, due to these being common and widespread species); and
 - All wader species.
- 7.4.8 As ‘large gulls’ (comprising herring, lesser black-backed and great black-backed gull) were recorded early in the baseline survey programme passing regularly over the proposed development in reasonable numbers, these species were also treated as target species. These species may be susceptible to collision and herring gull is listed as a Section 7 species.
- 7.4.9 Secondary species⁵¹ (species of lesser conservation concern or species regarded as being less sensitive to wind farm developments) included the following:
- All other waterfowl (e.g. mallard and including grey heron and cormorant);
 - All other raptor species (including buzzard and sparrowhawk);
 - Raven;
 - Other gull species;
 - Crossbill; and
 - Any large aggregations of red-listed passerines.
- 7.4.10 Note that following consultation, kestrel and black-headed gull were both moved from being secondary species to being recorded as target species from March 2021 (2021 breeding season).

Evaluating Ornithological Features

- 7.4.11 This section presents the approach taken to the EcIA within this chapter and provides an overview of how the potential for impact has been determined and the method by which impact significance has been ascertained. The approach to the EcIA adopted within this assessment follows the CIEEM guidelines¹ in line with these guidelines professional judgement has been applied where appropriate. The criteria used and the underlying rationale are described further within the following sections.
- 7.4.12 The assessment process involves identifying IOFs, in accordance with CIEEM guidelines¹. Assigning a value level to ornithological features is undertaken with reference to the criteria defined

⁵¹ Secondary species are species which may also be sensitive to wind farm development, but which are of lesser conservation concern or lower sensitivity than target species. These species were recorded during flight activity surveys but in less detail than target species (for example their flights were not mapped).

⁵² An area is used regularly by 1% or more of the Great Britain population of a species listed in Annex I of the Birds Directive (79/409/EEC as amended) in any season; an area is used regularly by 1% or more of the biogeographical population of a regularly occurring migratory species (other than those listed in Annex I) in any season; an area is used regularly by over 20,000 waterfowl (waterfowl as defined by the Ramsar Convention) or 20,000 seabirds in any season.

in Table 7.1. It should be noted that these criteria are intended as a guide and are not definitive; professional judgement is also applied in determining value level for ornithological features.

Table 7.1: Approach used to evaluate ornithological features by defined geographical context

Level of value	Example of IOF
International	A regularly occurring species listed as a qualifying feature of an internationally designated site (e.g. SPA or Ramsar wetland site) within the Zone of Influence (ZoI) of the proposed development.
	Species populations present with sufficient conservation importance to meet criteria for SPA selection ⁵² .
National	A regularly occurring species listed as a qualifying feature of a nationally designated site (e.g. SSSI) within the ZoI of the proposed development.
	Species populations present with sufficient conservation importance to meet criteria for SSSI selection ^{53, 54, 55} .
Regional	A species occurring within SPAs, Ramsar sites and SSSIs, but not crucial to the integrity of the site.
	Species populations present falling short of SSSI selection criteria but with sufficient conservation importance to likely meet criteria for selection as a local site ²⁸ .
Local	Species described above but which are present very infrequently or in very low numbers.
	Other species of conservation concern, including species included on the UK or Welsh BoCC Red and Amber Lists ^{33,34} .
Negligible	All other species that are widespread and common and which are not present in locally important (or greater) numbers and which are considered to be of low conservation concern (e.g. UK BoCC Green List species ³³).

- 7.4.13 The assessment of ornithological features recorded during the baseline surveys also considers the importance of the proposed development area for the species under consideration, rather than only considering the nature conservation importance of the species itself. As such, a species of international conservation importance may only have local or negligible importance in the context of the proposed development if very rarely recorded at Y Bryn site boundary.
- 7.4.14 Therefore, while the importance of the species is taken into account, in order to assess the nature conservation importance of the proposed development, the number of individuals of that species using it and the nature and level of this use is also taken into account. An assessment is then made of the importance of the proposed development area to the species in question, in order to determine whether they are an IOF.

⁵³ Drewitt, A.L., Whitehead, S. and Cohen, S. (2020). *Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups*. Chapter 17 Birds (version 1.1). Joint Nature Conservation Committee, Peterborough.

⁵⁴ Areas which regularly support 1% or more of the total British breeding population of any native species (as per Woodward *et al.*, 2020), including lekking and feeding areas and seabird colonies of over 10,000 breeding pairs; Areas which regularly support 1% or more of the total British non-breeding population of any native species in any season and non-breeding waterbird assemblages of over 20,000 individuals (as per Woodward *et al.*, 2020).

⁵⁵ Woodward, I., Aebischer, N., Burnell, D., Eaton, M., Frost, T., Hall, C., Stroud, D.A. & Noble, D. (2020). *Population estimates of birds in Great Britain and the United Kingdom*. British Birds 113: 69–104.

7.4.15 In line with the principles of proportionate EIA, embedded mitigation is considered at the outset of the assessment. IOF status has only been assigned where there is still considered to be the potential for significant effects to the feature at the assigned value level arising from the proposed development, after the application of embedded measures.

Characterising Potential Impacts on Ornithological Features

- 7.4.16 Impacts on IOFs are judged in terms of magnitude and duration.
- 7.4.17 Magnitude refers to the size of an impact and is determined on a quantitative basis where possible. This may relate to the area of habitat lost to the development footprint in the case of a habitat feature or predicted loss of individuals in the case of a population of a particular species of bird. Within this EclA, magnitude is assessed within six levels, as detailed in Table 7.2.

Table 7.2: Criteria used within this EclA to determine the magnitude of ecological impacts

Impact magnitude	Definition
Very highly negative	Total or almost complete loss of an ornithological feature resulting in a permanent adverse effect on the integrity ⁵⁶ of the feature. The conservation status of the feature would be permanently affected.
Highly negative	Result in large-scale, permanent changes in an ornithological feature, likely to change its ecological integrity. These impacts are therefore likely to result in overall changes in the conservation status of the feature.
Moderately negative	Includes moderate-scale long-term changes in an ornithological feature, or larger-scale temporary changes; however, the integrity of the feature is not likely to be affected. This may result in temporary changes in the conservation status of the feature, but these are reversible and unlikely to be permanent.
Low negative	Includes impacts that are small in magnitude, with small-scale temporary changes, and where integrity of an ornithological feature is not affected. These effects are unlikely to result in overall changes in the conservation status of the feature.
Negligible	No perceptible change in an ornithological feature.
Positive	The changes in an ornithological feature are considered to be beneficial to its ecological integrity or nature conservation status.

- 7.4.18 In the case of designated sites, spatial magnitude is assessed in respect of the area within the designated site boundary or using a scale at which the designated features can be regarded as having potential connectivity with the proposed development. For non-designated sites, spatial magnitude is assessed at an appropriate scale depending on the feature’s importance.
- 7.4.19 Impacts and spatial magnitude are assessed within an appropriate bio-geographic scale:
- Impacts on breeding bird populations are assessed in a regional context; and
 - Impacts on non-breeding bird populations are assessed in a national context.

⁵⁶ Note that integrity in this context refers to ecological integrity of a population of a species at a defined value level, i.e., the maintenance of the conservation status of a population of a species at a specific location or geographic scale. This should not be confused with the specific term ‘Site Integrity’ used in Appropriate Assessment for Natura 2000 sites.

7.4.20 Duration is defined as the time for which the impact is expected to last before recovery, i.e. return to pre-construction baseline conditions. The criteria used for describing duration in this EclA is summarised in Table 7.3.

Table 7.3: Criteria used in this EclA for describing duration

Duration	Definition
Permanent	Effects continuing indefinitely beyond the span of one human generation (taken as approximately 25 years), except where there is likely to be substantial improvement after this period (e.g. the replacement of mature trees by young trees which need > 25 years to reach maturity, or restoration of ground after removal of a development. Such exceptions are termed “very long-term effects”).
Temporary	Long-term (15 - 25 years or longer; see above) Medium term (5 – 15 years) Short-term (up to 5 years)

- 7.4.21 Knowledge of how rapidly the population or performance of a species is likely to recover following loss or disturbance (e.g. by individuals being recruited from other populations elsewhere) is used to assess duration, where such information is available.
- 7.4.22 In addition, birds are assessed with consideration for their behavioural sensitivity and ability to recover from temporary negative conditions. Behavioural sensitivity is determined subjectively based on the species’ ecology and behaviour, using the broad criteria set out in Table 7.4. The judgement takes account of information available on the responses of birds to various stimuli (e.g. predators, noise and disturbance by humans).

Table 7.4: Behavioural sensitivity of birds

Sensitivity	Definition
High	Species or populations occupying habitats remote from human activities, or that exhibit strong and long-lasting (guide: > 20 minutes) reactions to disturbance events.
Moderate	Species or populations that appear to be warily tolerant of human activities, or that exhibit short-term reactions (guide: 5 - 20 minutes) to disturbance events.
Low	Species or populations occupying areas subject to frequent human activity and exhibiting mild and brief reaction (including flushing behaviour) to disturbance events.

7.4.23 It should be noted that behavioural sensitivity can differ between similar species and between different populations of the same species. Thus the behavioural responses of birds are likely to vary with both the nature and context of the stimulus and the experience of the individual bird. Sensitivity also depends on the activity of the bird, for example, a species is likely to be less adaptable to disturbance whilst breeding than at other times. In addition, individual birds of the same species will differ in their tolerance depending on the level of human disturbance that they regularly experience in a particular area and have become habituated to (e.g. individuals that live in an area with high levels of forestry activity and associated disturbance are likely to have a greater

tolerance than those that occupy remote locations with little or no human disturbance). However, tolerance is likely to increase as breeding progresses.

Determining Significance of Potential Ornithological Effects

- 7.4.24 CIEEM guidance¹ states that determining the significance of effects using a matrix approach to produce a ‘significance score’ should be avoided for the ecology (and so also ornithology) discipline of an EIA, due to the assumptions that would be required to create values that are not easily quantified. Therefore, this approach has not been used.
- 7.4.25 Only features for which there is considered to be the potential for significant effects are identified as IOFs and taken forward for EcIA. Having followed the process of identifying an IOF, determining its sensitivity, and characterising potential impacts, the significance of the effect is then determined. The CIEEM guidelines¹ use only two categories to classify effects: ‘significant’ or ‘not significant’. In this ES chapter, significance of effects is assessed following an assumption of the application of embedded mitigation measures. The significance of an effect is determined by considering the importance of the feature, the magnitude of the impact and applying professional judgement as to whether the integrity of the feature will be affected. The assessment includes potential impacts on each IOF from all phases of the development, e.g. construction, operation and decommissioning, and considers direct, indirect, secondary and cumulative impacts and whether the impacts and their effects are short, medium, long-term, permanent, temporary, reversible, irreversible, positive and/or adverse.
- 7.4.26 Effects are more likely to be considered significant where the feature affected is of higher conservation importance or where the magnitude of the effect is high. Effects not considered to be significant would be those where the integrity of the feature is not threatened, effects on features of lower conservation importance, or where the magnitude of the effect is low.
- 7.4.27 With reference to CIEEM¹, paragraph 5.25 of this guidance states ‘a significant effect is simply an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. A significant effect is a positive or negative ecological effect that should be given weight in judging whether to authorise a project’.
- 7.4.28 Where potential effects on an IOF of the proposed development are assessed as significant, specific mitigation measures are identified following the recognised hierarchy of ‘avoid, minimise, off-set’ in order to avoid, reduce and/or compensate’ for potentially significant effects.
- 7.4.29 The significance of residual effects on features after the effects of implementation of mitigation measures has been considered can then be determined, along with any monitoring requirements (in line with the recommendations outlined in NatureScot guidance²¹).

Trends and Predicted Future Baseline

- 7.4.30 Current habitat use within the wind farm area is productive forestry. In the absence of the proposed development, it is assumed that the habitat use would remain the same for the long-term future. Taking into account the rotational harvesting that is a feature of productive forestry, which means there would continue to be temporary changes in forest structure as coupes are felled and

replanted. Small scale changes in management of the forest may occur as commercial conifers are harvested but the overall purpose of the land management in the vicinity of the proposed development is expected to remain the production of commercial timber.

- 7.4.31 Access tracks to the proposed development cross open areas that include acid grassland and scrub. Baseline conditions include the presence of an operational wind farm to the west of the south section (Mynydd Brombil Wind Farm) and land managed for a golf course to the north of the south section. In the absence of Y Bryn Wind Farm it is expected that these habitats/land uses would remain in place for at least the short and medium term.

Climate Change

- 7.4.32 It is difficult to predict changes that may occur in the longer-term (i.e. over 25 years; or represent one human generation). Climate change and the shift in species and habitat distributions that this may cause, as well as potential land management changes that this may bring about, cannot be accurately predicted at this time given the complexity of the issue and the uncertainty in the magnitude of change that may occur. The predominant land-use in the proposed development area (productive forestry) is predicted to continue to account for the habitat within this area. Climate change may result in potential impacts to the forest however, through potentially increasing timber productivity, but also potentially increasing wind damage, and increases in pests and disease. This may in turn lead to changes in forest management. However, this can be considered to be part of the dynamicity of productive forestry that already exists under baseline conditions. Baseline surveys carried out for the proposed development represent the ecology community present at that time and cannot be extrapolated to predict future population trends in the event of climate change, or future land use changes.

7.5 CONSULTATION

- 7.5.1 Y Bryn Wind Farm Scoping Report was submitted to a range of consultees in January 2021. Responses were returned in March 2021. This in turn led to further liaison between Natural Power and consultees regarding specific elements of ornithological data recording and ecological assessment. Further consultation has occurred with other interest groups during stakeholder meetings held during 2021. All consultation considered to be relevant to this chapter is summarised in Table 7.5. The table does not repeat scoping responses listed in Table 6.1 in Chapter 6: Ecology. A full copy of the responses can be found in Appendix 3.

Table 7.5: Consultee scoping responses relating to ornithology

Consultee	Comments/ issues raised/ recommendations	Addressed responses/ outcomes
NPTCBC	The breeding bird survey should be repeated for a second season and territory mapping should be included.	A breeding bird survey was undertaken in 2021, as well as 2020, and it included territory mapping of passerines, in open habitat areas.

Consultee	Comments/ issues raised/ recommendations	Addressed responses/ outcomes
NPTCBC	We are unaware of ornithological features not discussed in the Scoping Report that require consideration in the EIA.	-
NPTCBC	Initial ideas for mitigation and enhancement measures are provided in the Scoping Direction (subject to the outcomes of the assessment).	The aims of the enhancement measures proposed in the outline Habitat Management Plan have been informed by these ideas and include management for the benefit of invertebrates, reptiles and birds. Not all suggestions have been possible for inclusion, for example where plans do not meet the long-term management objectives for the forested estate.
NPTCBC	It is recommended that records are sourced from local bird groups.	GOS and BTO Glamorgan were contacted as part of the data search.
NPTCBC	It is essential that the second year of VP surveys meets the requirement for survey hours.	The requirement for survey hours has been met in both the breeding and non-breeding seasons in the second year of baseline surveys, with guidance exceeded in some cases.
NPTCBC	The breeding bird survey in 2020 started late in the season and may have missed early nesting species.	The 2021 breeding bird survey was completed during April to July, as set out in guidance.
NPTCBC	Non-breeding season surveys for passerines are recommended to inform the assessment in relation to impacts on habitat.	Non-breeding season walkovers/woodland point counts are not in current survey guidance due to the acknowledged low impact of wind farms on passerines. It is considered that the baseline surveys undertaken, in conjunction with the desk study, were satisfactory for determining baseline conditions. The potential impact of the development on bird habitats is included within the EclA.
NPTCBC	More detail is required as to the method employed for undertaking the honey buzzard survey.	Details of the honey buzzard survey are provided in this chapter and within Appendix 7.1: Ornithology Appendix.
NPTCBC	It should be noted that Mynydd Brombil Wind Farm's HMP includes measures for increasing golden plover habitat and this should be considered in the EIA.	The Mynydd Brombil Wind Farm HMP has been consulted. The status of golden plover in the vicinity of the proposed development is covered in this chapter and this species is included in the assessment.
NPTCBC	Detail should be provided for the black-headed gull flights recorded, to determine if this species can be scoped out.	Black-headed gull was changed to a target species during the 2021 breeding season flight activity surveys as a precaution to allow full assessment.

Consultee	Comments/ issues raised/ recommendations	Addressed responses/ outcomes
NPTCBC	Kestrel should not be scoped out and should be fully assessed.	Following this response kestrel was made a target species during the 2021 breeding season flight activity surveys. Kestrel has not been scoped out and is included within the EclA.
NPTCBC	Disturbance/displacement effects on passerines should not be scoped out.	Disturbance/displacement effects on passerines is included within the EclA.
NPTCBC	No detail as to how cumulative effects will be assessed is included in the Scoping Report.	Cumulative effects are assessed in this chapter with full detail as to approach used.
NRW	Eglwys Nunydd Reservoir SSSI should be screened in to assess impacts on its ornithological features.	The SSSI is included in this assessment.
NRW	A large proportion of Y Bryn site boundary is not covered by the vantage point surveys.	The VP locations were located to cover the area of potential collision risk (turbines and 500 m buffer). The areas of Y Bryn site boundary not covered by the viewsheds do not contain proposed turbines.
NRW	We agree that VP survey effort in the 2019/20 non-breeding season is sufficient.	CRM shall take account of survey effort.
NRW	A second year of breeding bird surveys is required to account for inter-annual variation. The second year of surveys should provide an even spread across the full season.	A second year of breeding bird surveys was completed in 2021, during April to July, as set out in guidance.
NRW	The target species list should include Section 7 species and Amber-listed species in BoCC.	These lists have been consulted when evaluating ornithological features.
NRW	All relevant SPAs have been identified in the Scoping Report.	-
BTO Cymru	Confirmation requested that surveys of the proposed development have included breeding curlew	A breeding bird survey, using the method recognised as standard for recording breeding waders, was undertaken in both baseline survey years. All wader species were regarded as target species during VP surveys.
BTO Cymru	Make sure the data search includes systematic survey data and local environmental records centre data.	The comprehensive ornithological data supplied by SEWBRc includes records from individuals, BTO, systematic nightjar surveys (RSPB), systematic breeding bird surveys (TACP consultants) and the NPTCBC Biodiversity Unit.

Consultee	Comments/ issues raised/ recommendations	Addressed responses/ outcomes
GBC	Data should be sought regarding breeding, feeding, roosting and migrating bird records and through liaison with RSPB, BTO and Welsh Ornithological Society (WOS).	Records were requested from RSPB Cymru and BTO (East Glamorgan representative). The WOS gathers its bird records at a local level and therefore records have been sourced from the two appropriate local bird clubs: GOS and GBC. The data obtained from SEWBRc (the most comprehensive source of ornithological data) included all bird records within the search area (all species, all times of year, etc).

7.6 BASELINE RESULTS

7.6.1 This section presents the baseline environment for desk-based review and field surveys in relation to the proposed development.

Desk Study

Statutory, National and Locally Designated Sites of Nature Conservation

7.6.2 A list of designated sites with an ornithological interest that are located within 10 km of the proposed wind farm areas (25 km radius for sites with gulls or geese as a designated feature) is provided in Table 7.6. There is one site of international designation (SPA, Ramsar) for ornithological features, within the search area: Burry Inlet Ramsar (and SPA). There is one site of national importance for its ornithological interest within the search area: Eglwys Nunydd Reservoir SSSI. There are three locally designated sites, for which ornithological features are described, within the search area: locations of these sites can be found on Figure 7.3. Designated sites with a non-avian interest are discussed in Chapter 6: Ecology.

Table 7.6: Designated sites with ornithological interests within 10 km of site boundary (25 km for gulls and geese as designated features)

Site	Designation	Distance to Site Boundary (km)	Designation Criteria
Bryn Tip	LNR/SINC	0 (700 m from nearest turbine)	Reclaimed coal pit. Biodiversity interests mention breeding skylark and linnet.
Eglwys Nunydd Reservoir	SSSI	1.7	Wintering wildfowl and passage migrants, including pochard and tufted duck. Breeding species include; great crested grebe, little grebe, mallard, gadwall and coot.
Melincwrt Waterfalls	Wildlife Trust Reserve	6.6	Mature oak woodland habitat. Breeding bird assemblage includes redstart, wood warbler and pied flycatcher.
Red Jacket Fen	Wildlife Trust Reserve	7.3	Lowland fen habitat. Nesting birds include Cetti's warbler, reed bunting, reed warbler and sedge warbler.
Burry Inlet	SPA/Ramsar	21.7	Wintering waterfowl and waders.

Site	Designation	Distance to Site Boundary (km)	Designation Criteria
			Dark-bellied brent goose is listed as fauna of note under the Ramsar designation (but no geese or gulls are listed as SPA features).

Source: DEFRA³⁸, NRW³⁹, SEWBRc

Ornithological Features

7.6.3 The SEWBRc data search returned 4,719 ornithological records within the wind farm and AIL access areas and a 2 km radius. Table 7.7 provides a list of ornithological features of conservation concern, recorded within the search area since 2015.

7.6.4 It should be noted that with all data supplied by a biological records centre, the records in the database will be influenced by observer effort (e.g. in the distribution of records (well populated vs remote) and in the species recorded (large obvious species vs small hard to identify species)).

Table 7.7: Bird species recorded in the wind farm and AIL access areas plus 2 km (2015-2021)

	Schedule 1/ Annex 1 Species	Section 7/ LBAP Species	BoCC Red/Amber listed
Non-passerines	Barn owl	Bar-tailed godwit	Common gull
	Black-necked grebe	Black-headed gull	Common sandpiper
	Black tern	Cuckoo	Goldeneye
	Golden plover	Herring gull	Lesser black-backed gull
	Goshawk	Kestrel	Mallard
	Hen harrier	Lapwing	Oystercatcher
	Marsh harrier	Nightjar	Pochard
	Merlin	Ringed plover	Redshank
	Peregrine		Swift
	Osprey		Woodcock
	Quail		
	Red kite		
	Short-eared owl		

	Schedule 1/ Annex 1 Species	Section 7/ LBAP Species	BoCC Red/Amber listed
Passerines	<i>Black redstart</i>	Bullfinch	Dipper
	<i>Brambling</i>	Dunnock	House martin
	Cetti's warbler	Grasshopper warbler	Meadow pipit
	Common crossbill	Hawfinch	Redstart
	Dartford warbler	House sparrow	Willow warbler
	<i>Fieldfare</i>	Lesser redpoll	
	<i>Firecrest</i>	Linnet	
	Kingfisher	Marsh tit	
	<i>Redwing</i>	Pied flycatcher	
	Woodlark	Ring ouzel	
	<i>Wryneck</i>	Reed bunting	
		Skylark	
		Song thrush	
		Spotted flycatcher	
		Starling	
		Tree pipit	
		Willow tit	
		Wood warbler	

Species are listed in the column of greatest conservation value and are listed in one column only

Schedule 1/Annex 1 species which are protected due to their rare breeding status in the UK, but which are only recorded in south Wales as wintering or passage birds are in italics.

BoCC lists refer to either the UK or Welsh lists.

Source: SEWBRc

7.6.5 The GOS annual bird report for 2018⁴⁰ includes the following records that are considered of note to the proposed development:

- Honey-buzzard: bred at one (undisclosed) site in the recording area in 2018;
- Goshawk: bred at one (undisclosed) site in NPTCBC area in 2018 and were also seen at eight other sites;
- Red kite: bred at one site in NPTCBC area in 2018 and probably bred at one other; as well as being seen at an additional 24 locations;
- Nightjar: three males and one female were recorded at Mynydd Dinas on 27 May 2018. Two churring males were recorded in Margam Forest on 15 June 2018; and
- Peregrine: breeding confirmed at one (undisclosed) site in NPTCBC area.

7.6.6 The GOS annual bird report for 2019⁴¹ includes the following records that are considered of note to the proposed development:

- Honey buzzard: a pair probably bred at one (undisclosed) site in the recording area in 2019;
- Goshawk: present at six sites in NPTCBC area in 2019;

- Red kite: bred at one site in NPTCBC area in 2019 and probably bred at one other; as well as being seen at an additional 28 locations;
- Nightjar: two churring males recorded at Mynydd Dinas on 01 June 2019. Three separate churring males were recorded in Margam Forest on 19 June 2019. A male was recorded west of Bryn on 28 June 2019 and a churring male was recorded east of Bryn on 03 July 2019. Two churring males were recorded at Cwm Maelog on 29 June 2019 (with a pair there on 12 July 2019) and another male was at Cwm Philip on 29 June 2019; and
- Peregrine: bred at one (undisclosed) site in NPTCBC area.

7.6.7 The GOS annual bird report for 2020⁴² includes the following records that are considered of note to the proposed development:

- Honey-buzzard: 2-3 pairs bred at (undisclosed) sites in NPTCBC area in 2020;
- Goshawk: 3 pairs bred at (undisclosed) sites in NPTCBC area in 2020 and were also seen at three other sites;
- Red kite: bred at one (undisclosed) site in NPTCBC area in 2020 and probably bred at one other; as well as being seen at an additional 15 sites in NPTCBC area;
- Nightjar: one to two churring males were recorded at Mynydd Dinas on 25 May 2020 and three males were recorded on 2 July 2020. Five were recorded at Foel Fynyddau on 22 July 2020; and
- Peregrine: breeding confirmed at one (undisclosed) site in NPTCBC area in 2020 and probably bred at one other; as well as being seen at an additional two sites in NPTCBC area.

7.6.8 The GOS annual bird report for 2021⁴³ includes the following records that are considered of note to the proposed development:

- Honey buzzard: a few observations in NPTCBC area in 2021;
- Goshawk: no confirmed breeding in NPTCBC area in 2021 but four pairs present;
- Red kite: suspected breeding at two (undisclosed) sites in NPTCBC area in 2021;
- Nightjar: two churring males and one female were recorded at Mynydd Dinas on 8 June 2021. One to two were recorded at Bryn, Abercreggan and Cymmer between 31 May and 28 August 2021. Four were recorded at Foel Fynyddau on 20 July 2021; and
- Peregrine: no confirmed breeding in NPTCBC area in 2021 but present at 16 sites in the recording area.

7.6.9 The GBC annual bird report for 2020⁴⁴ includes the following records that are considered of note to the proposed development:

- Osprey: a single individual on passage was recorded over Mynydd Bach (east of site boundary) on 23 April 2020;
- Goshawk: records from 88 locations within the recording area in 2020, of which four were confirmed breeding and five were possible breeding (locations undisclosed);

- Red kite: widespread reports from recording area (194 locations) but only one record of confirmed breeding (undisclosed location);
- Nightjar: records of birds seen or heard came from the Garnwen – Nantfyllon area and are considered to represent possible breeding (suitable habitat);
- Golden plover: no records within the vicinity of the proposed development; and
- Peregrine: of the 25 breeding territories visited in the Eastern Glamorgan recording area, 22 were occupied and 15 had confirmed breeding (locations undisclosed)..

7.6.10 The GBC annual bird report for 2019⁴⁵ includes the following records that are considered of note to the proposed development:

- Goshawk: records from 29 potential breeding locations (undisclosed) in Eastern Glamorgan, from which breeding was proven in two localities;
- Hen harrier: a record of one at Mynydd Margam on 11 April 2019;
- Red kite: a pair were seen mating at a site near Maesteg, but no further reports were made;
- Nightjar: no records within the vicinity of the proposed development;
- Golden plover: at Mynydd Bach (east of site boundary), c.130 were recorded on 27 February 2019 with 52 on 25 March 2019 and in the autumn c.120 were present on 02 October 2019; and
- Peregrine: there were 32 occupied sites (undisclosed) in Eastern Glamorgan in 2018, of which successful breeding took place in 17 sites.

7.6.11 Consultation with NRW forest managers produced ornithological records held by NRW for the turbine development area. The species listed as having been recorded here (including historical records), were bullfinch, crossbill, dunnoek, golden plover, goshawk, lesser redpoll, linnet, kestrel, nightjar and song thrush.

Baseline Surveys

VP Surveys

7.6.12 The breeding season surveys (March to August) in 2020 and 2021 recorded flight lines from a total of 13 target species (plus one species group), most of which were raptors or gulls. Table 7.8 summarises levels of flight activity for each species and the amount of that flight activity which was in the CRZ at PCH (i.e. potential for collisions). Species for which CRM was carried out (because the number of flights in either the breeding season or non-breeding season met the minimum criteria) are shown in bold. Herring gull and lesser black-backed gull were the most frequently recorded species. The flight lines for target species recorded during the 2020 and 2021 breeding seasons are shown in Figures 7.4 to 7.7.

7.6.13 Note that for kestrel and black-headed gull, which were recorded as target species in the 2021 breeding season (following a Scoping Direction) but as secondary species prior to this, their totals include flights recorded on the secondary species recording form.

Table 7.8: Results of the breeding season flight activity surveys in 2020 and 2021, including flights and individuals recorded in the CRZ at PCH. Species for which CRM was carried out are in bold

Species	No. of flights (individuals)	No. of flights (individuals) in the CRZ at PCH
Greylag goose	1 (3)	0 (0)
Goosander	1 (1)	1 (1)
Woodcock	1 (1)	0 (0)
Great black-backed gull	8 (9)	3 (3)
Herring gull	254 (434)	47 (64)
Lesser black-backed gull	72 (108)	14 (20)
<i>Large gull species*</i>	20 (215)	1 (1)
Honey buzzard	1 (1)	0 (0)
Goshawk	20 (21)	7 (7)
Red kite	44 (45)	5 (5)
Kestrel	27 (27)	9 (9)
Merlin	2 (2)	1 (1)
Hobby	1 (1)	1 (1)
Peregrine	2 (2)	1 (1)

* Denotes either great black-backed gull, herring gull or lesser black-backed gull

Source: Natural Power

7.6.14 A total of nine target species were recorded during non-breeding season VP surveys between October 2019 and February 2020, and September 2020 and February 2021 (inclusive). Seven of those species were also recorded during the breeding season, the only target species not recorded during breeding seasons were golden plover and black-headed gull. The flight lines for the non-breeding season target species are shown in Figures 7.8 and 7.9.

7.6.15 Table 7.9 summarises levels of flight activity during the non-breeding seasons for each species and the amount of that flight activity recorded in the CRZ at PCH. Herring gull was the most frequently recorded species.

Table 7.9: Results of the non-breeding season flight activity surveys (October 2019 to February 2020 and September 2020 to February 2021) including flights and individuals recorded in the CRZ at PCH. Species for which CRM was carried out are in bold

Species	No. of flights (individuals)	No. of flights (individuals) in the CRZ at PCH
Golden Plover	1 (6)	0 (0)
Woodcock	2 (2)	0 (0)
Black-headed gull	1 (2)	0 (0)
Herring gull	25 (121)	0 (0)
Lesser black-backed gull	1 (1)	0 (0)
Goshawk	15 (16)	3 (3)
Red kite	17 (24)	2 (2)

Species	No. of flights (individuals)	No. of flights (individuals) in the CRZ at PCH
Kestrel	42 (44)	10 (10)
Peregrine	7 (7)	1 (1)

Source: Natural Power

- 7.6.16 Incidental records (off-effort) of target species noted during VP surveys are summarised in Appendix 7.1: Ornithology Appendix.
- 7.6.17 A summary of the secondary species recorded during the VP surveys is shown in Table 7.10. ‘Number of records’ in this instance refers to the number of 5-minute blocks in which the species was recorded, across all VP surveys.

Table 7.10: Secondary species recorded during baseline flight activity VP surveys

Species	Number of records	
	Breeding Season (2020 and 2021)	Non-breeding Season (2019/20 and 2020/21)
Canada goose	2	-
Mallard	7	-
Grey heron	6	2
Cormorant	-	1
Sparrowhawk	26	14
Common buzzard	603	249
Kestrel*	16	37
Raven	369	50

* Kestrel was recorded as a secondary species during the non-breeding seasons of 2019/20 and 2020/21 and the 2020 breeding season.

Source: Natural Power

Breeding Bird Surveys: Wind Farm Areas

- 7.6.18 The results of the breeding bird surveys are presented in Table 7.11. The table presents a species list of all ornithological features recorded during the BBS, irrespective of breeding status (e.g. including birds overflying Y Bryn site boundary or recorded on one survey visit only). The table also provides lists of those species recorded for which there was evidence of breeding, both for the wind farm areas and the surveyed surrounding buffer. Breeding species that appear on the Section 7 list³⁵ are highlighted in **bold**.

Table 7.11: Species recorded during the breeding bird survey 2020 and 2021

Species	Present within survey area (site/buffer)		Evidence of breeding within wind farm areas		Evidence of breeding within buffer	
	2020	2021	2020	2021	2020	2021
Mallard		X				
Nightjar	X	X	X	X		
Cuckoo	X	X	X	X	X	
Woodpigeon	X	X	X	X		

Species	Present within survey area (site/buffer)		Evidence of breeding within wind farm areas		Evidence of breeding within buffer	
	2020	2021	2020	2021	2020	2021
Sparrowhawk	X	X	X			
Goshawk	X	X	X	X		
Red kite	X	X				
Common buzzard	X	X		X		
Great spotted woodpecker	X	X	X	X		
Green woodpecker	X	X	X	X		
Kestrel	X					
Jay	X	X	X	X		
Magpie		X				
Jackdaw		X				
Carrion crow	X	X	X	X	X	
Raven	X	X		X		
Coal tit	X	X	X	X		
Marsh tit	X	X	X			
Blue tit	X	X	X	X	X	
Great tit	X	X	X	X		
Skylark	X	X	X	X	X	X
Swallow	X	X	X	X		
Long-tailed tit	X	X	X	X		
Wood warbler	X	X		X		
Willow warbler	X	X	X	X		
Chiffchaff	X	X	X	X	X	
Grasshopper warbler		X		X		
Blackcap	X	X	X	X		
Whitethroat	X	X	X	X		
Goldcrest	X	X	X	X		
Wren	X	X	X	X		
Nuthatch	X	X	X	X		
Treecreeper	X	X	X	X		
Starling	X		X			
Blackbird	X	X	X	X	X	
Song thrush	X	X	X	X	X	
Mistle thrush	X	X	X	X		
Robin	X	X	X	X	X	
Redstart	X	X	X	X		
Stonechat	X	X	X	X	X	X
Dunnock	X	X	X	X	X	
House sparrow		X		X		

Species	Present within survey area (site/buffer)		Evidence of breeding within wind farm areas		Evidence of breeding within buffer	
	2020	2021	2020	2021	2020	2021
Grey wagtail	X	X		X	X	
Pied wagtail	X	X		X	X	
Meadow pipit	X	X	X	X	X	X
Tree pipit	X	X	X	X		
Chaffinch	X	X	X	X	X	
Bullfinch		X		X		
Greenfinch	X		X	X		
Linnet		X		X		X
Lesser redpoll	X	X	X	X		
Common crossbill		X		X		
Goldfinch	X	X	X	X		
Siskin	X	X	X	X		
Reed Bunting		X		X		

Source: Natural Power

- 7.6.19

A total of 50 species were considered to be breeding within the wind farm areas across both breeding seasons, of which the large majority were passerines or near-passerines. Many of the species listed in Table 7.11 are arboreal species and were recorded in the woodland edge rather than in the open ground habitat that is the focus of this survey method.
- 7.6.20

The BBS in 2021 undertook to count all breeding territories encountered for woodland nesting passerines. (These territories were not mapped.) These counts are not absolute but allow relative abundance to be determined. Those species found to have high abundance across the wind farm areas (more than 100 territories counted) were: wren, chaffinch, willow warbler, robin, goldcrest, dunnock and blackbird.
- 7.6.21

Those species recorded as breeding in the wind farm areas in very small numbers (≤3 pairs counted) were carrion crow, cuckoo, garden warbler, grasshopper warbler, greenfinch, grey wagtail, house sparrow, long-tailed tit, nuthatch, raven, reed bunting and wood warbler.
- 7.6.22

No species of wader were recorded on any of the four survey visits in either year. Raptor species and nightjar are included in Table 7.11, as they were recorded on the BBS, but these species are the focus of separate dedicated surveys.
- 7.6.23

In 2020, territory mapping was undertaken for all species recorded in open ground and on the forest edge and the results are presented in Figure 7.10.
- Breeding Bird Surveys: AIL Access Areas**
- 7.6.24

BBS surveys covering the AIL access areas plus a 400 m buffer were undertaken between May and July (inclusive) in 2021 and consisted of four survey visits. The ornithological features recorded on these surveys are presented in Table 7.12. The table presents a species list of all ornithological features recorded during the BBS (e.g. including birds overflying Y Bryn site boundary or recorded on one survey visit only) as well as detailing which of these species showed evidence of breeding.

Breeding species that appear on the Section 7 list³⁵ are highlighted in bold. For the AIL access area south-west of the south section territory analysis was undertaken; and for the AIL access area north of the south section a total number of territories was estimated (not mapped). The results are presented on Figure 7.11.

Table 7.12: Status of all species recorded during the breeding bird survey within the proposed access route survey area (2021)

Species	Present within survey area (AIL access route/buffer)	Evidence of breeding
Moorhen	X	X
Woodpigeon	X	X
Kestrel	X	
Jay	X	X
Magpie	X	X
Jackdaw	X	X
Rook	X	
Carrion Crow	X	X
Raven	X	
Blue Tit	X	X
Great Tit	X	X
Skylark	X	X
Swallow	X	X
Long-tailed Tit	X	X
Willow Warbler	X	X
Chiffchaff	X	X
Grasshopper Warbler	X	X
Blackcap	X	X
Garden Warbler	X	
Whitethroat	X	X
Goldcrest	X	X
Wren	X	X
Nuthatch	X	
Treecreeper	X	
Blackbird	X	X
Song Thrush	X	X
Mistle Thrush	X	X
Robin	X	X
Stonechat	X	X
Wheatear	X	X
House Sparrow	X	X
Dunnock	X	X
Grey Wagtail	X	

Species	Present within survey area (AIL access route/buffer)	Evidence of breeding
Pied Wagtail	X	X
Meadow Pipit	X	X
Tree Pipit	X	X
Chaffinch	X	X
Bullfinch	X	
Greenfinch	X	
Linnet	X	X
Lesser Redpoll	X	X
Goldfinch	X	X
Siskin	X	X
Reed Bunting	X	X

Source: Natural Power

7.6.25 A total of 35 species were considered to have shown evidence of breeding within the survey area (AIL access areas plus 400 m). Almost all were passerine species. The list of breeders includes those recorded in woodland and scrub within the survey area.

Breeding Raptor Surveys

- 7.6.26 Goshawk, a Schedule 1 raptor species, was recorded as breeding in the wind farm areas in both years. In 2020, an active goshawk nest was located within the south section, 880 m and 395 m from the nearest proposed turbine and track respectively. Continued monitoring suggested that the nesting attempt failed at the chick-rearing stage. This location was monitored again in 2021 and although a pair of goshawks was recorded in this area there was no evidence of breeding.
- 7.6.27 In 2021 a different goshawk nest was located in the south section. This nest was successful, with monitoring showing that two fledged chicks were present in and around the nest site during mid-July. This nest was located approximately over 2000 m from the nest recorded in 2020 and was 1160 m and 1135 m from the nearest proposed turbine and track respectively.
- 7.6.28 Also in 2021, a potential goshawk nest was located early in the season in another part of the south section. However, continued monitoring suggested that breeding did not take place. A goshawk was still recorded in the area as the season progressed but the nest that had been identified was in a poor state of repair and was confirmed as inactive.
- 7.6.29 The goshawk nesting locations are given in Appendix 7.2: Ornithology Confidential Appendix and the associated confidential Figure 7.12.
- 7.6.30 Other target raptor species recorded during the dedicated surveys include red kite (one flight in 2020) and peregrine (one flight in 2021). In 2021 kestrel was treated as a target species. In May a female was seen flying off carrying prey, which was regarded as being evidence of breeding. However, the bird headed away from the survey area and is thought to have bred to the west of the south section.

⁵⁷ RBBP, (2020). Honey-buzzard survey 2020-21. Available at: <http://www.rbbp.org.uk/honey-buzzard-2020/> [Accessed 08/12/2023]

7.6.31 Of the secondary raptor species recorded during the raptor surveys, common buzzard was confirmed as breeding within the wind farm areas, and sparrowhawk was also considered to have bred, though no nest was located.

Honey Buzzard Surveys

- 7.6.32 Despite the significant survey efforts in 2020 and 2021, particularly in July and August when detection rates are considered to be highest (Rare Breeding Birds Panel, 2020)⁵⁷, no honey-buzzards were recorded during the dedicated raptor surveys.
- 7.6.33 In 2021 flight activity surveys recorded only a single bird in July, which provides further evidence that honey-buzzard did not breed within the vicinity of the wind farm areas.

Nightjar Surveys

7.6.34 During the nightjar surveys any nightjars seen/heard were mapped and details recorded as to the nature of the record, such as individual bird, churring (singing) male, pair together or confirmed nest. This data (presented in confidential Figure 7.13) was used to estimate the number of breeding territories within the wind farm areas. Guidance²⁹ suggests that a separation distance of 400 m be used to determine separate territories. The results are presented in Table 7.13.

Table 7.13: Estimated number of breeding nightjar territories in the wind farm areas

Year	North Section	South Section	Total
2020	8	12	20
2021	6	12	18

Source: Natural Power

7.6.35 In 2021 all nightjar records referred to churring males. In 2020 three nightjar nests were located. The distance of these nests from infrastructure is shown in Table 7.14. Distances have not been calculated for territories for which the nest was not located.

Table 7.14: Distance from nightjar nests to proposed infrastructure

Confirmed nightjar nest	Nearest proposed turbine	Nearest proposed track
Nest 1	1020 m	285 m
Nest 2	1080 m	180 m
Nest 3	1150 m	265 m

Source: Natural Power

Collision Risk Modelling

7.6.36 Six target species fulfilled criterion for CRM. These species comprised: great black-backed gull (breeding season), herring gull (breeding season), lesser black-backed gull (breeding season), goshawk (breeding and non-breeding season), kestrel (breeding and non-breeding season) and red kite (breeding season). If the criteria were met in one season, CRM was undertaken in both seasons to allow annual collision rates to be estimated.

- 7.6.37 Great black-backed gull, lesser black-backed gull and herring gull were considered to have ‘directional’ flights and goshawk, red kite and kestrel were considered to have ‘non-directional’ flights (see Section 7.3).
- 7.6.38 There were two flights (two individuals) of ‘unidentified large gull’ recorded within the CRZ at PCH. So that these records were included within the CRM, two individuals were added to the totals for both herring gull and lesser black-backed gull, as a precautionary approach. This assumes that the unidentified gulls were not great black-backed gulls, which were recorded much less frequently.
- 7.6.39 Kestrel was not recorded as a target species during the flight activity surveys until March 2021. During the period in which it was treated as a secondary species, details of duration and location for kestrel flights was not recorded, as flights of secondary species are recorded within five-minute blocks and flights are not mapped. Therefore, in order to use the full baseline dataset in the CRM the kestrel records from the period October 2019 to February 2021 required some additional processing. The duration of kestrel flights was taken to be the total number of seconds covered by all five-minute blocks containing kestrel flight activity at collision height. This means that a flight within one five-minute block was taken to be 300 seconds. However, many of these flights will have been of shorter duration than this approach suggests (for example a flight of 360 seconds would be treated as having a duration of 600 seconds) and so this approach is considered to be very precautionary. Flight durations were then multiplied by the number of kestrels recorded within the five-minute block, if applicable (for example if two birds were recorded). The records from the period when kestrel was treated as a target species were then used to estimate the duration of secondary kestrel flight activity that was within the CRZ. Of the 16 kestrel flights recorded as target flights in 2021, 77 seconds of a total of 3958 seconds (2%) of kestrel activity was within the CRZ. The duration of kestrel flights within the CRZ, when recorded as a secondary species, was therefore taken to be 2% of the total duration of flights at risk height from the five-minute block data.
- 7.6.40 The risk of collision for each species, calculated with avoidance factors of 95%, 98%, 99%, 99.5% and 99.8%, are presented in Table 7.15. The avoidance rate appropriate to that species, as recommended by NatureScot guidance²⁴, is highlighted.

Table 7.15: Estimated number of collisions during the breeding season (March to August) and non-breeding season (September to February). Annual estimates are sums of breeding and non-breeding season estimates

Species	Season	Estimated mortality assuming avoidance of:				
		95%	98%	99%	99.5%	99.8%
Great black-backed gull	Breeding	0.18	0.078	0.04	0.02	0.01
	Non-breeding	0	0	0	0	0
	Annual	0.18	0.07	0.04	0.02	0.01
Herring gull	Breeding	5.01	2.00	1.00	0.50	0.20
	Non-breeding	0	0	0	0	0
	Annual	5.01	2.00	1.00	0.50	0.20
Lesser black-backed gull	Breeding	2.14	0.86	0.43	0.21	0.09
	Non-breeding	0	0	0	0	0
	Annual	2.14	0.86	0.43	0.21	0.09

Species	Season	Estimated mortality assuming avoidance of:				
		95%	98%	99%	99.5%	99.8%
Goshawk	Breeding	0.08	0.03	0.02	0.01	<0.01
	Non-breeding	0.03	0.01	0.01	<0.01	<0.01
	Annual	0.11	0.04	0.03	0.01	<0.01
Kestrel	Breeding	<0.01	<0.01	<0.01	<0.01	<0.01
	Non-breeding	<0.01	<0.01	<0.01	<0.01	<0.01
	Annual	<0.01	<0.01	<0.01	<0.01	<0.01
Red kite	Breeding	0.16	0.06	0.03	0.02	0.01
	Non-breeding	0.02	0.01	<0.01	<0.01	<0.01
	Annual	0.18	0.07	0.03	0.02	0.01

Source: Natural Power

7.7 ASSESSMENT OF POTENTIAL EFFECTS

- 7.7.1 This section assesses the potential impacts (i.e. change to the baseline) during construction, operation and decommissioning of the proposed development on IOFs and the resultant effects on ornithological features. The proposed development has undergone several design iterations (see Chapter 4: Site Selection and Design Evolution) and ornithological features have been considered during the scheme evolution. Potential impacts and residual effects are assessed against this final design.
- 7.7.2 The main ways in which a wind farm may affect ornithological features are via:
- Habitat loss due to land-take;
 - Disturbance and/or displacement; and
 - Collision with turbines.
- 7.7.3 In addition to standalone effects which are directly related to the proposed development, there may be cumulative effects which arise as a result of the combined effects of multiple wind farms within the local or regional area. These cumulative effects may also result in effects, which individually would not be significant, becoming more important and significant in context.
- 7.7.4 Each of these potential impacts and resultant effects is discussed in turn for each stage of the development (construction, operation and decommissioning).

Potential Effects During Construction

Habitat Loss

- 7.7.5 Felling of trees, and construction of turbine bases, access tracks and other structures will lead to direct habitat loss and without adequate mitigation could also result in destruction or damage to nests, eggs and/or chicks. The effects of habitat loss will depend upon the extent of land-take and the type of habitat affected. Under the WCA 1981 (as amended) it is an offence to kill or injure any wild bird, or to damage or destroy nests and eggs; embedded mitigation measures will be put in

place to prevent damage to or destruction of nests, as discussed in 'Embedded Mitigation' later in this section.

Disturbance and Displacement

- 7.7.6 The construction stage of wind farm developments can have potential impacts of associated noise and visual disturbance and if unmitigated could lead to the temporary displacement or disruption of breeding and foraging birds. The level of impact depends on the timing of potentially disturbing activities, the extent of displacement (both spatially and temporally), and the availability of suitable habitats in the surrounding area for displaced birds to occupy.
- 7.7.7 Potential impacts are likely to be greatest during the breeding season (predominantly between March and August, depending on the species under consideration); behavioural sensitivity to the impacts will vary between species.
- 7.7.8 The available information for disturbance of birds due to construction activities of this type is often contradictory, however, it is likely that construction impacts will be greatest on species that are intolerant of noise and other sources of disturbance. Larger bird species, those higher up the food chain or those that feed in flocks in the open tend to be more vulnerable to disturbance than small birds living in structurally complex or closed habitats such as woodland⁵⁸.
- 7.7.9 The potential impacts associated with construction activities are only likely to occur for as long as the construction phase continues. They are thus short-term and can be readily mitigated by avoiding sensitive areas (through the implementation of appropriately defined buffer zones), and by timing construction activities to avoid periods where sensitive species are present (if and where possible) such as the breeding season. The exception to this would be if an adverse effect on the breeding success of a receptor were such that the local population becomes extinct and replacement through recruitment or re-colonisation does not occur.

Potential Effects During Operation

Disturbance and Displacement

- 7.7.10 The operation of turbines and associated human activities for maintenance purposes also has the potential to cause disturbance and displace birds from the development. Disturbance impacts during the operational phase may be less than during the construction phase, as species may become habituated to turbines and disturbance due to human activities will be considerably reduced. The proposed development is planned to have a lifespan of 50 years.

- 7.7.11 Studies have shown that, in general, species are not disturbed beyond 500 to 800 m from turbines^{59, 60} and in some cases, birds do not appear to have been disturbed at all^{61, 62, 63, 64}. However, this may depend on the sensitivity of the species in question. Specific disturbance impacts are discussed in the feature assessment, where appropriate.
- 7.7.12 There is less consensus of opinion about disturbance impacts closer to wind farm infrastructure. Several studies have examined this in detail, and these are summarised.
- 7.7.13 Pearce-Higgins *et al.* (2009)⁵⁸, found evidence of lower frequencies of occurrence of some species within the vicinity of wind turbines during the breeding season, with a significant reduction in frequency of occurrence, compared to control sites, in seven of the 12 species studied. The authors extrapolated these findings to predict a percentage reduction in breeding densities within 500 m of turbines and found that seven of the 12 species showed a significantly lower frequency of occurrence: buzzard, hen harrier, golden plover, snipe, curlew, meadow pipit and wheatear, while there was no significant effect of wind farm proximity on kestrel, red grouse, lapwing and stonechat distribution. A more recent study of displacement impacts of wind farms on 10 species of upland breeding birds, by the same lead author⁶⁵ found evidence for population declines in three of the studies species (red grouse, snipe and curlew) associated with wind farm construction, but little evidence for consistent post-construction population declines in any of the 10 species studied.
- 7.7.14 It has been suggested that passerines may behave differently to more long-lived species due to a lower site fidelity but relatively few studies have examined the effects of wind farms on breeding passerines compared to non-passerines. This is due to passerines being short-lived with a high productivity rate and thus being generally accepted as being of low sensitivity and vulnerability, at a population level, to wind farm effects. In the majority of cases in which passerines have been investigated, displacement appears to be limited to within 100 - 200 m of turbines⁶⁶.
- 7.7.15 In terms of non-breeding population densities, Hötter *et al.* (2006)⁵⁷ found a significant adverse displacement effect on geese (several species combined), golden plover and lapwing and a significantly positive effect on starling, although the distances involved were relatively small. In their study of the effects of wind turbines on the distribution of wintering farmland birds, Devereux *et al.* (2008)⁵⁹ found no effect on four species groups (seed-eaters, corvids, gamebirds and skylarks); with the only exception of pheasant.
- 7.7.16 Disturbance and displacement impacts associated with wind farm construction and operation appear to vary between species and sites and should be considered on a case-by-case basis.

⁵⁸ Hill, D.A. Hockin, D. Price, D. Tucker, G. Morris, R. and Treweek, J. (1997) Bird Disturbance: Improving the Quality of Disturbance research. *Journal of Applied Ecology* 34, 275-288.

⁵⁹ Hötter, H., Thomsen, K.M. and Koster, H. (2006). *The Impact of Renewable Energy Generation on Biodiversity with Reference to Birds and Bats – Facts, Gaps in our Knowledge, Areas for Further Research and Ornithological Criteria for the Expansion of Renewables*. NABU Report, Germany.

⁶⁰ Pearce-Higgins, J.W., Stephen, L., Langston, R.H.W., Bainbridge, I.P. and Bullman, R. (2009). The Distribution of Breeding Birds Around Upland Wind Farms. *Journal of Applied Ecology* 46, 1323-1331.

⁶¹ Devereux, C.L., Denny, M.J.H. and Whittingham, M.J. (2008). Minimal Effects of Wind Turbines on the Distribution of Wintering Farmland Birds. *Journal of Applied Ecology* 45, 1689–1694.

⁶² Whitfield, D.P., Green, M. and Fielding, A.H. (2010). *Are Breeding Eurasian Curlew Numenius Arquata Displaced by Wind Energy Developments?* Natural Research Projects Ltd, Banchory, Scotland.

⁶³ Douglas, D.J.T., Bellamy, P.E. and Pearce-Higgins, J.W. (2011). Changes in the Abundance and Distribution of Upland Breeding Birds at an Operational Wind Farm. *Bird Study* 58, 37-43.

⁶⁴ Fielding, A.H. and Haworth, P.F. (2013). *Farr Wind Farm: A Review of Displacement Disturbance on Golden Plover Arising from Operational Turbines 2005-2013*. Haworth Conservation, Isle of Mull, Scotland.

⁶⁵ Pearce-Higgins, J.W., Stephen, L., Douse, A. and Langston, R. H. W. (2012). Greater Impacts of Wind Farms on Bird Populations During Construction Than Subsequent Operation: Results of a Multi-site and Multi-species Analysis. *Journal of Applied Ecology* 49, 386–394.

- 7.7.17 Individual turbines, or a wind farm as a whole, may present a barrier to the movement of birds, restricting or displacing birds from much larger areas. The effect this would have on a population is subtle and difficult to predict with any degree of certainty. If birds regularly have to fly over or around obstacles or are forced into suboptimal habitats, this may result in reduced feeding efficiency and greater energy expenditure. By implication, this will reduce the efficiency with which they accumulate reserves, potentially affecting breeding success or survival.

Collision With Turbines

- 7.7.18 Collision of a bird with turbine rotors or towers is almost certain to result in the death of the bird. In low density populations (e.g. raptors) this could have a more adverse effect on the local population than in higher density populations (e.g. skylark) because a higher proportion of the local population would be affected in a low-density population. The frequency and likelihood of a collision occurring depends on a number of factors. These include aspects of the size and behaviour of the bird (including their use of a development site), the nature of the surrounding environment, and the structure and layout of the turbines.
- 7.7.19 Collision risk is perceived to be higher for birds that spend much of the time in the air, such as foraging raptors and those that have regular flight paths between feeding and breeding/roosting grounds (e.g. geese). The risk of bird collisions at wind farms is greatest in areas where large concentrations of birds are present (such as on major migration routes), and in poor flying conditions, such as rain, fog or strong winds that affect birds' ability to control flight manoeuvres, or on dark nights when visibility is reduced^{66,67}. Birds may also be more susceptible if the wind farm is located in an area of high prey density.
- 7.7.20 It should be noted that operational disturbance and collision risk impacts are mutually exclusive in a spatial sense; i.e. a bird that avoids the wind farm area due to disturbance cannot be at risk of collision with the turbine rotors at the same time. However, they are not mutually exclusive in a temporal sense; i.e. a bird may initially avoid the wind farm but habituate to it and would then be at risk of collision.

Potential Effects During Decommissioning

- 7.7.21 Turbine, or other infrastructure, removal may cause disturbance to birds breeding, foraging or roosting within the proposed development. The level of impact will depend on the bird species present at the time of decommissioning and cannot be reliably predicted at this stage. However, as decommissioning activities are of a similar type and intensity as construction activities, the assessment considers that the potential effects of decommissioning will be similar in nature to the potential effects of construction, with the exception that habitat is likely to be restored and displaced birds will be able to return to abandoned territories.

Embedded Mitigation

- 7.7.22 Embedded mitigation is built into the project to minimise the potential for any negative effects associated with the proposed development, and to ensure compliance with the WCA (1981) as amended, as well as potentially providing positive effects in the longer term. Various measures will be proposed to provide compliance with legislation, and to follow good practice guidance and consultation recommendations with regard to breeding birds. Where experience of developing projects of this nature has shown that embedded mitigation is sufficient to prevent significant adverse effects on IOFs, this has been built into the assessment in order to produce an EclA which is proportionate to the risks posed by the proposed development. These embedded mitigation measures are outlined.

Construction Phase

- 7.7.23 All relevant construction phase embedded mitigation measures, such as the appointment of an ECoW, would be implemented through a CEMP, which will be agreed in advance with the local planning authorities, in consultation with NRW.

Environmental Clerk of Works (ECoW)

- 7.7.24 In line with good practice, an independent ECoW will be appointed prior to the commencement of construction and will be present on site during enabling works and throughout the construction period. They will be a suitably experienced individual, whose role will be to oversee that all works are carried out in accordance with environmental legislation and good practice, and with agreed construction phase management plans, such as the CEMP.
- 7.7.25 Prior to the start of construction, contractors will be made aware of the ornithological sensitivities within the area of the proposed development (particularly with regard to the potential presence of Schedule 1 breeding species). The ECoW will give regular Toolbox Talks to contractors regarding the status and locations of protected and sensitive species and habitats at the proposed development.
- 7.7.26 The ECoW will carry out pre-construction survey checks during the nesting season in advance of tree felling, vegetation stripping or excavation works to check for the presence of any active nests. To account for the small number of species that may nest outside the typical breeding season, for example early nesters such as crossbill, nest checks will be carried out between February and August. Any active nests found will be cordoned off to a suitable distance for the species concerned (in line with appropriate guidance²⁷) and construction operations delayed within the cordon until the young have fledged and/or the nest becomes vacant naturally. There will be a clear line of responsibility for establishing that these measures are adhered to. This will reduce the possibility of illegal damage, destruction or disturbance to occupied bird nests during the construction phase. Full details of the ECoW's role and responsibilities will be provided in the CEMP and secured through an appropriate planning condition.

⁶⁶ Gove, B., Langston, R.H.W, McCluskie, A., Pullan, J.D. and Scrase, I. (2013). *Windfarms and Birds: an Updated Analysis of the Effects of Wind Farms on Birds, and Best Practice Guidance on Integrated Planning and Impact Assessment*. Report T-PVS/Inf. (2013) 15, by RSPB/BirdLife International to the Convention on the Conservation of European Wildlife and Natural Habitats. Bern Convention Bureau Meeting (and references therein)

⁶⁷ RBBP, (2020). *Honey-buzzard survey 2020-21*. Available at: <https://rbbp.org.uk/honey-buzzard-2020/> [Accessed 08/12/2023]

Legal Compliance Regarding Breeding Birds

- 7.7.27 Under the WCA (1981) as amended it is an offence, with only limited exceptions, to:
- Intentionally or recklessly take, interfere with, damage or destroy the nest of any wild bird whilst it is in use or being built;
 - Obstruct or prevent any wild bird from using its nest;
 - Intentionally or recklessly take, interfere with or destroy the egg of any wild bird;
 - Intentionally or recklessly disturb any wild bird listed on Schedule 1 while it is nest building, or at (or near) a nest containing eggs or young, or disturb the dependent young of such a bird;
 - Intentionally or recklessly harass any wild bird included in Schedule 1A; or
 - Knowingly cause or permit any of the above acts.
- 7.7.28 Good practice via timing of works and pre-construction surveys will be necessary to reduce the possibility of illegal damage, destruction or disturbance to occupied bird nests during the construction phase. Adherence to this will be overseen by the ECoW.
- 7.7.29 A Species Protection Plan (SPP) will be produced; this plan will detail embedded mitigation measures required prior to and during construction for protected bird species potentially breeding at the proposed development site, particularly in the vicinity of historic nests or suitable nesting habitat.

Operational Phase

- 7.7.30 With the exception of the operation of the wind turbines and general maintenance of the turbines, there will be little on-site activity during the operational phase and therefore levels of disturbance will be considerably reduced relative to the construction period.

Decommissioning

- 7.7.31 Embedded mitigation of decommissioning activities will follow that proposed for the embedded mitigation of construction activities, including pre-decommissioning surveys and ecological supervision of activities.

Feature Assessment

- 7.7.32 The ornithological features determined for inclusion in the EcIA follows the information gathered through the Scoping Reports, and subsequent consultation responses, and the results of the two years of baseline surveys.
- 7.7.33 A summary of the features and impacts identified to inform the determination of IOFs occurring within the proposed development is shown in Table 7.16.

Table 7.16: Features and impacts identified for inclusion in the assessment

Features	Impact
Nightjar	Collision and Disturbance/displacement
Golden plover	Collision and Disturbance/displacement
Great black-backed gull	Collision

Features	Impact
Herring gull	Collision
Lesser black-backed gull	Collision
Goshawk	Collision and Disturbance/displacement
Red kite	Collision and Disturbance/displacement
Kestrel	Collision and Disturbance/displacement
Passerines	Disturbance/displacement
Burry Inlet SPA/Ramsar	Adverse effects on integrity
Eglwys Nunydd Reservoir SSSI	Adverse effects on ornithological features of interest
Bryn Tip LNR/SINC	Adverse effects on ornithological features of interest
Melincourt Waterfalls Wildlife Trust Reserve (WTR)	Adverse effects on ornithological features of interest
Red Jacket Fen WTR	Adverse effects on ornithological features of interest

Source: Natural Power

- 7.7.34 The Scoping Report stated that a number of ornithological features would be ‘scoped out’ unless flight activity substantially increased in the second year of surveys. Following the two years of flight activity surveys, peregrine qualified for CRM and so this species has been scoped back in to the EcIA. Those target species which did not qualify for CRM are not considered further within this assessment as the level of flight activity recorded signifies negligible collision risk and thus no likely significant effect. This includes honey buzzard. During the two years of baseline surveys only one flight record of honey buzzard was made, and this was not in the CRZ. No birds were located during the dedicated surveys. The data search did not return any recent records of this species from the vicinity of the proposed development (the most recent records from the search area are from 2009). The data therefore suggests no route to impact for disturbance/displacement and a nil/negligible (not significant) collision risk, so honey buzzard is not considered further within the feature assessment.
- 7.7.35 Golden plover would not be assessed further based on baseline survey results. However, a scoping response requested that golden plover be included within the EcIA, as habitat prescriptions at the nearby Mynydd Brombil Wind Farm include measures to encourage wintering golden plover, therefore is it included in this EcIA. The inclusion of passerines in the assessment is also in response to scoping consultation. A further scoping response stated that black-headed gull may need to be scoped into the EcIA, however, the flight activity surveys only produced one flight (two individuals), and this was not within the CRZ. Therefore, black-headed gull remains ‘scoped out’ as the level of flight activity recorded signifies negligible collision risk and thus no significant effect (see Section 7.4 ‘Consultation’).
- 7.7.36 All the designated sites highlighted in the data search (Table 7.6) are included in the feature assessment. Burry Inlet SPA/Ramsar appears in the screening for Appropriate Assessment (AA) presented in Section 7.11.

7.7.37 The ornithological features listed in Table 7.16 have been evaluated to determine which features are IOFs in the context of the proposed development. The details of this evaluation are provided in Table 7.17. Those species classed as IOFs are assessed fully.

Table 7.17: Determination of Important Ornithological Features occurring within the proposed development

Feature	Covering legislation and guidance/conservation designation*	Value	Population estimate ⁶⁸	Welsh context ^{69,70}	Baseline	IOF	Justification
Nightjar	Sec7; Amber(UK)	Regional	UK estimate 4,600 males (breeding season).	Nightjars are a scarce migrant breeder and passage migrant. The last national census (2004) estimated 280 churring males in Wales, however this is considered an under-estimate and a current estimate of >500 churring males (406 in productive forestry) is suggested ⁶⁶ . The increase in recent decades, attributed to nightjars adapting to non-native forestry plantation habitats, follows a period of decline in the mid-20 th century.	The results from the dedicated nightjar surveys in 2020 and 2021 estimated 18-20 breeding pairs were present within the wind farm areas, with territories located in both the north and south sections. Not recorded during the flight activity surveys and CRM not undertaken.	Yes	This species is of regional value as a species of moderate conservation concern (Section 7 species and on the UK BoCC Amber List) that is present in regionally important numbers but is not a qualifying feature of any statutory sites within 10 km of the proposed development. Given the conservation status of nightjar in the region, the number of breeding territories present within Y Bryn site boundary and potential disturbance/ displacement, this species is considered to be an IOF and is taken forward for a full EcIA.
Golden plover	Ann I; Sec7; Red(W)	Local	UK breeding population is estimated at 32,500-50,500 pairs. UK wintering population 410,000 individuals.	Golden plover is rare as a breeding bird, with Wales being at the southern edge of their breeding distribution. A significant decline has occurred during the last century as a result of afforestation, drainage and climate change. By 2008 there were c.36 pairs at 11 sites. However, golden plover is a common passage and winter migrant. The wintering population has shown a 36% increase in range between 1980-2010, with a wintering estimate of 10,000 in Wales in 2017/18. Some flocks winter inland, but most are found in coastal fields and estuaries. There is considered to be a high turnover, especially during cold weather.	During flight activity surveys, only one record (of six individuals) was made; this being in the non-breeding season. No golden plover was recorded during the breeding bird surveys, the area around the proposed development not being suitable breeding habitat for golden plover. SEWBrEC data reported several records of golden plover since 2015, these were of birds on open ground to the north and east of the wind farm areas. Records refer to non-breeding birds, including a flock of up to 150 birds in 2021, but these do not appear to linger. A prescription in the Mynydd Brombil Wind Farm HMP requires a minimum of 5 ha of habitat (within a total management area of 70 ha) to be managed as suitable foraging for non-breeding golden plover. However, the Mynydd Brombil HMP area has not attracted in this species, with no golden plover recorded during surveys completed there in 2020 and 2021.	No	Golden plover is of high conservation concern in Wales (BoCC Red list), due to its declining breeding population. It is occasionally recorded in open areas outside the wind farm areas during the non-breeding season, only. It is not a qualifying feature of any statutory sites within 25 km of Y Bryn site boundary. On this basis, golden plover is considered to be of local value. Golden plover did not meet the criteria for CRM and the data suggests that very few birds pass over the CRZ at PCH. Therefore, collision risk is considered to be negligible. Golden plover forage in open ground habitats with clear all-round visibility and avoid areas close to forest edges. Therefore, land within the wind farm areas does not provide suitable habitat. However, Y Bryn site boundary (AIL access area (south)) overlaps with 16 ha of the Mynydd Brombil Wind Farm HMP area managed for wintering golden plover. During construction, there is the potential for disturbance/displacement of golden plover, but the general absence of golden plover here suggests this area is not an important foraging location. Thus only a low negative impact is predicted. During the operational phase of the proposed development there is potential for displacement as a result of land take, but a minimum of 54 ha of the Mynydd Brombil HMP area shall remain available in which only 5 ha is to be managed for golden plover. Given the status of golden plover in the vicinity of the proposed development, disturbance/displacement is predicted to have a negligible

⁶⁸ Woodward, I., Aebischer, N., Burnell, D., Eaton, M., Frost, T., Hall, C., Stroud, D.A. & Noble, D. (2020). Population estimates of birds in Great Britain and the United Kingdom. *British Birds* 113: 69–104.

⁶⁹ Pritchard, R., Hughes, J., Spence, I.M., Haycock, B. & Brechley, A. (eds) (2021). *The Birds of Wales*. Liverpool University Press.

⁷⁰ Bladwell S, Noble DG, Taylor R, Cryer J, Galliford H, Hayhow DB, Kirby W, Smith D, Vanstone A, Wotton SR (2018). *The state of birds in Wales 2018*. The RSPB, BTO, NRW and WOS. RSPB Cymru, Cardiff.

Feature	Covering legislation and guidance/conservation designation*	Value	Population estimate ⁶⁸	Welsh context ^{69,70}	Baseline	IOF	Justification
							impact on the local population. Golden plover is therefore not considered to be an IOF.
Great black-backed gull	Amber (W/UK)	Local	UK breeding population is estimated at 15,000 breeding pairs. UK wintering population 77,000 individuals.	Great black-backed gull is a resident breeder and winter migrant with a breeding population estimate of 504 apparently occupied nests in the latest national census (2015-2019). There has been an increase in numbers since the 1980s, but this follows a long-term decline previous to this. There are an estimated 4,365 individuals in Wales in winter. Wintering numbers are considered to be stable.	Great black-backed gull records only involved birds passing over in flight. Flights were recorded during the breeding season only (eight records, of which three birds were at PCH in the CRZ). Predicted collision mortality for great black-backed gull gives an annual estimate of 0.02 bird collisions.	No	This species is of local value as a species of moderate conservation concern (Amber listed in Wales and UK) but is not a qualifying feature of any statutory sites within 25 km of Y Bryn site boundary. The predicted collision mortality at the proposed development for great black-backed gull is 0.02 birds per year. The low negative impact of collision as a result of operation of the proposed development is unlikely to be detectable against the background rate of mortality and is therefore considered to be not significant. There is no route to impact as a result of disturbance/displacement. As such this species is not considered to be an IOF.
Herring gull	Sec7; Red(W/UK)	Local	UK breeding population is estimated at 130,000 breeding pairs. UK wintering population 740,000 individuals.	The preliminary results of the latest national census (2015-2019) are of an estimated 7,988 breeding pairs in Wales (does not include all roof nesting birds). This marks a continued decline in this species that has occurred since the 1970s (although there was a large increase prior to this). Roof nesting birds in urban environments may be under-counted but the latest estimate is of 2,960 nests at 45 sites (2014-2019). The population of wintering herring gulls in Wales has been estimated at 93,613 individuals. This number has increased since the 1990s.	Herring gull records only involved birds passing over in flight. Flights were recorded during the breeding and non-breeding seasons (254 and 25 records respectively). However, records in the CRZ at PCH were only recorded in the breeding season (47 flights (64 individuals)). CRM was conducted for this species and is estimated to result in an annual collision risk estimate for herring gull of 0.50 birds. VP flight data highlights three main areas where activity was generally recorded; the valley between the north and south sections, the central area of the south section and valley below the south section (see Figures 7.6 and 7.7).	Yes	A regularly occurring species of high conservation concern (Section 7 and BoCC Red listed) which is not a qualifying feature of any statutory sites within 25 km of the proposed development. There is no risk of disturbance/displacement but there is a risk of collision. Given the conservation status of herring gull, the predicted mortality rate from collision (0.50 birds per annum) at the proposed development, herring gull is considered to be an IOF and is taken forward for a full EclA.
Lesser black-backed gull	Red(W)/Amber(UK)	Local	UK breeding population is estimated at 110,000 breeding pairs. UK wintering population 130,000 individuals.	The Welsh lesser black-backed gull breeding population is estimated to be a minimum of 13,500 pairs (2019). However, approximately a third of the total is made up of roof nesting birds, which are considered to be under-recorded. This marks a decline in numbers since the previous census, 20,722 pairs (1998-2002), but this follows a rapid increase during the 1960s-1990s. The 30-year WeBS (Wetland Bird Survey) count trends for the UK shows that the wintering population of this species has declined but is now stable in Wales.	Lesser black-backed gull flights were recorded during the breeding season (only one flight was recorded in the non-breeding season). Of the 72 records, 14 (20 individuals) were in the CRZ at PCH. CRM was therefore conducted for this species, and this gives an annual collision risk estimate for lesser black-backed gull of 0.21 birds. VP flight data highlights three main areas where activity was generally recorded; the valley between the north and south sections, the central area of the south section and valley below the south section (see Figures 7.6 and 7.7).	Yes	Although this species was recorded relatively regularly in the breeding season, numbers were less than for herring gull and this is reflected in the lower estimated collision rate (0.21). Lesser black-backed gull is of high conservation concern in Wales (BoCC Red List) but is not on the Section 7 list. It is not a qualifying feature of any statutory sites within 25 km of the proposed development. There is no route to impact as a result of disturbance/ displacement. However, given the current conservation status for this species in Wales and the potential collision risk, lesser black-backed gull is considered to be an IOF and is taken forward for a full EclA.
Goshawk	Sch1.1; Amber(W)	Local	UK breeding population is	Goshawk is a resident breeder that is increasing in number and is now found in all	Goshawk flights were recorded during both the breeding and non-breeding seasons (20 and	Yes	Goshawk is of local value as a species of moderate conservation concern (Amber listed in Wales) that is not a

Feature	Covering legislation and guidance/conservation designation*	Value	Population estimate ⁶⁸	Welsh context ^{69,70}	Baseline	IOF	Justification
			estimated at 620 breeding pairs (minimum – under-reported).	large, forested areas of Wales. Wales is considered to be a stronghold for the species in the UK. The latest estimate is of 310 pairs (2018) though this is considered to be an under-estimate.	15 records respectively). Predicted collision mortality for goshawk is 0.03 birds per breeding season and 0.01 birds per non-breeding season, which gives an annual estimate of 0.04 birds. Nesting was confirmed in the south section in 2020 but failed at chick rearing stage. This nest was not used in 2021. However, a second nest site was located in the south section in 2021, with a successful breeding attempt fledging two chicks. A third potential nest site was also recorded in the south section in 2021 with birds present in the area but no breeding attempt was recorded.		qualifying feature of any statutory sites within 10 km of the proposed development but is afforded special protection (Schedule 1). One pair were confirmed as breeding on site during 2020 and 2021 with potentially two further territories recorded within Y Bryn site boundary. Given its relatively small breeding population and potential to be subjected to displacement/disturbance effects as a result of the proposed development, goshawk is considered to be an IOF and is taken forward for a full EclA. Although the collision risk to goshawk has been estimated to be very low, as this species qualifies as an IOF, collision risk is also assessed for this feature for completeness.
Red kite	Sch1.1; Ann 1	Local	UK breeding population is estimated at 4,400 pairs.	Recent research from 2018 has identified that the Welsh population of red kite has increased by 368% between 1995-2016. In 2019 it was estimated that the Welsh red kite population was 2,500 breeding pairs ⁷¹ .	Red kite flights were recorded during both the breeding and non-breeding seasons (44 and 17 records respectively). However, the number of flights in the CRZ at PCH was low: five individuals in the breeding season and two individuals in the non-breeding season. The predicted collision mortality for red kite gives an annual estimate of 0.03 birds. No breeding attempts were recorded within the raptor survey area during the 2020 and 2021 dedicated raptor surveys and no records of confirmed nesting within this area were returned by the desk study	No	Red kite is of local value. This species is not of conservation concern and is not a qualifying feature of any statutory sites within 10 km of the proposed development, although it is afforded special protection (Annex I & Schedule 1). During the baseline surveys it was recorded regularly during the breeding season, but few records came from within the turbine development area, and this is reflected in the very low collision risk. Collision impact is considered to be of low negative magnitude. No evidence of breeding was recorded within the wind farm areas plus 2 km buffer, however, the desk study ⁴⁵ produced a record of a copulating pair near Maesteg in 2019, which suggests breeding within the wider area may be possible. Areas of conifers within the interior of the plantation do not offer suitable nesting locations for red kite and thus the proposed development is considered unlikely to prevent breeding in future in suitable areas (mature broadleaf trees on the forest edge). As red kite forage over open farmland areas displacement/disturbance effects are considered to be of a negligible level. Construction and operation of the proposed development are unlikely to be significant to the local red kite population. As such this species is not considered to be an IOF.
Kestrel	Sec7; LBAP; Red(W)/Amber (UK)	Local	UK breeding population is estimated at 31,000 pairs.	Kestrel is widely, but thinly, distributed in Wales and has undergone an obvious and continuing decline. The 2016 estimate of 1,750 pairs is now considered too high and 265-475 breeding pairs in Wales (2020) is now estimated. Changes in habitat as a result of farming practices is believed to be behind this decline.	Kestrel flights were recorded during both the breeding and non-breeding seasons. Predicted collision mortality for kestrel was estimated to be <0.01 birds in both seasons and <0.01 birds per annum. There was no evidence of breeding within the wind farm areas and 2 km buffer. However, during the breeding season in May 2021 a	No	This species is of local value as a target species of high conservation concern (Section 7 species and species on the Wales BoCC Red List) but is not a qualifying feature of any statutory sites within 10 km of Y Bryn site boundary. Using all kestrel records from the baseline flight activity surveys, the predicted collision mortality at the proposed development for kestrel is estimated to <0.01 birds annually. This reflects this species preference for foraging in open

⁷¹ The Welsh Kite Trust (2020). Available at: <http://welshkitetrust.wales/how-many-kites-are-there-in-wales> [Accessed 08/12/2023]

Feature	Covering legislation and guidance/conservation designation*	Value	Population estimate ⁶⁸	Welsh context ^{69,70}	Baseline	IOF	Justification
					female kestrel was observed flying away from the survey area carrying food and was thought to have bred at a farm to the west of the south section. The SEWBReC data includes a record of a pair and a juvenile from the edge of the north section in 2020 which suggests breeding took place in the local area but no breeding records from the wind farm areas were returned.		areas (outside the wind farm areas), rather than within the forest. The level of collision risk is considered to be of negligible magnitude. Areas of mature broadleaved trees near the forest edge may provide suitable habitat for this species, but the only evidence of breeding during baseline surveying was beyond the raptor survey area. With the availability of large areas of suitable foraging habitat in the wider area, and little within the actual wind farm areas, displacement/disturbance effects are considered to be of a negligible level. As such, effects of collision risk and displacement/disturbance associated with construction and operation of the proposed development are unlikely to be significant to the local kestrel population. As such this species is not considered to be an IOF.
Passerines (and near passerines)	various, including: Sch1.1: common crossbill; Sec7: cuckoo, bullfinch, dunnock, grasshopper warbler, house sparrow, lesser redpoll, linnet, marsh tit, reed bunting, skylark, song thrush, wood warbler; Red(W): greenfinch, goldcrest, starling, tree pipit, willow warbler	Local	various	This feature covers a variety of passerine species. An estimate as to the population in Wales is unavailable for most species. However, trends, such as a contraction in range or apparent reductions in density have highlighted those species in decline and thus those of conservation concern.	A typical community of passerines were recorded during baseline surveys across the breeding bird survey areas.	Yes	Guidance states that surveys for passerines in woodland and farmland sites is generally not required ¹⁷ (with surveys in other habitats only required due to the potential for other species, such as waders). This is because passerines are short-lived species with high productivity so are not considered to be sensitive at a population level to wind farm impacts. However, following consultation, displacement of passerines as a result of habitat loss is to be assessed. For the purpose of proportionality ¹ , common and widespread passerine species shall not be considered IOFs. Passerine species that are Sch1.1, Sec7 or Red-listed shall be considered as IOFs and taken forward to full EcIA.
Burry Inlet SPA/Ramsar	Site information: The SPA is designated for regularly supporting wintering waterfowl (shelduck, pintail, shoveler, teal, wigeon) and waders (dunlin, knot, oystercatcher, curlew, grey plover, redshank) in internationally important numbers. Other ornithological features listed as 'noteworthy fauna' in the Ramsar information sheet are: dark-bellied brent goose, little egret, whimbrel, greenshank and spotted redshank.				None of the qualifying ornithological features were recorded during baseline surveys. The desk-based study returned records of oystercatcher and redshank.	Yes	The Burry Inlet SPA is 21.7 km west of the proposed development. No geese or gulls are listed as SPA features, although dark-bellied brent geese are listed as fauna of note under the Ramsar designation (1.1% of the GB population). No brent geese were recorded during baseline surveys. However, as a result of the international designation of this site it is included in the screening for AA (Section 7.11).
Eglwys Nunydd Reservoir SSSI	Site information: Wintering wildfowl and passage migrants including pochard and tufted duck. Breeding species including great crested grebe, little grebe, mallard, gadwall and coot.				Seven flights of mallard were recorded during the VP surveys (breeding season). The only other species of waterfowl recorded during the flight activity surveys were greylag goose (one flight), goosander (one flight) and Canada goose.	No	Eglwys Nunydd Reservoir SSSI is 1.7 km from Y Bryn site boundary and 3.7 km from the nearest turbine. Any wildfowl utilising reservoirs within the wind farm areas are likely to move up valleys and the flight activity surveys indicate that wildfowl very rarely pass within the vicinity of the turbine development area. The proposed development shall not result in any changes in habitat or displacement within the designated site. No significant effects upon listed features are predicted and therefore Eglwys Nunydd Reservoir SSSI is not considered to be an IOF.

Feature	Covering legislation and guidance/conservation designation*	Value	Population estimate ⁶⁸	Welsh context ^{69,70}	Baseline	IOF	Justification
Bryn Tip LNR/SINC	Site information: Reclaimed coal pit. Ornithological interests mention breeding skylark and linnet.				Skylark and linnet were recorded as breeding species during baseline surveys.	No	Bryn Tip LNR/SINC is adjacent to the western boundary of the north section of the proposed development but 700 m from the nearest turbine. The proposed development will not result in any changes in habitat within the designated site and infrastructure is sited beyond that at which passerines will be disturbed or displaced. No significant effects upon ornithological features are predicted and therefore Bryn Tip is not considered to be an IOF.
Melincwrt Waterfalls Wildlife Trust Reserve	Site information: Mature oak woodland habitat. Breeding bird assemblage includes redstart, wood warbler and pied flycatcher.				Redstart and wood warbler were recorded within the wind farm areas during baseline BBS.	No	Melincwrt Waterfalls Wildlife Trust Reserve lies 6.6 km north of Y Bryn site boundary. The proposed development will not result in any changes in habitat or displacement within the designated site. Based upon the distance to the designated site and the passerine species for which it is of interest it can be concluded that there will be no significant effect and therefore Melincwrt Waterfalls Wildlife Trust Reserve is not an IOF.
Red Jacket Fen Wildlife Trust Reserve	Site information: Lowland fen habitat. Nesting birds include Cetti's warbler, reed bunting, reed warbler and sedge warbler.				Lowland fen habitat is not present within the proposed development.	No	Red Jacket Fen Wildlife Trust Reserve is 7.3 km west of Y Bryn site boundary. The proposed development shall not result in any changes in habitat or displacement within the designated site. Based upon the distance to the designated site and the passerine species for which it is of interest it can be concluded that there shall be no significant effect and therefore Red Jacket Fen Wildlife Trust Reserve is not an IOF.

* Key: Sch1.1 = Schedule 1 part 1 of the Wildlife & Countryside Act 1981 (as amended); Ann I = Annex I of the EC Birds Directive; Sec7 = Environment (Wales) Act 2016 Section 7 – priority species list; LBAP = species listed on either the NPT Nature Partnership list or Bridgend LBAP list; Red/Amber = Birds of Conservation Concern (BoCC) Red-listed or Amber-listed species (W = BoCC Wales 3; UK = BoCC UK 5)

7.7.38 The species considered to be IOFs in the context of the proposed development, and therefore considered further in this EcIA are:

- Nightjar (disturbance/displacement, collision);
- Herring gull (collision only);
- Lesser black-backed gull (collision only);
- Goshawk (disturbance/displacement, collision); and
- Passerines of conservation concern (disturbance/displacement only).

7.7.39 Impact assessment for each of these ornithological features is provided.

Nightjar

Introduction

7.7.40 Nightjar is a scarce summer migrant that is now mainly found in areas of clear-felled plantation. The population has increased in the last few decades and nightjar are no longer on the BoCC

red/amber list in Wales. The most recent national census of nightjar (2004) recorded 4,600 males across the UK, with 280 churring males in Wales. However, the most recent estimate is of over 500 churring males in Wales⁶⁶. Without dedicated surveys nightjars remain greatly under-recorded due to their crepuscular activity. Surveys of the kind undertaken for the proposed development should be seen in this context as the wider area may hold more nightjar than is currently known. Nightjar is Section 7 listed.

Baseline Summary

7.7.41 Nightjar were recorded breeding within the wind farm areas, but outside of the turbine development area. It is estimated that 20 and 18 territories were held in 2020 and 2021 respectively within the proposed development. The distances of the three nests located in 2020 to the nearest proposed turbines ranges from 1020 m to 1150 m, and 180 m to 285 m from the nearest proposed track. However, churring males were recorded within 250 m of proposed turbines. This indicates territories, and hence also nests, were present close to these locations. The number of territories within the wind farm areas suggests that this area is of regional importance for nightjar.

Potential Collision Risk Impacts

- 7.7.42 Nightjar were not recorded during the flight activity surveys, and although all times of daylight hours were covered over the course of baseline surveying, it is acknowledged that standard VP surveys are likely to be limited in recording nightjar flights, which may take place in low light levels when detection is difficult.
- 7.7.43 Nightjar may fly at turbine rotor height when displaying or when pursuing prey⁷², however there is little supporting evidence in regard to quantifying nightjar flight heights. A radar study at Thorne Moor (South Yorkshire) undertaken by the University of York in relation to a wind farm extension⁷³, indicated that the majority of flights were 0-34 m above the ground but that 25% of radar-tracks were at that site's rotor swept height. Observations undertaken as part of nightjar radio-tracking studies undertaken at Pen y Cymoedd Wind Farm (NPTCBC/Rhondda Cynon Taf area)⁷⁴ showed that birds flew mainly at low altitudes that were well below that site's rotor swept height, although it is acknowledged that high flying birds may have gone unseen. This same radio-tracking study also showed that nightjars were only active for a small part of any 24-hour period, even when chick-rearing, with activity mainly focussed around dusk and dawn. This is supported by other studies⁷⁵ ⁷⁶. Thus, it can be expected that the time period in which nightjars are at risk of collision is also short in duration, within any 24-hour period.
- 7.7.44 The time spent by nightjars foraging in any location shall depend on the ease of capture of their insect prey. Favoured foraging habitats have been shown to depend on the availability of different habitats in the vicinity of the nest site, and especially the availability of different age stands of conifers⁷⁷. Scrub, heath and grazed pastures may also be utilised in addition to newly planted and pre-closure stands of plantation forest. A radio-tracking study in Thetford Forest (Norfolk/Suffolk)⁷⁷ showed ungrazed grassland and broadleaved areas to be the least selected habitats. Therefore, the creation of ungrazed grassland areas around turbines, in which scrub growth is controlled (as prescribed in the outline HMP (see Appendix 6.3)), can be considered unfavourable habitat for foraging nightjar. The radio-tracking studies at Pen y Cymoedd Wind Farm also showed that nightjars in the wider area around the wind farm avoided the plateaus in favour of using the lower slopes for foraging, likely as a result of better foraging for insects in these more sheltered areas.
- 7.7.45 Pen y Cymoedd Wind Farm has parallels with the proposed development: it was built in upland productive forestry in NPTCBC area (and Rhondda Cynon Taf), and the site held 24 territorial male nightjars prior to construction. Operational monitoring there shows that nightjars can successfully co-exist with operational wind farms and no collisions have been recorded here despite the close

proximity in which nightjars nest to operational turbines⁸⁰. Nightjar collisions with turbines appear to be rare events, with only two fatalities officially reported in Europe⁷⁸.

- 7.7.46 Based on the evidence available, the potential effect as a result of collision risk is considered to be of **low negative magnitude** and **not significant** for nightjar.

Potential Disturbance/Displacement Impacts

- 7.7.47 Disturbance is likely to be most detrimental at nightjar breeding territories. As nightjar are active at dusk and dawn, they are unlikely to be disturbed when foraging due to the minimal level of human activity that shall be present on site at sunrise and sunset during the summer months. Nightjars rely on their cryptic plumage to evade detection when perched or sitting on a nest⁷⁹. For this reason they are unlikely to flush until a potential predator is in very close proximity (<10 m), although it is possible that birds become stressed at greater distances than this. In summarising the available literature Goodship & Furness (2022)²⁷ gave a disturbance distance of 50-200 m for forest operations. If disturbed, adults may take up to 15 minutes to return to the nest.
- 7.7.48 Regarding displacement, work undertaken at Pen y Cymoedd Wind Farm has indicated no evidence of displacement of territorial birds as a result of operational works⁸⁰. A post construction nightjar monitoring protocol was developed for Pen y Cymoedd to determine whether nightjar territories/nests had been impacted by displacement as a result of the wind farm. In the first year of operational surveying (2018) 24 territorial males were located; the same number as recorded during baseline surveying. Five nests were found, with one of these located within 60 m of a turbine base. Two young successfully fledged from this nest. The other four nests were located within 400 m of turbine bases and two of these were successful. This evidence suggests that the distribution of nightjar is more dependent on available habitat than the proximity of an operating turbine.
- 7.7.49 It should also be noted that the outline HMP prescriptions for the proposed development (see Appendix 6.3 in Volume 3 of the ES) includes clearance of dense bracken cover in areas on the edge of the north section, which shall create new suitable nesting habitat for nightjar within the wind farm areas away from the turbine development area.
- 7.7.50 The evidence suggests that disturbance/displacement effects for Y Bryn during the **operational stage** will be of **low negative magnitude** and **not significant** for nightjar.
- 7.7.51 However, during construction there is potential for breeding nightjars to be disturbed/displaced or their nest to be destroyed. During baseline surveys no nightjars were recorded within 180 m of track/turbine locations. However, nightjars nest in the most favourable habitat and this varies through time as a result of tree growth and clear-felling. There is therefore potential for nightjar to

⁷² Bright, J.A., Langston, R.H.W., Bullman, R., Evans, R.J., Gardner, S., Pearce-Higgins, J & Wilson, E. (2006) *Bird sensitivity map to provide locational guidance for onshore wind farms in Scotland*. RSPB Research Report No. 20.

⁷³ Mitchell, L.J., White, P.C.L. & Arnold, K.E. (2018) *Scoping report for windfarm extension in the context of European nightjar (Caprimulgus europaeus) movements*. University of York.

⁷⁴ Pen y Cymoedd Wind Farm Environmental Statement, Chapter 8: Ecology.

⁷⁵ Cross, T., Lewis, J., Lloyd, J., Morgan, C. & Rees, D. (2005) *European nightjar (Caprimulgus europaeus) breeding success and foraging behaviour in upland coniferous forests in Mid-Wales*. CCW Species Challenge Report.

⁷⁶ Alexander, I. & Cresswell, B. (1990) Foraging by nightjars *Caprimulgus europaeus* away from their nesting areas. *Ibis*, 132/4: 568-574.

⁷⁷ Sharps, K., Henderson, I., Conway, G., Armour-Chelu, N. & Dolman, P.M. (2015) Home-range size and habitat use of European nightjars *Caprimulgus europaeus* nesting in a complex plantation-forest landscape. *Ibis*, 157/2, 260-272.

⁷⁸ Vogelverluste an Windenergieanlagen / Bird fatalities at wind turbines in Europe; Daten aus der zentralen Fundkartei der Staatlichen Vogelschutzwarte im Landesamt für Umwelt Brandenburg zusammengestellt: Tobias Dürr; Stand vom: 7 May 2021. [last accessed 18/11/2021]

⁷⁹ Murison, G. (2002) *The impact of human disturbance on the breeding success of nightjar Caprimulgus europaeus on heathlands in south Dorset, England*. English Nature Research Reports, No. 483.

⁸⁰ BSG project profile. Available at: https://www.bsg-ecology.com/wp-content/uploads/2019/04/Project-Profile_Pen-y-Cymoedd-Nightjars.pdf [Accessed 08/12/2023]

nest within the turbine development area during the construction period, especially where clear-felling occurs in advance of turbine construction. Embedded mitigation, such as standard pre-construction nest searches, may not be adequate for detecting nightjar 'nests', which are located on the ground and are extremely well camouflaged. However, any impacts caused shall be restricted to the period of construction and so will be of a short-term temporary nature.

- 7.7.52 Species-specific mitigation is proposed to ensure that any breeding nightjars are protected during construction. Further details of the measures proposed can be found in Section 7.8. Without further mitigation, potential effects due to disturbance/displacement during the **construction stage** are predicted to be of **moderate negative magnitude** but **not significant**.

Herring Gull

Introduction

- 7.7.53 Herring gull is a Section 7 priority species and is on the UK/Wales BoCC Red Lists due to severe declines in the UK (and Welsh) breeding and non-breeding populations, restriction in breeding range and because the UK supports internationally important numbers of non-breeding birds⁸¹. The preliminary estimate for Wales from the latest national survey is of a minimum of 7,988 pairs, of which increasing numbers are now breeding on roofs in urban areas rather than traditional coastal colonies. The Welsh wintering population is estimated to be 93,613 individuals.

Baseline Summary

- 7.7.54 A relatively high number of herring gull flights were recorded during the breeding season VP surveys with a total of 254 (434 individuals). Fewer birds were recorded during the non-breeding season with 25 flights (121 individuals). The flight activity during the breeding and non-breeding season of 2020 clearly shows birds flying along a west-east axis above Cwm Forte between the north and south section of Y Bryn site boundary and flying along a north-east and south-west axis at the southern boundary of the south section above Cwm Philip (Figures 7.6 and 7.8). There was no evidence of herring gull breeding, roosting or foraging within the proposed development.
- 7.7.55 Current estimates suggest that over a third of herring gulls breeding in Wales now nest in urban areas⁶⁹. Given the large number of urban nesting gulls in South Wales, it is probable that herring gulls recorded in the vicinity of the proposed development originate from birds breeding in these settings, rather than from more distant populations found at traditional (and designated) seabird colonies.

Potential Collision Risk Impacts

- 7.7.56 Flight activity of herring gulls within the proposed development was greater during the breeding season VP surveys than during the non-breeding season VP surveys. The flight paths described above meant most birds did not pass through the turbine development area and this is reflected in the data: 47 flights (64 individuals) were within the collision risk zone at PCH; all these were in the breeding season. Assuming an avoidance rate of 99.5%²⁴, predicted collision mortality for herring gulls was 0.50 birds per year.

- 7.7.57 Herring gulls generally do not breed until several years of age (typically four years old), and as a result a relatively high proportion of herring gulls recorded passing over the proposed development are likely to be non-breeding birds. Additionally, a significant proportion of adult herring gulls do not breed every year; this proportion has been estimated to be between 33% and 37% of adult birds (Calladine & Harris, 1997⁸¹).

- 7.7.58 The predicted annual collision rate represents 0.003% of the breeding adult population of herring gulls in Wales. This does not include the large number of non-breeding birds in the population and so can be considered precautionary. The annual survival of adult herring gulls has been estimated as 0.82 (long-term study, Skomer Island⁸²) but has varied annually between 0.608 and 0.971. The level of change in mortality that could potentially result from the proposed development (collision impacts) will not be detectable against this background level of mortality.

- 7.7.59 As the impact of any potential collisions is not predicted to be detectable at a population level, the potential impact as a result of collision risk is considered to be of **low negative magnitude**, and **not significant** for herring gull.

Lesser black-backed Gull

Introduction

- 7.7.60 Lesser black-backed gull appears on the Wales BoCC Red List³⁴ due to the continued decline in its breeding population, a population which is of international importance. Within the UK as a whole lesser black-backed gull is amber listed. This species has no other conservation designations. The Welsh breeding population of lesser black-backed gull is estimated to be 13,500 pairs (2019)⁶⁹. The breeding population is likely to be under-estimated, however, as although the traditional and well-monitored coastal colonies are in decline, there are increasing numbers breeding in urban locations.

Baseline Summary

- 7.7.61 Lesser black-backed gulls were recorded during the breeding season VP surveys. A total of 72 flights were recorded, however only 14 flights were recorded as being 'at risk', as many flights passed between the north and south sections or to the south of the proposed development (Figures 7.6 and 7.7). Only one flight was recorded in the non-breeding season (outside the CRZ). There was no evidence of lesser black-backed gulls breeding, roosting or foraging within the proposed development.
- 7.7.62 Current estimates suggest a third of lesser black-backed gulls breeding in Wales now nest on roofs in urban or industrial areas⁶⁹. Given the large number of urban nesting gulls in South Wales, it is probable that lesser black-backed gulls recorded in the vicinity of the proposed development originate from birds breeding in these settings, rather than from more distant populations found at traditional (and designated) seabird colonies.

Potential Collision Risk Impacts

- 7.7.63 The 14 flights (20 individuals) that were within the collision risk zone at PCH resulted in a collision mortality of 0.21 birds per breeding season being predicted (using 99.5% avoidance²⁴). As no flights

⁸¹ Calladine, J. & Harris, M.P. (1997) Intermittent breeding in the herring gull *Larus argentatus* and the lesser black-backed gull *Larus fuscus*. *Ibis* 139/2: 259-263.

⁸² Newman, L., Blockley, F., Hewitt, J. & Wood, M.J. (2021) *Seabird monitoring on Skomer Island in 2021*. JNCC Report.

were recorded in the CRZ at PCH in the non-breeding season, this same estimate of 0.21 collision can be used for the per annum estimate.

- 7.7.64 Lesser black-backed gulls do not breed until they reach sexual maturity, which is usually in their fourth year. Additionally, it has been shown that all adult birds do not breed every year, with an estimate of 34-40% of adults not breeding in a particular season^{81,83}. As a result, a relatively high proportion of lesser black-backed gulls recorded passing over the proposed development are likely to be non-breeding birds.
- 7.7.65 The predicted collision rate represents <0.001% of the breeding adult population of lesser black-backed gulls in Wales. This does not include the large number of non-breeding birds in the population and so can be considered precautionary.
- 7.7.66 The annual survival of adult lesser black-backed gulls has been estimated as 0.87 but has varied annually between 0.585 and 0.983⁸². The level of change in mortality that could potentially result from the proposed development (collision impacts) will not be detectable against this background level of mortality.
- 7.7.67 The impact of any potential collisions is not predicted to be detectable at a population level, and so the potential impact as a result of collision risk is considered to be of **low negative magnitude**, and **not significant** for lesser black-backed gull.

Goshawk

Introduction

- 7.7.68 Goshawk is mostly found in large coniferous forests where birds are least vulnerable to disturbance. Following historical population demise as a result of habitat loss and persecution, goshawk numbers and range are slowly expanding, although the species remains a relatively scarce, but fairly widespread, breeding bird in Wales. Goshawk is amber listed in Wales. Being a secretive species and remaining inconspicuous for much of the year, goshawk is notoriously difficult to monitor and is under reported. The 2017 Welsh bird report indicates a possible minimum of 73 territories across Wales⁸⁴ (based upon records submitted by observers) however the latest estimate is given by Pritchard *et al.* (2021)⁶⁷ as 310 pairs, though this too is considered an under-estimate. All extensive areas of woodland in Wales are considered to hold goshawk and, increasingly, smaller woodlands as well.

Baseline Summary

- 7.7.69 Flights were recorded regularly during baseline surveys with a total of 20 and 15 flights recorded during the breeding and non-breeding seasons respectively, with the majority of activity recorded within the south section. During the 2020 raptor surveys nesting was confirmed in the south section but failed at chick rearing stage. In 2021 a pair were recorded in the vicinity of the 2020 nest site, but no evidence of breeding was recorded. A second nest site was located in a different part of the south section with a successful breeding attempt fledging two chicks. A third potential nest site was also recorded in the south section with birds present in the area, but no breeding attempt was

recorded. The desk study data showed goshawk are present in numerous locations in NPTCBC area (nine sites) and Eastern Glamorgan (29 sites), though few have been proven as breeding.

Potential Collision Risk Impacts

- 7.7.70 Seven flights (seven individuals) from the breeding season and three flights (three individuals) from the non-breeding season were used to calculate the collision risk for goshawk in the respective seasons, producing seasonal estimates of 0.03 birds and 0.01 birds. The predicted collision mortality for goshawk is therefore 0.04 birds per year.
- 7.7.71 Although raptors are susceptible to collision with turbines due to their morphology (i.e. heavy wing loading) goshawk is considered to be generally at low risk of collision due to their foraging behaviour being at low level and mostly being within and adjacent to woodland cover. However, goshawks may fly at PCH during display flights, which are usually undertaken early in the breeding season (February and March). Soaring flights are more likely to take a bird into the CRZ, but such flights are likely to be most frequent in the vicinity of the nest. It is expected that goshawks are likely to avoid the turbine envelope once the proposed development has been constructed. Indeed, studies suggest that raptors are likely to decline in general abundance in a given area due to avoidance of the wind farm⁸⁵. Such avoidance means that flight activity within the proposed development is likely to be lower after construction than during baseline conditions, and it follows that the likelihood of collision will also be lower than estimated by CRM. There are no goshawk collisions formally reported and only one anecdotal collision in the UK and a very low rate of reported collisions throughout Europe⁷⁸.
- 7.7.72 The annual collision rate for goshawk is 0.04; although following construction, the reduction in forestry cover in the vicinity of the wind farm and the avoidance of the wind farm itself is likely to mean this collision rate is not realised. In this assessment the 39 occupied sites in the recording areas of the GOS and GBC are assumed to represent the number of individuals in this area. This is considered to be precautionary for undertaking the assessment, as the local population is likely to be larger than this total: most occupied sites will hold a pair rather than single birds, and there are likely to be many unrecorded birds not in these totals. A total of 39 individuals in Gower and East Glamorgan does not appear to be unrealistic given the two or three territories recorded just within the south section of the wind farm areas. On this basis the estimate of 0.04 collisions represents 0.10% of the local population (and <0.01% of the Welsh breeding population). The mortality rate of goshawk has been calculated to be 17% annually⁸⁶. On this survival rate the Welsh population is slowly rising. Any additional mortality at the level modelled is not predicted to result in any recognisable change in the local population nor in the overall population trend. On this basis, the potential effect as a result of collision risk is considered to be of **low negative magnitude** and **not significant** for goshawk.

Potential Disturbance/Displacement Impacts

- 7.7.73 Goshawks are particularly vulnerable to disturbance in the early part of the breeding season during the nest building and early incubation stages (mid-March to mid-May). Some pairs are prone to

⁸³ Ross-Smith, V.H., Robinson, R.A., Banks, A.N., Frayling, T.D., Gibson, C.G. & Clark, J.A. (2014) The lesser black-backed gull *Larus fuscus* in England: how to resolve a conservation conundrum. *Seabird* 27, 41-61.

⁸⁴ Hughes, J. (2019) *Welsh Bird Report No. 31: 2017*. Welsh Ornithological Society.

⁸⁵ Garvin, J. C., Jennelle, C. S., Drake, D. and Grodsky, S. M. (2011) *Response of raptors to a windfarm*. Journal of Applied Ecology, 48: 199-209.

⁸⁶ BTO (2021). Available at: <https://www.bto.org/understanding-birds/birdfacts> [Accessed 08/12/2023]

desert, particularly if they are first-time breeders or in years when prey availability is low^{87,27}. The type of disturbance most likely to affect goshawks is when a sudden change occurs in the nesting environment, such as commencement of harvesting operations or a sudden increase in traffic volume⁸⁷. Thus, there is potential for breeding birds to be disturbed, particularly during construction activities. However, goshawks can become conditioned to some types of regular disturbance, such as road traffic, if the disturbance is present from the start of nesting. It is considered unlikely that goshawks will be disturbed during the operational phase due to the less frequent and less impactful activities taking place compared to construction, although some operational wind farm activities (e.g. track maintenance, cable repairs, etc.) have the potential to disturb breeding goshawks with nests close to such activities. However, as discussed above, the operational wind farm is considered likely to displace goshawk from breeding within the turbine development area. Studies have shown that within a forest, loss of certain areas (through tree harvesting) does not affect goshawk on a population level, provided the habitat lost does not exceed 30%²⁷ (<6% of woodland cover within the proposed development will be permanently lost as a result of the proposed development (see Chapter 6: Ecology).

- 7.7.74 Evidence suggests that the maximum disturbance distance for goshawks is 300-500 m, with a protective buffer of 400 m recommended by a number of authors ^{27 88}. The buffer distance may depend on nesting stage and whether the disturbance is brief or prolonged. During baseline surveys no goshawk nests were found within 500 m of proposed turbines. The active nest monitored in 2021 was 1,160 m from the nearest turbine and 1135 m from the nearest track. The active goshawk nest monitored in 2020 was 880 m from the nearest turbine and 395 m from the nearest track associated with the proposed development (it is closer to an existing forest track). Thus, this latter nest is located at the upper limits of a safe disturbance distance. However, at 400 m it is considered that moving traffic is unlikely to cause significant disturbance, especially as no tree felling is to be undertaken in the vicinity of the nest and thus it shall remain screened from view. The location of existing nests also means that no displacement from nests shall result from construction and operation of the proposed development.
- 7.7.75 Embedded mitigation, involving pre-construction nest monitoring for breeding activity, implementing and maintaining an appropriate exclusion zone around any active nests, as well as monitoring for disturbance and controlling the construction traffic, are considered sufficient to prevent or minimise any disturbance to breeding goshawks. In addition, large forestry stands exist within the wind farm areas providing topographical variety and habitat richness that attracts goshawk. Furthermore, impacts should be looked at in the context of this being a working commercial forest (habitat suitability for goshawk within commercial conifer plantations is subject to constant change due to the nature of rotational harvesting).
- 7.7.76 Given the distance from the monitored nests to the areas where construction activities will occur, construction phase disturbance/displacement effects on this species is predicted to be of no more

than short-term, **low negative magnitude** and **not significant**. During the operational phase, **negligible** disturbance/displacement effects that are **not significant** are predicted for goshawk.

Passerines of Conservation Concern

Introduction

- 7.7.77 Baseline surveys recorded a community of passerines and near-passerines within Y Bryn site boundary that can be considered typical for this part of Wales and for the habitats present. A total of 49 passerine (or near-passerine) species were recorded as showing breeding evidence within the breeding bird survey areas (wind farm areas plus buffer and AIL access areas plus buffer). Many of these are common and widespread species. Only those of high conservation concern are assessed here, although the potential effects apply to the other ornithological features that have not been specifically included. Only the effects of disturbance/displacement are assessed. There is consensus in the available literature that passerines are at low risk from collisions with turbines e.g. ^{66,89}.

Baseline Summary

- 7.7.78 The baseline breeding bird surveys did not determine true abundance estimates for woodland passerines within the surveyed area, but the results do allow for relative abundance to be assessed. The species recorded within the wind farm areas in the greatest number was wren, with an estimated 205 territories recorded during the 2021 BBS (wind farm areas within 750 m of infrastructure); so this provides an indication of the number of territories recorded for a very abundant species. In the AIL access survey area, the actual number of territories was estimated. Based upon the June 2021 totals recorded for the surveyed portion of the wind farm area (WFA) and the number of territories recorded in the AIL access survey area (AIL), the passerines of high conservation concern were recorded in the following numbers: bullfinch (17 territories WFA), common crossbill (11 territories WFA), cuckoo (1 territory WFA), dunnoek (102 territories WFA and 15 AIL), goldcrest (107 territories WFA and 2 AIL), grasshopper warbler (3 territories WFA and 1 AIL), greenfinch (1 territory WFA), house sparrow (3 territories WFA and 3 AIL), lesser redpoll (19 territories WFA and 2 AIL), linnet (9 territories WFA and 16 AIL), reed bunting (2 territories WFA), skylark (20 territories AIL), song thrush (62 territories WFA and 6 AIL), starling (1 territory WFA), tree pipit (31 territories WFA and 2 territories AIL), wood warbler (2 territories WFA) and willow warbler (146 territories WFA and 11 AIL). These numbers are considered to be within expectation and do not indicate the wind farm areas as being atypical from other areas containing the same habitats.

Potential Disturbance/Displacement Impacts

- 7.7.79 House sparrows were recorded nesting in buildings that are found within the breeding bird survey area, but these buildings will not be affected by the proposed development. Therefore, the effect of disturbance/displacement of the proposed development on house sparrow (and other ornithological features that nest in buildings, such as starling) shall be nil.

⁸⁷ Petty, S.J. (1996) *Reducing disturbance to goshawks during the breeding season*. Forestry Commission Research Information Note 267.

⁸⁸ Whitfield, D.P., Ruddock, M. & Bullman, R. 2008. Expert opinion as a tool for quantifying bird tolerance to human disturbance. *Biological Conservation* 141, 2708-2717.

⁸⁹ Desholm, M. (2009) Avian sensitivity to mortality: prioritising migratory bird species for assessment at proposed wind farms. *Journal of Environmental Management*: 90, 2672-2697.

- 7.7.80 Marsh tit (recorded on the 2020 BBS) and wood warbler breed in broadleaved woodlands and so are restricted to these areas within the wind farm areas. The felling of areas of broadleaved woodland shall be avoided as much as possible during construction of the proposed development (0.5% of semi-natural broadleaved and mixed woodland shall be lost from within Y Bryn site boundary during construction) and indeed the planting of further areas of broadleaved woodland is included within the outline HMP (see Appendix 6.3), which will result in a net gain in broadleaved woodland within Y Bryn site boundary in the long-term. Therefore, the effect of disturbance/displacement of the proposed development on ornithological features that breed only in broadleaved forest (also includes species such as greenfinch) shall be negligible in the short and medium term and positive in the long term.
- 7.7.81 Species such as skylark (which breeds in open grassy areas) and linnet (which breeds in scrub in open areas) were recorded mainly breeding outside the north and south sections of forest. The impact of displacement will be minimal due to the small area affected compared to the suitable habitat available adjacent to Y Bryn site boundary. The proposed development shall lead to a loss of 6.1% of current scrub cover and a loss of 7.8% of current 'grassland and marsh' cover within Y Bryn site boundary. One study actually showed that skylark increased in breeding density during construction and the early operational stage of wind farms⁶⁵. This shall depend on the initial habitat present, but this indicates that skylark are not negatively impacted by wind farms. Indeed a literature review of wind farm effects on a suite of species found no significant effect for both skylark and linnet⁹⁰. During the construction phase, nest checks will prevent the physical loss of nests. It can be predicted that the effect of disturbance/displacement on all passerines in open ground habitats will be of low negative or negligible magnitude that will be not significant at a local population scale.
- 7.7.82 The other passerines of high conservation concern have potential to breed in areas of conifer plantation. Species such as common crossbill are specialists that only breed in mature conifer plantation. Grasshopper warbler breed in clear-felled and very early-stage plantation (as well as other areas of low scrub). The majority of the other species (such as dunnoek, lesser redpoll, reed bunting and willow warbler) favour young age plantation but can be found in other scrubby habitats. Song thrush and goldcrest can be found in a variety of woodland habitats including un-thinned mature conifers.
- 7.7.83 Common crossbill is a Schedule 1 species and so requires additional consideration. Despite common crossbill's inclusion on the Schedule 1 list there are an estimated 40,000 breeding pairs in the UK. In Wales, common crossbill is green listed as it has shown a 69% increase in breeding numbers in the last 30 years⁶⁹, which is attributed to the increase in mature plantation area. NatureScot guidance¹⁷ states that for crossbills any survey should be undertaken prior to construction and after consent. However, crossbill were recorded as part of baseline surveys and small numbers were recorded within the breeding bird survey area (wind farm areas within 750 m of infrastructure) within suitable habitat. The common crossbill population is mobile and eruptive in response to the available cone crop and so the number of common crossbills present within the

wind farm areas shall fluctuate greatly year to year. As common crossbills show this fluctuation in their local populations it is likely that they are less affected by habitat changes than resident, non-dispersive species.

- 7.7.84 Hötter *et al.* (2006)⁹⁰ found no significant effect of wind farms upon willow warbler and found a positive effect on reed bunting. For blackbird (a proxy for song thrush) no significant effect was found and for sedge warbler (a proxy for grasshopper warbler) a positive effect was determined. The minimum distance at which the passerines species listed in the literature review⁹⁰ were found from wind farms also indicate that displacement (subject to suitable habitat being present) is likely to have a limited impact on these ornithological features (mean distances in the breeding season are listed): willow warbler (40 m) and reed bunting (56 m); with other examples including blackbird (82 m), whitethroat (79 m) and sedge warbler (14 m).
- 7.7.85 In determining the effects of the proposed development on these plantation-dwelling passerine species, this must be considered against the baseline condition, which is that the land within the wind farm areas is an active commercial forest that is managed primarily for the production of timber. Thus there is a rotation of tree felling and planting to which the community of breeding birds must adapt. Although some early felling is required for the construction of the proposed development, these trees would be subject to harvesting at some point, irrespective of the proposed development. Indeed, it is expected likely that felling for accommodating turbines will be absorbed into the forest resource plans such that there would be no net increase in felling (i.e. other areas planned for earlier harvesting will be pushed back) (see Chapter 13: Forestry).
- 7.7.86 For all species, including common crossbill and passerine species, nest checks shall be carried out ahead of construction as part of embedded mitigation. This shall minimise the potential for nests being inadvertently destroyed.
- 7.7.87 In summary, some passerine species shall be displaced due to changes in habitat, as a result of construction of the proposed development. Where open ground habitats are created post-felling, this will have a positive effect on some of the passerine species recorded; e.g. those that require open habitats as well as those species that benefit from more insects or seed-bearing flora. Where coupes are replanted, this shall initially benefit scrub/young-age stand specialists in the short-medium term, before becoming available again to mature-age dwelling species in the medium to long term. The wind farm itself (i.e. the presence of infrastructure rather than the associated habitat changes) shall result in a potential disturbance/displacement impact to a very small part of the wind farm areas.
- 7.7.88 Based on existing knowledge of the impact of wind farms on passerines, following embedded mitigation measures, the effect of disturbance/displacement on passerines of conservation concern is predicted to be of **negligible magnitude** and **not significant** at a local population scale, for all species.

⁹⁰ Hötter, H., Thomsen, K.-M. & Jeromin, H. (2006) *Impacts on biodiversity of exploitation of renewable energy sources: the examples of birds and bats - facts, gaps in knowledge, demands for further research and ornithological guidelines for the development of renewable energy exploitation*. Michael-Otto-Institut im NABU, Bergenhusen.

7.8 FURTHER MITIGATION AND RESIDUAL EFFECTS

- 7.8.1 The proposed development is predicted to have moderately, low or negligible, and therefore not significant effect, on all of the IOFs recorded.
- 7.8.2 For all IOFs (excluding nightjar), although no species-specific mitigation is required, various embedded measures (described in Section 7.6) will be implemented to ensure compliance with legislation, and to follow good practice guidance with regard to breeding birds.

Mitigation for Nightjar

- 7.8.3 For nightjar (the ornithological feature for which a moderately negative effect has been predicted: disturbance/displacement during construction), additional mitigation measures shall be applied. These prescriptions shall be listed in the nightjar SPP that shall be written post consent and ahead of construction. Some of the proposed species-specific measures are likely to be as follows:
- Radio-tracking of nightjars to aid in the locating of nests;
 - The erection of screening, where appropriate, to minimise disturbance; and
 - Monitoring of nightjars during the construction and operational phases of the proposed development (including monitoring of the areas proposed for nightjar habitat enhancement in the HMP). Summary of Residual Effects Following Mitigation
- 7.8.4 Following species-specific mitigation, the effects of disturbance/displacement as a result of construction activities are predicted to be reduced from moderately negative to **low negative** and **not significant** for nightjar.

Habitat Management Plan

- 7.8.5 An outline HMP has been written and can be found in Appendix 6.3 The final HMP shall be agreed post-consent, secured by planning condition and agreed with local planning authorities. The principal aim of this plan in relation to ornithology shall be to improve habitat within the wind farm areas for nightjar as well as other ornithological features. Measures shall include:
- Bracken control to increase suitable nesting habitat for nightjars;
 - Removal of scrub growth around turbines to discourage nesting of nightjars in these locations;
 - Keyholing of turbines (replanting of coupes) to minimise the loss of coniferous tree cover, to the benefit of species including passerines of conservation concern;
 - Planting of broadleaved trees to increase habitat diversity, to the benefit of species including passerines of conservation concern and those on the Section 7 species list; and
 - Creation of open ground corridors to improve populations of insects, which shall in turn benefit insectivorous passerines.
- 7.8.6 Production of a HMP is in line with the Well-being of Future Generations (Wales) Act 2015 goal ‘a resilient Wales’ for ‘a nation which maintains and enhances a biodiverse natural environment with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change’.

- 7.8.7 The habitat enhancement measures proposed in the HMP shall create an overall biodiversity net benefit for the proposed development.

Operational Ecological Monitoring Plan

- 7.8.8 An outline Operational Ecological Monitoring Plan (OEMP) that outlines proposed monitoring for bat and bird species can be found in Appendix 6.3. The final HMP will be subject to agreement with NRW (acting as landowner), NPTCBC and BCBC. The measures proposed in the outline OEMP are summarised below:
- Acoustic monitoring for bat species;
 - Weekly carcass searching for bats between July and September (inclusive) for the first three years of operation;
 - Monthly carcass searching for bird species between March and August (inclusive) for the first three years of operation; and
 - Recommendations for potential mitigation and when mitigation may be required.

7.9 SUMMARY OF EFFECTS

- 7.9.1 The magnitude of pre-mitigation effects and the magnitude and significance of residual effects following the implementation of mitigation on each IOF during the construction and operation phases is detailed in Table 7.18. The proposed development is not predicted to have a significant effect on any IOF, following the implementation of mitigation

Table 7.18: Summary of pre-mitigation effects and residual effects on each IOF, and the residual significance of effect

IOF	Conservation importance	Nature of potential pre-mitigation effect	Magnitude of pre-mitigation effect	Significance of pre-mitigation effect	Specific mitigation/enhancement measure	Magnitude of residual effect	Residual significance	Level of certainty/comments
Construction/Decommissioning								
Nightjar	Regional	Disturbance and/or displacement	Moderately negative	Not significant	Specific mitigation is required (after implementation of embedded mitigation).	Low negative	Not significant	A measurable effect on the regional population is considered to be highly unlikely. Confidence in the prediction: high.
Goshawk	Local	Disturbance and/or displacement	Low negative	Not significant	No specific mitigation required (after implementation of embedded mitigation).	Low negative	Not significant	A measurable effect on the local population is considered to be highly unlikely. Confidence in the prediction: high.
Passerines of conservation concern	Local	Disturbance and/or displacement	Low negative or Negligible	Not significant	No specific mitigation required (after implementation of embedded mitigation).	Negligible	Not significant	A measurable effect on the local population is considered to be highly unlikely. Confidence in the prediction: high.
Operational								
Nightjar	Regional	Collision	Low negative	Not significant	No specific mitigation required.	Low negative	Not significant	A measurable effect on the regional population is considered to be highly unlikely. Confidence in the prediction: high.
		Disturbance and/or displacement	Low negative	Not significant	No specific mitigation required.	Low negative	Not significant	A measurable effect on the regional population is considered to be highly unlikely. Confidence in the prediction: high.
Herring gull	Local	Collision	Low negative	Not significant	No specific mitigation required.	Low negative	Not significant	A measurable effect on the local population is considered to be highly unlikely. Confidence in the prediction: high.
Lesser black-backed gull	Local	Collision	Low negative	Not significant	No specific mitigation required.	Low negative	Not significant	A measurable effect on the local population is considered to be highly unlikely. Confidence in the prediction: high.
Goshawk	Local	Collision	Low negative	Not significant	No specific mitigation required.	Low negative	Not significant	A measurable effect on the local population is considered to be highly unlikely. Confidence in the prediction: high.
		Disturbance and/or displacement	Negligible	Not significant	No specific mitigation required.	Negligible	Not significant	A measurable effect on the local population is considered to be highly unlikely. Confidence in the prediction: high.
Passerines of conservation concern	Local	Disturbance and/or displacement	Negligible	Not significant	No specific mitigation required.	Negligible	Not significant	A measurable effect on the local populations is considered to be highly unlikely. Confidence in the prediction: high.

7.10 CUMULATIVE EFFECTS

7.10.1 The following section assesses the predicted cumulative effects on IOFs from the proposed development along with all other plans or projects within an appropriate ZOI following NatureScot guidance⁹¹.

7.10.2 The IOFs for which cumulative effects may occur are as follows:

- Nightjar: disturbance/displacement and collision effects;
- Herring gull: collision effects;
- Lesser black-backed gull: collision effects; and
- Goshawk: disturbance/displacement and collision effects.

7.10.3 In line with this guidance, all wind farm developments within the vicinity of the proposed development have been assessed using the following method. Wind farm developments of fewer than three turbines (small scale wind energy proposals⁹¹) were excluded from the cumulative impact assessment, due to the problems associated with finding appropriate data for developments of this size. Only IOFs for which a greater than negligible residual impact is predicted are considered in the cumulative impact assessment, as negligible impacts will not result in a detectable increase in cumulative impacts. All existing, consented and submitted developments (of three or more turbines) within 10 km of the proposed development, were considered as part of the assessment of cumulative impacts. Within this search area data were sought for a total of seven developments for inclusion in the cumulative impact assessment which comprise:

- **Mynydd Brombil Wind Farm (operational)** – This is a four-turbine operational site located adjacent to the south section and the AIL access areas is located partially within Y Bryn site boundary;
- **Foel Trawsant Wind Farm (consented)** – This is a consented eight-turbine site, located adjacent to the north boundary of the north section;
- **Melin Court Wind Farm (consented)** – This is a consented five-turbine site, located approximately 6.5 km north of the proposed development;
- **Llynfi Afan Wind Farm (operational)** – This is a 12-turbine operational site, located approximately 3.3 km east of the northwest corner of the proposed development;
- **Pen y Cymoedd Wind Farm (operational)** – This is a 76-turbine site located (at its closest western end) approx. 2.6 km north of the north section;
- **Upper Ogmore Wind Farm (consented)** – This is a seven-turbine site located about 7.5 km east of the northeast corner of the north section; and
- **Ffynnon Oer Wind Farm (operational)** – This is a 16-turbine site located about 4 km north of the north section.

7.10.4 It should be noted that cumulative assessments may be complicated by lack of availability of ES chapters for consented developments and, where this information is available, survey periods and methods may differ between sites. Furthermore, some wind farms may have been in existence for many years, and thus contemporary data may not be available.

7.10.5 Data for informing the CIA was not available for Ffynnon Oer.

7.10.6 As well as considering other wind farm developments, the cumulative impact assessment has also taken into account other 'non-wind' projects. Within 10 km of the proposed development 41 projects were identified, consisting mostly of housing development construction, as well as waste treatment schemes, quarries, solar farms and other industrial developments. None of these projects were considered likely to contribute to collision impacts. Thus these projects were only considered in terms of their likely disturbance or displacement impacts upon nightjar and goshawk. In all cases, with the exception of one, these projects are located in urban, industrial or agricultural areas, with the large majority being located along the highly developed coastal plain. As all the listed projects are located outside the coniferous plantation and upland heathland habitats utilised by goshawk and nightjar, these projects will have no disturbance or displacement impact upon the breeding populations of these ornithological features.

7.10.7 The only non-wind project considered to be located in an area suitable for goshawk and nightjar is a proposed sandstone quarry (extraction and restoration) site at Bwlch Ffos Quarry, Mynydd Resolfen. No ecological impact assessment data is available for this latest phase of the quarrying project (which is at the pre-planning stage). However, an ES from 2012 (for the continuation of mining at this location) identifies goshawk as being recorded in the vicinity of the project through desk study data, but the habitat on site is not considered suitable for this species and goshawk is not considered further. The ES states that there is a small area of habitat considered suitable for breeding nightjar but that the area around the project is not a significant habitat resource for this species. Although no birds had been recorded breeding on site, species-specific surveys for nesting nightjar were proposed ahead of new works. Having investigated the data available (no breeding nightjar nor goshawk), this project was not included within the cumulative impact assessment. Thus only wind farm projects have been included below.

7.10.8 The residual effect of the individual operational, constructed, consented and submitted developments for which information was available and the cumulative residual effect on each of the target species most likely to be affected by cumulative effects (as listed above) is described in Table 7.19.

7.10.9 No significant cumulative disturbance/displacement or collision effects were concluded for any IOFs.

⁹¹ SNH (2016) Assessing the impact of small-scale wind energy proposals on the natural heritage (Guidance note). Scottish Natural Heritage.

Table 7.19: Summary of the potential cumulative disturbance/displacement impacts of operational, consented/under construction and submitted wind energy developments within 10 km of the proposed development on IOFs

Site	Y Bryn (proposed development)	Mynydd Brombil	Foel Trawsnant	Melin Court	Llynfi Afan Renewable Energy Park	Pen Y Cymoedd	Upper Ogmore	Cumulative residual effects
Turbines	18	4	8	5	12	76	7	130 turbines
Site status	EIA	Operational	Consented	Consented	Operational	Operational	In Planning	
Baseline survey period	2019-2021	2011-2013 (updated assessment)	2008-2015 and 2017-2018	September 2012 to August 2013	Baseline: 2005-2006 and 2008-2009 Pre-construction: 2015	2008-2009	2014-2016 and 2020	
Nightjar	An estimated 20 and 18 breeding territories recorded within the wind farm areas in 2020 and 2021 respectively.	Nightjar surveys conducted in 2010 and 2011 estimated between 3-5 breeding pairs during both years. Updated conclusions (SEI 2014) stated that a low magnitude of impact on nightjar of medium sensitivity would result in an effect that is not significant in a local or national context.	A total of five breeding territories were recorded within 500 m of the proposed development.	Two churring males were recorded outside the proposed development.	Three birds (two male and a one female) were located within the survey area to the west of the proposed development in 2005; none were found to be present in later years. Disturbance effects predicted to be low in the short term and negligible in the long term.	Twelve nightjars were recorded in 2008 within the proposed site. It was estimated the population could be approximately 40 pairs in the wider forest. A significant adverse effect on nightjar was considered to be unlikely but monitoring was recommended.	Not recorded within the development area.	No individuals recorded at PCH within the sites considered, so no assessments undertaken. Therefore cumulative collision risk cannot be determined but is considered to be low negative or negligible magnitude. The data suggests a maximum of 44 nightjar territories within the development area of these sites. However at Pen y Cymoedd it was shown during operational monitoring that the number of nightjars did not decline after construction. Therefore, cumulative disturbance/ displacement effects are likely to be of low magnitude. Both cumulative collision and disturbance/ displacement effects are predicted to be not significant.
Herring gull	Herring gull flights were recorded during the 2020 and 2021 breeding seasons. CRM was conducted and this gives an annual collision risk estimate of 0.50 birds.	Not mentioned in the ES.	Small numbers recorded during VP surveys as secondary species. CRM not undertaken.	Not mentioned in the ES.	Not mentioned in the ES.	Herring gull was recorded during the VP surveys, but no further assessment was undertaken within the ES.	Recorded occasionally during VP surveys and as a non-breeding species recorded during BBS. CRM not undertaken.	CRM not undertaken at the other sites. Therefore, the cumulative collision estimate is the same as for the proposed development on its own (0.50). The cumulative collision effect is predicted to be of low negative magnitude and not significant.
Lesser black-backed gull	Lesser black-backed gull was recorded during the breeding season flight activity surveys. A collision risk of 0.21 birds per annum was estimated.	Not mentioned in the ES.	Not mentioned in the ES.	Not mentioned in the ES.	Not mentioned in the ES.	Lesser black-backed gull was recorded during the VP surveys, but no further assessment was undertaken within the ES.	Recorded very occasionally during VP surveys. CRM not undertaken.	CRM not undertaken at the other sites. Therefore, the cumulative collision estimate is the same as for the proposed development on its own (0.21). The cumulative collision effect is predicted to be of low negative magnitude and not significant.

Site	Y Bryn (proposed development)	Mynydd Brombil	Foel Trawsnant	Melin Court	Llynfi Afan Renewable Energy Park	Pen Y Cymoedd	Upper Ogmere	Cumulative residual effects
Goshawk	Goshawk flights were recorded during both the breeding and non-breeding seasons. CRM was conducted and this gives an annual collision risk estimate of 0.04 birds. One active nest was located in the south section in both years (different locations). A total of up to three territories may be present in the wind farm areas. No nests were located within the turbine development area.	Low flight activity was recorded during the breeding and non-breeding seasons in 2010 and 2011. No CRM data. No breeding attempts were recorded within the proposed development.	Two active breeding territories recorded within 1-2 km of the proposed development with a third 3-4 km distant. During autumn 2018 VP surveys one flight was recorded (not at PCH).	Flight activity recorded two goshawk flights outside the proposed development site. No CRM data. It was estimated that three pairs bred within 2 km for the proposed development boundary.	A single pair bred in 2005 and three were thought to have bred in 2008. Goshawk flights recorded during VP surveys were used to undertake CRM: this gave an annual collision of 0.182 (99% avoidance).	Goshawk did not breed within the development site during the baseline surveys. Eight flights were recorded during VP surveys (one in the breeding season and seven in non-breeding). No CRM data. It was concluded there was a very low risk of collision.	No breeding recorded within proposed development (nearest confirmed breeding was 3.5 km distant). One flight recorded during 2014-16 VP surveys. One flight recorded during 2020 breeding season VP surveys. Did not qualify for CRM.	Goshawk bred in the vicinity of three sites in addition to the proposed development. CRM data is only available for one other site however, giving a cumulative annual collision estimate of 0.222. The paucity of flight records even when goshawk are breeding within 2 km of a site shows the low number of flights that are at CRH. The cumulative collision mortality is not predicted to be significant at the local population scale. Llynfi Afan was the only site to have goshawk breed within the development area, with nests at other sites within a 1-2 km buffer. Displacement effects here were considered to be high negative in the short-term but negligible in the long-term. Therefore, the cumulative disturbance/ displacement effect can be predicted to be no more than low negative magnitude. No significant cumulative effects predicted.

7.11 STATEMENT OF SIGNIFICANCE

- 7.11.1 An assessment has been made of the predicted significance of effects of the proposed development on ornithological interests. The proposed development includes for a 50 m microsite allowance where the environmental impacts would be assessed and signed-off by the ECoW.
- 7.11.2 By applying effective embedded mitigation measures and following good practice guidelines during construction, the magnitude of residual effects of the proposed development on all ornithological features is assessed as being low/negligible in terms of magnitude, and thus not significant in the professional judgment of Natural Power.
- 7.11.3 Furthermore, additional mitigation for nightjar during construction, which will be specified in a SPP, shall be undertaken to further reduce the potential for any low negative impacts. As well as mitigation, enhancement measures shall be undertaken through the habitat improvement prescriptions described in the HMP (Appendix 6.3), which shall provide an overall biodiversity net benefit. Although this net gain is not quantifiable for ornithological features, it is expected to benefit a variety of deciduous woodland utilising species, ground-nesting species and insect-eating species.

7.12 SCREENING FOR APPROPRIATE ASSESSMENT

- 7.12.1 Under the Conservation of Habitats and Species Regulations 2017 (as amended) any development that may have a likely significant effect (LSE) on an SPA, Special Area of Conservation (SAC), or Ramsar site, either alone or in combination with other projects, requires an AA to be carried out by the relevant competent authority, to determine whether or not the development would have an adverse effect on the integrity of the SPA, SAC or Ramsar site.
- 7.12.2 Before an AA is initiated, a screening process is undertaken to determine whether any of the predicted impacts of the development would result in an LSE. This screening assessment is presented here to provide information to the competent authority to allow them to reach a decision on whether or not the development would have a LSE on any SPAs and therefore whether an AA is required.
- 7.12.3 There is one statutory site of international importance within 25 km of the proposed development designated for ornithological features: Burry Inlet SPA/Ramsar.

- 7.12.4 The designated ornithological features of the SPA are wintering populations of named waterfowl species (pintail, shoveler, teal, wigeon, shelduck) and named wader species (turnstone, dunlin, knot, oystercatcher, curlew, grey plover, redshank) as well as its wintering waterbird assemblage (comprising shoveler, wigeon, shelduck, dunlin, curlew and grey plover).
- 7.12.5 Other ornithological features listed as 'noteworthy fauna' in the Ramsar information sheet are: little egret, whimbrel, greenshank, dark-bellied brent goose and spotted redshank.
- 7.12.6 For the purposes of this screening assessment, reasoned argument and professional judgement of biological significance are used to determine whether no adverse effect on the integrity of the SPA can be concluded.
- 7.12.7 The SPA has the following conservation objectives:
- To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of Y Bryn site boundary is maintained; and
 - To ensure for the qualifying species that the following are maintained in the long term:
 - Population of the species as a viable component of Y Bryn site boundary;
 - Distribution of the species within Y Bryn site boundary;
 - Distribution and extent of habitats supporting the species;
 - Structure, function and supporting processes of habitats supporting the species; and
 - No significant disturbance of the species.
- 7.12.8 Due to the distance between the proposed development and Burry Inlet SPA (21.7 km) there would be no direct or indirect effect on the habitats contained within the SPA. Furthermore, there would be no disturbance during construction, operation or decommissioning of the proposed development and therefore no impact on the distribution of qualifying species within the SPA.
- 7.12.9 There is also considered to be no route to impact on the qualifying species themselves, due to the distance between the proposed development and Burry Inlet SPA.
- 7.12.10 Therefore, it is the maintenance of the population of the qualifying species as viable components of the SPA that must be considered to determine whether or not there will be a LSE of the proposed development (either on its own or in combination with other similar projects).
- 7.12.11 A literature review⁹² of mean foraging distances utilised by waterfowl around their winter roost sites indicates that the proposed development is well beyond the distances that can be expected to be used by the designated features:
- Dark-bellied brent goose: 5 km;
 - Pintail: a maximum mean distance (European studies) of 1.3 km; and
 - Shoveler: 2.5 km; wigeon: 2.5 km; teal: 8.4 km (maximum; it was 1 km in another study)).

- 7.12.12 The land within Y Bryn site boundary does not offer favourable foraging habitat for these species and based upon the above mean foraging distances, waterfowl will not pass over the proposed development to reach other locations.
- 7.12.13 For wading birds, the land within the wind farm areas does not provide favourable foraging for the species listed as features of the SPA, which winter at Burry Inlet due to its coastal location and availability of inter-tidal, rocky shore and saltmarsh habitats. Curlew is the only one of the listed wader species that also forages in grassland habitats in the winter (and which could therefore utilise the AIL access routes), but a tracking study⁹³ in England has shown that home ranges of wintering curlews were only between 4.4 km² and 9.6 km² and so only coastal fields are likely to be utilised at this time, by SPA birds.
- 7.12.14 The baseline flight activity surveys did not record any of the ornithological features listed for the Burry Inlet SPA/Ramsar.
- 7.12.15 It can be concluded that there is no connectivity between the proposed development and Burry Inlet SPA/Ramsar and that the proposed development will, therefore, not impact upon the qualifying interests. **No likely significant effect can be concluded and therefore no Appropriate Assessment is required.**

⁹² Johnson, W.P., Schmidt, P.M. & Taylor, D.P. (2014) Foraging flight distances of wintering ducks and geese: a review. *Avian Conservation and Ecology* 9(2): 2.

⁹³ Cook, A.S.C.P., Turner, C., Burton, N.H.K. & Wright, L. J. (2016). Tracking curlew and redshank on the Humber estuary. *BTO Research Report* 688. British Trust for Ornithology, Thetford.