CENIN

Chapter 7

Ornithology

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Author	Shona Ruesch	07/12/2022
Checked	Graeme Garner	27/02/2023
Approved	Laura Turner	27/02/2023

Client Details	
Contact	Martyn Popham
Client Name	Cenin Renewables
Address	Solcer House
	Parc Stormy
	Stormy Down
	Bridgend
	CF33 4RS

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Glossary

Term	Definition
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	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.
Habitat	The area or environment where a species naturally occurs.
Infrastructure	This is used to describe all parts of Manmoel Wind Farm development that require construction activities, both temporary and permanent; including turbines, hard standings, borrow pits and tracks (where new or widened).
Manmoel site boundary	The proposed application boundary for the proposed development.
Manmoel Wind Farm	The turbines and all associated infrastructure required for Manmoel Wind Farm (also referred to as the 'proposed development').
Mitigation	Measures, including any process, activity or design to avoid, reduce, remedy or compensate for potential negative effects of a development.
Previously proposed site boundary	Relates to the boundary before changes were made end of 2020 to the site boundary and turbine layout.
Proposed development	Manmoel Wind Farm development
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.
Section 7 species	A list of species of 'principal importance' for maintaining and enhancing biodiversity, as named under the Environment (Wales) Act 2016.
Site of Special Scientific Interest (SSSI)	Sites of Special Scientific Interest are protected areas that represent the UK's most important wildlife and/or geological sites.
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 generally refers to the proposed development plus a surrounding buffer, the size of which is determined by the specific survey being described. Details of the area covered are described in the methodology provided for each field survey (See Section 7.2).
Zone of Influence	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
BBS	Breeding Bird Survey
BGBAP	Blaenau Gwent Biodiversity Action Plan
BGCBC	Blaenau Gwent County Borough Council
BoCC	Birds of Conservation Concern
BTO	British Trust for Ornithology
CBAP	Caerphilly Biodiversity Action Plan
CCBC	Caerphilly County Borough Council
CEMP	Construction Environmental Management Plan
CIA	Cumulative Impact Assessment
CIEEM	Chartered Institute of Ecology and Environmental Management
CRM	Collision Risk Modelling
CRZ	Collision Risk Zone
DEFRA	Department of Environment, Food and Rural Affairs
EcIA	Ecological Impact Assessment
ECoW	Environmental Clerk of Works
EIA	Environmental Impact Assessment
ES	Environmental Statement
FWPAA	Future Wales Pre-Assessed Area
GIS	Geographical Information System
HMP	Habitat Management Plan
IBA	Important Bird Area
IOF	Important Ornithological Feature
JNCC	Joint Nature Conservation Committee
LBAP	Local Biodiversity Action Plan
LNP	Local Nature Partnership
LNR	Local Nature Reserve
LPA	Local Planning Authority
MAGIC	Multi-Agency Geographic Information for the Countryside
Natural Power	Natural Power Consultants Limited, the lead EIA Co-ordinator
NPTCBC	Neath Port Talbot County Borough Council
NRW	Natural Resources Wales
PAA	Pre-Assessed Area
PCH	Potential Collision Height
RSPB	Royal Society for the Protection of Birds
SEWBReC	South-East Wales Biodiversity Records Centre
SINC	Site of Importance for Nature Conservation
SNH	Scottish Natural Heritage (former name of NatureScot)
SPA	Special Protection Area
SPP	Species Protection Plan
SSSI	Site of Special Scientific Interest
VP	Vantage Point
WCA	Wildlife and Countryside Act (1981)
ZoI	Zone of Influence

7.1 INTRODUCTION

Summary of Chapter

7.1.1 In order to inform the Ecological Impact Assessment (EcIA), 24 months of ornithological survey work was undertaken at the proposed development between September 2019 and August 2021 (two breeding seasons and two non-breeding seasons). 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 two VP locations;
- Breeding bird surveys (BBS) in 2020 and 2021;
- Breeding raptor 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 part of a Site of Special Scientific Interest (SSSI) is located just within 10 km of the proposed development (River Usk (Upper Usk)/Afon Wysg (Wysg Uchaf)).

7.1.4 Vantage point surveys recorded flight lines from a total of nine target species, most of which were raptors or gulls. No breeding target raptor species were found breeding within the survey area. Breeding nightjars were confirmed in both years, with an estimate of two probable territories in 2020 and two in 2021 within the survey area. No 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 the wind 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 herring gull (collision risk only), lesser black-backed gull (collision risk only) and red kite (collision risk only). Following such further assessment (including collision risk modelling 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 (SPP) and appointing an Environmental Clerk of Works (ECoW) to monitor adherence to such plans.

Contents of Chapter

7.1.6 This ornithological chapter of the Environmental Statement (ES) has been prepared by Natural Power Consultants (Natural Power) on behalf of Cenin (the Applicant) in respect of the proposed Manmoel Wind Farm (hereafter referred to as the proposed development). The proposed development comprises up to five wind turbines and associated infrastructure on Manmoel Common, southeast of Tredegar, South Wales (see Figure 7.1). The site lies mostly within the Blaenau Gwent County Borough Council (BGCBC) area, although its south-western corner lies within the Caerphilly County Borough Council (CCBC) local authority boundary. Four out of the five turbines proposed for Manmoel lies within a Pre-Assessed Area (PAA), Future Wales Pre-Assessed Area 10 (FWPAA)[1], with one turbine just located north of the FWPAA.

7.1.7 This chapter provides details of the baseline ornithological conditions within the Manmoel site boundary and the immediate surrounding environment. Baseline ornithological conditions have been established for avian fauna through a programme of rigorous ornithological field surveys, in addition to a desk-based review to obtain additional relevant ornithological data. The identified species comprising the ornithological baseline are described and assessed using recognised criteria, in accordance with industry guidelines (e.g. that produced by the Chartered Institute of Ecology and Environment Management: CIEEM, 2018[2]).

7.1.8 This ES chapter has been prepared following a scoping process which led to a Scoping Report issued to consultees in June 2021 and Scoping Direction received in August 2021.

7.1.9 In line with the principles of proportionate Environmental Impact Assessment (EIA), embedded mitigation is considered at the outset of the assessment (see Section 7.5 of this chapter). 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 EcIA.

7.1.10 The potential for ornithological impacts (i.e., predicted change to the baseline) as a result of the proposed development during the construction, operational and decommissioning phases have been identified and assessed, with particular attention paid to species of high vulnerability, conservation concern and those afforded a high level of legal protection. These impacts are then assessed in terms of their significance of effects to each IOF (where effects are the consequence of impacts on the environmental receptor). Where potentially adverse ornithological effects 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 impacts are predicted after the application of this mitigation, cumulative effects with other nearby developments have also been considered within this EcIA.

7.1.11 This Ornithology chapter should be read alongside Chapter 6: Ecology.

7.1.12 All Latin names for species mentioned in this chapter are listed in Table A7.1, Appendix A7.1; Ornithology Technical Appendix. Summaries of survey times and dates are also given in Appendix A7.1. Full survey data, including all details of survey dates, times and weather conditions, plus full results data, can be provided on request.

7.1.13 The ‘previously proposed site boundary’ marks the area that was originally identified for the proposed development. Following the commencement of the breeding season surveys in 2020, this site boundary was revised in June/July 2020. 49.7 ha were added to the previously proposed site boundary, a larger area to the south and a section to cover the access track to the north. The proposed site boundary, for which consent is sought, is referred to as ‘Manmoel site boundary’ hereafter.

7.1.14 Chapter 4: Site Selection and Design Evolution provides details on the evolution of proposed infrastructure location. Of relevance to this chapter are the changes in the proposed turbine layout which were made prior to Scoping in June 2021 (i.e. partway through the baseline survey period). This change resulted in the most northerly turbine being removed from the layout and thereafter consisted of five turbines. At the design freeze stage in July 2022, the locations of the five turbines were altered slightly. The currently proposed turbines are all located within Manmoel site boundary and existing ornithological survey areas. A large part of the 500 m buffer around turbines continued to be covered by the viewsheds of the two VPs under this new layout (for more detail on the design evolution, see Chapter 4: Site Selection and Design Evolution; for further information on VP viewshed coverage see Section ‘Survey Limitations’). Most of the open land within the new turbine buffers was covered by the breeding bird surveys area (see Section ‘Survey Limitations’). Therefore, no additional survey effort was required following layout changes.

[1] Available from: https://gov.wales/future-wales-national-plan-2040-0 [Accessed 28/11/2022]

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

7.1.15 The baseline studies referenced in this chapter are supported by the following technical appendices and supporting figures which provide detailed information regarding the ornithological field survey methods and field data:

- Appendix A7.1: Ornithology Technical Appendix;
- Figure 7.1: Vantage Point Locations and Viewsheds;
- Figure 7.2: Site and Ornithological Survey Areas;
- Figure 7.3: Designated Ornithological Sites within 10 km and within 25 km for Geese and Gulls
- Figure 7.4: Breeding Season VP Flightlines Mar-Aug 2020 Raptors;
- Figure 7.5: Breeding Season VP Flightlines Mar-Aug 2021 Raptors;
- Figure 7.6: Breeding Season VP Flightlines Mar-Aug 2020 Gulls;
- Figure 7.7: Breeding Season VP Flightlines Mar-Aug 2021 Gulls;
- Figure 7.8: Winter Season VP Flightlines Sep 2019-Feb 2020;
- Figure 7.9: Winter Season VP Flightlines Sep 2020-Feb 2021;
- Figure 7.10: Breeding Raptor Survey Results 2020 and 2021; and
- Figure 7.11: Nightjar Survey Results 2020 and 2021.

7.2 METHOD OF ASSESSMENT

Legislation, Policy and Guidance

7.2.1 The ornithological baseline surveys and subsequent assessment have been carried out with reference to a number of national policy documents, as addressed in Chapter 2: Legal and Policy Context and Chapter 6: Ecology of the ES. Legislative and guidance documents with specific relevance to ornithology are listed:

Legislation

- Directive 2009/147/EC on the Conservation of Wild Birds (the Birds Directive)[3];
- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive)[4];
- The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (the Habitats Regulations), which transposes the Habitats Directive into law in England and Wales[5];
- Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, which ensures domestic implementation of the Habitats Directive continues from 1 January 2021[6];
- Wildlife and Countryside Act 1981 (as amended)[7];
- The Environment (Wales) Act 2016[8]; and
- Well-being of Future Generations (Wales) Act 2015[9].

Policy

- Planning Policy Wales: Edition 11 (2021)[10];
- Future Wales – the National Plan 2040 (2021)[11];
- Technical Advice Note 5: Nature Conservation and Planning (2009)[12];
- UK Post 2010 UK biodiversity framework[13];
- Blaenau Gwent CBC Local Development Plan 2006-2021 (2012)[14], and
- Caerphilly Local Development Plan 2010-2021 (2010)[15].

The Welsh Biodiversity Strategy compromising:

- The Nature Recovery Plan for Wales (2015)[16]; and
- The Nature Recovery Action Plan (NRAP) for Wales 2020-2021[17].

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 below, that are applicable to assessing the effects of wind farm developments on ornithological features.

- CIEEM (2018). Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland[2];
- Recommended bird survey methods to inform impact assessment of onshore wind farms[18];
- Birds and Wind Farms: Risk Assessment and Mitigation[19];

[3] Available from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32009L0147&qid=1669635009762 [Accessed 28/11/2022]

[4] Available from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A31992L0043 [Accessed 28/11/2022]

[5] Available from: https://www.legislation.gov.uk/uksi/1994/2716/contents/made [Accessed 28/11/2022]

[6] Available from: https://www.legislation.gov.uk/ukdsi/2019/9780111176573/regulation/30 [Accessed 28/11/2022]

[7] Available from: https://www.legislation.gov.uk/ukpga/1981/69 [Accessed 28/11/2022]

[8] Available from: http://www.legislation.gov.uk/anaw/2016/3/ [Accessed 28/11/2022]

[9] Available from: https://gov.wales/well-being-of-future-generations-wales [Accessed 28/11/2022]

[10] Available from: https://gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11_0.pdf [Accessed 28/11/2022]

[11] Available at: https://gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11_0.pdf [Accessed 28/12/2022]

[12] Available from: https://gov.wales/sites/default/files/publications/2018-09/tan5-nature-conservation.pdf [Accessed 28/11/2022]

[13] JNCC and Defra (on behalf of the Four Countries' Biodiversity Group). 2012. UK Post-2010 Biodiversity Framework. July 2012. Available from: https://jncc.gov.uk/our-work/uk-post-2010-biodiversity-framework/ [Accessed 28/11/2022]

[14] Available from: https://www.blaenau-gwent.gov.uk/en/resident/planning/local-development-plan/adopted-local-development-plan-2006-2021/adopted-ldp/ [Accessed 31/01/2023]

[15] Available from: https://www.caerphilly.gov.uk/Business/Planning-and-building-control-for-business/Local-Development-Plan/Local-Development-Plan-2010-(Adopted)/The-Adopted-LDP [Accessed 28/11/2022]

[16] Available from: https://gov.wales/sites/default/files/publications/2019-05/nature-recovery-action-plan-2015.pdf [Accessed 28/11/2022]

[17] Available from: https://gov.wales/sites/default/files/publications/2020-10/nature-recovery-action-plan-wales-2020-2021.pdf [Accessed 28/11/2022]

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

[19] de Lucas, M., Janss, G. & Ferrer, M. (eds.) (2007) *Birds and Wind Power*. Quercus, Madrid.

- Developing field and analytical methods to assess avian collision risk at wind farms[20];
- Windfarms and birds: calculating a theoretical collision risk assuming no avoidance action[21];
- Assessing significance of impacts from onshore windfarms on birds outwith designated areas[22];
- Monitoring the impacts of onshore wind farms on birds[23];
- Guidance on methods for monitoring bird populations at onshore wind farms[24];
- Avoidance rates for the onshore SNH wind farm collision risk model[25];
- Assessing the cumulative impact of onshore wind energy developments[26]
- Assessing connectivity with Special Protection Areas (SPAs)[27];
- A Review of Disturbance Distances in Selected Bird Species[28];
- British Standard 42020:2013 Biodiversity – code of practice for planning and development;
- Wildlife Sites Guidance Wales: a guide to develop local wildlife systems in Wales[29];
- Bird Monitoring Methods[30];
- A method for censusing upland breeding waders[31];
- Raptors: A Field Guide to Survey and Monitoring[32];
- SR; SNH; SEPA (2010) Good Practice during Wind Farm Construction[33];
- Birds of Conservation Concern (BoCC) 5: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man[34]; and
- Birds of Conservation Concern in Wales 4: the population status of birds in Wales[35].

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 2016[8]. Local biodiversity interests have been assessed using the species listed on the Blaenau Gwent Local Biodiversity Action Plan (LBAP)[36] and those on the CCBC LBAP[37] lists.

7.2.4 To note, although the guidance referred to as standard for assessing impacts for birds is provided by NatureScot, this is generally accepted as standard across the UK nations, including by Natural Resource Wales (NRW).

Key issues

7.2.5 It is widely accepted that wind turbines present three main areas of potential risk to birds[19,38]:

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.

7.2.6 These issues are all considered in this assessment (Section 7.5).

7.2.7 The potential key avian ecology issues relating to the proposed development are as follows:

- The potential to adversely affect defined populations of bird species, particularly those afforded the highest level of statutory protection via inclusion in Annex I of the Birds Directive and/or Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). Such an effect may arise directly through habitat loss, disturbance or displacement, or collisions with turbines, or indirectly through cumulative effects; and
- The potential to have an adverse effect on the integrity of a statutory site designated for its ornithological features, particularly those with an international designation such as Special Protection Areas (SPAs), either as a direct result of the proposed development or in combination with other projects.

[20] 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.

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

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

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

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

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

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

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

[28] Goodship, N.M. & Furness, R.W. (MacArthur Green) (2022) *Disturbance Distances Review: an updated literature review of disturbance distances of selected bird species*. NatureScot Research Report 1283.

[29] Wales Biodiversity Partnership. (2008) *Wildlife Sites Guidance Wales: A Guide to Develop Local Wildlife Systems in Wales*. Available from http://biodiversitywales.org.uk

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

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

[32] 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.

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

[34] 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.

[35] 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.* The Welsh Ornithological Society.

[36] Available from: https://www.blaenau-gwent.gov.uk/media/q5ifcbc0/lbap_2015.pdf [Accessed 28/11/2022]

[37] Available from: https://www.caerphilly.gov.uk/CaerphillyDocs/Planning/Biodiversity-Action-Plan-Caerphilly-County-Borough.aspx [Accessed 28/11/2022]

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

Target species

7.2.8 NatureScot guidance[18] 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[34,35] (Red listed species).

7.2.9 In addition, consideration should be given to LBAP species (taken here to also include Section 7 listed bird species[8]) and any other species for which a site hosts a particular concentration.

7.2.10 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.

7.2.11 In accordance with NatureScot guidance[18], surveys focused on the following target species:

- All raptors and owls listed in Schedule 1 and 1A of the WCA 1981 (as amended);
- All species of wildfowl (with the exception of widespread species Canada goose and mallard); and
- All wader species.

7.2.12 As 'large gulls' (comprising herring gull, lesser black-backed gull and great black-backed gull) were recorded early in the baseline survey programme passing regularly over the proposed development, these species were also treated as target species.

7.2.13 Secondary species[39] (species of lesser conservation concern) which were surveyed are:

- All other waterfowl (e.g. grey heron and cormorant);
- All other raptor species (including buzzard and sparrowhawk);
- Raven;
- Other gull species;
- Crossbill species; and
- Any large aggregations of red-listed passerines.

7.2.14 Note that following consultation, kestrel was moved from being recorded as a secondary species to being recorded as a target species from October 2020 onwards because kestrel is on the BoCC red list in Wales.

7.2.15 Proposed wind farm sites may differ considerably in their ornithological sensitivity; NatureScot guidance therefore recommends that survey programmes and the level of survey effort should be tailored to an individual site's needs.

[39] 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 are recorded during flight activity surveys but in less detail than target species (for example their flights are not mapped and so collision risk modelling cannot be undertaken for secondary species).

[40] MAGIC. (2022). Available from: https://magic.defra.gov.uk/MagicMap.aspx [Accessed 28/02/2023]

Data collection

Desk Study

7.2.16 A desk study was undertaken to collate relevant existing ornithological survey data, public domain survey data, and to obtain historical records of protected and relevant species from within the Manmoel site boundary and surrounding environment. This provided background information on the ornithological features that are potentially present, to help inform and guide the baseline ornithological field surveys and it also provides context to their results. 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

7.2.17 A web-based search was undertaken to identify and provide information on statutory designated sites of nature conservation, with avian species as listed features. The search was carried out using the Multi-Agency Geographic Information for the Countryside (MAGIC) Map application tool[40], the NRW website[41] and the South East Wales Biodiversity Records Centre (SEWBReC)[42]. The search focussed on identifying the following sites:

- SPAs – within 10 km of Manmoel site boundary;
- Ramsar sites (Ramsar Convention on Wetlands of International Importance) where waterfowl or waterfowl habitat are described as ecological features – within 10 km of Manmoel site boundary;
- Sites of Special Scientific Interest (SSSIs) – within 10 km of Manmoel site boundary;
- Locally designated sites such as Sites of Important Nature Conservation (SINC) – within 2 km of Manmoel site boundary; and
- Local and National Nature Reserves (LNRs/NNRs) – within 2 km of Manmoel site boundary.

7.2.18 Due to the large foraging distances of goose and swan species, the Scoping Report laid out that a search radius of 20 km would be used for designated sites with geese listed as designated features. Since no records of goose or swan species were recorded during baseline surveys for the proposed development, a 10 km search radius was considered sufficient.

7.2.19 In the case of designated sites with gulls listed as a designated feature, the search area was larger due to their large foraging distances. For more information, see Paragraph 7.4.3.

7.2.20 LNRs and 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 searched for indications of ornithological use. However, since these sites are non-statutory and numerous in the vicinity of the proposed development, sites that overlap with Manmoel site boundary and a precautionary 2 km search radius around the proposed development were focussed on during the search.

Ornithological Features of Conservation Concern

7.2.21 A data search from SEWBReC requested all ornithological records held within the Manmoel site boundary and a 10 km buffer for raptor species. Data from within 20 km of the Manmoel site boundary was requested for goose and swan species.

[41] Natural Resources Wales. (2022). Available from: https://naturalresources.wales/?lang=en [Accessed 27/02/2023]

[42] South East Wales Biodiversity Records Centre. (2022). Available from: http://www.sewbrec.org.uk/ [Accessed 27/02/2023]

7.2.22 The Royal Society for the Protection of Birds (RSPB) was approached in July 2020 to request any ornithological data on Schedule 1 and BoCC red-list species they hold for the Manmoel site boundary and a 10 km radius between 2010-2020. They confirmed that they do not hold any records for this area during the requested time period.

7.2.23 The bird reports produced by the Gwent Ornithological Society (GOS) (who record birds in the historic vice-county of Monmouthshire, in the eastern part of Caerphilly, Blaenau Gwent, Torfaen, Newport and Monmouthshire unitary authorities), for 2017[43] and 2018[44], have been consulted for any records of interest in relation to the area around the proposed development. The GOS recording area is extensive and its border reaches from the height of Abergavenny in the north to the Mouth of the Severn in the south and from the River Wye in the east to the River Rhymney in the west.

7.2.24 Ornithology Chapters of other developments in the vicinity of the proposed development were consulted for any relevant information.

Field Surveys

7.2.25 In order to assess the potential effects of a wind farm on birds, both the value of the site itself to birds and the level of flight activity within and around the site should be determined. In view of the target species (see Section 7.2) identified as potentially occurring within the vicinity of the proposed development, the surveys listed were undertaken, in line with NatureScot guidance[18].

- Non-breeding season Vantage Point (VP) surveys in 2019/20 and 2020/21 (September to February, inclusive);
- Breeding season VP surveys in 2020 and 2021 (March to August inclusive);
- Breeding bird surveys (BBS) in 2020 and 2021;
- Breeding raptor surveys in 2020 and 2021; and
- Breeding nightjar surveys in June and July 2020 and 2021.

7.2.26 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 A7.1: Ornithology Technical Appendix. Full survey details including survey timings and weather conditions can be provided on request.

Vantage Point Surveys (flight activity survey)

7.2.27 Flight activity surveys were undertaken to cover two non-breeding seasons and two breeding seasons, thus completing 24 months of baseline surveys in total. Surveys were completed from two VP locations with a 2 km viewshed in order to adequately cover the proposed turbine locations (see Figure 7.1).

7.2.28 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 inclusive[45] and the non-breeding season is considered to be September to February inclusive, in accordance with survey guidance[18]. 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 (full details of VP survey effort can be found in Appendix A7.1: Ornithology Technical Appendix).

7.2.29 The flight activity survey focuses on identifying flight lines and flight heights of target species and allows any regular patterns of flight lines to be identified, allowing turbine locations to be designed to minimise collision risk to birds, if necessary. 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 time and duration of the flight were recorded, and the altitude of the target bird(s) was recorded at the start of the observation and at 15 second intervals thereafter into one of four height bands: (1) less than 20 m, (2) 20 m to 40 m, (3) 40 m to 175 m, (4) over 175 m. These height bands are subsequently referred to as height bands 1, 2, 3 and 4.

7.2.30 The ornithological features recorded during the VP surveys (classed as 'target' species) are described in the baseline survey results sections. 'Secondary' species were also recorded in accordance with NatureScot guidance[18].

7.2.31 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 Collision Risk Modelling (CRM).

Breeding Bird Surveys

7.2.32 Breeding bird surveys were undertaken in 2020 and 2021 and were based upon the standard methodology for assessing upland wader populations, as described in Brown and Shepherd (1993)[31], but utilising the four survey visit methodology, as is currently recommended (Calladine et *al*., 2009[46]). The surveys focused only on open ground habitats, with survey guidance[18] not recommending the inclusion of forested areas except in very limited circumstances (e.g. Caledonian pinewoods).

7.2.33 In 2020 the breeding bird survey covered all open ground within the previously proposed site boundary plus a 500 m buffer. In 2021, following site boundary changes, surveys covered the Manmoel site boundary plus a 500 m buffer, access permitting. As stated in guidance[18], the target species for these surveys were: waders, red grouse, gulls and wildfowl species. Any such species encountered were recorded and mapped, along with any details of breeding behaviour. Moorland passerines are not recorded as standard during BBS, however in the case of the proposed development, passerines were noted, and a list collated of all passerine species present. Areas of open ground that were not accessible by foot were scanned from the edge of the accessible area (see Paragraph 7.2.43 for further information regarding survey limitations and Figure 7.2 for survey areas).

7.2.34 Upon completion of the fourth (and final) survey visit, records from all visits were combined and analysed to estimate the location of any breeding territories, based upon the territory analysis method outlined in Bibby *et al.* (2000) [47].

Breeding Raptor Surveys

7.2.35 Dedicated breeding raptor surveys covered the previously proposed site boundary and a 1 km buffer in 2020 and the Manmoel Site Boundary and a 1 km buffer in 2021, access permitting (see Paragraph 7.2.44 for further information regarding survey limitations and Figure 7.2 for survey areas). The details of these surveys can be found in Appendix A7.1: Ornithology Technical Appendix. The nature of the breeding raptor surveys was

[43] GOS Annual Report 2017. Gwent Ornithological Society. Available from: http://www.gwentbirds.org.uk/annual-reports/ [Accessed 27/02/2023]

[44] GOS Annual Report 2018. Gwent Ornithological Society. Available from: http://www.gwentbirds.org.uk/annual-reports/ [Accessed 27/02/2023]

[45] 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.

[46] 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.

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

determined by the target species recorded during the VP surveys and BBS and by those species considered to have the potential to breed within the Survey Area based upon the available habitat and desk study results. Surveys involved a mixture of walkovers and short VP watches to identify potential breeding sites and, where possible, to monitor productivity. Regular scanning for raptors was undertaken both within the site and by watching the surrounding area, thus covering ground not covered by the standard VP flight activity surveys. Surveys were undertaken by experienced surveyors holding a Schedule 1 Licence. Species-specific survey methods were informed by the methods outlined in Gilbert *et al*. (1998)[30] and Hardey *et al*. (2013)[32].

Nightjar Surveys

7.2.36 Dedicated surveys to record any nightjars present in the vicinity of the proposed development were carried out in 2020 and 2021. Survey methods followed Gilbert *et al*. (1998)[30]. The surveys covered all suitable habitat within the previously proposed site boundary plus a 500 m buffer in 2020 and all suitable habitat within the Manmoel site boundary and a 500 m buffer in 2021, access permitting. The nightjar surveys were carried out at dusk over multiple nights, in suitable weather conditions. Two survey visits were made, in June and July, 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.

7.2.37 Following the completion of surveys in 2021, all nightjar records were mapped, and territories defined based on methods outlined in Gilbert *et al.* (1998)[30].

Collision Risk Modelling

7.2.38 CRM uses data collected during flight activity surveys to predict the number of individuals per target species that have the potential to collide with the wind turbine rotors. This is undertaken when sufficient flight activity occurs within the Collision Risk Zone (CRZ) at Potential Collision Height (PCH) (i.e. the height at which rotor blades sweep), as per the Band *et al*. (2007)[20] collision risk model recommended by NatureScot[21]. For the purposes of this assessment, sufficient flight activity was defined as three or more flights, or more than ten individuals, at PCH in the CRZ within a season. Thus, species that rarely pass through the study area and which are not considered to be at risk of significant effects did not undergo CRM.

7.2.39 For the purposes of this EcIA, flights which pass through or touch a 275 m buffer of the proposed turbine locations are considered to be in the CRZ, based upon a blade length of 75 m plus a precautionary 200 m buffer.

7.2.40 CRM was run based on a layout of five turbines of 180 m height (to blade tip), with blade lengths of 75 m and a hub height of 105 m. Therefore, for the purposes of the EcIA, the turbine swept height shall be between 30 m and 180 m altitude. Using the height bands recorded during the VP surveys, all flights in height band 2 (20 m - 40 m), 3 (40 m - 175 m) and height band 4 (over 175 m) were included in the CRM, although this will be a precautionary approach as some flights at the lower end of height band 2 and the large majority of flights recorded in height band 4 will lie outside the actual PCH. Flights recorded in height band 1 are below PCH. Only records at PCH within the CRZ (blade width plus 200 m buffer) are used within the CRM.

7.2.41 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 foraging raptors, the observed time spent flying within the risk area is 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) is calculated. This metric is then used to extrapolate flight activity across time and across the entirety of the CRZ to estimate the total flight activity across the site per year (or season). The underlying assumption behind this is that the surveys provide a representative sample of flight activity over time and in space.

7.2.42 The number of flights or flight activity are 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 is then combined with a parameter representing avoidance behaviour likely to be displayed by birds flying towards turbine blades. Collision estimates were calculated based on a range of avoidance rates including recommended species-specific avoidance rates (SNH, 2018[25]).

7.2.43 For each species, the risk of collision for an individual is 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 A7.1: Ornithology Technical Appendix.

Survey Limitations

7.2.44 There were limiting factors to survey methodologies, the details of which are provided in this section. As a whole, it is not considered that these limitations have resulted an impact on the assessment provided within this Chapter, and the reasoning for this in relation to each limitation is provided on a case-by-case basis below. The following limitations were experienced:

- 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 VP 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 both years 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.
- The survey areas for the baseline ornithology surveys included the previously proposed site boundary/Manmoel site boundary plus a buffer area. Not all sections of the buffer areas were accessible: only Manmoel Common and St James Wood adjacent to the west boundary of the common land had permitted access. Therefore, those areas that could not be accessed by the surveyor, were instead surveyed from public foot paths, roads and from the Manmoel site boundary during BBS and raptor surveys (see Figure 7.2). As the Manmoel site boundary sits atop a ridge, visibility looking down the surrounding slopes was considered to be good. Furthermore, because non-passerines were the focus of these surveys, detectability at distance is possible for most species.
- During BBS all open ground was covered to which access was permitted within the previously proposed site boundary (2020) and Manmoel site boundary (2021) plus a 500 m buffer. Open ground within the survey buffer that was accessible was all land within Manmoel Common. The remaining area within the survey buffer was walked along public foot paths and scanned from the edge of the boundary where not accessible by foot. Access restrictions resulted in c. 12 % of the open ground within the 500 m buffer of turbines not being surveyed directly on the ground during BBS visits. However, half of this area was within 100 m of the previously proposed site boundary/Manmoel site boundary and was therefore surveyed within guidance (surveyor to approach within 100 m of all parts of the proposed development). The Manmoel site boundary covers an area that extends beyond the proposed turbine locations and therefore already incorporates a surrounding buffer of variable extent (between 215 m and 1,500 m beyond the proposed turbine locations).
- Dedicated breeding raptor surveys were undertaken within the previously proposed site boundary (2020) and Manmoel site boundary (2021) plus a 1 km buffer. Generally, a 2 km recommended survey buffer is utilised

for raptor surveys (though it is species-specific), however access was only available to suitable habitat within 1 km of the Manmoel site boundary due to the proximity of urban populations. Urban areas are considered unsuitable habitat for most breeding Schedule 1 raptors, so the access of such parts of the survey buffer were not considered to have been necessary.

- The site boundary was altered in June/July 2020 after the commencement of ornithology surveys. While all turbine locations are still located within the Manmoel site boundary and within the VP viewsheds, 18 % of the 500 m buffer of turbines was not covered by the VP viewsheds utilised (coverage of a 500 m buffer around turbines being recommended in guidance). Only 11 % of the 275 m buffer (the CRZ) was not covered by the VP viewsheds. It is considered that 18 % (or 11 % of the CRZ) is not a significant loss of coverage. The locations of the proposed turbines were covered by the VP viewsheds, as was the area between turbines. It was therefore not possible for a target species to fly through the proposed turbine array without detection.

Approach to Impact Assessment

7.2.45 This section summarises how the significance of effects on the ornithological interests at the proposed development was assessed. The approach used for the assessment of ornithological effects followed the guidance produced by CIEEM[2].

Evaluating ornithological features

7.2.46 The assessment process involves identifying IOFs, in accordance with CIEEM guidelines[2]. These ornithological features and their values are determined by the criteria defined in Table 7.1. It should be noted that these criteria are intended as a guide and are not definitive; professional judgement has also been 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 and found in numbers that are crucial to the integrity of the designated site. Species populations present with sufficient conservation importance to meet criteria for SPA selection[48].
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[49, 50, 51].
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[29].
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[34,35].
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[34]).

7.2.47 The assessment of ornithological features recorded during the baseline surveys also considers the importance of the site 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 the site.

7.2.48 Therefore, while the importance of the species is considered, 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 are also taken into account. An assessment is then made of the importance of the area of the proposed development to the species in question, in order to determine whether they are an IOF.

7.2.49 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 on the feature at the assigned value level arising from the proposed development, after the application of embedded measures.

Characterising Potential Effects on Ornithological Features

7.2.50 Impacts on IOFs are judged in terms of magnitude and duration.

7.2.51 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 EcIA, magnitude is assessed within six levels, as detailed in Table 7.2.

[48] An area that 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 that is used regularly by over 20,000 waterfowl (waterfowl as defined by the Ramsar Convention) or 20,000 seabirds in any season.

[49] 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.

[50] 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).

[51] 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.

Table 7.2: Approach used to evaluate ornithological features by defined magnitude

Impact magnitude	Description
Very highly negative	Total or almost complete loss of an ornithological feature resulting in a permanent adverse effect on the integrity[52] 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.

7.2.52 In the case of designated sites, spatial magnitude is assessed in respect of the area within the designated Manmoel 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.

7.2.53 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.

7.2.54 Duration is defined as the time for which the impact is expected to last before recovery, i.e., return to pre-construction baseline conditions[22]. This is summarised in Table 7.3.

Table 7.3: Criteria 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)

[52] 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.

7.2.55 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.

7.2.56 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: Criteria for describing sensitivity

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 minutes - 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.

7.2.57 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

7.2.58 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 guidelines[2] use only two categories to classify effects: "significant" or "not significant". In this EIA chapter, significance of effects is assessed following an assumption of the application of embedded mitigation measures (see Section 7.5). 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.

7.2.59 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.

This should not be confused with the specific term 'Site Integrity' used in Appropriate Assessment for Natura 2000 sites.

7.2.60 With reference to CIEEM[2], paragraph 5.25 provides "*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".*

7.2.61 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 impacts.

7.2.62 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 guidance[24]).

Trends and Predicted Future Baseline

7.2.63 Current habitat use within the proposed development is grazed common land. In the absence of development, it is assumed that the habitat use at the proposed development would remain the same for the foreseeable future.

7.2.64 It is more difficult to predict changes that may occur in the longer-term (i.e. over 25 years). 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 reliably predicted at this time. Baseline surveys carried out for the proposed development represent a snapshot of the ecology community present at the time and cannot be extrapolated to predict future population trends in the event of climate change, or a future change in land use at the proposed development.

7.3 CONSULTATION

7.3.1 As per good practice guidelines, a Scoping Report for the proposed development was issued to a range of consultees in June 2021 (see Appendix A3.1). This document contained details of the proposed assessment methodology and ornithological features proposed for full EcIA and those to be scoped out of the EcIA, following one year of baseline surveys. Most ornithological features were proposed to be scoped out on the basis that construction and operation of the proposed development would not be likely to result in significant effects. However, following consultee responses to the Scoping Report the following ornithological features were scoped in:

- Nightjar;
- Herring gull;
- Lesser black-backed gull;
- Goshawk;
- Hen harrier;
- Red kite;
- Kestrel;
- Merlin;
- Peregrine;
- Secondary raptor species; and
- Passerine species.

7.3.2 Throughout the baseline survey period, NRW were provided with a summary of the survey programme and results of the first baseline year to seek agreement on baseline ornithological surveys being carried out at the proposed development. No response was received regarding the survey programme or survey results.

7.3.3 Manmoel Wind Farm Scoping Report was submitted to a range of consultees in June 2021. Responses were returned in August 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 6.6 in Chapter 6: Ecology.

Table 7.5: Consultee scoping responses relating to ornithology

Consultee	Comments/ issues raised/ recommendations	Addressed responses/ outcomes
Planning Inspectorate	The Scoping Direction states that the Scoping Report did not list designated sites within 10 km that will be considered in the assessment. The ES should include this information, although it is noted that the Severn Estuary SPA is more than 10 km away from the proposed development.	The criteria used for undertaking the desk-based search of designated sites is set out in Section 7.2 and the results are presented in Section 7.4.
NRW / Planning Inspectorate	Both consultees noted that in 2020 upland breeding bird survey visits were conducted from May onwards and advise this timing may mean that early nesting species might have been missed. In addition, the Planning Inspectorate also stated that limitations to surveys should be clearly indicated in the ES.	Two years of breeding bird surveys were undertaken and in the second year the early breeding season was adequately covered. Survey limitations are discussed in Paragraph 7.2.44.
NRW	NRW noted there is some evidence that lesser black-backed gulls from breeding colonies on Steep Holm and Flat Holm forage as far as Merthyr Tydfil and advise these are considered.	Lesser black-backed gull is considered within this ES chapter.
Planning Inspectorate	Due to the absence of year 2 (2021) results, the Planning Inspectorate did not agree to scoping out the following species: nightjar, goshawk, hen harrier, merlin, peregrine, kestrel, secondary raptor and passerine species.	All listed species are considered within this ES chapter.
Planning Inspectorate	The Planning Inspectorate agreed to scope out all other secondary bird species.	Noted and these species are not considered further.
Planning Inspectorate	The ES should include a detailed ecological management plan, including targets and enhancement objectives specific to the habitats and species present on site. The plan should include monitoring and indicate triggers which would prompt changes in the management of the site. Net benefits should be clearly identified.	Noted and details of an ecological management plan are discussed in Chapter 6: Ecology.

Consultee	Comments/ issues raised/ recommendations	Addressed responses/ outcomes
Planning Inspectorate	Disturbance during construction (in particular during breeding season) should be considered in the ES.	Disturbance impacts during construction are discussed under Section 7.5 “Embedded Mitigation” and considered for species-specific assessments (Section 7.5).
Planning Inspectorate	Cumulative impacts within this area should be assessed as they may be significant. The Applicant should continue to engage with NRW and relevant local planning authorities (LPAs) once the baseline surveys are complete and the collision model prepared.	The cumulative impact assessment is laid out in Section 7.8 (Cumulative Effects).

7.4 BASELINE RESULTS

7.4.1 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

7.4.2 A list of designated sites with an ornithological interest that are located within the search area around Manmoel site boundary (2 km for LNRs/NNRs and SINCs, 10 km for SPA, Ramsar, SSSI) is provided in Table 7.6. There are no sites of international designation (SPA, Ramsar) for ornithological features within the search area. There is one site of national importance for its ornithological interests, which is just within the search area: River Usk (Upper Usk)/Afon Wysg (Wysg Uchaf) SSSI.

7.4.3 International designated sites (SPA, Ramsar) were considered beyond the search criteria in relation to gulls due to their large foraging distances and potential connectivity to breeding colonies on Flat Holm (40.9 km from proposed development) and Steep Holm (45.3 km from proposed development). For further information, see Section 7.10.There are three local nature reserves within 2 km of the Manmoel site boundary that mention ornithological presence. No national nature reserves with ornithological features are within 2 km of the proposed development.

7.4.4 A total of 64 SINCs lie within the search area. Of these however, there are only four SINCs that mention ornithological features (most are designated for habitats and flora). Locations of designated sites can be found on Figure 7.3.

Table 7.6: Designated sites with ornithological interests within 10 km of the Manmoel site boundary (20 km for gulls and geese as designated features)

Site	Designation	Distance to Manmoel site boundary	Designation criteria
Sirhowy Hill Woodlands and Cardiff Pond	LNR	0.2 km	Over 21 bird species have been recorded, including 12 species of conservation concern including kestrel and green woodpecker.
Bryn Serth	SINC	1 km	The site is an important breeding site for lapwing and skylark. Further bird species recorded include snipe, jack snipe, barn owl, wheatear, goldfinch, whinchat, stonechat, kestrel, buzzard, merlin, carrion crow, raven, wood pigeon, magpie, linnet, meadow pipit and reed bunting.
Silent Valley	LNR	1.4 km	At various times throughout the year, green woodpeckers, pied flycatcher and redstarts can be seen.
Rhyd y Blew	SINC	1.4 km	The site is of historical importance for its breeding lapwing, which continue to breed on site.
Slopes of Mynydd Carn-y-Cefn (2 of 2)	SINC	1.4 km	Bird species recorded include meadow pipit, skylark and buzzard.
Parc Bryn Bach	LNR	1.7 km	Bird species recorded include lapwing and skylark.
Bwlch y Garn North	SINC	1.8 km	Bird species recorded include meadow pipit and stonechat.
River Usk (Upper Usk)/Afon Wysg (Wysg Uchaf)	SSSI	9.9 km	Breeding species include; common sandpiper, grey wagtail, dipper, goosander, and little grebe, yellow wagtail, little ringed-plover. kingfisher and sand martin.

Source: DEFRA[40], NRW[41], SEWBReC

Ornithological Features

7.4.5 The data requests to RSPB and SEWBReC in 2020 did not return any data from the RSPB but did return records from SEWBReC.

7.4.6 A full list of all protected bird species from the SEWBReC dataset is provided in Appendix A7.1: Ornithology Technical Appendix. The full ornithological dataset received from SEWBReC represents a typical bird assemblage associated with open upland habitats in this region of Wales.

7.4.7 The data contained records for a total of 55 protected bird species and/or birds of conservation concern between 2010 and 2020 (36 species excluding passerines). This included ten *Schedule 1* raptor species and four wader species. The recorded species are listed. Note that these records refer to individuals and are not necessarily

indicative of breeding or of regular presence within the search area. The baseline surveys undertaken are considered to have been suitable for recording these target species within the vicinity of the proposed development.

7.4.8 Schedule 1 raptor species recorded within 10 km of the proposed development comprise:

- Osprey;
- Honey buzzard;
- Goshawk;
- Marsh harrier;
- Hen harrier;
- Red kite;
- Barn owl;
- Merlin;
- Hobby; and
- Peregrine.

Wader species recorded within 10 km of the proposed development comprise:

- Lapwing;
- Ringed plover;
- Little ringed plover; and
- Curlew.

7.4.9 The GOS annual bird report for 2017[43] includes the following records that provide context to the proposed development:

- Goshawk: 16 nests monitored in the east/south-east of the Gwent recording area in 2017. Displaying and juveniles recorded at six sites (locations undisclosed), Hunting records for five further locations;
- Hen harrier: seven sighting records in the recording area in 2017;
- Red kite: bred at seven sites in the recording area in 2017 (north of Usk and Western Valleys), as well as being seen at an additional three locations. The regularity of sightings suggested that many more breeding attempts were overlooked;
- Herring gull: 360 apparently occupied nests recorded in Monmouthshire in 2017, mostly in urban settings around Newport, Trethomas, heads of the valleys, Chepstow and Monmouth;
- Lesser black-backed gull: 555 apparently occupied nests recorded in Monmouthshire in 2017, mostly in urban settings around Newport, Trethomas, heads of the valleys, Chepstow and Monmouth;
- Nightjar: six churring males were recorded around Monmouth in May and June 2017. At least six territories were recorded in Wentwood, one pair was present at Upper Llanover in June and July 2017 and two pairs were recorded at Coed y Prior in 2017. On the Blorenge, one male was churring on 14 May 2017. In the west, birds were heard at Hafodrynys, Nant Gwyddon, in the forest east of Mynydd Garn Clochdy, Coed y Llanerch (four), near Manmoel (three), Lasgarn Wood, St. James Forestry, Blackweir at Crosskey (six), Cwmfelinfach and Machen Mountain. One nest was fully confirmed at Coed y Prior;
- Kestrel: breeding confirmed at eight coastal locations (Caldicot levels, Newport Wetlands Reserve, Peterstone Wentlooge). Away from coastal areas, birds were recorded from around 16 locations in the north and west of Gwent;
- Merlin: no evidence of confirmed breeding but single birds recorded throughout the year in recording area; and
- Peregrine: breeding confirmed at nine sites in the north and west of the recording area in 2017 (undisclosed, four sites in urban areas, five sites at rural rock faces and quarries). It was assumed that the breeding reports were an under-representation of the true breeding number in Gwent.

7.4.10 The GOS annual bird report for 2018[44] includes the following records that provide context to the proposed development:

- Goshawk: five nests reported away from main study population (one nest felled during forest operations, locations undisclosed), 23 monitored nests. Further displaying and hunting records for four locations, including a pair plus juvenile seen near Pontypool;
- Hen harrier: 17 sighting records in the recording area in 2018;
- Red kite: bred at eleven sites in the recording area in 2018 (Torfaen/Blaenau Gwent, wider Usk Valley, south of Usk, Sirhowy Valley, Monmouth), as well as being seen at multiple additional locations in the recording area;
- Herring gull: Breeding colonies were poorly reported in 2018. Total 12 breeding pairs recorded in Monmouth and Denny Island. Although successful breeding was reported at other colonies (Newport, Trethomas), no nest counts were made;
- Lesser black-backed gull: Breeding colonies were poorly reported in 2018. Total 93 breeding pairs recorded in Monmouth and Denny Island. Although successful breeding was reported at other colonies (Newport, Trethomas), no nest counts were made;
- Nightjar: birds were heard at two sites at Coed-y-Llanerch on 7 May 2018. A pair was displaying at Crosskeys on 14 May 2018. In June and July, churring males were reported from Wentwood (five males on 1 June, further males near Reservoir and Cadira Beeches in July). Churring males or pairs were also recorded at Blaenavon, St. James Forestry, Chatham on Machen Mountain (two pairs), Upper Llanover, Abersychan (two males), Hafodrynys (two pairs) and Gwyddon Valley (three pairs). In addition, four males were churring by Beacon Hill in June 2018. One nest was fully confirmed at Llanellen, and fledged young were seen at Coed y Prior;
- Kestrel: breeding confirmed at three sites in recording area (Llangybi, Llanfihangel Gobion, Pwll Du). Juveniles were recorded at three further sites (Cardiff and Newport area and park by Aberbargoed);
- Merlin: no evidence of confirmed breeding but single records came from areas of suitable habitat (undisclosed). Single birds recorded throughout the year in recording area; and
- Peregrine: breeding confirmed at six sites in the north and west of the recording area in 2018 (undisclosed). It was assumed that the breeding reports were an under-representation of the true breeding number in Gwent.

Baseline surveys

Vantage Point Surveys: Breeding Season

7.4.11 The breeding season surveys (March to August) undertaken in 2020 and 2021 recorded flight lines from a total of nine target species, all of which were raptors or large gull species. Table 7.7 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). This shows that herring gull and red kite were the most frequently recorded species. The associated flight lines

are shown in Figure 7.4 (2020 breeding season: raptors), Figure 7.5 (2021 breeding season: raptors), Figure 7.6 (2020 breeding season: gulls) and Figure 7.7 (2021 breeding season: gulls).

7.4.12 Note that for kestrel, which was recorded as target species in the 2021 breeding season but as secondary species during the 2020 breeding season, the totals include flights recorded on the secondary species recording form.

Table 7.7: Results of the breeding season flight activity surveys in 2020 and 2021

Species	No. of flights (individuals)	No. of flights (individuals) in the CRZ at PCH
Great black-backed gull	1 (1)	0 (0)
Herring gull	112 (186)	54 (80)
Lesser black-backed gull	27 (35)	13 (17)
Large gull species*	3 (28)	0 (0)
Goshawk	1 (1)	1 (1)
Hen harrier	2 (2)	0 (0)
Red kite	32 (34)	21 (22)
Kestrel**	11 (12)	0 (0)
Merlin	1 (1)	1 (1)
Peregrine	2 (2)	2 (2)

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

***Kestrel was recorded as a target species as of October 2020. The flight numbers include secondary flights only one target record of kestrel was made during the 2021 breeding season VP surveys. For 10 kestrel flights recorded as secondary species, it is not possible to say if the flights were in the CRZ at PCH. The single target record was at PCH but not within CRZ.*

Source: Natural Power

Vantage Point Surveys: Non-breeding Season

7.4.13 A total of five target species were recorded during non-breeding season VP surveys between September 2019 and February 2020 (inclusive) and September 2020 and February 2021 (inclusive). All five of those species were also recorded during the breeding season. Table 7.8 summarises levels of flight activity for each species and the amount of that flight activity recorded in the CRZ at PCH. Red kite was the most frequently recorded species. The flight lines for the non-breeding season target species are shown in Figure 7.8 (2019/20) and Figure 7.9 (2020/21).

Table 7.8: Results of the non-breeding season flight activity surveys in 2019/20 and 2020/21

Species	No. of flights (individuals)	No. of flights (individuals) in the CRZ at PCH
Herring gull	6 (22)	1 (13)
Goshawk	3 (3)	1 (1)
Hen harrier	2 (2)	1 (1)
Red kite	15 (20)	9 (9)
Kestrel*	13 (13)	0 (0)

**Kestrel was recorded as a target species as of October 2020. The total flight numbers are made up of flights from the 2020/21 non-breeding season (no kestrel flights recorded in the 2019/20 non-breeding season) when kestrel was still recorded as a secondary. Three of these secondary flights were recorded at PCH, however it is not possible to say if these were within the CRZ.*

7.4.14 Table 7.9 summarises all baseline flights of target species which were recorded with a period in the CRZ and with a period at PCH. Only species for which there were a minimum of either three flights or ten individuals in the CRZ and at PCH (in either season) qualified for CRM. Those ornithological features for which CRM was undertaken are shown in bold text.

Table 7.9: Number of flights and individuals recorded passing through the CRZ at PCH during VP surveys

Species	Season	Total flights (individuals)	Risk flights (individuals)	CRM carried out
Great black-backed gull	Breeding	1 (1)	0 (0)	No
Herring gull	**Breeding**	**111 (185)**	**54 (80)**	**Yes**
	Non-breeding	**6 (22)**	**1 (13)**	**Yes**
Lesser black-backed gull	**Breeding**	**27 (35)**	**13 (17)**	**Yes**
Large gull species*	Breeding	3 (28)	0 (0)	No
Goshawk	Breeding	1 (1)	1 (1)	No
	Non-breeding	3 (3)	1 (1)	No
Hen harrier	Breeding	2 (2)	0 (0)	No
	Non-breeding	2 (2)	1 (1)	No
Red kite	**Breeding**	**32 (34)**	**21 (22)**	**Yes**
	Non-breeding	**15 (20)**	**9 (9)**	**Yes**
Kestrel	Breeding	11 (12)	0 (0)	No
	Non-breeding	13 (13)	0 (0)	No
Merlin	Breeding	1 (1)	1 (1)	No
Peregrine	Breeding	2 (2)	2 (2)	No

** Denotes either herring gull or lesser-black backed-gull. As no unidentified gull flights were recorded in the CRZ at PCH there was no need to apportion out records to the two individual species.*

Source: Natural Power

7.4.15 Records of secondary species and incidental records of target species recorded during the breeding and non-breeding season VP surveys are summarised in Appendix A7.1: Ornithology Technical Appendix.

Breeding Bird Surveys

7.4.16 The breeding bird survey in 2020 and 2021 did not identify any signs of breeding within the study area for any wader species. No species of wader were recorded on any of the eight survey visits, nor were there records of any other species targeted by these surveys (e.g. red grouse, gulls, wildfowl). The only non-passerine recorded was buzzard.

7.4.17 Passerine species observed during the breeding bird surveys included: blue tit, great tit, skylark, swallow, wren, starling, song thrush, mistle thrush, blackbird, robin, stonechat, wheatear, house sparrow, dunnock, grey wagtail, pied wagtail, meadow pipit, chaffinch, linnet and goldfinch.

Breeding Raptor Surveys

7.4.18 The results of the dedicated breeding raptor surveys carried out in 2020 and 2021 are shown in Figure 7.10.

7.4.19 There were no Schedule 1 raptor species recorded as breeding within the study area in either the 2020 or 2021 breeding season.

7.4.20 Target raptor species recorded during the dedicated surveys were: goshawk, merlin, peregrine, red kite and kestrel. As well as recording sightings of these birds, the records also included pellets (considered to be kestrel) and feeding signs (plucked meadow pipit). No evidence was found of target raptors breeding within the survey area.

7.4.21 Of the secondary raptor species recorded during the raptor surveys, buzzard was confirmed as breeding within the Manmoel site boundary in 2021, and sparrowhawk was also considered to have bred within the survey buffer, though no nest was located.

Nightjar Surveys

7.4.22 Dedicated nightjar surveys in 2020 found three records of churring males within the Coed y Rhyd forestry block that lies within the 500 m buffer of the western Manmoel site boundary. In 2021, one churring male and one hawking male were recorded in the same area. This data was used to estimate the number of breeding territories within the survey buffer of the Manmoel site boundary. Guidance[30] suggests that a separation distance of 400 m be used to determine separate territories. The results are presented in Table 7.10. Records are mapped in Figure 7.11.

Table 7.10: Estimated number of breeding nightjar territories within and surrounding Manmoel site boundary

Year	Total
2020	2
2021	2

Source: Natural Power

Collision Risk Modelling

7.4.23 Three target species fulfilled criterion for CRM. During the breeding season these were: herring gull, lesser black-backed gull and red kite. During the non-breeding season these were: herring gull and red kite.

7.4.24 Herring gull and lesser black-backed gull were considered to have ‘directional’ flights and red kite was considered to have ‘non-directional’ flights (see Section 7.2).

7.4.25 The risk of collision for each species, calculated with avoidance factors of 95 %, 98 %, 99 %, 99.5 % and 99.8 % are presented in Table 7.11. The results in bold indicate the NatureScot recommended avoidance rate (SNH, 2018)[25] for each species.

Table 7.11: Estimated number of collisions by season

			Estimated mortality assuming avoidance rate of:			
Species	**Model type**	**Season**	**95 %**	**98 %**	**99 %**	**99.5 %**
Herring gull	Commuting	Breeding	3.20	1.28	0.64	**0.32**
		Non-breeding	0.33	0.13	0.07	**0.03**
		Annual	3.53	1.41	0.71	**0.35**
Lesser black-backed gull	Commuting	Breeding	0.59	0.24	0.12	**0.06**
		Non-breeding	0	0	0	**0**
		Annual	0.59	0.24	0.12	**0.06**
Red kite	Non-directional	Breeding	0.49	0.19	**0.10**	0.05
		Non-breeding	0.15	0.06	**0.03**	0.01
		Annual	0.64	0.25	**0.13**	0.06

Numbers in bold represent NatureScot recommended avoidance rates. Annual estimates are the sum of the breeding and non-breeding estimates for species with at-risk flight activity across more than one season

Source: Natural Power

7.5 POTENTIAL EFFECTS

7.5.1 This section outlines the potential impacts (i.e. change to the baseline) during the construction, operation and decommissioning phases of the proposed development on birds, prior to the implementation of any further mitigation.

7.5.2 As outlined in Section 7.2.5, it is widely accepted that wind turbines present three main areas of potential risk to birds[53]:

- Direct habitat loss resulting from the construction and operation of a wind farm and associated infrastructure.
- 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.
- Death due to collision (or interaction) with rotating turbine blades, towers, overhead wires, guy lines and fencing. Collision risk depends on a range of factors related to the species, numbers and behaviour of birds, weather conditions and topography and the nature of the wind farm itself. However, is generally considered to be of particular relevance for sites located in areas known to support raptors or large concentrations of wildfowl.

7.5.3 In addition to effects which are directly related to the proposed development, there may be other impacts which arise as a result of the combined effects of multiple wind farms (or other developments) within the local or regional area. These cumulative impacts may also result in effects, which individually would not be significant, becoming more important and significant in context.

7.5.4 Each of these potential effects is discussed in turn for each phase of the proposed development (construction, operation and decommissioning) and are considered within this assessment.

Potential Effects During Construction

Habitat Loss

7.5.5 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

7.5.6 The construction phase of the proposed development could have potential impacts of associated noise and visual disturbance and if unmitigated could lead to the temporary displacement or disturbance of breeding and foraging birds. The magnitude of the 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.

7.5.7 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 effects will vary between species.

7.5.8 Disturbance of birds due to construction activities of this type have not been sufficiently quantified and the available information is often contradictory. However, it is likely that construction impacts will be greater 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 woodland[54].

7.5.9 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

7.5.10 The operation of turbines and associated human activities for maintenance purposes have the potential to cause disturbance and displace birds. 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 proposed to have a lifespan of up to 50 years.

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

[54] 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.

7.5.11 Studies have shown that, in general, species are not disturbed beyond 500 to 800 m from turbines[55,56] and in some cases, birds do not appear to have been disturbed at all[57,58,59,60]. However, this may depend on the sensitivity of the species in question; specific disturbance impacts are discussed in the feature assessment below, where appropriate.

7.5.12 There is less consensus of opinion about disturbance impacts closer to wind farm infrastructure. Several studies have examined this in detail and have been summarised.

7.5.13 Pearce-Higgins *et al.*[56], 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 author[61] 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. Previous studies of golden plover[59] and curlew[58], involving long-term monitoring found no evidence of displacement due to wind farm infrastructure in either species. In addition, a synthesis of European work found no statistically significant adverse effect on breeding population density of any bird species, including several species found within the site such as skylark and meadow pipit[38].

7.5.14 It has however 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 m - 200 m of turbines[61].

7.5.15 In terms of non-breeding population densities, Hötker *et al.* (2006)[55] reported a significantly adverse effect on geese (several species combined), golden plover and lapwing and a significantly positive effect on starling although the distances involved were relatively limited (mean distances were between 30 m for starling and 373 m for geese). In their study of the effects of wind turbines on the distribution of wintering farmland birds, Devereux *et al.* (2008)[57] found no effect on four species groups (seed-eaters, corvids, gamebirds and skylarks); the only exception was pheasant.

7.5.16 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.

7.5.17 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

7.5.18 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.

7.5.19 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., gulls). 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, strong winds that affect birds' ability to control flight manoeuvres, or on dark nights when visibility is reduced[62]. Birds may also be more susceptible if the wind farm is located in an area of high prey density.

7.5.20 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.

7.5.21 Passerines nesting within a wind farm site would be expected to be regularly flying between turbines and could therefore be expected to be most at risk of collision. However, passerines tend to fly below PCH, and evidence suggests that passerines collide with turbines too infrequently for there to be a significant effect of collision at the population level. Moreover, most of the species concerned are of low conservation value.

Potential Effects During Decommissioning

7.5.22 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.

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[55] Hötker, 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.

[56] 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.

[57] 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.

[58] 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.

[59] 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.

[60] 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.

[61] 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.

[62] 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)

Embedded Mitigation

7.5.23 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 EcIA which is proportionate to the risks posed by the proposed development. These embedded mitigation measures are outlined.

Construction Phase

7.5.24 All relevant construction phase embedded mitigation measures, such as appointment of an ECoW, will 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)

7.5.25 In line with good practice, an independent ECoW will be appointed prior to the commencement of construction and will be present 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.

7.5.26 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.

7.5.27 The ECoW will carry out pre-construction survey checks during the bird breeding season (March to August, inclusive) in advance of tree felling, vegetation stripping or excavation works to check for the presence of any active nests. Any active nests found will be cordoned off to a suitable distance for the species concerned (in line with appropriate guidance) 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.

Legal Compliance Regarding Breeding Birds

7.5.28 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 (applies year-round for nests of birds included in Schedule 1A);
- 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; and
- Knowingly cause or permit any of the above acts.

7.5.29 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.

7.5.30 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, particularly in the vicinity of historic nests or suitable nesting habitat.

Operational Phase

7.5.31 With the exception of the operation and general maintenance of the wind 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

7.5.32 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

7.5.33 The ornithological features determined for inclusion in the EcIA follows the information gathered through the Scoping Report, and subsequent consultation responses, and the results of the two years of baseline surveys.

7.5.34 A summary of the features and impacts identified to inform the determination of IOFs occurring within the proposed development is shown in Table 7.12.

Table 7.12: Features and impacts identified for inclusion in the assessment

Features	Impact
Nightjar	Disturbance/displacement
Herring gull	Collision
Lesser black-backed gull	Collision
Goshawk	Collision and disturbance/displacement
Hen harrier	Collision
Red kite	Collision
Kestrel	Collision and disturbance/displacement
Merlin	Collision and disturbance/displacement
Peregrine	Collision
Secondary raptor species	Collision and disturbance/displacement
Passerine species	Disturbance/displacement
Sirhowy Hill Woodlands and Cardiff Pond LNR	Adverse effects on ornithological features
Silent Valley LNR	Adverse effects on ornithological features
Parc Bryn Bach LNR	Adverse effects on ornithological features
Bryn Serth SINC	Adverse effects on ornithological features
Rhyd y blew SINC	Adverse effects on ornithological features
Slopes of Mynydd Carn-y-Cefn (2 of 2) SINC	Adverse effects on ornithological features

Features	Impact
Bwlch y Garn North SINC	Adverse effects on ornithological features
River Usk (Upper Usk)/Afon Wysg (Wysg Uchaf) SSSI	Adverse effects on ornithological features

Source: Natural Power

7.5.35 Designated sites, including LNRs and SINCs, highlighted during the data search are included in the feature assessment.

7.5.36 The ornithological features listed in Table 7.12 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 7.13. Those species classed as IOFs are assessed fully.

Table 7.13: Determination of Important Ornithological Features occurring within the proposed development

Feature	Covering legislation and guidance/conservation designation*	Value	Population estimate[63]	Welsh context[64,65]	Baseline	IOF	Justification
Nightjar	Ann I; Sec7; Amber (UK)	Local	UK estimate 4,600 males (breeding season).	Nightjars are a scare 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 is suggested[63]. The increase in recent decades, attributed to nightjars adapting to non-native forestry plantation habitats, follows a period of decline in the mid-20th century.	The results from the dedicated nightjar surveys in 2020 and 2021 estimated two breeding pairs were present in the north-east survey buffer, beyond the Manmoel site boundary. Not recorded during the flight activity surveys and CRM not undertaken.	No	This species is of local value as a species of moderate conservation concern (Section 7 species) that is present in locally important numbers but is not a qualifying feature of any statutory sites within 10 km of the proposed development. Nightjar were recorded breeding outside the Manmoel site boundary but within the survey buffer. It is estimated that two territories were held in both 2020 and 2021 within the buffer surrounding the proposed development. The area within Manmoel site boundary is common grazing land i.e. not suitable for breeding nightjar and no suitable habitat will be created as a result of the construction of the proposed development. The distances of the estimated territories ranged from 973 m to 1.8 km to the nearest proposed turbines, and from 282 m to 422 m to the nearest proposed track. No singing males were recorded closer to proposed turbines. The mean maximum foraging range for nightjar is 747 m which is less than the distance measured between recorded territories and proposed turbines. Available literature[28] suggests a nightjar buffer zone of 150-500 m for pedestrian disturbance and 50 m - 200 m for forestry operations during the breeding season. This suggested buffer zone is less than the measured distance to proposed infrastructure. The proposed development is unlikely to have a significant impact on the species through displacement/disturbance. As such, this species is not considered to be an IOF in the context of the proposed development.
Herring gull	Sec7; Red (W/UK)	Local	UK breeding population is estimated at	The preliminary results of the latest national census (2015-2019) are of an estimated 7,988 breeding pairs in Wales (does not	Herring gull records only involved birds passing over in flight. Flights were recorded during the breeding and non-	**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.

[63] 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.

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

[65] 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[63]	Welsh context[64,65]	Baseline	IOF	Justification
			130,000 breeding pairs. UK wintering population 740,000 individuals.	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. A comprehensive breeding survey of *Larus* gulls carried out in Monmouthshire in 2017[66] found 360 apparently occupied nests.	breeding seasons (111 and 6 records respectively). Predicted collision mortality for herring gull is 0.32 birds per breeding season and 0.03 birds per non-breeding season, which gives an annual estimate of 0.35 birds.		Flat Holm and Steep Holm that are part of the Severn Estuary SPA however are located within the mean foraging range (58.8 km) for herring gulls[67]. 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 (0.35 birds per annum) at the proposed development, herring gull is considered to be an IOF and is taken forward for a full EcIA.
Lesser black-backed gull	Amber (UK), Red (W)	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. A comprehensive breeding survey of *Larus* gulls in Monmouthshire in 2017[66] found 555 apparently occupied nests in 2017.	Lesser black-backed gull records only involved birds passing over in flight and these were recorded during the breeding season. Of the 27 records, 13 (17 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 0.06 birds.	**Yes**	Lesser black-backed gull is of moderate to high conservation concern (BoCC Amber List for the UK, Red List for Wales) but has no other conservation designations. Lesser black-backed gull is not a qualifying feature of any statutory sites within 25 km of the proposed development. Flat Holm and Steep Holm that are part of the Severn Estuary SPA however are located within the mean foraging range (127 km) for lesser black-backed gulls[67]. Although this species was recorded relatively regularly in the breeding season, numbers were lower than for herring gull and this is reflected in the low estimated collision rate (0.06). There is no route to impact as a result of disturbance/ displacement. Given the level of conservation status for this species and the potential for collision risk this species is considered to be an IOF and is taken forward for a full EcIA.
Goshawk	Sch1.1; Ann I, Amber (W)	Local	UK breeding population is estimated at 620 breeding pairs (minimum – under-reported).	Goshawk is an uncommon resident breeder that is increasing in number and is now found in all 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)	Goshawk flights were recorded during both the breeding season and non-breeding seasons (one and three respectively). The flight activity in general was low and numbers of flights in the CRZ at PCH did not qualify for CRM.	No	Goshawk is of local value. It is not a qualifying feature of any statutory sites within 10 km of the proposed development but is afforded special protection (Schedule 1). It has a favourable conservation status and has a widespread distribution in Wales. Goshawk flights were recorded in small numbers during the breeding and non-breeding season surveys, including some flights at PCH. However, the flight activity was not sufficient to

[66] Clarke, R. (2017) *Breeding Larus Gulls in Monmouthshire (VC 35)*. Gwent Bird Report 2017: pp115-120.

[67] Woodward, I., Thaxter, C.B., Owen, E & Cook, A.S.C.P. (2019) *Desk-based revision of seabird foraging ranges used for HRA screening.* BTO Research Report No. 724. BTO, Thetford.

Feature	Covering legislation and guidance/conservation designation*	Value	Population estimate[63]	Welsh context[64,65]	Baseline	IOF	Justification
				though this is considered to be an under-estimate.	In 2020, a female goshawk was seen in the east survey buffer in May and an individual was heard calling in the south-west survey buffer in July. Surveys did not record evidence of breeding in these areas. The desk study returned 51 records of goshawk within 10 km of the Proposed Development between 2010-2020, the closest record was located 1.2 km from the Manmoel site boundary in 2016.		qualify goshawk for CRM. Goshawk is a species which is generally at low risk of collision due to their foraging behaviour being at low level and mostly being within and adjacent to woodland cover. There is no woodland present within the Manmoel site boundary with proposed turbines located >250 m from any woodland edge. No goshawk nests were found within the Manmoel site boundary or the survey buffer during baseline surveys. Collision risk to goshawk is estimated to be very low and the proposed development is unlikely to have a significant impact on the species through displacement/disturbance. As such, this species is not considered to be an IOF in the context of the proposed development.
Hen harrier	Sch 1.1; Ann I; Sec7; Red (W/UK)	Local	UK breeding population is estimated at 545 pairs.	Hen harrier is a scarce passage migrant and winter visitor to Wales, mostly found in upland areas. Some birds move to lower altitudes or south in winter. Persecution of this species across Britain is well documented and remains severe in certain areas. Although it has shown a recovery, hen harrier remains a scarce breeding species in Wales (35 pairs nationally in 2016).	Hen harrier were recorded during the breeding season (two flights) and non-breeding season (two flights). Only one of these flights (during the non-breeding season) was recorded at PCH, meaning that this species does not qualify for CRM. No evidence of breeding hen harrier was found during breeding raptor surveys. The desk study returned 40 records of individual hen harriers within 10 km of the proposed development between 2010-2020, the closest record was located over 4 km from the Manmoel site boundary in 2011.	No	Hen harrier is BoCC red-listed due to its historical decline in population and is an Annex I and Schedule 1 species. This species is of local value due to the low number of records and is not a qualifying feature of any statutory sites within 10 km of the proposed development. Flight activity was low, with too few flights recorded within the CRZ at PCH to undertake CRM. Hen harrier is a species which is generally at low risk of collision due to their foraging behaviour being at low level. Potential collision risk at the proposed development is considered to be negligible. The timing of the flight records (December, January and March), the lack of breeding evidence and distribution of this species within South Wales during the breeding and winter seasons[68,69], suggest that the recorded birds were transitory migrants passing through from further north in Wales, northern England or from south-west Europe. Given the low level of activity on site, displacement and disturbance is not likely to occur during construction or operation of the proposed development. As such, this species is not considered to be an IOF.
Red kite	Sch1.1; Ann I	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[70].	Red kite flights were recorded during both the breeding and non-breeding seasons (32 and 15 records respectively). Predicted collision mortality for red kite is 0.1 birds per breeding season and 0.03 birds per non-breeding season,	**Yes**	Red kite is of local value. This species is not a qualifying feature of any statutory sites within 10 km of the proposed development but is afforded special protection (Annex I & Schedule 1). During the baseline surveys it was recorded regularly during the breeding season in 2020 with flights across the centre of the proposed development. Flights recorded during the breeding season in 2021 were centred to the west of the Manmoel site

[68] Brenchle, A., Gibbs, G., Pritchard, R. & Spence, I.M. (2013) *The Breeding Birds of North Wales*. Liverpool University Press.

[69] Dobson, A.D.M., Clarke, M., Kjellen, N. & Clarke, R. (2012) *The size of migratory origins of the population of Hen Harriers Circus cyaneus wintering in England*, Bird Study, 59:2, 218-227.

[70] The Welsh Kite Trust (2020) http://welshkitetrust.wales/how-many-kites-are-there-in-wales [Accessed 27/02/2023]

Feature	Covering legislation and guidance/conservation designation*	Value	Population estimate[63]	Welsh context[64,65]	Baseline	IOF	Justification
					which gives an annual estimate of 0.13 birds. No breeding attempts were recorded within the raptor survey area during the 2020 and 2021 dedicated raptor surveys. The SEWBReC data requested for the desk study includes 214 red kite records of which the closest breeding record was over 2.5 km from the proposed development in 2016.		boundary. Areas within Manmoel site boundary do not offer suitable breeding habitat and no nests were found during the breeding raptor surveys in the 1 km survey buffer around the proposed development. There is suitable habitat in the wider forestry which is beyond the suggested buffer zone for red kite (150-300 m[28]). Given the flight activity recorded during baseline surveys and predicted mortality rates at the proposed development for this species, red kite is considered to be an IOF and is taken forward for a full EcIA.
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 (11 and 13 records respectively). This species was recorded as secondary species in the non-breeding season 2019/20 and breeding season 2020. Six flights were recorded during the non-breeding season 2020/21 and one flight during the breeding season 2021. The flight recorded during the breeding season 2021 was at PCH but outside the CRZ. No evidence of breeding kestrel was found during baseline surveys. The desk study returned 123 records within 10 km of the proposed development between 2010-2020. There were multiple records of flying individuals within 1 km of the Manmoel site boundary of which the most current record was made in 2016. The closest confirmed breeding record was made in 2012, over 6 km from the Manmoel site boundary.	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 the proposed development. Kestrel was regularly seen during baseline VP surveys, but the lack of target flight records does not allow CRM to be carried out. Including secondary flights, a total of 24 kestrel flights were noted during baseline surveys. The number of flights suggests that the site is occasionally used for foraging in open areas. Most flights were timed around July and September 2020. The July flights were all juvenile birds. This would result in a small collision risk and impact of collision at the proposed development is therefore considered to be of low negative magnitude. The second baseline year, however, predicted no bird collision mortality based on recorded target flight lines. Areas of broadleaved trees near the forest edge (228 m to 289 m to nearest proposed turbines) may provide suitable habitat for this species, but no evidence of breeding was observed during baseline surveys. With the availability of large areas of suitable foraging habitat in the wider area, displacement/disturbance effects are considered to be of a negligible level. 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.
Merlin	Sch1.1; Ann I; Red (W/UK)	Local	UK breeding population is estimated at 1,150 pairs.	Merlin is an uncommon winter visitor and scarce breeder in Wales. In 2008, an estimate of 94 breeding pairs was given	Merlin flights were recorded in low numbers, with only one flight of one bird recorded during the breeding season, which was at PCH. This means that merlin does not qualify for CRM. No merlin nests were found within the survey area during dedicated	No	Merlin is of local value, is BoCC red-listed due to its historical decline in population and is an Annex I and Schedule 1 species. During the baseline surveys it was recorded only once during the breeding season and is not a qualifying feature of any statutory sites within 10 km of the proposed development. No evidence of breeding was recorded within the Manmoel site boundary and survey buffer and the habitat within the Manmoel site boundary

Feature	Covering legislation and guidance/conservation designation*	Value	Population estimate[63]	Welsh context[64,65]	Baseline	IOF	Justification
				which is a small increase compared to previous years[71].	breeding raptor surveys in 2020 and 2021. The desk study returned 37 records within 10 km of the proposed development between 2010-2020, the closest record was a bird perched in a tree, 1.5 km from the Manmoel site boundary in 2012. The closest potential breeding record (calling, juvenile presence assumed) was made in 2014, over 3.7 km from the Manmoel site boundary.		is not considered to offer favourable breeding opportunities for this species. The effects of collision risk from operation of the proposed development are considered to be negligible. There is no route to impact for displacement/disturbance. As such this species is not considered to be an IOF.
Peregrine	Sch1.1; Ann I	Local	UK breeding population is estimated at 1,750 pairs.	Peregrine is a scare breeder with an estimate of c. 280 pairs in Wales. Although this is a recovery from low numbers in the 1960s and 70s this marks a small decline since the turn of the century.	A small number of peregrine flights were recorded during the breeding season (two records) with none in the non-breeding seasons. The level of flight activity was not high enough to conduct CRM for this species. No evidence of breeding was recorded within the raptor survey area. The desk study returned 71 records within 10 km of the proposed development between 2010-2020, the closest record was a bird flying over, 1.7 km from the Manmoel site boundary in 2016. The closest breeding record was made in 2014, over 7 km from the Manmoel site boundary.	No	This species is of local value as a target species that is afforded special protection (Schedule 1). It was recorded irregularly and is not a qualifying feature of any statutory sites within 10 km of the proposed development. Predicted collision mortality was not calculated for this species due to a low number of recorded flights. There is no suitable habitat present within Manmoel site boundary that could offer potential breeding opportunities for this species. The effects of collision risk from operation of the proposed development are unlikely to be detectable against the background rate of mortality and is therefore considered to be not significant. There is no route to impact for displacement/disturbance. As such this species is not considered to be an IOF.
Secondary raptor species (buzzard, sparrow-hawk)	Sparrowhawk: Ann I; Amber (UK)	Local	Buzzard: UK breeding population 63,000-87,500 pairs; Sparrowhawk: UK breeding population 30,500 pairs	Buzzard is a common breeding resident with an estimate of 9,850-13,500 pairs in Wales. Sparrowhawk is a breeding resident in Wales and the most current population estimate is 2,950 pairs.	Buzzard was regularly recorded during baseline VP surveys with 124 flights in total. A buzzard nest at unknown stage was recorded in May 2021 (within 200 m of proposed turbines). Buzzard activity surrounding the nest location was high which suggests that it was an active breeding territory. One sparrowhawk flight was recorded during the 2020/21 non-breeding season. Sparrowhawk was considered	No	Buzzard is a common and widespread raptor which has no species-specific conservation status and is of local value as a secondary species. It was frequently recorded during baseline surveys and an active nest location was found in 2021 within Manmoel site boundary. Turbine collision is a potential risk for buzzard; however, any such effects are considered unlikely to have any more than a local impact on the population. As buzzard was thought to be nesting within Manmoel site boundary there is potential for disturbance/displacement effects on this species. Measures for protecting active nests of all

[71] Ewing, S.R., Graham, R.W., Heavisides, A., Court, I.R., Lindley, P., Ruddock, M., Cohen, S. & Eaton, M.A. (2008) Breeding status of the Merlins Falco columbarius in the UK 2008. Bird Study 58:4, 379-389.

Feature	Covering legislation and guidance/conservation designation*	Value	Population estimate[63]	Welsh context[64,65]	Baseline	IOF	Justification
					to have bred within the survey buffer, though no nest was located. No other secondary raptor species was recorded during baseline surveys (with the exception of kestrel that has been covered above).		species, will be an important part of embedded mitigation (see Section 7.5). Sparrowhawk is also of local value as a secondary species but is afforded special protection (Annex I). It was only recorded once during baseline surveys and may have bred within the survey buffer. The effects of collision risk from operation of the proposed development are considered to be negligible. As the species was not found to be nesting within the Manmoel site boundary, it is unlikely that significant disturbance/displacement effects would be posed to this species due to the operation of the proposed development. Given the relatively low predicted potential impact of collision effects, and very localised disturbance/displacement effects following embedded mitigation, we would scope out secondary raptor species from the EIA Report.
Passerine species	Various, including: Sec7: cuckoo, dunnock, house sparrow, linnet, skylark, song thrush, wood warbler; Red(W): cuckoo, meadow pipit, starling, linnet.	Local	Various	This feature covers a variety of passerine (and near passerine) species. An estimate as to the population in Wales in 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 area.	No	Guidance states that baseline surveys targeting passerines is generally not required[18]. 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. A low level of disturbance/displacement is likely to occur within the open ground habitat in which the proposed development is to be located. However, the wider area supports extensive areas of similar habitat. None of the passerine species recorded have a range that is very localised and dependant on the area of the proposed development. Passerines within the forested areas of the surrounding buffer are not considered to be affected by disturbance/displacement as a result of the proposed development. During the construction phase, nest checks will prevent the physical loss of nests (see Section 7.5). It can be predicted that the effect of disturbance/displacement and collision on all passerine species will not be significant at a local population scale.
Sirhowy Hill Woodlands and Cardiff Pond LNR	Site information: Mosaic of habitats including grasslands, heathlands and woodland (historically worked for coal, depository for steel industry waste and household refuse tip) with three ponds. Over 21 bird species have been recorded, including 12 species of conservation concern (species not specified) including kestrel and green woodpecker.				24 kestrel flights were noted during VP surveys however no evidence of breeding was recorded. No records of green woodpecker were made during baseline surveys.	No	Sirhowy Hill Woodlands and Cardiff Pond LNR is 0.2 km north of the proposed development and 2.2 km from the nearest proposed turbine. The proposed development will not result in any changes in habitat or displacement within the designated site. Therefore no significant effects are predicted and Sirhowy

Feature	Covering legislation and guidance/conservation designation*	Value	Population estimate[63]	Welsh context[64,65]	Baseline	IOF	Justification
							Hill Woodlands and Cardiff Pond LNR is not considered to be an IOF.
Silent Valley LNR	Site information: Semi-natural beech woodland habitat. Green woodpecker, pied flycatcher and redstarts can be seen at various times throughout the year.				None of the qualifying ornithological features were recorded during baseline surveys.	No	Silent Valley LNR lies 1.4 km east of the proposed development and 1.6 km from the nearest proposed turbine. The proposed development will not result in any changes in habitat or displacement within the designated site. In addition, none of the listed species were recorded during baseline surveys. No significant effects upon listed features are predicted and therefore Silent Valley LNR is not considered to be an IOF.
Parc Bryn Bach LNR	Site information: Grasslands mosaic on post-industrial land. Bird species recorded include lapwing and skylark.				The presence of skylark was noted during baseline surveys. No lapwing were recorded during baseline surveys. The desk-based study returned records of lapwing.	No	Parc Bryn Bach LNR is 1.7 km north-west of the proposed development and 3.2 km from the nearest proposed turbine. The proposed development shall not result in any changes in habitat or displacement within the designated site. No lapwing were recorded during baseline surveys and the designated site description does not specify if lapwing are breeding at Parc Bryn Bach LNR. Based upon the distance to the designated site, no significant effects on listed features are predicted and Parc Bryn Bach LNR is not considered to be an IOF.
Bryn Serth SINC	Site information: Mosaic of heath, acid and marshy grassland, swamp and standing open water habitats. The site is an important breeding site for lapwing and skylark. Further bird species recorded include snipe, jack snipe, barn owl, wheatear, goldfinch, whinchat, stonechat, kestrel, buzzard, merlin, carrion crow, raven, wood pigeon, magpie, linnet, meadow pipit and reed bunting.				The presence of skylark was noted during baseline surveys. No lapwing were recorded during baseline surveys. The desk-based study returned records of lapwing. Presence of the following species was recorded during baseline species: wheatear, goldfinch, stonechat, kestrel, buzzard, merlin, raven, linnet and meadow pipit.	No	Bryn Serth SINC is 1 km north of the proposed development and 3.4 km from the nearest proposed turbine. The proposed development shall not result in any changes in habitat or displacement within the designated site. Lapwing, which are listed as important breeders on site, were not recorded during baseline surveys for the proposed development and based on the distance to the designated site, no significant effects are predicted. Bryn Serth SINC is therefore not considered to be an IOF.
Rhyd y Blew SINC	Site information: Levelled former open cast coal mine with a central main plateau comprising grassland and rush habitats. The site is of historical importance for its breeding lapwing, which continue to breed on site.				No lapwing were recorded during baseline surveys. The desk-based study returned records of lapwing.	No	Rhyd y Blew SINC lies 1.4 km north of the proposed development and 3.8 km from the nearest proposed turbine. The proposed development shall not result in any changes in habitat or displacement within the designated site. No lapwing were recorded during baseline surveys and no significant effects on this species are predicted, Rhyd y Blew SINC is therefore not considered to be an IOF.
Slopes of Mynydd Carn-y-Cefn	Site information: No habitat information available. Bird species recorded include meadow pipit, skylark and buzzard.				The presence of meadow pipit and skylark was noted during baseline surveys.	No	Slopes of Mynydd Carn-y-Cefn (2 of 2) SINC is 1.4 km east of the proposed development, 1.6 km from the nearest proposed turbine.

Feature	Covering legislation and guidance/conservation designation*	Value	Population estimate[63]	Welsh context[64,65]	Baseline	IOF	Justification
(2 of 2) SINC					124 buzzard flights were recorded during VP surveys. In 2021, an active breeding territory was assumed within 200 m of proposed turbines.		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 species for which it is of interest it can be concluded that there shall be no significant effect and therefore Slopes of Mynydd Carn-y-Cefn (2 of 2) SINC is not an IOF.
Bwlch y Garn North SINC	Site information: Acid grassland habitat. Bird species recorded include meadow pipit and stonechat.				The presence of meadow pipit and stonechat was noted during baseline surveys.	No	Bwlch y Garn North SINC lies 1.8 km north-east of the proposed development and 2.8 km from the nearest proposed turbine. 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 Bwlch y Garn North SINC is not an IOF.
River Usk (Upper Usk)/Afon Wysg (Wysg Uchaf) SSSI	Site information: Upland river and woodland habitat. Breeding species include; common sandpiper, grey wagtail, dipper, goosander, little grebe, yellow wagtail, little ringed-plover, kingfisher and sand martin.				Grey wagtail was recorded once during breeding bird surveys. The other listed features were not recorded during the baseline.	No	River Usk/Afon Wysg is >9.9 km north-east of the proposed development. The proposed development will not result in any changes in habitat or displacement within the designated site. The vicinity of the proposed development provides little or no suitable habitat for the majority of the listed features. Those species that would have been classed as target species were not recorded during baseline surveys. No significant effects upon listed features are predicted and therefore River Usk (Upper Usk)/Afon Wysg (Wysg Uchaf) SSSI is not considered to be 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 4; UK = BoCC UK 5)

Source: Natural Power

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

- Herring gull (collision);
- Lesser black-backed gull (collision); and
- Red kite (collision).

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

Herring Gull

Introduction

7.5.39 Herring gull is a Section 7 priority species and is on the UK BoCC Red List due to severe declines in the UK breeding and non-breeding populations, restriction in the UK breeding range and because the UK supports internationally important numbers of non-breeding birds[34]. 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. In 2017, a study focussing on counting occupied gull nests in Monmouthshire found 360 apparently occupied herring gull nests in that vice-county[66].The Welsh wintering population is estimated to be 93,613 individuals.

Baseline Summary

7.5.40 A relatively high number of herring gull flights were recorded during the breeding season VP surveys with a total of 111 flights (185 individuals). Fewer birds were recorded during the non-breeding season with six flights (22 individuals). During the baseline VP surveys herring gulls were observed foraging within and adjacent to the

proposed development as well as commuting down the valleys either side of the proposed development. It is likely that these birds were breeding within the nearby urban populations such as Ebbw Vale with numerous flights observed over these areas, as well as flights to and from these areas.

Potential Collision Risk Impacts

7.5.41 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 that around half of the birds passed through the turbine development area and this is reflected in the data: 55 flights (93 individuals) were within the collision risk zone at PCH; 54 of these flights were in the breeding season. Assuming an avoidance rate of 99.5%[25], predicted collision mortality for herring gull was 0.35 birds per year.

7.5.42 As with other long-lived seabirds, herring gulls generally do not breed until several years of age, and as a result a relatively high proportion of herring gulls recorded passing over the proposed development are likely to be non-breeding birds; indeed, the proportion of adult herring gulls which breed in each year is 0.66[72].

7.5.43 The predicted collision rate represents 0.002% of the breeding adult population of herring gulls in Wales; or <0.0015% of the total adult population in Wales. Thus, even if actually realised, the predicted collision rate would be undetectable against background annual mortality. Indeed, annual mortality of adult herring gulls has been estimated at approximately.18%[73].

7.5.44 Typically, large numbers of gull collisions at wind farm sites are recorded only under specific circumstances, such as the close proximity of landfill sites which attract large concentrations of feeding gulls, especially during the non-breeding season[74]. Collisions at wind farm sites which are not situated near attractive feeding sites appear to be a relatively rare event.

7.5.45 In Gwent herring gull is described as a common resident but there are no large colonies and many breeding birds are associated with urban and industrial settings. However, herring gulls have been shown to have large foraging distances: mean-maximum foraging range of 58.8 ± 26.8 km[67]. It is therefore likely that birds recorded at the proposed development during the breeding season also originate from larger, more distant coastal colonies. No SPAs for which herring gull is a designated feature are located within 20 km of the proposed development. However, the Severn Estuary Ramsar site which lists herring gull as "*noteworthy fauna*", is within mean maximum foraging range for herring gull (i.e. within 86 km). See Section 7.10 for more information.

7.5.46 As the impact of any potential collisions is not predicted to be detectable at a population level, the potential effect 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

7.5.47 Lesser black-backed gull is on the UK BoCC Amber List and Welsh Red List due to longer term population declines[35]. In 2019, the lesser black-backed gull breeding population in Wales was estimated to be a minimum of 13,500 pairs, of which 32% were nesting on buildings. The population count is suggested to be an underestimate. A study counting occupied gull nests in Monmouthshire found 555 apparently occupied lesser black-backed gull nests in that vice-county in 2017[65].

Baseline Summary

7.5.48 A relatively low number of lesser black-backed gull flights were recorded during the breeding season VP surveys with a total of 27 flights (35 individuals). No flights were recorded during the non-breeding season surveys. During the baseline VP surveys lesser black-backed gulls were observed foraging within and adjacent to the proposed development as well as commuting down the valleys either side of the proposed development.

Potential Collision Risk Impact

7.5.49 Flight activity of lesser black-backed gulls within the proposed development was only observed during the breeding season VP surveys. The flight paths described meant that around half of the birds passed through the turbine development area and this is reflected in the data: 13 flights (17 individuals) were within the collision risk zone at PCH. Assuming an avoidance rate of 99.5%[25], predicted collision mortality for lesser black-backed gulls was 0.06 birds per breeding season.

7.5.50 As with other long-lived seabirds, lesser black-backed gulls generally do not breed until several years of age, and as a result a proportion of lesser black-backed gulls recorded passing over the proposed development are likely to be non-breeding birds.

7.5.51 The predicted collision rate represents 0.0002% of the breeding adult population of lesser black-backed gull in Wales. This predicted collision rate would be undetectable against background annual mortality which has been estimated at approximately. 13%[73].

7.5.52 Typically, large numbers of gull collisions at wind farm sites are recorded only under specific circumstances, such as the close proximity of landfill sites which attract large concentrations of feeding gulls, especially during the non-breeding season[74]. Collisions at wind farm sites which are not situated near attractive feeding sites appear to be a relatively rare event.

7.5.53 In Gwent, lesser-black backed gull is classed as a fairly common resident with modest but growing breeding numbers. Breeding birds are mainly encountered in industrial areas. Lesser black-backed gull however has a large foraging distance: mean-maximum foraging range of 127 ± 109 km[67]. Although there is no SPA for which lesser black-backed gull is a designated feature within 20 km of the proposed development, there is a possibility that birds recorded at the proposed development originate from more distant colonies such as Flat Holm and Steep Holm. A study looking at the movements of lesser black-backed gulls on Flat Holm used colour rings resighting to track bird movements[75]. The results showed that lesser black-backed gulls historically foraged at landfill sites in coastal South Wales and Gloucester. Following closures of these landfill sites, birds dispersed to other sites located in Merthyr Tydfil, Shropshire and Berkshire.

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

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[72] 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.

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

[74] Snow, D.W. & Perrins, C.M. (1998) *The Birds of the Western Palearctic Volume 1: Non-Passerines*. Oxford University Press.

[75] Ross-Smith, V. H., Conway, G. J., Facey, R. J., Bailey, B. H., Lipton, M., Whitfield, S. A. and Ferns, P. N. (2013) *Population size, ecology and movements of gulls breeding on Flat Holm Island*. Birds in Wales, Volume 10 (part 1).

Red Kite

Introduction

7.5.55 Red kite is an Annex I and Schedule 1 species. Red kite is classified as 'least concern' by the International Union for Conservation of Nature (IUCN)[76] and has recently moved onto the Welsh Green list[35], due to population increases and recovery following historic population declines. Red kite is now an increasing resident breeder, scarce visitor and passage migrant in Wales, with numbers increasing each year. Research from 2018 identified that the Welsh population of red kite has increased by 368% between 1995-2016[64]. In 2019 the Welsh population stood at 2,500 breeding pairs[70].

Baseline Summary

7.5.56 Red kite was the most frequently recorded target raptor species during the baseline VP surveys. There were 47 flights (54 individuals) of which the majority was recorded during the breeding seasons (32 flights were recorded over two breeding seasons and 15 flights were over two non-breeding seasons). A large part of the flights during the breeding season were recorded in 2020 (25 flights), with seven flights in 2021. 16 out of the 25 flights recorded during the 2020 breeding season were recorded in March where red kites were observed displaying over the proposed development. Flights recorded during the 2021 breeding season were of red kite hunting. The non-breeding season 2019/20 recorded three flights whereas the 2020/21 non-breeding season found 12. Overall, red kite is considered to be present at the proposed development all year round. Also, three incidental red kite flights were recorded during VP surveys and four during raptor surveys. Most flights over the proposed development were over open ground of the common and open ground to the west of the Manmoel site boundary. The dedicated raptor surveys did not record evidence of red kites breeding within the Manmoel site boundary and a 1 km buffer surrounding the proposed development, but an individual was seen foraging within the Manmoel site boundary in June 2020. There is suitable breeding habitat within the nearby forestry, however no nests were recorded during dedicated raptor surveys. The data request to SEWBReC data returned 214 red kite records of which the closest breeding record was over 2.5 km from the proposed development in 2016. In 2018, GOS reported 11 red kite breeding sites in the recording area with confirmed breeding in the Sirhowy Valley, which lies to the west of the Manmoel site boundary.

Potential Collision Risk Impact

7.5.57 Red kite is relatively susceptible to collision with turbines compared to the collision rate of other species. A total 798 collisions were reported at European wind farms; the vast majority of them occurring in Germany (though noting that more than half of the world's population of red kite breed in this country)[77].

7.5.58 CRM was undertaken for this species and the output estimates, based upon an avoidance rate of 99%[25] were of 0.1 collisions for the breeding season and 0.03 collisions for the non-breeding season. This would be equivalent to 3.5 and 1.05 collisions throughout the lifespan of the proposed development respectively). The higher collision rate predicted for the breeding season (0.1 birds) represents 0.002% of the Welsh population (2,500 pairs).

7.5.59 Annual survival rates for red kite have been calculated as being 0.91 for adults (wild-hatched, in areas without illegal persecution), and 0.58 for birds in their first year[78]. Thus, the predicted collision rate is unlikely to be detectable against background mortality, and any potential increase in foraging birds within the proposed development as a result of the increase in the size of local red kite population is not likely to change this conclusion. Nonetheless, the Welsh red kite population continues to grow at a time when the number of wind farms in the region is also increasing and so, thus far, there is no evidence of collisions with turbines affecting the local population. In light of this, it is considered that collision risk to red kite is of **low magnitude** and therefore **not significant**.

7.6 FURTHER MITIGATION AND RESIDUAL EFFECTS

7.6.1 The proposed development is predicted to have low, and therefore not significant effect, on all of the IOFs recorded.

7.6.2 For all IOFs, although no species-specific mitigation is required, various embedded measures (described in Section 7.5) will be implemented to ensure compliance with legislation, and to follow good practice guidance with regard to breeding birds. In addition, an outline Ecological Management Plan has been prepared which includes measures for habitat enhancements and ornithological monitoring and is provided as Appendix 6.6.

7.7 SUMMARY OF EFFECTS

Table 7.14: Summary of pre-mitigation effects and residual effects on each IOF, and the residual significance of effects

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
Operational								
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

[76] BirdLife International (2022) *Species factsheet: Milvus milvus*. Downloaded from http://www.birdlife.org on 15/12/2022.

[77] 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: 17 June 2022. [last accessed 15/12/2022]

[78] Sansom, A., Etheridge, B., Smart, J. & Roos, S. (2016) *Population modelling of north Scotland red kites in relation to the cumulative impacts of wildlife crime and wind farm mortality*. Scottish Natural Heritage Commissioned Report No. 904.

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
								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.
Red kite	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.

7.8 CUMULATIVE EFFECTS

7.8.1 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 guidance[18].

7.8.2 In line with this guidance, any wind farm developments of fewer than three turbines (small scale wind energy proposals[79]) 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 large scale energy infrastructure developments (of three or more turbines for wind farms and over 10 MW for solar farms) within 10 km of the proposed development, were considered as part of the cumulative impact assessment (CIA).

7.8.3 Within this search area data were sought for a total of 12 developments that have been included in the CIA which comprise:

- Pen Bryn Oer Wind Farm (operational) – This is a three-turbine operational site with a tip height of 110 m, located approx. 4 km to the north of the Manmoel site boundary for which an EIA was not required;
- Penyfan Caravan Park Solar Farm (operational) – This is an operational 50 MW solar farm located approx. 5 km south of the Manmoel site boundary for which an EIA could not be found;
- Twyn Gwyn Solar Farm (operational) – This is an operational 29 MW solar farm located approx. 9 km south of the Manmoel site boundary for which an EIA was not required;
- Hendai Solar Farm (operational) – This is an operational 13.8 MW solar farm located approx. 9.5 km south west of the Manmoel site boundary;
- Hafod y Dafal Solar Farm (operational) – This is an operational 14 MW solar farm located approx. 4 km south of the Manmoel site boundary. No EIA could be found for this development;
- Penyfan Leisure Park (consented) – This is a consented three-turbine site with a tip height of 31.5 m, located to the south of the Manmoel site boundary approx. 5 km for which an EIA was not required;
- Wauntysswg Solar Farm (consented) – This is a consented 30 MW solar farm located approx. 2.5 km north west of the Manmoel site boundary. No EIA could be found for this development;
- Land to north of Rassau Industrial Estate Solar Farm (consented) – This is a consented 12 ha solar farm located approx. 5 km north of the Manmoel site boundary. No EIA could be found for this development;
- Mynydd Carn-y-Cefn (scoping) – This is an eight-turbine proposed site, located approx. 1.5 km to the east of the Manmoel site boundary;
- Mynydd Llanhillieth (scoping) – This is a 12-turbine proposed site, located approx. 8 km to the south east of the Manmoel site boundary;
- Land North of Rassau Industrial Estate (scoping) – This is a five-turbine proposed wind farm, located approx. 5 km north of the Manmoel site boundary; and
- Circuit of Wales Solar Farm (pre-scoping) – This is a 50 MW - 70 MW proposed solar farm located approx. 5.5 km north of the Manmoel site boundary.

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

7.8.4 The proposed development along with these other projects give a total of 36 proposed turbines. Pen Bryn Oer Wind Farm and Penyfan Leisure Park were not required to undergo EIA and therefore do not have data for inclusion in the CIA.

7.8.5 Twyn Gwyn Solar Farm was not required to undergo EIA and is therefore also not included in the CIA. An EIA could not be found for Penyfan Leisure Park Solar Farm, Hafod y Dafal Solar Farm, Wauntysswg Solar Farm and Land to north of Rassau Industrial Estate Solar Farm and therefore they have not been included in the CIA. Hendai Solar Farm did produce an ES, however it does not mention any of the IOFs considered for this assessment. Therefore it is not included in the CIA.

7.8.6 The wind farm and solar developments at the scoping or pre-scoping stage have also not been included as impacts have not yet been assessed and the projects have yet to go through planning.

7.8.7 As these are the only developments within 10 km of the proposed development no cumulative impact assessment is presented.

7.9 STATEMENT OF SIGNIFICANCE

7.9.1 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 micrositing allowance where the environmental impacts would be assessed and signed-off by the Environmental Clerk of Works.

7.9.2 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 in terms of magnitude, and thus not significant in the professional judgment of Natural Power.

7.9.3 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 Appropriate Assessment (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.

7.10 HABITATS REGULATIONS ASSESSMENT

7.10.1 Under the Conservation of Habitats and Species Regulations 2017 (as amended), any development that may have a likely significant effect (LSE) on an SPA, SAC or Ramsar site, either alone or in combination with other projects, requires an Appropriate Assessment (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.

7.10.2 Before an AA is initiated, a screening process is undertaken to determine whether any of the predicted impacts of the development would result in a LSE. This Stage 1 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 internationally designated sites and therefore whether an AA is required.

7.10.3 Where LSE cannot be ruled out, a shadow AA is provided (Stage 2).

7.10.4 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 designated site can be concluded.

Stage 1: Screening for LSE

7.10.5 Stage 1: Screening for LSE is undertaken to remove any proposals, or components of proposals, which do not require consideration under AA (Stage 2: Shadow AA). For the ornithological component of the HRA process, Screening should largely consider three important aspects of the proposal and the qualifying features of the site:

- Connectivity between the proposal and the site;
- Route to impact between the proposal and the site; and
- Numbers of qualifying features (birds) available for impact (trivial or non-trivial?).

7.10.6 If any one of the above aspects can be clearly demonstrated, it can be concluded that there is no LSE on the site. If, however, there is any doubt that no LSE can be concluded in Stage 1, the process should move on to Stage 2.

7.10.7 Firstly, any SPAs or Ramsar sites with potential connectivity to the proposed development are identified, as those designated sites without potential connectivity will have no route to impact and no adverse effect.

7.10.8 Typically, an HRA considers internationally designated sites within 10 km - 15 km[80]. A surrounding search area of 10 km around the proposed development is sufficient to determine potential connectivity for most terrestrial ornithological features, as most species have a foraging range that is well below this distance[27] (the exceptions being features such as breeding diver species or wintering grey geese species; neither of which occur in the vicinity of the proposed development). However, marine species (unlike terrestrial species) typically have large foraging distances (well in excess of 10 km), but any statutory sites designated for breeding populations of seabird species will not have connectivity with the proposed development due to the project's inland location and so can be excluded. The exception to this is gulls, which may breed in coastal localities but travel large distances inland to forage. These ornithological features should be regarded as having potential connectivity with the proposed development, as stated in the Scoping Direction.

7.10.9 Guidance does not state the foraging distances to use for gulls when assessing connectivity with SPAs[27]. For the purposes of this assessment, internationally designated sites with breeding gulls as a listed feature have been identified as having potential for connectivity with the proposed development, if they are located within mean maximum (max.) foraging distance of the designated feature. For lesser black-backed gull a foraging range of 127 km[67] has been used and for herring gulls a foraging range of 58.8 km[67] has been used. Note that these foraging distances are based on 'at sea' distances, and the distance travelled by birds foraging over land is generally less than that of birds foraging offshore[81]. Mean foraging range, plus one standard deviation (as opposed to mean max.), is stated as being 61.7 km and 22.4 km for lesser black-backed gull and herring gull respectively[67] and these distances are likely to be more appropriate; however, a precautionary approach has been taken.

7.10.10 No impacts are predicted for any other gull species, based on the baseline data and so lesser black-backed gull and herring gull are the only gull species considered.

7.10.11 There are no statutory sites of international importance designated for ornithological features that are located within 10 km of the proposed development.

7.10.12 One statutory site of international importance designated for lesser black-backed gull or herring gull has been identified within the search area (mean max. foraging distance): Severn Estuary Ramsar.

7.10.13 Note that the marine part of the Skomer, Skokholm and Seas off Pembrokeshire SPA (designated for a variety of breeding seabird species) is located within the edge of the 127 km search area, but as the islands of Skomer and

[80] South-east Wales Strategic Planning Group (2008). Habitat Regulations Assessment: A toolkit to support HRA Screening and Appropriate Assessment of plans. Available from: https://apps.caerphilly.gov.uk/LDP/Examination/PDF/SEW4.pdf [Accessed 27/02/2023]

[81] Isaksson, N., Evans, T.J., Shamoun-Baranes, J. & Akersson, S. (2016) Land or sea? Foraging area choice during breeding by an omnivorous gull. *Movement Ecology* 4 (11)

Skokholm (the locations of the designated breeding lesser black-backed gull colonies) are over 140 km from the proposed development, this designated site is not considered further.

7.10.14 The Severn Estuary Ramsar site's datasheet (2008)[82] includes lesser black-backed gull as a "species identified subsequent to designation (1995), for possible future consideration". The 2015 site data[83] states that the Ramsar site holds lesser black-backed gull in internationally important numbers. Additionally, the site information sheet[82] includes herring gull as other "noteworthy fauna", as the site supports nationally important numbers in the breeding season. For the purposes of this assessment, both lesser black-backed gull and herring gull are treated as being qualifying features of an internationally designated site.

7.10.15 The Severn Estuary is an SPA, as well as being a Ramsar site (and SAC). However, the SPA designation relates to non-breeding waterfowl and waders, and it is these species that comprise the current list of designated features[84].

7.10.16 The Ramsar breeding population of lesser black-backed gull is given as 4,167 nests; this total arising from the last national seabird survey for which data is available (Seabird 2000 Census). This represented 2.8% of the national population. The breeding population of herring gulls is stated as being 1,540 nests (1.1% of the Great Britain population (Seabird 2000 Census)) for the Ramsar site[83].

7.10.17 The important gull colonies are located on the islands of Flat Holm (Wales) and Steep Holm (England), which lie within the Severn Estuary. Flat Holm is located 40.9 km from the proposed development and Steep Holm is located 45.3 km from the proposed development. Both islands are also designated as SSSIs, with breeding gulls amongst their listed features.

7.10.18 As Ramsar sites do not have Conservation Advice Packages, in relation to HRA the Conservation Advice Packages for the overlapping European Marine Site designation should be used. However, the European Marine Sites for which conservation advice has been produced by NRW do not overlap with the Severn Estuary Ramsar[85]. The Ramsar site does overlap with SSSIs that are appropriate to the designated features (Flat Holm and Steep Holm) and so the guidelines for management of these SSSIs should be used in this instance. However, the guidelines for management for these two SSSIs all apply directly to the islands themselves and not to conservation of features whilst they are off-site. Due to the distance between the proposed development and the islands of Steep Holm and Flat Holm there will be no direct or indirect effect on the habitats present as a result of the Proposed Development and thus the management guidelines will be safeguarded.

7.10.19 There will also be no direct or indirect effect on the habitats present within the whole site boundary of the Severn Estuary Ramsar as a result of the proposed development (27 km distant from the proposed development at its nearest point). 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 designated site.

7.10.20 The only route to impact to breeding gulls associated with the Severn Estuary, are impacts to individuals whilst they are in the vicinity of the proposed development. Wind farms can affect ornithological features through disturbance/displacement and through mortality as a result of collision.

7.10.21 The mean max. foraging distance of 58.8 km for herring gulls creates a foraging area of approximately 10,862 km^2 and the mean max. foraging distance of 127 km for lesser black-backed gull gives this species a foraging area of approximately 50,671 km^2. Should displacement occur around the proposed development following construction, the area of foraging range that would become unavailable would be very minor (herring gull: development area is <0.02% of total foraging area; lesser black-backed gull: development area is <0.005% of total foraging area). Such habitat loss would be negligible, especially given that large gulls are generalist foragers and very adaptable and the development site itself is of low value to foraging gulls. No noticeable impact as a result of disturbance/displacement is predicted.

7.10.22 Therefore, the only impact that has potential to result in an adverse effect on the integrity of the SPA populations of herring and lesser black-backed gulls is collision mortality. The number of flight-lines of large gulls recorded during baseline surveys (total of 27 flights for lesser black-backed gull and total of 117 flights for herring gull) is 'non-trivial'.

7.10.23 **Therefore, no LSE cannot be concluded for the Severn Estuary Ramsar for lesser black-backed gull and herring gull, in relation to collision impacts and so these impacts are progressed to Stage 2: Shadow Appropriate Assessment.**

Summary

7.10.24 The main conclusions from the screening for LSE are:

- The Severn Estuary Ramsar has potential connectivity with the proposed development, due to the large foraging ranges of two designated ornithological features: lesser black-backed gull and herring gull. These species are not listed features of the Severn Estuary SPA.
- The proposed development will have no LSE on the habitats that support the ornithological features listed under the Severn Estuary Ramsar designation.
- There will be no LSE on the ornithological features listed in the designation for the Severn Estuary Ramsar as a result of disturbance or displacement impacts.
- LSE as a result of collision mortality to lesser black-backed gull and herring gull cannot be ruled out at the screening stage and requires further assessment.

Stage 2: Shadow Appropriate Assessment

7.10.25 The estimated collision risk for each species was calculated to be 0.32 individuals per breeding season for herring gull and 0.06 individuals per breeding season for lesser black-backed gull. Note that as it is the breeding population of both features that is designated, only the collision estimates for the breeding season are used in this assessment. The dispersal and migration of gulls in the non-breeding season means that gulls found in the vicinity of the proposed development outside the breeding season may originate from elsewhere in the UK or northern Europe.

7.10.26 To determine whether the predicted rates of collision have potential to result in an adverse effect on the integrity of the designated features, requires the size of the source population (breeding population) to be estimated for both gull species.

7.10.27 The most recent population estimate for Flat Holm is of 2,055 pairs of lesser black-backed gull in 2019. This equates to a recent decline of 52% since 2010, when there were still 4,137 apparently occupied nests[64] (a very similar population to that given in the Ramsar citation for the Severn Estuary (4,167 pairs, Seabird 2000 Census)).

[82] Available from: https://jncc.gov.uk/jncc-assets/RIS/UK11081.pdf [Accessed 27/02/2023]

[83] Available from: UK Ramsar Information Sheets – all details in structured spreadsheet format | JNCC Resource Hub [Accessed 13/12/2022]

[84] Available from: https://naturalresources.wales/media/673887/severn-estuary-sac-spa-and-ramsar-reg-33-advice-from-ne-and-ccw-june-09.pdf [Accessed 27/02/2023]

[85] Available from: https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/protected-areas-of-land-and-seas/conservation-advice-for-european-marine-sites/?lang=en [Accessed 27/02/23]

The majority of lesser black-backed gulls are on Flat Holm; an estimate for Steep Holm was not found. The majority of breeding herring gulls are found on Steep Holm and the most recent estimate from there is of 956 pairs (Seabird 2000 Census). The number of breeding herring gulls on Flat Holm each year is currently between 250 and 400 pairs[75].

7.10.28 Therefore, for lesser black-backed gull a breeding population estimate of 2,055 pairs (latest estimate for Flat Holm) has been used for the size of the source population, against which collision impacts are assessed. For herring gull a breeding population estimate of 1,206 pairs has been used (latest estimate for Steep Holm plus minimum yearly estimate for Flat Holm). Both estimates are less than those in the Ramsar citation and so provide a further precautionary approach when assessing collision impacts.

7.10.29 Using these population estimates, for lesser black-backed gull the collision estimate of 0.06 birds per breeding season equates to 0.001% of the designated breeding population. The annual survival of adult lesser black-backed gulls has been estimated as 0.87 (long-term study, Skomer Island[73]) but has varied annually between 0.585 and 0.983. 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.

7.10.30 For herring gull the collision estimate of 0.32 birds per breeding season equates to 0.01% of the designated breeding population. The annual survival of adult herring gulls has been estimated as 0.82 (long-term study, Skomer Island[73]) 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.

7.10.31 Although already considered negligible at a population scale, there are several reasons why the impact values presented are extremely precautionary.

7.10.32 It is clearly the case that not all of the gulls recorded in the vicinity of the proposed development will come from the breeding colonies in the Severn Estuary Ramsar site (Flat Holm and Steep Holm). A significant, and increasing, proportion of lesser black-backed and herring gulls are now breeding in urban areas, rather than in traditional coastal colonies. It is estimated that of the current (2019) Welsh population of 13,500 pairs of lesser black-backed gulls[64], approximately one third are roof-nesting birds. The true population of urban-nesting gulls is unknown, as such birds are generally under-recorded, however in Cardiff alone urban lesser black-backed gulls totalled 2,697 pairs in 2011, with 4,038 pairs predicted by 2020[86] (i.e. a greater number than breed within the designated colony on Flat Holm).

7.10.33 The preliminary results of the latest national seabird census (2015 - 2021) estimated 7,988 breeding pairs of herring gull in Wales, however this total does not include all roof-nesting birds. The most recent estimate (2019) suggests there were 2,960 herring gull pairs nesting in urban areas at 45 sites in Wales. As with lesser black-backed gull, the estimate for the urban population of herring gulls is considered to be an under-estimate[64] but the data suggests a large proportion of the herring gull population are now breeding in urban areas. The wider Severn estuary region (Wales and England) was estimated as holding a minimum of 5,103 pairs of urban nesting herring gulls in 2013[86] (with the true value considered likely to be in excess of 6,000 pairs); a total that will have continued to increase since that time. Based on this, urban nesting gulls in the wider Severn estuary region outnumber herring gulls from Steep Holm and Flat Holm by a minimum of approximately 4:1.

7.10.34 The population of large gulls is further complicated by the fact that a relatively low proportion of the population breed in any year. Both lesser black-backed gull and herring gull do not start breeding before they are four years old, and in addition not all adult age birds are breeding birds, e.g. the proportion of adult herring gulls that breed in each year has been estimated as being 0.66 and some lesser black-backed gulls only breed every other year (Ross-Smith *et al*., 2014[87]).

7.10.35 Thus, of the lesser black-backed and herring gulls recorded during baseline surveys at the proposed development many will be birds that breed in non-designated and urban areas and, of these, only some individuals will have been breeding birds. Therefore, to assign all predicted collisions to the Severn Estuary Ramsar breeding population is incorrect.

7.10.36 It is a requirement of the AA process that LSE be determined for a project both alone and in combination with other projects. The potential effect of collision on gulls associated with the Severn Estuary Ramsar has been described for the proposed development alone, despite the stated limitations in doing so. For the 'in combination' assessment the limitations in the data available make determining impacts of the project even more difficult.

7.10.37 Following the process described, to include all projects that have potential connectivity with the Ramsar site, would necessitate the inclusion of all projects within 127 km of Flat Holm (mean max. foraging distance of lesser black-backed gull). The accurate assignment of gulls recorded at each of the projects within this area to the designated breeding colonies on Flat Holm and Steep Holm is not possible. A much greater number of lesser black-backed and herring gulls breeding within this wide area will be in non-designated sites (such as Gloucester and Bristol which hold large numbers of urban nesting gulls) and will include many nesting areas that are not surveyed and for which data does not exist. The precautionary approach used, in which all gulls recorded at the proposed development are assigned to the Ramsar population, is excessively precautionary if used for all significant development projects within the 127 km radius search area.

7.10.38 Furthermore, a provisional examination of ES ornithology chapters that could be located for wind farms within the search area, found that in most cases gulls were not mentioned in the assessment (either because they were not recorded as a target species during flight activity surveys or were not considered to be significant) and, as such, for many projects there would be no data available as to the magnitude of collision impacts. In the absence of data, projects that do not include gulls would need to be excluded from the in-combination assessment. Thus, there would be a low reliability in the output, which would make undertaking this process unproductive.

Conclusion

7.10.39 The proposed development alone will have no adverse effect on site integrity for the Severn Estuary Ramsar.

[86] Cardiff Council (2013) Urban gulls (Environmental Scrutiny Committee Agenda Item). Available from: https://cardiff.moderngov.co.uk/Data/Environmental%20Scrutiny%20Committee/20130507/Agenda/Urban%20Guls%20%2812.68M%29.pdf [Accessed 27/02/2023]

[87] 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.