# 12 Ornithology

## 12.1 Introduction

12.1.1 This chapter considers the potential for significant effects on important ornithological receptors[1] associated with the construction, operation and decommissioning of the Proposed Development. Within this chapter and assessment, the term 'Proposed Development' includes turbines, ancillary infrastructure and the ground mounted solar array area (as detailed in Chapter 5: Project Description).

12.1.2 The Site is defined by the red line Site boundary shown on Figures 12.1 to 12.9.

12.1.3 The assessment presented within this chapter is based on the Guidelines for Ecological Impact Assessment (EcIA) in the United Kingdom (CIEEM, 2018[i])[2].

12.1.4 The specific objectives of this chapter are to:

- Describe the assessment methodology and significance criteria used in completing the impact assessment;
- Describe the ornithological baseline conditions at the Proposed Development and associated Study Areas, to identify the ornithological receptors which will be the focus of this assessment;
- Evaluate the sensitivity of each ornithological receptor;
- Describe the potential impacts, including direct, indirect and cumulative impacts;
- Describe the mitigation measures proposed to avoid, reduce and offset potential significant adverse effects (where required);
- Assess the significance of residual effects remaining following the implementation of mitigation; and,
- Describe biodiversity enhancement opportunities to be adopted as part of the Proposed Development.

12.1.5 The assessment is informed by comprehensive baseline data, including targeted ornithological field surveys of important and legally protected ornithological receptors identified during desk study and consultation feedback. It draws on pre-existing information, where appropriate, from other studies, including survey data sources.

12.1.6 This chapter is supported by the following figures:

- Figure 12.1 - Ornithological Statutory Designated Sites;
- Figure 12.2 - Non-statutory Designated Sites;
- Figure 12.3 - Existing Ornithological Records (Non-Sensitive);
- Figure 12.4 - Vantage Point Flight Activity Survey Plan;

[1] Note that the term 'ecological receptors' used in this chapter is equivalent to the term 'ecological features' used in the CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018[i]), and can refer to species and/or ecosystems and their functions or services. Receptors is used herein to be consistent with other technical chapters.
[2] Note, CIEEM (2018) guidance, updated in 2022 providing principally minor typographical edits.

- Figure 12.5 - Breeding Bird Survey Plan;
- Figure 12.6a - VP Flight Activity – Red Kite (Year 1);
- Figure 12.6b - VP Flight Activity – Other Species (Year 1);
- Figure 12.7a - VP Flight Activity – Red Kite (Year 2);
- Figure 12.7b - VP Flight Activity – Other Species (Year 2);
- Figure 12.8a - Moorland Breeding Bird Survey Results - Year 1 (2022);
- Figure 12.8b - Moorland Breeding Bird Survey Results - Year 2 (2023);
- Figure 12.9 – Breeding Raptor and Owl Search Results - Year 2 (2023);
- Confidential Figure C12.10 – Existing Ornithological Records (Sensitive); and,
- Confidential Figure C12.11 – Breeding Raptor and Owl Search Results – Year 1 (2022).

12.1.7 This chapter is supported by the following technical appendices:

- Appendix 12.1: Ornithology;
- Confidential Appendix C12.2: Ornithology; and,
- Appendix 12.3: Collision Mortality Risk.

12.1.8 Figures and technical appendices, including those of other chapters, are referenced within the text where relevant. Only common species names are used within this chapter; scientific names are provided in Appendix 12.1.

12.1.9 This Chapter complements Chapter 11: Ecology and Chapter 10: Ground Conditions. Note that in the interests of concision, information contained in other chapters and appendices is not repeated herein unless essential for understanding and is instead cross referred within this chapter.

## 12.2 Legislative, Policy and Guidance

12.2.1 Only legislation and policy with specific relevance to ecological interests are listed in this section; general legislation and planning policy relevant to the Proposed Development are detailed in Chapter 3: Planning Policy.

12.2.2 The following legislation and policy have been considered as part of this ornithology assessment:

- The Conservation of Habitats and Species Regulations 2017, as amended by the Conservation (Natural Habitats, &c.) (EU Exit) (Amendment) Regulations 2019 (collectively 'the Habitats Regulations'[ii]);
- The Environment (Wales) Act 2016[iii];
- The Wildlife and Countryside Act 1981 (as amended[iv]);
- Future Wales (2021) Policy 9 Resilient Ecological Networks and Green Infrastructure[v];
- Welsh Government (2022) Biodiversity deep dive: recommendations[vi];
- Planning Policy Wales (PPW) 11 (2021) Chapter 6 Distinctive and Natural Places[vii];
- Welsh Government (2023) Updated National Policy for Chapter 6 of PPW[viii];
- Technical Advice Notes 5 (2009) Nature Conservation and Planning[ix];
- Caerphilly County Borough Council (CCBC) Adopted Local Development Plan (LDP) Up to 2021 (Adopted November 2010[x]);

- CCBC Adopted Local Development Plan (LDP) Up to 2021 Review Report (1st June 2021, for 2nd Replacement LDP up to 2035) – SP10 (Conservation of Natural Heritage[xi]); and,
- CCBC Action Plan 'Species Action Plans' (Volume 2, Interim Guidance, 2002[xii]).

12.2.3 The following key pieces of guidance has been considered as part of this ornithology assessment:

- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018[i]);
- Biodiversity – Code of practice for planning and development (BSI, 2013[xiii]);
- Assessing Connectivity with Special Protection Areas (SNH, 2016a[xiv]);
- Assessing the Cumulative Impacts of Onshore Wind Farms on Birds (SNH, 2018a[xv]);
- Assessing the Significance of Impacts from Onshore Wind Farms outwith Designated Areas (SNH, 2018b[xvi]);
- Fifth Birds of Conservation Concern in the UK, Channel Islands and the Isle of Man (Stanbury *et al*., 2021[xvii]);
- Birds of Conservation Concern Wales 4 (Johnstone *et al*. 2022[xviii])
- Environmental Statements and Annexes of Environmentally Sensitive Bird Information: Guidance for Developers, Consultants and Consultees (SNH, 2016b[xix]);
- Windfarms and Birds – Calculating a Theoretical Collision Risk Assuming No Avoiding Action (SNH, 2000[xx]);
- Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms (SNH, 2017[xxi]);
- Avoidance Rates for the onshore SNH (now NatureScot) Wind Farm Collision Risk Model (SNH, 2018c[xxii]); and,
- NatureScot pre-application guidance for onshore wind farms (NatureScot, 2024[xxiii]).

12.2.4 Guidance relating solely to survey methods used is contained in Appendices 12.1-12.3.

## 12.3 Assessment methodology

### Scope of Assessment

12.3.1 The assessment presented within this Chapter has been undertaken with reference to CIEEM guidelines (2018[i]) and considers the following potential impacts upon ornithological receptors associated with construction, operation and decommissioning of the Proposed Development:

- collision mortality – the risk of mortality resulting from collision or interaction with the turbines and/or other wind farm infrastructure; and,
- disturbance/ displacement of species - disturbance and displacement of birds from the area occupied by the Proposed Development and surrounding areas as a result of the Proposed Development, including through direct habitat loss.

12.3.2 The potential effects are considered as a result of the Proposed Development alone and cumulatively, in-combination with other wind farm developments which are the subject of a valid planning application. Note, where relevant, notable non-wind developments are also considered in the cumulative assessment.

12.3.3 CIEEM guidelines (2018[i]) stipulate that it is not necessary to carry out a detailed assessment of impacts upon ornithological receptors that are sufficiently widespread, unthreatened and

**Commented [pa1]:** is this title correct?

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resilient to impacts of the proposed development. As such, the assessment considers impacts upon designated sites and ornithological receptors which are considered 'important' on the basis of baseline information, relevant guidance, literature, professional judgement of the authors and opinions of statutory advisory bodies provided through consultations in relation to the Proposed Development and, where relevant, other wind farm developments.

12.3.4 Where ornithological receptors are not considered so important as to warrant a detailed assessment, or where they would not be significantly affected on the basis of baseline information (e.g., some passerine species), these are 'scoped out' of the assessment. Mitigation measures for such receptors may, however, still be outlined as appropriate to reduce and/ or avoid any potentially adverse effects or to ensure legislative compliance e.g., for breeding and roosting birds.

12.3.5 The assessment is based on the Proposed Development described in Chapter 5: Project Description and Chapter 6: Assessment of Alternatives and has been undertaken in recognition of design evolution and embedded mitigation measures, and standard practices and construction environmental management included within the accompanying Outline Construction Environmental Management Plan (OCEMP), document 'BR10167_PEP_CEMP[i]').

**Commented [CB3]:** Wardell - happy with this reference to OCEMP?

12.3.6 The scope of the assessment has been informed by consultation responses summarised in Table 12.4 and key legislation, policy and guidance.

### Predicting effects

12.3.7 The assessment has been undertaken with reference to CIEEM guidelines (2018[i]) and includes the following stages:

- determination and evaluation of important ornithological receptors;
- identification and characterisation of impacts;
- outline of mitigating measures to avoid and reduce significant impacts;
- assessment of the significance of any residual effects after such measures;
- identification of appropriate compensation measures to offset significant residual effects; and,
- identification of opportunities for ornithological/biodiversity enhancement.

#### Criteria for Assessing the Sensitivity of Receptors

12.3.8 Relevant European, national and local guidance from governments and specialist organisations has been referred to in order to determine the sensitivity (or importance) of ornithological receptors. In the absence of Welsh-specific guidance, reference has also been made to Annex 1 of NatureScot guidance (SNH, 2017[xxi]) on key ornithological receptors when considering the development of onshore wind farms and species with 'restricted ranges' potentially at risk of impacts from wind farms.

12.3.9 In addition, importance or sensitivity has also been determined using professional judgement and taking account of the results of baseline field and desk study findings and the functional role of receptors within the context of the geographical area.

12.3.10 It should be noted that importance does not necessarily relate to the level of legal protection that a receptor receives, and ornithological receptors may be important for a variety of reasons, such as their connectivity to a designated site, rarity or the geographical location of species relative to their known range.

12.3.11 For the purposes of this assessment the sensitivity or importance of an ornithological receptor is considered in the context of a defined geographical area, ranging from Negligible to Very High, as detailed in Table 12.1.

12.3.12 Effects upon receptors identified as being of Negligible value/sensitivity are not likely to be significant in an EIA context at any geographic scale, and as such are scoped out of detailed assessment within this Chapter.

Table 12.1 Value/sensitivity assessment

| Receptor value / sensitivity | Receptor type |
|---|---|
| **Very High - International** | An internationally designated site i.e., Special Protection Area (SPA) and/or Ramsar site or candidate/potential site (pSPA).<br>A regularly occurring species present in internationally important numbers (>1% of its biogeographic population) listed under Annex I of the Birds Directive, or regularly occurring migratory species listed under Annex II of the Birds Directive connected to an internationally designated site for this species. |
| **High - National** | A nationally designated site e.g., Site of Special Scientific Interest (SSSI), or area meeting criteria for national level designations.<br>A regularly occurring species present in nationally important numbers (>1% of its Welsh population) and listed as a UK Biodiversity Action Plan (BAP), Section 7 priority species, Red-listed BoCC (Stanbury *et al*., 2021[xvii] ; &/or Johnstone *et al*. 2022[xviii]) or listed under Schedule 1 of the Wildlife & Countryside Act or Annex 1 of the Birds Directive. |
| **Medium - Regional** | A regularly occurring species present in regionally important numbers (>1% of the regional estimate, or appropriate alternative) and listed as a UK BAP, Section 7 priority species, Red-listed BoCC (Stanbury *et al*., 2021[xvii] ; &/or Johnstone *et al*. 2022[xviii]) or listed on Schedule 1 of the Wildlife & Countryside Act or Annex 1 of the Birds Directive. |
| **Low - Local** | All other species that are widespread and common and which are not present in regionally or nationally important numbers, but which do contribute to the local breeding/wintering bird assemblage. |
| **Negligible** | All other species that are widespread and common and which are not present in regionally, nationally or locally important numbers. |

**Criteria for Assessing the Magnitude of Change**

12.3.13 Once identified, potential impacts are described making reference to the following characteristics as appropriate:

- Adverse or beneficial;
- Extent;
- Magnitude;
- Duration;
- Timing;
- Frequency; and
- Reversibility.

12.3.14 The assessment only makes reference to those characteristics relevant to understanding the nature of an effect and determining its significance. For the purposes of this assessment the temporal nature of potential effects are described where appropriate as follows:

- Negligible: of inconsequential duration;
- Short-term: for 1-5 years;
- Medium-term: for 5-10 years;
- Long-term: >10-30 years; and
- Permanent: >30 years.

12.3.15 The criteria used to determine the magnitude of effects are set out in Table 12.2.

12.3.16 It is important to note that, where reference is made to population level impacts, to assess magnitude the most recently published available population estimates used are considered to be guides.

12.3.17 In addition, it will often be impossible to equate an impact to an actual population loss. For example, where birds may be displaced from a wind farm site as a result of construction or operational activities, such a loss may be temporary or may reasonably result in the relocation of birds to suitable habitats elsewhere within the site, immediate or wider area. Where uncertainty arises a precautionary approach has been adopted.

12.3.18 As such, professional judgement, on the basis of best available evidence, has been used to inform the assessment presented within this chapter.

Table 12.2 Magnitude of impact

| Magnitude | Description |
|---|---|
| Very High | The impact (either on its own or in-combination with other proposals) may result in the permanent total or almost complete loss of a site and/or species status or productivity.<br><br>E.g., Affecting >80% of the regional population estimate (or appropriate alternative). |
| High | The effect (either on its own or in-combination with other proposals) may adversely affect the conservation status of a site and/or species population, in terms of the coherence of its ecological structure and function (integrity), across its whole area, that enables it to sustain the habitat, complex of habitats and/or the population levels of species of interest.<br><br>E.g., Affecting 31%-80% of the regional population estimate (or appropriate alternative). |
| Medium | The effect (either on its own or in-combination with other proposals) would not adversely affect the conservation status of a site and/or species, but some element of the functioning might be affected, and impacts could potentially affect its ability to sustain some part of itself in the long term.<br><br>E.g., Affecting 11%-30% of the regional population estimate (or appropriate alternative). |
| Low | Neither the above or below applies, but some observable adverse effect is evident on a temporary basis or affects extent of habitat/species abundance in the local area.<br><br>E.g., Affecting 1%-10% of the regional population estimate (or appropriate alternative). |

| Magnitude | Description |
|---|---|
| Negligible | A very slight (indiscernible) reduction in a site and/or species status or productivity and/or no observable effect.<br><br>e.g., Affecting <1% of the regional population estimate (or appropriate alternative). |

**Criteria for Assessing Significance**

12.3.19 CIEEM guidelines (2018[i]) note that:

*"A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects have been lawfully permitted following EIA procedures."*

12.3.20 For the purposes of this assessment significant effects are therefore identified as those which encompass impacts on the structure and function of defined sites, habitats or ecosystems and the conservation status of species (including extent, abundance and distribution).

12.3.21 Such effects are identified by considering the importance of a receptor, the magnitude of the impact and applying professional judgement based on best available evidence, to identify whether the integrity of a receptor would be affected.

12.3.22 The term 'integrity' is used here to refer to the maintenance of the conservation status of a population of a species at a specific location or geographical scale.

12.3.23 For the purposes of this assessment, significant effects are primarily expressed with reference to an appropriate geographical scale and are based on Welsh population estimates where these are available, and where available regional estimates provide sufficient information to allow a meaningful assessment.

12.3.24 In cases of reasonable doubt, where it is not possible to robustly justify a conclusion of no significant effect, a significant effect has been assumed as a precautionary approach. Where uncertainty exists, this is acknowledged.

12.3.25 Where the assessment proposes measures to mitigate potentially significant adverse effects on ornithological receptors, a further assessment of residual effects, taking into account such measures, has been undertaken.

12.3.26 CIEEM guidelines (2018[i]) do not recommend the sole use of a matrix table as commonly set out in ES Chapters to determine 'significant' and 'non-significant' impacts. For the purposes of the assessment presented herein, Table 12.3 sets out adapted CIEEM terminology and equivalent in the context of the EIA Regulations, which has been used within this Chapter.

12.3.27 Major and moderate effects are typically considered significant in the context of the EIA Regulations.

Table 12.3 Significance of effect

| Significance | Definition | |
|---|---|---|
| **Significant** | Major Adverse/Beneficial | A medium or high, medium or long-term adverse or beneficial effect upon the integrity of an ornithological receptor of Very High/High value. |
| | Moderate Adverse/Beneficial | A high or very high, long-term or permanent adverse or beneficial effect upon the integrity of an ornithological receptor of Medium/High value. |
| **Non-significant** | Minor Adverse/Beneficial | A low or medium, short-term or long-term adverse or beneficial effect upon the integrity of an ornithological receptor of Low/Medium value. |
| | Negligible/Beneficial | A negligible or low adverse or beneficial effect upon the integrity of an ornithological receptor of Low/Negligible value. |

**Requirements for Avoidance, Mitigation, Compensation and Enhancement**

12.3.28 The mitigation hierarchy has been adopted to avoid, mitigate and compensate for potentially adverse effects upon ornithological receptors as a result of the Proposed Development:

- Avoidance is used where an impact has been avoided or minimised e.g., through changes in Proposed Development design;
- Mitigation is used to refer to measures to reduce or remedy a specific adverse impact in situ;
- Compensation describes measures taken to offset residual effects, i.e., where mitigation in situ is not possible; and,
- Enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.

12.3.29 Note, that in this Chapter these are referred to collectively as 'mitigation' for brevity when discussing generalities, though with the form of mitigation specified as appropriate in discussion of any specific requirements.

**Criteria for Assessing Cumulative Effects**

12.3.30 In the absence of specific guidance for Wales, cumulative impacts have been assessed with reference to NatureScot guidance (SNH, 2012[xxiv] and 2018a[xv]) for important ornithological receptors subject to a detailed assessment.

12.3.31 Cumulative effects are only considered for impacts of above negligible magnitude, as it is considered that negligible residual impacts would not likely contribute measurably to significant cumulative effects.

12.3.32 The cumulative assessment includes consideration of:

- Existing wind farm developments, either operational or under construction;
- Consented wind farm developments, awaiting implementation; and,
- Wind farm applications awaiting determination within the planning process with design information in the public domain.

12.3.33 Non-wind farm developments identified within 10km of the Proposed Development site, are not considered likely to contribute to potentially significant operational collision mortality risks to birds, nor are displacement effects likely to be significant, and as such have been typically scoped out of subsequent assessment. The only exception is the precautionary inclusion of Wauntysswg solar farm (3.6km from Site), but no relevant publicly available information was available. General cumulative effects are however considered in the absence of available baseline information.

**Commented [pa4]:** so has this been included in the assessment? this suggests it hasn't because of a lack of data - in the absence of available data, couldn't assumptions be made ?

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12.3.34 Those developments which have been withdrawn and/or refused are not considered, unless an appeal is currently in progress and information is available. Furthermore, those developments at the EIA screening stage are not considered as no information relevant to the cumulative effects is available for these projects.

12.3.35 For the Proposed Development, red kite and kestrel were the only species which were recorded in sufficient number to warrant collision risk mortality modelling. Cumulative assessment has accordingly been undertaken for red kite and kestrel in this Chapter. Given 6km is the maximum documented foraging range for red kite (SNH, 2016a[xiv]), and although not documented, likely exceeds the foraging range for kestrel, the inclusion of wind farms (and notable non-wind farm developments) within 10km of the Proposed Development in the cumulative assessment (see Figure BR10167 045), is considered a precautionary worst-case scenario approach.

### Consultation

12.3.36 Table 12.4 summarises the consultation responses received regarding ornithology and provides information on where and/ or how they have been addressed in this assessment. To avoid repetition, information contained elsewhere in the chapter is only briefly summarised in Table 12.4, with cross references given to where in the Chapter and/or application documentation further information is provided.

Table 12.4 Consultation Responses

| Consultation and Date | Scoping/Other Consultation | Issues Raised | Response/ Action Taken |
|---|---|---|---|
| Caerphilly County Borough Council (CCBC) (10th January 2024) | Scoping | • Noted that a number of ornithology surveys (passerine bird species, targeted nightjar and black grouse surveys and migratory waterfowl surveys) are proposed to be scoped out of the EIA. The requirement for these surveys (or not) should be determined through a preliminary ecological assessment. If found to be required, these surveys would be expected to inform the ornithology chapter and included in scope of the EIA. | • Passerines are not considered sensitive to wind farm developments (see per SNH, 2017[xxi]), but given the potential effects of solar arrays on species like skylark, Section 7 passerines were included in the MBBS target species (see Appendix 12.1), and effects on species such as skylark are considered in Section 12.6. |

| Consultation and Date | Scoping/Other Consultation | Issues Raised | Response/ Action Taken |
|---|---|---|---|
| | | | • Targeted nightjar, black grouse and migratory waterfowl surveys were scoped out of the EIA, given the lack of existing records at the locality for these birds, lack of suitable habitat (particularly for nightjar), limited range of black grouse in Wales, limited to north and mid-Wales, and there being no designated sites with qualifying migratory goose interest within 20km of the Site. |
| CCBC (10th January 2024) | Scoping | • The Site encroaches onto the Cefn Gelligaer (west of Deri) Site of Importance for Nature Conservation (SINC). The SINC and the effect of the Proposed Development on its qualifying features should be considered in the chapter. Primary qualifying features of the SINC include breeding lapwing (northern part of area).<br>• The ponds in the north occasionally attract uncommon birds. | • Effects on the SINC (and all SINCs and designated sites) were considered in this Chapter, but effects were scoped out of detailed assessment, due to a number of factors, as discussed in Section 12.6.<br>• Target species for survey are detailed in Appendix 12.1, and this includes many wetland species. Desk study information was also gathered including the Site and out to |

| Consultation and Date | Scoping/Other Consultation | Issues Raised | Response/ Action Taken |
|---|---|---|---|
| | | | 10km, including the ponds in the north. |
| | | • Any biodiversity supported by the tip should be considered in the chapter. | • Baseline data gathering (field surveys and desk study) searched for records up to 2km-10km from the Site, and this information is included in Appendix 12.1 and is considered in this Chapter. The search areas included the tip to the south. |
| | | • The comments from the Council's Ecologist have not yet been received, and should any further comments be received on this matter, they will be forwarded to Planning and Environment Decisions Wales (PEDW) separately. | • Noted. |
| CCBC (11th January 2024) | Scoping | • Would like to see further considerations given to the possible impacts of the solar farm, as the wind farm aspect appears to be suitably addressed. | • Potential effects on key ornithological receptors from the solar farm, and consideration of effects from the Proposed Development (solar and wind aspects in-combination), are considered in Section 12.6. |
| | | • Largely agree with scoping report, but have some concerns given the area of the proposed solar, which appears to not have given consideration in assessing effects on wildlife, in particular ground-nesting birds, with respect to protection of nesting habitats. | • See above. Effects (including on ground-nesting species) of the solar aspect of the Proposed Development are addressed in Section 12.6. |
| Blaenau Gwent County Borough Council (BGCBC) | Scoping | • The Site is within 2.5km of the Mynydd Bedwellte SINC, as referred to in Policy ENV3.50 of the BGCBG Local Development Plan, so should be considered in the assessment. | • Effects on SINCs within 2km of the Site have been |

| Consultation and Date | Scoping/Other Consultation | Issues Raised | Response/ Action Taken |
|---|---|---|---|
| (18th December 2023) | | | considered in the assessment (with the SINCs considered shown in Figure 12.2). The Mynydd Bedwellte SINC is understood to have ecological qualifying interest, so that site is considered in Chapter 11. |
| | | • Proposals in the Blaenau Gwent that should be considered in the cumulative assessment are:<br>- DNS CAS-02060-F3S0H4 – Wind Turbines North of Rassau Industrial Estate;<br>- DNS/3239181 - Manmoel Wind Farm;<br>- DNS/3270299 - Mynydd Carn-y-Cefn Wind Farm;<br>- DNS/3278009 - Abertillery Wind Farm;<br>- DNS/3273368 - Mynydd Llanhilleth Wind Farm;<br>- DNS CAS-02504-M9J3F4 - Mynydd Bedwellte; &,<br>- C/2023/0212- Installation of one wind turbine and associated infrastructure on land at Penrhiwgwaith Farm, Hollybush. Pending application. | • BGCBC were contacted on 4th February 2024 for relevant ornithological information for these schemes, and BGCBC provided all the relevant data they have, which has been considered in the cumulative assessment in Section 12.11. |
| Blaenau Gwent County Borough Council (BGCBC) (18th December 2023) | Scoping | • Recent amendments to PPW Chapter 6, need to be taken into consideration and detailed in the submission. | • Section 12.10 provides information into biodiversity net benefits through habitat enhancements, in accordance with updated Chapter 6 of PPW[vii]. |
| | | • Red kite, kestrel and merlin have been recorded flying over Parc Bryn Bach which is located *c*.2.5km from the Site, and it is considered likely that these species will traverse over the wider area.<br>• Marsh harrier has been recorded within 500m of the Site. | • Red kite, kestrel, merlin and marsh harrier were all considered as target species for the surveys and are considered in this Chapter. Of these, red kite and kestrel were taken forward for detailed |

| Consultation and Date | Scoping/Other Consultation | Issues Raised | Response/ Action Taken |
|---|---|---|---|
| | | • Consideration should be given to impacts on Parc Bryn Bach Local Nature Reserve (LNR) *c*.2.5km from the Site, which supports a variety of wildfowl including goldeneye, black-headed gulls and herring gulls, which are all red-listed species.<br>• The A465 corridor has historically been known to support lapwing populations, albeit the lapwing numbers have suffered serious declines in recent years. | assessment (see Section 12.6).<br>• Many wetland birds were treated as target species for surveys (see Appendix 12.1). Although it is not disputed that the LNR is likely to support wildfowl and gulls, these are not considered qualifying features of the designated site (and with these species not regarded on the LNR website as 'wildlife you may see[3]). Potential effects on the LNR are scoped out, with justification provided in Section 12.6.<br>• Lapwing was regarded as a target species and is thus considered in this Chapter, although given the lack of records during two years of surveys the species was scoped out of detailed assessment. |
| Merthyr Tydfil County Borough Council (MTCBC) (18th December 2023) | Scoping | • No objection/concern with the Proposed Development but flagged another DNS application within the area (3253147 – Land at Gelligaer and Merthyr Common, to the north of the Heads of the Valleys) and should be considered in the cumulative assessment. | • It is understood that this scheme is called 'Pen-March Wind Farm' and is |

[3] https://www.parcbrynbach.co.uk/nature (Accessed 08/02/2024).

| Consultation and Date | Scoping/Other Consultation | Issues Raised | Response/ Action Taken |
|---|---|---|---|
| | | | considered in the cumulative assessment, in Section 12.11. |
| Natural Resources Wales (NRW) (18th December 2023) | Scoping | • EIA should provide sufficient information to enable the LPA to determine the extent of the environmental impacts arising from the Proposed Development.<br>• Evaluation of impacts should include: direct and indirect, cumulative, short, medium and long-term, permanent and temporary, positive and negative, construction, operation and decommissioning/post-operational phases, and impacts on the long-term Site security or the nature conservation resource.<br>• EIA must include a description of all existing natural resources and wildlife interests within and in the vicinity of the Proposed Development, together with a detailed assessment of likely impacts and significance of those impacts. | • Noted, Chapter has provided such information.<br>• Such impacts have been considered within this Chapter.<br>• Section 12.4 provides a summary of the baseline conditions (with further detail in Appendix 12.1), with respect to existing natural resources and wildlife interests associated with the Site. Section 12.6 includes the assessment of those ornithological receptors scoped in (and significance of impacts) and those receptors scoped out and justification as to why. |
| Natural Resources Wales (NRW) (18th December 2023) | Scoping | • Site and, where necessary, land adjacent to the Site should be subject to assessment to determine the likelihood of protected species being present and affected by the Proposed Development.<br>• Targeted surveys should be undertaken of those species scoped in, which are carried out by suitable qualified, experienced and (where necessary) licensed ecologist(s), and following best practice guidelines, and if surveys deviated from the published guidance, this should be fully justified within the EIA. | • Noted, and considered in this Chapter. Section 12.4 principally covers what notable bird species, and Section 12.6 considers effects to these.<br>• Noted, and this principal has been followed in this Chapter. |

| Consultation and Date | Scoping/Other Consultation | Issues Raised | Response/ Action Taken |
|---|---|---|---|
| | | • Grassland restoration could be undertaken as a biodiversity enhancement measure to increase the diversity of wildflowers present. | • Grassland restoration is to be included as one of the Proposed Development's habitat enhancement measures (see Section 12.10). |
| Natural Resources Wales (NRW) (18th December 2023) | Scoping | • Should protected species be confirmed, information must be provided identifying the species-specific impacts in the short, medium and long term together with any mitigation and compensation measures proposed to offset the impacts identified.<br>• Advised that comprehensive descriptions of the habitats affected are included to support robust conclusions about their significance for the species.<br>• Advised that EIA should consider significance (alone and in combination) and where applicable conservation status. In respect to conservation status, advised consideration to be given to current conservation status of the relevant species. EIA must demonstrate that there will be no detriment to maintenance of favourable conservation status of the species during any phase of the Proposed Development.<br>• Where the Proposed Development implicates protected species which are also notified features of designated sites (e.g. SAC, SSSI) advised that the EIA considers impacts on those species from both perspectives. | • Noted, and this has been included in this Chapter, in relation to target (bird) species.<br>• Comprehensive descriptions of habitats are provided in Appendix 11.1 and are summarised in Chapter 11. Habitat type is also considered in this Chapter in relation to suitability for target (bird) species.<br>• Section 12.6 considers significance (alone), Section 12.11 cumulatively and Table 12.6 provides a summary of effects assessed during relevant phases of the Proposed Development.<br>• Noted. No such protected species identified, but effects on all relevant designated sites are considered in Section 12.6. |

| Consultation and Date | Scoping/Other Consultation | Issues Raised | Response/ Action Taken |
|---|---|---|---|
| | | • Advised that EIA sets out how the long-term security of any mitigation or compensation will be assured, including management and monitoring information and long term financial and management responsibility. Where the potential for significant impacts on protected species is identified, advocate that a Conservation Plan is prepared for the relevant species and included as an annex to the EIA. | • Information into how long-term security of any mitigation or compensation will be assured, including management and monitoring, and long term financial and management responsibility will be included in a HMP if the Proposed Development is consented (to be conditioned, and will be agreed with CCBC, with input from NRW). |
| Natural Resources Wales (NRW) (18th December 2023) | Scoping | • Recommended that the developer consults with LPA ecologist on scope of the work to ensure that regional and local biodiversity issues are adequately considered, particularly those habitats and species listed in the relevant Local Biodiversity Action Plan (LBAP), and those that are considered important for the conservation of biological diversity in Wales.<br><br>• Noted the presence of Cefn Gelligaer (west of Deri) SINC directly to the south of the Site. Advise that the applicant consult with CCBC if they have any concerns or requirements as they manage the SINC. | • Information from the LPA has been provided as summarised in this table, with further remarks from the LPA ecologist potentially to follow. Habitat enhancement measures will be strongly focused on providing biodiversity net benefits in relation to local and/or regional biodiversity priorities.<br><br>• Such a request into effects on this SINC has been provided by CCBC (as presented in this table). Effects have been considered in Section 12.6, and |

| Consultation and Date | Scoping/Other Consultation | Issues Raised | Response/ Action Taken |
|---|---|---|---|
| | | | enhancement opportunities (see Section 12.10) will benefit the condition of the SINC, including suitability for lapwing. |
| | | • Expect developer to contact relevant people/organisations for biological information/records relevant to the Site and surrounds. These include the relevant local records centre and any local ecological interest groups. | • Noted. See Section 12.4. which summaries the desk study information gathered (including from SeWBReC). |
| | | • In accordance with the Environment (Wales) Act 2016 and PPW the application should demonstrate how it can deliver biodiversity enhancements and thus contribute to promoting ecological resilience. | • Noted. Section 12.10 summarises the habitat enhancements to be adopted and demonstrates how these measures are in accordance with updated Chapter 6 of PPW. |
| | | • Advised that provisions in the EIA audit compliance in respect of relevant nature conservation legislation (UK and Wales) together with relevant local and national policies, including BS 42020:2013[xiii]. | • Noted. Such legislation is considered throughout this Chapter and is largely the basis of the target species considered for assessment, as well as the recommended good practice measures in Section 12.5. |
| Natural Resources Wales (NRW) (18th December 2023) | Scoping | • Desk study records within 2km will generally be helpful but consideration should also be given to the presence of records in the wider catchment for species, like otter who have large home ranges. | • The desk study search area for ornithology records was 2km (but this was extended to 10km for (sensitive) Schedule 1 bird |

| Consultation and Date | Scoping/Other Consultation | Issues Raised | Response/ Action Taken |
|---|---|---|---|
| | | • Advised that applicant liaises with PEDW and LPA into consented/in the planning system wind farms for the cumulative assessment.<br>• Confirmed that they do not hold any up-to-date information on the red kite population within Caerphilly. | species, and statutory designated sites), as detailed in Appendix 12.1, and summarised in Section 12.4.<br>• Noted, and these have been gathered, and relevant schemes considered are presented in Section 12.11.<br>• Noted. In the absence of any known regional estimates, the Welsh population estimate for kite (2,500 pairs [xxv]) is regarded in the assessment, see Section 12.6. |

### Assumption and Limitations

12.3.37 Potential limitations to assessment arising from baseline studies are discussed in full within Appendices 12.1 and 12.3. It is concluded that there are no substantive limitations to subsequent assessment.

12.3.38 All habitats within the Site were accessible for survey. Access to and observations of areas outside the Site was possible from suitable locations within the site or public rights of way (PRoWs), scanning areas with the use of optics (telescope and binoculars).

## 12.4 Baseline conditions

### Current Baseline

12.4.1 This section provides a summary of baseline ornithological conditions including an overview of the known distribution of birds and designated sites (with qualifying ornithological interests) in proximity to the Proposed Development.

**Desk study**

*Designated sites*

12.4.2 Designated sites (with qualifying ornithological interests) identified in proximity to the Proposed Development are detailed in Appendix 12.1.

12.4.3 There is one statutory designated site with qualifying ornithological interests within 10km of the Site (Cwm Glo a Glyndyrys SSSI, 5.59km from the Site) (Figure 12.1). This SSSI has a passerine assemblage of interest, including tree pipit, whinchat and wood warbler, and also cuckoo and nightjar. Furthermore, as stated by BGCBC, within Table 12.4, the Parc Bryn Bach LNR (1.92km, north-east of the Site) is used by a variety of wetland birds, including goldeneye, herring gull and black-headed gull (which are BoCC Red list species). Although these are not qualifying features of the designated site[4].

12.4.4 There are six Sites of Importance for Nature Conservation (SINCs) within 2km of the Site (see Figure 12.2):

- Cefn Gelligaer (west of Deri) – adjoins the southern Site boundary; upland area of acid grassland, semi-improved acid grassland, marshy grassland and wet heath, and associated mosaics, and northern part supports breeding lapwing;
- River Rhymney (160m, east) – full length of watercourse is a significant linear wildlife corridor, providing a variety of riverine habitats and used by species like kingfisher and passerines;
- Butetown, Llechryd and Rhymney Grasslands, Rhymney (295m, north) – variety of habitats, including marshy grassland, semi-improved acid (and neutral) grassland, used by green woodpecker, buzzard and a number of passerines;
- Pan March and Traed y Milwyr, Llechryd (500m, north) – upland area supporting a mix of wet and dry grassland and heath, and used by buzzard, raven and a number of passerines, including skylark;
- Tair Carreg Moor, north west of Fochiw (980m, south-west) – upland area supporting a mosaic of wet and dry acid grassland and heath, and used by buzzard, raven and a number of passerines, including skylark; and,
- Merthyr Common, North (1.3km, north-west) - upland common land supporting a mosaic of wet and dry moorland, including unimproved acid grassland, wet heath, acid flush and scree. No specific ornithology interest is provided.

12.4.5 Information on SINCs, including the main threats to each, are taken from the South East Wales Biodiversity Records Centre (SeWBReC) website[xxvi], and to avoid repetition are detailed in Chapter 11 and not in this Chapter.

*Protected/Notable Species*

12.4.6 Existing records of protected and notable bird species obtained from the SeWBReC are shown on Figures 12.3 and Confidential Figure C12.10, and further detailed in Appendices 12.1 and Confidential Appendix C12.2. The search for these records was typically 2km from the Site, extended to 10km for records of sensitive Schedule 1 bird species.

12.4.7 In summary, no existing ornithological records were returned from within the Site by the SeWBReC. The nearest records returned were notable ornithology records from Bute Town Reservoir 450m north of the Site. Species records included herring gull, kingfisher, red kite and skylark.

[4] Noting, that for LNRs designated features are not defined, but instead overall habitats present and likely species supported are presented.

12.4.8 Sensitive records of Schedule 1 species were predominantly >2km from the Site, with the exception of two little ringed plover (possible breeding) records and one non-breeding short-eared owl record within 2km of the Site, with the nearest of these records *c*.800m from the Site.

**Field surveys**

12.4.9 Full details of methods for baseline surveys are provided Appendix 12.1, with survey areas illustrated on Figure 12.4 (vantage point survey plan) and Figure 12.5 (breeding bird survey plan).

12.4.10 The scope for field surveys was determined through a review of 'Key Sources' specified in the EIA Scoping Report (see Appendix 12.1), as well as professional judgement and experience of likely ornithological receptors needed to be considered, and confirmed via the EIA Scoping exercise.

12.4.11 The following baseline ornithological field surveys have therefore been completed within the Site to confirm the presence and distribution of ornithological receptors:

- Vantage Point (VP) Flight Activity Surveys;
- Moorland Breeding Bird Surveys; and,
- Annex 1 / Schedule 1 Breeding Raptor and Owl Searches.

**Vantage Point (VP) Flight Activity Surveys**

12.4.12 VP flight activity surveys to establish the level and distribution of potential "at collision risk" target species flight activity were undertaken between December 2021 and November 2022 (Year 1) and between December 2022 and November 2023 (Year 2).

12.4.13 Vantage Point (VP) flight activity surveys were carried out in accordance with NatureScot guidance (SNH, 2017[xxi]), and the VP Study Area comprised the Proposed Development's turbines plus 500m.

12.4.14 Surveys adopted one VP location in both survey years from the same location (see Figure 12.4) and which have provided visual coverage of the VP survey area.

12.4.15 Full details of surveys, including survey effort and viewshed visibility coverage of the VP survey area are detailed within Appendix 12.1. Survey effort was at least 72 VP hours in each survey year, which met the minimum number of hours required in NatureScot guidance (SNH, 2017[xxi]).

12.4.16 Target species flight activity recorded during surveys is detailed in Appendix 12.1 and illustrated in Figures 12.6a-b (Year 1) and Figures 12.7a-b (Year 2).

12.4.17 For the purposes of assessment using the NatureScot Collision Risk Model (CRM) (Band *et al*., 2007[xxvii]) "at collision risk" flight activity has been identified as those flights occurring at, or in part, between 0m and 150m above the ground, and within 200m of proposed turbine locations. Details of all target species flights considered to be "at collision risk" together with collision mortality risk calculations using the NatureScot CRM (Band *et al*., 2007[xxvii]) are provided in Appendix 12.3.

12.4.18 The target species with "at collision risk" flights were as follows (across the entire two-year survey period):

- Red kite (51 flights, 55 birds);
- Kestrel (4 flights, 4 birds);

- Merlin (1 flight, 1 bird);
- Hen harrier (1 flight, 1 bird);
- Curlew (1 flight, 1 bird); and,
- Grey heron (2 flights, 2 birds).

12.4.19 Detailed analysis of collision mortality risks using the NatureScot CRM (Band *et al*, 2007[xxvii]) has been undertaken for red kite (both survey years) and kestrel (year 2 only), given these were the only target species for which three or more "at collision risk" flights were recorded in any one survey year[5]. Accordingly, collision mortality risks for all other target species recorded during baseline surveys can be concluded as inconsequential at any population level without the requirement for detailed analysis.

12.4.20 Predicted annual collision mortality risks for red kite as a result of the Proposed Development is estimated as 0.747 to 0.933 birds per annum. For kestrel, the predicted annual collision mortality risk is estimated as being 0.368 birds per annum.

12.4.21 Although there is currently no evidence that estimates of collision mortality risks calculated using the NatureScot CRM are realised in actual mortality events at onshore wind farms in Wales, the potential occurrence of bird collisions cannot be entirely precluded, so it provides an indicative measure of collision risk, rather than absolute.

**Moorland Breeding Bird Surveys**

12.4.22 Moorland breeding bird surveys (MBBS) were undertaken in 2022 and 2023, following an adapted Brown and Shepherd (1993[xxviii]) methodology for the census of upland breeding waders, in accordance with NatureScot guidance (SNH, 2017[xxi]).

12.4.23 The survey area comprised the Site plus a 500m buffer in both survey years, where accessible, in accordance with NatureScot guidance (SNH, 2017[xxi]), as shown in Figure 12.5.

12.4.24 During survey in 2022 and 2023, only a narrow assemblage of breeding passerines (and cuckoo) was recorded, with no breeding ground-nesting waders or waterfowl recorded. Most breeding passerines recorded within the Site are species which are associated with habitats including woodland, hedgerows and treelines (see Figures 12.8a-b), with the exception of skylark which was recorded in the interior of the fields onsite.

12.4.25 Full details of surveys, including survey effort and species recorded are provided in Appendix 12.1.

**Annex 1 / Schedule 1 Breeding Raptor and Owl Searches**

12.4.26 Annex 1/Schedule 1 breeding raptor and owl searches were undertaken in 2022 and 2023, following methodologies in Hardey *et al*. (2013[xxix]) in accordance with NatureScot guidance (SNH, 2017[xxi]).

12.4.27 The survey area comprised the Site plus a 2km buffer in both survey years, where accessible, in accordance with NatureScot guidance (SNH, 2017[xxi]), as shown in Figure 12.5.

[5] Number of birds recorded for the other target species at collision risk was also very low across the survey period (≤2 flights).

12.4.28 In 2022, the survey area was found to support a single red kite breeding territory, with an active nest site, located outside the Site. There was no evidence that the nest site was in use in 2023, nor was there any other red kite nest site identified.

12.4.29 In 2023, a single kestrel breeding territory was identified, with an active nest site, 150m west from the Site.

12.4.30 Information pertaining to non-sensitive information (like the kestrel nest site) is presented in Appendix 12.1, and Figure 12.9. Information pertaining to the locations of the breeding sites of Schedule 1 breeding raptor species are considered sensitive and is therefore restricted to the Confidential Appendix C12.2 and Confidential Figure C12.11.

**Future Baseline**

12.4.31 In the absence of the Proposed Development, assuming a "do-nothing" scenario or gap between baseline surveys and the commencement of construction of the Proposed Development, changes in the baseline ornithological conditions (i.e. distribution and/or populations of ornithology species) of the Site are most likely to be modest and result from habitat modifications within, or surrounding, the Site due to changes to the livestock grazing regime within the open habitats of the Site.

12.4.32 Changes are likely to be small-scale, localised changes to the existing habitats and therefore breeding bird densities would reasonably be expected to remain at comparable levels with those recorded during field surveys and identified through desk study i.e., at relatively low levels, albeit central territory locations may shift.

12.4.33 The establishment of additional breeding raptor species currently considered to be absent is considered unlikely given the overall unsuitability of habitats present to support nesting features for species like hen harrier, short-eared owl, peregrine and merlin (such as deep heather swards and crags). and the low likelihood that this will change substantially within the timescales under consideration for the Proposed Development.

12.4.34 The SINCs surrounding the Site (most notably the adjoining Cefn Gelligaer (west of Deri) SINC) is identified to be threatened by a number of factors, comprising over-grazing by livestock (and resulting increased nutrient levels affecting habitats), encroaching bracken and invasive (Schedule 9) species including Japanese knotweed, fires, the use of the SINC by off-road vehicles, and fly-tipping and litter. In the absence of nature conservation management (which is considered the baseline condition) to halt the decline in the habitats for which the SINC is notified it is expected that habitat condition will continue to deteriorate, with associated reduction in suitability for the species which are supported by these habitats and the specific conditions found within this site. Such a qualifying feature is breeding lapwing. Such adverse impacts will reduce the potential for lapwing to breed within the SINC.

## 12.5 Inherent Design Mitigation

12.5.1 In line with the principles of proportionate EIA, embedded mitigation, including avoidance through the design process and application of industry standard good practice, are considered at the outset of the assessment. Important ornithological receptor status will only be assigned where there is still considered to be the potential for significant effects on the identified receptor arising from the Proposed Development after the application of embedded mitigation measures.

**Mitigation by Design**

12.5.2 The Proposed Development has been subject to a number of design iterations and evolution in response to constraints identified as part of the baseline studies, intended to reduce environmental effects (see Chapter 5: Project Description and Chapter 6: Assessment of Alternatives, for further details).

12.5.3 Design considerations have been incorporated to avoid or minimise adverse effects upon ornithological receptors, as set out below.

12.5.4 The proposed onsite track layout has been designed to minimise environmental disturbance and land take by, wherever possible, avoiding completely or minimising loss of areas of identified environmental constraints and habitats that are used by nesting birds (including grassland used by nesting skylark). This includes using existing onsite routes where practical.

12.5.5 The solar array component of the Proposed Development has been positioned where direct effects on ground-nesting species (like skylark) is likely to be minimised, and significant displacement effects are not predicted.

12.5.6 The Proposed Development's turbines also achieve a stand-off buffer of 315m from the kestrel nest site and 515m from the red kite nest site, noting that disturbance distances to breeding kestrel is 100-200m and 150-300m for breeding red kite (see Goodship and Furness, 2022[xxx]).

**Good Practice Measures**

12.5.7 The construction phase of the Proposed Development will be undertaken in accordance with a Construction Environmental Management Plan (CEMP), and which will be finalised in consultation with CCBC and NRW on the basis of the OCEMP, which accompanies the application for the Proposed Development, and which will include measures relevant to ornithology receptors summarised below.

12.5.8 Works under the CEMP will be implemented under the supervision of an appointed Ecological Clerk of Works (ECoW).

12.5.9 A suitably qualified ECoW will be employed for the duration of the construction and works (including habitat reinstatement period), to oversee environmental protection measures and working practices specified in the CEMP and prevent breaches of legislation pertaining to protected species and habitats.

12.5.10 The role of the ECoW will be defined in the CEMP, and will include the following, non-exhaustive, tasks:

- provide toolbox talks and information to all staff on-site, so staff are aware of the ornithological sensitivities within the Site and the legal implications of not complying with agreed working practices;
- agree and monitor measures designed to minimise damage to retained habitats;
- undertake pre-construction surveys and advise on ornithological issues and working restrictions where required;
- complete site-supervision works as required, in relation to sensitive habitats and protected ornithology species; and,
- oversee restoration of working areas following construction.

12.5.11 All wild birds in the UK are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended), which makes it an offence to intentionally or recklessly kill, injure or take any wild bird or take, damage or destroy the nest (whilst being built or in use) or its eggs. In addition, all wild birds listed on Schedule 1 of the Act (including red kite) receive additional legal

protection which makes it an offence to intentionally or recklessly disturb these species while building a nest or are using or near a nest containing eggs or young; or to disturb their dependent young.

12.5.12 Prior to the commencement of construction activities, the CEMP will include for the preparation of a Construction Breeding Bird Protection Plan (CBBPP), and which will be submitted for agreement in consultation with CCBC and NRW.

12.5.13 The CBBPP will be informed by a pre-commencement breeding bird survey to establish the status and distribution of Schedule 1 breeding birds within the Site and within 300m of disturbing activities.

12.5.14 The CBBPP will detail the following measures and any additional measures required on account of findings from the pre-commencement breeding bird survey, to enable the protection of breeding birds over the course of construction works during the breeding season is updated to reflect best available species guidance applicable at the time.

*Site Clearance Activities*

- Habitat clearance activities, where these coincide with the breeding bird season (1st March to 31st August, inclusive) will be subject to a pre-clearance survey by a competent ornithologist to identify any active wild bird nests. Should any active nests be found, works will only proceed under the advice of the appointed ornithologist and following a disturbance risk assessment. This would include all works within the Site.
- Work exclusion buffers around identified nest sites will be implemented where necessary in accordance with current NatureScot guidance (Goodship and Furness, 2022[xxx]) or best available species guidance applicable at the time and/ or as agreed in consultation with CCBC and NRW. No works will be permitted within the implemented exclusion zone until where otherwise advised by the ECoW.

*Schedule 1 Raptors*

- To avoid potential disturbance to breeding Schedule 1 listed raptors, all areas within 300m of construction activities within the Proposed Development will be surveyed in advance of works being commenced during the core breeding season (1st March to 31st August, inclusive) to identify any nesting locations for such species.
- Where necessary, work exclusion buffers around identified nest sites will be established in accordance with current NatureScot guidance (Goodship and Furness, 2022[xxx]) or best available species guidance applicable at the time and/ or as agreed in consultation with CCBC and NRW. No works will be permitted within the implemented exclusion zone until where otherwise advised by the ECoW.

12.5.15 Compliance reporting for all works undertaken under the CBBPP will be provided to CCBC and NRW on request and following the completion of construction works.

## 12.6 Potential Effects

### Receptors Scoped Out

12.6.1 CIEEM guidelines (2018[i]) stipulate that it is not necessary to carry out a detailed assessment of impacts upon ornithological receptors that are sufficiently widespread, unthreatened and/ or resilient to impacts of a development proposal.

12.6.2 As such, the assessment presented within this Chapter considers the potential for significant effects upon designated sites for nature conservation and Ornithological receptors which are considered ‘important’ on the basis of relevant guidance and professional judgement.

12.6.3 Where ornithological receptors are not considered so important as to warrant a detailed assessment, or where they would not be significantly affected on the basis of baseline information, these are 'scoped out' of the assessment, and are not considered further within this Chapter.

12.6.4 Mitigation measures for such features may however, still be outlined as appropriate, to reduce and/ or avoid any non-significant potentially adverse effects, to provide enhancements, or to ensure legislative compliance.

12.6.5 Effects of aviation lighting on ornithology receptors are scoped out of detailed assessment given applicable current guidance (NatureScot, 2024[xxiii]), which states that such impacts need only be considered where the proposed development site could affect breeding colonies of three nocturnal burrow nesting seabird species, is on or adjacent to protected areas that host large concentrations of wintering waterbirds, or within known migratory corridors or bottlenecks for nocturnally migrating passerines. It is apparent the Site does not meet any of these criteria.

*Designated Sites*

12.6.6 Cwm Glo a Glyndyrys SSSI was the only statutory designated site identified within 10km of the Site with qualifying ornithological interests. The SSSI is 5.59km from the Site and has passerines and cuckoo as a qualifying feature. These are birds that are considered not be sensitive to wind farm development (see SNH, 2017[xxi]), but it is appreciated that some passerines (like skylark) may be impacted by solar arrays. The SSSI citation however does not explicitly cite skylark as a bird species supported. The distance is also considered to exceed likely foraging distances of these qualifying ornithological receptors. There are also topographical, woodland, hydrological and anthropogenic built habitat (particularly the town of Merthyr Tydfil) barriers between the Site and this designated site. On account of spatial separation, absence of connectivity and existing barriers, and because qualifying features of the SSSI are not sensitive to wind farm developments, no potential pathways for effects upon the qualifying ornithological interests of the Cwm Glo a Glyndyrys SSSI are identified. The potential for effects upon the ornithological qualifying features of the Cwm Glo a Glyndyrys SSSI is therefore scoped out of further assessment.

12.6.7 The Parc Bryn Bach LNR has no documented, qualifying features, but the BGCBC identified that the LNR is used by a variety of wildfowl, including goldeneye and gulls (herring and black-headed gull) (see Table 12.4), and effects should be considered in the assessment[6]. The LNR is 2.5km from the Site. As per NatureScot guidance (SNH, 2017[xxi]) gulls are more likely to be recorded as 'target' species during VP surveys where concentrations of gulls could be affected by the proposal, such as breeding colonies, roosts and feeding areas like landfill sites. There were typically modest numbers of such gull species recorded during field surveys (no goldeneye recorded), and the desk study identified waterbodies surrounding the Site, including Bute Town Reservoir as being used by species, like herring gull. Therefore, the gulls recorded during surveys are not considered necessarily those which use the LNR. Breeding birds associated with the LNR will have no connectivity with the Site due to spatial distance, and the LNR is considered unlikely to be crucial for non-breeding birds, and as detailed in Appendix 12.1 waterbirds and gulls were recorded only infrequently during field surveys. Effects on the Parc Bryn Bach LNR are accordingly scoped out of further assessment.

[6] Note however that the Parc Bryn Bach LNR website does not identify herring or black-headed gull as being 'wildlife you may see at the park', and its importance as a site for these species may be modest.

12.6.8 Those ornithological species recorded as being supported by the six SINC summarised in paragraph 12.4.4 are species typically not sensitive to wind farm developments (as per SNH, 2017[xxi]). The SINCs are also typically considerably spatial separated from the Site, with habitats such as woodland and built environment and road infrastructure in between. Furthermore, species like buzzard and raven (which are included in several of the SINCs) are not considered sensitive species to wind farm developments (nor are sensitive to solar farms). Effects on five of the SINCs, in relation to ornithological interest, are thus scoped out of further assessment. The exception is the Cefn Gelligaer (west of Deri) SINC which adjoins the southern Site boundary which has breeding lapwing as a qualifying feature. Although the desk study (with records since 1994) did identify lapwing in the surrounding area (nearest *c*.750m north-west of the Site, and north of the A465, and *c*.750m south of the Site at Rhaslas Pond), no lapwings were recorded during two years of survey. The MBBS survey area included the Site plus 500m buffer, and thus any lapwing in the northern part of the SINC where it adjoins the Site, would have been recorded, and as they were not, no disturbance impacts are predicted. It is understood there has been notable declines of lapwing in the 'A465 corridor' (as identified by BGCBC in Table 12.4) and the lack of lapwing during the field surveys may reflect this declining trend in lapwing numbers at the locality. Given the lack of lapwing records identified relevant to the Site, effects on the Cefn Gelligaer (west of Deri) SINC, in relation to breeding lapwing, are scoped out of further assessment. Furthermore, measures that will be incorporated into a HMP, such like grassland restoration and invasive scrub clearance will benefit breeding lapwing (see Section 12.10).

*Ornithological Species*

12.6.9 The following ornithological receptors have been scoped out of further assessment:

- Goosander;
- Curlew;
- Cormorant;
- Grey heron;
- Hen harrier;
- Merlin;
- Mallard;
- All gulls;
- All commoner raptors (like buzzard);
- Cuckoo;
- Raven; and,
- All passerines (including skylark).

12.6.10 Note, the above listed species are scoped out of detailed assessment on the basis that they are considered to be of low value/sensitivity, generally comprising common and widespread species (with some not considered sensitive to wind farm developments (SNH, 2017[xxi] and 2018b[xvi]) and/ or were recorded very infrequently or in numbers of very low importance during the baseline studies, in that the potential for effects from the Proposed Development on the species is considered inconsequential and not significant at any population level.

12.6.11 For the avoidance of doubt, those species which were identified within 10km of the Site from the desk study (records detailed in Appendix 12.1) but that were not recorded during two years of surveys, are also scoped out of further assessment due to lack of presence within, and adjacent to, the Site.

12.6.12 Skylark is a CCBC LBAP species. Although skylark, like other passerines, is considered not likely to be significantly impacted by wind farm developments (SNH, 2017[xxi]), there is recent evidence that skylark is unlikely to nest within solar array areas, and thus displacement of breeding skylarks, from solar farms are predicted (Fox, 2022**Error! Bookmark not defined.**). It should be noted that skylark continue to use solar array areas for foraging and as 'nurseries' with fledged young (RSPB, 2020[xxxi]). The solar arrays comprise 10.675ha, which is 25.3% of the neutral (semi-improved) grassland habitat onsite, available to nesting skylark, and thus there will continue to be considerable suitable habitat for breeding skylark onsite and adjacent to the Site.

12.6.13 Furthermore, the position of the solar array component of the Proposed Development is not located on the identified skylark breeding territories (as shown in Figures 12.8a-b), compared to Figure BR10167 Site Layou Jan2024 RevD, although a small number of territories are on the periphery of the solar arrays and there may be some minimal overlap of the solar arrays with at least parts of some of the skylark territories. It is also considered that skylarks are unlikely to nest within 50m of features such as solar arrays (as with hedgerows), so some limited displacement cannot be entirely precluded. It is predicted, however, that breeding skylarks will continue to use grassland habitats onsite (and in adjacent habitats including the Cefn Gelligaer (west of Deri) SINC to the south), including for nesting, and no substantive displacement effects are predicted. Furthermore, given habitat enhancement measures that are to be adopted, such as grassland restoration and invasive scrub control, nesting habitat for skylark will be improved, over the existing heavily grazed semi-improved grassland habitat onsite. All breeding birds will also be considered through the adoption of good practice measures (summarised in Section 12.5), to ensure nesting birds, including the nests of passerines (like skylark) are protected during works associated with the Proposed Development.

**Receptors Scoped in**

12.6.14 The assessment presented within this Chapter considers in detail the potential for significant effects upon red kite and kestrel in relation to the construction, operation and decommissioning of the Proposed Development. In the absence of documented regional population estimates for red kite and kestrel, and no such regional estimates available from NRW (see Table 12.4), an approach following that in Chapter 8 'Ornithology' which supported the nearby 'Pen March Wind Farm' application (RSK, 2023[xxxii]), was adopted, for consistency and to allow robust cumulative comparisons.

12.6.15 On the basis of justification provided above, the potential for significant effects upon all other identified ornithological receptors as a result of the construction, operation and decommissioning of the Proposed Development, both alone and cumulatively with other developments is considered highly unlikely and therefore scoped out of detailed assessment.

*Red Kite*

12.6.16 Red kite is scoped into detailed assessment and is considered to be of low/local value/sensitivity[7]. A red kite pair bred within 220m of the Site (with relatively high kite activity onsite during VP surveys). One pair is 0.04% of the current Welsh population[xxv] of red kite, considerably below the threshold for national importance, and is considered unlikely to represent >1% of the regional population. For the purpose of this assessment 'regional' is

[7] Particularly in the absence of a 'regional' population estimate for red kite.

defined throughput in relation to the Welsh Statement Areas, with the Site considered just within the 'South East Area'.

12.6.17 Red kite is listed on Annex 1 of the Birds Directive, Schedule 1 and Schedule 1A (which protects the species from intentional/reckless disturbance at all times) of the Wildlife and Countryside Act 1981 (as amended) and listed in Annex 1 of NatureScot guidance (SNH, 2017[xxi]).

12.6.18 Numbers of red kite continue to increase in Wales and the UK, with the species now on the BoCC Green list with increasing population numbers and distribution in Wales (Johnstone *et al.*, 2022[xviii]), and in the UK (Stanbury *et al*., 2021[xvii]). The Welsh population estimate for red kite is 2,500 pairs[8] (Welsh Kite Trust, 2023[xxv]), with numbers of kite increasing in Wales by 423% between 1995 and 2021 (Heywood *et al*., 2023[xxxiii]), and Wales now supporting 30% of the British population (Hughes *et al*., 2021[xxxiv]). Subsequently, it is clear that the red kite population is in a sustained period of growth.

12.6.19 Red kite flight activity recorded during baseline VP Flight Activity Surveys between December 2021 and November 2022, and December 2022 and November 2023 comprised a total of 71 red kite flights. This included 51 flights considered to be "at collision risk".

12.6.20 A single red kite nest site was recorded *c*.200m from the Site boundary in 2022, but it was not active in 2023.

*Kestrel*

12.6.21 Kestrel is a CCBC LBP species, is scoped into detailed assessment and is considered to be of low/local value/sensitivity[9]. A red kestrel bred *c*.115m from the Site (but relatively low kestrel activity was recorded onsite during VP surveys). A previous 2016 estimate for Kestrel in Wales of 1,750 pairs (see Hughes *et al*., 2020[xxxv]), is now considered too high and 265-475 breeding kestrel pairs in Wales is now considered more accurate (Pritchard *et al*. 2021[xxxvi]). Using the updated lower breeding kestrel estimated (265 pairs) as a precaution, one pair is 0.38% of the current Welsh population of kestrel, considerably below the threshold for national importance, and is considered unlikely to represent >1% of the regional population.

12.6.22 Kestrel is a BoCC Red list species in Wales (Johnstone *et al.*, 2022[xviii]) and BoCC Amber list species in the UK (Stanbury *et al*., 2021[xvii]), and also a Section 7 species of the Environment (Wales) Act.

12.6.23 Kestrel flight activity recorded during baseline VP Flight Activity Surveys between December 2022 and November 2023 comprised a total of six kestrel flights. This included four flights considered to be "at collision risk".

12.6.24 A single kestrel nest site was recorded *c*.115m from the Site boundary in 2023, but no nest site was identified in 2022[10].

[8] Based on a 2019 estimate.
[9] Particularly in the absence of a regional population estimate for kestrel.
[10] Kestrels were treated as a target species in Year 2 (2023) and as a secondary species in Year 1 (2022), although it is considered that any obvious signs of nesting kestrel during field surveys in 2022 would also have been recorded.

### Construction Phase

12.6.25 Potential construction phase ornithological impacts associated with the Proposed Development are considered to relate to disturbance/ displacement of birds from the area occupied by the Proposed Development and a species-specific surrounding area.

12.6.26 Potential effects are assessed on the assumption that embedded mitigation measures, as detailed in Section 12.5 and within Chapter 4: Site Description, Chapter 5: Project Description and Chapter 6: Assessment of Alternatives are implemented.

12.6.27 During construction of the Proposed Development, noise and visual disturbance could lead to the temporary displacement or disruption of breeding and foraging birds. The magnitude of the impact would be dependent on the timing, the extent of displacement, species affected and availability of alternative suitable habitats within the Site's locality.

*Red kite*

12.6.28 Baseline surveys recorded a single red kite breeding territory within the survey area, with an active nest recorded in 2022 (but not in 2023). Red kite activity recorded during VP flight activity comprised a total of 71 flights across the 2-year survey period.

12.6.29 The locations of the Proposed Development's turbines are >500m from the red kite nest site identified in 2022, and therefore beyond the maximum suggested disturbance buffer zones for this species (disturbance buffer zone of 150-300m recommended in Goodship and Furness, 2022[xxx]); thus no disturbance can be concluded from human activity associated with construction. Furthermore, the closest part of the Proposed Development footprint to the red kite nest site is the access route entrance in the north-east of the Site which is >450m from the nest, which is also outside the reference disturbance buffer zone (beyond 300m).

12.6.30 As determined during baseline surveys, the nest sites chosen by red kite can be variable between years with the offsite nest site used in 2022 but not in 2023.

12.6.31 Given the identified location of the nest site offsite (and typical lack of suitable large, mature trees that could support a kite nest onsite), it is considered that the red kite pair are unlikely to breed within the disturbance buffer zone (<300m), from the proposed turbines, so the potential for direct disturbance of nesting kites is considered unlikely. However, some short-term, limited level of disturbance/displacement may be caused to foraging birds using the Site. The construction works will be phased with much of the Site continuing to be available to foraging kites. Furthermore, only 11.49ha of suitable land onsite will be directly lost due to the Proposed Development (with some limited displacement of kites from these areas during construction predicted), leaving 43.29ha of suitable habitat onsite (79% retained). It is considered unlikely that this red kite breeding territory would be lost, and the pair are considered likely to continue nesting at, or close to, the nest locality, with the nest site exceeding the disturbance buffer zone, from the Proposed Development footprint. There are also considerable swathes of suitable habitat for red kite in the surrounding area to the north of the Site, and north of the A465, and south of the Site, into the Cefn Gelligaer (west of Deri) SINC and extending beyond, providing alternative foraging habitat for the species. Enhancement measures to be adopted (see Section 12.10) including grassland restoration and the control of invasive plants will also provide further foraging opportunities for red kite.

12.6.32 Overall construction phase disturbance/displacement to red kite is considered to represent no more than a Short-term, Low magnitude impact at the regional population level, which would have a Minor Adverse effect that is concluded as being Non-Significant. This is with

consideration also given to mitigation adopted for Schedule 1 species to enable legislative compliance summarised in Section 12.5.

*Kestrel*

12.6.33 Baseline surveys recorded a single kestrel breeding territory within the survey area, with an active nest recorded in 2023 (but not in 2022). Kestrel activity recorded during VP flight activity comprised a total of six flights across a two-year survey period.

12.6.34 The locations of the Proposed Development's turbines are >310m from the kestrel nest site identified in 2023, and therefore beyond the maximum suggested disturbance buffer zones for this species (disturbance buffer zone of 100-200m recommended in Goodship and Furness, 2022[xxx]); thus no disturbance can be concluded from human activity associated with construction. No other parts of the Proposed Development footprint are within 310m of the kestrel nest site.

12.6.35 As determined during baseline surveys, the nest sites chosen by kestrel can be variable between years with the offsite nest site used in 2023 but not in 2022.

12.6.36 As with red kite, as the kestrel nest site is offsite and there is a lack of suitable large, mature trees (or other structure) that could support nesting kestrel within the disturbance buffer zone (<200m), from the proposed turbines, the potential for direct disturbance of nesting kestrel is considered unlikely. However, some short-term, limited level of disturbance/displacement may be caused to foraging birds using the Site. The construction works will be phased with much of the Site continuing to be available to foraging kestrels. Furthermore, only 11.49ha of suitable land onsite will be directly lost due to the Proposed Development (with some limited displacement of kestrels from these areas during construction predicted), leaving 43.29ha of suitable habitat onsite (79% retained). It is considered unlikely that this kestrel breeding territory would be lost, and the pair are considered likely to continue nesting at, or close to, the nest locality, with the nest site exceeding the disturbance buffer zone, from the Proposed Development footprint. There are also considerable swathes of suitable habitat for kestrel in the surrounding area, providing alternative foraging habitat for kestrel. Enhancement measures to be adopted (see Section 12.10) including grassland restoration and the control of invasive plants will also provide further foraging opportunities for kestrel.

12.6.37 Overall construction phase disturbance/displacement to kestrel is considered to represent no more than a Short-term, Low magnitude impact at the regional population level, which would have a Minor Adverse effect that is concluded as being Non-Significant. This is with consideration also given to mitigation adopted for breeding bird species to enable legislative compliance summarised in Section 12.5.

**Operational Phase**

12.6.38 Potential operational ornithological effects associated with the Proposed Development are considered to relate to collision mortality risks and disturbance/ displacement of birds from the area occupied by the Proposed Development and a species-specific surrounding area.

12.6.39 Note that collision risk and displacement risk are mutually exclusive in a spatial sense, in that a bird which avoids a wind farm cannot be at risk of collision at the same time. Therefore, the collision risk estimate is likely to be lower than stated, given fewer red kite and kestrel flights may be expected within the collision risk area post-construction. The effects stated in this Chapter are therefore considered likely to represent worst-case scenarios. Furthermore, during CRM analysis given the distances used as height bands (see Appendix 12.3), all kite and kestrel flights within 200m of the Proposed Development's turbines, and 0m to 150m had to be

regarded, and accordingly this is likely to have included flights below risk height, but precautionarily included.

12.6.40 Collision risk analysis has been undertaken for red kite and kestrel only, on the basis of the low incidence of “at collision risk” flight activity recorded for all other target species. Full details are provided in Appendix 12.3.

*Red kite*

Displacement

12.6.41 There is limited evidence for displacement effects upon red kites as a result of operational wind farms, with kites often reported foraging close to wind farm sites (e.g., Hötker *et al*., 2017[xxxvii]), and a review by Madders and Whitfield (2006[xxxviii]) reporting sensitivity of the species to displacement by wind farms as being low. A long-term study of potential effects (including displacement) upon red kite at the Braes of Doune Wind Farm near Stirling in central Scotland, found that kites continue to use the area and frequently passed through the operational wind farm (Duffy and Urquhart, 2014[xxxix]).

12.6.42 The habitat within 200m of the Proposed Development's turbine locations is typically open grassland habitat, which will provide suitable foraging habitat for red kite. Furthermore, the Site is largely used for livestock (sheep) grazing and thus there is potential for a food resource onsite (carrion) and this will not change during the operational phase of the Proposed Development. The identified red kite nest site offsite is sufficiently distant from the Proposed Development’s turbines that barrier effects to birds accessing and egressing the nest site (if in use) are not anticipated.

12.6.43 Overall red kite flight activity within 200m of Proposed Development's turbine across the 2-year survey period was 71 flights, with 51 of these identified as "at collision risk".

12.6.44 For the purposes of a precautionary assessment, the Proposed Development may affect the potential foraging range for one known breeding pair of red kite. Some limited level of disturbance/displacement may be caused to foraging birds using the Site, with 11.49ha of suitable land onsite directly lost due to the Proposed Development (but still leaving 43.29ha of suitable habitat onsite; 79% retained). Furthermore, there is likely to be some level of avoidance of turbines, although given there is considerable evidence that kites continue to use wind farms, this is not considered likely to reduce breeding success or lead to a subsequent abandonment of the territory by the pair. This is largely due to red kite being documented as using habitat in, and around, operational wind farms (such as Hötker *et al*., 2017[xxxvii]), the limited footprint of the Proposed Development (79% of habitat onsite to be retained), as well as the considerable swathes of alternative foraging habitat both north and south of the Site (including land immediately north of the nest site and the A465).

12.6.45 Overall, operational phase disturbance/displacement to red kite is considered to represent no more than a Long-term, Low magnitude impact at the regional population level, which would result in a Minor Adverse effect that is concluded as being Non-Significant.

Collision Mortality

12.6.46 Incidents of red kite collision fatalities at operational wind farms in the UK are uncommon, but not unprecedented (e.g., Braes of Doune Wind Farm). Despite the potential for collisions, red kite populations are demonstrated to continue to increase in key areas with an increasing number of operational and proposed wind farm development (Sansom *et al*., 2016[xl]).

12.6.47 Collision mortality risks to red kite have been estimated using the SNH CRM (Band *et al.*, 2007[xxvii]) using flight activity data for the period December 2021 to November 2022 (Year 1), and December 2022 to November 2023 (Year 2), with a total of 51 "at collision risk" flights identified.

12.6.48 The SNH CRM estimates an annual collision mortality risk of 0.747 to 0.933 red kites (based respectively on Year 1 and Year 2 survey results) for the Proposed Development, equivalent to 1.338 to 1.071 years per collision, with an avoidance rate of 99%, in accordance with guidance (see SNH, 2018c[xxii], and Urquhart and Whitfield, 2016[xli]).

12.6.49 The annual collision mortality risk predicted (0.747 to 0.933, assuming mortality involves breeding adult birds) is only 0.015% and 0.019% of the Welsh breeding population.

12.6.50 Estimated adult survival rates for red kite are stated as 61% (BTO BirdFacts, 2024a[xlii]), which gives a background mortality of 39% for adult birds. For a Welsh breeding population of 2,500 pairs (thus 5,000 adults) the background rate of mortality equates to 1,950 adults annually.

12.6.51 The additional estimated annual mortality (0.747 to 0.933 birds) resulting from the Proposed Development represents a 0.04% to 0.05% increase in adult mortality for the Welsh red kite population. This is not significant at a national level, nor is it considered likely to be significant at a regional level.

12.6.52 This value is considered likely to overestimate the potential effects of the Proposed Development on baseline mortality given the rapid population growth of red kite in recent years (and thus the breeding population estimate for Wales is likely to exceed the estimate used in this assessment over the lifetime of the Proposed Development), because the baseline mortality is based on the rates in adults (39%) and does not consider juvenile birds (in their first year) which have a higher background mortality rate (50%; BTO BirdFacts, 2024a[xlii]), that wind farms have not been identified as a factor which is hindering red kite population growth (see Sansom *et al.* 2016[xl]), and because there is strong evidence that red kites exhibit high levels of avoidance to collisions with wind turbines, despite continued use of wind farm sites (Whitfield and Madders, 2006[xliii]). Furthermore, during CRM analysis given the distances used as height bands (see Appendix 12.3), all kite flights within 200m of the Proposed Development's turbines, and 0m to 150m had to be regarded, and accordingly this is likely to have included flights below risk height, but precautionarily included.

12.6.53 Although some local level effects cannot be precluded, overall collision mortality risks to red kite are considered to represent no more than a Long-term, Low magnitude impact at the regional population level, which would have a Minor Adverse effect that is concluded as being Non-Significant.

*Kestrel*

Displacement

12.6.54 There is limited evidence of how kestrels are affected by operational wind farms through displacement. This is likely a reflection of the species not being listed as a target species on applicable guidance (SNH, 2017[xxi]), and accordingly few studies have considered the potential issue. Professional experience has however found that kestrel will readily use operational wind farms.

12.6.55 The habitat within 200m of the Proposed Development's turbine locations is typically open grassland habitat, which will provide suitable foraging habitat for red kite. The identified kestrel

nest site offsite is sufficiently distant from the Proposed Development's turbines that barrier effects to birds accessing and egressing the nest site (if in use) are not anticipated.

12.6.56 Overall kestrel flight activity within 200m of Proposed Development's turbine across a 1-year survey period was low, comprising of six flights, with four of these identified as "at collision risk".

12.6.57 For the purposes of a precautionary assessment, the Proposed Development may affect the potential foraging range for one known breeding pair of kestrels, but it is not considered likely to reduce breeding success or lead to a subsequent abandonment of the territory by the pair. This is largely due to the limited footprint of the Proposed Development (79% of habitat onsite to be retained), as well as the considerable swathes of alternative foraging habitat around the nest site including to the south and west.

12.6.58 Overall, operational phase disturbance/displacement to kestrel is considered to represent no more than a Long-term, Low magnitude impact at the regional population level, which would result in a Minor Adverse effect that is concluded as being Non-Significant.

Collision Mortality

12.6.59 The behaviour of kestrel (hovering) is considered to increase the species' vulnerability to collisions with wind turbines (Marques *et al*., 2014[xliv]), and this is reflected by the 95% avoidance rate for the species referenced in NatureScot guidance (SNH, 2018c[xxii]), which is the lowest for all species, and to be used in CRM analysis.

12.6.60 There is evidence of kestrel collisions with wind turbines (Schőll and Nopp-Mayr, 2021[xlv]), and this has principally been identified in the summer and has been attributed to inexperienced, juvenile birds foraging close to operational wind turbines (Barrios and Rodríguez, 2004[xlvi]). The documented/published instances of kestrel collisions with wind turbines have been outside Britain, but the potential for collisions to occur at UK wind farms is considered also possible.

12.6.61 Collision mortality risks to kestrel have been estimated using the SNH CRM (Band *et al*., 2007[xxvii]) using flight activity data for the period December 2022 to November 2023 (Year 2), with a total of four "at collision risk" flights identified.

12.6.62 The SNH CRM estimates an annual collision mortality risk of 0.368 kestrels for the Proposed Development, equivalent to 2.721 years per collision, with an avoidance rate of 95%, in accordance with guidance (SNH, 2018c[xxii]).

12.6.63 The annual collision mortality risk predicted (0.368, assuming mortality involves breeding adult birds) is only 0.069% of the Welsh breeding population (based on an estimate of 530 adult kestrel in Wales[xxxvi]).

12.6.64 Estimated background mortality is documented as 31% for adult birds (BirdFacts, 2024b[xlvii]). For a Welsh breeding population of 265 pairs (thus 530 adults[xxxvi]) the background rate of mortality equates to 164 adults annually.

12.6.65 The additional estimated annual mortality (0.368 birds) resulting from the Proposed Development represents a 0.22% increase in adult mortality for the Welsh kestrel population. This is not significant at a national level, nor is it considered likely to be significant at a regional level.

12.6.66 This value is considered likely to overestimate the potential effects of the Proposed Development on baseline mortality of kestrel, because the baseline mortality is based on the rates in adults (31%) and does not consider juvenile birds (in their first year) which have a higher

background mortality rate (68%; BirdFacts, 2024b[xlvii]), because the lowest updated population estimate for kestrel in Wales has been used as a precaution in the assessment, and because during CRM analysis given the distances used as height bands (see Appendix 12.3), all kestrel flights within 200m of the Proposed Development's turbines, and 0m to 150m had to be regarded, and accordingly this is likely to have included several flights in reality below risk height, but precautionarily included.

12.6.67 Overall collision mortality risks to kestrel are considered to represent no more than a Long-term, Low magnitude impact at the regional population level, which would result in a Minor Adverse effect that is concluded as being Non-Significant

**Decommissioning Phase**

12.6.68 Potential decommissioning effects are considered to be similar to those identified for the construction phase (i.e., disturbance/displacement). Decommissioning effects are therefore not considered separately for each ornithological receptor.

12.6.69 The future of the bird community at the time of decommissioning (30 years) is unknown and cannot be reasonably assumed with any certainty.

12.6.70 In the absence of mitigation, decommissioning effects may result in the destruction of nest sites and disturbance and displacement of medium sensitivity species such as red kite and kestrel.

12.6.71 Providing the implementation of good practice measures such as those summarised in section 12.5 and included in the accompanying OCEMP, which would be amended to form a Decommissioning Environmental Management Plan (DEMP) and include a Decommissioning Breeding Bird Protection Plan (DBBPP), it is unlikely that significant effects upon important ornithological receptors would occur during the decommissioning phase.

## 12.7 Additional Mitigation

12.7.1 Providing the implementation of embedded mitigation outlined in Section 12.5, no significant effects upon red kite and kestrel (or any other ornithological receptor) is predicted to occur as a result of the Proposed Development.

12.7.2 Additional mitigation measures are therefore not required, in accordance with CIEEM guidance (2018[i]).

## 12.8 Residual effects

12.8.1 Residual effects upon ornithological receptors will not be significant.

## 12.9 Implications of Climate Change

12.9.1 The UKCP18 climate change projections, most notably predict increased summer and winter temperatures and higher average precipitation rates in summer and winter (Chapter 15: Climatic Change). These factors are likely to result in an extended breeding bird season with earlier in the year (and likely more) nesting attempts (which has potential to increase breeding productivity, although this will be dependent on prey availability), but contrary to this the increased rainfall is likely to result in higher rates of fledgling mortality.

12.9.2 The opposing potential effects of climatic change on ornithology receptors makes predicting future likely outcomes difficult. There is no reason to consider that the breeding bird assemblage presenting using the Site will change substantially over the lifespan of the Proposed

Development due to climate change. However, breeding productivity, given the predicted substantially higher rates of average precipitation across the lifespan of the Proposed Development (according to the UKCP18 climate change projections) is considered likely to reduce, and this may have some impacts for species recorded, such as red kite and kestrel, which have one (typically, for kestrel) brood per year.

12.9.3 Potential effects on ornithology receptors detailed in this Chapter are not predicted to substantively change in relation to climate change over the lifespan of the Proposed Development.

## 12.10 Habitat Management Measures and Biodiversity Net Benefits

12.10.1 Measures for habitat enhancement, if the Proposed Development is consented, are summarised here and would comprise:

- Pond creation (and looking at opportunities to enhance the overgrown flooded disused mine shaft onsite);
- Enhancement of grassland habitats;
- Targeted clearance of bracken and Schedule 9 plants in the Cefn Gelligaer (west of Deri) SINC;
- Monitoring the Cefn Gelligaer (west of Deri) SINC in relation to assessing the condition particularly of qualifying features (including lapwing);
- Enhancement of connectivity through the Site and into the wider area, through hedgerow planting, improving the condition and species-diversity of existing hedgerows and tree planting (to provide shelter, foraging, nesting and roosting potential for birds); and,
- Identify whether re-wetting the dry ditches onsite, potentially through ditch blocking, is possible (with hydrologist expert input).

12.10.2 The specifics into each measure would be agreed through consultation with NRW, CCBC (and additional relevant stakeholders).

12.10.3 The biodiversity net benefits of these measures are considered in the context of the updated National Planning Policy for Chapter 6 of Planning Policy Wales (PPW[vii]). Where 'policy' is stated below, this is in reference to those stated in this updated Chapter 6.

12.10.4 The policy states that developments should be shaped by the principle of retaining and enhancing existing habitats and species. The measures which would be adopted if the Proposed Development is consented would be enhancement of onsite habitats which would benefit species like red kite and kestrel. Other measures like the adoption of sensitive livestock grazing regimes, to avoid over-grazing, will also benefit birds (including red kite and kestrel) through the enhancement of habitats for prey species, and ground-nesting species like skylark. Given the enhancement measures to be adopted in the Cefn Gelligaer (west of Deri) SINC (particularly the targeted clearance of invasive species) this is in accordance with policy that non-statutory designated sites and habitats need to be properly protected and managed and their role in resilient ecological networks safeguarded.

12.10.5 As per the policy, monitoring, along with rectification strategies, are fundamental for ensuring notable biodiversity, sites and habitats are maintained (or improved where enhancement measures are adopted). Accordingly, monitoring would be undertaken for all enhancement measures summarised in Section 12.10.1 and to be set out in a HMP if the Proposed Development is consented. This includes monitoring of qualifying features (like lapwing) of Cefn Gelligaer (west of Deri) SINC. This would include surveys prior to enhancement and then repeated surveys over the course of the Proposed Development's lifespan. This would ensure

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that biodiversity benefits would be identified, and any rectification measures (if required) adopted. Furthermore, monitoring would be undertaken in relation to the onsite conditions, and this would include monitoring habitats onsite (especially those created as part of the HMP) and ornithology monitoring, including identifying any evidence of bird collisions, and any rectification measures, or improvements, that may be required. The regularity of these monitoring surveys would be agreed with NRW and CCBC.

12.10.6 The policy states that development must minimise the impact on biodiversity and maintain the largest possible area of existing habitat supporting biodiversity and functioning ecosystems, particularly Section 7 habitats and species. With management of these areas and the Section 7 habitats and species key. The measures listed above would benefit Section 7 and CCBC LBAP habitats and Section 7 and CCBC LBAP species (like kestrel and skylark).

12.10.7 Trees and hedgerows are of great importance for biodiversity, as stated in the policy, and all efforts should be made to maintain these habitat features given their multi-faceted role, including in connecting habitats for resilient ecological networks. No tree or hedgerow clearance would be undertaken as a result of the Proposed Development. The creation of hedgerows will contribute towards improving habitat connectivity through that part of the Site and create habitat for foraging and nesting bird species.

## 12.11 Cumulative effects

*Construction phase effects*

12.11.1 Construction activities at nearby projects could result in cumulative disturbance and displacement effects when within close proximity to the Site if undertaken at the same time or consecutively.

12.11.2 A high-level assessment is undertaken on the assumption that for any development to proceed it will be required to comply with legislation and planning policy and a full assessment of effects and subsequent mitigation or compensation will be required, as necessary.

12.11.3 Those consented ('pre-construction') (or 'in planning') wind farm developments (shown in Figure BR10167 045) within 5km of the Site are considered for the potential to contribute to cumulative construction effects. Operational developments are omitted from consideration in the cumulative construction effects given these developments will not contribute to cumulative construction phase effects.

12.11.4 Accordingly, the potential for cumulative effects on ornithological receptors (red kite and kestrel) to occur is only considered in relation to Pengarnddu Industrial Estate, Dowlais Top (P/15/0241) and Pen March (DNS/3253147), which are either pre-construction or 'in planning'.

12.11.5 The potential for effects during construction (habitat loss and disturbance/displacement) on kestrel for Pen March were discounted from assessment and are considered inconsequential. The potential of effects from habitat loss on red kite were also discounted from assessment and are similarly considered inconsequential. Although the effects of disturbance/displacement during construction were assessed for red kite, no significant effects were considered likely, following the implementation of mitigation.

12.11.6 Potential effects during construction on all birds (including kestrel and red kite) for Pengarnddu Industrial Estate, Dowlais Top were considered negligible, with some mitigation adopted.

12.11.7 Therefore, cumulative construction effects of the Proposed Development in-combination with this other two projects (should the developments be constructed simultaneously) are predicted to be Short-term, Minor Adverse and Non-Significant.

*Operational phase effects*

12.11.8 A review of publicly available documentation for those wind farms (and other notable developments) out to 10km (see Figure BR10167 045) for red kite and kestrel (both scoped into detailed assessment), found no evidence of significant displacement effects upon either species. The potential for loss and/or, reduction in available foraging opportunities for these species is therefore considered negligible, in the context of the available opportunities locally and the wider regional spatial scale.

12.11.9 Potential cumulative impacts as a result of operational displacement to red kite and kestrel are therefore not considered likely at any population scale, and a Non-Significant effect is predicted.

12.11.10 Only cumulative operational collision risks for important ornithological receptors (red kite and kestrel) have been considered as being potentially significant for the purposes of this assessment.

12.11.11 The geographic scale at which a cumulative assessment of collision risks for red kite and kestrel has been undertaken is 10km, which is above the maximum documented foraging distance for red kite (6km; in accordance with SNH, 2016a[xiv]), and above the likely the foraging distance for kestrel. Thus, 10km is considered precautionary and a worst-case scenario for the identification of potentially significant cumulative effects.

12.11.12 A summary of predicted cumulative annual collision mortality risks to red kite and kestrel, including the Proposed Development and other wind farm developments (for which data was available), is provided in Table 12.5. All considered wind farm developments, within 10km of the Site, shown in Figure BR10167 045 are considered in the assessment (and include other notable developments, where relevant).

12.11.13 Where the wind farm is marked as 'No information available' within Table 12.5, information required to inform a cumulative assessment is not publicly available or has not been presented. For the purposes of the assessment, it is not possible to include specific projects for which there is no data. Those wind farm developments which are listed with a '0' estimate in Table 12.5, did have publicly available information (or information that could be requested from an LPA), but no collision risk for red kite and kestrel was reported (and thus collision risk estimates for red kite are considered inconsequential).

12.11.14 It is assumed that for at least some of the other developments, particularly those smaller developments (single turbines and/ or <80m high turbines, for example) detailed ornithology surveys may not have been undertaken, and as such effects of these developments on key ornithological features are considered likely to be inconsequential, and cumulative effects with the Proposed Development would also be inconsequential. This lack of cumulative effect of those developments with no publicly available information and the Proposed Development is considered particularly likely given the spatial separation between those developments and the Proposed Development (>1.5km, and typically >3.5km).

12.11.15 Estimates presented for other wind farm developments in Table 12.5 have not been checked or amended to reflect avoidance rates used within the assessment and data is reproduced in good faith.

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**Commented [pa8]:** are we not able to make any assumption about likely cumulative effect given we must know the configuration of the development proposed in these sites and distance from us?

**Commented [CB9R8]:** Added a paragraph below to this effect

Table 12.5 Cumulative Collision Risk for Red Kite and Kestrel

| Development | Status | Distance | Annual collision risk estimate | |
|---|---|---|---|---|
| | | | Red kite | Kestrel |
| Pen Bryn Oer Wind Farm (3-turbine development at 110m tip height) | Operational | 1.6km | No information available. | |
| Pengarnddu Industrial Estate (1-turbine development at 77m tip height) | Operational | 2.1km | No information available. | |
| Pengarnddu Industrial Estate, Dowlais Top (1-turbine development at 77m tip height) | Pre-construction | 2.2km | 0 | 0 |
| Unit 29 Tafaranaubach Industrial Estate, Tredegar (1-turbine development at 74m tip height) | Operational | 2.5km | 0 | 0 |
| Pen March (6-turbine development at 180m tip height) | In planning | 2.7km | 0.1718 | 0.0187 |
| Wauntysswg solar farm | Pre-construction | 3.6km | No information available. | |
| Eurocaps Ltd, Crown Business Park, Dukestown (2-turbine development at 45m tip height) | Operational | 4.9km | Preliminary report available, but no information on any CRM (and whether it was carried out). | |
| Rassau Industrial Estate (1-turbine development at 72m tip height) | Operational | 5.7km | No information available. | |
| Penrhiwgwaith Single Turbine (1-turbine development at 86.5m tip height) | In planning | 6km | No information available. | |
| Rassau Industrial Estate (1-turbine development at 80m tip height) | Pre-construction | 6.3km | Preliminary report available, but no information on any CRM (and whether it was carried out). | |
| Rassau Industrial Estate (1-turbine development at 80m tip height) | In planning | 6.3km | 0 | 0 |
| Penrhiwgwaith Farm (1-turbine development at 87m tip height) | Operational | 6.7km | No information available. | |
| Bedlwyn Farm (1-turbine development at 86m tip height) | Operational | 6.8km | 0 | 0 |
| Pen-yr-heol Farm (1-turbine development at 77m tip height) | Operational | 6.8km | 0 | 0 |

| Development | Status | Distance | Annual collision risk estimate | |
|---|---|---|---|---|
| | | | Red kite | Kestrel |
| Rassau Industrial Estate (1-turbine development at 77m tip height) | Operational | 7km | 0 | 0 |
| Cruglwyn, Mynydd Mamoel (2-turbine development at 86m tip height) | Operational | 7km | 0 | 0 |
| Cefn Bach Farm (1-turbine development at 78m tip height) | Operational | 7km | 0 | 0 |
| Gelli-wen Farm (1-turbine development at 77m tip height) | Operational | 7.6km | No information available. | |
| Silent Valley Waste Services, Cwm, Ebbw Vale (1-turbine development at 102m tip height) | In planning | 8.5km | 0 | 0 |
| Proposed Development | - | - | 0.747 – 0.933 | 0.368 |
| **Total** | **-** | **-** | **0.92518 – 1.1048** | **0.3867** |

*Red kite*

12.11.16 The cumulative collision mortality risk estimates for red kite can be calculated at 0.925 to 1.105 birds per year, which represents 0.019% to 0.022% of the Welsh population estimate for red kite (5,000 adults), and a 0.05% to 0.06% increase in annual baseline mortality for the Welsh population. This is considered an over-estimate as to the percentage of the Welsh red kite population impacted, in the context of the expanding red kite population.

12.11.17 Although some local level cumulative effects cannot be precluded, overall cumulative collision mortality risks to red kite are therefore considered to represent no more than a Long-term, Low magnitude impact at any population level above local level, resulting in a Minor Adverse cumulative effect which is Non-Significant.

12.11.18 This estimate is considered likely to overestimate the potential effects of the Proposed Development on baseline mortality given wind farms have not been reported as hindering red kite population growth (see Sansom *et al*. 2016[xl]), and because there is strong evidence that red kites exhibit a high level of avoidance to collisions with wind turbines, despite continued use of wind farm sites (Madders and Whitfield, 2006[xxxviii], and Whitfield and Madders, 2006[xliii]).

*Kestrel*

12.11.19 The cumulative regional collision mortality risk estimates for kestrel can be calculated at 0.3867 per year, which represents 0.073% of the Welsh population estimate for kestrel (530 adults[xxxvi]), and a 0.236% increase in annual baseline mortality for the Welsh population.

12.11.20 Overall cumulative collision mortality risks to kestrel are therefore considered to represent no more than a Long-term, Low magnitude impact at any population level above local level, resulting in a Minor Adverse cumulative effect which is Non-Significant.

## 12.12 Monitoring

12.12.1 Post-construction monitoring is proposed to assess bird activity from the outset of the operational phase of the Proposed Development, over a period to be agreed with CCBC, in consultation with NRW. This will assess breeding bird activity (and any evidence of collisions) and identify whether any further mitigation/remedial measures are required.

## 12.13 Summary

12.13.1 A summary of the assessment presented within this chapter is set out in Table 12.6.

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Table 12.6. Summary of effects

| Receptor | Description of potential impact | Significance prior to mitigation | Proposed mitigation | Residual effect | Significant / non-significant |
|---|---|---|---|---|---|
| **Construction Phase** | | | | | |
| Red kite | Habitat Loss / Disturbance | Minor adverse, Non- significant | Not required. Good practice protocols included as part of the CEMP to ensure legislative compliance for breeding birds as part of the CBBPP. | Minor adverse. | Non-significant |
| Kestrel | Habitat Loss / Disturbance | Minor adverse, Non- significant | Not required. Good practice protocols included as part of the CEMP to ensure legislative compliance for breeding birds as part of the CBBPP. | Minor adverse | Non-significant |
| **Operation Phase** | | | | | |
| Red kite | Disturbance / Displacement | Minor adverse, Non-significant | Not required. | Minor adverse | Non-significant |
| Red kite | Collision risk mortality | Minor adverse, Non-significant | Not required. | Minor adverse | Non-significant |
| Kestrel | Disturbance / Displacement | Minor adverse, Non-significant | Not required. | Minor adverse | Non-significant |
| Kestrel | Collision risk mortality | Minor adverse, Non-significant | Not required. | Minor adverse | Non-significant |
| **Decommissioning Phase** | | | | | |
| Red kite | Habitat Loss / Disturbance | Minor adverse, Non- significant | Not required. Good practice protocols included as part of a DEMP to ensure legislative compliance for breeding birds as part of the DBBPP. | Minor adverse | Non-significant |
| Kestrel | Habitat Loss / Disturbance | Minor adverse, Non- significant | Not required. Good practice protocols | Minor adverse | Non-significant |

| Receptor | Description of potential impact | Significance prior to mitigation | Proposed mitigation | Residual effect | Significant / non-significant |
|---|---|---|---|---|---|
| | | | included as part of a DEMP to ensure legislative compliance for breeding birds as part of the DBBPP. | | |

**References**

[i] CIEEM (2018, updated 2022). Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.

[ii] The Habitats Regulations https://www.legislation.gov.uk/ukdsi/2019/9780111176573.

[iii] The Environment (Wales) Act 2016 https://www.legislation.gov.uk/anaw/2016/3/contents/enacted.

[iv] The Wildlife and Countryside Act 1981 (as amended) https://www.legislation.gov.uk/ukpga/1981/69.

[v] Arcadis (2021). Future Wales – The National Plan 2040. February 2021. https://www.gov.wales/sites/default/files/publications/2021-02/future-wales-the-national-plan-2040-habitats-regulations-assessment.pdf

[vi] Welsh Government (2022). Written Statement: Biodiversity Deep Dive. https://www.gov.wales/written-statement-biodiversity-deep-dive#:~:text=The%20recommendations%20are%20a%20mixture,this%20Senedd%20term%20and%20beyond.&text=A%20priority%20will%20be%20transforming,freshwater%20and%20marine%20protected%20sites.

vii Planning Policy Wales 11 (2021). Chapter 6 Distinctive and Natural Places https://gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11_0.pdf.

[viii] Welsh Government (2023). Addressing the Nature Emergency through the Planning System: Updated National Planning Policy for Chapter 6 of Planning Policy Wales https://www.gov.wales/addressing-nature-emergency-through-planning-system-update-chapter-6-planning-policy-wales

[ix] Technical Advice Notes 5 (2009). Nature Conservation and Planning https://gov.wales/technical-advice-note-tan-5-nature-conservation-and-planning.

[x] Caerphilly County Borough Council (2010). The Adopted LDP. https://www.caerphilly.gov.uk/business/planning-and-building-control-for-business/local-development-plan/local-development-plan-2010-(adopted)/the-adopted-ldp

[xi] CCBC (2021) Review Report. https://www.caerphilly.gov.uk/caerphillydocs/ldp/ldp_draft_review_report.aspx

[xii] CCBC (2002). Action Plan for Caerphilly County Borough. Species Action Plans. https://www.caerphilly.gov.uk/caerphillydocs/planning/biodiversity-action-plan-for-caerphilly-county-bor.aspx

[xiii] BSI (2013). Biodiversity – Code of practice for planning and development. BSI Standards Publication. BS 42020:2013.

[xiv] SNH (2016a). Assessing connectivity with Special Protection Areas (SPAs). Guidance. Version 3 – June 2016.

[xv] SNH (2018a). Assessing the cumulative impacts of onshore wind farms on birds. Guidance. August 2018.

[xvi] SNH (2018b). Assessing significance of impacts from onshore wind farms outwith designated sites. Guidance. Version 2 – February 2018.

[xvii] Stanbury, A., Eaton, M., Aebischer, N., Balmber, 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 the Isle of Man and

second IUCN Red List assessment of extinction risk for Great Britain. British Birds 114: 723-747.
[xviii] Johnstone, I.G., Hughes, J., Balmer, D.E., Brenchley, A., Facey, R.J., Lindley, P.J., Noble, D.G. and Taylor, R.C. (2022). Birds of Conservation Concern Wales 4: the population status of birds in Wales. Milvus 2:1 (Online First). https://tinyurl.com/BoCCW4
[xix] SNH (2016b). Environmental Statements and Annexes of Environmentally Sensitive Bird Information: Guidance for Developers, Consultants and Consultees. Version 2, September 2016
[xx] SNH (2000). Windfarms and Birds – Calculating a Theoretical Collision Risk Assuming No avoiding Action.
[xxi] SNH (2017). Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms. March 2017, version 2.
[xxii] SNH (2018c). Avoidance Rates for the onshore SNH Wind Farm Collision Risk Model.
[xxiii] NatureScot (2024). NatureScot pre-application guidance for onshore wind farms. August 2022.
[xxiv] SNH (2012). Assessing the cumulative impacts of onshore wind energy developments. Scottish Natural Heritage (SNH), Guidance.

[xxv] Welsh Kite Trust (2023). How Many Kites are there in Wales? http://welshkitetrust.wales/how-many-kites-are-there-in-wales
[xxvi] Local Environmental Records Centre Wales (LERC), maintained by SeWBReC (undated). Caerphilly SINCs. http://citations.lercwales.org.uk/index_sinc_cly
[xxvii] Band, W., Madders, M. and Whitfield, D.P. (2007). Developing field and analytical methods to assess avian collision risk at wind farms. In: de Lucas, M., Janss, G.F.E. and Ferrer, M. (Eds.) Birds and Wind Farms: Risk Assessment and Mitigation, pp 259-275. Quercus, Madrid.
[xxviii] Brown, A.F. and Shepherd, K.B. (1993) A method for censusing upland breeding waders. Bird Study 40, 189-195.
[xxix] Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. and Thompson, D. (2013). Raptors: a field guide to survey and monitoring. Third Edition. The Stationary Office, Edinburgh.
[xxx] Goodship, N.M. and Furness, R.W. (2022). Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. A report from MacArthur Green to NatureScot.
[xxxi] RSPB (2020). Bird use on solar farms, final results. https://community.rspb.org.uk/ourwork/b/science/posts/bird-use-on-solar-farms-final-results
[xxxii] RSK (2023). Chapter 8: Ornithology. Pen March Wind Farm: Environmental Statement (Volume 2) Chapter 8: Ornithology, July 2023. Report for RWE Renewables UK Swindon Ltd.
[xxxiii] Heywood, J.J.N., Massimino, D., Balmer, D.E., Kelly, L., Noble, D.G., Pearce-Higgins, J.W., Woodcock, P., Wotton, S., Gillings, S. and Harris, S.J. (2023). The Breeding Bird Surveys 2022. BTO Research Report 756. BTO, Thetford.
[xxxiv] Hughes, J., Mason., H., Bruce, M and Shorrock, G. (2021). Crimes against raptors in Wales 1990-2019. Birds in Wales 18:1.
[xxxv] Hughes, J., Spence, I.M. and Gillings, S. (2020). Estimating the size of breeding populations of birds in Wales. Birds in Wales, 65-67
[xxxvi] Pritchard, R., Hughes, J., Spence, I.M., Haycock, H. and Brenchley, A. (2021). The Birds of Wales. Adar Cymru. Welsh Ornithological Society.
[xxxvii] Hötker, H., Mammen, K., Mammen, U. and Rasran, L. (2017). Red kites and wind farms – telemetry data from the core breeding range. Wind Energy and Wildlife Interactions pp3-15, In: Köppel J. (eds) Wind Energy and Wildlife Interactions. Springer, Cham.
[xxxviii] Madders, M. and Whitfield, D.P. (2006). Upland raptors and the assessment of wind farm impacts. Ibis, 148, 43–56.
[xxxix] Duffy, K. and Urquhart, B. (2014). Braes of Doune Windfarm report on red kite studies 2004 to 2012. Unpublished report to the Braes of Doune Wind Farm Ornithology Steering Group.
[xl] Sansom, A., Etheridge, B., Smart, J. and 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.
[xli] Urquhart, B. and Whitfield, D.P. (2016). Derivation of an avoidance rate for red kite *Milvus milvus* suitable for onshore wind farm collision risk modelling. Natural Research Information Note 7. December 2016.
[xlii] BTO (2024a). BirdFacts. Red Kite. https://www.bto.org/understanding-birds/birdfacts/red-kite
[xliii] Whitfield, D.P. and Madders, M. (2006) Deriving avoidance rates for red kites *Milvus milvus*. Natural Research Information Note 3. Natural Research Ltd, Banchory, UK.
[xliv] Marques, A. T., Batalha, H., Rodrigues, S., Costa, H., Ramos Pereira, M.J., Fonseca, C., Mascarenhas, M. and Bernardino, J. (2014). Understanding bird collisions at wind farms: An updated review on the causes and possible mitigation strategies. Biological Conservation. 179, 40–52.
[xlv] Schöll, E.M. and Nopp-Mayr, U. (2021). Impact of wind power plants on mammalian and avian wildlife species in shrub-and woodlands. Biological Conservation 256: 109037.
[xlvi] Barrios, L., Rodríguez, A. (2004). Behavioural and environmental correlates of soaring-bird mortality at on-shore wind turbines. Journal of Applied Ecology. 41, 72–81.
[xlvii] BTO (2024b). BirdFacts. Kestrel. https://www.bto.org/understanding-birds/birdfacts/kestrel