Foel Fach Wind Farm Limited.

Foel Fach Wind Farm – Environmental Statement Volume II

Main Written Statement– Chapter 6

Project Reference: 664094

This chapter is summarised within the Non-Technical Summary of this Environmental Statement.

DECEMBER 2025

Energy for generations

Coriolis Energy

RSK

DECEMBER 2025

Energy for generations

CONTENTS

TABLES

VOLUME III: SUPPORTING TECHNICAL APPENDICES

Appendix 6.1: Ornithology
Appendix 6.2: Collision Risk Model Analysis
Appendix 6.3: Ornithology (Confidential)
Appendix 6.4: Habitats Regulations Assessment - Ornithology

VOLUME IV: SUPPORTING FIGURES AND PLANS

Figure 6.1: Ornithological Statutory Designated Sites
Figure 6.2: Vantage Point Flight Activity Survey Plan
Figure 6.3: Breeding Bird Survey Plan
Figure 6.4a: Target Species Flight Activity – Red Kite (Year 1)
Figure 6.4b: Target Species Flight Activity – Other Species (Year 1)
Figure 6.5a: Target Species Flight Activity – Red Kite (Year 2)
Figure 6.5b: Target Species Flight Activity – Other Species (Year 2)
Figure 6.6: Moorland Breeding Bird Survey Results (Year 1)
Figure 6.7: Moorland Breeding Bird Survey Results (Year 2)
Figure 6.8a: Existing Ornithological Records (Cofnod) (Confidential)
Figure 6.8b: Existing Ornithological Breeding Records (Cofnod) (Confidential)
Figure 6.8c: Existing Ornithological Records (RSPB) (Confidential)
Figure 6.8d: Existing Ornithological Breeding Records (RSPB) (Confidential)
Figure 6.9a: Breeding Raptor and Owl Survey Results (Year 1) (Confidential)
Figure 6.9b: Breeding Raptor and Owl Survey Results (Year 2) (Confidential)

6 ORNITHOLOGY

6.1 Introduction

6.1.1 This chapter reports the outcome of the assessment of potential significant effects arising from the Proposed Development upon important ornithological features during the construction, operation and decommissioning phases.

6.1.2 This chapter is supported by the following technical appendices, in the Environmental Statement **(ES) Volume III**:

- Appendix 6.1: Ornithology
- Appendix 6.2: Collision Risk Model Analysis
- Appendix 6.3: Ornithology (Confidential), and
- Appendix 6.4: Habitats Regulations Assessment - Ornithology.

6.1.3 This chapter is supported by the following figures, presented in **ES Volume IV**:

- Figure 6.1: Ornithological Statutory Designated Sites
- Figure 6.2: Vantage Point Flight Activity Survey Plan
- Figure 6.3: Breeding Bird Survey Plan
- Figure 6.4a: Target Species Flight Activity – Red Kite (Year 1)
- Figure 6.4b: Target Species Flight Activity – Other Species (Year 1)
- Figure 6.5a: Target Species Flight Activity – Red Kite (Year 2)
- Figure 6.5b: Target Species Flight Activity – Other Species (Year 2)
- Figure 6.6: Moorland Breeding Bird Survey Results (Year 1)
- Figure 6.7: Moorland Breeding Bird Survey Results (Year 2)
- Figure 6.8a: Existing Ornithological Records (Cofnod) (Confidential)
- Figure 6.8b: Existing Ornithological Breeding Records (Cofnod) (Confidential)
- Figure 6.8c: Existing Ornithological Records (RSPB) (Confidential)
- Figure 6.8d: Existing Ornithological Breeding Records (RSPB) (Confidential)
- Figure 6.9a: Breeding Raptor and Owl Survey Results (Year 1) (Confidential), and
- Figure 6.9b: Breeding Raptor and Owl Survey Results (Year 2) (Confidential).

6.1.4 This chapter (and its associated figures and appendices) is intended to be read as part of the wider ES, with particular reference to **ES Volume II, Chapter 5: Terrestrial Ecology**.

6.2 Consultation and Scope

Scoping Direction

6.2.1 The scope of this assessment has been established through an ongoing scoping process. This has involved the production of an EIA Scoping Report (provided in **ES Volume III, Appendix 1.1: EIA Scoping Report**), which was submitted to Planning and Environment Decisions Wales (PEDW) in July 2024. Further information on the scoping process can be found in **ES Volume II, Chapter 4: Approach to the EIA**.

6.2.2 The Scoping Direction, a copy of which is included in **ES Volume III, Appendix 1.2: EIA Scoping Direction and Addendum**, was received on 05 December 2024 and 18 December 2024.

6.2.3 **Table 6.1** summarises the key Scoping Direction comments related to this ornithology assessment and sets out how these have been addressed by the Applicant. To avoid repetition, information contained elsewhere in the chapter is only briefly summarised in **Table 6.1**, with cross references given to where in the chapter (and/ or accompanying technical appendices or figures) further information is provided.

Table 6.1 Summary of Scoping Direction Comments Relevant to this Ornithology Assessment

ID no.	Issue	Comment Raised	Applicant Response
ID.19	*Consultation*	The applicant's attention is drawn to comments from Natural Resources Wales (NRW) advising the Local Planning Authority (LPA) is consulted regarding local biodiversity net benefit measures and methodologies.	Information from the LPA with regards to the content of the outline Habitat Management Plan (OHMP) has been considered (see below in this table information from Gwynedd Council). See **ES Volume III, Appendix 5.4: Outline Habitat Management Plan**.
ID.20	*Study area*	NRW confirms they are content with the proposed study areas for each ornithological and protected species survey type.	N/A
ID.21	*Data sources*	NRW in their comments agrees with the list of data sources to be used to inform baseline ecological and ornithological conditions.	The full details of the desk study sources consulted is provided in **ES Volume III**, **Appendix 6.1: Ornithology** and summarised in **Section 6.3**.
ID.22	*Surveys*	NRW agrees with the scope of ecological and ornithological field surveys undertaken to inform baseline conditions. They also consider the surveys and methodologies for European Protected Species to be reasonable. The Scoping Report (SR) states that the precise access track to be taken has not been decided and that when decided, depending on its location, further ecological / ornithological surveys may be required. PEDW recommends that when the route has been confirmed, the applicant liaises directly with NRW and the LPA regarding any further survey requirements. Any departure from the	The access track has been appropriately covered during the ornithological surveys, and the survey included extensive buffers used for bird surveys (**ES Volume IV, Figure 6.3: Breeding Bird Survey Plan**). Given the unremarkable habitats present (existing farming track, with grazed species-poor pasture, and nearby hedgerows which will be unaffected by works associated with the Proposed Development), further liaison has not been considered necessary.

ID no.	Issue	Comment Raised	Applicant Response
		advice provided by NRW and the LPA should be supported by a robust rationale in the ES.	
ID.23	*Ornithological features*	NRW in their response states that based on the information provided, the ornithological features identified, and impacts scoped in and out appear appropriate. They state they can confirm this upon sight of the full survey data.	Information on scoped in and out features is provided in **Section 6.2** and further baseline information is provided in the Appendices in **ES Volume III**.
ID.23	*Ornithological features*	NRW adds that the ES must clearly lay out how the three connectivity tests (as outlined in the SR in section 7.3.1) have been addressed for all species features of the Migneint-Arenig-Dduallt Special Protection Area (SPA) and Berwyn SPA. The applicant's attention is drawn to NRW's comments regarding the underpinning Sites of Special Scientific Interest (SSSI) which also include designated ornithological features, as well as features which may be affected by the proposal.	Effects on the Migneint-Arenig-Dduallt SPA and SSSI, and Berwyn SPA and SSSI are considered in **Section 6.6**. Information to inform Habitats Regulations Assessment (HRA), with respect to likely significant effects (LSEs) on the Migneint-Arenig-Dduallt SPA and Berwyn SPA is provided in **ES Volume III, Appendix 6.4: Habitats Regulations Assessment - Ornithology**, where the three evidence-led tests of functional linkage are considered with respect to the classified features of the two named SPAs.
ID.23	*Ornithological features*	NRW expects a comprehensive assessment of potential adverse effects on the site features listed for assessment in the SR and assessment of the combined effects from the proposal with the existing and proposed windfarms in the area.	The assessment of potential adverse effects on the key species scoped in is provided in **Section 6.6** in terms of the Proposed Development alone, and cumulatively with other relevant wind farm schemes in the area (**Section 6.11**).

ID no.	Issue	Comment Raised	Applicant Response
			The Information to inform the HRA (**Appendix 6.4**) specifically provides screening information as part of the HRA process with regards to qualifying species of the Migneint-Arenig-Dduallt SPA and Berwyn SPA. This also considers 'in-combination' effects with other relevant wind farm schemes in the area.
ID.23	*Ornithological features*	The SR states that as turbine specifications and locations have not been finalised yet, detailed analyses of the potential for collision risks for key ornithological species has not been undertaken. The number of scoped in ornithological species may therefore be subject to a reduction once detailed analysis is undertaken. PEDW recommends the applicant liaises directly with NRW on these matters and advises the agreed approach is clearly outlined in the ES. If following consideration of the full survey data, as well as collision risk data when the turbine specification and locations have been finalised, it is agreed to amend the scope in relation to ornithological features, a robust rationale for this should be provided in the ES. Any departure from the advice provided by NRW should also be supported by a robust rationale.	NRW have been consulted with regards to the approach to the ornithological assessment as summarised in this table. **ES Volume III, Appendix 6.2: Collision Risk Model Analysis** provides results of the Collision Risk Model (CRM) analysis undertaken and the rationale for those species which were subjected to the analysis. CRM analysis was not undertaken for hen harrier given the number of at-risk flights for the species was under the threshold (see **Table 6.3**). The collision risk mortality rates are subsequently considered in the assessment in **Section 6.6**.

ID no.	Issue	Comment Raised	Applicant Response
ID.27	*Significant effects*	PEDW notes that the SR states that following review of baseline information and considering potential pathways for effect, ecological and ornithological features would be scoped out if they are unlikely to be so important in the context of the proposed development to warrant detailed assessment, or unlikely to be significantly affected. The SR adds that mitigation measures may still be outlined, to reduce and / or avoid any potentially adverse effects or ensure legislative compliance. PEDW advises that if adverse effects are identified and mitigation measures are relied on to reduce or avoid any potential impacts, these aspects should be scoped into the ES. PEDW also advises that any ecological and ornithological features to be scoped out should be agreed with NRW and the LPA. If it is agreed any effects can be scoped out, a robust rationale for this should be provided in the ES. Any departure from the advice provided by NRW and the LPA should also be supported by a robust rationale.	Noted. Those features scoped in and out are provided (with full justification) in **Section 6.20**, and the assessment considers effects on scoped in features in **Section 6.6**. Any 'additional mitigation' required is considered with respect to scoped in features. The scoped out features have been agreed with NRW and the LPA (through scoping and/or DAS consultation with NRW) and scoped out features (and rationale for scoping out) is provided in **Table 6.30**.
ID.28	*Assessment methodology – ornithology*	NRW confirms they are content with the proposed ornithological assessment approach and states that determining the importance of species and populations identified from surveys should refer to Wales-specific resources and publications, where practical. NRW adds that reference should be made to Birds of Conservation Concern (BoCC) Wales 4 as well as listing on Section 7 of the Environment Act (Wales) 2016, and	NRW have provided information/resources on population estimates in Wales for scoped in species which have been considered in the assessment, in **Section 6.6**. The Hereward *et al*. (2024) report with respect to the red kite population in Wales has been duly considered. Birds on these lists have been considered in this assessment.

ID no.	Issue	Comment Raised	Applicant Response
		Schedule 1 of the Wildlife & Countryside Act 1981 (as amended). The applicant's attention is drawn to their comments regarding the location of relevant population estimates.	Noted. As above. These estimates have been used in the assessment, see **Section 6.6**.
ID.31	*Cumulative assessment*	NRW in their comments confirm they agree with the proposed approach to cumulative ornithological assessment. The SR states that non-wind farm proposals will not be included in the assessment unless specifically requested by key stakeholders. PEDW advises that to ensure a comprehensive assessment in the ES, the applicant liaises with the LPA and other relevant consultees on schemes that should be included in the cumulative assessment, as they will be aware of developments in their area which will need to be considered, which may extend beyond other wind farm developments.	Noted. The cumulative assessment is provided in **Section 6.11**. The Applicant has consulted the LPA (through scoping and a planning performance agreement) on any other schemes (including non-wind) that should be considered in the cumulative assessment. The list of developments considered, out to 10 km as stated in the scoping, is provided in **Section 6.11**.
PEDW DNS: EIA Scoping Direction Addendum 18/12/2024 *Information from Gwynedd Council from*	-	Confirmed that Gwynedd Council said that the following surveys/items should be undertaken to inform the ES: • Breeding and nesting birds; • Migrating birds/raptor flight paths; • Wintering birds; • Assessment of noise and activity impact on breeding birds and foraging / hunting birds; and • The numbers and significance of bird species populations present requires assessment.	The scope of surveys undertaken has been agreed with NRW (see consultation with NRW/PEDW in this table and further consultation discussed in **Table 6.2**). This has included two full years of ornithology surveys, supplemented by desk study gathering (full details regarding baseline gathering is provided in **Appendix 6.1**). Those surveys/features scoped out are provided in **Section 06.2**, with rationale included.

ID no.	Issue	Comment Raised	Applicant Response
September 2024			The assessment considers effects on scoped in features from disturbance (including noise/activity), with the assessment in **Section 6.6**. Information on population estimates of scoped in features are considered in the assessment in **Section 6.6**.
		Advised that Gwynedd Council should be liaised with to confirm which Wildlife Sites are to be included in the impact assessment.	Effects on those ('Candidate') Wildlife Sites onsite have been considered in the assessment. However, given none of these sites list specific ornithological interests, this is addressed in **ES Volume II, Chapter 5: Terrestrial Ecology**.
		Stated that Gwynedd Council noted that the Local Record Centre hold up to date records to inform the baseline assessment.	The Local Record Centre (Cofnod) has been consulted for desk study data, which has been gathered and considered, see details in **ES Volume III, Appendix 6.1** and **Appendix 6.3: Ornithology (Confidential),** and accompanying **ES Volume IV, Figure 6.8a: Existing Ornithological Records (Cofnod) (Confidential)** and **Figure 6.8b: Existing Ornithological Breeding Records (Cofnod) (Confidential).**

ID no.	Issue	Comment Raised	Applicant Response
		Gwynedd Council advised that a biodiversity enhancement plan should be prepared and could include peatland restoration (ditch-blocking), other habitat enhancement like grasslands, woodland and hedgerows, providing features for key species and reducing grazing pressure.	An OHMP has been prepared and is included as **Appendix 5.4**. These include consideration of the measures suggested by Gwynedd Council

Additional Consultation

6.2.4 **Table 6.2** provides a summary of the additional consultation activities undertaken in support of the preparation of this assessment outside of the EIA scoping process.

Table 6.2 Summary of Additional Consultation Undertaken

Consultee	Type of Engagement	Key Matters Raised	Actions in Response to Consultee Comments
Natural Resources Wales (NRW)	Discretionary Advice Service (DAS) 08/08/2022	NRW confirmed that they consider the proposed scope of ornithological surveys to be generally adequate.	N/A
		NRW advised that they do not hold any ornithological population data that have been enquired about and advised that the Core Management Plans are referred to for the latest population data and conservation objectives for the Migneint-Arenig-Ddualllt SPA and Berwyn SPA features.	N/A
		Given close presence of two SPAs, it was noted that two full years of survey data would be expected to be submitted with any planning application, to enable a robust assessment of functional linkage between each site.	Two full years of survey have been undertaken, see **Appendix 6.1** for full details, and a summary, respectively of methodologies and survey results in **Sections 6.3** and **6.4**.

Consultee	Type of Engagement	Key Matters Raised	Actions in Response to Consultee Comments
		Advised that three evidence-led tests of functional linkage / connectivity for all classified features of the Berwyn SPA and the Migneint-Arenig-Dduallt SPA and the proposed development area are clearly determined and presented in the planning submission. The details of these tests are not included here for brevity.	An information to inform HRA report is provided as **Appendix 6.4**, where the three evidence-led tests of functional linkage are considered with respect to the classified features of the two named SPAs.
		Requested that confirmation of the extent of the "immediately surrounding area (where accessible)" that was checked during the late August 2021 reconnaissance visit should be provided.	The reconnaissance visit was a preliminary check of the Site (and immediate surrounding area, viewable from within the Site) which was used to help define survey scope, as well as enable health and safety and logistical considerations to be identified. The results of this visit are not considered relevant to the assessment, other than the survey scope which was determined (partly as a result of the visit), and this scope has been agreed with NRW.
		Advised agreement with the proposed approach regarding black grouse surveys (no surveys required).	N/A
		Advised that Environment (Wales) Act Section 7 moorland and open country species e.g., grasshopper warbler (*Locustella naevia*) should be included in the Moorland Breeding Bird Surveys (MBBS), and this required discussed with the Local Authority's ecologist. Also advised that evidence should also be provided as to why nightjar (*Caprimulgus europaeus*) surveys have not	Environment (Wales) Act Section 7 moorland and open country species ('S7 species') were considered as target species during the MBBS (**Appendix 6.1** for full details), and a summary of results in **Section 6.4**. However, no effects on passerine species are predicted with justification provided in **Section 6.20**.

Consultee	Type of Engagement	Key Matters Raised	Actions in Response to Consultee Comments
		been proposed and how suitable habitat association for this species at the Site has been ruled out.	Furthermore, habitat enhancement to be adopted (**Appendix 5.4**) will benefit moorland and open country species. Nightjar is scoped out of further assessment, and rationale for this is provided in **Table 6.3**.
		Advised that an 800 m buffer zone should be applied to MBBS for breeding curlew (*Numenius arquata*).	The methodology used accords with standard guidance (NatureScot, 2025a) which considers a 500 m buffer. Goodship and Furness (2022) refer to a disturbance limit of 200–300 m for curlew during the breeding season, and thus 500 m well exceeds even the upper disturbance limit. Note that the 800 m displacement reported by Pearce-Higgins *et al*. (2009) has not been recorded in subsequent studies. During the Annex 1/ Schedule 1 raptor and owl searches (which are out to 2 km from the Site) any anecdotal evidence of breeding curlew would also have been recorded, so the reality is the survey buffer would have exceeded 500 m. Furthermore, the Proposed Development is offset from the Site boundary and given the 500 m buffer was from the Site boundary, the survey buffer from the Proposed Development (and the works) would have exceeded 500 m.

Consultee	Type of Engagement	Key Matters Raised	Actions in Response to Consultee Comments
			Breeding curlew were recorded, and so the species presence at the Site (and surrounds) where effects are possible have been robustly assessed in **Section 6.6**.
		Noted changes to Chapter 6 of Planning Policy Wales (PPW) in relation to net benefit for biodiversity and the step-wise approach, green infrastructure and protection for Sites of Special Scientific Interest.	The changes to PPW have been considered in this chapter.
		Sufficient information must be provided to allow the competent authority to enable them to carry out an AA with regards to likely significant effects on relevant SPAs.	An information to inform HRA report is provided as **Appendix 6.4**, where the three evidence-led tests of functional linkage are considered with respect to the classified features of the two named SPAs.
NRW	Scoping Response 26/09/2024	Potential effects on the upland breeding bird assemblage, hen harrier (*Circus cyaneus*), merlin (*Falco columbarius*), peregrine (*Falco peregrinus*) and red kite (*Milvus milvus*) should be considered in the assessment (and any other notable features where effects are possible). Provided information on population estimates to consider in the assessment. *Note for brevity, many of PEDW's responses reverted to NRW, and so some of the above PEDW responses also reflect NRW's response (as stated).*	Effects on relevant species/features are considered (see **Section 6.20**), with the assessment of effects for scoped in species/features provided in **Section 6.6**.

Scope of the Assessment

6.2.5 The technical scope of this assessment has been established through an ongoing scoping process. This assessment has been undertaken in accordance with CIEEM guidelines (2018 (updated 2024)), and considers the following four main potential impacts upon ornithological features associated with wind farm developments:

- Direct habitat loss – as a result of the construction of the Proposed Development.
- Disturbance/displacement – the displacement of birds from the wind farm and surrounding areas as a result of the construction, operation and decommissioning of the Proposed Development.
- Barrier effects – presence of turbines may result in a barrier to established bird movements (during operational phase). This is only likely to arise where there are regular movements along 'corridors' between nest sites and foraging habitats during the breeding season, or between roost sites and foraging habitats during the non-breeding season.
- Collision mortality – mortality resulting from collision or interaction with turbines or other infrastructure which forms part of the Proposed Development during operation.

6.2.6 The ornithological features scoped into further assessment are:

- Migneint-Arenig-Dduallt SPA (and SSSI) – effects during the construction, operational and decommissioning phases on the qualifying species of the SPA and SSSI, with sufficient activity recorded during the surveys. This includes impacts of habitat loss, disturbance/displacement and collision mortality for those qualifying species with sufficient levels of activity. This is due to the Site being within the documented foraging range of at least some qualifying species (taken from Scottish Natural Heritage (SNH)[1], 2016). An information to inform HRA report is also provided assessing for likely significant effects on the Migneint-Arenig-Dduallt SPA.
- Berwyn SPA – effects during the construction, operational and decommissioning phases on the qualifying species of the SPA , with sufficient activity recorded during the surveys. This will include impacts of habitat loss, disturbance/displacement and collision mortality for those qualifying species with sufficient levels of activity. This is due to the Site being within the documented foraging range of at least some qualifying species (taken from SNH, 2016). An information to inform HRA report is also provided assessing for likely significant effects on the Berwyn SPA.
- Red kite – effects during the construction, operational and decommissioning phases will be considered on red kite. Red kite is a Schedule 1 (of the Wildlife and Countryside Act) and Annex 1 of the Birds Directive listed species. This will include potential impacts of habitat loss, disturbance/displacement and collision mortality on the species. Although no evidence of breeding/nesting was recorded during the two-year survey period, the flight activity of the species during survey was high (116 flights over two years of survey, including 90 at-risk height). Red kite is also a qualifying species of the Berwyn

[1] Now known as NatureScot.

SPA, and effects on red kite will be considered in the context of the SPA population.

- Golden plover (*Pluvialis apricaria*) – effects during the construction, operational and decommissioning phases will be considered on golden plover. Golden plover is an Annex 1, Section 7 of the Environment (Wales) Act and BoCC Red list species in Wales. This will include potential impacts of habitat loss, disturbance/displacement and collision mortality on the species. Although no evidence of breeding was recorded during the two-year survey period, and flight activity for the species over the period was relatively modest (total of 19 flights, with 15 of these flights at-risk height), this was sufficient for collision risk modelling to be undertaken for this species. Furthermore, some of the flights comprised notable numbers of golden plover (up to 80 birds) and so although overall activity of golden plover onsite was relatively modest, there were notable numbers of birds recorded.
- Kestrel (*Falco tinnunculus*) – effects during the construction, operational and decommissioning phases will be considered on kestrel. Kestrel is a Section 7 of the Environment (Wales) Act and BoCC Red list species in Wales. This will include potential impacts of habitat loss, disturbance/displacement and collision mortality on the species. Although no evidence of breeding was recorded during the two-year survey period, and flight activity for the species over the period was relatively modest (total of 18 flights, with three of these flights at-risk height), collision risk modelling has been undertaken for this species.

6.2.7 The potential for effects is considered as a result of the Proposed Development alone and cumulatively with other wind farm developments.

6.2.8 CIEEM guidelines (2018) and, in the absence of Welsh-specific guidance, NatureScot (2024) stipulate that in accordance with the principle of proportionate EIA it is not necessary to carry out a detailed assessment of impacts upon ecological (and ornithological) features that are sufficiently widespread, unthreatened and resilient to impacts of a development proposal. As such, the assessment considers effects upon designated sites and ornithological features which are considered important on the basis of relevant guidance and professional judgement.

6.2.9 Where ornithological features are not considered so important as to warrant a detailed assessment, or where they will not be significantly affected on the basis of baseline information, these are 'scoped out' of the assessment (see below). Mitigation measures for such features may, however, still be outlined as appropriate to reduce and/or avoid any potentially adverse impacts or to ensure legislative compliance.

Decommissioning Phase Effects

6.2.10 Decommissioning phase effects are considered to result in no greater scope and magnitude of impacts upon ornithological features than would occur during the construction phase of the Proposed Development, albeit occurring over a shorter timescale. Furthermore, as stated in **Section 6.4**, although accurately predicting changes the number of ornithological species and abundance of species associated with the Site over the lifetime of the Proposed Development is difficult, the future baseline is not predicted to notably change from that of the current baseline.

6.2.11 However, for completeness, decommissioning phase effects upon ornithological features are also considered within this assessment.

Direct Habitat Loss

6.2.12 The Proposed Development will result in the direct and permanent loss of open upland, moorland/grassland habitats as detailed within **ES Volume II, Chapter 5: Terrestrial Ecology**.

6.2.13 Habitat losses have the potential to result in the loss, or otherwise lowered quality, of foraging opportunities for ornithological features which are known to use or inhabit the Site (or the wider area), primarily red kite.

6.2.14 Direct and permanent habitat losses, on the basis of the nature and scale of the Proposed Development, are considered to be small, resulting in an adverse impact upon ornithological features at no more than a "*Local*" level only. However, habitat loss is considered in the assessment specific to those ornithological features that are scoped into the assessment at the construction and decommissioning phases.

6.2.15 All wild birds, their active nests, eggs and dependent young are protected under the provisions of the Wildlife and Countryside Act 1981 (as amended). Site clearance activities during the construction phase of the Proposed Development, where undertaken during the breeding bird season (broadly March to August inclusive), may therefore result in an offence under the act should activities result in the loss or damage to in use nests, eggs or dependent young of any wild bird species. Mitigation measures are therefore outlined to ensure the protection of active nests during the construction phase and further consideration is scoped out of this assessment.

6.2.16 The potential for indirect habitat loss as a result of disturbance and displacement and effects on ornithological features is however, assessed for both the construction and operational phase of the Proposed Development.

Factors Scoped out for Further Assessment

6.2.17 **Table 6.3** presents the features that are scoped out of further assessment, together with appropriate justification. Where a change has occurred since EIA scoping, this is clearly stated and justified.

Table 6.3 Receptor/Matters Scoped Out of Further Assessment

Feature/matter	Phase	Justification	Change since EIA Scoping?
Nightjar	Construction, Operational & Decommissioning	Nightjar are documented to use, and breed within, plantation forest habitat, with the configuration of growth stages within the forest mosaic important for nightjar (Sharps *et al*., 2015). Pre-thicket forest (5-10 years) is considered the most important habitat with other forest stages including restocked forest (0-4 years), pole forest (21-44 years) and thicket forest (11-20 years) also providing habitat to varying degrees. Open habitats such as grazed heathland can be beneficial for foraging nightjar if sufficient nesting habitat is present in proximity to the open habitat. The Site is exposed, upland, open habitat, with no suitable forestry, forestry clearings or clear-fell present. The Proposed Development is offset from the nearest block of mature forestry (> 300 m) and most forestry is much further away from the Proposed Development (>1 km). Furthermore, research reveals that construction works have no detectable effects on breeding/nesting nightjar within 150-200 m (Shewring, 2021), and the disturbance limits for operational wind turbines is reported to be even less. Furthermore, no records of nightjar were returned from the desk study. Nightjar has thus been scoped out of further assessment given it is not predicted to be present in the zone of influence of the Proposed Development.	No. The Scoping Direction stated that if the species is to be scoped out of further assessment, justification should be provided. Justification is provided in this table into why nightjar has been scoped out of further assessment.
Black grouse (*Lyrurus tetrix*)	Construction, Operational & Decommissioning	No records (no evidence during field surveys, and no desk study records within 3 km of the Site), and very localised distribution of the species in North Wales. The desk study revealed several black grouse records (including lekking birds) within an area of moorland	No. The Scoping Direction (and DAS from NRW) agreed that this species would be

Feature/matter	Phase	Justification	Change since EIA Scoping?
		over 3 km west from the Site, which concurs that the black grouse population is very localised in North Wales.	scoped out of further assessment.
Hobby (*Falco subbuteo*)	Construction, Operational & Decommissioning	A breeding pair were recorded near the southern Site boundary (>1 km from the Proposed Development). Only two flights recorded during VP flight activity surveys across an entire two-year period (neither were at-risk height). There is no evidence therefore that the zone of influence of the Proposed Development within the Site is readily used by hobby, or that it provides an important habitat for the species. The breeding hobby territory is on the edge of the Site but well beyond 450 m from the Proposed Development, which is the maximum disturbance buffer recommended for the species (see Goodship and Furness, 2022). Therefore, with embedded mitigation (and pre-construction surveys to ensure works can continue in a legally compliant way) effects on breeding hobby are scoped out.	No. The Scoping Direction agreed that this species would be scoped out of further assessment.
Hen harrier	Construction, Operational & Decommissioning	Qualifying species of the Migneint-Arenig-Dduallt SPA and Berwyn SPA (and component SSSIs of both SPAs). No evidence of breeding of species over the two-year survey period in the study area was recorded. Only two at-risk hen harrier flights were noted during the two years of surveys (two individuals for a total of 155 seconds at-risk height, in Year 2). A total of five flights were recorded during the two-year survey period. There is no evidence therefore that the Site is readily used by hen harrier, or that it provides an important habitat for the species. The desk study results revealed a high number of hen harrier records in the wider area, with the nearest breeding/nesting site over3 km from the Site. Impacts on hen harrier are therefore considered to be inconsequential and are scoped out. However, effects on the Migneint-Arenig-Dduallt SPA and Berwyn SPA and component	Yes. Effects on hen harrier considered to be inconsequential given the very limited usage of the Site. However, effects on the Migneint-Arenig-Dduallt SPA and Berwyn SPA, and component SSSIs are considered.

Feature/matter	Phase	Justification	Change since EIA Scoping?
		SSSIs (and with respect to hen harrier) are considered in **Section 6.6**. An information to inform HRA report is also provided with respect to LSEs on both SPAs (**Appendix 6.4**).	
Peregrine	Construction, Operational & Decommissioning	Qualifying species of the Migneint-Arenig-Dduallt SPA and Berwyn SPA (and component SSSIs of both SPAs). No evidence of breeding of species over the two-year period in the study area. Only two peregrine flights were noted during the two years of surveys (two individual birds for a total of 200 seconds at-risk height, in Year 2). There is no evidence therefore that the Site is readily used by peregrine, or that it provides an important habitat for the species. The desk study results revealed several peregrine records in the wider area, with the nearest breeding/nesting site over 3 km from the Site. Effects on peregrine are therefore considered to be inconsequential and are scoped out. However, effects on the Migneint-Arenig-Dduallt SPA and Berwyn SPA and component SSSIs (and with respect to peregrine) are considered in **Section 6.6**. A report to inform a HRA is also provided with respect to LSEs on both SPAs (**Appendix 6.4**).	No. The Scoping Direction agreed that this species can be scoped out of further assessment. However, effects on the Migneint-Arenig-Dduallt SPA and Berwyn SPA, and component SSSIs are considered.
Merlin	Construction, Operational & Decommissioning	Qualifying species of the Migneint-Arenig-Dduallt SPA and Berwyn SPA. No evidence of breeding of species over the two-year period in the study area. No merlin flights during the two years of surveys. The desk study results revealed several merlin records in the wider area, with the nearest breeding/nesting site >3 km from the Site. Effects on merlin are therefore considered to be inconsequential and are scoped out. However, effects on the Migneint-Arenig-Dduallt SPA and Berwyn SPA and component SSSIs (and with respect to merlin) are considered in **Section 6.6**.	No. The Scoping Direction agreed that this species can be scoped out of further assessment. However, effects on the Migneint-Arenig-Dduallt SPA and Berwyn SPA, and component SSSIs are considered.

Feature/matter	Phase	Justification	Change since EIA Scoping?
		An information to inform HRA report is also provided with respect to LSEs on both SPAs (**Appendix 6.4**).	
Curlew	Construction, Operational & Decommissioning	Only one flight (not at-risk) in two years during VP flight activity surveys, so nil or negligible collision mortality risk during operational phase. During both survey years, two curlew pairs were recorded. In Year 1, both breeding curlew pairs were located >800 m from the nearest proposed turbine and in Year 2, one pair was again >800 m from the nearest turbine, and the second pair was *c*. 650 m from the nearest turbine. This exceeds the upper disturbance limit guideline of 300 m for breeding curlew (Goodship and Furness, 2022) and so no disturbance impacts are predicted. Furthermore, a multi-site survey (Whitfield *et al*., 2010) has previously indicated no displacement impacts on curlew as a result of operational turbines in most cases. The onsite breeding pair, as well as being spatially separated from the Proposed Development (including turbines), is located on lower ground in flatter open valley, down slope from the Proposed Development (where lines of sight of the Proposed Development will be, at least partially, obscured by undulating topography). The Proposed Development is also located uphill from the breeding pair and does not enclose the breeding habitat that the curlew is using in any way. Therefore, no habitat loss predicted. Some of the enhancement measures to be implemented as part of the OHMP will benefit curlew.	Yes. Effects on curlew are considered to be inconsequential given the very limited usage of the Site.
Passerines	Construction, Operational & Decommissioning	Effects on passerines (small perching birds) are scoped out of assessment, in accordance with NatureScot guidance (2025a). As per this guidance, passerines are not considered sensitive to wind farm developments and effects at a population-level are inconsequential. Breeding numbers of passerines recorded during	No. The Scoping Direction agreed that these species would be scoped out of further assessment.

Feature/matter	Phase	Justification	Change since EIA Scoping?
		the MBBS were modest and most species were associated with habitats on the periphery of the Site, such as areas of forestry.	
Other wetland species (incl. waders, migratory waterfowl & gulls)	Construction, Operational & Decommissioning	Very low flight activity of lapwing (*Vanellus vanellus*) (one flight over two-year period), woodcock (*Scolopax rusticola*) (one flight) and snipe (*Gallinago gallinago*) (one flight) were recorded, with no evidence of breeding of these species within the study area. There is no evidence therefore that the Site is readily used by these species or represents an important habitat for the listed waders. A modest breeding number of little grebe (*Tachybaptus ruficollis*) (maximum of two pairs) was recorded at Llyn Maen Bras in the south-west of the Site. Activity of gulls (herring gull (*Larus argentatus*) and lesser black-backed gull (*Larus fuscus*)) was low during the surveys. Due to the very low activity, and with adoption of embedded mitigation effects on these species are scoped out.	No. The Scoping Direction agreed that this receptor/matter would be scoped out of further assessment.
Other raptors, raven, red grouse & cuckoo	Construction, Operational & Decommissioning	Breeding buzzard (*Buteo buteo*), cuckoo (*Cuculus canorus*) (maximum three pairs) and red grouse (*Lagopus lagopus scotica*) (maximum two pairs) were recorded. Raven (*Corvus corax*) was recorded in low number during the field surveys. These species are not considered target species for wind farm surveys (see NatureScot, 2025a), with any effects on these species inconsequential, and so are scoped out.	No. The Scoping Direction agreed that this receptor/matter would be scoped out of further assessment.

6.2.18 The potential effects of lighting on ornithological features is scoped out of further assessment. NatureScot guidance (2020) states that the main risk associated with artificial lighting on wind turbines, is phototaxis (attraction to the lights, and so potentially increasing the collision risk).

6.2.19 The types of birds considered to be at most risk from phototaxis are burrow-nesting seabirds and nocturnally migrating passerines. Species that are considered most at risk from collisions (like large raptors and waterfowl) are not susceptible to phototaxis. There is no route to impact of burrow-nesting seabirds, given the inland nature of the Site, and the Site is not located where migrating passerines are likely to be flying through, such as a coastal headland. Any passing migrating passerines would be passing on a very broad front, not passing through particularly localised areas. Such migratory birds would be passing over innumerable sources of artificial light (like the town of Bala to the south-west), and so apportioning risk to the Proposed Development is not considered appropriate. Such effects of lighting from the Proposed Development are therefore not anticipated to have any adverse effects on ornithological features.

6.2.20 Potential barrier effects are scoped out further assessment. There was no evidence of any important ornithological features using well established routes, or movement corridors, for example between nesting or roost site and foraging grounds. Red kite was the most regularly recorded species and was most active around three 'hotspot' areas, with the highest proportion of the kite activity around Moel Emoel in the south of the Site, around Foel Goch offsite to the north-east, and around Llaithgwm (farm) to the West in the proximity to the Site (**ES Volume IV, Figure 6.4a: Target Species Flight Activity – Red Kite (Year 1)** and **ES Volume IV, Figure 6.5a: Target Species Flight Activity – Red Kite (Year 2)**). Kite movements through the Site itself between these areas were relatively modest in comparison. Furthermore, red kite have been shown to continue using wind farm sites when operational (see Mammen *et al*., 2011). Golden plover (the second most regularly recorded species during the VP flight activity surveys) passed through the Site sporadically, with the largest levels of activity on upper reaches to the north-east of the Site near Foel Goch and in the south of the Site near Moel Emoel, with modest numbers of flights passing between these two areas (**ES Volume IV, Figure 6.4b: Target Species Flight Activity – Other Species (Year 1)** and **ES Volume IV, Figure 6.5b: Target Species Flight Activity – Other Species (Year 2)**). Given the lack of identified established movement routes by important ornithological features, no barrier effects are anticipated as a result of the Proposed Development.

6.3 Methodology

6.3.1 This assessment has been undertaken in accordance with the following legislation, and with regard to the following planning policy and guidance. It should be noted that this chapter does not assess the compliance of the Proposed Development against relevant planning policy. Such an assessment is presented in the **Planning Statement**.

Legislation

- 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')
- The Environment (Wales) Act 2016
- Wildlife and Countryside Act 1981 (as amended)

National Planning Policy

- Planning Policy Wales: Edition 12, Policy 6 'Distinctive and Natural Places' (Welsh Government, 2024), and Section 6 Duty, securing a net benefit for biodiversity and building resilience through the planning system
- Technical Advice Notes 5– Nature Conservation and Planning (Welsh Government, 2009)
- Nature Recovery Action Plan (Welsh Government, 2020)
- Future Wales (Welsh Government, 2021)

Local Planning Policy

- Anglesey and Gwynedd Joint Local Development Plan 'AMG5 – Local Biodiversity Conservation' and 'AMG6 – Protecting Sites of Regional or Local Significance' (March 2022)

Guidance

6.3.2 The following guidance documents have been used during the preparation of this chapter:

- Pre-application guidance for onshore wind farms (NatureScot, 2024)
- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018)
- Recommended bird survey methods to inform impact assessment of onshore wind farms (NatureScot, 2025a[2])
- Assessing connectivity with Special Protection Areas (SPAs) (SNH, 2016)
- Assessing the significance of impacts on bird populations from onshore wind farms that do not affect protected areas (NatureScot, 2025b)
- Windfarms and Birds – Calculating a Theoretical Collision Risk Assuming No Avoiding Action (SNH, 2000)
- Use of Avoidance Rates in the NatureScot Wind Farm Collision Risk Model (NatureScot, 2025c)
- Assessing the Cumulative Impacts of Onshore Wind Farms on Birds (NatureScot, 2025d)

[2] Note, the field surveys were undertaken before the publication of this latest guidance from this year (2025), but the field surveys undertaken (which followed the previous SNH, 2017 guidance) are considered robust and appropriate for informing the assessment.

6.3.3 Note, NatureScot (formerly SNH) guidance is considered in the absence of Welsh-specific guidance, unless otherwise recommended through consultation, which is the standard accepted approach.

Baseline Characterisation

Extent of the Study Area

6.3.4 The main study area within which baseline information in relation to ornithological features has been obtained has comprised the turbine area and buffer areas out to at least 500 m, extended up to 2 km for field surveys of specific species as per current guidance (NatureScot, 2025a) and up to 20 km searches for internationally important designated sites with migratory goose interests (SPAs).

6.3.5 Full details of study areas adopted for desk study and field surveys are provided in **Appendix 6.1** and illustrated on **ES Volume IV, Figure 6.1: Ornithological Statutory Designated Sites to ES Volume IV, Figure 6.3**, and **ES Volume IV, Figure 6.8a to ES Volume IV, Figure 6.8d: Existing Ornithological Breeding Records (RSPB) (Confidential)**.

Desk Study

6.3.6 As per current guidance (NatureScot, 2025a) an initial review of existing ornithological information was undertaken before the commencement of field surveys. This enabled a preliminary overview of likely bird species and populations in proximity to the Site to be formed, identify possible target species for survey and define field survey requirements, which were subsequently agreed in consultation with NRW (see **Table 6.1** and **Table 6.2**).

6.3.7 The desk study has comprised a review of designated sites within proximity to the Site and consultation with specialist recording groups for existing ornithological records from the Royal Society for the Protection of Birds (RSPB) and Cofnod (North Wales Environmental Information Service).

6.3.8 Full details and results of the desk study undertaken are provided in **Appendix 6.1** and **Appendix 6.3**.

Field Study(s)

6.3.9 The following field surveys were carried out between 2021 and 2023 to inform the design and assessment of the Proposed Development:

- Vantage Point (VP) flight activity surveys
- Moorland Breeding Bird Surveys (MBBS), and
- Annex 1/ Schedule 1 Breeding raptor and owl searches.

6.3.10 Surveys have been undertaken in accordance with NatureScot guidance applicable at the time of surveys (SNH, 2017[3]) and full details are provided in **Appendix 6.1**.

[3] Note the guidance has been recent updated (NatureScot, 2025a). The surveys were completed prior to the updated guidance in March 2025. This is not considered an issue given the guidance are largely comparable, with one of the main differences the inclusion of gulls as target species in the 2025 guidance. Gulls were treated as secondary species during surveys (following SNH, 2017) Only low numbers of flights of herring and lesser black-

6.3.11 Current guidance (NatureScot, 2025a) recommends that a minimum of two years of ornithological surveys are carried out to inform the assessment of wind farm developments, unless it can be demonstrated that a shorter period of survey is sufficient. The collated dataset therefore provides two years of ornithological survey data, with data gathered within the last five years in accordance with guidance.

Target Species

6.3.12 Target species for survey and recording have been drawn from the following lists adopting a precautionary approach and with reference to current guidance (NatureScot, 2025a and 2025b):

- Annex 1 of the EC Birds Directive
- Schedule 1 of the Wildlife & Countryside Act 1981
- 'Red-listed' Birds of Conservation Concern in the UK (Stanbury *et al*., 2021), and 'Red-listed' Birds of Conservation Concern specific to Wales (Johnstone *et al*., 2022), and
- Section 7 species of the Environment (Wales) Act 2016.

6.3.13 The broad selection of target species for survey and recording included qualifying interests or features for identified designated sites for nature conservation (**Table 6.7**) and for which core foraging ranges in accordance with current guidance (SNH, 2016), overlap with the Site.

6.3.14 Passerine species were not identified as target species for survey and recording and are not considered sensitive to wind farm developments (NatureScot, 2025a and 2025b). Observations of notable passerine species e.g. those listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and/or Red-listed BoCC species (i.e. Stanbury *et al*., 2021 and/ or Johnstone *et al*., 2022) during MBBS were however recorded. Note, this was extended to include those species listed on Section 7 of the Environment (Wales) Act 2016, as requested through consultation (**Table 6.1**). Given kestrel is a Red-listed species in Wales (see Johnstone *et al*., 2022) and a Section 7 species this was treated as a target species during surveys in Year 2.

6.3.15 Gulls and commoner raptor species including buzzard and sparrowhawk (*Accipiter nisus*) were not identified as target species given their general widespread number and abundance but were recorded as secondary species during VP flight activity surveys[4].

6.3.16 Note, other wetland species such as grebes, were also recorded as target species for survey.

Field Survey Personnel

6.3.17 All field surveys were completed by experienced, reputable and professional ornithologists, fully conversant in established bird survey methodologies for proposed wind turbine developments.

6.3.18 Details of the field surveyors used are provided in **Appendix 6.1.**

backed gulls were recorded during surveys. This approach to surveys was agreed with NRW during consultation as detailed in **Tables 6.1** and **6.2**.

[4] This accorded with the guidance at the time of the surveys (SNH, 2017).

Assessment Methodology

6.3.19 Assessment has been undertaken in accordance with CIEEM guidance (2018) and includes the following stages:

- determination and evaluation of important ornithological features
- identification and characterisation of impacts
- assessment of the significance of effects prior to mitigation measures
- 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 (if appropriate), and
- identification of opportunities for biodiversity enhancement.

6.3.20 The assessment has also been undertaken with reference to NatureScot guidance (SNH, 2016 and NatureScot 2025b) on the assessment of wind farm developments in relation to designated sites and those located within the wider countryside.

6.3.21 In accordance with current NatureScot guidance (NatureScot, 2025b) the assessment of impacts has been undertaken at a regional scale (where this is information is available) with regards species populations, unless an alternative geographical scale is considered appropriate on the basis of best available information. Effects on qualifying species of designated sites are also considered at the SPA population level, and with respect to red kite, populations are taken from Hereward *et al*. (2024).

Requirements for Mitigation

6.3.22 A step-wise approach (mitigation hierarchy) has been adopted to avoid, mitigate and compensate for potential ornithological impacts as a result of the Proposed Development:

- Avoidance is used where an impact has been avoided e.g., through changes in scheme design.
- Mitigation is used to refer to measures to reduce or remedy a specific negative impact in situ.
- Compensation describes measures taken to offset residual effects, i.e., where mitigation in situ is not possible.
- 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.

Assessment of Residual Effects

6.3.23 Where the assessment proposes measures to mitigate adverse effects on ornithological features, a further assessment of residual effects, taking into account any ornithological mitigation recommended has been undertaken.

Assessment of Cumulative Effects

6.3.24 Potentially significant cumulative effects can result from individually not significant but collectively significant actions taking place over a period of time or concentrated in a location.

6.3.25 Cumulative impacts have therefore been assessed with reference to guidance (NatureScot, 2025c) for important ornithological features subject to a detailed assessment.

6.3.26 The cumulative assessment therefore includes consideration of:

- Existing wind farm developments, either built or under construction
- Approved wind farm developments, awaiting implementation, and
- Proposals awaiting determination within the planning process with design information in the public domain.

6.3.27 Other major non-wind developments are also considered for completeness (see **Section 6.11** for the list considered).

6.3.28 Those developments which have been withdrawn and/or refused, are not considered, unless an appeal is currently in progress and information is available.

6.3.29 With regard to the spatial extent of the cumulative assessment, guidance (SNH, 2018) recommends that cumulative effects should typically be assessed at the relevant regional scale, unless there is a reasonable alternative.

6.3.30 An approach has been adopted for the purposes of this assessment and in accordance with the maximum documented foraging range of target species potentially present, a search area ('zone of influence', ZoI) out to 10 km, is used to determine the spatial extent over which the cumulative assessment is undertaken. This ZoI was agreed through consultation (see **Table 6.1**) and was set out in the EIA Scoping Report.

Requirements for HRA

6.3.31 The Site is in proximity to Migneint-Arenig-Dduallt SPA and Berwyn SPA where effects on the designated site's qualifying species are considered possible.

6.3.32 Accordingly, **Appendix 6.4** provides a 'screening' stage where the Proposed Development is examined to determine if it is likely to have a significant effect on the aforementioned protected sites. **Appendix 6.4** also provides information to inform an HRA to allow the competent authority to undertake an appropriate assessment (AA), where a likely significant effect cannot be ruled out.

Assessment Criteria

Determining Importance

6.3.33 Relevant European, national and local guidance has been referred to in order to determine the importance of ornithological features. Reference has also been made to NatureScot guidance on "*Priority*" bird species for assessment, when considering the development of onshore wind farms (NatureScot, 2025b). Although this is guidance for Scotland, it is applicable to Welsh onshore wind farms, in the absence of Welsh-specific guidance.

6.3.34 In addition, importance has also been determined using professional judgement and taking account of the results of baseline surveys, desk study and the importance of features within the context of the regional ('Gwynedd' or 'North Wales'; where available) geographical area.

6.3.35 For the purposes of this assessment the importance of ornithological features is considered within a defined geographical context, from 'Local' to 'International', as outlined in **Table 6.4**.

6.3.36 It should be noted that importance does not necessarily relate to the level of legal protection that a feature receives, and ornithological features 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.

6.3.37 Similarly, while a particular feature may be associated with a nearby internationally designated site, the feature is not automatically assigned a value of "*International*" importance, for example if only recorded rarely and in low numbers.

Table 6.4 Geographic Scale of Ornithological Feature Importance

Importance	Definition
High – International/ National	An internationally designated site e.g. a SPA and/or Ramsar site or candidate site (e.g. cSPA), a nationally designated site e.g. a SSSI, and qualifying features of such sites. A regularly occurring species present in internationally important numbers (>1 % of its biogeographic population) listed under Annex 1 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. A regularly occurring species present in nationally important numbers (>1 % of its Welsh population) and listed as a Section 7 'priority' species of the Environment (Wales) Act, Red-listed bird of Conservation Concern (Stanbury *et al*., 2021 and/ or Johnstone *et al*., 2022) and 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 its regional population, where available), or appropriate alternative and listed as a UK BAP, Section 7 'priority' species of the Environment (Wales) Act, Red-listed bird of Conservation Concern (Stanbury *et al*., 2021 and/ or Johnstone *et al*., 2022) and listed under 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.

Characterising Impacts

6.3.38 Once identified, potential impacts are described with reference to the following characteristics as appropriate:

- Positive or negative
- Extent
- Magnitude
- Duration
- Timing
- Frequency, and
- Reversibility.

6.3.39 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 impacts is described as follows:

- Negligible: of inconsequential duration
- Short-term: for 1 to 5 years
- Medium-term: for 5 to 10 years
- Long-term: >10 to 40 years, and
- Permanent: >40 years.

6.3.40 The likelihood or probability that an impact will occur is also described as far as possible based on best available information and professional judgement and is referred to using the following terms: certain, likely, unlikely or highly unlikely where appropriate.

6.3.41 The criteria used to determine the magnitude of impact are set out in **Table 6.5.**

6.3.42 It is important to note that where reference is made to population level impacts to assess magnitude (e.g. at the regional and/ or SPA population level), population estimates used are considered to be guides. Up to date population estimates have been resourced where possible and confidence in these estimates are provided where required in the assessment.

6.3.43 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 wind farm site, immediate or wider area. Where uncertainty arises, a precautionary approach has been adopted.

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

Table 6.5 Impact Magnitude

Magnitude	Definition
Very High	The impact (either on its own or in-combination with other proposals) may result in the long-term or permanent total or almost complete loss of a site and/or species status or productivity. E.g. Affecting >80 % of the regional population estimate (or appropriate alternative) and/or SPA population.
High	The impact (either on its own or in-combination with other proposals) may adversely affect the conservation status of a site/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. E.g. Affecting 21%-80 % of the regional population estimate (or appropriate alternative), and/ or SPA population.
Medium	Biodiversity conservation status of a site or population would not be adversely affected, 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. E.g. Affecting 6 %-20 % of the regional population estimate (or appropriate alternative), and/ or SPA population.
Low	None of the above applies, but some minor adverse effect is evident on a temporary basis or affects extent of habitat/species abundance in the local area. E.g. Affecting 1 %-5 % of the regional population estimate (or appropriate alternative), and/or SPA population.
Negligible	No observable adverse effect. E.g. Affecting <1 % of the regional population estimate (or appropriate alternative), and/or SPA population.
Beneficial	The impact is considered to be beneficial to a species or sites nature conservation status.

Determining Significance

6.3.45 For the purposes of assessment, a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important features' or for biodiversity in general.

6.3.46 Significant effects encompass impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution) and are identified on the basis of magnitude, professional judgment and best available evidence.

6.3.47 CIEEM guidance (2018) notes 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 can be lawfully permitted following EIA procedures.*"

6.3.48 For the purposes of this assessment, significant effects are primarily expressed with reference to the regional and/ or SPA population scales, in line with NatureScot's interests of a species status at wider spatial levels (NatureScot, 2025b). The significance of effects at other geographical scales (such as local or national) is also expressed where appropriate and where sufficient information allows a meaningful assessment.

6.3.49 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.

6.3.50 CIEEM guidance (2018) does not recommend the sole use of a matrix table as commonly set out in ES Chapters to determine 'significant' and 'not significant' effects. For the purposes of this assessment presented herein, **Table 6.6** sets out adapted CIEEM terminology and equivalent EIA terms, for ease of interpretation. Within **Table 6.6**, 'major' and 'moderate' are considered as significant in the context of the EIA regulations (and these are shown in **bold**).

Table 6.6 Determining Significance

Sensitivity	Impact Magnitude				
	Very high	High	Medium	Low	Negligible
High	**Major**	**Major/ Moderate**	**Moderate**/ Minor	Minor	Negligible
Medium	**Major/ Moderate**	**Moderate**	Minor	Minor/ Negligible	Negligible
Low	**Moderate**/ Minor	Minor	Minor	Minor/ Negligible	Negligible

6.4 Baseline Conditions

Existing Baseline

6.4.1 This section provides a summary of baseline ornithology conditions in relation to:

- statutory designated sites nature conservation with ornithological interests;
- target species flight activity; and
- distributions and abundances of breeding bird species as recorded during baseline ornithology surveys and established from desk study.

6.4.2 Detailed information regarding desk study records and field survey results is presented in **Appendix 6.1** and **Appendix 6.3** and as relevant within the "Predicted Impacts" (see **Section 6.6**) with regards important ornithological features.

Designated Sites for Nature Conservation

6.4.3 This section should be read with reference to **ES Volume IV, Figure 6.1**.

6.4.4 **Table 6.7** provides a summary of statutory designated sites with cited ornithological interests located within 10 km of the Site. Note that this search was extended to 20 km for internationally designated sites with migratory waterfowl interest, but no such sites are located within this radius of the Site.

6.4.5 Sites designated for other ecological features are addressed separately in **ES Volume II, Chapter 5: Terrestrial Ecology**.

6.4.6 The distances specified within **Table 6.7** are measured from the Site to the designation boundary at its nearest point.

Table 6.7 Designated Sites for Nature Conservation

Designated Site	Distance and Direction	Qualifying Interests
Migneint-Arenig-Dduallt SPA and SSSI	805 m, west	Breeding populations of: • Hen harrier • Merlin, and • Peregrine. *The SSSI citation states that the site also supports other upland bird species which form part of an assemblage of special interest, and these include red grouse, black grouse, golden plover, dunlin (Calidris alba), snipe, curlew, short-eared owl (Asio flammeus), whinchat (Saxicola rubetra), stonechat (Saxicola torquata), wheatear (Oenanthe oenanthe), ring ouzel (Turdus torquatus) and raven.*
Berwyn SPA and SSSI	7.3 km, south-east	Breeding populations of: • Hen harrier • Merlin • Peregrine, and • Red kite. *The SSSI citation states that the Site also supports significant proportions of the Welsh populations of other breeding species including short-eared owl, golden plover, red grouse and black grouse.*

6.4.7 There are 79 Gwynedd 'Wildlife Sites' (all Candidate Wildlife Sites) within 2 km of the Site. Of these, there are three Candidate Wildlife Sites within the Site ('Llandderfel', 'Llwyn-y-brain heath' and 'Nant Gau'). However, none of these Candidate Wildlife Sites have any listed ornithological features. See full details of all identified Wildlife Sites (including Candidate Wildlife Sites in **ES Volume IV, Figure 5.2: Ecological Non-Statutory Designated Sites (Confidential).**

VP Flight Activity Surveys

6.4.8 Target species flight activity recorded during the entire VP survey effort (September 2021 – August 2023) is summarised in **Table 6.8.** The total number of flights, total number of birds recorded, and the flight time (seconds) are presented. Note, **Table 6.8** provides information of all target species flights, with **Table 6.9** summarising which of these target species flights were at-risk from collision[5]. Note, of these target species collision risk modelling has been undertaken for red kite, golden plover and kestrel (those with ≥3 at-risk flights during a survey year). CRM analysis followed the approach from Band *et al.* (2007), but with due regard given to the recent updated guidance (Band, 2024).

6.4.9 Detailed flight records are presented in **Appendix 6.1**, with flight lines illustrated in **ES Volume IV, Figure 6.4a** to **ES Volume IV, Figure 6.5b**.

Table 6.8 Target Species Flight Activity Summary (All Flights)

Species	Total No. of Flights	Total No. of Birds	Flight Time (seconds)
Red kite	116	141	19,719
Golden plover	19	537	3,292
Kestrel	18	20	2,062
Hen harrier	5	5	571
Hobby	2	3	58
Peregrine	2	2	200
Curlew	1	1	18
Lapwing	1	1	95
Woodcock	1	1	75
Snipe	1	1	10

[5] At-risk from collision flights are those at height bands 2 - 6 – at rotor sweep height (29 - 220 m) and within 300 m of proposed turbine locations for all target species. It is based on a worst-case scenario of 220 m tip height, 87.5 m maximum rotor diameter and 114.45 m – 132.46 m hub height, thus considering the upper limit of the larger turbines (220 m tip height) and lower limit of the smaller turbines (29 m minimum rotor sweep height).

Table 6.9 Target Species At-Risk Flight Activity Summary

Species	Total No. of Flights	Total No. of Birds	Flight Time At-Risk Height (seconds)
Red kite	63	69	12,023
Golden plover	11	333	1,985
Kestrel[6]	3	5	220
Hen harrier	2	2	155
Peregrine	2	2	200
Snipe	1	1	10

Moorland Breeding Bird Surveys

6.4.10 In summary, the study area was found to support a limited moorland breeding bird assemblage with a small number of territories, with only one breeding species of ground-nesting wader recorded (curlew). Information of those recorded breeding species is provided in **Table 6.10** for Years 1 (2022) and 2 (2023), noting, that information for non-moorland species is also provided for completeness, given these relate to Section 7 species. Most of the breeding territories were on peripheral areas of the Site, with the highest concentration of breeding species in the south of the Site associated with Llyn Maen Bras and forestry adjoining the southern Site boundary.

6.4.11 Further details of the breeding bird assemblage recorded is provided in Appendix 6.1, and the accompanying ES Volume IV, Figure 6.6: Moorland Breeding Bird Survey Results (Year 1) and ES Volume IV, Figure 6.7: Moorland Breeding Bird Survey Results (Year 2).

Table 6.10 Breeding Bird Territories/ Pairs – Within Study Area

Species	No. of Territories / Pairs	
	2022	2023
Curlew	2	2
Little grebe	2	1
Grasshopper warbler	2	1
Red grouse	0	2
Lesser redpoll (*Acanthis cabaret*)	3	1
Spotted flycatcher (*Muscicapa striata*)	1	1

[6] Recorded as a target species in Year 2 only.

Species	No. of Territories / Pairs	
	2022	2023
Linnet (*Linaria cannabina*)	3	2
Tree pipit (*Anthus trivialis*)	1	2
Cuckoo	3	3
Reed bunting (*Emberiza schoeniclus*)	2	0
Common crossbill (*Loxia curvirostra*)	3	0
Wood warbler (*Phylloscopus sibilatrix*)	0	2

6.4.12 The desk study revealed records of species including curlew, lapwing, golden plover, snipe and black grouse within 6 km of the Site. Information related to desk study records are provided in **Appendix 6.3** and the accompanying **ES Volume IV, Figure 6.8a** to **Figure 6.8d.**

Annex 1/ Schedule 1 Breeding Raptor and Owl Searches

6.4.13 The desk study revealed records of breeding (confirmed or suspected) hen harrier, peregrine, red kite, goshawk (*Accipiter gentilis*), merlin, hobby and short-eared owl within 6 km of the Site. All desk study records are provided in **Appendix 6.3** and the accompanying **ES Volume IV, Figure 6.8a** to **Figure 6.8d**.

6.4.14 Breeding raptor and owl searches recorded breeding evidence for one Schedule 1 raptor species within the study area: hobby. A breeding hobby territory was identified in the south of the Site during both survey years (2022 and 2023).

6.4.15 Red kite and kestrel (including pairs) were recorded during surveys, with both species using the Site for foraging and traversing, but no evidence of breeding was recorded for either of these species (nor any other Annex 1/ Schedule 1 raptor or owl species).

6.4.16 Further details relating to these raptor and owl searches are provided in **Appendix 6.1**, with sensitive locations of hobby provided in **Appendix 6.3**, and the accompanying **ES Volume IV, Figure 6.9a: Breeding Raptor and Owl Survey Results (Year 1) (Confidential)** and **Figure 6.9b**: **Breeding Raptor and Owl Survey Results (Year 2) (Confidential).**

Sensitive Features

6.4.17 The following sensitive receptors have been assessed (with the importance assigned):

- Migneint-Arenig-Dduallt SPA (and component SSSI) – both the SPA and SSSI are assigned a 'High' importance, given this is an international (SPA) and national (SSSI) designated site
- Berwyn SPA (and component SSSI) – both the SPA and SSSI are assigned a 'High' importance, given this is an international (SPA) and national (SSSI) designated site

- Red kite – assigned a 'Medium' importance given the relatively high activity during field surveys (albeit no evidence of breeding was recorded). Assuming there is at least one pair in the wider area this would represent 1.01 % of the North Wales population (99 pairs; from Hereward *et al.*, 2024). Given the spatial separation between the Site and the Berwyn SPA (and SSSI; for which kite is a qualifying species) it is considered unlikely (but not impossible) that kite recorded during field surveys are representative of SPA/SSSI birds. In the event that at least some of the red kite are (particularly during the non-breeding season when red kite may range up to 10 km (Pendlebury *et al.*, 2011)) from the SPA/SSSI, as a precaution, one pair from the Berwyn SPA (and out to 2 km) would represent 1 % of the Berwyn SPA population (estimates from Hereward *et al.*, 2024)
- Golden plover – assigned a 'Low' importance. No evidence of breeding was recorded, with most activity recorded during the non-breeding season (14 of the 19 flights recorded during VP flight activity surveys) and flocks in late April also considered to be birds passing through the Site to breeding grounds elsewhere. Activity was sporadic with no particular parts of the Site appearing to be favoured (and birds just passing through and not settling/using habitats onsite). Non-breeding golden plover flocks are highly mobile and are best considered nationally rather than at a regional scale. The non-breeding population in Wales for 2017/18 is 10,000 birds (Hughes, 2021), but an estimate for the period 2012/13 to 2016/17 is of 20,302 birds (obtained from count data from the BTO WeBs website, 2025[7]), and
- Kestrel – assigned, as precaution, a 'Medium' importance. No contemporary regional (North Wales) estimates are available, but the Welsh population is 530-850 pairs based on surveys between 1997-2002 (Pritchard *et al.*, 2021), and another report states the breeding population as 1,750 pairs (Hughes, 2021). The species has suffered a notable national decline in Wales. No evidence of breeding recorded, and activity (total of 18 flights during Year 2 VP flight activity surveys) was principally hunting birds.

6.4.18 With respect to the locations of the Migneint-Arenig Dduallt SPA (and SSSI) and Berwyn SPA, these are shown on **ES Volume IV, Figure 6.1**, for flight activity of red kite this is shown on **ES Volume IV, Figure 6.4a** and **ES Volume IV, Figure 6.5a** and for flight activity of golden plover this is shown on **ES Volume IV, Figure 6.4b** and **ES Volume IV, Figure 6.5b.**

Future Baseline in the Absence of the Proposed Development

6.4.19 In the absence of the Proposed Development, or assuming a gap between baseline surveys and the commencement of the Proposed Development construction, changes in baseline ornithology conditions (i.e. distributions and populations) are most likely to result from habitat modifications within or surrounding the Site due to land management practices. In the absence of the Proposed Development, the habitats within the Site are considered to largely remain under the existing management regime. This comprises grazing by livestock (sheep and cattle). Commercial forestry operations within adjacent plantation forestry, such as felling,

[7] This is the sum of each 5-year mean count from each WeBS site in Wales from the BTO website. This estimate could include some double recording of birds moving from one to another (if close by), but equally the WeBS counts do not include sites away from estuaries and wetlands (which golden plover may use).

may also alter the distribution of ornithological species in the wider area; however, it is highly unlikely this would be in such a way as to substantially alter the baseline reported here.

6.4.20 The Site is not subject to any other development pressures or management which would affect the habitats or ornithological species in such a way that the present baseline conditions presented here would become substantively different. Breeding bird densities would therefore 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. The establishment of new breeding raptor territories within the Site is considered unlikely, given the general absence of suitable nesting habitat features such as deep heather swards, crags, steep scree and mature woodland onsite, particularly in close proximity to the Proposed Development's turbines.

6.4.21 While short-term and small-scale variability in ornithological populations and distributions may occur, and revisions to conservation statuses and designations are possible, such changes would be unlikely to qualitatively alter the conclusion of the assessment presented within and have been accounted for through application of a precautionary approach and appropriate mitigation.

6.4.22 In the long-term, climatic changes may include increased summer and winter temperatures and higher average precipitation rates in summer and winter. These factors are likely to result in an extended breeding bird season with earlier in the year (and likely more) nesting attempts for those species that have multiple broods, which has potential to increase breeding productivity (although this will be dependent on prey availability). However, given the substantially higher rates of average precipitation predicted across the next 40 years, breeding productivity may be reduced, and this may have notable effects for species which have one brood per year.

6.4.23 The opposing potential effects of climatic change on ornithology receptors makes predicting future likely outcomes difficult. However, there is no reason to consider that the breeding bird assemblage presenting using the Site will change substantially during the operational lifetime of the Proposed Development due to climate change.

6.5 Mitigation Embedded into the Design

6.5.1 The embedded mitigation relevant to this assessment is detailed in **Table 6.11.**

Table 6.11 Embedded Mitigation

Embedded Mitigation Measure Relevant to Ornithology	Function
Turbines offset (where possible) from areas with the highest activity of target species, including red kite and golden plover. These 'hotspot' areas included Moel Emoel for both species (golden plover during the non-breeding season in Year 2), and Llaithgwm to the west in the proximity of the Site with regards to red kite (see **ES Volume IV, Figures 6.4a**, **6.5a** and **6.5b**). Red kite activity	To reduce collision risk with target species and minimise affecting the most heavily used habitats for target species.

Embedded Mitigation Measure Relevant to Ornithology	Function
was notably associated with the peak Foel Goch to the north-east of the Site, and turbines have been located away from the Site boundary at this locality.	
Turbines have been appropriately offset from the identified breeding curlew territories, with all turbines at least 650 m from estimated territory locations, and the majority >800 m offset (which exceeds the upper disturbance limit reported in Goodship and Furness (2022)). Curlew breeding territories in relation to the Proposed Development are shown in **ES Volume IV, Figures 6.6** and **6.7**.	To minimise the potential for displacing breeding curlew.
The Proposed Development has been located away (at least 300 m, and typically >1 km) from potentially important habitat features including forestry habitat on the periphery of the Site to the south, and from the reservoir Llyn Maen Bras in the south of the Site. Noting, the habitat close to Llyn Maen Bras supported breeding hobby in both survey years.	To minimise the potential for negative effects on birds in key areas which have potential to be focal points for some species (including waterfowl and raptors).
Design evolution resulted in avoidance of main areas of deeper peat where possible.	Areas of deeper peat are predicted to be some of the best peatland habitat for birds, such as ground-nesting species (passerines and waders).

6.5.2 The extent of the micro-siting allowance to be included (50 m) would not undermine any of the mitigation measures listed in **Table 6.11**.

6.5.3 To ensure works can proceed in a legally complaint manner and not result in an offence under the Wildlife and Countryside Act (1981), pre-construction checks for nesting birds would be undertaken. The results of the pre-construction checks would be considered and included within a Breeding Bird Protection Plan (BBPP), and the BBPP would be secured as part of the Construction Environmental Management Plan (CEMP).

6.5.4 Details of the CEMP are provided in the **Section 6.7**. Furthermore, as part of the CEMP an Ecological Clerk of Works (ECoW) would be employed for the duration of the construction and reinstatement works, and further details of the role of the ECoW are also provided in **Section 6.7**.

Site Clearance Activities

6.5.5 Habitat clearance activities, where these coincide with the breeding bird season (1 March to 31 August, inclusive) would be subject to a pre-clearance survey by the ECoW or a competent ornithologist to identify any active wild bird nests. Should any active nest be found, works would only proceed under the advice of the ECoW/appointed ornithologist and following a disturbance risk assessment. This would include all works within the Site.

6.5.6 Work exclusion buffers around identified nest site would be implemented where necessary in accordance with best available species guidance applicable at the time and/ or as agreed in consultation with NRW.

6.5.7 Note, this approach to pre-clearance survey (like pre-construction surveys to be included in the BBPP) is to ensure works can proceed in a legally compliant manner and not result in an offence under the under the Wildlife and Countryside Act (1981), so its implementation is fundamental.

6.6 Assessment of Likely Effects (Without Additional Mitigation)

Construction

Migneint-Arenig-Dduallt SPA (and component SSSI)

Habitat Loss / Displacement / Disturbance

6.6.1 The Migneint-Arenig-Dduallt SPA (and component SSSI) lies 805 m west of the Site at its nearest point (from the proposed access track). The SPA (and component SSSI) is designated for breeding hen harrier, merlin and peregrine, and the SSSI citation reports a breeding bird assemblage of special interest (which includes short-eared owl, golden plover and curlew; but no population estimates are provided). The Site is within the core foraging range for all SPA qualifying species and some of the species listed as part of the SSSI assemblage (SNH, 2016).

6.6.2 Documented disturbance limits (from Goodship and Furness, 2022) reveal that upper limits of all qualifying species for the Migneint-Arenig-Ddault SPA and SSSI exceed the spatial separation between the SPA/SSSI and the Site. Therefore, no disturbance impacts (directly or indirectly) on qualifying species within the SPA/SSSI during the construction phase of the Proposed Development are anticipated, with no significant effects.

6.6.3 Activity of hen harrier, peregrine and merlin during the two-year field survey period was very limited, and infrequent, comprising of a total of five flights, two flights and zero flights, respectively during VP flight activity surveys. There was no evidence of breeding for any of the three species, including any behaviour indicative of birds holding breeding territory, within the Site and a 2 km surrounding study area.

6.6.4 The paucity of records for all three qualifying species of the SPA (and SSSI) is evidence that the Site is not an important foraging area (or breeding area). It is predicted that any hen harrier, merlin or peregrine that do forage in the Site during construction, would continue to do so, but may avoid areas out to 750 m (hen harrier) and 200 m (merlin and peregrine) from construction works, given these are the upper disturbance limits for these species away from breeding sites (Goodship and Furness, 2022).

6.6.5 Of the other species listed in the breeding bird assemblage of special interest (for the SSSI), red grouse, curlew, golden plover and raven were recorded during field surveys. Low levels of raven flight activity were recorded during VP flight activity surveys, up to two breeding pairs of red grouse and curlew were recorded during MBBS, and a total of 19 golden plover flights were recorded during the VP flight activity surveys (only five of these flights, during two years of survey, were during the breeding season, April to July, and four of these were late in April comprising

flocks of birds, considered to be on passage to breeding grounds). There was no evidence of golden plover breeding within the Site. There is little evidence that the Site is an important habitat for those species forming part of the breeding bird assemblage of the SSSI. Birds such as golden plover are predicted to be able to forage within the Site (out to 200-500 m from construction works, although noting none did during the field surveys) in accordance with disturbance limits from Goodship and Furness (2022). Furthermore, the breeding curlew pairs were spatially distant from the Proposed Development that no adverse impacts are predicted on breeding curlew (see **Table 6.3**). One of the red grouse breeding territories was also spatially distant from the Proposed Development, at Foel Goch offsite.

6.6.6 Note, in terms of habitat loss, the footprint of the Proposed Development is modest in comparison to the amount of suitable habitat in the wider area onsite. During construction the footprint will be extended to include areas to be temporarily 'lost' for example, the location of the construction compound. The direct habitat losses (including potential direct temporary loss) is *c*. 52.61 ha, which is *c*. 8.86 % of the available habitat retained onsite (and much of the Site will still be available for birds, with consideration also given to be above mentioned documented disturbance limits). The habitats within the designated areas will be unaffected by the Proposed Development.

6.6.7 Note that an information to inform HRA with respect to likely significant effects on the Migneint-Arenig-Ddualllt SPA (and its qualifying features) is provided as **Appendix 6.4**.

Berwyn SPA (and Component SSSI)

Habitat Loss / Displacement / Disturbance

6.6.8 The Berwyn SPA (and component SSSI) lies 7.3 km south-east of the Site at its nearest point. The SPA (and component SSSI) is designated for breeding hen harrier, merlin, peregrine and red kite, and the SSSI citation reports a breeding bird assemblage with significant proportions of the Welsh populations of species including short-eared owl, golden plover and black grouse (although it does not provide any population estimates). The Site is outside the core foraging range for all SPA qualifying species (and the species, for which ranges are documented, listed as part of the SSSI assemblage), although it is within the maximum ranges for some species (hen harrier, peregrine and golden plover) (SNH, 2016), and within the possible ranging distance of red kite during the non-breeding season (Pendlebury *et al*., 2011).

6.6.9 Documented disturbance limits (from Goodship and Furness, 2022) reveal that upper limits of all qualifying species for the Berwyn SPA and SSSI exceed the spatial separation between the SPA/SSSI and the Site. Therefore, no disturbance impacts (directly or indirectly) on qualifying species within the SPA/SSSI during the construction phase of the Proposed Development are anticipated, with no significant effects.

6.6.10 Activity of hen harrier, peregrine and merlin during the two-year field survey period was very limited, and infrequent, comprising of a total of five flights, two flights and zero flights, respectively during VP flight activity surveys. There was no evidence of breeding for any of the three species, including any behaviour indicative of birds holding breeding territory, within the Site and a 2 km surrounding study area.

6.6.11 The paucity of records for all three of these qualifying species of the SPA (and SSSI) is evidence that the Site is not an important foraging area (or breeding area). It is predicted that any hen harrier, merlin or peregrine that do forage in the Site during construction, would continue to do so, but may avoid areas out to 750 m (hen harrier) and 200 m (merlin and peregrine) from construction works, given these are the upper disturbance limits for these species away from breeding sites (Goodship and Furness, 2022).

6.6.12 Red kite was recorded in the highest number and was the most regularly occurring target species during field surveys, with a total of 116 flights across the two-year survey period. Red kite flight activity was typically around three 'hotspot' areas with the highest proportion of the kite activity around Moel Emoel in the south of the Site, around Foel Goch offsite to the north-east, and around Llaithgwm (farm) to the west in close proximity to the Site (**ES Volume IV, Figure 6.4a** and **ES Volume IV, Figure 6.5a**). The Proposed Development (turbines) are offset from these areas. Kite flights through the Site between these three areas are relatively modest in comparison. There was no evidence of breeding red kite recorded. Given the distance of the SPA (and SSSI) from the Site (>6 km) and the documented core foraging range for the species (4 km, with maximum of 6 km; SNH, 2016), the Site is considered to be on the periphery of any red kite's range from the SPA (noting that SPA birds are reported as nesting in peripheral areas of the SPA, rather than within the SPA itself (Countryside Council For Wales, 2008) and that birds breeding within 4 km of the SPA can be considered as being 'SPA birds'). Red kite have been shown to use wind farm sites during construction (see Duffy and Urquhart, 2014) and so are expected to continue to use the Site during construction, while potentially avoiding areas out to 300 m from construction works, based on the upper disturbance limits from Goodship and Furness (2022).

6.6.13 Of the other species listed in the breeding bird assemblage of special interest (for the SSSI), red grouse, and golden plover were recorded during field surveys. However, given the spatial separation between the Site and SSSI (>6 km), the red grouse recorded during field surveys (up to two pairs) cannot be considered SSSI birds. The Site is located well beyond core foraging range for golden plover (3 km (SNH, 2016)) but is located within maximum range of 11 km suggesting the potential for limited connectivity. A total of 19 golden plover flights were recorded during the VP flight activity surveys (with none indicative of breeding birds). There was no evidence of golden plover breeding within the Site. There is little evidence that the Site is an important habitat for the golden plover that form part of the breeding bird assemblage of the SSSI. Birds such as golden plover are predicted to be able to forage within the Site (out to 200-500 m from construction works) in accordance with Goodship and Furness (2022). Furthermore, at least one of the two red grouse breeding territories was also spatially distant from the Proposed Development, at Foel Goch offsite. Note that no red grouse territories were recorded in Year 1 of baseline surveys.

6.6.14 Note, in terms of habitat loss, the footprint of the Proposed Development is modest in comparison to the amount of suitable habitat in the wider area onsite. During construction the footprint will be extended to include areas to be temporarily 'lost' for example, the location of the construction compound. The direct habitat losses (including potential direct temporary loss) is *c*. 52.61 ha, which is *c*. 8.86 % of the available habitat retained onsite (and so much of the Site will still be available for birds, with consideration also given to be above mentioned documented disturbance limits). The habitats within the designated areas will be unaffected by the Proposed Development.

6.6.15 Note that an information to inform HRA with respect to likely significant effects on the Berwyn SPA (and its qualifying features) is provided as **Appendix 6.4**.

Red Kite

Habitat Loss / Displacement / Disturbance

6.6.16 No evidence of breeding (or roosting) red kite was recorded during field surveys within the Site and a 2 km surrounding area.

6.6.17 The Proposed Development (turbines) are offset from the identified three red kite 'hotspot' areas. Kite flights through the Site between these three areas are relatively modest in comparison. Red kite have been shown to use wind farm sites during construction (see Duffy and Urquhart, 2014), and so are expected to continue to use the Site during construction, while potentially avoiding localised areas out to 300 m from construction works (which will be phased to minimise the extent of the works), based on the upper disturbance limits from Goodship and Furness (2022).

6.6.18 Note, in terms of habitat loss, the footprint of the Proposed Development is modest in comparison to the amount of suitable habitat in the wider area onsite. There would also be no loss of potential nesting habitat for red kite. During construction the footprint will be extended to include areas to be temporarily 'lost' for example, the location of the construction compound. The direct habitat losses (including potential direct temporary loss) is *c*. 52.61 ha, which is *c*. 8.86 % of the available (foraging) habitat retained onsite (and so much of the Site will still be available for kite, with consideration also given to be above mentioned documented disturbance limit; 300 m). Such habitat losses are unlikely to have a noticeable effect on a species that has a core range with a radius of 4 km (maximum range of 6 km) (SNH, 2016).

Golden plover

Habitat Loss / Displacement / Disturbance

6.6.19 No evidence of breeding golden plover was recorded during field surveys.

6.6.20 During construction there is potential for disturbance and displacement of any golden plover flocks using the Site (in close proximity to the Proposed Development) at that time. Although some studies reported no significant effect of construction activity on golden plover breeding abundance or distribution (such as Sansom *et al*., 2016), Cutts *et al*. (2013) suggest non-breeding golden plover could be disturbed within 200 m of works, while Goodship and Furness (2022) give a more precautionary 200-500 m. Given the turnover of golden plover during the winter, which is reflected in the very sporadic flights through the Site by this species and with no habitats onsite utilised, the Site cannot be regarded as being an important

location and the avoidance of construction works would have a negligible impact on such a mobile species. With golden plover a non-breeding bird only in the vicinity of the Site there is no risk of disturbance and displacement in the breeding season (it being the breeding population that is designated for the SSSI).

6.6.21 Note, in terms of habitat loss, the footprint of the Proposed Development is modest in comparison to the amount of suitable habitat in the wider area onsite, for the species in terms of potential breeding and foraging habitat. During construction the footprint will be extended to include The direct habitat losses (including potential direct temporary loss) is *c*. 52.61 ha, which is *c*. 8.86 % of the available habitat retained onsite (and so much of the Site will still be available for golden plover, with consideration also given to be above mentioned documented disturbance limit; 200-500 m).

Kestrel

Habitat Loss / Displacement / Disturbance

6.6.22 No evidence of breeding kestrel was recorded during field surveys.

6.6.23 Kestrel activity (in Year 2) recorded during VP flight activity surveys comprised of 18 flights, and so activity was low-moderate. Documented disturbance limits for kestrel are limited (100-200 m, Goodship and Furness, 2022). Kestrel are still considered likely to use the Site for hunting, albeit with localised areas out to 200 m from construction potentially avoided while works are active.

6.6.24 Note, in terms of habitat loss, the footprint of the Proposed Development is modest in comparison to the amount of suitable habitat in the wider area onsite. There would also be no loss of potential nesting habitat for kestrel. During construction the footprint will be extended to include areas to be temporarily 'lost' for example, the location of the construction compound. The direct habitat losses (including potential direct temporary loss) is *c*. 52.61 ha, which is *c*. 8.86 % of the available (foraging) habitat retained onsite (and so much of the Site will still be available for kestrel, with consideration also given to be above mentioned documented disturbance limit; 100-200 m). The frequency of kestrel records during baseline surveys does not indicate that the Site is a prime foraging area.

Operational

Migneint-Arenig-Ddualllt SPA (and component SSSI)

Displacement / Disturbance

6.6.25 Documented disturbance limits (from Goodship and Furness, 2022) reveal that upper disturbance limits of all qualifying species for the Migneint-Arenig-Ddault SPA (breeding hen harrier, merlin and peregrine), and SSSI (including short-eared owl, golden plover and curlew) exceed the spatial separation between the SPA/SSSI and the Site, which is 805 m.

6.6.26 Activity of hen harrier, peregrine and merlin during the two-year field survey period was very limited, and infrequent, comprising of a total of five flights, two flights and zero flights, respectively during VP flight activity surveys. There was no evidence of breeding of any of the species, including any behaviour indicative of birds holding breeding territory.

6.6.27 The paucity of records for all three qualifying species of the SPA (and SSSI) is evidence that the Site is not an important foraging area (or breeding area). Furthermore, studies have reported that hen harrier (Haworth and Fielding, 2012), merlin (Vattenfall, 2023) and peregrine (WindPower Monthly, 2018) will readily use operational wind farm sites.

6.6.28 Of the other species listed in the breeding bird assemblage of special interest (for the SSSI), red grouse, curlew, golden plover and raven were recorded during field surveys. Low levels of raven flight activity were recorded during VP flight activity surveys, up to two breeding pairs of red grouse and curlew were recorded during MBBS, and a total of 19 golden plover flights were recorded during the VP flight activity surveys (with no flights considered to be breeding birds). There was no evidence of golden plover breeding within the Site. There is little evidence that the Site is an important habitat for those species forming part of the breeding bird assemblage of the SSSI.

6.6.29 There is conflicting evidence of the effect of operational wind turbines in upland areas on (breeding) golden plover. Although Fielding and Haworth (2015) reported no evidence of changes in the location of plover territories in relation to operational turbines, other studies have reported displacement by up to 400 m from turbines during operation (see Sansom *et al*., 2016). Golden plover did not use the habitats onsite during baseline surveys but instead birds passed through sporadically, principally during the non-breeding season. Those birds recorded early in the breeding season were not thought to be local breeders but birds still on migration, with golden plover moving through the UK until early May.

6.6.30 The modest numbers of breeding curlew recorded (two pairs) are spatially distant from the Proposed Development, with undulating topography likely to provide notable screening between the Proposed Development and breeding territories (see **Table 6.3**), which limits potential for any effects on breeding curlew during the operational phase. In terms of curlew, some avoidance of operational turbines has been reported (Pearce-Higgins *et al*., 2012), but other studies have determined no evidence of displacement at the majority of operational wind farms studied and pairs breeding close to turbines (e.g. Whitfield *et al*., 2010). There is no evidence that red grouse display more than minor displacement as a result of operational turbines.

6.6.31 Human activity onsite during the operational phase would be relatively low, but higher than baseline conditions. This may also include potentially increased footfall in relation to increased accessibility for the public if the Proposed Development is consented. However, there are public rights of ways (PRoWs) which currently pass through the Site and during surveys walkers were seen on occasion, so increases in footfall are predicted to be only moderately higher than the baseline conditions. As a result, species such as golden plover and curlew during the operational phase are predicted to avoid any onsite activity by up to 500 m and 300 m respectively (although avoidance distances from transient walkers only passing through the Site are likely to be considerably less).

Collision Risk

6.6.32 The SPA qualifying species hen harrier, peregrine and merlin were recorded during two years of surveys in very limited numbers (respectively two, two and zero at risk from collision flights). This very low level of flight activity indicates that collision impacts would be inconsequential on the populations of these species and CRM analysis was not undertaken.

6.6.33 For features which form part of the breeding bird assemblage of species interest (for the SSSI), CRM analysis has only been undertaken for golden plover, this being the only species with sufficient flight activity to warrant further investigation. Therefore, collision risk for the other species listed as part of the breeding assemblage is considered negligible. CRM analysis has been undertaken on golden plover which are considered non-breeding, and thus part of the large Welsh non-breeding population rather than connected to the spatially distant SSSI breeding population. Accordingly, the collision mortality estimates for (non-breeding) golden plover are not considered applicable to the SSSI breeding population.

6.6.34 Note that an information to inform HRA with respect to likely significant effects on the Migneint-Arenig-Dduallt SPA (and its qualifying features) is provided as **Appendix 6.4**.

Berwyn SPA (and component SSSI)

Displacement / Disturbance

6.6.35 The Site is outside the core foraging range for all SPA qualifying species (and the species, for which ranges are documented, listed as part of the SSSI assemblage), although it is within the maximum ranges for some species (hen harrier, peregrine and golden plover) (SNH, 2016), and within the possible ranging distance of red kite during the non-breeding season (Pendlebury *et al*., 2011).

6.6.36 Documented disturbance limits (from Goodship and Furness, 2022) reveal that upper limits of all qualifying species for the Berwyn SPA (breeding hen harrier, merlin, peregrine and red kite), and SSSI (breeding bird assemblage with significant proportions of the Welsh populations of species including short-eared owl, golden plover and black grouse) exceed the spatial separation between the SPA/SSSI and the Site, which is 7.3 km. Therefore, no disturbance or displacement impacts (directly or indirectly) on qualifying species within the SPA/SSSI during the operational phase of the Proposed Development are anticipated, which is not significant.

6.6.37 Activity of hen harrier, peregrine and merlin during the two-year field survey period was very infrequent, and comprised of a total of five flights, two flights and zero flights, respectively during VP flight activity surveys. There was no evidence of breeding of any of the species, including any behaviour indicative of birds holding breeding territory.

6.6.38 The paucity of records for all three qualifying species of the SPA (and SSSI) is evidence that the Site is not an important foraging area (or breeding area). Furthermore, studies have reported that hen harrier (Haworth and Fielding, 2012), merlin (Vattenfall, 2023) and peregrine (WindPower Monthly, 2018) readily use operational wind farm sites.

6.6.39 No evidence of breeding by red kite was recorded. The Proposed Development (turbines) are offset from the three identified red kite hotspot areas. Kite flights through the Site between these three areas are relatively modest in comparison. Given the distance of the SPA (and SSSI) from the Site (>6 km) and the documented core foraging range for the species (4 km, with maximum of 6 km; SNH, 2016), the Site is considered to be on the periphery of any red kite's range from the SPA (noting that SPA birds are reported as nesting in peripheral areas of the SPA, rather than within the SPA itself and that birds breeding within 4 km of the SPA can be considered as being 'SPA birds'). Research into red kites across numerous sites has shown that they continue to use operational wind farms, where suitable habitat continues to be available[8] (Mammen *et al*., 2011). Therefore, the evidence suggests that red kites are not greatly impacted by disturbance and displacement from wind farm projects and use of the Site by SPA/SSSI kites (where this may occur) is likely to continue during operation of the Proposed Development, with only minor changes in distribution of activity expected.

6.6.40 Of the other species listed in the breeding bird assemblage of special interest (for the SSSI), red grouse and golden plover were recorded during field surveys. However, given the spatial separation between the Site and SSSI (>6 km), red grouse on the Site are not regarded as SSSI birds and it is considered unlikely that golden plover recorded during field surveys are SSSI birds. Field surveys revealed up to two breeding pairs of red grouse during MBBS, and a total of 19 golden plover flights were recorded during the VP flight activity surveys (with no flights considered to be breeding birds). There was no evidence of golden plover breeding within the Site. There is little evidence that the Site is an important habitat for those species forming part of the breeding bird assemblage of the SSSI.

6.6.41 There is conflicting evidence of the effect of operational wind turbines on breeding golden plover. Although Fielding and Haworth (2015) reported no evidence of changes in the location of plover territories in relation to operational turbines other studies have reported displacement by up to 400 m from turbines during operation (see Sansom *et al*., 2016). However, golden plover did not use the habitats onsite but instead some birds passed through the Site sporadically, principally during the non-breeding season. Small numbers of breeding red grouse were recorded (two pairs) in Year 2 of baseline surveys, with one territory at Foel Goch offsite and spatially distant from the Proposed Development. A report found no evidence that red grouse are adversely affected as a result of displacement by turbines (see Pearce-Higgins *et al*., 2012), with no evidence that red grouse densities were affected by operational wind farms.

[8] Noting, this would be the case for the Proposed Development where c. 97.1 % of the available habitats onsite will be available (and free) of turbines (only c. 2.93 % to be permanently lost), but noting some small-scale displacement from turbines is anticipated.

6.6.42 Human activity onsite during the operational phase would be relatively low, but higher than baseline conditions. This may also include potentially increased footfall in relation to increased accessibility for the public if the Proposed Development is consented. However, there are PRoWs which currently pass through the Site and during surveys walkers were seen on occasion, so increases in footfall are predicted to be only moderately higher than the baseline conditions. As a result, species such as golden plover are predicted to avoid any onsite activity by up to 500 m during the operational phase (although avoidance distances of golden plover from transient walkers only passing through the Site are likely to be considerably less).

Collision Risk

6.6.43 The SPA qualifying species hen harrier, peregrine and merlin were recorded during two years of surveys in very limited numbers (respectively two, two and zero at risk from collision flights). CRM analysis was accordingly not undertaken for these species and the impact of collision on the populations of hen harrier, merlin and peregrine is considered negligible.

6.6.44 Red kite is a SPA qualifying species and the greatest potential risk to red kites posed by the Proposed Development is collision with turbines. Collision mortality for red kite has been estimated by CRM analysis at 0.441 birds per year. However, this is considered to be a precautionary estimate (**Appendix 6.2**).

6.6.45 It is not clear whether the red kites recorded in the vicinity of the Site are associated with the Berwyn SPA given the spatial separation between the Site and the SPA (> 6 km), and the documented core foraging range for the species (4 km; SNH, 2016). However, given that red kites breeding in land adjacent to the SPA are still considered to be part of the designated population, and as maximum range of 6 km is documented (SNH, 2016), and kite have been reported to range out to 10 km during the non-breeding season (see Pendlebury *et al.*, 2011), the possibility that, at least some, birds recorded on-site are SPA birds cannot be completely discounted.

6.6.46 Assessing the potential impact of the CRM mortality estimate against the Berwyn SPA estimate as a precaution predicts a loss of 2.32 % of the breeding population of 19 birds (taken from Hereward *et al.*, 2024). It should be noted that the SPA estimate is for breeding adult birds, and so does not include juvenile and immature birds, so the true population will be greater than that used in this assessment, which will exaggerate the level of impact.

6.6.47 Estimated adult survival rates for red kite are stated as 61 % (BTO Bird Facts, 2025), which gives a baseline mortality of 39 % for adult birds. Assuming a Berwyn SPA population estimate of 19 birds; the baseline mortality rate in the absence of the Proposed Development would be 7.4 adult birds per year. The estimated annual mortality (0.441 birds) resulting from the Proposed Development represents a potential 5.959 % increase in annual baseline mortality.

6.6.48 Population Viability Analysis (PVA) has been undertaken (Hereward *et al*. (2024) to investigate the potential collision impacts of wind farm developments on the Welsh red kite population. This determined that an average of 12 % of the red kite (national) population could suffer collision mortality each year from wind farm developments before a population decline becomes more probable than not. Note, the average collision mortality of 0.441 birds per year from the Proposed Development is only 0.01 % of the Welsh kite population (2,117 pairs, thus 4,234 birds; Hereward *et al*.,

2024). It is clear that the Proposed Development's red kite collision mortality is inconsequential at the national level.

6.6.49 It should be noted that the Proposed Development was included in the Hereward *et al.* (2024) assessment which predicts that *"currently proposed levels of wind farm development* (for which the Proposed Development is included) *are unlikely to prevent the continued growth of the Welsh red kite population, even in the most extreme scenarios where all sites currently in development go ahead."* This report adds that greater caution is required for those wind farm schemes in proximity to the SPAs (including Berwyn SPA). As discussed above, the Site is located on the periphery of the likely (maximum) foraging range for red kite from the Berwyn SPA (based on documented foraging ranges; SNH, 2016, although it is appreciated that functionally linked land from the SPA may extend out to 4 km from the SPA boundary), so not all kites recorded are likely to be connected to the SPA.

6.6.50 For species which form part of the breeding bird assemblage of species interest (for the SSSI), CRM analysis was only undertaken for golden plover as this was the only species recorded with sufficient flight activity to warrant further investigation. Collision risk for the other species listed as part of the breeding assemblage is considered negligible. CRM analysis was undertaken on golden plover which are considered non-breeding, and part of the large Welsh non-breeding population rather than connected to the spatially distant and temporally separated SSSI breeding population. Accordingly, the collision mortality estimates for (non-breeding) golden plover are not considered applicable to the SSSI breeding population (and are discussed separately in **paragraphs 6.6.61** to **6.6.65**).

6.6.51 Note that an information to inform HRA with respect to likely significant effects on the Berwyn SPA (and its qualifying features) is provided as **Appendix 6.4**.

Red Kite

Displacement / Disturbance

6.6.52 No evidence of breeding (or roosting) red kite was recorded during field surveys.

6.6.53 Red kite was recorded in the highest number and was the most regularly occurring target species during field surveys, with a total of 116 flights across the two-year survey period. Red kite flight activity was typically around three 'hotspot' areas with the highest proportion of the kite activity around Moel Emoel in the south of the Site, around Foel Goch offsite to the north-east, and around Llaithgwm (farm) in close proximity to the west of the Site (**ES Volume IV, Figure 6.4a** and **ES Volume IV, Figure 6.5a**). The Proposed Development (turbines) are offset from these areas. Kite flights through the Site between these three areas are relatively modest in comparison. Research into red kites across numerous sites has shown that they continue to use operational wind farms, where suitable habitat continues to be available[8] (Mammen *et al.*, 2011). Therefore, the evidence suggests that red kites are not greatly impacted by disturbance and displacement from wind farm projects and use of the Site by red kite is likely to continue during operation of the Proposed Development, with only minor changes in distribution of activity expected. These minor changes in activity may come as a result of meso-avoidance of turbines and as a result of kites potentially being displaced by out to 300 m (upper disturbance limit reported by Goodship and Furness, 2022) around any works or human activity taking place during the operational phase. The Proposed Development layout is

limited in extent (*c*. 2.93 % of the habitats onsite to be permanently lost only, *c*. 8.86 % if temporary and permanent losses are considered[9]) and therefore the vast majority of the habitats onsite will be retained and potentially suitable for red kite (even with disturbance limits of 150-300 m considered, as reported in Goodship and Furness, 2022).

Collision Risk

6.6.54 The greatest potential risk to red kites posed by the Proposed Development is considered to be collision with turbines. Collision mortality for red kite has been estimated by CRM analysis at 0.441 birds per year. However, this is considered to be a precautionary estimate (**Appendix 6.2**).

6.6.55 Assessing the potential impact of the CRM mortality estimate against the most recent Welsh population estimate of 2,117 pairs and the Area Statement Area 'North West Wales' of 99 pairs where the Site is located (from Hereward *et al*., 2024), predicts a respective loss of 0.01 % and 0.223 % of the breeding populations. It should be noted that the population estimates are for breeding adult birds, and does not include juvenile and immature birds, so the true population will be greater than that used in this assessment, which will exaggerate the level of impact.

6.6.56 Estimated adult survival rates for red kite are stated as 61 % (BTO Bird Facts, 2025), which gives a baseline mortality of 39 % for adult birds. Assuming a national (Welsh) population estimate of 4,234 birds; the baseline mortality rate in the absence of the Proposed Development would be 1,651 adult birds per year. The estimated annual mortality (0.441 birds) resulting from the Proposed Development represents a potential 0.027 % increase in annual baseline national mortality. For the North West Wales Area Statement Area the equivalent would be a baseline mortality rate in the absence of the Proposed Development would be 77 adult birds per year. The estimated annual mortality (0.441 birds) resulting from the Proposed Development represents a potential 0.573 % increase in annual baseline regional mortality.

6.6.57 Population Viability Analysis (PVA) has been undertaken (Hereward *et al*. (2024) to investigate the potential collision impacts of wind farm developments on the Welsh red kite population. This determined that an average of 12 % of the red kite (national) population could suffer collision mortality each year from wind farm developments before a population decline becomes more probable than not. Note, the average collision mortality of 0.441 birds per year from the Proposed Development is only 0.01 % of the Welsh kite population (2,117 pairs, 4,234 birds; Hereward *et al*., 2024). It is clear that the Proposed Development's red kite collision mortality is inconsequential at the national level.

6.6.58 It should be noted that the Proposed Development was included in the Hereward *et al.* (2024) assessment which predicts that *"currently proposed levels of wind farm development* (for which the Proposed Development is included) *are unlikely to prevent the continued growth of the Welsh red kite population, even in the most extreme scenarios where all sites currently in development go ahead."*

[9] Noting that temporary loss areas will be reinstated during the operation phase, so inclusion of temporary loss here is considered as precaution and worst-case scenario.

Golden plover

Displacement/ Disturbance

6.6.59 No evidence of breeding golden plover was recorded during field surveys.

6.6.60 During the operational phase there is the potential for golden plover displacement from the Proposed Development. Most studies in the UK have assessed the impacts on golden plover in the breeding season and in most cases, it has been found that there is little redistribution away from infrastructure post-construction (e.g. Douglas *et al*., 2011). Research for the non-breeding season found that golden plovers will approach to within an average of 175 m from turbines (Hötker *et al*., 2006). This suggests that only a relatively small area around the wind farm would be avoided during the operational phase (and with an avoidance of 200–500 m around any active works or human activity; from Goodship and Furness, 2022). There was no evidence that habitats onsite were used by golden plover, and instead a relatively limited number of sporadic flights were recorded, principally during the non-breeding season. It is anticipated that the irregular movement of golden plover through the Site will continue during the operational phase, although there may be small-scale alterations in the distribution of activity in response to localised displacement from operational turbines (175–500 m). The Proposed Development layout is limited in extent (*c*. 2.93 % of the habitats onsite to be permanently lost only, *c*. 8.86 % if temporary and permanent losses during construction are considered[9]) and therefore the vast majority of the habitats onsite will be retained and potentially suitable for golden plover. Furthermore, golden plovers are highly mobile in the non-breeding season and there is plentiful available habitat in the wider area (even with disturbance limits of 200-500 m considered, as reported in Goodship and Furness, 2022).

Collision Risk

6.6.61 The potential collision risk to golden plover as a result of the Proposed Development has been estimated. No up-to-date regional golden plover estimates are available, however given the mobility of non-breeding flocks it is considered appropriate to consider impacts against the national population. In the winter period golden plover remains abundant in Wales; numbers vary between years, but a precautionary wintering estimate of 10,000 in 2017/18 (from Hughes, 2021) provides a recent example (other estimates suggest *c*. 20,000 birds; from BTO WeBS website, 2025). There is considerable turnover of birds during the non-breeding season period.

6.6.62 The mortality estimate has been calculated as 1.796 birds per year in Year 1. In this period all at risk of collision flights were recorded during the breeding season (April) although these were not considered to be locally breeding birds. For Year 2, the CRM estimated 16.49 birds per year, with all flights recorded during the non-breeding season. This estimate was heavily influenced by a flock of 80 plovers recorded three times during one survey in late November 2022. The average annual mortality estimate was 9.293 birds per year. No golden plover was recorded as breeding.

6.6.63 Determining the impact of this loss is difficult to quantify given the variability in golden plover numbers between winters (no risk from collision flights at all during the Year 1 non-breeding season) and the turnover of birds within a single winter; however, the most conservative estimate of 10,000 individuals for the Welsh wintering population is considered appropriate and precautionary. The potential mortality estimate (taken as 9.293 birds per year) is equivalent to 0.09 % of this population.

6.6.64 Estimated adult survival rates for golden plover are stated as 73 % (BTO Bird Facts, 2025), which gives a baseline mortality of 27 % for adult birds. Assuming a national (Welsh) population estimate of at least 10,000 birds; the baseline mortality rate in the absence of the Proposed Development would be 2,700 adult birds per year. The estimated annual mortality (9.293 birds) resulting from the Proposed Development represents a potential 0.344 % increase in annual baseline national mortality. Such a low level of additional mortality would be undetectable at this (national) scale.

6.6.65 Although a total of 47 golden plover collisions have been reported at European wind farms, none of these were from Britain (Dürr, 2023). Although this is not a full and comprehensive dataset of all collisions that have occurred, this suggests that, even assuming some collisions will go undetected, golden plover collisions with turbines are an uncommon event.

Kestrel

Displacement/ Disturbance

6.6.66 No evidence of breeding kestrel was recorded during field surveys.

6.6.67 Kestrel activity (in Year 2) recorded during VP flight activity surveys comprised of 18 flights, and so activity was low-moderate[10]. Kestrels are still considered likely to use the Site for hunting during the operational phase, with kestrels known to forage within the vicinity of operational wind farms. Only minor changes in the distribution of activity is expected, with these minor changes resulting from meso-avoidance of turbines and as a result of kestrels potentially being displaced by 100-200 m (Goodship and Furness, 2022) around any works or human activity taking place during the operational phase. The Proposed Development layout is limited in extent (c. 2.93 % of the habitats onsite to be permanently lost only) and therefore the vast majority of the habitats onsite will be retained and potentially suitable for kestrel (while acknowledging some minor displacement from operational turbines, and out to 200 m from active works; based on Goodship and Furness, 2022).

Collision Risk

6.6.68 The main risk to kestrel from the Proposed Development is considered to be the potential for collision with turbines. The mortality estimate for kestrel has been calculated at 1.485 birds per annum (with all at risk from collision flights during the breeding season). Assessing the impact of this against the most conservative of the national population estimates (530 pairs; from Pritchard *et al*., 2021), indicates the mortality estimate equates to a potential loss of 0.14 % of the breeding population

[10] A total of 29 flights were recorded in Year 1, but many of these were birds hunting in the south of the Site in habitat associated with Moel Emoel and Llyn Maen Bras, and in the north-east near Foel Goch, and spatially distant from the Proposed Development.

each year. This is a precautionary estimate given that it is young (non-breeding birds) that are likely to be most susceptible to collision, and these birds are not included in the population estimate. Assessing against the national population estimate of 1,750 pairs (from Hughes *et al*., 2020), the collision mortality is equal to 0.04 % of the population.

6.6.69 Estimated adult survival rates for kestrel are stated as 69 % (BTO Bird Facts, 2025), which gives a baseline mortality of 31 % for adult birds. Assuming a national (Welsh) population estimate of least 530 pairs (1,060 adult birds); the baseline mortality rate in the absence of the Proposed Development would be 329 adult birds per year. The estimated annual mortality (1.485 birds) resulting from the Proposed Development represents a potential 0.451 % increase in annual baseline national mortality. Such a low level of additional mortality would be undetectable at this (national) scale.

Decommissioning

6.6.70 Potential decommissioning effects are considered to be similar to (and not more than) those identified for the construction phase (i.e. disturbance/displacement and habitat loss). Decommissioning effects are therefore not considered separately for each important ornithological feature.

6.6.71 The future of the bird community at the time of decommissioning (>40 years) is unknown and cannot be reasonably assumed with any certainty.

6.6.72 In the absence of mitigation, decommissioning impacts may result in the destruction of nest sites and disturbance and displacement of the important ornithological features considered in **Section 6.6**, as well as any additional species that might be identified at that time.

6.6.73 As with construction, embedded mitigation would be implemented during decommissioning in accordance with applicable best practice measures and to ensure compliance with legal obligations (currently those afforded by the Wildlife and Countryside Act, 1981 (as amended)). Following the implementation of embedded mitigation measures, such as those outlined in **Section 6.5**, which would be implemented at the time of decommission, it is unlikely that significant effects upon important ornithological features would occur during the decommissioning phase.

6.7 Additional Mitigation Measures

6.7.1 The Proposed Development is predicted to have minor or negligible impacts on the important ornithological features assessed, with no significant adverse effects have been concluded, during construction, operation and decommissioning phases. Therefore, no additional mitigation measures are required. However, it is considered good practice to include mitigation measures to reduce impacts even where significant effects are not predicted.

6.7.2 As stated in **Section 6.5** the CEMP (and role of the ECoW) would be implemented, and this is considered an additional mitigation measure. Further details are provided below.

Construction Environmental Management Plan

6.7.3 An outline Construction Environmental Management Plan (OCEMP) is provided in **ES Volume III, Appendix 2:1 Outline Construction Environmental Management Plan**. The CEMP would include all good practice construction measures, pollution prevention controls and monitoring to be implemented over the course of the Proposed Development in line with current industry statutory guidance and as detailed within **ES Volume II, Chapter 2: Description of the Proposed Development**. A CEMP would be produced irrespective of the ornithological features recorded onsite to ensure compliance with good practice and legal obligations.

6.7.4 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 (while being built or in use) or its eggs. In addition, all wild birds listed on Schedule 1 of the Act receive additional legal protection which makes it an offence to intentionally or recklessly disturb these species while building a nest, using, or when near, a nest containing eggs or young; or to disturb their dependent young.

6.7.5 Before the commencement of construction activities, a Breeding Bird Protection Plan (BBPP) would be prepared and submitted for agreement in consultation the Gwynedd Council and NRW which would form part of the CEMP.

6.7.6 The BBPP would be informed by a pre-commencement breeding bird survey to establish the status and distribution of any nesting bird, including Schedule 1 breeding birds, within the Site and within 800 m of disturbing activities. This would be carried out in the breeding season preceding the construction phase of the Proposed Development to ensure the most updated information is considered, following receipt of consent. Note, surveys would also be undertaken during the construction phase to inform of 'live' constraints.

6.7.7 The BBPP would detail the measures required to protect ornithological features (including detailing nesting bird checks immediately prior to works), and any additional measures required on account of findings from the pre-commencement breeding bird survey (for example the nest location of any Schedule 1 raptor or owl and protections that are required), to ensure the protection of breeding birds over the course of construction works during the breeding season.

Ecological Clerk of Works

6.7.8 A suitably qualified Ecological Clerk of Works (ECoW) would be employed for the duration of the construction and reinstatement periods, to ensure ornithological interests are safeguarded, although this may not necessarily be a full-time role throughout. The role of the ECoW would include the following tasks:

- Provide toolbox talks and information to all staff onsite, so staff are aware of the ornithological sensitives of 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-and during construction surveys and advise on ornithological issues and working restrictions (including compliance monitoring) where required, and
- Complete Site-supervision works as required, in relation to sensitive habitats and protected ornithological species.

6.7.9 **Table 6.12** sets out the additional mitigation measure which is precautionary to further minimise the likely effects identified in **Section 6.6** (but noting no significant effects are anticipated).

Table 6.12 Additional Mitigation

ID	Phase	Description of additional mitigation measure	Securing mechanism
1	Operation	Red kites can be encouraged by the presence of carrion (such as dead sheep). Although no definitive evidence of red kite foraging carcasses was noted, the remains of a dead sheep was noted onsite. The removal of such food sources from the turbine area would reduce the likelihood of birds being attracted into the operational wind farm and so reduce the risk of collision. Therefore, any potential sources of carrion, particularly dead sheep, would be removed from the wind farm area, if and when encountered.	Details of how this measure will be achieved, would be written into the OHMP, or similar document.

6.8 Assessment of Residual Effects (with Additional Mitigation)

6.8.1 As stated in **Section 6.6** no potential significant effects are anticipated, with the implementation of embedded mitigation (including measures to ensure works proceed in a legally compliant manner), and as such there is no requirement for additional mitigation.

6.8.2 Precautionary additional mitigation is included in **Table 6.12**. The measure is not predicted to reduce adverse effects (which are already, without additional mitigation, not significant) in any substantive way but, in terms of carrion removal (when required) this would act to minimise the potential for collisions and would be expected to reduce the mortality risk from that predicted based on baseline surveys, when no active carcass removal was undertaken. The residual effects are provided below and are summarised in **Table 6.13**.

Construction

Migneint-Arenig-Dduallt SPA (and component SSSI)

Habitat Loss / Displacement / Disturbance

6.8.3 Disturbance/ displacement impacts during the construction phase on the SPA (and SSSI) qualifying species, hen harrier, merlin and peregrine are predicted to be short-term, and a **negligible (not significant)** effect is concluded.

6.8.4 Similarly, disturbance/ displacement impacts during the construction phase on SSSI qualifying species (including curlew, golden plover, red grouse and raven) are predicted to be short-term, and a **negligible (not significant)** effect is concluded

6.8.5 The impact of habitat loss during the construction phase on qualifying species of the SPA (and SSSI, including those species listed as part of the SSSI breeding assemblage) is predicted to be long-term, and a **negligible (not significant)** effect is concluded.

Berwyn SPA (and Component SSSI)

Habitat Loss / Displacement / Disturbance

6.8.6 Disturbance/ displacement impacts during the construction phase on the SPA (and SSSI) qualifying species, hen harrier, merlin, peregrine and red kite are predicted to be short-term, and a **negligible (not significant)** effect is concluded.

6.8.7 Similarly, disturbance/ displacement impacts during the construction phase on SSSI qualifying species (including golden plover and red grouse) are predicted to be short-term, and a **negligible (not significant)** effect is concluded.

6.8.8 The impact of habitat loss during the construction phase on qualifying species of the SPA (and SSSI, including those species listed as part of the SSSI breeding assemblage) is predicted to be long-term, and a **negligible (not significant)** effect is concluded.

Red Kite

Habitat Loss / Displacement / Disturbance

6.8.9 No disturbance impacts are predicted on breeding (or roosting) red kite during the construction phase, with **not significant** effects anticipated.

6.8.10 Displacement impacts during the construction phase on red kite are predicted to be short-term, and a **negligible (not significant)** effect is concluded.

6.8.11 The impact of habitat loss during the construction phase on red kite is predicted to be long-term, and a **negligible (not significant)** effect is concluded.

Golden plover

Habitat Loss / Displacement / Disturbance

6.8.12 No disturbance impacts are predicted on breeding golden plover during the construction phase, with **not significant** effects anticipated.

6.8.13 Displacement impacts during the construction phase on golden plover are predicted to be short-term, and a **negligible (not significant)** effect is concluded.

6.8.14 The impact of habitat loss during the construction phase on golden plover is predicted to be long-term, and a **negligible (not significant)** effect is concluded.

Kestrel

Habitat Loss / Displacement / Disturbance

6.8.15 No disturbance impacts are predicted on breeding kestrel during the construction phase, with **not significant** effects anticipated.

6.8.16 Displacement impacts during the construction phase on kestrel are predicted to be short-term, and a **negligible (not significant)** effect is concluded.

6.8.17 The impact of habitat loss during the construction phase on kestrel is predicted to be long-term, and a **negligible (not significant)** effect is concluded.

Operational

Migneint-Arenig-Dduallt SPA (and component SSSI)

Displacement / Disturbance

6.8.18 Disturbance/ displacement impacts during the operational phase on the SPA (and SSSI) qualifying species, are predicted to be long-term, and a **negligible (not significant)** effect is concluded.

Collision Risk

6.8.19 Collision impacts for all SPA (and SSSI) qualifying ornithological features during the operational phase are predicted to be long-term and of **negligible** magnitude. The effect would be **not significant**.

Berwyn SPA (and Component SSSI)

Displacement / Disturbance

6.8.20 Disturbance/ displacement impacts during the operational phase on the SPA (and SSSI) qualifying species, are predicted to be long-term, and a **negligible (not significant)** effect is concluded.

Collision Risk

6.8.21 Collision impacts for red kite during the operational phase are predicted to be long-term and **low** magnitude, **minor adverse**. The effect would be **not significant**.

6.8.22 Collision impacts for all other SPA (and SSSI) qualifying ornithological features during the operational phase are predicted to be long-term and of **negligible** magnitude. The effect would be **not significant**.

Red Kite

Displacement / Disturbance

6.8.23 No disturbance impacts are predicted on breeding (or roosting) red kite during the operational phase, with **not significant** effects anticipated.

6.8.24 Displacement impacts during the operational phase on red kite are predicted to be long-term, and a **negligible (not significant)** effect is concluded.

Collision Risk

6.8.25 Collision impacts for red kite during the operational phase are predicted to be long-term and of **negligible** magnitude. The effect would be **not significant**.

Golden plover

Displacement / Disturbance

6.8.26 No disturbance impacts are predicted on breeding golden plover during the construction phase, with **not significant** effects anticipated.

6.8.27 Displacement impacts during the construction phase on golden plover are predicted to be long-term, and a **negligible (not significant)** effect is concluded.

Collision Risk

6.8.28 Collision impacts for golden plover during the operational phase are predicted to be long-term and of **negligible** magnitude (at the national level), and of **minor/negligible adverse** magnitude (at the regional level). The effects would be **not significant**.

Kestrel

Displacement / Disturbance

6.8.29 No disturbance impacts are predicted on breeding kestrel during the operational phase, with **not significant** effects anticipated.

6.8.30 Displacement impacts during the operational phase on kestrel are predicted to be long-term, and a **negligible (not significant)** effect is concluded.

Collision Risk

6.8.31 Collision impacts for kestrel during the operational phase are predicted to be long-term and of **negligible** magnitude (at the national level), and of **minor/negligible adverse** magnitude (at the regional level). The effects would be **not significant**.

Table 6.13 Assessment of Likely Affects (With Additional Mitigation)

Paragraph number	Receptor/ receptor groups	Description of impact	Magnitude of Impact	Description of likely effect	Monitoring
Table key: ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
Construction					
6.13.1	Migneint-Arenig-Dduallt SPA (and component SSSI)	Habitat Loss/ Displacement & Disturbance to SPA/SSSI qualifying species	Negligible	**Negligible (not significant)** ST (displacement & disturbance) & LT (habitat loss)	N/A
6.13.2	Berwyn SPA (and component SSSI)	Habitat Loss/ Displacement & Disturbance to SPA/SSSI qualifying species	Negligible	**Negligible (not significant)** ST (displacement & disturbance) & LT (habitat loss)	N/A
6.13.3	Red kite	Habitat Loss/ Displacement & Disturbance	Negligible	**Negligible (not significant)** ST (displacement & disturbance) & LT (habitat loss)	N/A
6.13.4	Golden plover	Habitat Loss/ Displacement & Disturbance	Negligible	**Negligible (not significant)** ST (displacement & disturbance) & LT (habitat loss)	N/A

Paragraph number	Receptor/ receptor groups	Description of impact	Magnitude of Impact	Description of likely effect	Monitoring
Table key: ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
6.13.5	Kestrel	Habitat Loss/ Displacement & Disturbance	Negligible	**Negligible (not significant)** ST (displacement & disturbance) & LT (habitat loss)	N/A
Operational					
6.13.6	Migneint-Arenig-Ddualllt SPA (and component SSSI)	Displacement & Disturbance to SPA/ SSSI qualifying species	Negligible	**Negligible (not significant)** LT	N/A
6.8.18	Migneint-Arenig-Ddualllt SPA (and component SSSI)	Collision risk	Negligible	**Negligible (not significant)** LT	N/A
6.13.8	Berwyn SPA (and component SSSI)	Displacement & Disturbance to SPA/SSSI qualifying species	Negligible	**Negligible (not significant)** LT	N/A
6.13.9	Berwyn SPA (and component SSSI)	Collision risk	Low – red kite	**Minor adverse (not significant)** – red kite	N/A, although the protocol for monitoring (and removal) of

Paragraph number	Receptor/ receptor groups	Description of impact	Magnitude of Impact	Description of likely effect	Monitoring
Table key: ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
			Negligible – other SPA/SSSI species	LT **Negligible (not significant)** – other SPA/SSSI species LT	carcasses from the Site (with respect to red kite) will be detailed in the HMP, post consent
6.13.10	Red kite	Displacement & Disturbance	Negligible	**Negligible (not significant)** LT	N/A
6.13.11	Red kite	Collision risk	Negligible	**Negligible (not significant)** LT	N/A, although the protocol for monitoring (and removal) of carcasses from the Site will be detailed in the HMP, post consent
6.13.12	Golden plover	Displacement & Disturbance	Negligible	**Negligible (not significant)** LT	N/A
6.13.13	Golden plover	Collision risk	Low	**Minor/negligible adverse (not significant)** LT	N/A

Paragraph number	Receptor/ receptor groups	Description of impact	Magnitude of Impact	Description of likely effect	Monitoring
Table key: ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
6.13.14	Kestrel	Displacement & Disturbance	Negligible	**Negligible (not significant)** LT	N/A
6.13.15	Kestrel	Collision risk	Low	**Minor/negligible adverse (not significant)** LT	N/A
Decommissioning					
6.13.16	Comparable to those considered at the construction phase (see above)				

6.9 Opportunities for Environmental Enhancement

6.9.1 Suitable principles for biodiversity enhancement to be delivered as part of the Proposed Development are provided within the outline Habitat Management Plan (OHMP; **Appendix 5.4**) and are underpinned by Section 6 of PPW.

6.9.2 This policy 'states that the planning system must ensure development results in a net benefit for biodiversity and ecosystem resilience to enhance well-being'. PPW defines a net benefit as development leaving "*biodiversity and the resilience of ecosystems in a significantly better state than before, through securing immediate and long term, measurable and demonstrable benefit, primarily on or immediately adjacent to the site.*"

6.9.3 Enhancement measures to be adopted are moorland and heathland enhancement, with areas of modified, and degraded peatland the focal areas for enhancement, which will benefit ground-nesting waders and passerines, as well as invertebrates (benefitting insectivorous bird species). Riparian planting with native trees and scrub to improve habitat connectivity and networks through the Site and provide shade for the benefit of aquatic wildlife (increasing food resource for species such as grey wagtail and dipper). Riparian planting may be used by woodland and scrub inhabiting bird species (as well as being used by mammals and reptiles and used as foraging/commuting routes for bats). A floating island would be installed at Llyn Maen Bras (the waterbody in the south of the Site) to provide shelter, and a potential roost and/or nest site for wetland bird species.

6.9.4 An Outline Habitat Management (OHMP) is provided as **Appendix 5.4** which a Habitat Management Plan (HMP), secured by condition, will align with, for the Proposed Development.

6.10 Difficulties and Uncertainties

6.10.1 Difficulties and/or uncertainties related to baseline data gathering are provided **Appendix 6.1.** The below provides a summary of the main considerations.

6.10.2 In the absence of Welsh-specific guidance concerning and ornithological features and wind farms, NatureScot guidance has been considered for determining survey and assessment scope (and this is the accepted approach). Surveys and assessment have also been undertaken in response to consultee comments, including NRW.

6.10.3 There are minor gaps in coverage of the viewsheds for the VP flight activity surveys (in peripheral areas), which is expected due to the undulating topography of the study area. All turbines of the Proposed Development (**ES Volume IV, Figure 6.2: Vantage Point Flight Activity Survey Plan**) are however covered by the viewsheds, and survey coverage is considered appropriate for determining the activity of target species within the study area, considered in this assessment.

6.10.4 NatureScot guidance (2025a) recommends that VPs be sited outside the turbine area of the Proposed Development to prevent the presence of the surveyor from potentially altering flight behaviour and artificially reducing the level of activity during the course of the survey. VPs 1 and 2 are located within the turbine envelope (within 500 m, albeit both are several hundred metres from the nearest turbine). At all VPs, surveyors were positioned off the peaks and instead positioned on slopes (below the skyline) and wore muted clothes to be as inconspicuous as possible, while maximising visibility of the study area. The recorded flight activity indicates no evidence of bird activity being influenced by the presence of surveyors.

6.10.5 As shown in **ES Volume IV, Figure 6.3**, the western extreme of the proposed access track is outside the MBBS study area. This is not considered a limitation as this area was the access to the Site used during MBBS, so any target species (such as curlew) in this area would have been anecdotally recorded. The proposed access track also follows an existing rough, stone track through grazed pasture which is unremarkable habitat for supporting target species.

6.10.6 During the Annex 1/ Schedule 1 breeding raptor and owl searches, MBBS and breeding black grouse searches, direct access to land outside the Site for survey was restricted. Suitable habitat features were however scanned from appropriate vantage points within the site and from PRoWs to detect activity and likely breeding locations of key species. In conjunction with the desk study data, it is considered unlikely that any breeding target species were overlooked.

6.10.7 No substantive difficulties or uncertainties have been experienced to date in the undertaking of baseline studies for the Proposed Development.

6.11 Abnormal Indivisible Loads Route

6.11.1 There are expected to be minor works around highways junctions associated with the 'Abnormal Indivisible Load Route' (AILR) (see **ES Volume II Chapter 2 Section 6**), rom the Port of Liverpool through to the access route junction of the Site and is required to facilitate transport of the large turbine components. The AILR has been reviewed for environmental constraints (see **ES Volume II Chapter 4 Section 3**). Where environmental constraints were identified in relation to ornithology, these are further considered here.

6.11.2 As part of the AILR constraints screening, potential impacts to sensitive ornithological receptors have been identified. The AILR would be used in the construction phase therefore effects are confined to during the construction phase. This assessment is high-level given it would be subject to a separate application, and any works required are not known at this stage. For the separate application further existing baseline information from local biological records centres, which would provide relevant ornithological records and locations of non-statutory designated sites, would be gathered, to assist in fully assessing impacts on sensitive ornithological receptors.

Assessment of Effects

6.11.3 The AILR may require some limited, localised road realignment and potentially the resulting loss of marginal roadside verge with some scrub/tree pruning and potential removal a possibility.

6.11.4 The limited, localised habitat which may be affected and which adjoins the major road network has only limited value for birds. The principal value is considered to be nesting birds (principally passerines) which may nest in vegetation (such as scrub or trees), some of which that may need to be cleared/pruned.

6.11.5 Given the location of the AILR in relation to statutory designated sites with ornithological interest, and the limited, localised nature of any works that may be required, no effects on such sites are anticipated.

Mitigation

6.11.6 The location of the AILR has minimised landtake and the loss of higher quality habitats like scrub and mature woodland habitat. The route largely follows the existing major road network, and where it does deviate from the road network passes within localised areas of amenity grassland (including in the centre of road roundabouts) and clipping edges of shelterbelt plantation woodland. It is considered not possible to entirely avoid areas of vegetation removal.

6.11.7 For any subsequent application, good practice construction measures implemented as part of a CEMP would include for pre-construction nesting bird checks during the breeding bird season (1st March to 31st August, inclusive) prior to the commencement of any required works and habitat clearance and which will enable legislative compliance with regards to the protection of breeding/nesting birds. Should any active nests be found, work exclusion buffers around identified nest sites would be implemented where necessary in accordance with best available species guidance applicable at the time and/ or as agreed in consultation with NRW via a Construction Breeding Bird Protection Plan (CBBPP).

6.11.8 A suitably qualified ECoW would be employed for the duration of the construction and reinstatement periods, to oversee environmental protection measures and working practices specified in a CEMP and prevent breaches of legislation pertaining to birds. Good practice measures to protect retained habitats during the construction works would be implemented including the sensitive demarcation of working areas, to be overseen by an ECoW.

6.11.9 If hedgerow sections are required to be impacted for turbine delivery access, including oversailing of turbine structures, hedgerows will be coppiced and allowed to reinstate post construction. If any hedgerow sections are required to be removed to facilitate the AILR, hedgerow planting would be implemented and realigned to run parallel with the AILR.

6.11.10 Any areas of land affected by the installation and use of the AILR will be reinstated.

Statement of Significance

6.11.11 Based on this high-level appraisal of the AILR, the installation and use of the AILR during the construction phase would result in a short-term, **negligible** magnitude of impact, on sensitive ornithological features, and a **negligible (not significant)** effect is concluded.

6.11.12 Furthermore, no significant cumulative impacts as a result of the AILR are anticipated combined with the Proposed Development or other major schemes, given the predicted limited and localised nature of any the works for the AILR, on unremarkable ornithological habitats.

6.12 Inter-project Cumulative Effects

6.12.1 An assessment of potential impacts on important ornithological features as a result of the Proposed Development on its own is presented above **Section 6.8**). This section presents a Cumulative Impact Assessment (CIA), in which other relevant development projects are also considered. The CIA has been undertaken in reference to the four stage process set out in NSIP: Advice on Cumulative Effects Assessment (formerly PINS advice note 17).

6.12.2 Given all habitat, displacement and disturbance impacts are of negligible magnitude, only the following are assessed cumulatively (all at the operation phase):

- Berwyn SPA and SSSI – collision (red kite)
- Red kite – collision
- Golden plover – collision, and
- Kestrel - collision.

Screening Cumulative Developments within the Zone of Influence

6.12.3 The inter-project CIA has been undertaken in accordance with Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment, as detailed in **ES Volume II, Chapter 4: Approach to the EIA**.

6.12.4 **Table 6.14** sets out the other committed developments located within 10 km of the Site. In the absence of Welsh-specific guidance, this Zone of Influence (ZoI) has been determined as appropriate for this cumulative assessment given it is the maximum documented foraging range for important ornithological features recorded (maximum range for breeding hen harrier; SNH, 2016, and non-breeding possible range for red kite, Pendlebury *et al*., 2011). This ZoI was agreed through scoping with NRW (see **Table 6.1**).

6.12.5 **Table 6.14** also sets out the findings of a screening assessment undertaken to identify those schemes which have the potential to result in significant effects with the Proposed Development. For completeness all identified major developments within 10 km are given due regard.

Table 6.14 Inter-project Cumulative Effects: Screening

ID	Committed development	Scheme description	Potential for cumulative effects?
C21	C20/0963/04/YA Rhiwlas Home Farm	RWK Price - Engineering operation to form 3 wetlands. Located 2.45 km from the Site.	No. The development is engineering works to create wetland habitat, which will benefit many bird species, rather than lead to any adverse cumulative effect. Given only collision risk for important ornithological features are considered in the cumulative assessment, there is no collision risk applicable to this development, and no cumulative effects are anticipated.

ID	Committed development	Scheme description	Potential for cumulative effects?
C18	DNS CAS-02646-S1G1Q8 Moel Chwa Energy Park	Moel Chwa Energy Park Ltd - energy park - 12 turbines, 200 m in height. Located 4.30 km from the Site.	There is a potential for cumulative effects, however, based on the limited information available (development has scoping submitted, only) there is no information that can be used in the assessment. Projects at the scoping stage are in any case subject to change or may not progress to an application.
C19	DNS/3276735 Gaerwen Wind Farm	RWE Renewables UK Ltd - wind farm - Approximately 9 km north-east of Bala with the site entrance directly off the A494 near Glan yr Afon. Located 5.09 km from the Site.	**Yes.** There are potential cumulative effects with collision risk calculated for this development for red kite, golden plover and kestrel.
C2	07/2022/0824 Tyfos, Pen Y Geulan Solar Array	Tyfos Ltd - Installation for the erection of a 609.12kw ground mounted solar array and all associated works. Located 7.84 km from the Site.	No. There is limited information on ornithology that accompanies the development. Furthermore, no collision risk with respect to ornithological features is considered, so no cumulative effects are anticipated.
C23	0/52115 Proposed new slurry lagoon	Maes Tyddyn Maes Tyddyn Llanfihangel Glyn Myfyr LL21 9UF. Located 10 km from the Site.	No. No cumulative effects are anticipated, with no collision risk to any ornithological features.
C10	DNS/3214855 Alwen Forest	RWE Renewables UK Ltd - 9 turbines, 200m height to blade tip. Alwen Forest, 5 km north of Cerrigydrudion. Located 10.08 km from the Site[11].	**Yes.** There are potential cumulative effects with collision risk calculated for this development for red kite and kestrel.

[11] Considered as a precaution given it lies just outside the 10 km ZoI.

Assessment

6.12.6 Relevant information during the operational phases from other committed developments determined to have the potential to result in likely significant cumulative effects with the Proposed Development, is provided in **Table 6.15.**

Table 6.15 Inter-project Cumulative Effects: Assessment

ID	Committed development	Inter-development cumulative effect description
C19	DNS/3276735 Gaerwen Wind Farm	This development reports the following average collision mortality estimates: • Red kite – 0.8944 birds/year. • Golden plover – 1.8025 birds/year. • Kestrel – 0.3523 birds/year.
C10	DNS/3214855 Alwen Forest	This development reports the following average collision mortality estimates: • Red kite – 0.4 birds/year. • Kestrel – 0.17 birds/year. Golden plover was not considered in detailed assessment.

Berwyn SPA and SSSI – Collision (red kite)

6.12.7 The Alwen Forest ornithology report states that given the development is *c.* 15 km from the Berwyn SPA/SSSI, potential effects on the SPA/SSSI (including its qualifying species like red kite are not considered). Therefore, cumulative effects with regards to the red kite population of the Berwyn SPA and SSSI is considered with respect to red kite for Gaerwen wind farm only.

6.12.8 The collision mortality estimate for Gaerwen wind farm was an average of 0.8944 birds per year. Cumulatively with the annual estimate for the Proposed Development, this gives an estimate of 1.335 birds per year.

6.12.9 Following the approach used for the Proposed Development alone, the cumulative estimate of 1.335 birds per year equates to 7.03 % of the Berwyn SPA (and therefore assumed SSSI) population estimate (19 birds; from Hereward *et al*., 2024). This added mortality within the population (Berwyn SPA/SSSI) is insufficient to prevent a continued increase in the red kite population. This is particularly given Hereward *et al*. (2024) states that even in the worst-case scenario with all wind farm developments in the planning system (at the time of writing the report, which included the Proposed Development) this is unlikely to prevent the continued growth of the red kite population nationally. Furthermore, an average of 12 % of the national red kite population could be lost per year by collisions, before a population decline would be more probable than not.

6.12.10 For the Berwyn SPA and SSSI, with respect to red kite, the cumulative collision impact is considered to be of low magnitude, resulting in a **minor adverse** and **not significant effect**.

Red kite - Collision

6.12.11 The collision mortality estimate for Gaerwen wind farm was an average of 0.8944 birds per year, and 0.4 birds per year for Alwen Forest. Cumulatively with the annual estimate for the Proposed Development, this gives an estimate of 1.735 birds per year.

6.12.12 Assessing the potential impact of the CRM mortality estimate against the most recent Welsh population estimate of 2,117 pairs and the Area Statement Area 'North West Wales' of 99 pairs where the Site is located (from Hereward *et al*., 2024), predicts a respective loss of 0.041 % and 0.876 % of the breeding populations. It should be noted that the population estimates are for breeding adult birds, and so does not include juvenile and immature birds, so the true population will be greater than that used in this assessment, which will exaggerate the level of impact.

6.12.13 Estimated adult survival rates for red kite are stated as 61 % (BTO Bird Facts, 2025), which gives a baseline mortality of 39 % for adult birds. Assuming a national (Welsh) population estimate of 4,234 birds; the baseline mortality rate in the absence of the Proposed Development would be 1,651 adult birds per year. The estimated annual cumulative mortality (1.735 birds) represents a potential 0.105 % increase in annual baseline national mortality. For the North West Wales Area Statement Area the equivalent baseline mortality rate in the absence of the Proposed Development (and relevant cumulative developments) would be 77 adult birds per year. The estimated annual mortality (1.735 birds) resulting from the Proposed Development and cumulative developments represents a potential 2.25 % increase in annual baseline regional mortality.

6.12.14 Population Viability Analysis (PVA) has been undertaken (Hereward *et al*. (2024) to investigate the potential collision impacts of wind farm developments on the Welsh red kite population. This determined that an average of 12 % of the red kite (national) population could suffer collision mortality each year from new wind farm developments before a population decline becomes more probable than not. Note, the average cumulative collision mortality of 1.735 birds per year is only 0.041 % of the Welsh kite population (2,117 pairs, 4,234 birds; Hereward *et al*., 2024), and 0.876 % of the regional (North West Wales Area Statement Area). It is clear that the CIA's red kite collision mortality is inconsequential (negligible) at the national and regional levels.

6.12.15 It should be noted that the Proposed Development was included in the Hereward *et al.* (2024) assessment which predicts that *"currently proposed levels of wind farm development* (for which the Proposed Development is included) *are unlikely to prevent the continued growth of the Welsh red kite population, even in the most extreme scenarios where all sites currently in development go ahead."*

6.12.16 Overall, a **negligible** cumulative collision impact is predicted for red kite at the regional and national level, and **not significant effect** is concluded.

Golden plover - Collision

6.12.17 Of the cumulative developments considered only the Gaerwen wind farm considered golden plover in detailed assessment.

6.12.18 The collision mortality estimate for Gaerwen wind farm was an average of 1.8025 birds per year. Cumulatively with the annual estimate for the Proposed Development, this gives an estimate of 11.0955 birds per year.

6.12.19 No up-to-date regional golden plover estimates are available. In the winter period golden plover remains abundant in Wales; numbers vary between years, but a wintering estimate of 10,000 in 2017/18 provides a recent example. There is considerable turnover of birds during the non-breeding season period. Given the golden plover recorded during the field surveys for the Proposed Development are indicative of non-breeding birds, using the non-breeding 10,000 bird estimate is considered appropriate.

6.12.20 Assessing the potential impact of the CRM mortality estimate against the estimate of 10,000 non-breeding golden plover predicts a loss of 0.111 % of the non-breeding populations.

6.12.21 Estimated adult survival rates for golden plover are stated as 73 % (BTO Bird Facts, 2025), which gives a baseline mortality of 27 % for adult birds. Assuming a conservative national (Welsh) population estimate of 10,000 birds; the baseline mortality rate in the absence of the Proposed Development (and relevant cumulative developments) would be 2,700 adult birds per year. The estimated annual cumulative mortality (11.0955 birds) represents a potential 0.411 % increase in annual baseline national mortality. Such a low level of additional mortality would be undetectable at this (national) scale.

6.12.22 Although a total of 47 golden plover collisions have been reported at European wind farms, none of these were from Britain (Dürr, 2023). Therefore, even if some collisions go undetected, golden plover collisions with turbines are considered an uncommon event.

6.12.23 Overall, a **negligible** cumulative collision impact is predicted for golden plover at the national level (with no more than a low magnitude, **minor/ negligible adverse** cumulative collision impact predicted at the regional level), and **not significant effect** is concluded.

Kestrel - Collision

6.12.24 The collision mortality estimate for Gaerwen wind farm was an average of 0.3523 birds per year, and 0.17 birds per year for Alwen Forest. Cumulatively with the annual estimate for the Proposed Development, this gives an estimate of 2.007 birds per year.

6.12.25 Assessing the impact of this against the most conservative of the population estimates (530 pairs; from Pritchard *et al*., 2021), indicates the mortality estimate equates to a potential loss of 0.19 % of the breeding population each year. This is a precautionary estimate given that it is young (non-breeding birds) that are likely to be most susceptible to collision, and these birds are not included in the population estimate. Assessing against the estimate of 1,750 pairs (from Hughes *et al*., 2020), the collision mortality is equal to 0.06 % of the population.

6.12.26 Estimated adult survival rates for kestrel are stated as 69 % (BTO Bird Facts, 2025), which gives a baseline mortality of 31 % for adult birds. Assuming a national (Welsh) population estimate of least 530 pairs (1,060 adult birds); the baseline mortality rate in the absence of the Proposed Development (and relevant cumulative developments) would be 329 adult birds per year. The estimated annual cumulative mortality (2.007 birds) represents a potential 0.61 % increase in annual baseline national mortality. Such a low level of additional mortality would be undetectable at this (national) scale.

6.12.27 Overall, a **negligible** cumulative collision impact is predicted for kestrel at the national level (with no more than a low magnitude, resulting in a **minor/ negligible adverse** cumulative collision effect predicted at the regional level), and **not significant effect** is concluded.

Proposed Mitigation

6.12.28 Given no significant cumulative effects are predicted when considering the effects of other major developments within the ZoI, no additional mitigation is proposed.

References

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. & Ferrer, M. (Eds.) Birds and Wind Farms: Risk Assessment and Mitigation, pp 259-275. Quercus, Madrid.

Band, W. (2024). Using a collision risk model to assess bird collision risks for onshore wind farms. NatureScot Research Report 909.

BTO Bird Facts Species (2025). BirdFacts Species. [Online]
Available at: https://www.bto.org/learn/about-birds/birdfacts
[Accessed July 2025]

BTO WeBS (2025). Wetland Bird Survey
Available at: https://www.bto.org/get-involved/volunteer/projects/wetland-bird-survey
[Accessed July 2025]

CIEEM (2018 (updated 2024)). Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, freshwater, coastal and marine. Chartered Institute of Ecology and Environmental Management, Winchester. Version 1.3 (updated September 2024).
Available at: https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.2-April-22-Compressed.pdf
[Accessed July 2025]

Countryside Council For Wales (2008). Core Management Plan Including Conservation Objectives for Berwyn & South Clwyd Mountains SAC & Berwyn SPA. Version 23. [Online]
Available at:
https://naturalresources.wales/media/670888/Berwyn%20man%20plan%20(E)%20(table%20revis%2010.09.09).pdf
[Accessed June 2025]

Cutts, N., Hemingway, K. and Spencer, J. (2013). Waterbird disturbance mitigation toolkit: informing estuarine planning and construction projects, version 3.2. Institute of Estuarine and Coastal Studies, University of Hull.

Douglas, D.J.T., Bellamy, P.E. and Pearce-Higgins, J.W. (2011). Changes in the abundance and distribution of upland breeding birds at an operational wind farm. Bird Study 58 (1), 37-43.

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.

Dürr, T. (2023). Vogelverluste an Windenergieanlagen / bird fatalities at windturbines in Europe. Daten aus der zentralen Fundkartei der Staatlichen Vogelschutzwarte im

Landesamt für Umwelt, Gesundheit und Verbraucherschutz Brandenburg zusammengestellt. Tobias Dürr; Stand vom: 9 August 2023 [Online]
Available at:
https://lfu.brandenburg.de/lfu/de/aufgaben/natur/artenschutz/vogelschutzwarte/arbeitsschwerpunkt-entwicklung-und-umsetzung-von-schutzstrategien/auswirkungen-von-windenergieanlagen-auf-voegel-und-fledermaeuse/#
[Accessed June 2025].

Fielding, A.H. and Haworth, P.F. (2015). Farr Wind Farm: a review of displacement disturbance on golden plover arising from operational turbines 2005-2015. September 2015. Haworth Conservation.

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

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.

Haworth, P. and Fielding, A. (2012). A review of the impacts of terrestrial wind farms on breeding and wintering hen harriers. Haworth Conservation 24/08/2012.

Hereward, H. F. R., Macgregor, C.J., Gabb, O., Connell, A., Thomas, R.J., Cross, A.V. and Taylor, R.C. (2024). Modelling population-level impacts of wind farm collision risk on Welsh red kites. BTO Research Report 766.Report to RenewableUK Cymru.

Hughes, J. (ed.) (2021). Welsh Bird Report No. 34: 2020. Birds of Wales 18:3.

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*, Online First, December 2022

Mammen, U., Mammen, K., Heinrichs, N. and Resetaritz, A. (2011). Red kite *Milvus milvus* fatalities at wind farms – why do they occur and how are they to prevent? Proceedings Conference on Wind Energy and Wildlife Impacts, NNU Report 693, pp108.

NatureScot (2020). The effect of aviation obstruction lighting on birds at wind turbines, communication towers and other structures. NatureScot Information Note September 2020 v1.1. NatureScot, Inverness.

NatureScot (2024). NatureScot pre-application guidance for onshore wind farms. Version: November 2024.

NatureScot (2025a). Recommended bird survey methods to inform impact assessment of onshore windfarms. Updated March 2025.

NatureScot (2025b). Guidance note - assessing the significance of impacts on bird populations from onshore wind farms that do not affect protected areas. March 2025.

NatureScot (2025c). Wind farm impacts on birds – use of avoidance rates in the NatureScot wind farm collision risk model. Updated: March 2025.

NatureScot (2025d). Guidance - assessing the cumulative impacts of onshore wind farms on birds. Updated: March 2025.

Pearce-Higgins, J.W., Stephen, L., Langstone, R.H.W., Bainbridge, I.P. and Bullman, R. (2009). The distribution of breeding birds around upland wind farms. Journal of Applied Ecology 46, 1323-1331.

Pearce-Higgins, J.W., Stephen, L., Douse, A. and Langston, R.H.W. (2012). Greater impacts of wind farms on bird populations during construction than subsequent operation: results of a multi-site and multi-species analysis. Journal of Applied Ecology, 49 (2), 386-394.

Pendlebury, C., Zisman, S., Walls, R., Sweeney, J., McLoughlin, E., Robinson, C., Turner, L. and Loughrey, J. (2011). Literature review to assess bird species connectivity to Special Protection Areas. Scottish Natural Heritage (now NatureScot) Commissioned Report No. 390.

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

Sansom, A., Pearce-Higgins, J.W and Douglas, D.J.T. (2016). Negative impact of wind energy developments on a breeding shorebird assessed with a BACI study design. Ibis 158 (3), 541-555.

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

Shewring, M. (2021). European nightjar and upland plantation woodland management. Thesis submitted in part fulfilment of PhD. December 2021. Retrieved from https://orca.cardiff.ac.uk/id/eprint/153640/ (Accessed October 2025).

SNH (2012). Assessing the Cumulative Impact of Onshore Wind Energy Developments. Scottish Natural Heritage, Inverness.

SNH (2000). Calculating a theoretical collision risk assuming no avoiding action. SNH, Inverness.

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

SNH (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. March 2017, Version 2.

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.

Vattenfall (2023). Britain's smallest bird of prey continues to thrive at Ray wind farm. [Online]. Available at: https://group.vattenfall.com/press-and-media/newsroom/2023/britains-smallest-bird-of-prey-continues-to-thrive-at-ray-wind-farm
[Accessed June 2025].

Whitfield, D.P., Green, M. and Fielding, A.H. (2010). Are breeding Eurasian curlew *Numenius Arquata* displaced by wind energy developments? Natural Research Projects Ltd., Banchory.

WindPower Monthly (2018). Safe havens for protected birds? [Online]
Available at: https://www.windpowermonthly.com/article/1489017/safe-havens-protected-

birds
[Accessed June 2025].