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## 8. Biodiversity

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### 8.1 Introduction

8.1.1 The Draft ES has been produced to fulfil the Applicant's consultation duties and enable consultees to develop an informed view of the likely significant effects of the Proposed Development. This chapter provides an assessment of the likely significant effects of the Proposed Development with respect to Biodiversity, based on the information obtained to date. Following consultation, the assessment will be updated for the final ES that will accompany the planning application for the Proposed Development.

8.1.2 This chapter should be read in conjunction with:

- the description provided in **Chapter 4: Description of the Proposed Development**; and
- the relevant parts of the following chapters where common receptors such as peat have been considered and where there is an overlap or relationship between the assessments of effects:
  - ▶ **Chapter 10: Water Environment**, (due to the close association between ecological features<sup>1</sup> and local hydrology);
  - ▶ **Chapter 11: Ground Conditions** (due to peat being an ecological feature/receptor); and
  - ▶ **Chapter 13: Noise** (due to the potential for fauna to be disturbed or displaced by noise and vibration associated with the Proposed Development).

8.1.3 This chapter describes:

- the legislation, policy and technical guidance that has informed the assessment (**Section 8.2**);
- consultation and engagement that has been undertaken and how comments from consultees relating to Biodiversity have been addressed (**Section 8.3**);
- the methods used for baseline data gathering (**Section 8.4**);
- overall baseline (**Section 8.4.5**);
- embedded measures relevant to Biodiversity (**Section 8.6**);
- the scope of the assessment for Biodiversity (**Section 0**);
- the methods used for the assessment (**Section 8.8**);
- the assessment of Biodiversity effects (**Section Error! Reference source not found. - 8.21**);
- assessment of cumulative (inter-project) effects (**Section 8.16**);
- a summary of the preliminary significance conclusions (**Section 8.173**); and

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<sup>1</sup> "The Chartered Institute for Ecology and Environmental Management (CIEEM) refer to biodiversity receptors within technical guidance as ecological features. This term is therefore used in this chapter in place of 'receptors' but for the purposes of the assessment they are the same

- an outline of further work to be undertaken for the Environmental Statement (ES) (**Section 8.18**).

## Limitations and assumptions

- 8.1.4 Some of the areas within the 250m buffer immediately outside of the Site boundary were steeply sloped and therefore could not be safely accessed. Although full access was not possible, it is considered an accurate mapping of these habitats could be undertaken from nearby accessible adjacent land.
- 8.1.5 There is grazing access to sheep across the entire Site. As a result of the intense grazing, and in some areas, exposure to wind, the sward of the grassland was generally short, making species identification difficult.
- 8.1.6 Best efforts were made to achieve ten consecutive nights of automated monitoring for bats in optimal weather conditions within each seasonal window. Notwithstanding, some monitoring nights fell outside of the optimum weather conditions. In most cases, the weather was only marginally outside of the optimal range (e.g. 0.5 – 3m/s over the optimum wind or 1°C below the optimum temperature range). Given the nature and location of the Site coupled with the marginal variation from optimal conditions, it is considered that the monitoring data was collected during acceptable weather conditions for each season and that the results accurately reflect bat activity at the Site.
- 8.1.7 Due to the evolution of scheme design, proposed turbine locations changed between 2020 and 2022. A seventh turbine location was also added in 2021. The 2020, 2021 and 2022 monitoring locations are shown in reference to the current proposed turbine positions in **Figure 2.2, Figure 2.3 and Figure 2.4 (Appendix 8B)**. By the end of the three years recording, automated monitoring was undertaken in close proximity to all final turbine locations.
- 8.1.8 The walked transect surveys were planned to be undertaken once each month from May to October inclusive. However, the August transect could not be completed due to health and safety access restrictions with cattle being present across the Site. To ensure a good spread of data collection through the season, an additional transect was undertaken in September.
- 8.1.9 All reptile visits were conducted as far as was practically possible in optimum conditions. All visits commenced during optimum temperature range however, three visits were outside of the ideal temperature range (>17°C) when surveys finished. That said, conditions were still deemed suitable for reptile activity.

## 8.2 Relevant legislation, planning policy and technical guidance

- 8.2.1 This section identifies the legislation, planning policy and technical guidance that has informed the assessment of effects with respect to Biodiversity. Further information on policies relevant to the Proposed Development is provided in **Chapter 5: Legislation and policy overview**.

## Legislation

- 8.2.2 A summary of the relevant legislation is given in **Table 8.1**.

**Table 8.1 Legislation relevant to the biodiversity assessment**

Legislation	Legislative context
<b>The Conservation of Habitats and Species Regulations 2017 (as amended)<sup>2</sup></b>	<p>The Conservation of Habitats and Species Regulations 2017 (“the Habitats Regulations”) transposed the Habitats Directive into English and Welsh law. The Habitats Regulations provided for the designation and protection of European sites, the protection of certain species (referred to as European Protected Species or EPS) and the adaptation of planning and other controls for the protection of European sites.</p> <p>Note that The Conservation of Habitats and Species Regulations 2017 were amended by the <b>Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019</b> to reflect the UK’s exit from the EU. These largely carried forward the provisions and terminology of the 2017 Habitats Regulations, and so the term ‘European site’ is currently retained and for all practical purposes the definition is essentially unchanged, although the UK European sites are no longer legally part of the ‘Natura 2000’ network of protected sites, with this being replaced in the UK by the ‘national site network’ which comprises all existing Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) and any new SACs and SPAs designated under the 2019 Regulations (Ramsar sites do not form part of the network). This also has relevance if compensation measures are required for an adverse effect, as the relevant metric is the overall coherence of the ‘national site network’. The 2019 Regulations establish management objectives for the ‘national site network’ which contribute to the conservation of UK habitats and species that are also of pan-European importance, and to the achievement of their favourable conservation status within the UK.</p>
<b>The Environment (Wales) Act 2016<sup>3</sup></b>	<p>The Act makes provisions within Wales for the planning and managing of natural resources at national and local level. Section 6 of the Act introduces the biodiversity and resilience of ecosystems duty whereby public authorities are required to seek to maintain and enhance biodiversity so far as it is consistent with the proper exercise of those functions. Section 7 of the Act introduces a list of living organisms and types of habitat in Wales, known as Species or Habitats of Principal Importance, which in Wales are considered of key significance to sustain and improve biodiversity.</p>
<b>The Wildlife And Countryside Act 1981 (as amended) (WACA)<sup>4</sup></b>	<p>This act consolidates and amends existing national legislation to implement the Bern Convention. This piece of legislation remains the primary UK mechanism for statutory site designations (e.g. Sites of Special Scientific Interest, SSSI) and the protection of individual species listed under Schedules 5 and 8 of the Act, each subject to varying levels of protection.</p>
<b>Countryside &amp; Rights of Way Act 2000<sup>5</sup></b>	<p>This act details further measures for the management and protection of SSSIs and strengthens wildlife enforcement legislation.</p>

<sup>2</sup> Conservation of Habitats and Species Regulations 2017 (“the Habitats Regulations”) has been amended by (*inter alia*) the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 [online]. Available at: <https://www.legislation.gov.uk/ukdsi/2019/9780111179512/contents?sort=year> [Accessed 19 April 2022].

<sup>3</sup> The Environment (Wales) Act 2016. Available at: <https://www.legislation.gov.uk/anaw/2016/3/contents> [Accessed 19 April 2022].

<sup>4</sup> The Wildlife And Countryside Act 1981 (as amended) <https://www.legislation.gov.uk/ukpga/1981/69> [Accessed 19 April 2022].

<sup>5</sup> Countryside and Rights of Way Act 2000 (<https://www.gov.uk/guidance/open-access-land-management-rights-and-responsibilities>) [Accessed 19 April 2022].

Legislation	Legislative context
<b>The Hedgerows Regulations 1997<sup>6</sup></b>	The Hedgerows Regulations is intended to protect important countryside hedges from damage or destruction.
<b>Protection of Badgers Act 1992<sup>7</sup></b>	The Protection of Badgers Act provides protection to badgers and their places of shelter (setts).

## Planning policy

8.2.3 A summary of the relevant national and local planning policy is given in **Table 8.2**.

**Table 8.2 Planning policy relevant to the biodiversity assessment**

Policy	Policy context
<b>National planning policy</b>	
<b>Future Wales: The National Plan<sup>8</sup></b>	The Welsh national development framework sets the direction for development in Wales to 2040 and includes a Habitats Regulations Assessment. Policy 9 – Resilient Ecological Networks and Green Infrastructure outlines measures to ensure the enhancement of biodiversity, the resilience of ecosystems and the provision of green infrastructure.
<b>Planning Policy Wales – Chapter 6 Distinctive and Natural Places (11th Ed.; 2021)<sup>9</sup></b>	Chapter 6 of Planning Policy Wales (PPW) sets out the Welsh Government’s objectives for Distinctive and Natural Places theme of planning policy topics covers historic environment, landscape, biodiversity and habitats, coastal characteristics, air quality, soundscape, water services, flooding and other environmental (surface and sub-surface) risks. In particular, the Biodiversity and Resilience of Ecosystems section puts emphasis on planning authorities to have regard for the State of Natural Resources Report (SoNaRR) and Area Statements published by Natural Resources Wales.
<b>Technical Advice Note 5 (TAN5) Nature Conservation and Planning (2009)<sup>10</sup></b>	Welsh Government (WG) policy on positive planning for nature conservation and developments affecting designated sites and habitats, along with protected priority habitats and species. It brings together advice on sources of legislation relevant to various nature conservation topics which may be encountered by local planning authorities. It sets out the key principles of planning for nature conservation and addresses nature conservation in development control procedures. It also deals with the conservation of protected and priority species. It also outlines that developments that may adversely impact on sites designated for their national nature conservation interest will generally not be permitted.

<sup>6</sup> The Hedgerows Regulations 1997 <https://www.legislation.gov.uk/ukxi/1997/1160/contents/made> [Accessed 19 April 2022].

<sup>7</sup> Protection of Badgers Act 1992

<https://www.legislation.gov.uk/ukpga/1992/51/introduction/enacted?view=plain>[Accessed 19 April 2022].

<sup>8</sup> Welsh Government (2021) Future Wales: The National Plan 2040, February 2021. [online]. Available at: <https://gov.wales/future-wales-national-plan-2040>

<sup>9</sup> Welsh Government (2021) *Planning Policy Wales, Edition 11, February 2021*. [online]. Available at: [https://gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11\\_0.pdf](https://gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11_0.pdf). [Accessed 01 December 2021].

<sup>10</sup> Welsh Government, (2009). Planning Policy Wales Technical Advice Note 5: Nature Conservation and Planning.

Policy	Policy context
<b>Local planning policy</b>	
<p><b>Rhondda Cynon Taf Local Development Plan (LDP) up to 2021 (Adopted 2011)</b> <sup>11</sup></p>	<p>The LDP identifies where allocations for new developments such as housing, employment, community facilities, and roads have been made. It provides a framework for local decision making and brings together both development and conservation interests to ensure that any changes in the use of land are coherent and provides maximum benefits to the community.</p> <p>Policy AW8 Protection and Enhancement of the Natural Environment: outlines the measures to protect, and, where appropriate, enhance Rhondda Cynon Taf's natural environment and designated landscape. Development proposals would only be permitted where:</p> <ul style="list-style-type: none"> <li>• They would not cause harm to the features of a Site of Importance for Nature Conservation (SINC) or Regionally Important Geological Site (RIGS) or other locally designated sites, unless it can be demonstrated that: <ul style="list-style-type: none"> <li>▶ The proposal is directly necessary for the positive management of the site; or</li> <li>▶ The proposal would not unacceptably impact on the features of the site for which it has been designated; or</li> <li>▶ The development could not reasonably be located elsewhere and the benefits of the proposed development clearly outweigh the nature conservation value of the site.</li> </ul> </li> <li>• There would be no unacceptable impact upon features of importance to landscape or nature conservation, including ecological networks, the quality of natural resources such as air, water and soil, and the natural drainage of surface water.</li> </ul> <p>All development proposals, including those in built up areas, that may affect protected and priority species will be required to demonstrate what measures are proposed for the protection and management of the species and the mitigation and compensation of potential impacts. Development proposals must be accompanied by appropriate ecological surveys and appraisals, as requested by the Council.</p> <p>Additionally, development proposals should conform to policies AW10, DM15 and DM16.</p> <p>AW10 Environmental Protection and public Health: Development proposals will not be permitted where they would cause or result in a risk of unacceptable harm to health and / or local amenity because of:-</p> <ul style="list-style-type: none"> <li>• 1. Air pollution; 2. Noise pollution; 3. Light pollution; 4. Contamination; 5. Landfill gas; 6. Land instability; 7. Water pollution; 8. Flooding; 9. Or any other identified risk to the environment, local amenity and public health or safety;</li> </ul> <p>unless it can be demonstrated that measures can be taken to overcome any significant adverse risk to public health, the environment and / or impact upon local amenity.</p>

<sup>11</sup> Rhondda Cynon Taf County Borough Council (2011) *Local Development Plan up to 2021*. [online]. Available at: <https://www.rctcbc.gov.uk/EN/Resident/PlanningandBuildingControl/LocalDevelopmentPlans/RelateddocumentsLDP20062021/AdoptedLocalDevelopmentPlan.pdf>. [Accessed 19 April 2022].

Policy	Policy context
	<p>AW13 Large Wind Farm Development: Proposals for wind farm developments of 25MW and over or capable of accommodating 25MW or over will be permitted where it can be demonstrated that the proposal:</p> <ul style="list-style-type: none"> <li>• 1. Is within the boundary of the strategic search area;</li> <li>• 2. Is sited on a predominantly flat, extensive area of upland;</li> <li>• 3. Is located a minimum of 500 metres away from the nearest residential property unless it can be demonstrated that locating turbines closer to residential properties will have no unacceptable impact on human health;</li> <li>• 4. Will not because of its siting, scale or design have an unacceptable effect on the visual quality of the wider landscape;</li> <li>• 5. Will minimise any loss of, and where possible enhance public accessibility to the countryside;</li> <li>• 6. Will not cause unacceptable impact on, and where appropriate will enhance, sites designated for their international, national or local nature conservation value; and</li> <li>• 7. Will protect the natural beauty and special qualities of the Brecon Beacons National Park.</li> </ul>
<p><b>Rhondda Cynon Taf Supplementary Planning Guidance (SPG) Nature Conservation 2011</b></p>	<p>The Rhondda Cynon Taf Supplementary Planning Guidance (SPG) on Nature Conservation was produced in 2011 and provides additional guidance to support the Local Development Plan (LDP) policies. The purpose of the SPG is to assist those submitting and determining planning applications in Rhondda Cynon Taf to ensure that nature conservation is protected and conserved when development is proposed.</p>
<p><b>Rhondda Cynon Taf Biodiversity Action Plan (Action for Nature) 2000 (updated 2008)</b></p>	<p>The national strategy for biodiversity is delivered at local level via Local Biodiversity Action Plans (LBAP). Rhondda Cynon Taf LBAP (Action for Nature) is the driver to protect, enhance and manage the biodiversity resource, by setting out objectives, targets and actions for the conservation of biodiversity within Rhondda Cynon Taf.</p>

## Technical guidance

- 8.2.4 A summary of the technical guidance for biodiversity that is relevant to the assessment is given in **Table 8.3**. Technical guidance that has been used to define the survey methods used to inform this assessment is referenced in **Appendices 8A – 8E** as required.

**Table 8.3 Technical guidance relevant to the biodiversity assessment**

Technical guidance document	Context
<p><b>Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and</b></p>	<p>Sets out the industry standard approach to Ecological Impact Assessment (EclA) for assessing the potential effects of a project on ecological receptors.</p>



Technical guidance  
document

Context

Marine (CIEEM, 2018,  
updated in 2019).<sup>12</sup>

## 8.3 Consultation and engagement

### Overview

- 8.3.1 The assessment has been informed by consultation responses and ongoing stakeholder engagement. An overview of the approach to consultation is provided in **Section 2.4 of Chapter 2: Approach to Environmental Impact Assessment**.

### Scoping Direction

- 8.3.2 A Scoping Direction was issued by The Planning Inspectorate (now Planning and Environment Decisions Wales (PEDW)) on behalf of the Welsh Ministers, on 17 November 2021. A summary of the relevant responses received in the Scoping Direction in relation to biodiversity and confirmation of how these have been addressed within the assessment to date is presented in **Table 8.4**.

**Table 8.4 Summary of EIA Scoping Direction responses for biodiversity**

Consultee	Consideration	How addressed in this Draft ES
PINS (ID.24/34)	<p><i>Badgers</i></p> <p><i>“It is noted that Appendix 7.1 states that no evidence of badger setts or activity was recorded on Site. However, PEDW notes that the Phase 1 Habitat survey informing Appendix 7.1 was conducted at a suboptimal time where setts and runs are less visible and concealed by vegetation. It is not possible to completely exclude badger activity at this stage”</i></p>	<p>Surveys for badger have been conducted alongside all other survey work between 2020 and 2022, with no badger signs recorded. The Site is open with short vegetation as such signs of badger would be recorded at any time of year (if present) and seasonal survey constraints (dense vegetation) are not applicable. No signs indicating the presence of badger have been observed during survey work completed to date. Alongside site habitat conditions, it is concluded that badgers are not present on or adjacent to the Site and as such are scoped out of the assessment.</p>

<sup>12</sup> CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, Version 1.1*. [online]. Available at: <https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.1Update.pdf> [Accessed 31 March 2022].

Consultee	Consideration	How addressed in this Draft ES
LPA/PINS (ID.25/29)	<p><i>Dormouse</i></p> <p><i>Section 4.2 of Appendix 7.1 states that the habitats present within and adjacent to the Site are not considered to be supportive to dormice and that food species were limited with no hazel. However, table 4.14 at Appendix 7.1 states that “a small fenced area is present in the south with dominant willow scrub with some scattered hazel”. Additionally, the Applicant is reminded that heath and bracken, although suboptimal, can offer nesting opportunities for dormice.</i></p> <p><i>As detailed at ID.25 and ID.26, PEDW does not consider that the presence of these species can be excluded at this stage and further survey work is therefore required. These species should not be Scoped Out of the ES.</i></p>	<p>Following the Scoping Direction dormouse surveys were conducted. The baseline dormouse survey report is provided in <b>Appendix 8E</b>. It is concluded that dormouse is not present on or adjacent to the Site and as such, this species is scoped out of the assessment.</p>
LPA/PINS (ID.26/29/33)	<p><i>Water voles</i></p> <p><i>Appendix 7.1 states that the waterbodies on Site are not considered to support water voles. The Applicant’s attention is drawn to RCTCBC comments regarding the potential for upland water vole population. The presence of water vole on Site cannot be discounted at this stage.</i></p> <p><i>As detailed at ID.25 and ID.26, PEDW does not considered that the presence of these species can be excluded at this stage and further survey work is therefore required. These species should not be Scoped Out of the ES.</i></p>	<p>Following the scoping response water vole surveys were conducted. The baseline water vole survey report is provided in <b>Appendix 8D</b>. It is concluded that water vole are not present on or adjacent to the Site and as such, this species is scoped out of the assessment.</p>
LPA/PINS (ID.27)	<p><i>Great Crested Newts</i></p> <p><i>Section 4.2 of Appendix 7.1 states that Pond 3 was found dry at the time of the survey but table 4.17 states that the pond was surveyed using eDNA techniques on 1st May 2020. It is assumed that table 4.17 contains a typo.</i></p>	<p>Corrected in <b>Appendix 8A</b>, Pond 3 was found dry at the time of the survey and not taken forward for eDNA survey.</p>

Consultee	Consideration	How addressed in this Draft ES
<b>PINS (ID.28)</b>	<p>Protected and notable vegetation species</p> <p>PEDW notes the results of the desk study and Phase 1 Habitat survey. There is potential for the Site to support important plant communities. These should be added to the list at section 5.</p>	Protected and notable vegetation species have been considered during scoping <b>Appendix 8F</b>
<b>PINS (ID.30)</b>	<p><i>Great Crested Newts</i></p> <p><i>PEDW agrees that GCN can be scoped out of further assessment. However, the Applicant should be mindful of the age of the surveys at the time of submission of the ES. Depending on the date the application will be submitted, a survey update may be required.</i></p>	Although surveys are over 2 years old, it was agreed through LPA consultation that full eDNA survey updates are not required. Pond habitat surveys updates were undertaken in 2022 to confirm the status of the ponds on Site had not changed. Results are presented in <b>Appendix 8A</b> .
<b>NRW/PINS (ID.31)</b>	<p><i>Bats surveys</i></p> <p><i>PEDW welcomes the methodology used during the 2020 bat surveys. However, it is noted at paragraph 2.7.4 of Appendix 7.2 that, due to the evolution of the scheme, not all the turbine positions were surveyed. PEDW agrees with NRW that additional survey effort during autumn for all known turbine positions should be conducted, in line with Bats and Onshore Wind Turbines - survey, assessment and mitigation guidance (NatureScot).</i></p>	Further bat surveys were undertaken in July and September 2022 to ensure sufficient data is collated from all turbine locations, as detailed in <b>Appendix 8B</b> .
<b>NRW/PINS (ID.35)</b>	<p><i>Marsh fritillary</i></p> <p><i>See NRW's comment at Appendix 1 regarding the potential for effects on Rhos Tonyrefail SSSI from the proposed development. Further assessment of the potential impact of the proposal on Marsh fritillary is required and thus cannot be scoped out at this stage.</i></p>	Rhos Tonyrefail SSSI and has been considered in the assessment ( <b>Section 8.9</b> ). Marsh fritillary surveys have been conducted and this species is not considered to be present on the Site.
<b>LPA/PINS (ID.36)</b>	<p><i>Section 7 habitats and species-Phase II Vegetation survey</i></p> <p><i>The SR states that impacts on Section 7 habitats and species will be avoided. At this stage it is unclear how this will be achieved as only a Phase 1 Habitat survey has</i></p>	Following consultation and agreement on approach with the LPA, National Vegetation Classification (NVC) surveys have been conducted within the Site at locations where direct land take will occur and where vegetation may qualify as Section 7 habitat.

Consultee	Consideration	How addressed in this Draft ES
	<p><i>been conducted. Due to the presence of the 18 DNS: EIA Scoping Direction 3280378 18 ID Reference in Scoping Report Issue Comment priority habitats identified, additional vegetation surveys are required. The Phase II Vegetation survey can be designed to follow the methodology described in Rodwell, J. S. (2006). National Vegetation Classification: Users' handbook. Representative quadrats should be selected taking into consideration not only the final location of the turbines (including micrositing) but associated infrastructure and construction areas (including borrow pits if relevant). The survey results should inform the assessment of the potential impact on non-statutory designated sites. See also RCTCBC comments at Appendix 1.</i></p>	
<b>PINS (ID.37)</b>	<p><i>Peat &amp; Groundwater Dependent Terrestrial Ecosystems (GWDTEs)</i></p> <p><i>The SR does not mention the potential for GWDTEs to be affected by the proposal even though there is potential for peat deeper than 0.5 m to be present. The Ecological assessment should consider GWDTEs, with reference to the hydrological assessment.</i></p>	<p>Effects on peat are considered in <b>Chapter 10: Water Environment;</b> and <b>Chapter 11: Ground Conditions.</b></p>
<b>PINS (ID.38)</b>	<p><i>Approach to mitigation</i></p> <p><i>The SR states that enhancement measures will be implemented so as to ensure overall net biodiversity benefit. No details are available at this stage, but the ES should include a detailed ecological management plan, including targets and enhancement objectives specific to the habitats and species present on site. The plan should include monitoring, in particular post construction bat monitoring (see Section 8 of the NatureScot guidance "Bats and Onshore Wind Turbines - survey, assessment and mitigation" (August 2021)) and</i></p>	<p>The final ES will include a detailed ecological/habitat management plan, including targets and enhancement objectives specific to the habitats and species present on site. Where applicable consultation shall be undertaken with relevant consultees.</p>

Consultee	Consideration	How addressed in this Draft ES
	<p><i>indicate triggers which would prompt changes in the management of the site. Net benefits should be clearly identified. At this stage, PEDW is not in a position to provide further recommendations for the delivery of specific mitigations. It is recommended that relevant consultees are further engaged once a draft mitigation proposal is emerging.</i></p>	
NRW	<p><i>The scoping report states that there are two Special Areas of Conservation (SAC) within a 10km radius of the proposed development. Given the lack of impact pathways (as cited in the scoping report), it is unlikely there will be significant effects on Blackmill Woodlands SAC and Cardiff Beechwoods SAC. Therefore these can be scoped out of the ES.</i></p>	<p>Blackmill Woodlands SAC and Cardiff Beech Woods SAC have been scoped out of the assessment (<b>Appendix 8F</b>).</p> <p>Given the clear lack of impact pathways a HRA is not proposed.</p>
LPA	<p><i>In line with Policy AW8 of the RCT LDP a full ecological habitat and species assessment of an EIA standard will be needed. This will need to include:</i></p> <ul style="list-style-type: none"> <li><i>• More detailed Phase I and Phase II Vegetation Survey</i></li> <li><i>• Hedgerow/Woodland/Tree Surveys of routes affected by infrastructure connections (road or power grid)</i></li> <li><i>• Ditch/Watercourse assessment</i></li> <li><i>• Grassland Fungi Survey</i></li> <li><i>• Nesting, wintering and passage bird use</i></li> <li><i>• Bat roost, foraging and commuting use</i></li> <li><i>• Badger Survey (plus possibly otter)</i></li> <li><i>• Dormouse Survey if infrastructure connections affect hedgerows/woodlands</i></li> <li><i>• Water Vole Survey</i></li> <li><i>• Reptile/Amphibian Surveys</i></li> </ul> <p><i>Also, in line with Policy AW8 and recent WG requirements for biodiversity net gain, a scheme of ecological mitigation and enhancement will be needed. This should include</i></p>	<p>Following scoping response consultation was held with RCTCBC Ecologist with regards to the scope of surveys required (see <b>Table 8.5</b>).</p> <p>The following surveys have or are being undertaken:</p> <ul style="list-style-type: none"> <li>• More detailed Phase I and Phase II Vegetation Survey</li> <li>• Grassland Fungi Survey</li> <li>• Bat roost, foraging and commuting use surveys</li> <li>• Badger Surveys</li> <li>• Dormouse Survey if infrastructure</li> <li>• Reptile/Amphibian Surveys</li> </ul> <p>An outline Habitat Management Plan (oHMP) will be written detailing the ecological mitigation and enhancement required including long-term habitat management and monitoring of key habitats. This will include consultation on the scope of these measures with the RCTCBC Ecologist. The oHMP will be included in the final ES.</p>

Consultee	Consideration	How addressed in this Draft ES
	<i>long-term habitat management and monitoring of key habitats (e.g. blanket bog/SINC habitats) and species through a Habitat Management Plan secured via S106 Agreement.</i>	

## Technical engagement

8.3.3 A summary of the technical (biodiversity) engagement undertaken to date is outlined in **Table 8.5**.

**Table 8.5 Technical engagement on the biodiversity assessment**

Consultee	Consideration	How addressed in this Draft ES
<b>NRW</b>	A meeting was requested in 2021 with regards to survey scope and evolving development plans; however NRW did not have availability to meet at that time.	A meeting with NRW will be requested once all bat survey data has been analysed and assessed.
<b>RCTCBC Ecologist</b>	A technical meeting with the RCTCBC ecologist was held on 6th May 2022. The species, habitats and SINCS potentially impacted were discussed along with potential prescriptions to include within the HMP. The scope of surveys which had been completed to date were discussed and any additional survey requirements were discussed to ensure site, regional and local biodiversity issues were adequately considered.	Following consultation, water vole, NVC, dormouse, marsh fritillary, fungus surveys and update pond Habitat Suitability Index (his) have been undertaken, with the scope of surveys agreed as detailed in <b>Table 8.7</b> .

## 8.4 Data gathering methodology

### Study area

8.4.1 The study area encompasses the area for which desk-study and field-survey data were collected to inform the biodiversity assessment. The level and type of data collection varies across the study area due to the presence of multiple ecological features and effect-pathways. The study area comprises:

- the land within the Site boundary (as shown on **Figure 1.2**);
- the desk study areas (known as 'areas of search') for sites designated for their nature conservation interest at the international, national and local levels;
- the area of search for legally protected and notable ecological features;
- the area of search for any legally controlled species; and

- for the Wind Farm development and section of Grid Connection Corridor within the Site<sup>13</sup>, the field survey areas for each ecological feature covered during baseline data collection activities.
- 8.4.2 The extent of the areas of search and field survey areas (**see Section 8.4.3 and Table 8.7**) were determined based on best practice guidance and a high-level overview of the types of ecological features present, informed by the desk study and Preliminary Ecological Appraisal and the potential effects that could occur (**see Table 8.12**). The study area was defined on a precautionary basis to ensure that the Zone of Influence (Zol)<sup>14</sup> relevant to all ecological features were covered during baseline data collection activities. Zols are the areas within which a potentially significant effect associated with the Proposed Development may be identified for a particular ecological feature.

## Desk study

- 8.4.3 A data-gathering exercise was undertaken in May 2020 to obtain information relating to statutory and non-statutory biodiversity sites; species or habitats of principal importance for the conservation of biodiversity; legally protected and controlled species; and other conservation-notable habitats or species (see **Boxes 8.1 and 8.2**, below). Given the potential for the Proposed Development to affect ecological features located off-site as well as on-site, data were obtained for:
- European sites and other biodiversity sites of international importance within 10km of the Site;
  - statutory designated biodiversity sites of national/ local importance within 2km of the Site;
  - non-statutory designated biodiversity sites areas within 2km of the Site;
  - protected species, species of principal importance for the conservation of biodiversity, or other conservation-notable species recorded within 2km of the Site, and bat records within 10km of the Site;
  - habitats of principal importance for the conservation of biodiversity in Wales or Rhondda Cynon Taf, or other conservation-notable habitats recorded within 2km of the Site; and
  - water bodies within 500m of the Site.
- 8.4.4 A summary of the organisations that have supplied data, together with the nature of that data is outlined in **Table 8.6**.

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<sup>13</sup> The Grid Connection includes an overhead line from the onsite substation to the edge of the Site (this portion of the connection is included in this DNS application) at which point the line will be undergrounded to the Point of Connection (this portion of the connection will be assessed via a desk-based assessment).

<sup>14</sup> The Zol in this context is the area over which an individual ecological feature may be subject to a potentially significant effects resulting from changes in the baseline environment due to the Proposed Development.

## Box 8.1 - Designated Biodiversity Sites, and Priority Habitats and Species

### Statutory Biodiversity Sites

- **European sites:** The *Conservation of Habitats and Species Regulations 2017* were amended by the *Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019* to reflect the UK's exit from the EU. These largely carried forward the provisions and terminology of the 2017 Regulations, and so the term 'European site' is currently retained and for all practical purposes the definition is essentially unchanged. **European sites are therefore:** any **Special Area of Conservation (SAC)** from the point at which the European Commission and the UK Government agreed the site as a '**Site of Community Importance (SCI)**' (if this was before 31 Jan 2020); any classified **Special Protection Area (SPA)**; and any **candidate SAC (cSAC)**. However, the term is also commonly used when referring to **potential SPAs (pSPAs)**, to which the provisions of Article 4(4) of Directive 2009/147/EC (the 'new wild birds directive') are applied; and to **possible SACs (pSACs)** and listed **Ramsar Sites**, to which the provisions of the Habitats Regulations are applied a matter of Government policy (**TAN 5.1.3**) when considering development proposals that may affect them. **"European site" is therefore used in this document in its broadest sense, as an umbrella term for all of the above designated sites.** Note, it is likely that this term will be supplanted at some point in the future although an appropriate UK-wide alternative has not yet been agreed (e.g. the NPPF in England has adopted the term 'Habitats sites' to refer collectively to those sites defined by Regulation 8; the *Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019* has renamed the Natura 2000 network of sites as the 'National Site Network').
- **Sites of Special Scientific Interest (SSSIs):** Nationally important sites notified under the *Wildlife and Countryside Act 1981* (as amended) that provide the best examples of the UK's flora, fauna, or geological or physiographical features (note, this assessment focuses on those sites notified for their biodiversity interest).
- **National Nature Reserves (NNRs):** Nationally important sites notified under the *National Parks and Access to the Countryside Act 1949* and the *Wildlife and Countryside Act 1981* (as amended); in practice most NNRs are SSSIs also.
- **Local Nature Reserves (LNRs):** Locally important sites that are designated under the *National Parks and Access to the Countryside Act 1949* with the objective of encouraging their use for the study, research or enjoyment of nature.

### Non-statutory Biodiversity Sites

Non-statutory biodiversity sites in Rhondda Cynon Taf County Borough Council are known as Sites of Importance for Nature Conservation, (SINCS) and are safeguarded by the policy provisions of Rhondda Cynon Taf County Borough Council LDP.

### Other important habitats or species

**Species or habitats of "principal importance for the conservation of biodiversity"** in Wales are those listed by Natural Resources Wales (NRW) pursuant to Section 7 of the *Environment Act (Wales) 2016*. They are commonly referred to as 'Section 7' or 'S.7' habitats or species, or HPI/SPIs (Habitats / Species of Principal Importance).

**Other conservation-notable habitats and species** would include:

- Species listed as being of conservation concern in the relevant UK Red Data Book (RDB) or the Birds of Conservation Concern Red List (Eaton *et al.* 2009).
- Ancient woodland (i.e. areas that have been under continuous woodland cover since at least 1600 listed on the Ancient Woodland Inventory (AWI));
- Nationally Rare and Nationally Scarce species in the UK, which are species recorded from, respectively, 1-15 and 16-100 hectares (10x10km squares of the UK national grid).
- Populations of birds comprising at least 1% of the relevant British breeding/wintering population (where data are available).
- Habitats and species listed by the relevant LBAP; and
- Other species or assemblages such as large populations of animals considered uncommon or threatened in a wider context.



### Box 8.2 - Legally Protected and Controlled Species

#### Legal Protection

Many species of animal and plant receive some degree of legal protection. For the purposes of this report, legal protection refers to:

- Species included on Schedules 5 and 8 of the *Wildlife and Countryside Act 1981* (as amended), excluding species that are only protected in relation to their sale (see Sections 9[5] and 13[2] of the Act);
- Species included on Schedules 2 and 5 of the *Conservation of Habitats and Species Regulations 2017*; and
- Badgers, which are protected under the *Protection of Badgers Act 1992*.

#### Legal Control

Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended) lists species of animal that it is an offence to release or allow to escape into the wild (for example grey squirrel) and species of plant that it is an offence to plant or otherwise cause to grow in the wild (for example, Japanese knotweed).

**Table 8.6 Data sources used to inform the biodiversity assessment**

Aspect	Data	Sources
<b>Statutory sites</b>	<ul style="list-style-type: none"> <li>• Boundary data</li> <li>• Citations</li> <li>• Other site information (e.g. Conservation Objectives; Management Plans; etc.)</li> </ul>	Magic: <a href="http://www.magic.gov.uk">www.magic.gov.uk</a> JNCC: <a href="http://jncc.defra.gov.uk/page-4">http://jncc.defra.gov.uk/page-4</a> NRW: <a href="http://lle.gov.wales/home">http://lle.gov.wales/home</a>
<b>Non-statutory sites</b>	<ul style="list-style-type: none"> <li>• Boundary data</li> <li>• Citations</li> </ul>	South East Wales Biodiversity Records Centre (SEWBRc)
<b>Other sites and habitats</b>	<ul style="list-style-type: none"> <li>• Boundary data</li> </ul>	Magic: <a href="http://www.magic.gov.uk">www.magic.gov.uk</a> SEWBRc
<b>Species records</b>	<ul style="list-style-type: none"> <li>• Location data</li> </ul>	SEWBRc

## Survey work

- 8.4.5 The biodiversity field survey programme was designed to provide sufficient information on legally protected and conservation notable species, and the general status and condition of all habitats within the Site. Surveys were designed based on the evolving Site boundary.
- 8.4.6 The grid connection includes an overhead line from the onsite substation to the edge of the Site and this area is included within the survey area. The overhead line will be undergrounded between the edge of the Site and the offsite Point of Connection to the electricity grid network and baseline biodiversity data for this part of the connection has been acquired via a desk-based assessment.
- 8.4.7 The grid connection between the on-site substation and electricity grid will be agreed and delivered as a separate DNS application. Notwithstanding this, the potential environmental effects arising from this have been considered in the Environmental Impact Assessment (EIA) for the proposed wind farm.

- 8.4.8 The survey areas for each ecological feature comprises the land within the Site and additional areas that were determined based on best-practice guidance and the potential effects that could occur. The search areas were defined on a precautionary basis to ensure that the Zol relevant to each ecological feature was covered during baseline data collection activities. The field survey programme was also informed by the results of the desk study, discussions with NRW, the RCTCBC ecologist and comments received in the Scoping Direction.
- 8.4.9 A summary of the surveys carried out to inform the preparation of this chapter is provided in **Table 8.7**, with the methods and results of these detailed in **Appendices 8A to 8E**.

**Table 8.7 Surveys conducted to inform the biodiversity assessment**

Survey type	Scope of survey	Survey status	Location of survey report
<b>Phase 1 habitat survey</b>	<p>Phase 1 habitat survey has been used to classify and map habitats inside the Site boundary and within a buffer up to 250m from it. The survey was 'extended' to identify the presence or potential presence of species of importance for biodiversity conservation and/or species that are afforded legal protection.</p> <p>Surveys followed the methods described in the Joint Nature Conservation Committee (JNCC) Handbook for Phase 1 habitat survey (2010)<sup>15</sup>.</p>	Survey complete (April and May 2020 with an update botanical surveys in July 2020 and July/August 2022).	<b>Appendix 8A – PEA Report</b>
<b>NVC</b>	National Vegetation Classification (NVC) assessment; has been conducted in areas identified as being priority habitat during the Phase 1 habitat surveys that would be subject to direct land take by the Proposed Development. Surveys followed the methods described in the Rodwell (2016) <sup>16</sup> .	Survey complete (August 2022), however data analysis is ongoing.	<b>Provided at Final ES submission.</b>
<b>Badger</b>	<p>Badger surveys have focussed on identifying signs of activity and places of shelter (setts) inside the Site boundary and within a buffer of 250m from it.</p> <p>Surveys have been informed by good practice guidelines by Scottish Badgers (2018)<sup>17</sup>.</p>	Survey complete. Undertaken concurrently with the Phase 1 habitat surveys in 2020 and 2022 and alongside all other survey work.	<b>Appendix 8A – PEA Report</b>
<b>Dormouse</b>	Areas of potentially suitable vegetation for dormouse on and directly adjacent to the Site were surveyed using methods	Surveys complete (September 2022).	<b>Appendix 8E – Dormouse Report</b>

<sup>15</sup> JNCC, (2010), Handbook for Phase 1 habitat survey – a technique for environmental audit, JNCC, Peterborough, ISBN 0 86139 636 7.

<sup>16</sup> Rodwell J.S. (2006). National Vegetation Classification Users' handbook. Joint Nature Conservation Committee, Peterborough.

<sup>17</sup> Scottish Badgers (2018). Surveying for Badgers: Good Practice Guidelines. Version 1

Survey type	Scope of survey	Survey status	Location of survey report
	described in the Dormouse Conservation Handbook (2006) <sup>18</sup>		
<b>Fungus</b>	Surveys are being undertaken for notable grassland fungus in areas of suitable habitat that would be subject to direct land take by the Proposed Development.	Surveys ongoing (to be completed November 2022)	<b>Provided at Final ES submission.</b>
<b>Water vole</b>	Water vole survey focussed on the ditches and peat bog on site.  Surveys have been informed by good practice guidelines (The Water Vole Mitigation Handbook 2016) <sup>19</sup> .	Survey complete (July and August 2022).	<b>Appendix 8D – Water vole Report</b>
<b>Terrestrial Invertebrates</b>	Desk study/ extended Phase 1 survey.	Survey complete. Undertaken concurrently with the Phase 1 habitat survey.	<b>Appendix 8A – PEA Report</b>
<b>Marsh Fritillary</b>	The methodology was based upon methods detailed United Kingdom Butterfly Monitoring Scheme <sup>20</sup> . Marsh Fritillary webs surveys were undertaken across all locations where temporary or permanent land take would occur and botanical survey for devils bit scabious across the Site.	Survey complete (September 2022).	<b>Summarised in Section 8.5 and 8.5</b>
<b>Section 7 priority species</b>	Desk study/ extended Phase 1 survey.	Survey complete. Undertaken concurrently with the Phase 1 habitat survey.	<b>Appendix 8A – PEA Report</b>
<b>Peat</b>	The peat depth probing survey.	Survey to be completed	<b>Provided at Final ES Submission: Chapter 11: Ground Conditions</b>
<b>Bat roost</b>	Bat roost surveys have focussed on establishing which trees and built structures inside the Site boundary and within a buffer of approximately 275m <sup>21</sup> from the area of the Site where the turbines were proposed. This has been achieved via a mix of external inspections and dusk emergence and dawn re-entry surveys on built	Survey complete (April 2020 to July 2022).	<b>Appendix 8B – Bat Report</b>

<sup>18</sup> Bright, P., Morris, P. & Mitchell-Jones, T. (2006) The Dormouse Conservation Handbook. English Nature, Peterborough.

<sup>19</sup> Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016) The Water Vole Mitigation Handbook (Mammal Society Mitigation Guidance Series). Eds Fiona Mathews and Paul Chanin. Mammal Society, London.

<sup>20</sup> <https://ukbms.org/sites/default/files/downloads/UKBMS%20Ng2%20%20Marsh%20Frit%20Webs%20guidance%20not%20es.pdf> (accessed July 2022)

<sup>21</sup> Survey area comprised 200m from Site boundary and a worst case rotor radius of 75m (275m).

Survey type	Scope of survey	Survey status	Location of survey report
	<p>structures; and ground based and climbing inspections on trees as required.</p> <p>Surveys have followed the Bats and Onshore Wind Turbines Guidelines (2019)<sup>22</sup>, Bat Conservation Trust Good Practice Guidelines (2016)<sup>23</sup>, Bat Tree Habitat Key, 2013<sup>24</sup>, and British Standard 8596:2015: Surveying for bats in trees and woodland, 2016<sup>25</sup>.</p>		
<b>Bat activity</b>	<p>Automated detector surveys were completed at six potential turbine locations in spring, summer and autumn of 2020 and 2021. An additional seventh location was surveyed in summer 2021 to reflect the addition of a seventh turbine to the Proposed Development. Additional monitoring was also undertaken at some locations in July and September 2022. Detectors were deployed to record bat calls continuously from 30 minutes before sunset to 30 minutes after sunrise for a minimum of ten nights per season.</p> <p>Six manual transect surveys of two transect routes were completed monthly between May and October inclusive 2020. During each survey visit, the surveyor walked at least two circuits of the transect route from sunset, until approximately three hours after sunset; recording species and number of 'passes'.</p> <p>Surveys followed the Bats and Onshore Wind Turbines Guidelines (2019) and Bat Conservation Trust Good Practice Guidelines (2016).</p>	<p>Surveys ongoing (May 2020 to October 2022)</p> <p>Automated detector results for 2022 to be provided at final ES submission.</p>	<b>Appendix 8B – Bat Report</b>
<b>Otter</b>	<p>Desk study/ extended Phase 1 survey. The extended Phase 1 Survey visited watercourses on and adjacent to the Site, employing standard searches for field signs.</p>	<p>Survey complete. Undertaken concurrently with the Phase 1 habitat survey.</p>	<b>Appendix 8A – PEA Report</b>

<sup>22</sup> SNH, NE, NRW, Renewable UK, Scottish Power Renewables, Ecotricity Ltd, University of Exeter and BCT *et al.* (2019) *Bats and onshore wind turbines: survey, assessment and mitigation*.

<sup>23</sup> Collins (ed.). Bat surveys for professional ecologists: Good practice guidelines. 3rd Edition. London: Bat Conservation Trust, 2016.

<sup>24</sup> H. Andrews. Bat roosts in trees: a guide to identification and assessment for tree-care and ecology professionals. Exeter: Pelagic Publishing, 2018

<sup>25</sup> British Standards Institution. BS 8596:2015: Surveying for bats in trees and woodland. London: BSI. 2015.

Survey type	Scope of survey	Survey status	Location of survey report
Reptile	<p>Reptile presence/likely absence surveys, comprising seven visits using artificial refugia, have been undertaken within the Site.</p> <p>Surveys have followed Froglife (1999) Advice sheet 10 Reptile survey: An introduction to planning, conducting and interpreting surveys for snake and lizard conservation.</p>	Survey complete (May and September 2020).	<b>Appendix 8D – Reptile Report</b>
Great crested newts	<p>All accessible waterbodies within 500m of the Site were assessed using the HSI scoring system. Environmental DNA (eDNA) surveys for GCN presence/absence were undertaken on all accessible waterbodies (excluding those which were dry at the time of survey). All samples returned negative for GCN. HSI surveys of waterbodies were retaken in 2022.</p> <p>The surveys were undertaken in line with Oldham et al. "Evaluating the suitability of habitat for the Great Crested Newt (<i>Triturus cristatus</i>)" (2000)<sup>26</sup>, and Biggs et al "Analytical and methodological development for improved surveillance of the Great Crested Newt" (2014)<sup>27</sup>.</p>	Survey complete (April 2020 and HSI updated July 2022).	<b>Appendix 8A – PEA Report</b>

## 8.5 Overall baseline

- 8.5.1 The description of the ecological features below provides a summary of the biodiversity baseline as determined through desk-study and field survey. Further details of the desk study and field survey programme are provided in **Appendix 8A – Appendix 8E**.

### Current baseline

#### Site context and surrounding habitats

- 8.5.2 The Site is located on Mynydd y Glyn which rises to 377m. The Site supports a range of habitats (**Figure 8.3**) with a heavily sheep grazed plateau dominated by semi-improved acid grassland and poor semi-improved grassland to the southeast. These areas are frequently intersected by dry-stone walls and fencing for livestock control, with wet heath/acid grassland mosaic and blanket bog also present in the centre of the Site. Dense and scattered bracken was recorded in a large continuous block to the east of the Site and frequently along the access route to the west. There is a small block of continuous

<sup>26</sup> Oldham, R.S., Keeble, J., Swan, M.J.S., Jeffcote, M (2000), Evaluating the Suitability of Habitat for Great Crested Newt (*Triturus cristatus*). Herpetological Journal.

<sup>27</sup> Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford.

scrub to the south and a parcel of scattered scrub at the start of the proposed access route to the west of the Site.

- 8.5.3 Much of the wider landscape is semi-improved acid grassland and poor semi-improved grassland with the exception of an area of conifer plantation to the northeast.

### Designated sites

- 8.5.4 Two statutory designated biodiversity sites of international importance are located within 10km of the Site boundary: Blackmill Woodlands SAC and Cardiff Beach Woodlands SAC. Two statutory designated biodiversity sites of national importance were identified within 2km: Nant Gelliwion Woodland SSSI and Rhos Tonyrefail SSSI.

- 8.5.5 There are eight non-statutory nature conservation sites (SINCs) within the study area.

The interest features of these designated sites are summarised in **Table 8.8** and shown on **Figure 8.1 and 8.2**), with the following considered particularly relevant to this application:

- Rhos Tonyrefail SSSI;
- Mynydd y Glyn SINC;
- Trebanog Slopes SINC;
- Mynydd Gelliwion and Gelliwion Slopes SINC; and
- Nant Gelliwion /Waun Castellau SINC

**Table 8.8 Designated nature conservation sites within the search areas**

Site	Location*	Summary of interest features
<b>Blackmill Woodlands SAC</b>	8.4km SW	<p>Designated as an example of old sessile oak woods at the southern extreme of the habitat's range in Wales and contributes to representation of the habitat in Wales and in south-west England.</p> <p>The qualifying features are: Annex I features:</p> <ul style="list-style-type: none"> <li>• Old sessile oak woods with Ilex and Blechnum in the British Isles.</li> </ul>
<b>Cardiff Beech Woods SAC</b>	8.8km SE	<p>Designated as one of the largest concentrations of <i>Asperulo-Fagetum</i> beech forest in Wales. The site also supports <i>Tilio-Acerion</i> forests of slopes, screes and ravines.</p> <p>The qualifying features are: Annex I features:</p> <ul style="list-style-type: none"> <li>• <i>Asperulo-Fagetum</i> beech forests; and</li> <li>• <i>Tilio-Acerion forests of slopes, screes and ravines</i>.</li> </ul>
<b>Nant Gelliwion Woodland SSSI</b>	1.1km SE	<p>The Nant Gelliwion Woodland SSSI (Coed Gelli Draws) occupies a small tributary valley of the Rhondda which flows over Pennant Sandstone and superficial deposits of boulder clay. The mixed deciduous woodland is dominated by stands of sessile oak which occur with a scattering of beech on the free-drainage valley slopes. Alder dominates areas of wetter ground while birch, ash, hazel, hawthorn, willow and rowan are locally abundant.</p>

Site	Location*	Summary of interest features
<b>Rhos Tonyrefail SSSI</b>	5m S	Rhos Tonyrefail is a large lowland site of special interest for its marshy grassland, acid flush, species-rich neutral grassland, acid grassland, wet heath and blanket mire. These habitats are associated with areas of woodland. The site is also of special interest for its population of marsh fritillary butterfly.
<b>Mynydd y Glyn SINC</b>	Within site	Area of upland peat bog, the core of which is in good condition, with surrounds that have been variously semi-improved.
<b>Mynydd Gelliwion and Gelliwion Slopes SINC</b>	Within Site	Bog mosaic SINC of forestry plantation, ffridd marshy and acid grassland, woodlands, ponds and colliery spoil.
<b>Bronwydd Woods SINC</b>	1.1km N	Ancient woodland with associated hillside ffridd.
<b>Trebanog Slopes SINC</b>	Within site	Very large hillside mosaic site with ffridd, marshy grassland, acid grassland and heath and colliery spoil.
<b>The Glyn SINC</b>	0.6km SW	A wooded valley and associated marshy grassland, which lies along the eastern edge of part of the Rhos Tonyrefail SSSI. The valley is steep sided, with a fast flowing 'mountain' stream.
<b>Tonyrefail East SINC</b>	0.4km SW	A wooded valley with marshy grassland and neutral grasslands.
<b>Coed Castellau SINC</b>	519m SE	The valley of the Nant Castellau and its associated habitats. This includes a fast-flowing stream and the large ancient woodland of Coed Castellau.
<b>Nant Gelliwion /Waun Castellau SINC</b>	10m SE	The SINC is a network of wet woodland and marshy grassland habitats.

\* Location (distance and direction) in relation to development site boundary.

**(Q):** Interest features (habitats or species) that are qualifying SAC features; all other habitats and species are a primary reason for designation.

**Annex I/II:** Habitats or species listed on Annex I or II (respectively) of Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (the 'Habitats Directive') Habitats.

## Habitats

8.5.6 The habitats present within and immediately adjacent to the Site boundary are summarised in **Table 8.9**, with the approximate areas within the Site boundary (i.e. which could be directly affected by the scheme) also noted. Where habitats are large enough to map these are shown in **Figure 8.3** and **Figure 8.4**.

**Table 8.9 Habitats within the site boundary and the approximate area**

Phase 1 habitat	S.7 Priority Habitat*	Summary	Area in Site boundary (ha)**
<b>Blanket bog</b>	Yes	An area of blanket bog is present in the centre of the Site below the plateau that is fenced off from livestock and public	6.45

Phase 1 habitat	S.7 Priority Habitat*	Summary	Area in Site boundary (ha)**
		access for protection as it is one of the designated features of the Mynydd y Glyn SINC. This habitat was boggy underfoot and dominated by purple-moor grass, scattered rush sp., mat grass, bell heather, ling heather, cross-leaved and cotton grass with scattered sphagnum moss, cuckoo flower, marsh thistle and deer grass. Round-leaved sundew was recorded in the wetter areas of the bog.	
<b>Broad-leaved woodland - plantation</b>	No	A small strip of broad-leaved plantation woodland can be found on public land adjacent to a busy road to the west of site. This consisted of young hazel, hawthorn and field maple and is separated from the wider landscape by Collenna Road to the south.	0.48
<b>Continuous bracken</b>	No	Bracken is found scattered throughout the semi-improved acid grasslands on-Site and there is also a stand of continuous bracken in the east of the Site. This is located on a slope that borders semi-improved acid grassland and wet heath.	17.48
<b>Dense and scattered scrub</b>	No	<p>An area of scattered scrub was identified at the start of the proposed access route at the west of the Site. This was relatively diverse with bracken and bramble being locally dominant in some areas. Species recorded include false-oat grass, cock's foot, hairy willowherb, rosebay willowherb, great willowherb, ribwort plantain, creeping cinquefoil, common nettle, cleaver, broad leaf dock, red shank, creeping thistle, common hemp nettle and agrimony.</p> <p>Small areas of dense scrub are also present within the Site boundary. A small fenced area is present in the south with dominant willow scrub with some scattered hazel, sycamore, silver birch and Scot's pine saplings. The understorey is dominated by rush and bracken with bramble and some small areas resemble an attempt at mixed plantation woodland. There is also a small block of willow scrub at the northeast boundary of the Site, with scattered conifer saplings and silver birch.</p>	1.04
<b>Hardstanding (including tracks)</b>	No	A hardstanding track is present in the southwest southeast, used to access the site by vehicle. The A4233, a busy single carriageway road borders the western end of the proposed access road to site.	0.30
<b>Marshy grassland</b>	No	A small (~0.15 ha) area of marshy grassland was recorded at the southeast of the site ( <b>TN2</b> ). This contained plant species typical of regularly inundated habitat with dominant soft rush. Other species recorded include heath bedstraw, foxglove, sweet vernal, marsh thistle, tormentil and square stalked willowherb. This does not qualify as Section 7 habitat due to the low species diversity and the absence of purple moor grass, sharp-flowered rush or jointed rush as would be expected in "Purple moor grass and rush pastures" Habitat of Principal Importance.	0.15



Phase 1 habitat	S.7 Priority Habitat*	Summary	Area in Site boundary (ha)**
Poor semi-improved grassland	No	Poor semi-improved grassland was recorded within fields in the southeast of the Site, heavily grazed by sheep and cattle. As a result of the intense grazing, the sward of the grassland is generally short with species recorded including perennial rye, sheep's fescue, Yorkshire fog, ribwort plantain, white clover, creeping buttercup, creeping thistle, daisy, and scattered rush species.	29.31
Refuse	No	Area used for refuse with exposed rock and hardcore (TN1), discarded timber, piles of manure, exposed earth and signs of regular disturbance. Likely high value for invertebrates however does not qualify as "Open Mosaic Habitat on Previously Developed Land" as it is too small (0.15 ha, minimum 0.25 required). Some vegetation was present but this was not well established, this includes Himalayan balsam, bracken, foxglove, hairy willowherb, rosebay willowherb, ling heather, soft rush, sheep's fescue, curled dock, ivy snapdragon, common nettle and sweet vernal.	0.16
Semi-improved grassland – acid	No	The dominant habitat type found on the steeper areas surrounding the plateau was semi-improved acid grassland (turbines 2, 4, 5, 6 and 7 are located in this habitat). These areas were generally heavily sheep-grazed with species present including sheep's fescue, common bent, sweet vernal, purple moor-grass, mat-grass, Yorkshire fog, sheep's sorrel, marsh thistle, heath bedstraw and dog violet. Scattered bracken and rush sp. were also recorded frequently in this habitat. Rush sp. and purple moor-grass were found to be more prevalent in less intensively grazed areas.	92.17
Waterbodies	No	The waterbodies were visited during the extend Phase 1 habitat survey. Two were within the Site boundary though only one held water at the time of survey. These were located within a heavily grazed grassland, frequently used by livestock with evidence of poaching at the margins. Waterbodies are shown in <b>Figure 4.4, Appendix 8A</b> . The waterbodies did not have the required characteristics to qualify as Section 7 habitat.	0.01
Watercourses	No	There are dry ditches present in the east and south of the Site, with some standing vegetation recorded. Although these likely hold water during the winter, plant species recorded within these were not aquatic and in keeping with the surrounding grassland suggesting they are dry throughout much of the year. The watercourses did not have the required characteristics to qualify as Section 7 habitat.	-
Wet heath/acid grassland	No	Wet heath/acid grassland was recorded in the centre of the site bordering the blanket bog (turbines 1 and 3 are located in this habitat). This habitat was predominately semi-improved acid grassland however frequent ling heather and purple moor-grass with areas of scattered bracken and rush were also present. Wetter areas hosted sphagnum moss, reindeer moss and other moss species. Other species recorded include marsh thistle, deer grass, bird's foot trefoil, bilberry,	31.34

Phase 1 habitat	S.7 Priority Habitat*	Summary	Area in Site boundary (ha)**
		tormentil, heath bedstraw, bell heather and cross-leaved heather. This habitat does not qualify as Section 7 habitat upland heath, the dwarf shrub presence is approximately 10%, less than the required 25%.	

\* Corresponding S.7 habitat based on the S.7 lists and the criteria within the *UK Biodiversity Action Plan: Priority Habitat Descriptions* (Maddock, JNCC 2011).

\*\* Approximate area within the Site boundary.

8.5.7 The Grid Connection corridor comprises a linear corridor approximately 8.5km in length, much of the route has been designed to be underground along the footprint of existing roads. The overhead section located within the Site boundary crosses agricultural fields with habitats including, semi-improved grassland. The underground corridor which is located outside of the Site boundary crosses semi-improved grassland, improved grassland, arable, i hedgerows and broadleaved woodland.

## Bats

8.5.8 There are no internationally or nationally important sites that are designated for bat conservation within 10km of the Site.

8.5.9 The desk study returned roost records of least 12 species of bat from the last 15 years and within 10km of the Site, with the most frequent records being for common pipistrelle **Figure 3.1, (Appendix 8B)**. The closest known roost to the Site is a common pipistrelle maternity roost 664 m to the west.

8.5.10 Six built structures were recorded within the survey area (**Figure 3.2, Appendix 8B**) and comprise a mix of agricultural buildings, residential dwellings and a stone wall. Four of the six built structures within the bat survey area were considered suitable for roosting bats; two structures were classed as low suitability (B1 and B6); one structure was categorised as moderate (B2), and one was assessed as having high suitability (B5). B3 and B4 were assessed as being of Negligible suitability.

8.5.11 All of the buildings were outside the Site boundary and would not be directly affected by the Proposed Development. Only B5 was therefore taken forward for further survey as this was the only building that had the potential to support a maternity roost or hibernation site<sup>28</sup> for bats (which may also traverse/forage over the Site). Emergence and re-entry surveys were undertaken on B5 which found the building to contain a day roost for an individual or small number of common pipistrelle bats.

8.5.12 A total of 20 trees were identified within the bat survey area see **Figure 3.3 (Appendix 8B)**. The following summarises the results of ground level roost assessments and potential roost feature (PRF) inspections during winter and summer:

- two trees provided high potential roost suitability;
- 12 trees provided moderate potential roost suitability;
- five trees provided low potential roost suitability; and
- one tree provided negligible potential roost suitability.

<sup>28</sup> In line with Bats and Onshore Wind Turbines - survey, assessment and mitigation guidance (NatureScot).

- 8.5.13 No bats or evidence of bats was identified within any of the trees on site.
- 8.5.14 The preliminary appraisal of the habitats within the bat survey area identified large areas of low and moderate suitability habitat and smaller areas of high suitability habitat for foraging and commuting bats. As such, the overall suitability of the survey area has been assessed as being 'moderate' for bats.
- 8.5.15 During walked transects, at least four species of bat were recorded: common pipistrelle, soprano pipistrelle, long-eared bats<sup>29</sup> and *Myotis* sp. Additional species may have been recorded within the *Myotis* sp. group, and within the Nathusius' or common pipistrelle (NP/CP) group
- 8.5.16 Common pipistrelle made up the greatest proportion of recordings with approximately 88 percent of all bat passes (5.94 passes per hour on average). The next most frequently recorded group was the NP/CP category which made up 5.7 percent of all bat passes across the Site (0.39 passes per hour on average).
- 8.5.17 The greatest levels of bat activity were recorded on the areas of transects that incorporated linear features or woodland edge habitat, such as the stone wall on the southeast of transect route 1, and around the area of blanket bog in the centre of the Site on transect route 2. Lower levels of activity were recorded in the more open and exposed habitats, in particular the northern sections of transect route 2, which incorporated fields of grazed pasture.
- 8.5.18 At least seven species of bat were confirmed to be using the bat survey area during the automated detector work: common pipistrelle, soprano pipistrelle, noctule, long-eared bats., *Myotis* sp., lesser horseshoe and greater horseshoe. Additional species may also have been recorded, where some ambiguous calls were allocated to groupings such as *Myotis* sp, common/ Nathusius' pipistrelle or noctule/serotine/Leisler's bat rather than species level.
- 8.5.19 In 2020, there was an average of 27.8 recordings per night for all species, across all locations over the monitoring period. Activity levels varied between the monitoring locations, with the highest levels of activity recorded at monitoring location 4 in the south of the bat survey area, averaging 52.1 recordings per night and monitoring location 3 in the centre of Site with an average of 47.1 recordings per night. Common pipistrelle was the most frequently recorded species, making up 67.5 percent of all recordings across all monitoring locations and the entire monitoring period (an average of 18.8 recordings per night). An additional 9.1 percent of recordings were assigned to the species group common or soprano pipistrelle and 6 percent assigned to the Nathusius' or common pipistrelle species group.
- 8.5.20 In 2021, there was an average of 19.2 recordings per night for all species, across all locations over the monitoring period. Activity levels were again notably different between the monitoring locations, with the highest levels of activity recorded at monitoring location 2 in the centre of the bat survey area, averaging 46.9 recordings per night, followed by monitoring location 3 in the centre of Site with an average of 43.8 recordings per night. Again, common pipistrelle was the most frequently recorded species, making up 74.4 percent of all recordings across all monitoring locations (with an exception at monitoring location 7) and the entire monitoring period (an average of 14.25 recordings per night). All other species or species groups recorded each accounted for less than 1 percent of the total recordings with average number of recordings per night of less than 1 for long-eared bats, the noctule or Leisler's bat genus and the noctule, serotine or Leisler's bat species group.

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<sup>29</sup> Considered likely to be brown long-eared.

- 8.5.21 While there was variability in the location of highest activity levels between years (location 4 in 2020 and location 2 in 2021), the relative activity level across automated monitoring locations in both years broadly showed a peak in recordings in September. September is typically associated with bats mating period as they are more likely moving around more, potentially moving towards swarming sites and starting to focus on storing fat for the hibernation period.
- 8.5.22 Further automated monitoring surveys have been undertaken in 2022 and this data will be included in the Final ES (data processing is on-going).

## Badgers

- 8.5.23 No signs indicating the presence of badger have been observed during survey work completed to date. The habitats present within the Site and wider landscape are dominated by heavily grazed semi-improved acid grassland with only small pockets plantation woodland and scrub in the southeast and west of the site. The Site is open with short vegetation as such signs of badger would be recorded at any time of year (if present) and seasonal survey constraints (dense vegetation leading to winter badger surveys being more optimal) are not applicable on this Site.
- 8.5.24 Although there is an abundance of foraging and commuting habitat for badgers, sett building opportunities are poor. Given that no signs of badger were observed during surveys and, coupled with habitat conditions, it is concluded that this species is not present on or adjacent to the Site (within 250m).

## Otter

- 8.5.25 No evidence of otter was recorded during surveys.
- 8.5.26 The desk study returned five records of otter within 2km of the Site. The closest of these was 974m from the Site in 2019.
- 8.5.27 The ditches in the south and east of the Site have moderate potential to support otter commuting during wetter months when they hold water, but have low potential for foraging, and negligible potential for resting and holt creation as the ditches are shallow with no cover.
- 8.5.28 The watercourse present off-Site to the north also has moderate potential for commuting, and low potential for foraging, resting and holt creation. The watercourse off-Site east of the site that runs within a hazel coppice woodland, has high commuting potential as it holds connectivity to a number of watercourses in the wider landscape and is well covered. This stream has low potential for foraging, holt creation and resting.
- 8.5.29 The waterbodies identified within 500m of the Site that have not dried out hold moderate foraging potential for otter, given the proximity to the network of ditches in the south.

## Reptiles

- 8.5.30 During the presence/absence reptile surveys grass snake, common lizard and slow worm were recorded in suitable habitat within the Site boundary, with results indicating the presence of a low population of slow worm and grass snake and a good population of common lizard in line with Froglife Advice Sheet 10<sup>30</sup>.

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<sup>30</sup> Froglife (1999). Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Froglife, Halesworth.

- 8.5.31 The desk study returned five records of common lizard and two records of grass snake within 2km of the Site. No desk study records for reptiles were recorded within the proposed Grid Connection corridor.
- 8.5.32 There is suitable habitat to support widespread British reptile species foraging, refuging and commuting in the heath, blanket bog, continuous bracken and less intensely grazed semi-improved acid grassland. The network of dry-stone walls and scattered stone and scrub on Site provides suitable habitat for refuge and hibernation.

### Great crested newts

- 8.5.33 There are limited habitats on Site for GCN with the areas of scrub in the south and northwest and the fenced area of blanket bog and heath are the only areas considered suitable to support terrestrial GCN. The intensive grazing, topography and vast open and exposed landscape make it sub-optimal for the species.
- 8.5.34 Of the four waterbodies on Site or within 500m of the Site assessed for their suitability to support GCN:
- two were dry (Pond 2 and Pond 3);
  - one was categorised as 'below average' (Pond 1); and
  - one was categorised as 'average' (Pond 4).
- 8.5.35 Environmental DNA (eDNA) surveys for GCN presence/absence were undertaken on Pond 1 and Pond 4 (**Figure 4.4, Appendix 8A**). All samples returned negative for GCN.
- 8.5.36 The suitability assessment of the ponds was repeated in July 2022 and all waterbodies remained identical to the status recorded in 2020. As the status remained the same repeat eDNA surveys were not considered required, as agreed with RCTCBC ecologist (**Table 8.5**).
- 8.5.37 There were no desk study records of GCN within 2km of the Site boundary or within the proposed Grid Connection corridor.

### Water vole

- 8.5.38 Surveys found no signs of water vole. The watercourses identified on Site had limited suitability for water vole generally with shallow banks, lack of vegetation, depth and lack of burrowing opportunities. A pond and an area of peat bog was also surveyed and was found to have low suitability of this species.
- 8.5.39 No records of water vole within 2km of the Site or within the proposed Grid Connection corridor were returned during the desk study.

### Hazel dormouse

- 8.5.40 Dormouse surveys of suitable habitat within the Site recorded no evidence of their presence. Phase 1 habitat surveys identified that the Site is predominantly unsuitable for dormouse, being dominated by sheep grazed semi-improved acid grassland and poor semi-improved grassland. Small sections of more optimal dormouse habitat comprising roadside treeline and hedge are present along the most western edge of the Site where the proposed access road joins Trebanog road, and adjacent to the south-eastern corner of the Site along a minor road.
- 8.5.41 The desk study returned no records of dormouse within 2km of the Site, nor within the proposed Grid Connection corridor.

## Notable plant species

- 8.5.42 A number of notable plant species records were provided from within 2km of the Site. Of the notable plant species identified in the desk study, only dog violet was recorded during the extended Phase 1 habitat survey.
- 8.5.43 No desk study records for notable plant species were recorded within the proposed Grid Connection corridor.

## Terrestrial invertebrates

- 8.5.44 Notable invertebrates identified within 2km of the Site during the desk study includes small pearl-bordered fritillary and small heath butterflies and cinnabar moth. The areas of continuous bracken habitat, particularly in the centre of the Site is suitable habitat for these species, with habitat occurring on south facing sunny slopes.
- 8.5.45 The desk study returned 32 records of marsh fritillary, a species of conservation concern, within 2km of the site; with the closest being 523m to the east. Webs surveys for marsh fritillary have also not recorded this species present on Site. Most of the site is heavily grazed with short sward acid grassland unsuitable to support marsh fritillary, a species commonly associated with calcareous grassland. The damper habitats within the Site, including the blanket bog and wet heath could provide sub-optimal habitat for this species; however no devil's bit scabious or field scabious, the main food plants for the species, was identified during surveys.
- 8.5.46 No desk study records for notable invertebrate species were recorded within the proposed Grid Connection corridor.

## Other protected / conservation notable species

- 8.5.47 The desk study identified two additional Section 7 species within 2km of the Site: hedgehog and common toad; the suitability of the site for these species is summarised below:
- Hedgehog: The only potentially suitable habitat for hedgehog is the scrub in the south and northeast of the Site. However this species is scarcely found in uplands and are commonly associated with a mosaic of hedgerows woodland and grassland at lower altitude; and
  - Common toad: The waterbody on Site holds the potential to support common toad, a Species of Principal Importance (SPI) in Wales, during their breeding phase. The adjacent scrub meanwhile and less heavily grazed areas could provide terrestrial habitat.
- 8.5.48 No desk study records for other protected / conservation notable species were recorded within the proposed Grid Connection corridor.

## Invasive non-native flora

- 8.5.49 A total of 43 records of seven invasive plant species as listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were identified from the desk study as occurring within 2km of the Site. These include three records for Himalayan balsam, Japanese knotweed, montbretia, *Rhododendron ponticum* and wall cotoneaster. Himalayan Balsam was recorded adjacent to the proposed access track to the west (TN1, Figure 8.3).
- 8.5.50 No desk study records for invasive plant species were recorded within the proposed Grid Connection corridor.

## Peat

8.4.40.1.1 Full details regarding proposed peat surveys and results are detailed in **Chapter 11: Ground Conditions**.

## Future baseline

- 8.5.51 Determining a future baseline draws upon information about the likely future use and management of the Site in the absence of the Proposed Development, known population trends (for species), climate change and any other proposed developments (consented or otherwise) that may act cumulatively to affect ecological features.
- 8.5.52 In this instance, the future baseline in the absence of the Proposed Development is unlikely to be markedly different from the current baseline, as land use/management within the Site is anticipated to remain largely unchanged. It is therefore considered appropriate to use the current baseline for the purpose of this assessment.

## 8.6 Embedded measures

- 8.6.1 A range of environmental measures have been embedded into the Proposed Development as outlined in **Section 4.8**. **Table 8.10** outlines how these embedded measures influence the biodiversity assessment.

**Table 8.10 Summary of the embedded environmental measures**

Aspect/Feature	Potential changes and effects	Embedded measures	Compliance mechanism
<b>Construction</b>			
<b>Dust management</b>	<p>Loss or damage of sensitive flora through smothering resulting in effects on habitat composition and the fauna that it supports.</p> <p>Deposition of dust resulting in enrichment of sensitive HPis, including those contained within statutory designated sites, leading to alteration of flora through changes in baseline conditions and the species which they support.</p> <p>Direct effects on invertebrates through ingestion or direct deposition on sedentary species.</p>	<p>Construction works would be undertaken using all necessary and practical measures to minimise the release of dust including: wheel wash facilities on site, enclosed and screened storage of aggregates; damping down haul roads during dry weather; and ensuring that lorries transporting material onto or off site are sheeted when conditions warrant, e.g. during dry periods or when carrying fine materials.</p> <p>Best practices air quality management measures will be applied as described in Institute of Air Quality Management (IAQM) (2014) guidance on the Assessment of Dust from Demolition and Construction 2014, version 1.1.</p>	<p>Construction Environmental Management Plan (CEMP)/Construction Method Statement (CMS) secured via DNS condition</p>

Aspect/Feature	Potential changes and effects	Embedded measures	Compliance mechanism
<b>Run-off</b>	The introduction of toxic pollutants or sediments into the environment resulting in changes, loss or damage to terrestrial or freshwater environments and the fauna they support.	Construction works would be undertaken using all necessary and practical measures to minimise the release of additional sediment-laden run-off into nearby watercourses. Full measures are detailed in <b>Chapter 10: Water Environment, Section 10.6 and the Water Management Plan (WMP)</b> .	CEMP/CMS secured via DNS condition
<b>General species safeguarding</b>	Death, injury or displacement during construction, e.g. due to entrapment within excavations or collisions with construction traffic; particularly relevant for: <ul style="list-style-type: none"> <li>• Badgers</li> <li>• Otters</li> <li>• Bats</li> <li>• Hedgehog</li> </ul>	<ul style="list-style-type: none"> <li>• Appropriate pre-construction surveys or inspections will be carried out.</li> <li>• A method statement would be prepared under which: <ul style="list-style-type: none"> <li>▶ Vehicle movement outside of daylight hours would be restricted, vehicle speeds controlled, and operatives warned of the presence of certain species in order to reduce the risk of collisions.</li> <li>▶ All excavations would have sloped sides or have a means of escape for entrapped animals. Excavations to be checked each morning by operatives prior to work within the excavation.</li> <li>▶ Construction activities would be restricted to normal working hours (so largely avoiding the hours of darkness, particularly in the summer when species are most active).</li> <li>▶ Site lighting will be controlled to prevent incidental spillage on to features that may be used by nocturnal species.</li> </ul> </li> </ul>	CEMP secured via DNS condition
<b>Reptiles</b>	Permanent or temporary land-take/changes to habitats resulting in: <ul style="list-style-type: none"> <li>• Degradation and/or loss of habitat</li> </ul>	<ul style="list-style-type: none"> <li>• Reptiles are confirmed present on Site and individual reptiles will be protected during construction using standard best-practice techniques. Effects on individual</li> </ul>	CEMP secured via DNS condition



Aspect/Feature	Potential changes and effects	Embedded measures	Compliance mechanism
	<ul style="list-style-type: none"> <li>Reduction in the availability of foraging and commuting habitat and resting or breeding sites.</li> <li>Killing or injury of reptiles through the removal of occupied resting or breeding sites</li> </ul>	<p>reptiles during construction can be avoided or mitigated using standard best-practice displacement techniques, due to the spatially discrete nature of the works and the large amounts of suitable habitat that would remain accessible.</p> <ul style="list-style-type: none"> <li>Removal of habitat or features that could support reptiles (e.g. scrub, dense tussocky grassland, rocks) will be kept to a minimum, and works in these areas will take place outside the hibernation period.</li> <li>Refugia features will be retained on site as far as possible.</li> <li>Areas of long grass and other similar vegetation that need to be removed will be strimmed prior to construction to reduce their suitability for reptiles, and hand-searched as necessary to disperse individuals from the construction area.</li> <li>Vegetation clearance will be sequenced to direct reptiles away from the construction area.</li> </ul>	
<b>Habitats</b>	Permanent or temporary land-take/changes to habitats resulting in degradation and/or loss of habitat	The wind farm infrastructure layout has been designed to avoid the loss of key habitats on-site (wetland habitats/semi-natural habitats) as far as is practicable, i.e. the infrastructure is generally located within improved grassland, semi-improved grassland and areas of bracken.	Embedded in design - secured via DNS condition
<b>Habitats</b>	Permanent or temporary land-take/changes to habitats resulting in degradation and/or loss of habitat	Habitats which would be subject to temporary loss, will be re-vegetated and reinstated as soon as possible after construction.	CEMP secured via DNS condition

Aspect/Feature	Potential changes and effects	Embedded measures	Compliance mechanism
<b>Mynydd y Glyn SINC</b>	Permanent or temporary land-take/changes to habitats resulting in degradation and/or loss of habitat	An Outline Habitat Management Plan (oHMP) will be devised which will include measures that compensate and enhance the SINC impacted by proposals and produce a net gain in nature conservation across the Site by designing in wildlife, and ensuring any avoidable impacts are appropriately mitigated.	oHMP
<b>Operation</b>			
<b>Bats</b>	Potential killing or injury to bats in flight, through direct collision with moving turbine blades or barotrauma.	A minimum of 50m stand-off will be maintained between turbine blade tips and the nearest point of linear/foraging features likely to be well-used by bats such as treelines, woodland, wetland habitats and waterbodies.	Embedded in design - secured via DNS condition
<b>Bats</b>	Potential killing or injury to bats in flight, through direct collision with moving turbine blades or barotrauma.	Collision and barotrauma risk to bats will be reduced by pitching the blades out of the wind ("feathering") to reduce rotation speeds below ~2 rpm while idling at all seven turbines.	Collision Mitigation Monitoring Strategy (CMMS)

8.6.2 Environmental measures required to avoid or reduce biodiversity impacts will be incorporated into an oHMP. The oHMP will set out the objectives for biodiversity protection, mitigation, monitoring and habitat enhancement (where applicable). It will set out a framework and timetable for ecological measures throughout the lifetime of the Proposed Development, including any pre-construction measures that are required. The final HMP will be agreed with the planning authority at the pre-construction stage either as part of the Construction Environmental Management Plan (CEMP) or as a standalone document.

## 8.7 Scope of the assessment

### Overview

8.7.1 The CIEEM guidelines recognise that an appropriate EclA cannot consider in detail every individual species or habitat that may potentially be present at a Site or affected by a development. The EclA process therefore aims to focus the assessment on those ecological features that could be 'significantly' affected by the Proposed Development (i.e. where the effects on the ecological features are of sufficient concern that they could influence the decision about whether or not planning permission should be consented; the

'significance test'), or for which the development could result in the contravention of relevant legislation. The EclA process therefore includes a 'scoping' stage which excludes those ecological features that will not be 'significantly' affected<sup>31</sup>, and a 'detailed assessment' stage, which examines more closely the potential effects of the scheme on those ecological features that could be subject to 'significant' effects. Detailed assessments may also be undertaken where it is considered appropriate to examine the predicted effects on a feature in more detail, for example due to consultee comments. This section summarises the approach to and outcomes of the EclA scoping stage.

## The Proposed Development

- 8.7.2 All the activities and consequent environmental changes associated with the construction, operation and decommissioning of the Proposed Development, as set out in **Chapter 4: Description of the Proposed Development** have been considered.

### Spatial scope

- 8.7.3 The spatial scope of the assessment of biodiversity covers the area of the Proposed Development contained within the red line boundary together with the Zones of Influence (Zols) that have formed the basis of the study area described in **Section 8.4**.
- 8.7.4 Through an understanding of the activities associated with the Proposed Development and the resulting environmental change, it is possible to identify ecological features that will not be subject to potentially significant effects (for example due to an absence of effect pathways or where the predicted magnitude of change is low), or certainty that incorporated measures will be entirely successful in preventing a significant effect occurring. In order to identify such ecological features, all the activities and consequent environmental changes associated with the construction, operation and decommissioning of the Proposed Development have therefore been considered.
- 8.7.5 The construction, operation and decommissioning of the wind farm may result in the following environmental changes, which have the potential to cause significant effects on ecological features at or near the Site. Many of these aspects will operate additively or synergistically to affect ecological features.
- Construction:
    - ▶ permanent or temporary land-take/changes to habitats;
    - ▶ increased light levels;
    - ▶ production of aural and visual stimuli and vibration;
    - ▶ hydrological changes;
    - ▶ creation of airborne particles (e.g. dust);
    - ▶ contamination of site run-off; and
    - ▶ vehicle movements.
  - Operation:
    - ▶ physical changes to the spatial environment;

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<sup>31</sup> Based on the results of desk-studies; field surveys; consultations; the importance of the ecological feature; the presence (or not) of pathways for effects; and the measures incorporated into the scheme to avoid effects occurring.

- ▶ vehicle movements;
  - ▶ hydrological changes; and
  - ▶ increased light levels.
  - Decommissioning:
    - ▶ as per construction stage.
- 8.7.6 Given these environmental changes, the spatial scope of the biodiversity assessment covers the area of the Proposed Development, together with the Zol that have formed the basis of the study area described in **Section 8.4**. However, Zol differ depending on the type of environmental change (i.e. the change from the existing baseline) as a result of the Proposed Development and the ecological feature being considered.
- 8.7.7 The most straightforward Zol to define is the area affected by land-take and direct land-cover changes associated with the Proposed Development. This Zol is the same for all affected ecological features.
- 8.7.8 By contrast, for each environmental change that can extend beyond the area affected by land-take and land-cover change (e.g. increased noise associated with construction activities within the land-take area), the Zol may vary between ecological features, dependent upon their sensitivity to the change and the precise nature of the change. For example, a badger might only be disturbed by noise generated very close to its sett, while nesting marsh harrier might be disturbed by noise generated at a much greater distance; other species (e.g. many invertebrates) may be unaffected by changes in noise. In view of these complexities, the definition of the Zols that extend beyond the land-take area was based upon professional judgement informed as far as possible by a review of published evidence (e.g. disturbance criteria for various species) and discussions with the technical specialists who are working on other chapters of the ES.
- 8.7.9 The spatial extent of the assessment therefore reflects the area occupied by the ecological feature that is being assessed and the Zol of the changes that are likely to affect it. Where part of a designated site which is considered as an ecological feature for the purposes of this assessment is located within the ecological Zol relating to a particular biophysical change as a result of the Proposed Development, an assessment would be made of the effects on the designated site as a whole. A similar approach has been taken for areas of notable habitat. For species that occur within the Zol, the assessment has considered the total area that is used by the affected individuals or the local population of the species (e.g. for foraging or as breeding territories).
- 8.7.10 It should be noted that the avoidance of potential effects through design are implicitly taken into account through the consideration of each Zol.

## Temporal scope

- 8.7.11 The temporal scope of the assessment of effects on Biodiversity is consistent with the period over which the development would be carried out, as defined in **Chapter 4**, and therefore covers the construction and operational periods. The magnitude of changes as a result of decommissioning will be no worse than during construction, for example and in many cases will be lesser as a result of the shorter programme and surface (access tracks) and sub-surface (e.g. transmission cables) elements being left in situ for example. Furthermore, given the timescales involved (approximately 30 years' operation) it is considered that an accurate assessment of decommissioning effects cannot be undertaken at this stage.

- 8.7.12 As resulting effects during decommissioning will be at worst similar to those resulting from construction, these have therefore not been considered separately.

## Ecological features

- 0.1.2 The starting point for defining which ecological features are taken forward to the detailed assessment stage was to use the baseline data collected through the desk study and field surveys to determine which of those are 'important' at the level of the project. Following CIEEM (2019) guidance, the importance of ecological features was determined using a geographic scale and described in relation to UK legislation and policy, and with regard to the extent of habitat or size of population that may be affected by the Proposed Development.
- 0.1.3 The importance of ecological features can therefore differ from that which would be conferred solely by legislative protection or identification as a conservation notable species. For example, a small length of hedgerow (a Section 7 habitat), even if deemed to be 'important' with regard to the Hedgerow Regulations, is unlikely to be considered to have greater than 'local' importance due to the extent of this habitat type across a given county.
- 0.1.4 Wherever possible, information regarding the extent and population size, population trends and distribution of the ecological features has been used to inform the categorisation described in Error! Reference source not found. and determine importance at the project level. Where detailed criteria or contextual data are not available, professional judgement has been used to determine importance. A justification of all determinations of importance are provided in Error! Reference source not found.<sup>11</sup> (for 'scoped in' ecological features) and **Appendix 8F** (for all ecological features, both those scoped in and out) to ensure transparency.

**Table 8.11 Importance of the Proposed Development for Ecological Features**

Geographic context of importance	Description
<b>International</b>	<ul style="list-style-type: none"> <li>European sites (SPAs, SACs, candidate SACs (cSACs) and Sites of Community Importance (SCI)), plus sites treated as such by national planning policy (potential SPAs (pSPA), possible SACs (pSAC) and Ramsar sites (designated under international convention)).</li> <li>Areas of habitat or populations of species which meet the published selection criteria for designation as a European site, but which are not themselves currently designated at this level (this would be agreed with NRW where applicable).</li> </ul>
<b>National (UK context)</b>	<ul style="list-style-type: none"> <li>Nationally designated sites including SSSIs and National Nature Reserves (NNRs).</li> <li>Areas (and the populations of species which inhabit them) which meet the published selection criteria guidelines for selection of biological SSSIs but which are not themselves designated (this would be agreed with NRW where applicable).</li> <li>Section 7 habitats and species, Red listed and legally protected species that are not addressed directly in Part 2 of the "<i>Guidelines for Selection of Biological SSSIs</i>" but can be determined to be of national importance using the principles described in Part 1 of the guidance.</li> <li>Areas of Ancient Woodland e.g. woodland listed within the Ancient Woodland Inventory and ancient and veteran trees.</li> </ul>

Geographic context of importance	Description
<b>National (Wales context)</b>	<ul style="list-style-type: none"> <li>Regularly occurring Section 7 habitats or populations of Section 7 species, Red listed and legally protected species may be of regional (Wales) importance in the context of published information on population size and distribution.</li> </ul>
<b>County</b>	<ul style="list-style-type: none"> <li>LNRs and Non-Statutory Designated sites including: SINCs of County Importance.</li> <li>Areas which based on field data collected to inform the EclA meet the published selection criteria for those sites listed above (for habitats or species, including those listed in relevant Local Biodiversity Action Plans) but which are not themselves designated.</li> </ul>
<b>Local</b>	<ul style="list-style-type: none"> <li>Section 7 habitats and species, Red listed and legally protected species that based on their extent, population size, quality etc are determined to be at a lesser level of importance than the geographic contexts above.</li> <li>Common and widespread semi-natural habitats occurring within the study area in proportions greater than may be expected in the local context.</li> <li>Common and widespread native species occurring within the study area in numbers greater than may be expected in the local context.</li> </ul>
<b>Negligible</b>	<ul style="list-style-type: none"> <li>Common and widespread semi-natural habitats and species that do not occur in levels elevated above those of the surrounding area.</li> <li>Areas of heavily modified or managed land uses (e.g. hard standing used for car parking, as roads etc.)</li> </ul>

0.1.5 All ecological features that were determined to be ecological importance at a 'Local' or 'Negligible' level were 'scoped out' of the assessment at this stage, with the exception of:

- species receiving specific legal protection or subject to legal control (e.g. invasive species); or
- features which consultees specifically indicated that the ES should consider.

0.1.6 This is because effects on features that are only important at a 'local' or 'negligible' level would not influence the decision-making about whether or not consent should be granted for the Proposed Development (i.e. a significant effect in EIA terms could not occur). Specific justification for the exclusion of these ecological features from detailed assessment is provided in **Appendix 8F**.

0.1.7 Legally protected species and ecological features that are sufficiently important, such that effects upon them as a result of the Proposed Development could be significant, were then taken through to the next stage of the assessment.

0.1.8 The value of bat roosts, commuting and foraging areas has been informed by Wray et al (2010).<sup>32</sup>

## Pathways for potentially significant effects

8.7.13 Ecological features that are scoped into the assessment (i.e. those of sufficient importance occurring within a relevant ZoI) are summarised in **Table 8.12**. For each

<sup>32</sup> Wray et al 2010. *Valuing Bats in Ecological Impact Assessment, IEEM In Practice v.70, December 2010.*

ecological feature presented in **Table 8.12** the potential environmental changes and effects resulting from the Proposed Development are provided.

- 8.7.14 **Appendix 8F** provides the same information for those ecological features of greater than local importance scoped out of further assessment based on a relevant ZOI and the potential environmental changes and effects resulting from the Proposed Development.

**Table 8.12 Ecological features scoped in for further assessment and pathways for potentially significant effects**

Ecological feature	Pathways for potentially significant effects
Rhos Tonyrefail SSSI	Permanent or temporary land-take/changes to habitats
Mynydd y Glyn SINC	Permanent or temporary land-take/changes to habitats
Mynydd Gelliwion and Gelliwion Slopes SINC	Permanent or temporary land-take/changes to habitats
Trebanog Slopes SINC	Permanent or temporary land-take/changes to habitats
Nant Gelliwion /Waun Castellau SINC	Permanent or temporary land-take/changes to habitats
Bats	Permanent or temporary land-take/changes to habitats Increased light levels Production of aural and visual stimuli and vibration Physical changes to the spatial environment
Reptiles	Permanent or temporary land-take/changes to habitats

- 8.7.15 The effects detailed in **Table 8.13** have been scoped out from being subject to further assessment because the potential effects are not considered likely to be significant.

**Table 8.13 Summary of pathways and effects scoped out of this assessment**

Potential effects	Justification
Contaminated site run-off	The risk of contaminated run off from the construction site, or decommissioning activity will be controlled via the implementation of embedded environmental measures ( <b>see Section 8.6 and Chapter 4</b> ). These measures will be effective in negating the risk to ecological features.
Creation of airborne particles (e.g. dust)	Changes in air quality during construction due to plant emissions or dust will be negligible and so this aspect has not been subject to detailed assessment within the Draft ES ( <b>see Chapter 4</b> ). As set out in <b>Section 8.6 and Chapter 4</b> however, measures will be implemented during construction and decommissioning to control dust emissions. Any effects on Site habitats due to this mechanism will be inconsequential, and so this aspect is not considered further in this chapter.
Vehicle movements	The risk to ecological receptors from vehicles from the construction site, operation or decommissioning activity will be controlled via the implementation of embedded environmental measures ( <b>Section 8.6</b>

Potential effects	Justification
	<b>and Chapter 4).</b> These measures will be effective in negating the risk to ecological features.
<b>Hydrological changes</b>	Changes in hydrology – <b>Chapter 10: Water environment</b> does not identify any likely significant effects on the hydrological regimes across designated sites or ground water dependent terrestrial ecosystems due to the construction, operation or decommissioning of the Proposed Development. Therefore, the ecological features that these designated sites and habitats support will also not be subject to likely significant effects.

## 8.8 Assessment methodology

- 8.8.1 The generic project-wide approach to the assessment methodology is set out in **Chapter 2: Approach to Environmental Impact Assessment**, and specifically in **Sections 2.5 to 2.7**. However, whilst this has informed the approach that has been used in this Biodiversity assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to align with the standard industry guidance provided by CIEEM (2019).
- 8.8.2 The assessment has been based upon not only the results of the desk study and field surveys, but also relevant published information (for example on the status, distribution, sensitivity to environmental changes and ecology of the features scoped into the assessment, where this information is available), and professional knowledge of ecological processes and functions.
- 8.8.3 For each scoped-in ecological feature (see **Table 8.12**), effects were assessed against the baseline conditions for that feature during construction, operation and decommissioning.
- 8.8.4 Throughout the assessment process, the initial results of the assessment regarding potentially significant effects have been used to inform whether additional baseline data collection is required, together with the identification of environmental measures that should be embedded into the development proposals (see **Section 8.6**). The results of the assessments therefore reflect the final scheme design (i.e. incorporating the environmental measures described in **Table 8.10**).

## Significance evaluation methodology

### Overview

- 0.1.9 CIEEM (2019) defines a significant effect as one “*that either supports or undermines biodiversity conservation objectives for ‘important ecological features’ or for biodiversity in general*”.
- 0.1.10 When considering potentially significant effects on ecological features, whether these be adverse or beneficial, the following characteristics of environmental change are taken into account<sup>33</sup>:
- extent – the spatial or geographical area over which the environmental change may occur;
  - magnitude – the size, amount, intensity or volume of the environmental change;

<sup>33</sup> The definitions of the characteristics of environmental change are based on the descriptions provided in CIEEM (2019). Other chapters in this ES may use some of the same terms albeit with a different definition.



- duration – the length of time over which the environmental change may occur;
- frequency – the number of times the environmental change may occur;
- timing – the periods of the day/year etc. during which an environmental change may occur; and
- reversibility – whether the environmental change can be reversed through restoration actions.

## Magnitude of change

0.4.148.1.11 Although the characteristics described above are all important in assessing effects by using information about the way in which habitats and species are likely to be affected, a scale of the magnitude of the environmental change as a result of the Proposed Development has been described in **Table 8.14**. This provides an understanding of the resultant effect in terms of relative change from the baseline position, be that adverse or beneficial.

**Table 8.14 Guidelines for the Assessment of the Scale of Magnitude**

Scale of change	Criteria and resultant effect
<b>High</b>	The change permanently (or over the long-term) affects the conservation status of a habitat/species, reducing or increasing the ability to sustain the habitat or the population level of the species within a given geographic area. Relative to the wider habitat resource/species population, a large area of habitat or large proportion of the wider species population is affected. For designated sites, integrity is compromised. There may be a change in the level of importance of the receptor in the context of the project.
<b>Medium</b>	The change permanently (or over the long term) affects the conservation status of a habitat/species reducing or increasing the ability to sustain the habitat or the population level of the species within a given geographic area. Relative to the wider habitat resource/species population, a small-medium area of habitat or small-medium proportion of the wider species population is affected. There may be a change in the level of importance of this receptor in the context of the project.
<b>Low</b>	The quality or extent of designated sites or habitats or the sizes of species' populations, experience some small-scale reduction or increase. These changes are likely to be within the range of natural variability and they are not expected to result in any permanent change in the conservation status of the species/habitat or integrity of the designated site. The change is unlikely to modify the evaluation of the receptor in terms of its importance.
<b>Very Low</b>	Although there may be some effects on individuals or parts of a habitat area or designated site, the quality or extent of sites and habitats, or the size of species populations, means that they would experience little or no change. Any changes are also likely to be within the range of natural variability and there would be no short-term or long-term change to conservation status of habitats/species receptors or the integrity of designated sites.
<b>Negligible</b>	A change, the level of which is so low, that it is not discernible on designated sites or habitats or the size of species' populations, or changes that balance each other out over the lifespan of a project and result in a neutral position.

## Determining Significance – adverse and beneficial effects

- 8.1.12 Adverse effects are assessed as being significant if the favourable conservation status of an ecological feature would be lost as a result of the Proposed Development. Beneficial effects are assessed as those where a resulting change from baseline improves the quality of the environment (e.g. increases species diversity, increases the extent of a particular habitat etc., or halts or slows down an existing decline). For a beneficial effect to be considered significant, the conservation status would need to positively increase in line with a magnitude of change of “high” as described in **Table 8.14**.
- 8.1.13 Conservation status is defined as follows (as per CIEEM 2019):
- “For habitats, conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and typical species within a given geographical area;*
- For species, conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area”.*
- 8.1.14 The decision as to whether the conservation status of an ecological feature would alter has been made using professional judgement, drawing upon the information produced through the desk study, field survey and assessment of how each feature is likely to be affected by the Proposed Development.
- 8.1.15 A similar procedure is used where designated sites may be affected by the Proposed Development, except that the focus is on the effects on the integrity of each site; defined as:
- “The coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified”.*
- 8.1.16 The assessment of effects on integrity draws upon the assessment of effects on the conservation status of the features for which the site has been designated.

## 8.9 Preliminary assessment of effects: Rhos Tonyrefail SSSI

### Baseline conditions

#### Current baseline

- 8.9.1 Rhos Tonyrefail SSSI is a large lowland site of special interest for its marshy grassland, acid flush, species-rich neutral grassland, acid grassland, wet heath and blanket mire. These habitats are associated with areas of woodland. The site is also of special interest for its population of marsh fritillary butterfly. The SSSI is located outside the Site, though very close at ~5m to the south of the proposed location of the access track, as shown in **(Figure 8.1)**.

#### Future baseline

- 8.9.2 The SSSI is unlikely to be subject to significant changes in land use in the absence of the wind farm. While there is the potential for long-term improvement depending on future land management, the predicted future baseline is assumed to be the same as the current baseline given the uncertainty of this.

## Predicted effects and their significance

### Permanent or temporary land-take/changes to habitats

- 8.9.3 The SSSI would not be subject to direct land take or encroachment effects. Although the Site boundary is 5m from the SSSI, the closest part of the Proposed Development infrastructure is the principal access track from the A4233 Trebanog Road, which is located approximately 25m to the north of the SSSI. All areas of proposed land take associated with the Proposed Development including access tracks and adjacent habitats have been surveyed for marsh fritillary through webs surveys and also for their host plant, devils bit scabious. Surveys found no presence of marsh fritillary or devils bit scabious. The areas of temporary and permanent land take within the Site are not flower rich areas which could potentially be valuable as nectaring areas (more optimal habitats were noted outside the Site boundary away from areas of proposed land take).
- 8.9.4 There would be no direct effects on Rhos Tonyrefail SSSI. The embedded measures (see **Section 8.6**) would ensure that indirect effects on this SSSI would be prevented or appropriately managed. Overall, therefore, the Proposed Development would have no effect on the integrity or conservation status of the Rhos Tonyrefail SSSI, and the effects are considered Not Significant on an ecological feature of National (UK) importance.

## 8.10 Preliminary assessment of effects: Mynydd y Glyn SINC

### Baseline conditions

#### Current baseline

- 8.10.1 Mynydd y Glyn SINC is a non-statutory designated site within the western half of the Site and covers a total area of 74.34ha, of which 67.7ha is located within the Site boundary (**Figure 8.2**). The SINC is designated as an area of upland peat bog, the core of which is in good condition, with surrounds that have been variously semi-improved. Extended Phase 1 habitat surveys (**Figure 8.3 and Figure 8.4**) determined that habitats comprise a mosaic of semi-improved acid grassland, wet heath/acid grassland (both of which are sheep grazed) with an area of blanket bog. It is considered likely the blanket bog previously covered a larger area and has reduced in size over time due to agricultural practices and a lack of management to maintain it.

#### Future baseline

- 8.10.2 The site is unlikely to be subject to significant changes in land use in the absence of the wind farm. While there is potential for long-term improvement depending on future land management, the predicted future baseline is assumed to be the same as the current baseline given the uncertainty of this.

## Predicted effects and their significance

### Permanent or temporary land-take/changes to habitats

- 8.10.3 Turbines 1, 3, 6 and 7 are located within the Mynydd y Glyn SINC along with the associated permanent crane pads and temporary storage areas. Additionally, sections of the new access tracks for these turbine locations cross through parts of the SINC. This

- would result in an estimated temporary loss of 2.27ha of habitat (storage areas) and permanent loss of 1.91ha of habitat.
- 8.10.4 Mynydd y Glyn SINC is predominantly designated for its blanket bog and this will be retained with no elements of the Proposed Development located within this habitat. The habitats within the SINC that would be subject to permanent or temporary land-take from the turbine locations and access tracks comprise areas of wet heath/acid grassland and grazed semi-improved acid grassland. The access tracks have been designed to utilise the existing access tracks across the SINC where possible to minimise the amount of habitat loss. The areas of semi-improved grassland that would be impacted by the Proposed Development are common and widespread across the Site and are not botanically notable locally. All habitats which would be subject to temporary loss will be re-vegetated and reinstated as soon as possible after construction (**Section 8.6**).
- 8.10.5 In order to mitigate the habitat losses within the SINC and additionally to provide an enhancement; an oHMP will be devised in consultation with the LPA, this will be informed by results from the NVC surveys. This will set out long-term habitat management and monitoring focussing on key habitats (such as the blanket bog and wet heath/acid grassland) and will be presented in the Final ES.
- 8.10.6 There would be limited permanent loss of common and widespread wet heath/acid grassland and grazed semi-improved acid grassland, and coupled with compensation and enhancement measures (that will be detailed in an oHMP at final ES submission) that will improve the ecological value of retained areas of the SINC the site integrity or conservation status of Mynydd y Glyn SINC would be maintained. On this basis, a low magnitude of change on an ecological feature of County importance is predicted as a result of the Proposed Development, with effects considered Not Significant.

## 8.11 Preliminary assessment of effects: Mynydd Gelliwion and Gellwion Slopes SINC

### Baseline conditions

#### Current baseline

- 8.11.1 Mynydd Gelliwion and Gellwion Slopes SINC is a non-statutory designated site, part of which is located on the eastern Site boundary. The SINC covers a total area of 261.1ha; none of the SINC is within the Site boundary.
- 8.11.2 The SINC contains a bog mosaic together with forestry plantation, marshy and acid grassland, woodlands, ponds and colliery spoil. The area within the site boundary comprises grazed semi-improved acid grassland.

#### Future baseline

- 8.11.3 The site is unlikely to be subject to significant changes in land use in the absence of the wind farm. While there is the potential for long-term improvement depending on future land management, the predicted future baseline is assumed to be the same as the current baseline given the uncertainty of this.

## Predicted effects and their significance

### Permanent or temporary land-take/changes to habitats

- 8.11.4 The SINC would not be subject to any permanent or temporary land-take/changes to habitats; the nearest land-take is from an access track to Turbine 5, approximately 20m south of the SINC's boundary.
- 8.11.5 There would be no direct effects on this SINC and the embedded measures (**see Section 8.6**) would ensure that indirect effects would not occur. The Proposed Development would have no effect on the integrity or conservation status of the Mynydd Gelliwion and Gelliwion Slopes SINC therefore. As such, effects on this ecological feature of County importance are considered Not Significant.

## 8.12 Preliminary assessment of effects: Trebanog Slopes SINC

### Baseline conditions

#### Current baseline

- 8.12.1 Trebanog Slopes SINC is a non-statutory designated site located within the Site. The SINC which measures 153.3ha is a large hillside mosaic site with ffridd, marshy grassland, acid grassland and heath and colliery spoil. Only a small area of this SINC is within the Site boundary (3.17ha), in the north-western corner where the main site access track enters the wider Site. Extended Phase 1 habitat surveys of this area of the SINC that lies within the Site recorded habitats dominated by dense continuous bracken split by a well-used bare earth agricultural access track, and a small area of improved grassland.

#### Future baseline

- 8.12.2 The site is unlikely to be subject to significant changes in land use in the absence of the wind farm. While there is the potential for long-term improvement depending on future land management, the predicted future baseline is assumed to be the same as the current baseline given the uncertainty.

## Predicted effects and their significance

### Permanent or temporary land-take/changes to habitats

- 8.12.3 The principal access track from A4233 Trebanog Road to the west crosses through the southern most tip of the SINC; the permanent land take would be approximately 0.025ha. This part of the access track would be located on an existing bare earth access track that would be upgraded to support site traffic. The habitat which would be subject to permanent land-take is assessed as having negligible ecological importance.
- 8.12.4 Due to the negligible ecological importance of the habitat within the SINC that would be affected by the Proposed Development, the temporary and permanent loss of these would have no effect on the integrity or conservation status of Trebanog Slopes SINC.
- 8.12.5 The magnitude of change is assessed to be negligible and the effect is assessed as Not Significant on an ecological feature of County importance.

## 8.13 Preliminary assessment of effects: Nant Gelliwion /Waun Castellau SINC

### Baseline conditions

#### Current baseline

- 8.13.1 Nant Gelliwion /Waun Castellau SINC is a non-statutory designated site located approximately 10m from the extreme south-eastern corner of the Site. The 40.33ha SINC is a network of wet woodland and marshy grassland habitats and includes the wooded Nant Gelliwion stream where woodland cover thins, steep valley sides support acid grassland, bracken and areas of purple moor-grass. Satellite imagery of the SINC within the Grid Connection route indicates habitats comprise sheep grazed semi improved grassland fields, and two country lanes including Tonyrefail Road with associated roadside bank/hedgerow.

#### Future baseline

- 8.13.2 The site is unlikely to be subject to significant changes in land use in the absence of the wind farm. While there is the potential for long-term improvement depending on future land management, the predicted future baseline is assumed to be the same as the current baseline given the uncertainty.

### Predicted effects and their significance

#### Permanent or temporary land-take/changes to habitats

- 8.13.3 The SINC is outside the Site boundary but is located within the proposed buried cable Grid Connection route. The connection is planned between the on-site substation and the electricity grid at Upper Boat. This connection will be comprised of two components, the first of which is an overhead line to the south-eastern boundary of the Site towards Upper Boat, subsequently the line will be undergrounded to the connection point. The underground cable outside the Site will be delivered by WPD, whilst the overhead line within the Site will be consented as part of this DNS process. Approximately 550m of underground cable would cross the SINC and would be subject to a separate application by WPD.
- 8.13.4 The SINC within the proposed Grid Connection corridor would be subject to temporary habitat loss associated with the construction of the 33kV underground cable. The route is not finalised and will be confirmed by WPD. Notwithstanding, it is assumed the connection would result in temporarily damaged habitat associated with the working areas and 0.45m wide underground trench which would be reinstated following works. The route through the SINC crosses heavily grazed semi-improved grassland, a section along Tonyrefail Road and may require a trench through a section of hedge bank. Any compensation and enhancement measures as required would be considered at the time..
- 8.13.5 The SINC habitats within the Grid Connection corridor are considered common and widespread and the area of temporary habitat damage associated with the works is small in comparison to the size of the SINC. As such, the magnitude of change as a result of the Grid Connection outside the Site boundary is considered to be very low and the temporary

loss of habitats would have no effect on the integrity or conservation status of Nant Gelliwion /Waun Castellau SINC. It is therefore expected that there would be no significant effects on this ecological feature of County importance as a result of the grid connection.

## 8.14 Preliminary assessment of effects: Bats

### Baseline conditions

#### Current baseline

0.1.178.1.17 The baseline for the Site has been established through:

- a desk study, involving a search for statutory sites within 10km for which bats are a key interest feature, non-statutory nature conservation within 2km and records of bats within 10km;
- surveys undertaken in 2020, 2021 and 2022 (reported in **Appendix 8B**), comprising:
  - ▶ roost identification surveys (built structures):
    - external inspections; and
    - emergence, re-entry surveys;
  - ▶ roost identification surveys (trees):
    - ground level roost assessment;
    - winter PRF inspection; and
    - summer PRF inspection;
  - ▶ bat activity surveys:
    - two activity transects across the Site surveyed monthly between May and October 2020;
    - 2020 automated detector surveys (Batlogger A+) deployed at six turbine locations in spring (May), summer (July) and autumn (September) for at least 10 nights in each period;
    - 2021 automated detector surveys (Batlogger A+) deployed at six turbine locations in May and June 2021 and seven locations in July for at least 10 nights in each month; and
    - 2022 Turbine 2 location monitored in Summer (July) with all seven-turbine locations monitored in Autumn.

8.14.1 The survey approach and results are detailed in Appendix 8B, alongside any details of constraints or data gaps. The baseline is summarised in the following sections. It should be noted that the activity surveys (transects and statics) focused on the main Site and not the western access track or the most south eastern section of the proposed Grid Connection Corridor within the Site as the works here would be limited and would not have significant negative effects on bat commuting or foraging.

## Site habitats

- 8.14.2 The dominant habitats within the Site boundary are a mosaic of semi-improved acid and poor grassland, with some areas of wet heath interspersed through the acid grassland. The majority of the Site is an open plateau grazed by sheep and, as such, grass swards are short which limits botanical diversity and reduces foraging value of these habitats for bats. Dense/continuous scrub is present in the south of the Site and an area of blanket bog is present centrally which both provide foraging opportunities for bats. The open mosaic of habitats on the Site as a whole, when assessed with reference to the BCT guidelines (2016), are assessed as being of 'moderate' suitability for bats.

## Roosts

- 8.14.3 The desk-study data shows records of at least 12 species of bat, recorded within the last 15 years within 10km of the Site. The bat roost records are summarised in **Table 8.15** and shown on **Figure 3.1, Appendix 8B**. Three 'high collision risk' species were identified roosting within 10km: common pipistrelle (within 664m), soprano pipistrelle (within 1.1km) and noctule (within 8.6km).

**Table 8.15 Summary of bat roost records within 10km of the Site**

Species	Number of Records	Types of Roost	Year of Most Recent Record	Distance (m) and Direction of Nearest Record from the Site
Common Pipistrelle	83	Maternity Day	2018	664 W
Soprano Pipistrelle	45	Maternity Day	2017	1,139 N
Pipistrellus Species	83	Maternity Day	2014	783 W
Noctule	1	-	2012	8,660 SW
Brown Long-eared Bat	41	Maternity Day Hibernation	2019	1,139 N
Brandt's Bat	1	Day	2012	9,865 N
Daubenton's Bat	7	Day Hibernation	2019	3,284 E
Natterer's bat	4	Day Hibernation	2012	2,836 W
Whiskered Bat	7	-	2011	4,637 NE
Myotis Bat Species	6	Maternity Day	2010	5,229 NE
Greater Horseshoe Bat	1	Hibernation	2013	9,519 SE



Species	Number of Records	Types of Roost	Year of Most Recent Record	Distance (m) and Direction of Nearest Record from the Site
Lesser Horseshoe Bat	8	Maternity Day Hibernation	2017	5,982 SW
Unidentified Bat Species	154	-	2017	267 W

- 8.14.4 Six built structures were recorded within the survey area (**Figure 3.2, Appendix 8B**) and comprise a mix of agricultural buildings, residential dwellings and a stone wall. Four of the six built structures within the bat survey area were considered suitable for roosting bats; two structures were classed as low suitability (B1 and B6); one structure was categorised as moderate (B2), and one was assessed as having high suitability (B5). B3 and B4 were assessed as being of Negligible suitability.
- 8.14.5 All of the buildings were outside the Site boundary and would not be directly impacted by the Proposed Development. B5 alone was taken forward for further survey as this was the only building that had the potential to support a maternity roost or hibernation site<sup>34</sup>. Emergence and re-entry surveys were undertaken at B5 which found the building to contain a day roost for one or a small number of common pipistrelle bats assessed. The bat roost was assessed as being of Local importance<sup>35</sup>.
- 8.14.6 A total of 20 trees were identified within the bat survey area see **Figure 3.3 (Appendix 8B)**, though no bats or evidence of their presence was identified at any of these trees. The following summarises the results after ground level roost assessments, winter PRF and summer PRF inspections:
- two trees provided high potential roost suitability;
  - 12 trees provided moderate potential roost suitability;
  - five trees provided low potential roost suitability; and
  - one tree provided negligible potential roost suitability.

## Bat activity

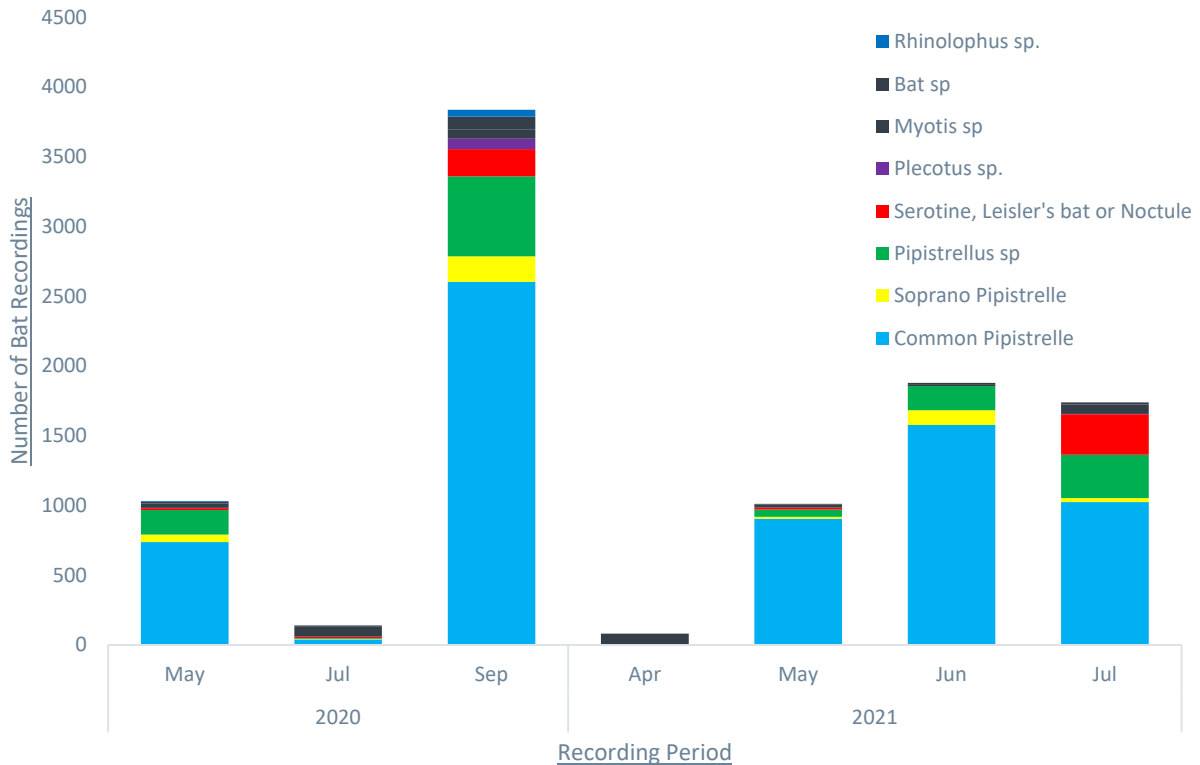
- 8.14.7 During walked transects, at least four species of bat were recorded: common pipistrelle, soprano pipistrelle, long-eared bats and *Myotis* sp. Additional species may have been recorded within the *Myotis* sp. group, and within the NP/CP (Nathusius' or common pipistrelle) group.
- 8.14.8 Common pipistrelle made up the greatest proportion of recordings with approximately 88 percent of all bat passes (5.94 passes per hour on average). The next most frequently recorded group was the category of 'Nathusius' pipistrelle or common pipistrelle' which made up 5.7 percent of all bat passes across the Site (0.39 passes per hour on average).
- 8.14.9 The greatest levels of bat activity were recorded on the areas of transects that incorporated linear features or woodland edge habitat, such as the stone wall on the

<sup>34</sup> in line with Bats and Onshore Wind Turbines - survey, assessment and mitigation guidance (NatureScot).

<sup>35</sup> Value based on Wray *et al.* 2010. *Valuing Bats in Ecological Impact Assessment*. IEEM In Practice v.70, December 2010. This document is widely used as a standard for determining value of bat populations in the EIA process.

- southeast of transect route 1, and around the area of blanket bog in the centre of the Site on transect route 2. Lower levels of activity were recorded in the more open and exposed habitats, in particular the northern sections of transect routes 2, which incorporated fields of grazed pasture.
- 8.14.10 At least seven species of bat were confirmed to be using the bat survey area during the automated detector work: common pipistrelle, soprano pipistrelle, noctule, long-eared bat., *Myotis* sp., lesser horseshoe and greater horseshoe. Additional species may also have been recorded, where some ambiguous calls were allocated to groupings such as *Myotis* sp, common/ Nathusius' pipistrelle or noctule/serotine/Leisler's bat rather than species level.
- 8.14.11 Leisler's bat, serotine and Nathusius' pipistrelle are also known to occur in South Wales and several ambiguous calls were recorded that may be attributable to these species; however, none of the calls recorded over the three-year survey period were definitively from these species, and so the ambiguous calls are considered more likely to be noctule (rather than Leisler's bat or serotine) or common pipistrelle (rather than Nathusius' pipistrelle), which were widely recorded across the Site.
- 8.14.12 Common pipistrelle was widely recorded across the Site and make up 70.8% of all automated detector recordings across all locations and all months. Contacts which could not be assigned to species-level between common or soprano pipistrelle accounted for 8.3%, while those which could not be assigned to species-level between common or Nathusius' pipistrelle accounted for 4.9%. Noctule was the fourth most frequently recorded species which make up 4.6% of all recordings.
- 8.14.13 Soprano pipistrelle was the fifth most frequently recorded species which make up 4% of all contacts. The species group *Myotis* sp. made up 3.6% of all recordings while the Bat sp. group made up 1.4% of all recordings. All other recorded species or groups of species each accounted for less than 1% of the total.
- 8.14.14 Due to ongoing analysis of 2022 automated recorder data, this assessment does not include results or the final assessment of the status of bat populations on the Site, and activity at turbine locations, which will be provided within the final ES.
- 8.14.15 A summary of bat activity from the 2020 and 2021 automated monitoring is presented in **Chart 8.1**; full results from the automated detector surveys are presented in **Appendix 8B**.

Chart 8.1 Average number of bat passes per recording month across Site for all automated monitoring locations in 2020 and 2021



8.14.16 In order to interpret the results of the automated detector surveys, the data was processed through Ecobat<sup>36</sup> to aid in quantifying bat activity levels in the context of bat activity levels recorded elsewhere in the region, this will be repeated for 2022 data. The activity levels of each species recorded on Site is discussed below in reference to the 2020-2021 automated detector locations (at turbine locations) and Ecobat outputs.

**Myotis**

8.14.17 *Myotis* bats are grouped together, as these species have widely overlapping call parameters and therefore cannot be identified from calls alone. **Table 8.16** below presents the *Myotis* bat species which may have been recorded within the bat survey area.

**Table 8.16 Status of *Myotis* bat populations which may be recorded within the bat survey area (data from Mathews *et al.*, 2018<sup>37</sup> and Battersby, 2005<sup>38</sup>).**

Common name	Scientific Name	UK population status	UK population	Welsh population
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<sup>36</sup> Ecobat compares survey results with a national reference dataset and objectively quantifies bat activity levels; <http://www.mammal.org.uk/science-research/ecostat/> (accessed October 2021)

<sup>37</sup> Mathews, F., Kubasiewicz, L.M., Gurnell, J., Harrower, C., McDonald, R.A., Shore, R.F (2018). A review of the population and conservation status of British Mammals. A report by the Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage.

<sup>38</sup> Battersby, J. (Ed) & Tracking Mammals Partnership. 2005. UK Mammals: Species Status and Population Trends. First Report by the Tracking Mammals Partnership. JNCC/Tracking Mammals Partnership, Peterborough

<b>Bechstein's bat</b>	<i>Myotis bechsteinii</i>	Very rare	21,800	1,500
<b>Whiskered bat</b>	<i>Myotis mystacinus</i>	Local	Not available	8,000
<b>Brandt's bat</b>	<i>Myotis brandtii</i>	Common in north and west, rare or absent elsewhere	Not available	22,500
<b>Natterer's bat</b>	<i>Myotis nattereri</i>	Fairly common throughout much of the UK	973,000	70,000
<b>Daubenton's Bat</b>	<i>Myotis daubentonii</i>	Common throughout much of the UK	1,030,000	95,000

- 8.14.18 Bechstein's, whiskered and Brandt's bat are predominantly woodland bats, with Bechstein's an extremely rare bat species which is not considered likely to be present. While some woodland is close to the Site, it is considered unlikely these bats account for the *Myotis* passes recorded at the turbine locations, being located in open habitats. The *Myotis* activity is therefore most likely associated with Daubenton's bat and Natterer's bat, although Brandt's and whiskered may be present in the nearby woodland blocks.
- 8.14.19 *Myotis* sp. were widely distributed across the entire survey area, at broadly similar levels of relative activity across automated monitoring locations 1, 2, 5 and 6. In 2020, automated monitoring locations 3 and 4 showed a higher level of relative activity when compared to monitoring locations 1, 2, 5 and 6. In 2021, *Myotis* sp. group was recorded at broadly similar levels of relative activity across automated monitoring locations 2, 4, 5 and 6 (less than 5 total recordings in 2021 at each location) with a higher level of relative activity recorded at monitoring location 1 (50 total recordings in 2021) and 3 (113 total recordings in 2021). Activity was recorded in all months at broadly similar levels apart from in May and June 2021 where lower levels of bat activity were recorded. Ecobat Data suggests an overall Low - Moderate level of *Myotis* activity across the Site. As illustrated in **Table 8.17**, Daubenton's bat and Natterer's bat are considered to have a 'low collision risk' and an overall 'low population vulnerability' to collision.

### Noctule

- 8.14.20 In 2020, noctule were recorded at broadly similar levels of relative activity across all automated monitoring locations with a peak of activity at monitoring locations 1 and 5. In 2021, noctule were recorded at all automated monitoring locations with an exception at monitoring location 7. Highest level of relative activity was recorded at monitoring locations 1 and 2.
- 8.14.21 Ecobat data indicates an overall Moderate level of activity across the Site, this means that activity levels of noctule within the bat survey area are similar on average to those recorded in the wider landscape on the same night. Noctule has an estimated population in Wales of 91,900 (Mathews *et al.* 2018). Noctule bat are considered to have a 'high collision risk' and an overall 'high population vulnerability' to collision.

### Common pipistrelle

- 8.14.22 Common pipistrelle was widely distributed across the entire bat survey area at varying levels of activity. The highest level of relative activity was recorded at automated monitoring locations 2 and 3. Lowest levels of relative activity was recorded at automated monitoring location 5. No common pipistrelle recording were recorded at automated

monitoring location 7. Activity was recorded in all months with a peak in recordings in September 2020 during the autumn monitoring period. Very low levels of bat activity were recorded in April 2021 and June 2020 with the following months showing an increase in bat activity. Ecobat data indicates an overall Moderate - High level of activity across the bat survey area.

- 8.14.23 Common pipistrelle is one of the most abundant species of bat across the UK with a UK population of around 3,040,000 and 297,000 in Wales (Mathews *et al.*, 2018). Common pipistrelle are considered to have a 'high collision risk' and an overall 'medium population vulnerability' to collision.

### ***Soprano pipistrelle***

- 8.14.24 Soprano pipistrelle was widely distributed across the entire bat survey area, at broadly similar levels of relative activity across automated monitoring locations 1, and 4, 5 and 6. Automated monitoring locations 2 and 3 in 2020 showed higher levels of activity when compared to monitoring locations 1, and 4, 5 and 6. In 2021, soprano pipistrelle was recorded at broadly similar levels of relative activity across all automated monitoring locations with less than 100 recordings at each location. Automated monitoring location 7 recorded no records of soprano pipistrelle.
- 8.14.25 Soprano pipistrelle was recorded in low levels of activity in all months, except September in 2020. The peak in activity for this species was recorded in September during the autumn monitoring period, when a total of 183 passes were recorded across the Site. In 2021, soprano pipistrelle was recorded in slightly lower numbers in June (106 passes), with less than 30 passes recorded in April and May 2021.
- 8.14.26 Ecobat data indicates an overall Low-Moderate level of activity across the bat survey area (median percentile of 31), based on 397 recordings uploaded to the Ecobat database. This means that activity levels of soprano pipistrelle within the bat survey area are slightly lower than those recorded in the wider landscape on the same night. Soprano pipistrelle is one of the most common species of bat in the UK with a population of around 4,670,000 and 478,000 in Wales (Mathews, *et al.* 2018). Soprano pipistrelle are considered to have a 'high collision risk' and an overall 'medium population vulnerability' to collision.

### ***Long-eared bats***

- 8.14.27 Long-eared bat recordings cannot typically be assigned to species level based on acoustic files alone although as the known distribution of the grey long-eared bat is very restricted in the UK, with no confirmed records of this species occurring in this region of Wales, it is assumed all records collected during the survey work are brown long-eared bats.
- 8.14.28 Long-eared bat were recorded at broadly similar levels of relative activity across all automated monitoring locations with a peak of activity at monitoring location 4 (26 total recordings in 2020). In 2021, long-eared bats were recorded at monitoring locations 1 – 3. No passes were recorded at monitoring locations 4 – 7. Ecobat data indicates an overall Low - Moderate level of activity across the Site (median percentile of 31), based on 84 recordings uploaded to the Ecobat database.
- 8.14.29 Brown long-eared bats have an estimated population in the UK of 934,000 and 97,000 in Wales (Mathews *et al.* 2018). This species is a woodland specialist and does not typically cross open spaces. Brown long-eared bats are considered to have a 'low collision risk' and an overall 'low population vulnerability' to collision.

### Greater horseshoe bats

- 8.14.30 Ecobat analysis of data indicates an overall Low level of greater horseshoe bat activity across the Site, this species being recorded at monitoring locations 2, 4 and 5 in 2020 and at no monitoring locations in 2021 (<10 recordings at each location). Greater horseshoe bats have an estimated population in Wales of 2,700 (Mathews *et al.* 2018). Greater horseshoe bats are considered to have a 'low collision risk' and an overall 'low population vulnerability' to collision.

### Lesser horseshoe bats

- 8.14.31 Lesser Horseshoe bat were recorded at monitoring locations 3, 4 and 6 in 2020 and at no monitoring locations in 2021. Ecobat analysis of data indicates an overall Low level of activity across the Site. Lesser horseshoe bats have an estimated British population of 14,000 (Mathews *et al.* 2018). Lesser horseshoe bats are considered to have a 'low collision risk' and an overall 'low population vulnerability' to collision

### Future baseline

- 8.14.32 The Site is unlikely to be subject to significant changes in land use in the absence of the wind farm. While there is the potential for long-term improvement depending on future land management, the predicted future baseline is assumed to be the same as the current baseline given the uncertainty of this.

## Predicted effects and their significance

### Overview

- 8.14.33 Research from Europe and North America has found that bat species can be affected by operational wind turbines, sometimes fatally through collision or barotrauma<sup>39</sup>. However, the behavioural responses of bats to wind farms are complex and not fully understood, with responses varying between sites, species, sexes and times of year. For example, whilst some studies have suggested that active avoidance of wind farms by some bats may occur (e.g. Roeleke *et al.* 2016<sup>40</sup>), there is good evidence that some bat species are attracted to wind turbines (Cryan *et al.* 2014<sup>41</sup>) for a range of possible reasons, including the presence of insect aggregations around the structures (Cryan *et al.* 2014); ultrasound emissions (Kunz *et al.* 2007<sup>42</sup>); or even attraction to red navigation lights (Voigt *et al.* 2018<sup>43</sup>).

<sup>39</sup> Damage to lungs caused by air pressure variations associated with the blades.

<sup>40</sup> Roeleke, M., Blohm, T., Kramer-Schadt, S., Yovel, Y., & Voigt, C. C. (2016). Habitat use of bats in relation to wind turbines revealed by GPS tracking. *Scientific Reports*, 6, 28961. doi:10.1038/srep28961

<sup>41</sup> Cryan, P.M., Gorresen, P.M., Hein, C.D., Schirmacher, M.R., Diehl, R.H., Huso, M.M., Hayman, D.T.S., Fricker, P.D., Bonaccorso, F.J., Johnson, D.H., et al. (2014). Behaviour of bats at wind turbines. *Proc. Natl. Acad. Sci. USA* 111, 15126–15131.

<sup>42</sup> Kunz, T.H., Arnett, E.B., Erickson, W.P., Hoar, A.R., Johnson, G.D., Larkin, R.P., Strickland, M.D., Thresher, R.W., and Tuttle, M.D. (2007). Ecological impacts of wind energy development on bats: questions, research needs, and hypotheses. *Front. Ecol. Environ.* 5, 315–324.

<sup>43</sup> Voigt CC, Rehnig K, Lindecke O, Pétersons G (2018): Migratory bats are attracted by red light but not by warm-white light: Implications for the protection of nocturnal migrants. *Ecology and Evolution* 2018;8:9353–9361.

- 8.14.34 The Proposed Development therefore has the potential to affect bat species using the local area through the following mechanisms:
- loss of habitats used for foraging, commuting or roosting;
  - disruption of flightlines or behavioural alterations due to turbines (e.g. due to presence of turbines, noise, lighting etc); and / or
  - increased mortality due to collisions with turbines.
- 8.14.35 It should be noted that these effects will typically operate ‘in combination’ to affect the use of the landscape by bats, and therefore the assessment of effects considers the overall effect of these factors on local bat populations. The Proposed Development includes embedded measures that will moderate these effect pathways:
- turbines have been located to maintain a minimum 50m blade-tip stand-off from features that are known to be favoured by bats (e.g. woodland edges and key waterbodies);
  - construction would adhere to a CEMP which would incorporate measures to minimise construction-stage effects on bats (specifically, ensuring that temporary lighting does not impinge on features that are known to be favoured by bats for commuting or foraging); and
  - collision and barotrauma risk to bats would be reduced by pitching the blades out of the wind (“feathering”) to reduce rotation speeds below ~2 rpm while idling at all seven turbines.

## Permanent or temporary land-take/changes to habitats

### *Wind Farm*

- 8.14.36 The Wind Farm development would predominately affect open upland habitats (grassland etc.) and some of these habitat changes are long-term. These changes could affect the value of the Site for foraging bats; however, the effects of habitat loss on bat populations would be negligible and not significant as discussed below.
- 8.14.37 **Loss of roosts or roosting opportunities:** It is not considered any roosts or trees or buildings with roosting potential would be affected by the Proposed Development, with the only confirmed roost in B5 located approximately 100m away from the nearest area of land take and over 400m from the nearest turbine.
- 8.14.38 **Loss of foraging commuting habitat:** the direct effect of habitat loss due to Proposed Development on bat foraging and commuting opportunities would be inconsequential. The Wind Farm development would affect a very small proportion of the habitat available to bat populations at this Site. The Wind Farm development would result in the permanent loss of relatively small areas of open upland habitats, including and semi-improved poor and acid grassland, arable and bracken. These habitats have suitability for bats which forage in the open, such as common and soprano pipistrelle. However, the loss of relatively small areas of these generally sub-optimal habitats and the availability of similar or more optimal habitat in the wider landscape would be inconsequential.
- 8.14.39 Species such as greater and lesser horseshoe bat, brown long-eared and *Myotis* forage and commute in more sheltered/cluttered habitats; the open/exposed habitats with limited structural complexity which would be lost provide sub-optimal habitats for these species. Any woody vegetation removal would be very limited and restricted to isolated trees which do not provide important foraging or connective habitat for these bat populations.

- 8.14.40 It is considered that any habitat removal would not result in direct severance of linear features (e.g. treelines) that may be used by bats for commuting. The habitats to be lost are not unique or otherwise notable in a site or local context, and their loss would have no effect on the availability or value of bat foraging habitat locally.

## Grid Connection

- 8.14.41 The Grid Connection Corridor inside and outside the Site would result in permanent and temporary habitat loss associated with the construction of the 33kV overhead line on wooden poles and an underground cable section. It is assumed the overhead line would result in temporarily damaged habitat associated with the working areas for the overhead poles and 0.45m wide underground trench, the permanent loss would be limited to the footprint of the wooden poles only as the underground sections would be revegetated. The overhead line would be located predominantly in open semi-improved grassland fields. Large sections of the underground route, which is located outside of the Site boundary, are within the footprint of existing roads, though trenches would require some crossings through sections of hedge bank and fields.
- 8.14.42 It is not considered the vegetation removal along the route of the 33kV route on wooden poles or working area for a 0.45m trench would create fragmentation for any bat species. The habitats along the route are predominately sub-optimal for the bat populations present and any permanent loss of foraging habitat would be negligible in the context of habitat available in the wider landscape. Overall, it is considered the effect of the land-take/changes to habitats associated with the Grid Connection on bat populations would be negligible.

## Conclusion

- 8.14.43 Overall, any changes as a result of the permanent or temporary land-take are considered to be of negligible magnitude and would result in no change to the conservation status of the bat populations on Site. Effects are therefore considered Not Significant on an ecological feature of County importance.

## Increased light levels and production of aural and visual stimuli and vibration

### *Construction / Decommissioning*

- 8.14.44 With regard to temporary changes in habitat use due to site lighting or construction activities, this would be short-term and largely controlled with normal best-practice construction measures including controls on night-time working and the appropriate design and placement of any site lighting, and so displacement effects via this pathway would be negligible. The only recorded roost (Building B5) is located in a farmhouse which is over 100m from the nearest part of the Proposed Development. It is considered any effects from increased light levels and production of aural and visual stimuli on bat populations during construction/decommissioning would be negligible and Not Significant.

### *Operation*

- 8.14.45 Some studies have suggested that active avoidance of wind farms by some bats may occur (e.g. Roeleke et al. 2016), while others present evidence that some are attracted to wind turbines (Cryan et al. 2014) through a range of potential mechanisms. As a result, it is difficult to accurately predict how bats would respond to the installation of turbines at this Site.



- 8.14.46 All turbines have been sited to provide a stand-off of at least 50m (from blade tip) from any key bat habitat (such as woodland). This stand-off will minimise the risk of the turbines physically intruding into areas of higher activity. There may still be some displacement effects due to the general proximity of new structures, but the effects of this are likely to be negligible and it is certain that bats would continue to use features around the Site margins for foraging and commuting.
- 8.14.47 With regard to turbines attracting bats, whilst this would increase collision risk (see below) it would not (in itself) necessarily result in adverse effects on bat populations; the net cost or benefit of any behavioural alteration would depend on the reasons for the change. Bats continually adapt their foraging strategies based on energy costs versus benefits, and there is no reason to assume that this would not occur if the turbines created a new foraging resource (i.e. the benefit of the resource would be set against the cost of accessing it). Adverse effects are possible if bats are attracted for reasons that do not confer a benefit, such as exploring an unusual ultrasound source or lighting; however, these effects in themselves are unlikely to significantly affect bat populations: the main risk is collision and increased mortality.
- 8.14.48 Overall, any changes from the light levels and production of aural and visual stimuli and vibration from the Proposed Development (during construction and operation) are considered to be of negligible magnitude and would not result in a change to the conservation status of the bat populations on Site. Effects are therefore considered Not Significant on an ecological feature of County importance.

### Physical changes to the spatial environment

- 8.14.49 The principal mechanism for significant effects on bats is from fatalities/injuries caused by collision with wind turbines or barotrauma (collectively referred to herein as 'collision risk'). The method for quantifying collision risk for bats from onshore wind turbines is detailed in the *Bats and onshore wind turbines - survey, assessment and mitigation* guidance (NatureScot 2021<sup>44</sup>). Following this guidance, a collision risk assessment for bats has been carried out which estimates the vulnerability of bat populations to wind farms based on the following factors:
- Relative abundance and collision risk of bat species;
  - The project size and habitat suitability within the Site; and
  - Bat activity recorded at the Site.
- 8.14.50 Table 8.17 outlines the relative abundance and level of potential vulnerability from wind farms of populations of Welsh bat species which has been used to inform the assessment.

**Table 8.15 Level of potential vulnerability of Welsh bat populations to wind farms**

Wales	Collision Risk			
		Low collision risk	Medium collision risk	High collision risk
Relative abundance	Common species			Common pipistrelle Soprano pipistrelle
	Rarer species	Brown long-eared bat		

<sup>44</sup> SNH, NE, NRW, Renewable UK, Scottish Power Renewables, Ecotricity Ltd, University of Exeter and BCT *et al.* *Bats and onshore wind turbines: survey, assessment and mitigation*. 2021

Wales	Collision Risk			
		Daubenton's bat Natterer's bat Lesser horseshoe		
	Rarest species	Alcathoe bat Bechstein's bat Brandt's bat Greater horseshoe Grey long-eared bat Whiskered bat	Barbastelle Serotine	Nathusius' pipistrelle Noctule bat Leisler's bat

Extracted from *Bats and Onshore Wind Turbines* (2021) Yellow = low population vulnerability, Orange = medium population vulnerability, Red = high population vulnerability.

- 8.14.51 The species recorded on Site that are considered to be 'high collision risk' are common pipistrelle, soprano pipistrelle and noctule bats; the other species recorded are all 'low collision risk' and so further consideration is not required (in line with the guidance, as the risk of mortality from collision is low such a significant effect could not occur). The full details of the methods and results of this collision risk assessment are presented in **Section 5, Appendix 8B**, but the outcomes of the process are summarised below. It should be noted this is based on data from 2020 and 2021; data from 2022 which includes some moved turbine locations will be presented at final ES submission. The collision risk assessment will be updated based on data from 2022 therefore outcomes of the collision risk assessment below may change. Notwithstanding the data presented is from two years of data collection across the Site and whilst turbine locations and therefore detector locations have moved the majority have stayed in the same general area of the Site and in contiguous habitats, therefore the data is robust enough to allow for a preliminary assessment to be made and for a mitigation approach for the Site to be designed.
- 8.14.52 To understand the collision risk to bats on the Site, an assessment was undertaken for each high collision risk species at each automated detector location (turbine locations) as presented in **Table 8.18**.

**Table 8.18 Overall collision risk assessment for high-risk bat species recorded on Site**

Automated Monitoring Location	Common pipistrelle		Soprano pipistrelle		Noctule	
	Ecobat Median Category	Overall Collision Risk Category	Ecobat Median Category	Overall Collision Risk Category	Ecobat Median Category	Overall Collision Risk Category
1	Moderate-High	12	Low	3	Moderate -High	12
2	High	15	Moderate	9	Moderate	9
3	High	15	Moderate	9	Low – Moderate	6
4	Moderate	9	Low – Moderate	6	Moderate	9
5	Low-Moderate	6	Low	3	Moderate	9
6	Moderate	9	Low	3	Moderate	9
7 <sup>45</sup>	-		-		-	

Overall assessment: Low (green) 0-4; Medium (amber) 5-12; High (red) 15-25

- 8.14.53 The collision risk assessment at the turbine level shows that at the seven turbine locations, two locations are classed as high risk for collision with the other four medium risk for one or more species. Embedded measures have therefore been designed into the Proposed Development to ensure the risk to bat populations from collision risk are reduced. These measures have been based on a habitat assessment of the Site and *Bats and onshore wind turbines - survey, assessment and mitigation* guidance (NatureScot 2021) and are summarised in **Table 8.10**.
- 8.14.54 A minimum of 50m stand-off will be maintained between all turbine blade tips and the nearest point of linear/foraging features likely to be well-used by bats such as treelines, woodland, wetland habitats and waterbodies, additionally the blades at all turbines will be pitched out of the wind (“feathering”) to reduce rotation speeds below ~2 rpm while idling, this has been shown to reduce fatality rates by up to 50% when compared to normal idling (NatureScot 2021).
- 8.14.55 For the purposes of the presented collision risk assessment the Site overall has been allocated a ‘Moderate’ habitat risk, the habitats where the turbines are located however are considered to be Low risk. Turbines are located on the most exposed areas of an open upland site and the grazed plateau is dominated by semi-improved acid grassland and poor semi-improved grassland with some areas of acid grassland with a low coverage of dwarf shrubs. Due to the grazed nature of the grasslands, the sward is often short and lacks botanical diversity. The more optimal areas of the Site comprising, hedgerows, treelines, ponds or scrub are not in close proximity to any of the turbine locations.
- 8.14.56 It is considered the lower suitability habitats where the turbines have been sited combined with feathering the turbines when idle would provide sufficient mitigation to reduce the risk to bats. It is possible that the Proposed Development would result in bat fatalities, predominantly common pipistrelle. However, this species is common and widespread and do not have a high population vulnerability to wind turbine fatalities. It is considered that

<sup>45</sup> No soprano pipistrelle common pipistrelle or noctule activity was recorded at Turbine 7.

the embedded measures would however reduce any mortalities to an incidental level and would not be of a threshold that would negatively impact the favourable conservation status of high-risk species populations (or any other bat species) at a Site level or national level. The magnitude of change on bat populations is therefore assessed to be low and the effect on an ecological feature of County importance is considered to be Not Significant.

## Summary

- 8.14.57 The proposed wind farm may affect the use of the Site by bats, including increasing the mortality risk for bats locally, particularly common pipistrelle (this being by far the most frequently recorded bat on Site). However, any effects on local bat populations are considered to be Not Significant.

## 8.15 Preliminary assessment of effects: Reptiles

### Baseline conditions

#### Current baseline

- 8.15.1 The desk study returned five records of common lizard and two records of grass snake within 2km of the Site. The suitability of the Site for reptile species was assessed during the Preliminary Ecological Appraisal (see Appendix 8A) where suitable habitat to support widespread British reptile species foraging, refuging and commuting was recorded in the heath, blanket bog, continuous bracken and less intensely grazed semi-improved acid grassland. The network of dry-stone walls and scattered stone and scrub on-Site provides suitable habitat for refuge and hibernation.
- 8.15.2 A seven-visit presence/absence survey for reptiles was carried out in the areas of habitat that were highlighted during the PEA to have the potential to support reptiles (see Appendix 8C). This recorded maximum counts of:
- Viviparous lizard: 18 adults and nine juveniles;
  - Slow worm: three adults and one juvenile; and
  - Grass snake: two adults
- 8.15.3 These results indicate the presence of a 'low' population of slow worm and grass snake and a 'good' population of viviparous lizard (based on Froglife<sup>46</sup>). It should be noted that a full population assessment comprising 20 visits was not conducted; this was not considered necessary as the surveys conducted were suitable to robustly assess the likely effects of the Proposed Development on reptiles, and allow the design of appropriate mitigation that would ensure no significant effects on these species.

#### Future baseline

- 8.15.4 The Site is unlikely to be subject to significant changes in land use in the absence of the wind farm. While there is the potential for long-term improvement depending on future land management, the predicted future baseline is assumed to be the same as the current baseline given the uncertainty of this.

<sup>46</sup> Froglife (1999). *Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation*. Froglife Advice Sheet 10. Froglife, Halesworth.

## Predicted effects and their significance

### Permanent or temporary land-take/changes to habitats

- 8.15.5 Of the environmental changes associated with the Proposed Development it is considered that reptiles present on or near the Site could be affected through land use change / habitat modification (loss of habitat, particularly areas that may be suitable for shelter or concealment); and associated physical intrusion (incidental killing or injury of individuals during construction).
- 8.15.6 The following incorporated measures are taken into account in the assessment:
- standard / established construction management and pollution control measures; and
  - standard / established construction management best-practice for reptiles, including phased or directional vegetation clearance techniques in higher-risk areas, and appropriate management of excavations and materials storage (etc).
- 8.15.7 The Proposed Development would affect a very small proportion of the habitat potentially available to reptiles at the Site, the majority of which is semi-improved grazed grassland with few refugia, and the habitats lost to the development infrastructure are not considered to form a unique or critical resource for reptiles in this area. The exact area of habitat loss is not possible to quantify accurately as suitable and unsuitable habitats for reptiles are not clearly defined over the large open upland Site, with a mosaic of habitats providing areas of suitable habitats, interspersed with less suitable areas. Nonetheless, the area permanently or temporarily lost would be relatively small and it is considered that this would not significantly affect the local reptile populations.
- 8.15.8 Effects on individual reptiles during construction will be avoided or mitigated using standard best-practice displacement techniques, due to the spatially discrete nature of the works and the large amounts of suitable habitat that would remain accessible. In summary, the removal of habitat or features that could support reptiles (mostly longer areas of grassland and bracken) would be kept to a minimum, where present, suitable habitat would be cut to ~150mm above ground level during the winter period to avoid nesting birds becoming established during the nesting season. Final removal, and grubbing out of roots would be conducted in the spring, outside of reptile hibernation period (i.e. avoiding mid-October through to mid-April depending on seasonal temperature) to allow any individuals to move out of the area of works. Areas of long grass and other similar vegetation that need to be removed would be strimmed prior to construction to reduce their suitability, and hand-searched as necessary to disperse reptiles from the construction area. The mortality risk would be elevated above the baseline during the construction period but the incorporated measures and the accessibility of suitable habitats outside construction areas would ensure that this elevated risk is moderated so that the reptile population at the Site is not significantly affected during construction.
- 8.15.9 With regard to operation, the alteration of the site habitats may alter the mortality risk by increasing the amount of 'bare ground' that is likely to be attractive to reptiles for basking; however, the effects of this on populations would be negligible and plenty of refugia would remain close to the new areas of bare ground, and so effects would not be significant.
- 8.15.10 The magnitude of change on reptile populations is assessed to be very low and would not change the conservation status of the population on Site or in the county, the effect on an ecological feature of local importance is therefore considered to be Not Significant.

## 8.16 Preliminary assessment of cumulative (inter-project) effects

- 8.16.1 Consideration has been given as to whether any of the ecological features that have been taken forward for assessment in this chapter are likely to be subject to cumulative effects as a result of the Proposed Development and by other developments. This includes the consideration of the effects summarised in **Appendix 8F** that are not significant, as a number of minor effects on an ecological feature from multiple projects may result in a significant cumulative effect.
- 8.16.2 Cumulative effects would generally be either:
- cumulative 'zone of influence' effects whereby two or more developments affect the same specific receptor (e.g. two developments in the same river catchment); or
  - cumulative effects on the total resource (or population) of an ecological feature in a region due to two or more developments (e.g. two developments affect the same habitat type in a region, reducing its overall area).
- 8.16.3 Cumulative Impact Assessment can be challenging as it relies on the definition of a reasonable scope for cumulative effects and the availability of a reasonable baseline for other developments. However, the same principles of assessment apply, i.e. an effect would have to be significant at the 'county' level to be significant in EclA terms. In addition, the assessment focuses on those occasions where two 'not significant' effects might operate cumulatively to result in a significant effect (rather than where the effects of one development on an ecological feature are already, on their own, considered significant).
- 8.16.4 No developments have been identified in the immediate vicinity of the Mynydd y Glyn site which are likely to affect those spatially discrete or range-limited features present on the site or in close proximity; therefore, there would be no possibility of significant cumulative effects on:
- any of the SINC's - as the Proposed Development would have low to negligible effects on these sites, and no other schemes (etc.) are likely to affect them;
  - blackmill Woodlands SAC, Cardiff Beech Woods SAC, Nant Gelliwion Woodland SSSI as there would be negligible effects on these sites, either due to the distance or absence of reasonable impact pathways (no hydrological linkages; interest features not sensitive);
  - the Proposed Development would have negligible effects on and Rhos Tonyrefail SSSI and no other schemes are likely to affect it;
  - any species present or potentially present at the Site, except for bats (all species other than bats will have relatively limited ranges and so the populations associated with Proposed Development would not be exposed to the effects of other developments; and the Proposed Development itself would have a very low- negligible effect on these populations, ensuring that the Mynydd y Glyn development would make a negligible contribution to any effects on county-wide populations that may occur cumulatively with other developments); and
  - any Site habitats as the Proposed Development would have negligible effects on these habitats, and no other development will affect these.
- 8.16.5 The following sections therefore examine the potential cumulative effects on bats; these ecological features are taken forward due to their large range and dependence on a range of habitats through their life-cycle.

## Bats

- 8.16.6 There are no accepted protocols or methods for assessing the cumulative effects of developments on local bat populations, and in reality, the range of conceivable cumulative effects is as variable as the range of developments or activities that could conceivably affect bats. For example, the loss of a roost due to a barn conversion could arguably have a cumulative effect with a wind farm if this increases collision risk as bats travel further to forage.
- 8.16.7 Furthermore, it is acknowledged that accurately establishing bats' use of the wider landscape (away from a development site) is very difficult. This is due to severe practical constraints on meaningful field surveys across substantially larger areas and the inherent limitations of current bat survey techniques (e.g. areas that can be covered, effective range of detection, and so on).
- 8.16.8 The range of conceivable effects and the patchiness of survey data in the wider area outside the Site therefore present some difficulties when assessing any potential cumulative effects on bats. In order to keep the assessment manageable, only wind farms with turbines with a height of 50m or over and which are either built, consented, going through the consenting process (scoping etc) or with submitted planning applications within 10km of the Proposed Development are considered for cumulative effects. This is because:
- it is considered that the principal risks to bat populations from wind farm development are increased collision risk and (to a lesser extent) possible reductions in available upland habitat if displacement occurs. Other than vehicles, wind farms are likely to present the main collision risk for bats in rural Wales. Since very few other developments are likely to significantly increase collision risk, it is most relevant to consider cumulative collision risk from wind farm developments only. Similarly, few (if any) other developments are likely to significantly affect the availability or accessibility of upland habitat resources;
  - most other developments do not take place on the same geographical scale as wind farms, and therefore it is likely that any effects that other developments may have on bats can be fully mitigated locally, without significant risk of cumulative effects with local wind farms. This is particularly relevant when considering the possible cumulative effects of wind farm developments with the lowland developments that are typical of rural Wales; and
  - the flight range of bat species is very variable (with some flying substantial distances between winter and summer roosts), but most species tend to forage within ~5km of their roost (based on BCT<sup>47</sup> guidelines) with the Core Sustenance Zone (CSZ)<sup>48</sup> for the bat species recorded on Site being between 2-4km (BCT 2016). On this basis, bats roosting ~5km from the Proposed Development could also be affected by other wind farms ~10km from the Site.
- 8.16.9 The wind energy developments within 10km of the Site which are considered as part of the cumulative assessment are detailed within **Table 8.19**.

<sup>47</sup> J. Collins (ed.). Bat surveys for professional ecologists: Good practice guidelines. 3rd Edition. London: Bat Conservation Trust, 2016.

<sup>48</sup> A CSZ refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost.

**Table 8.169 Cumulative assessment wind energy developments within 10km of the Site boundary**

Name of wind farm	Local Authority	Number of wind turbines	Height to blade tip (m)	Approximate distance from boundary of Proposed Mynydd y Glyn Wind Farm (km)	Status
<b>Llwyncelyn Farm 1 &amp; 2</b>	Rhondda Cynon Taff County Borough Council	2	125	2.56	Consented – under construction
<b>Mynydd Portref and Extensions 1-7</b>	Rhondda Cynon Taff County Borough Council	6	110	4.09	Operational
<b>Taff Ely 1 – 20</b>	Rhondda Cynon Taff County Borough Council	20	53	4.51	Operational
<b>Headwind Taff Ely 1 – 7</b>	Rhondda Cynon Taff County Borough Council	7	110	4.96	Consented – in construction
<b>Bryntail Farm 1 &amp; 2</b>	Rhondda Cynon Taff County Borough Council	2	71	5.38	Submitted – unknown
<b>Nant-y-Gwyddon</b>	Rhondda Cynon Taff County Borough Council	1	121.5	5.76	Consented – in construction
<b>Fforch Nest</b>	Bridgend County Borough Council	11	115	5.81	Operational
<b>Pant-y-Wal</b>	Bridgend County Borough Council	10	115	6.60	Operational
<b>Ferndale</b>	Rhondda Cynon Taff County Borough Council	8	74	6.70	Operational
<b>Pant-y-Wal Extension</b>	Bridgend County Borough Council	8	125	7.38	Consented
<b>Castell Llwyd Farm</b>	Caerphilly County Borough Council	1	77	9.41	Operational
<b>Cefn Fforest Farm</b>	Neath Port Talbot County Borough Council	1	67	9.64	Consented – unknown

\*Proposed; all other wind farms are operational or under construction.

8.16.10 Following a desk study; information available with regards to bats for the wind energy developments within 10km of the Site and which are considered as part of the cumulative assessment are detailed within **Table 8.20**.



**Table 8.20 Cumulative assessment wind energy developments within 10km of the Site boundary**

Name of wind farm	Source of information	Summary of available information
<b>Llwyncelyn Farm 1 &amp; 2</b>	RCTCBC Planning committee <sup>49</sup>	Turbine (T1) is curtailed during the month of May due to noctules. initial bat survey work carried out in September 2015 and the subsequent surveys in May and August 2017 confirm that a number of different bat species were identified during the survey period including common and soprano pipistrelle bats, greater and lesser horseshoe bats and noctule, long eared and myotis species bats. The report notes that bat activity levels are low at the turbine locations (compared to the adjacent habitat features) and are dominated by pipistrelle species which are considered to be low risk at the population level to wind turbine effects
<b>Mynydd Portref and Extensions 1-7</b>	No information available	-
<b>Taff Ely 1 – 20</b>	RCTCBC Planning committee <sup>50</sup>	The assessments conclude (in summary) that minimal impacts to bats will be experienced. It is noted that Serotine (a species with relatively few county records) and Noctule (a bat assessed as having high sensitivity to turbines) have both been recorded together with Soprano Pipistrelle roost in the adjacent woodland. However, the assessment rationales (which based on bat foraging habitat preference of different species, and low levels of bat activity) reaches a conclusion of minimal bat impact with no requirement for mitigation.
<b>Headwind Taff Ely 1 – 7</b>	RCTCBC Planning committee <sup>51</sup>	In respect of bats survey work presented in the ES and confirms that during the survey season only low levels of bat activity were recorded for all species recorded. Given the low levels of activity and open exposed nature of the application site the overall effects on bat species were considered to be negligible.
<b>Bryntail Farm 1 &amp; 2</b>	No information available	-
<b>Nant-y-Gwyddon</b>	No information available	-
<b>Pant-y-Wal/ Fforch Nest / Pant-y-Wal Extension</b>	Upper Ogmores wind farm ES cumulative section <sup>52</sup>	The twenty-one turbine Pant y Wal wind farm (which incorporates the Fforch Nest wind farm) and the twelve turbine Pant y Wal Extension site are located in upland moorland (open and rushy pasture) to the east of the Ogmores Valley. The Non-Technical Summary for the Pant y Wal Extension (WYG, 2014) noted that residual

<sup>49</sup><https://www.rctcbc.gov.uk/EN/Council/CouncillorsCommitteesandMeetings/Meetings/PlanningandDevelopmentCommittee/2017/11/16/Reports/AgendaItem5.REPORTAPPROVALS.pdf> (accessed 14th October2022)

<sup>50</sup><https://www.rctcbc.gov.uk/EN/Council/CouncillorsCommitteesandMeetings/Meetings/PlanningandDevelopmentCommittee/2017/10/05/Reports/AgendaItem5REPORTAPPROVALS.pdf> (accessed 14th October2022)

<sup>51</sup><https://www.rctcbc.gov.uk/EN/Council/CouncillorsCommitteesandMeetings/Meetings/PlanningandDevelopmentCommittee/2014/12/18/Reports/applicationsrecommendedforapproval.pdf> (accessed 14th October2022)

<sup>52</sup> <http://upperogmore-windfarm.co.uk/media/2638289/06-ecology-and-biodiversity.pdf> (accessed 14th October2022)

Name of wind farm	Source of information	Summary of available information
Ferndale	RCTCBC Planning committee <sup>53</sup>	impacts of the site were not considered significant, as mitigation and habitat management was proposed to minimise effects on species.  The EIA included bat survey work which was a species of principal concern. Of the species recorded only those belonging to the higher flying Eptesicus/Nyctalus genus were considered a high risk only two bats belonging to this genus were recorded. The bat assessment concludes that the upland wind farm site is considered to be of relatively low importance for bats. Given its location and the similar conclusions for neighbouring upland wind farms, the assessment of low impact on bats was considered reasonable
Castell Llwyd Farm	No information available	-
Cefn Fforest Farm	Planning application <sup>54</sup>	The ES considers that the development would not adversely impact on any roosting or foraging bats the Town Planning Division's Countryside Officer and NRW raised no objection to the development.

- 8.16.11 Direct comparison of bat survey results from different developments is not possible due to the variability in site conditions and survey effort. However, where studies for bats for the wind farms within 10km of the Proposed Development have been completed they report similar patterns and conclusions, i.e.:
- Pipistrelle species are referenced as the species with higher levels of activity;
  - Noctule bats have been recorded;
  - Bat activity within the sites, particularly in more 'exposed' areas away from features typically used by bats, is low; and
  - Some areas of the sites experience relatively higher levels of activity, but these areas invariably have features that are typically favoured by foraging or commuting bats (e.g. riparian corridors; woodland edges; hedgerows; sheltered treelines or gullies) which are away from Turbine locations.
- 8.16.12 The primary cumulative effects of multiple wind farms are considered to be increased collision risk (and hence direct effects on population size) and the possibility of indirect effects on habitat use (i.e. the displacement of bats from foraging areas due to the presence of turbines, or 'barrier effects' (the loss or modification of flight paths, although Jones et al. (2009) report no documented cases of barrier effects occurring at wind farms)).
- 8.16.13 The available bat survey data for the wind farms within 10km of the Proposed Development indicate that bat activity across these upland sites is generally low, and the risk of collision is therefore also low. Where data is available it is apparent the wind farms have or will all benefit from bat surveys and subsequent siting of turbines to avoid features used by bats, and curtailment of one turbine at Llwynceilyn Farm 1 & 2. Where data is

<sup>53</sup> [Item11Application180523.pdf \(rctcbc.gov.uk\)](https://democracy.merthyr.gov.uk/documents/s24731/P140228.pdf?LLL=1) (accessed 14th October2022)

<sup>54</sup> <https://democracy.merthyr.gov.uk/documents/s24731/P140228.pdf?LLL=1> (accessed 14th October2022)

available it is considered that the existing or proposed wind farms have taken appropriate measures to minimise collision risk and avoid potentially significant effects on local bat populations with the overall effects on bat species for these schemes being considered to be low or negligible and not significant.

- 8.16.14 Furthermore, the wind farms are sited in predominantly upland or upland margin habitats, away from the valley environments that are likely to provide the most significant foraging and roosting habitats locally, and the principal commuting and migration routes. The inter-connectivity of the valley systems in this area will not be meaningfully affected by the wind farms, and so the general 'permeability' of the landscape to bats is unlikely to be significantly reduced. As noted, there are no documented cases of wind farms having 'barrier effects' (Jones et al. 2009).
- 8.16.15 There is little evidence to suggest that the upland areas (particularly on Mynydd y Glyn) provide a significant habitat resource for local bat populations. It is considered that the wind farms within 10km are unlikely (on their own) to have any significant effect on either local bat populations, or their usage of the sites (this is also the conclusion reached by the assessment for Mynydd y Glyn). It is therefore considered extremely unlikely that the wind farms within 10km of Mynydd y Glyn Wind Farm will operate cumulatively to significantly affect local bat populations. It is therefore considered that cumulative effects on bats will be Not Significant.

## 8.17 Significance conclusions

- 8.17.1 A summary of the results of the biodiversity assessment is provided in **Table 8.21**

**Table 8.21 Summary of significance of effects**

Ecological feature and summary of predicted effects	Sensitivity/ importance/ value of ecological feature <sup>1</sup>	Magnitude of change <sup>2</sup>	Significance <sup>3</sup>	Summary rationale
<b>Rhos Tonyrefail SSSI</b>  <u>Potential effects:</u> Permanent or temporary land-take/changes to habitats	National (UK)	Negligible	Not significant	The SSSI would not be subject to direct land take or encroachment effects. Surveys found no presence of marsh fritillary, devils bit scabious host plant or botanically diverse nectar rich habitats within areas of land take. The embedded measures ( <b>see Section 8.6</b> ) would ensure that indirect effects on this SSSI would be prevented or appropriately managed. Overall, therefore, the Proposed Development would have no effect on the integrity or conservation status of the Rhos Tonyrefail SSSI.
<b>Mynydd y Glyn SINC</b>  <u>Potential effects:</u> Permanent or temporary land-take/changes to habitats	County	Low	Not significant	Mynydd y Glyn SINC is predominantly designated for its blanket bog, this will be retained with no elements of the Proposed Development within this habitat. There will be limited permanent loss of common and widespread habitats (wet heath/acid grassland and grazed semi-improved acid grassland) which will be off-set by compensation and enhancement measures (that will be detailed in a oHMP at final ES submission) will improve the ecological value of retained areas of the SINC; therefore the site integrity or conservation status of Mynydd y Glyn SINC would be maintained.
<b>Mynydd Gelliwion and Gellwion Slopes SINC</b>  <u>Potential effects:</u> Permanent or temporary land-take/changes to habitats	County	Negligible	Not significant	There would be no direct effects on this SINC. The embedded measures (see <b>Section 8.6</b> ) will ensure that indirect effects on the SINC will not occur. Overall, therefore, the Proposed Development would have no effect on the integrity or conservation status of the Mynydd Gelliwion and Gellwion Slopes SINC.
<b>Trebanog Slopes SINC</b>  <u>Potential effects:</u>	County	Negligible	Not significant	Permanent land take within the SINC would be located on an existing well used bare earth access track that would be upgraded to support site traffic. The habitats which would be

Ecological feature and summary of predicted effects	Sensitivity/ importance/ value of ecological feature <sup>1</sup>	Magnitude of change <sup>2</sup>	Significance <sup>3</sup>	Summary rationale
Permanent or temporary land-take/changes to habitats				subject to permanent land-take are assessed as having negligible ecological importance. Due to the negligible ecological importance of the habitats to be impacted within the SINC, the temporary and permanent loss of these habitats would have no effect on the integrity or conservation status of Trebanog Slopes SINC.
<b>Nant Gelliwion /Waun Castellau SINC</b>  <u>Potential effects:</u> Permanent or temporary land-take/changes to habitats	County	Very low	Not significant	The SINC is outside the Site boundary but is located within the proposed Grid Connection route. Approximately 550m of underground cable would cross the SINC and would be subject to a separate application by WPD. The SINC habitats within the Grid Connection route are considered common and widespread, the area of temporary habitat damage and loss associated with the works is small in comparison to the size of the SINC. Any compensation or enhancement measures as required would be detailed as part of the separate application. It is considered that the temporary loss of these habitats would have no effect on the integrity or conservation status of Nant Gelliwion /Waun Castellau SINC.
<b>Bats</b>  <u>Potential effects:</u> Permanent or temporary land-take/changes to habitats	County	Negligible	Not significant	Vegetation removal associated with the Proposed Development would predominately comprise sub-optimal semi-improved grazed grassland habitats. Any woody vegetation removal would be very limited and restricted to isolated trees which are not part of key foraging or connective habitat for bats. No loss of optimal foraging habitat or severance of flightlines would occur and the areas of loss with regard to the areas of similar or more optimal habitat which will be retained on Site and in the wider landscape will be inconsequential. The confirmed roost would be retained without any disturbance, with the Proposed Development having no impact on the availability or quality of roosting opportunities locally. Overall, any affects from the permanent or temporary land-take/changes on bat populations from the Proposed

Ecological feature and summary of predicted effects	Sensitivity/ importance/ value of ecological feature <sup>1</sup>	Magnitude of change <sup>2</sup>	Significance <sup>3</sup>	Summary rationale
Increased light levels and production of aural and visual stimuli and vibration	County	Negligible	Not significant	Development are considered negligible and would result in no change to the conservation status of the bat populations on Site.
Physical changes to the spatial environment	County	Low	Not significant	Common pipistrelle, soprano pipistrelle and noctule bats were recorded on Site; these are considered a high-risk species for collision and or barotrauma with wind turbines blades. The other species recorded on Site are all low collision risk and the risk of mortality from collision is low such as a significant effect could not occur. Two turbines are classed as high risk for collision (Turbine locations 2 and 3) for common pipistrelle and all (apart from Turbine 7) are moderate for common, soprano pipistrelle or noctule). Embedded measures have therefore been designed into the Proposed Development to ensure the risk to bat populations from collision risk are reduced. Measures include a minimum 50m stand-off between all turbine blade tips and the nearest point of linear/foraging features likely to be well-used by bats and feathering to reduce rotation speeds below ~2 rpm while idling at all seven turbines. It is considered the lower suitability habitat where the turbines would be located combined with feathering the turbines when idle would provide sufficient mitigation to reduce the risk to bats to an acceptable level. It is likely that the proposed wind farm would increase the mortality risk for bats locally, particularly common pipistrelle (this being by far the most frequently recorded bat on site). However, inclusive of the embedded measures, these changes are not considered to have adverse effects on the favourable conservation status of bat populations.

Ecological feature and summary of predicted effects	Sensitivity/ importance/ value of ecological feature <sup>1</sup>	Magnitude of change <sup>2</sup>	Significance <sup>3</sup>	Summary rationale
<p><b>Reptiles</b></p> <p><u>Potential effects:</u> Permanent or temporary land-take/changes to habitats</p>	Local	Very low	Not significant	<p>The Proposed Development would result in permanent or temporary loss of habitat suitable to support reptiles but will affect a very small proportion of the habitat available to reptiles at this Site. It is not considered the habitats lost to the development infrastructure would form a unique or critical resource for reptiles in this area. This loss would be offset by the habitat enhancement provided in an oHMP at final submission and the site infrastructure may incidentally improve some areas for reptiles by providing greater habitat complexity. Individual reptiles would be protected using standard best-practice measures that temporarily displace them from areas likely to be affected by construction; this is entirely achievable due to the discrete nature of the works and the large amounts of suitable habitat that would remain accessible.</p>

1. The sensitivity/importance/value of an ecological feature is defined using the criteria set out in **Section 8.8** and is defined as international, National (UK context), National (Wales context), county, local and negligible.
2. The magnitude of change on an ecological feature resulting from activities relating to the development is defined using the criteria set out in **Section 8.8** and is defined as negligible, very low, low, medium and high.
3. The significance of the environmental effects is based on the combination of the sensitivity/importance/value of a receptor and the magnitude of change and is expressed as major (significant), moderate (potentially significant) or minor/negligible (not significant), subject to the evaluation methodology outlined in **Section 8.8**.

## 8.18 Further work to be undertaken

- 8.18.1 The final assessment of likely significant effects will be reported in the ES. This section describes the further work to be undertaken to support the biodiversity assessment presented in the ES.

### Baseline

- 8.18.2 The desk study exercise undertaken in 2020 (**Appendix 8A**) will be updated using the updated Site boundary to obtain information relating to statutory and non-statutory nature conservation sites, Habitats of Principal Importance and species, and legally protected and controlled species. The data will be obtained from SEWBRcC and MAGIC website.
- 8.18.3 Results from the Phase II Vegetation survey (NVC) will be presented at final ES submission and used to inform the oHMP and assessment of effects.
- 8.18.4 The oHMP will include measures that compensate and enhance the Mynydd y Glyn SINC impacted by the Proposed Development and produce a net gain in nature conservation across the Site.
- 8.18.5 Results from the 2022 bat automated detector surveys will be analysed and used to inform the collision risk assessment and any required mitigation strategy.
- 8.18.6 Surveys are ongoing (to November) for notable grassland fungus in areas that would be subject to direct land take by the Proposed Development and are suitable to support these.