6 ECOLOGY

6.1 Introduction

6.1.1 This chapter of the Environmental Statement considers the effects of the proposed wind farm on terrestrial ecology and complements the assessment of ecological effects presented in Chapter 7: Ornithology.

6.1.2 This chapter describes the methods used to evaluate the ecological interest of the Site. It explains the ways in which ecological features may be affected by the proposed wind farm and assesses the likely significance of those effects. In making an assessment of impacts, the chapter draws on information obtained through desk study, consultation, and field survey.

6.1.3 The assessment has been undertaken by BSG Ecology.

6.1.4 The chapter is supported by:

- Appendix 6.1 – Legislation and planning policy summary
- Appendix 6.2 – Summaries of ecology meetings with stakeholders
- Appendix 6.3 – Survey tables[1]
- Appendix 6.4 – Phase 1 Habitat survey target notes
- Appendix 6.5 – Bat call identification methods
- Appendix 6.6 – Photographs

6.1.5 Figures 6.1- 6.11 are referenced in the text where relevant.

6.2 Legislation and Policy and Guidance

Legislation and Policy

6.2.1 There are several national and local policies and guidance documents that relate to nature conservation and ecology within the planning process that are relevant to the proposed wind farm. Reference to these provides an indication of the likely requirements and expectations of statutory authorities and others in relation to planning applications and nature conservation and ecology within a given area. There are also legislative requirements of new development. The national and local planning policies and the legislation relevant to the proposed Mynydd Maen wind farm are listed below (see Appendix 6.1 for further detail).

- Planning Policy Wales (Edition 12, February 2024).
- Technical Advice Note (TAN) 5 Nature Conservation and Planning (2009).
- The Environment (Wales) Act (2016).
- The Conservation of Habitats and Species Regulations (2017) as amended.
- The Wildlife and Countryside Act (1981) as amended.
- Relevant policies (S7 and others) within The Torfaen Local Development Plan (2013).
- Relevant policies (including CW4-6) of the Caerphilly County Borough Local Development Plan (2010).
- Supplementary Planning Guidance issued by Torfaen County Borough Council on Biodiversity, Ecosystem Resilience and Development (2023).

[1] These include tree roost assessment results / pictures (for bats) and great crested newt survey results.

- The Greater Gwent Nature Recovery Plan (2022).
- The Torfaen Biodiversity Action Plan (2003).
- The Caerphilly Biodiversity Action Plan (2002).

Guidance

6.2.2 This chapter has been based principally on relevant parts of the 2018 (partially updated 2022) Guidelines for Ecological Impact Assessment in the United Kingdom developed by the Chartered Institute of Ecology and Environmental Management[2].

6.2.3 In addition, the following technical guidance has been referred to in deriving the scope of survey work, interpreting results and assessing impacts:

- The identification of potential groundwater dependent terrestrial ecosystems (GWDTEs) has been undertaken based on guidance provided by SEPA (2017)[3].
- The approach to desk study, survey work and the assessment of the risk posed by the operational wind farm to bats has been informed by industry standard guidance produced by NatureScot *et al.*, (2021)[4'5]. In addition, the online database "Fledermausverluste an Windenergieanlagen / bat fatalities at wind turbines in Europe" maintained by Tobias Dürr (Dürr, 2022)[6] has been consulted for empirical data on collision fatality.

6.3 Consultations

Pre-application Consultation

6.3.1 Pre-application consultation with Natural Resources Wales (NRW) was not possible. Meetings were regularly requested from December 2020 onward via the Discretionary Planning Advice (DPAS) service, but ornithological staff and protected species ecologists were not available to attend these. Consultation was therefore via scoping.

6.3.2 Meetings were held with ecologists from Torfaen County Borough Council and Caerphilly County Borough Council in April 2021 and April 2023 and May 2021 and June 2023 respectively. The purpose of these meetings was to discuss the findings of survey work, the scope of the assessment and the biodiversity net benefit solution. Records of the meetings (agreed by all parties) are contained in **Appendix 6.2**.

EIA Scoping

[2] CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester. (updated April 2022)
[3] SEPA (2017). Guidance on assessing the impacts of development proposals on groundwater abstractions and groundwater dependent terrestrial ecosystems. Scottish Environment Protection Agency, Land Use Planning System Guidance Note 31 (LUPS-GU31). Available at https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-ofdevelopment-proposals-on-groundwater-abstractions-and-groundwater-dependent-terrestrialecosystems.pdf
[4] NatureScot, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter and the Bat Conservation Trust. (2021). *Bats and onshore wind turbines: survey, assessment and mitigation*. SNH, Inverness.
[5] The current iteration of the guidance is referred to here. The version referred to when planning the surveys was Scottish Natural Heritage, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter and the Bat Conservation Trust. (2019). *Bats and onshore wind turbines: survey, assessment and mitigation*. SNH, Inverness
[6] Most recently updated on 17 June 2022. Visited on 7 July 2023.Available at https://lfu.brandenburg.de/lfu/de/aufgaben/natur/artenschutz/vogelschutzwarte/arbeitsschwerpunkte/auswirkungen-von-windenergieanlagen-auf-voegel-und-fledermaeuse/

6.3.3 A scoping report was issued in November 2021 (Barton Willmore, 2021). Planning and Environment Decisions Wales (PEDW) responded in January 2022 (PEDW, 2022). A tabulated summary of comments was provided with regard to each technical discipline by PEDW.

6.3.4 Both Torfaen and Caerphilly Councils indicated they were content with the scope of survey work completed at that point. Blaenau Gwent County Borough also responded to the consultation and did not raise ecological concerns.

6.3.5 The comments on biodiversity, and how they have been addressed, are set out in Table 6.1.

Table 6.1. PEDW Scoping comments and responses

Issue	PEDW comment	Response
Silurian moth *Eriopygodes imbecilla*	PEDW notes that supporting habitats have been identified onsite but they are not shown in the SR. It is noted at paragraph 6.23 of the SR that there are no records of Silurian moth within 2 km of the Site. It is noted that the Applicant does not intend to complete a detailed assessment for Silurian moth but it is unclear whether this approach has been agreed with TCBC. A clarification is sought in the ES.	Silurian moth is confined to land above 450 m altitude where the larval foodplant (bilberry *Vaccinium myrtillus*) and a deep moss layer (in which the caterpillars hide during the day) are present. There is very little land above the 450 m contour at Mynydd Maen, and the Site is outside the known range of the species in the UK (the most southerly record is for Twyn Du and was of a caterpillar recorded by BSG Ecology staff in spring 2023 - this was at higher elevation (c. 550 m) and approximately 5 km to the north). Liaison with Butterfly Conservation staff and a review of published literature (Tordoff & Williams, 2018) in which the Site was scoped out of searches to establish the range of the species were considered in discounting the need to survey for the species. The approach was discussed with both Torfaen and Caerphilly CBCs and a record is contained in the meeting notes in **Appendix 6.2**.
SSSIs	There is not enough information provided in the SR to scope out Ty'r Hen Forwyn SSSI at this stage, therefore the site is provisionally scoped in. PEDW agrees that the two geological SSSIs identified within 5 km of the Site can be scoped out.	Further information with regard to all statutory designated sites within 10 km of the proposed Mynydd Maen wind farm is included in this document, and an assessment of likely impacts presented.
Hazel dormouse *Muscardinus avellanarius*	The SR states that the habitats present within and adjacent to the Site are not considered to be supportive to dormice. However the access road is surrounded by hedgerows and trees and has not been assessed during the Phase 1 habitat surveys. Works to the access road may affect dormice supportive habitats and thus further assessment on dormice is not scoped out of the EIA process. Further survey work would need to be conducted at the appropriate time of the year and the results reported in the ES. See also NRW comments at Appendix 1[7].	Dormouse surveys have been completed in relation to the trees and hedgerows along the access road. These are detailed in this chapter. Dormouse was not recorded. Habitat within the wind farm is mostly relatively short heather *Calluna vulgaris*-dominated habitat. Longer heather is present in the north-eastern part of the Site and there are bracken stands on the sloping edges of the plateau. There is some potential for dormouse to use these areas seasonally, when bracken growth is high, but they are poorly connected to high quality woodland habitat, and it is considered unlikely they do so.

[7] This is a reference to Appendix 1 of the scoping response.

	Additionally, the Applicant is reminded that heath and bracken, although suboptimal, can offer nesting opportunities for dormice.	A precautionary non-licensed method statement will apply to any works affecting these areas, and will be delivered as part of the Construction Environmental Management Plan (CEMP).
Great crested newts (GCN) *Triturus cristatus*	The SR states that GCN were found to be present within the Site. It is unclear how the surveys were conducted, for example the SR does not clarify whether 6 visits to assess population size were completed. This should be clarified in the ES and the assessment should be accompanied by a full set of mitigations. It is understood that the surveys were conducted in 2021. The application should be mindful of the CIEEM guidance on the lifespan of ecological surveys and reports.	A full account of the approach to GCN surveys is provided in this chapter, along with mitigation that will allow favourable conservation status to be maintained. Survey work has followed industry standard guidance for establishing presence / absence and population size. Additional survey has been completed due to NRW's apparent lack of comfort in negative eDNA results in demonstrating absence where a negative result has been returned. All work to inform the application has been completed and / or refreshed in 2022 and 2023.
Reptiles	Mitigation measures to prevent harm to reptiles during construction should be included in the ES	Mitigation measures to prevent harm to reptiles during construction have been set out in this document.
Badger *Meles meles*	The SR states that no setts or other evidence of badgers was found on-site. However, PEDW is unable to find in the SR when the Phase 1 Habitat survey was conducted. If the Phase 1 Habitat survey has been carried out at a suboptimal time, it may not be possible to conclude that there were no signs of badger activity. A repeat survey may be required. Mitigation measures should be included in the ES.	The timing of the Phase 1 survey (and update Phase 1 survey) are detailed in this document. Badger signs were not recorded during these or any other ecological or ornithological survey work. A repeat survey would be completed prior to construction to ensure the baseline remains the same (badgers are inherently mobile) and there are no potential licensing issues to consider. Precautionary measures to ensure legislative compliance are included in this document. If future survey determines that badgers are present and likely to be affected, then mitigation to address the particular situation would be implemented as necessary.
Section 7 habitats and species. Phase II vegetation survey	The SR does not state how impacts on Section 7 habitats and species would be avoided. At this stage it is unclear how this would be achieved as only a Phase 1 habitat survey has been conducted. Due to the presence of the priority habitats identified, additional vegetation surveys are required. The Phase II vegetation survey can be designed to follow the methodology described by Rodwell, J. S. (2006). National Vegetation Classification: Users' handbook. Representative quadrats should be selected taking into consideration not only the final locations of the turbines (including micro-siting) but associated infrastructure and construction areas including borrow pits if relevant. The survey results should inform the assessment of the potential impact on	All plant communities have been recorded to NVC level and assessed against Annex 1 and Section 7 priority habitat criteria. The identification of botanically sensitive areas has been used to inform the design as opposed to being considered retrospectively. The site is largely located in acid grassland / dry heath mosaic and agriculturally improved habitats. It is assumed that the reference to RTCBC is in error, as there are no comments from Rhondda in Appendix 1 of the document, and it unclear why that authority would comment on an application in Torfaen and Caerphilly.

	non-statutory designated sites. See also RTCBC comments at Appendix 1.	
Bats (activity surveys)	The SR states that the "Scottish Natural Heritage (2019) Bats and onshore wind turbines – survey, assessment and mitigation. NatureScot, Inverness" guidance would be followed but it is noted that no transect surveys of vantage point surveys are proposed. The Applicant is reminded that the most up to date guidance is the NatureScot guidance "Bats and Onshore Wind Turbines – survey, assessment and mitigation (August 2021). The SR states that "it is otherwise left to the professional judgement of the consultant to advise what complementary surveys are appropriate." However, the guidance is clear that these survey methods are there to complement the information gathered from static detectors. Transect surveys should be conducted at the appropriate time of the year. PEDW notes that the access route would require upgrade works but this has not been considered during the Phase 1 Habitat survey. Should trees be affected by the works, these should be assessed for bat roost potential and surveys be conducted appropriately. See also NRW comments at Appendix 1.	The update to the guidance is noted. Scoping text was drafted considerably in advance of the submission of the scoping report. There were few material changes to the guidance as a result of the update, and none that were relevant to the scope of work. Neither walked transect nor vantage point work are requirements for baseline survey to inform wind farm assessments. Both should be applied on a discretionary basis where they might add information to help address a question that has emerged from the data collection process). This is what the guidance indicates. BSG Ecology was closely involved in the steering group that developed the current industry standard guidance for bat surveys at proposed wind farms (NatureScot *et al.*, 2021). One of the aims of this guidance was to ensure survey work was focussed on understanding and assessing impacts, and the move away from transects as a core part of pre-application survey reflected their (typically) very limited value in informing baseline characterisation and assessment work. Vantage point surveys have always been discretionary. No clear driver for transect or vantage point has been identified for Mynydd Maen. Trees close to the access route have been subject to ground level tree inspections and close inspections to determine their potential to support bats.
Bats (risk of collisions)	PEDW does not have the expertise to advise on this matter and thus it is recommended that the applicant continues to engage with NRW and relevant LPAs once the baseline surveys are complete and the model prepared. As this is a highly technical subject, the applicant may want to explore the possibility of engaging the relevant parties with the preparation of Statements of Common Ground.	Collision of bats has been assessed in this report. RES are open to engaging with local authorities on this and other ecological issues to secure common ground. Engagement with NRW outside of the scoping process has not been possible to date.
Otter *Lutra lutra* and water vole *Arvicola amphibius*	PEDW agrees with the proposed survey approach.	No comment required.
Pine marten *Martes martes*	See comment on pine marten at Appendix 1.	NRW noted the need to consider pine marten in the event of removal of woodland. There would be no woodland lost as a result of the proposed wind farm.

Peat and Groundwater Dependent Terrestrial Ecosystems (GWDTEs)	The SR does not mention the potential for GWDTEs to the 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.	GWDTEs have been considered in this assessment. There has been an ecohydrologist within the project team.
Approach to Mitigation	No details are available at this stage in terms of mitigation and enhancement, 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 [see Section 8 of the NatureScot guidance "Bats and onshore wind turbines – survey, assessment and mitigation (August 2021)] and 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.	Mitigation proposals are set out in this document. The EcIA process involves characterising the baseline, identifying important features and assessing impacts. Wherever possible impacts would be avoided or minimised, and the significance of residual effects assessed. An ecological enhancement plan will be included that will set out how the project would deliver biodiversity net benefit in accordance with Welsh planning policy. Monitoring requirements would be driven by the conclusions of the ES. They are likely to include monitoring of habitat change to detect whether management is effective and work is delivering against objectives. Monitoring commitments should not pre-empt the assessment.
Cumulative Assessment	The Applicant is strongly advised to include relevant DNS schemes that have reached the EIA scoping stage in the assessment of cumulative effects for this ES. See also Section 6 of this Scoping Direction.	The cumulative assessment has considered relevant DNS schemes that have reached the EIA scoping stage.

Pre-application Consultation (PAC) comments

6.3.6 PAC comments on ecology were received from NRW on 22 March 2024 (letter reference CAS-248286-TZ3Z5. These comments, and how they have been addressed, are set out in Table 6.3. No other PAC comments were received by PEDW.

Table 6.2. PAC comments and responses

Issue	NRW comment	Response
Bats	" … *Figures 6.2a and 6.2b show the location of the trees inspected, but do not identify the outcome of the PRF inspections (i.e. positions of trees with low/moderate/high potential to support roosting bats.* *We advise a future planning application includes confirmation of whether any of the trees identified to have potential roost features will be affected by the proposals (e.g. through felling or pruning). If so we also advise that the application includes a plan to show the position of all trees with potential roost features and the outcome of the PRF inspections (i.e. whether they have low/moderate/high potential to support roosting bats*	The outcome of the PRF inspections are set out in Appendix 6.3. There is no requirement for felling or other works to trees with potential for roosting bats. This is further detailed in 6.18.2. There is a commitment to a pre-construction check of the building for roosting bats / to assess its condition at that time (as it lies within the wind farm), but not of trees (as those with bat roost potential will not be affected) within CEMP measures set out in 6.19.1.

	We advise that a Construction Environment Management Plan (CEMP) should include provision for pre-construction checks of trees that will be affected by the proposed development."	
Bats	"*We note the future application will include infrastructure micro-siting allowances (50 m for each wind turbine). Determination of the final position of the turbines utilising any micro-siting allowance must ensure that turbines continue to be sited to accord with the joint agency guidance 'Bats and Onshore Wind Turbines – Survey Assessment and Mitigation', specifically paragraph 7.1.2.*" The NRW comments go on to request confirmation that buffer distances for each turbine will meet this threshold distance, and confirmation that this can be achieved if micro-siting is required to a maximum of 50 m. NRW note that if required buffer distances can be met, an appropriately worded condition can be attached to any permission granted (to secure turbine siting in accordance with published guidance).	The minimum distance between a turbine and an edge feature that may be used by foraging bats is 102.3 m (Turbine 8 to the edge of the woody vegetation in the upper part of Cwm Lickey). Turbine 2 is 111.3 m from woody vegetation in Cwm Lickey. As this woody vegetation is in a valley, and does not project above the height of the moorland, it has been assumed (for the basis of the calculation) to have a height of 0 m. Given a blade length of 58.5 m and a hub height of 91.4 m, a stand off of 58 m to base is required to achieve a minimum of 50 m to tip. It follows that if the Turbine 8 moved the full 50 m micro-siting distance in a north-easterly direction, the shortest possible distance to tip would be 44 m. However, RES have confirmed that the turbine will not move in this direction to the maximum 50 m micro-siting extent. There are no potential issues with other turbines. All will have a greater stand off than 50 m to tip even if they are micro-sited 50 m towards the nearest woodland (which is always the nearest edge feature). The distance from the nearest turbine to woody vegetation beyond the northern and western site boundaries is 178.9 m and 358.9 m respectively.
GCN	NRW noted that mitigation for GCN was broadly acceptable to them subject to further detail. This included a requirement to amend scheme drawings to show the positions of additional ponds to be created, commitments to the long-term management and monitoring of the new waterbodies (for GCN) and that the Schedule of Mitigation (in Chapter 15) included the GCN proposals. NRW also requested that a GCN Conservation Plan be included in the planning application, and included a schedule of information (Section 2b i-xix) that it should include.	The recommendations made by NRW have been reviewed, and a commitment made to delivering in accordance with the schedule set out in Section 2b i-xix of their response is in Section 6.19.2. It is not possible to provide the GCN Conservation Plan as part of the planning application, as we are not at the detailed design stage, and the feasibility of e.g. winning stone for track creation from the site has yet to be established. As such any plan would need to be significantly caveated and would be potentially subject to significant change. However, it is considered that the commitment made in the ES will allow an appropriate condition to be attached to the consent. This will achieve the outcome sought by NRW.

6.4 Assessment Methods and Significance Criteria

6.4.1 The approach to the ecological impact assessment has been based on Chartered Institute of Ecology and Environmental Management Guidance (CIEEM, 2018).

6.4.2 Although this is recognised as the industry standard for ecological assessment, the guidance is not prescriptive; rather, it aims to "provide guidance to practitioners for refining their own methodologies." CIEEM promotes a professional judgement as opposed to a matrix-based method of assessment; guidance uses a geographical frame of reference for context, and relies on a description of available evidence and professional judgement (a matrix-based assessment will be applied in other chapters of the Environmental Statement as outlined in the introductory sections of this document).

6.4.3 The methods for ecological survey of the site, results and evaluation of receptors are provided in this assessment. The assessment considers potential effects on habitats and protected species at each of the construction, operational and decommissioning phases of the proposed wind farm.

6.5 Important Ecological Features

6.5.1 A first step in Ecological Impact Asessment (EcIA) is determination of which ecological features (habitats, species, ecosystems and their functions/processes) are important. Important features should then be subject to detailed assessment if they are likely to be significantly affected by a proposed wind farm. It is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to effects of the proposal, such that there is no risk to their viability.

6.5.2 Ecological features can be important for a variety of reasons and the rationale used to identify these is explained below. Importance may relate, for example, to the quality or extent of designated sites or habitats, to habitat/species rarity, to the extent to which they are threatened throughout their range, or to their rate of decline.

6.6 Establishing the Zone of Influence

6.6.1 The Ecological Zone of Influence (EZoI) is defined as the area within which there may be ecological features subject to effects from the proposed wind farm. Such effects could be direct, e.g., habitat loss resulting from land-take, or indirect, e.g., noise or visual disturbance causing a species to move out of the EZoI. The EZoI was determined through:

- Review of the existing baseline conditions based on desk study results, field surveys and information supplied by consultees.
- Identification of sensitivities of ecological features, where known.
- The outline design of the proposed wind farm and approach to construction.
- Through liaison with other technical specialists involved in the assessment, including the project hydrologists.

6.6.2 For bats, the area around a bat roost in which habitat availability and quality will have an influence on the resilience and conservation status of that roost (the core sustenance zone) is of particular importance. For (all) UK bat species, core sustenance zones range from approximately 1 to 4 km (Collins, 2016), although individual flights can be longer. Given the long distances that can be travelled by bats a zone of influence of 10 km for bat species is considered appropriate (and precautionary) for all bats with regard to the proposed Mynydd Maen Wind Farm. This distance is supported by current guidance on assessing impacts of wind farms on bats (NatureScot *et al.*, 2021), which suggests that relevant bat information within 10 km of the proposed wind energy site is obtained as well as the location, number and size of turbines in other wind energy developments within the surrounding 10 km.

6.6.3 A 10 km EZoI is considered to be precautionary as the identified impact mechanisms are unlikely to extend this far. Any impacts arising because of pollution events are unlikely to

extend beyond 10 km of the Site. The typical ranging distance of all protected species considered in this assessment, with the exception of otter, for which the Site is not considered of particular importance, is less than 10 km.

6.7 Evaluation: Determining Importance

6.7.1 The importance of an ecological feature should be considered within a defined geographical context. The following frame of reference has been used in this case:

- International and European
- National (UK)
- Regional (Wales)
- County (Caerphilly / Torfaen[8])
- Local (the upland area comprising Mynydd Maen, Mynydd Llwyd and Mynydd Twyn-glas)
- Site

6.7.2 In certain circumstances particular receptors may be valued below the Site level. In these instances they are described as being of Negligible importance.

6.7.3 The CIEEM guidance[9] indicates that features of less than local importance are generally considered unlikely to trigger a mitigation or policy response in EIA terms.

6.8 Significance Criteria

6.8.1 The CIEEM (2018) guidelines state that ecological effects or impacts should be characterised in terms of ecosystem structure and function and reference should be made where relevant to: beneficial, adverse or negligible effects; extent; magnitude; duration; reversibility; timing and frequency; and cumulative effects. The guidelines provide a list of "*aspects of ecological structure and function to consider when predicting impacts and effects*" (Box 16). The terms impact and effect are used within this chapter in accordance with the following definitions (as provided by the guidelines):

- Impact: Actions resulting in changes to an ecological feature. For example, the construction activities of a development removing a hedgerow.
- Effect: Outcome to an ecological feature from an impact. For example, the effects on a dormouse population from loss of a hedgerow.

6.8.2 Following the characterisation of effects, an assessment of their ecological significance is made. The guidelines promote a transparent approach in which a beneficial or adverse effect is determined to be significant or not, in ecological terms, in relation to the integrity of the defined site or ecosystem(s) and/or the conservation status of habitats or species within a given geographical area, which relates to the level at which it has been valued. The decision about whether an effect is significant or not, is independent of the value of the ecological feature; the value of any feature that will be significantly affected is then used to determine the implications, in terms of legislation and/or policy (CIEEM, 2018).

6.8.3 Significance is a concept related to the weight that should be attached to effects when decisions are made. For the purpose of this assessment, 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features'. A significant effect is simply an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the

[8] The access track and western part of the Site are within the County Borough of Caerphilly, and the eastern part of the Site is in the County Borough of Torfaen.
[9] CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. Chartered Institute of Ecology and Environmental Management, Winchester

environmental consequences of permitting a project. The EcIA guidelines (CIEEM, 2018) state that "A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant adverse ecological effects can be lawfully permitted following EIA procedures". The assessment of significance is based on professional judgement.

6.9 Mitigation

6.9.1 Where significant effects have been identified, the mitigation hierarchy has been taken into account, as suggested in the 2018 EcIA Guidelines, which set out a sequential approach of avoiding significant effects where possible, applying mitigation measures to minimise unavoidable significant effects and then compensating for any remaining significant effects. Once avoidance and mitigation measures, and any necessary compensation measures, have been applied, and opportunities for enhancement incorporated, residual significant effects have then been identified. This approach is reflected across UK planning policy at a national level.

6.9.2 Where mitigation and compensation has been proposed, this is proportionate with the geographical scale at which an effect is significant. "*For example, mitigation and compensation for effects on a species population significant at a county scale should ensure no net loss of the population at a county scale. The relative geographical scale at which the effect is significant will have a bearing on the required outcome which must be achieved*" (CIEEM, 2018, Paragraph 5.28).

6.10 Method of Evaluating Operational Collision Risk to Bats

6.10.1 One of the main considerations of wind farm ecological impact assessment is potential collision fatality of bats.

6.10.2 In order to be able to determine which features of the bat community of an operational wind farm require detailed assessment (i.e. to interpret data and evaluate resources), the following need to be taken into account based on industry standard guidance:

- Susceptibility of bat species to fatality
- Population vulnerability of bat species to fatality
- Relative level of bat activity (by species in relation to other sites)
- How to rank the proposed wind farm based on these factors (also taking into account wind farm size).

Categorising Operational Collision Risk to Bats

6.10.3 Operational wind farms can affect bats through:

- Collision mortality, barotrauma and other injuries (although it is important to consider these in the context of other forms of anthropogenic mortality such as road deaths).
- Displacement of individuals or populations (due to wind farm construction or because bats avoid the wind farm area).

6.10.4 To ensure that bats are protected by minimising the risk of collision, an assessment of impact at a site requires a detailed appraisal of:

- The level of activity of all bat species recorded at the site assessed both spatially and temporally.
- The risk of turbine-related mortality for all bat species recorded at the site during bat activity surveys.
- The effect on the species' population status if predicted impacts are not mitigated.

6.10.5 Relevant factors that should be considered include whether populations are at the edge of their range, cumulative effects, presence of protected areas designated for their bat interest

and proximity to maternity roosts, key foraging areas or key flight routes, including possible migration routes.

6.10.6 The risk of bat fatality at wind farms was categorised by Natural England (2014) as high, medium and low by species. This categorisation was based on mortality data from monitoring studies at wind farms as well as habitat preferences, echolocation characteristics, weight, wing-shape, flight speed and height, hunting techniques, flight behaviour, and use of the landscape. SNH *et al.,* (2019) adopted this categorisation system, but re-classified common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus* as "High Risk" based on evidence from a Defra-commissioned study (Mathews *et al.,* 2016).

6.10.7 Table 6.3 assigns species of bats a category of likely level of risk of death through interaction with operational wind turbines based on current industry standard guidance (NatureScot *et al.,* 2021).

Table 6.3. Likelihood of bat species being killed by wind turbines (based on Table 2 in NatureScot *et al.*, 2021).

High Risk	Medium Risk	Low Risk
Nathusius' pipistrelle	Serotine	*Myotis* species
Common pipistrelle	Barbastelle	Long-eared bats
Soprano pipistrelle		Horseshoe bats
Noctule		
Leisler's bat		

6.10.8 NatureScot *et al.,* (2021) also assess the vulnerability of bat populations to fatality caused by wind turbines. This is broken down on a regional basis; vulnerability information for Wales is presented in Table 6.4 below.

Table 6.4. Vulnerability of bat populations in Wales to additional fatality (based on Table 2 in NatureScot *et al.*, 2021).

High Vulnerability	Medium Vulnerability	Low Vulnerability
Barbastelle	Common pipistrelle	Brown long-eared bat
Nathusius' pipistrelle	Soprano pipistrelle	Daubenton's bat
Serotine	Alcathoe bat	Natterer's bat
Noctule	Bechstein's bat	Lesser horseshoe bat
Leisler's bat	Brandt's bat	
	Whiskered bat	
	Grey long-eared bat	
	Greater horseshoe bat	

6.10.9 Table 3 a in NatureScot *et al.,* (2021) sets out a matrix to derive an indicative risk category (to bats) for sites based on the habitats present at a proposed wind farm and the scale of the proposed wind farm. This matrix needs to be interpreted and applied with a degree of judgement, as most sites have features that fall into more than one risk category. A view therefore needs to be taken as to which category the site is more representative of, and the decision-making process in reaching this categorisation set out.

6.10.10 The NatureScot *et al.,* (2021) assessment of potential risk involves consideration of habitat and development related features, the relative vulnerability of each species of bat potentially at risk, and the bat activity output from the online EcoBat tool.

6.10.11 At the current time, the EcoBat tool is not being maintained and has not been available for use since 2022. For this reason it has not been used to inform this assessment. A categorisation

of bat activity has instead been derived through comparison with bat activity data collected by BSG Ecology at 52 other sites across England, Wales and Scotland.

6.10.12 Table 6.5 presents activity categories based on the spread of reference data collected by BSG Ecology at the 52 other sites split by 20th percentile (fifths of the data spread) for each species considered to be of high collision risk as defined in Table 6.3. Table 6.11 also provides the reference size of the comparison data for each species. This equals the sum of the hours of each survey at each of the other 52 sites at which the species was recorded.

Table 6.5. Activity categories based on BSG Ecology reference data (P/h).

Species	Low	Low-moderate	Moderate	Moderate-high	High	Reference Range (hours)
Common pipistrelle	<0.82	0.82-2.82	2.82-8.44	8.44-13.98	>13.98	76,663
Soprano pipistrelle	<0.14	0.14-0.46	0.46-1.48	1.48-5.88	>5.88	76,663
Noctule	<0.06	0.06-0.13	0.13-0.23	0.23-0.65	>0.65	75,277
Leisler's bat	<0.003	0.003-0.01	0.01-0.05	0.05-0.12	>0.12	58,349

Deriving a wind farm risk assessment for bats

6.10.13 In order to derive an "overall risk assessment" for a wind farm development site, NatureScot *et al.*, (2021) guidance suggests that an activity category is derived from comparison of the recorded activity of each species of high collision risk (as defined in Table **6.**3) at the site against a data set (summarised in Table **6.**5 above). These scores should then be set against the "site risk level" in the matrix presented in Table **6.**6. below (based on Table 3 b in the NatureScot guidance document) to determine the level of overall risk.

Table 6.6. Overall risk assessment (taken from NatureScot *et al.*, 2021)

	Site Activity					
Site Risk Level	Nil (0)	Low (1)	Low-moderate (2)	Moderate (3)	Moderate-high (4)	High (5)
Lowest (1)	0	1	2	3	4	5
Low (2)	0	2	4	6	8	10
Moderate (3)	0	3	6	9	12	15
High (4)	0	4	8	12	15	18
Highest (5)	0	5	10	15	20	25

6.10.14 The application of the NatureScot *et al.*, (2021) approach to assessing the risk to bats posed by the proposed Mynydd Maen wind farm is set out in the assessment section of this document.

6.11 Study Area

6.11.1 The ecological study area initially covered much of the high ground across Mynydd Llwyd, Mynydd Twyn-glas, Twyn Calch and Mynydd Maen. Areas to the west of this, along the access route between the Pantside Estate and the Site entrance, were also surveyed in relation to the access route.

6.11.2 As the wind farm design evolved, and constraints to development were identified, survey work became more focussed on the emerging layout. However, the initial survey work has assisted in understanding the wider context of the Site.

6.11.3 **Figure 6.1: Phase 1 habitat survey area** shows the Phase 1 survey area in relation to the final wind farm layout. Survey areas for species groups are discussed in the species survey methods (below) and shown in relation to the final wind farm layout.

6.12 Methods

Desk Study

6.12.1 An ecological desk study was carried out to compile existing baseline data for the proposed wind farm Site and local area.

6.12.2 The presence of statutory designated sites, such as Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSIs) within 10 km of the proposed wind farm Site was established using the Magic website[10]. Aerial photographs and maps were reviewed in order to consider the context of the Site in relation to the local landscape.

6.12.3 Existing records for protected and priority species were obtained from the South-East Wales Biodiversity Records Centre (SEWBReC[11]). A 2 km perimeter around the proposed wind farm Site was requested for non-statutory sites, protected and priority species, other than for bats for which an extended 10 km perimeter data search area was requested. Data were initially secured in April 2020 with the data search updated in July 2023 in conjunction with drafting this assessment.

Scope of Surveys

6.12.4 Ecological survey work was carried out between 2020 and 2023 inclusive. The approach was iterative, with some survey work periodically refreshed to ensure it remained an accurate reflection of the baseline, and other work unlikely to constrain the layout delayed until the project was close to a design freeze.

6.12.5 The following were completed:

- Phase 1 Habitat and NVC survey.
- Bat survey. In addition to activity surveys, building and ground level tree inspections were completed and emergence surveys (of the building) and climbed assessment of the trees was completed.
- Great crested newt survey
- Dormouse survey
- Otter and water vole survey
- Reptile habitat assessment

6.12.6 A summary of the approach to each element of survey is outlined below.

Phase 1 Habitat Survey and National Vegetation Classification

6.12.7 A Phase 1 habitat survey was carried out on 3, 13 and 14 July 2020 by Caroline O'Rourke MCIEEM and updated on 31 August 2022 by Kirsty Rogers ACIEEM. A Phase 1 habitat survey of the access route was completed on the 7 April 2022 by Kirsty Rogers ACIEEM. The area surveyed is illustrated in Figure **6.1: Phase 1 habitat survey area**.

6.12.8 The survey was based on industry standard guidance and involved identifying habitats in the field based on the descriptions and indicator species in the Handbook for Phase 1 Habitat Survey (JNCC, 2010). Mapping of habitats was carried out in the field on to (printed) aerial photographs of the Survey Area with reference to 1:25,000 scale Ordnance Survey maps. This

[10] http://magic.defra.gov.uk/ The website was visited when planning and reporting work. The most recent visit was on 8 July 2023.
[11] SEWBReC data obtained for the Site and surrounding area includes information sourced from Valleys Bat Group, Cardiff Bat Group, Bird Track, statutory agencies (NRW and its predecessor organisations), Gwent Wildlife Trust, Gwent Rare Plants Register, People's Trust for Endangered Species, RSPB and various county recorders (including for Lepidoptera and birds), as well as numerous local naturalists and consultants who are members of these and other groups.

was done by identifying habitat boundaries in the field and corresponding boundaries between areas of differing colour or pattern on the aerial photographs.

6.12.9 To provide more detailed habitat information, the surveyor also assigned all areas of grassland, heath, and mire habitat within the survey area to plant communities published within the National Vegetation Classification (Rodwell 1991; 1992). NVC communities were assigned based on the experience of the surveyor, and with reference to the community descriptions and keys in Rodwell (1991,1992) and Turner (2006).

6.12.10 The survey was 'extended' to include an assessment of the potential of habitats on-site to support protected species.

Bat Survey

6.12.11 Bat survey methods were derived with reference to guidance documents for onshore wind farms produced by SNH *et al.*, (2019 (updated by NatureScot *et al.*, 2021)). The guidance is endorsed by Natural Resources Wales (NRW), who formed part of the steering group involved in its development.

Preliminary Roost Assessment of Building

6.12.12 Industry standard guidance recommends that structures and trees within 250 m of potential turbine locations are assessed for their potential to support roosting bats (NatureScot *et al.*, 2021). Following confirmation of the Site layout, there is one structure within this ; a ruined building at ST 25577 98320 is approximately 100 m from the nearest turbine. A preliminary roost assessment of this building was undertaken during the Phase 1 habitat survey in 2020; the purpose was to identify any Potential Roosting Features (PRFs) suitable for use by bats. The position of the building in relation to the turbine layout is shown in Figure **6.2b: Bat survey: building surveyed and trees inspected**.

6.12.13 The preliminary roost assessment was carried out in accordance with industry standard guidance (Collins, 2016). The assessment involved checking the building for features which could be used for roosting (such as crevices between bricks) or provide bats with access into roosting spaces. Evidence of the presence of bats such as bat droppings on the walls and ground, or staining from bat's fur around possible roost access / egress points were searched for during the assessment. The ruined building was then categorised for its suitability to support roosting bats as outlined in **Table 6.7** below.

Table 6.7: Guidelines for assessing the potential suitability of a structure for roosting bats (adapted from Collins [Ed], 2016).

Suitability	Description
Negligible	A structure with negligible features likely to be used by roosting bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically, but which do not provide enough space, shelter, protection, appropriate conditions and / or suitable surrounding habitat to be used on a regular basis by a larger number of bats.
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but are unlikely to support a roost of high conservation status.
High	A structure with one or more potential roost sites that are obviously suitable for use by a larger number of bats on a more regular basis and potentially for longer periods of

	time due to their size, shelter, protection, conditions and surrounding habitat.

Emergence survey of Building

6.12.14 One dusk emergence survey was undertaken of a ruined building at Ordnance Survey Grid Reference ST 25577 98320 in both 2021 and 2023. The approach was in line with industry standard guidance, as it was assessed as having 'low potential' for roosting bats (Collins, 2016). The initial survey was completed on 18 June 2021 and the update survey on 22 August 2023.

6.12.15 During the surveys, one surveyor was positioned near to the north-western corner of the building and a second surveyor near to the south-eastern corner of the building; this provided visual coverage of all aspects of the building and all PRFs. Both surveyors used an Anabat Scout bat detector for listening to and recording bat calls for subsequent identification. Two FLIR T650sc thermal imaging cameras (one camera at both of the surveyor locations) were used to supplement surveyor observations. The recorded footage was saved so that bat passes noted by surveyors could be subsequently reviewed as necessary, for instance. if a bat was heard on the detector but was not seen by a surveyor.

6.12.16 The survey started 15 minutes before sunset and ended 1.5 hours after sunset in both 2021 and 2023. This is in line with industry standard guidance (Collins, 2016) and covers the peak times when bats are likely to be leaving their roosts.

Ground Level Tree Assessment and Close Inspections

6.12.17 Ground-Level Tree Assessment (GLTA) of forty-nine trees on the valley slope above Cwm Lickey and twenty-three trees close to the access route was completed by NRW-licensed surveyors during August 2022 and April 2022 respectively. The inspections included all trees within 200 m of potential turbine locations and of the access track.

6.12.18 The location of trees with features was recorded using a GPS and aerial imagery on an iPad. Notes on the feature type, size and likely suitability for bats was recorded.

6.12.19 The potential of identified PRFs in trees to support roosting bats was evaluated according to the criteria in **Table 6.8** (based on Collins, 2016). Trees are categorized according to the highest value of any one potential bat roost feature it supports. The evaluation criteria consider the potential for trees to support a bat roost of conservation importance (i.e., moderate, or high potential bat roost features).

Table 6.8: Evaluation Criteria for Bat Roost Features in Trees

Value	Criteria
Confirmed	Bats observed sheltering in the roost feature.
High	Bat droppings collected from the cavity or opening and confirmed through DNA analysis.
Moderate	A tree with one or more PRFs which are likely to be suitable for use by roosting bats, including features with potential to support a larger number of bats on a more regular basis, due to the PRF dimensions and conditions. The surrounding habitat is likely to be suitable for bats and connected to other suitable habitat features within the landscape.
Low	A tree with one or more PRFs which could be used by bats, although, based on characteristics (i.e., dimensions, position, shelter) of the features present, and/or lack of suitable nearby habitat, these are considered unlikely to support a roost of high conservation value.
Negligible	A tree with very limited potential to be used by bats. Any PRFs present have low suitability for bats on account of shallow dimensions or exposure to weather. Possible opportunistic use by individual bats is considered unlikely but cannot be ruled out.

6.12.20 Close inspection surveys[12] were carried out for all trees identified during the GLTA survey as having moderate suitability to support roosting bats (with reference to the criteria set out in **Table 6.8** above). Guidance recommends that two surveys are completed to confirm presence / likely absence of roosting bats in features of moderate suitability (Hundt [Ed], 2016).

6.12.21 The close inspection surveys of PRFs were undertaken on 20 April 2023 and 25 May 2023 (a description and photograph of each feature is presented in **Table 2** in **Appendix 6.3**). The trees were inspected by qualified tree climbers and bat licence holders. A roped-access survey was completed on Trees 36, 51, 52, 53, and 54. All other trees with features assessed as being of moderate suitability to support roosting bats were inspected using an endoscope or torch (as appropriate) from ground level.

6.12.22 Trees on the access track did not require climbed inspections, as all features could be inspected from ground level.

6.12.23 All PRFs were fully inspected to check for evidence of the use of the feature by bats, such as the presence of bats, characteristic oil staining, scratch marks and droppings. Both external and internal dimensions and internal conditions (including substrate and humidity) were recorded.

6.12.24 Moderate potential trees are shown in Figure **6.2 a-b: Bat survey: building surveyed and trees inspected**.

Bat Activity Survey

6.12.25 Bat survey methods were derived with reference to guidance documents for onshore wind farms produced by NatureScot *et al.,* (2021).

6.12.26 NatureScot *et al.,* (2021) guidance recommends:

> "*Where developments have more than ten turbines, detectors should be placed within the developable area at ten potential turbine locations plus a third of additional potential turbine sites up to a maximum of 40 detectors for the largest developments…The selection of locations at which to place detectors should be based on professional judgment, but at large sites, it is recommended that beyond the initial ten detectors placed at proposed turbine sites (if known), the remainder should be distributed according to a system of stratified sampling based on the availability of different habitats and topographical features on the Site*."

6.12.27 At the time of survey design up to 16 turbines were being considered for the Site. Guidance indicates that a total of 12 locations should be sampled for a total of ten consecutive nights in each of spring, summer and autumn for a wind farm of this scale. For a 13-turbine wind farm, which is what the Site has evolved into, 11 detector locations are recommended in guidance.

6.12.28 Static Song Meter 4 (SM4) bat detectors with integral microphones were deployed at each location. The detectors were configured to record above the level of ambient noise, such as from wind or rain, using an adaptive trigger set to 6 decibels (dB). They were set to define a bat pass (P) as a call note of >2 milliseconds (ms) separated from another by more than one second. Each detector was secured to a stake at approximately 2 m above ground level.

6.12.29 The static detectors were set to record for ten nights for each deployment, from half an hour before sunset to half an hour after sunrise (the period during which bats are usually active away from their roosts). The duration of recording per night varied throughout the survey period according to night length.

6.12.30 Bat detector locations are shown in Figure **6.3: Bat detector locations**.

Bat Data Analysis

[12] This term captures both detailed inspection of features from ground level using endoscopes and climbed inspection work where features cannot be inspected from the ground.

6.12.31 Recorded bat calls (from both the emergence survey and static detector surveys) were run through Wildlife Acoustics Kaleidoscope Pro auto-identification software, with each file then checked manually by an experienced ecologist using AnalookW software (produced by Titley Scientific). The species analysis follows the call parameters described in Russ (2012).

6.12.32 For further details on bat data analysis, including how data were attributed to different times of night, see **Appendix 6.5**.

Meteorological Data Collection

6.12.33 Simultaneous meteorological data was collected to identify the relationship between weather and bat activity on the Site. A Davis Vantage Vue wireless weather station was erected for the duration of the survey period. Data were collected on temperature, rainfall and wind speed and direction.

6.12.34 Weather variables (including temperature, rainfall, wind speed and direction) were recorded at 10-minute intervals for the duration of the survey period. For analysis, individual bat calls were allocated to one of these time slots (by rounding the recorded call time to the nearest 10 minutes). This allowed the weather conditions to be paired with bat calls and statistical analysis (correlation coefficients) to be run on the relationship between bat activity and weather.

Great crested newt survey

Habitat Suitability Index assessment

6.12.35 Fifteen ponds within or close to the Site boundary or the access track to the Site were assessed for their suitability to support great crested newt via the application of the Habitat Suitability Index (HSI) assessment method (Oldham *et al.*, 2000). Pond locations are shown in Figure **6.4: Ponds surveyed for great crested newt.**

6.12.36 The HSI scoring method is a quantitative means of evaluating habitat quality for great crested newts using ten suitability indices:

- UK location.
- Pond surface area.
- No. of years out of 10 in which the pond dries out.
- Water quality.
- Percentage shade.
- No. of waterfowl.
- Presence of fish.
- No. of ponds within 1 km.
- Area of suitable terrestrial habitat within 500 m and accessibility of this habitat.
- Percentage of macrophyte cover.

6.12.37 The HSI provides a numerical index between 0 and 1 where scores closer to 0 indicate poor habitat with lower probability of great crested newt occurrence and those closer to 1 represent optimal habitat with a higher probability of occurrence. A score of ≥ 0.5 is generally considered indicative that the pond could be suitable to support a population of breeding great crested newts (ARG UK, 2010).

6.12.38 HSI scores were taken for Ponds 1-12 inclusive in spring 2020 (and again in 2023), and for Ponds 13-15 inclusive in spring 2022. Ponds 13 and 14 were remote from the access and were not subject to further work.

eDNA Survey

6.12.39 eDNA samples were collected as follows:

- Ponds 3, 6 and 10-12 inclusive were sampled for great crested newt eDNA on 3 and 4 June 2020. Ponds 1, 2, 4, 5 and 7-9 inclusive were dry at the time of the survey and could not be sampled.
- Ponds 1-6 and 9-12 were also subject to eDNA survey in April 2021 and April 2023. Pond 7 was sampled in 2023 only (as it was dry in 2021) and Pond 8 was not sampled in either year as it was dry in both.
- Following confirmation of the likely access track route, Pond 15 was subject to eDNA survey in 2022.

6.12.40 The sample collection followed SureScreen Scientifics eDNA sample protocol, water samples were collected within the specified survey window for eDNA analysis, and in accordance with published methods (Biggs *et al.,* 2014).

Additional Methods

6.12.41 For all ponds subject to eDNA surveys in 2022 and 2023 additional methods were employed. This involved surveyors searching any suitable marginal plants for eggs and remaining on-site to torch survey the pond if water was present.

Population Survey

6.12.42 GCN population surveys were carried out on five ponds on and close to Site that returned a positive eDNA result or at which other evidence of great crested newts was recorded. These were as follows:

- Six survey visits were undertaken at Ponds 1-4 between 17 April and 06 June 2023, and Ponds 1-3 on 8 April and 3 June 2021.
- Six survey visits were undertaken at Pond 15 between 26 April and 7 June 2022[13].

6.12.43 All waterbodies were surveyed using the following three survey methods where they could be employed:

- Egg Search (ES): Submerged and floating vegetation and leaf litter was inspected for newt eggs at each waterbody. Once eggs were recorded further egg searches were not conducted in the same water body for following surveys.
- Torching (T): A torch survey was carried out on each of the six visits. This consisted of a systematic search made by walking the perimeter of the pond once using a 1,000,000-candlepower torch searching for amphibians. All amphibians seen were identified to species, counted, and sexed where possible.
- Bottle Trapping (BT): Bottle traps were placed around the pond margins overnight. Traps were placed in and amongst vegetation as well as in open water. An air bubble was left in each trap to maintain oxygen levels. The bottles were then checked early the following morning for the presence of newts. Where possible bottle traps were arranged around the margins of the pond at approximately one trap every 2 m.

6.12.44 Tabulated information relating to dates of survey work is contained in **Appendix 6.3 (Tables 3-5).**

Population size class estimate

6.12.45 On completion of the survey, the peak adult count per pond, per visit gained through either the torchlight survey, or the bottle-trapping was derived. Populations were then classed as:

- “small” for peak counts of up to 10 adults.
- “medium” for peak counts between 11 and 100.
- “large” for peak counts exceeding 100 adults.

[13] During these surveys it was noted that ponds 13 and 14 did not contain water or aquatic vegetation in 2022.

Dormouse Survey

6.12.46 Dormouse surveys were completed of hedgerows along the access route to the Site that had the potential to be affected by road widening works.

6.12.47 Work was led a licenced dormouse surveyor and undertaken in accordance with industry standard survey guidance. The guidance recommends that to determine the presence / likely absence of dormouse, a minimum of 50 nest tubes at a spacing of 15-20 m intervals need to be put out in suitable habitats for several months, and checked periodically for indications of use by dormouse. Surveys completed during each month receive a score (points) based on the probability of dormouse occupying nest tubes or boxes in that month. For a survey to be considered valid, a total of 20 or more points are required (English Nature, 2006).

6.12.48 A total of 55 nest tubes were deployed on 28 April 2022. After a period of 4 weeks (to allow the tubes to 'bed in' and for any dormouse present to find them), the tubes were checked monthly from May to October 2022. Nest tube locations are illustrated in **Figure 6.5: Dormouse nest tube locations**.

6.12.49 The details of the survey, including dates, times and weather conditions are detailed in **Table 6.9** below. Survey work achieved 22 of a recommended 20 points to accord with good practice guidance (English Nature, 2006).

6.12.50 Indications of use by dormice include observations of animals using nest tubes during survey work or finding a nest characteristic of the species. Dormouse typically make neat nests comprising tightly- woven honeysuckle bark (or similar), along with green leaves, normally hazel (although other species are used). This differs from the nest of other small mammals which typically lack a distinct structure.

Table 6.9. Dormouse survey dates and times

Date	Action	Time of survey	Weather conditions	Survey Points
28/04/2022	Deploy tubes	09:30-16:30	Sunny, 32°C, dry	-
26/05/2022	Check tubes	09:00-12:00	Overcast, 15°C, dry	4
30/06/2022	Check tubes	09:30-12:00	Sunny, 15°C, dry	2
22/07/2022	Check tubes	14:00-16:30	Overcast, 13°C, dry	2
30/08/2022	Check tubes	09:20-11:30	Overcast, 9°C, dry	5
29/09/2022	Check tubes	09:30-11:30	Sunny, 12°C, dry	7
27/10/2022	Check tubes and remove from site	08:45-11:00	Overcast, 16°C, dry	2
Total points achieved				**22**

Otter and Water Vole Survey

6.12.51 The survey area for otter and water vole included all watercourses / suitable habitats within 200 m of proposed Site infrastructure (Site design evolution remained in progress at this time). The survey areas and surveyed watercourses in relation to the final wind farm layout are shown in Figure **6.6; Otter and water vole survey area**.

Otter survey

6.12.52 Otter surveys were completed within the site on 22 June 2021 and 10 September 2021 and along the access route on 22 July 2022. Survey work was undertaken in accordance with industry standard guidance (Chanin, 2003), and involved searching for evidence of otter along the watercourses, their margins and other suitable habitat. Such evidence may include spraints (droppings), footprints, runs (paths worn through vegetation adjacent to the water),

couches (areas used by otters to rest and feed), slides (areas of steep bank showing signs of regular use by otters to access the water) and holts (burrows).

6.12.53 Otters often use conspicuous features such as sprainting sites (Lampa *et al.*, 2015). Therefore, particular attention was paid to prominent bankside or in-stream features such as tree trunks, branches, rocks, areas of bare ground, culverts and inflowing ditches or pipes.

Water vole survey

6.12.54 The water vole survey was conducted during the same visits as the otter survey, taking into account industry standard guidance (Dean *et al.*, 2016). Water margins and other suitable habitats were searched for evidence of water vole, including entrances to burrows, droppings, latrine sites, footprints, runs and feeding stations. The habitats present were also assessed for their suitability to support the species (being classed as suitable or not suitable based on characteristics of the watercourse shoreline and vegetation cover).

Reptile Habitat Assessment

6.12.55 An assessment of habitat quality for reptiles was completed by a national adder *Vipera berus* expert and experienced herpetologist in August 2022. The assessment covered the whole of the Site boundary.

6.12.56 One of the key aims of the work was to assess habitat quality for adder, which may become subject to enhanced protection should the recommendations of the Quinquennial Review of the Wildlife and Countryside Act (1981) as amended be adopted. However, all common reptile species were considered.

6.12.57 Survey was completed over two consecutive days, and included searches for basking and dispersing reptiles and other field signs such as sloughed skin alongside an assessment of habitat quality. The latter drew on the experience of the surveyor, and included an assessment of the structure and species composition of the vegetation, consideration of drainage, aspect and slope and the presence of refuge areas.

6.13 Consideration of Potential Limitations to Methods

6.13.1 The bat detector locations selected were based on the indicative turbine layout and constraints plan at the time of survey. This is in accordance with industry standard guidance (NatureScot *et al.*, 2021) which states: "*Survey effort should be focused in those parts of the development site where turbines are most likely to be located, although proposed turbine locations are often subject to change. At sites where the proposed turbine locations are known, static detectors should be placed to provide a representative sample of bat activity at or close to these points.*"

6.13.2 While it follows that not all turbine locations were sampled, the habitats on site, including the flatter common land and the edges of the moorland that characterise the area were sampled representatively. One more detector (12) was used than would be required under guidance for a 13 turbine site, and all data (including that for D6 which is now well outside the wind turbine area and had the highest rate of bat activity) was considered when deriving an activity level for the site. It is therefore considered that the bat data collected and presented is an accurate reflection of bat activity across the wind farm.

6.13.3 During the first two GCN surveys in 2021 conditions were not considered suitable to deploy bottle traps at ponds 1 and 3 (temperatures dropped too low over night[14]). As peaks in GCN numbers were recorded later in the season, and torch surveys were more effective at the Site than bottle trapping[15], this is not considered to have affected the conclusions of the survey work.

[14] It snowed during one of the surveys.
[15] Due to limited water depth.

6.13.4 One section of watercourse (approximately 75 m) was inaccessible during the water vole and otter survey due to dense vegetation and steep banks preventing safe access. This section of watercourse is shown in Figure **6.6: Otter and water vole survey area**.

6.13.5 The inaccessible section is a part of a larger network / stretch of watercourse, which was otherwise accessible and successfully surveyed. Otters and water vole are both mobile species: otters can have home ranges extending over tens of kilometres (Chanin, 2003) and water voles have home ranges up to 300 m (PTES, 2019). Therefore, if otter or water vole were present in the inaccessible section, it is likely that evidence of the species would also be present in the adjacent section of watercourse (which was successfully surveyed). This is therefore not considered a limitation to the work.

6.14 Baseline

Designated Sites

Statutory Designated Sites

6.14.1 Information on statutory designated sites and their features is presented in **Table 6.10** below. The locations and extents of these statutory sites are shown in Figure **6.7: Statutory designated sites within 10 km of site boundary**.

6.14.2 As the principal issue with regard to bats is potential for collision, for those sites that are designated or notified in whole or in part for their bat interest, the distance of the nearest turbine (as opposed to the Site boundary) from the designated area is also provided. This allows more straightforward consideration of whether the wind farm is likely to lie within core sustenance zones of populations associated with designated areas.

Table 6.10. Statutory site information

Site name	Distance from Site boundary	Reason for designation / notification
River Usk SAC and Lower Usk SSSI	7.1 km	Watercourses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation; importance to fish populations including lamprey (*Lampetra* and *Petromyzon* spp) and shad (*Alosa*) species, Atlantic salmon *Salmo salar* and bullhead *Cottus gobio*; and otter population.
Aberbargoed Grasslands SAC and SSSI	7.1 km	The SAC is designated due to its *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) and the population of marsh fritillary *Eurodryas aurinia* butterfly present. Aberbargoed Grasslands SSSI is notified for its extensive stands of fen meadow and mesotrophic (neutral) grassland and for marsh fritillary.
Ty'r Hen Forwyn SSSI	1.4 km	Species-rich neutral grassland, mosaic of other valuable habitats, large population of nationally scarce wood bitter-vetch *Vicia orobus*.
Henllys Bog SSSI	2.6 km	Small fen with a ground flora rich in plant species. The only site in the County for marsh helleborine *Epipactis palustris*.
Coed-y-Darren SSSI	3.7 km	Geological interest
Memorial Park Meadows Pontllanfraith SSSI	5.8 km	Large area of unimproved old meadows with associated rare plant species
Llandegfedd Reservoir SSSI	4.7 km	One of the three regionally important overwintering wildfowl refuges in Wales. Particularly important for the overall numbers and variety of wintering wildfowl, with

		large numbers of wigeon *Anas penlope*, pochard *Aythya ferina* and mallard *Anas platyrhynchos*.
Dan y Graig Quarry Risca SSSI	5.4 km	Geological interest
Penllwyn Grasslands SSSI	6.7 km	A mosaic of habitats including wet acid grassland, woodland, scrub and tall herb vegetation are present. The SSSI is notified for its extensive species-rich *Molinia* grassland representing the *Juncus acutiflorus – Erica tetralix* sub-community of the *Molinia caerulea – Cirsium dissectum* fen meadow type which is of very local distribution and confined to south-western Britain. Scarce plant and invertebrate species are present.
Ruperra Castle and Woodlands SSSI	8.7 km (9.5 km to nearest turbine)	Of special interest for its greater horseshoe *Rhinolophus ferrumequinum* bat nursery roost, which is the only known roost of this type in the (former) mid and south Glamorgan areas and is significant in Welsh terms. The citation states that the greater horseshoe bat population associated with the SSSI is of international and national importance.
Cwm-ton Glascoed SSSI	7.0 km	Geological interest
Cilwrgi Quarry SSSI	7.2 km	Geological interest
Brook Cottage, Llangybi SSSI	8.9 km	Geological interest
Plas Machen Wood SSSI	8.2 km	A woodland of tall coppice dominated by alder *Alnus glutinosa* with some oak *Quercus petraea* standards over a diverse ground flora.
Blorenge SSSI	8.4 km	Sub-montane heath and limestone grassland
Cwm Merthog Woodlands SSSI	9.2 km	Extensive beech *Fagus sylvatica* woodland near the western edge of its range.
Llanover Quarry SSSI	9.2 km	Geological interest

6.14.3 Impacts on geological SSSIs would not occur as a result of the proposed wind farm. Geological SSSIs are not considered further in this assessment.

6.14.4 Aberbargoed Grasslands SAC and the SSSIs within 10 km of the proposed wind farm that are notified for their grassland and woodland interest features are unlikely to be affected by the proposed wind farm. No clear direct or indirect impact pathways linking the proposed wind farm and these sites has been identified.

6.14.5 Due to the distance between the Site and the River Usk SAC and SSSI it is unlikely that any impacts would occur on the designated area[16]. It is possible that otter associated with the Usk range across the Site on an occasional basis, but no evidence has been found of this from survey work, and the foraging resource[17] and potential for shelter on-site are both limited. The proposed wind farm has very little potential to result in pollution or sedimentation of local watercourses, as these are very minor and rise around the edges of the Site, and impacts would be avoided and reduced through primary and tertiary mitigation to the point where they are unlikely to be significant even at the Site level. Chapter 9: Hydrology, Hydrogeology, Geology and Peat presents the hydrological evidence to support this conclusion.

[16] The wind farm has been designed, and would be constructed, under the overarching principle of hydrological, and by extension ecohydrological, neutrality.
[17] On-site watercourses are dry throughout the summer.

6.14.6 There is one statutory designated site within 10 km of the Site which is notified for its greater horseshoe bat interest (the SSSI supports a nursery roost of the species): Ruperra Castle and Woodlands Site of Special Scientific Interest (SSSI) is located approximately 8.7 km south / south-west of the Site.

6.14.7 Two greater horseshoe bat passes were recorded at the Site during baseline survey work. The core sustenance zone for greater horseshoe bats is 3 km. The SSSI is 8.7 km from the Site at its nearest point, and the Site is therefore unlikely to provide an important foraging resource for the SSSI horseshoe bats. Furthermore, the Site is separated from the SSSI by two valleys, the Rhymney Valley and the Ebbw Valley; the latter of these valleys is densely populated (and lit) with residential and industrial development, which limits habitat connectivity between the Site and the SSSI. Taking these points into consideration, as well as the fact that there is extensive good quality habitat in the area immediately surrounding Ruperra Castle and Woodlands SSSI, it is considered unlikely that bats from the nursery roost in the SSSI form part of the bat assemblage recorded on-site.

6.14.8 Statutory designated (biological) sites are of **international and national importance**. However, effects on them are very unlikely to occur, and they are **scoped out** of further assessment.

Non-statutory Designated Sites

6.14.9 There are 49 Sites of Importance for Nature Conservation (SINC) within 2 km of the Site boundary. These include a series of SINCs which together cover the entire Site boundary and some adjacent and nearby areas of land as follows:

- Mynydd Maen (east of Newbridge), which covers the western part of the Site, is designated for its extensive area of upland with semi-natural habitats, including acid grassland and heath and for locally significant bryophyte species (the latter located in woodland outside the Site boundary).
- Mynydd Maen/Mynydd Llwyd Common, Edlogan Common and Magna Porta[18], which cover the eastern part of the Site, are designated for common land.
- SINCs directly adjacent to the northern Site boundary are Coedcae Watkin Dafydd and Coed Golynos. These are designated as plantations on ancient woodland sites (PAWS) retaining a range of semi-natural woodland indicator species. Penyrheol Marshes SINC abuts the eastern Site boundary; no biological information is provided for this SINC in the site description. Mynydd Henllys Common SINC includes a small area within the southern Site boundary; however no wind farm infrastructure would be located within the SINC, which is designated for its disused quarries.

6.14.10 SINCs are of **county importance**. There is potential for impacts on the SINCs within the Site to occur as a result of the proposed wind farm. These SINCs are therefore **scoped in** to further assessment.

6.14.11 The proposed wind farm footprint is contained within the boundaries of the on-site SINCs. SINCs outside the proposed wind farm footprint and / or beyond the Site boundary are unlikely to be impacted by the proposals (due to a lack of land take from them[19]), and are **scoped out** of further assessment.

6.14.12 The locations of SINCs in relation to the Site boundary is shown in Figure **6.8: Non-statutory designated sites within 2 km of site boundary**.

Ancient Woodland

6.14.13 There are 42 areas of ancient woodland within 2 km of the Site[20]. The closest of these is Cwm Lickey, an area of ancient semi-natural woodland that extends to approximately 100 m from

[18] There is no wind farm infrastructure proposed within the Magna Porta SINC.
[19] The SINC descriptions and reasons for designation are typically very simple (as described in the preceding text).
[20] This is based on digital data supplied by SEWBReC and distance calculations made using GIS.

wind farm infrastructure at its closest point. Further ancient woodland abuts the south-western Site boundary, but is more remote from wind farm infrastructure, while some areas of plantation outside the Site boundary comprise Plantation on Ancient Woodland Sites (PAWS). PAWS is considered and evaluated under the section on Plantation Woodland that follows.

6.14.14 There is no ancient woodland within the Site, and the potential for impacts on ancient woodland habitats from the construction and operation of the proposed wind farm are unlikely.

6.14.15 Ancient woodland is considered to be of **county importance**. However, impacts on ancient woodland are unlikely to occur and are **scoped out** of further assessment.

Habitats

6.14.16 Phase 1 habitats within the Site are described in the sections below, with accompanying habitat maps and target notes (TNs) in **Appendix 6.4** of this report. **Figures 6.9 a-c: Phase 1 habitat survey results** indicate habitat types in relation to the proposed wind farmlayout.

Dry heath

6.14.17 This habitat is frequent across the Site, occurring on much of the high ground and is characterised by dense cover of Ericoid shrubs (25 % or more). The vegetation composition and condition varies across the Site, presumably due to a combination of previous management and current grazing levels. Evidence of damage presumed to be due to heather beetle *Lochmaea suturalis* was observed at TN 3.

6.14.18 On the eastern section of Mynydd llwydd, Twyn Calch, Mynydd Twn-glas and parts of Mynydd Maen the heath is moderately grazed and dominated by dense growth of heather *Calluna vulgaris*. Associated species occur at low frequency throughout including bilberry *Vaccinium myrtillus*, crowberry *Empetrum nigrum*, mat grass *Nardus stricta*, wavy hair-grass *Avenella flexuosa*, heath bedstraw *Galium saxatile* and heath rush *Juncus squarrosus*. The mosses *Pleurosium schreberi*, *Hypnum jutlandicum, Dicranum scoparium* and Cladonia spp. (lichens) are occasional. Stag's horn clubmoss *Lycopodium clavatum* was noted at one location (TN1). This vegetation corresponds to the *Calluna vulgaris* sub-community of the *Calluna vulgaris-Vaccinium myrtillus* heath NVC community (H12a).

6.14.19 To the north-west of the Site and the south of Mynydd Maen, above Cwm Carn the vegetation is lower growing, and heather is rare, indicating higher grazing pressure and potentially previous burning. Here bilberry is the dominant species with frequent heath bedstraw and occasional tormentil *Potentilla erecta* and heath rush. Grasses are an important component of the vegetation, with frequent wavy hair grass and mat grass, and occasional sheep's fescue *Festuca ovina* and common bent *Agrostis capillaris*. Bryophytes are also prominent with frequent *Hypnum jutlandicum* and occasional *Pleurosium schreberi*, *Rhytidiadelphus squarrosus*, *Polytrichum commune* and *Dicranum scoparium*. This vegetation corresponds most closely to the *Galium saxatile-Festuca ovina* sub-community of the *Calluna vulgaris-Vaccinium myrtillus* heath NVC community (H12c).

6.14.20 Heath in the remainder of the Site is typically transitional between the two subcommunities described above with varying dominance of heather and bilberry. H12a and H12c are both included in the Annex 1 priority habitat 4030 European dry heaths.

6.14.21 The dry heath is considered of **county importance** due to the large proportion of the resource that occurs on and around the Site (in county terms) and its conservation importance (as an Annex 1 and Section 7 (Environment (Wales) Act 2016) habitat type and as it is a local BAP priority habitat (under Upland Heath)). Impacts on dry heath are **scoped in** to further assessment.

Acid grassland

6.14.22 Acid grassland occurs along the access route to the west of the wind farm, with a smaller area to the east of it around the mast at Mynydd Twyn-glas. The sward is typically dominated by mat grass *Nardus stricta* with abundant common bent *Agrostis capillaris* and heath bedstraw

Galium saxatile. Sheep's fescue *Festuca ovina*, *Rhytidiadelphus squarrosus* and *Pleurozium schreberi* are frequent, and heath rush *Juncus squarrosus*, sweet vernal grass *Anthoxanthum odoratum*, wavy hair-grass *Deschampsia flexuosa*, and the mosses *Pseudoscleropodium purum* and *Polytrichum commune* are occasional. Small patches of soft rush Juncus effusus indicate impeded drainage in places. This vegetation is a good fit to the U5 *Nardus stricta-Galium saxatile* grassland NVC community. In small areas where heath rush is more frequent, this is likely to be transitional to U6 *Juncus squarrosus-Festuca ovina* grassland.

6.14.23 A small area of grassland west of the communication masts on Mynydd Llwyd is somewhat drier and is marked by replacement of mat grass by common bent as the dominant grass. Associates include abundant heath bedstraw, frequent sheep's fescue, red fescue *Festuca rubra* and occasional wavy hair-grass and sweet vernal grass. There is a prominent bryophyte layer of *Pseudoscleropodium purum*, *Rhytidiadelphus squarrosus* and *Polytrichum commune*. This grassland is a good fit to the U4 *Festuca ovina-Agrostis capillaris-Galium saxatile* NVC community

6.14.24 The acid grassland on Site does not conform to any priority habitat descriptions. It is heavily grazed, similar habitat is widespread on the higher ground, and it is of low intrinsic ecological value.

6.14.25 Acid grassland is considered to be of Site value and is scoped out of further assessment.

Dry heath/acid grassland mosaic

6.14.26 This habitat is frequent across the Site, and covers much of the eastern and western parts of Mynydd Maen and the southern part of Mynydd Llwyd. The vegetation is a complex mosaic of the two habitat types previously described. It is characterised by patchy cover of heather and/or bilberry shrubs growing amongst U5 acid grassland.

6.14.27 In 2022, an approximately 4 ha area of dry heath / acid grassland mosaic was cut / mown by tractor, towards the centre of the Site. The remaining habitat was unchanged.

6.14.28 The habitat is considered to be of **county value** based on the large proportion of the resource that occurs on and around the Site (in county terms) and its heath component, and is **scoped in** to further assessment.

Wet (dwarf shrub) heath

6.14.29 Wet heath is present in a few localised areas, most frequently in the southern and western parts of the Site. The vegetation is characterised by abundant purple moor-grass *Molinia caerulea* with frequent cross-leaved heath *Erica tetralix*, occasional heather and bilberry, small amounts of deergrass *Trichophorum germanicum* and occasional common cottongrass *Eriophorum angustifolium*. Bryophytes include frequent *Hypnum jutlandicum* and *Polytrichum commune* and occasional *Aulocomnium palustre*. Bog mosses are extremely limited and not a prominent feature of the vegetation. They are restricted to small amounts of *Sphagnum fallax* and occasional *Sphagnum denticulatum* close to ponds.

6.14.30 Whilst there is some similarity to the M15 *Scirpus cespitosus-Erica tetralix* wet heath community, the key to mires (Rodwell, 1991) places this vegetation in the *Erica tetralix* subcommunity of the *Molinia caerulea-Potentilla erecta* mire NVC community (M25a) on the basis of the low frequency of deergrass.

6.14.31 The area of wet heath at TN 2 occurs with a series of pools and has a different character. Here there is a similar assemblage of species with the addition of frequent hare's tail cottongrass *Eriophorum vaginatum*, particularly around the pools. This vegetation does not fit well within the published NVC communities but using the key in Turner (2006) can be referred to the *Eriophorum vaginatum* variant of M25.

6.14.32 Whist the wet heath on-site does not fit the definition for the Annex 1 priority habitat '4010 Northern Atlantic wet heaths with *Erica tetralix*' (which is limited to the H5 and M14-16 NVC communities), it does meet the criteria for the Section 7 habitat of principal importance (HPI) 'Upland Heath' which includes vegetation dominated by mixtures of purple moor-grass, cross-leaved heath, heather, and deergrass. It also falls under the local BAP priority habitat 'Upland Heath.'

6.14.33 The extent of wet heath in the local area is limited. The resource is very limited in Torfaen and Caerphilly however, and considered to be of County level importance. Impacts on wet heath are **scoped in** to further assessment.

Marshy grassland

6.14.34 Marshy grassland is infrequent across the Site, typically occurring as localised stands associated with areas of disturbance, such as in places along the gas pipeline easement and edges of trackways. The vegetation is dominated by rank growth of soft rush *Juncus effusus* and is species-poor with occasional marsh bedstraw *Galium palustre*, willowherbs *Epilobium* spp, marsh thistle *Cirsium palustre* and broad buckler fern *Dryopteris dilatata*.

6.14.35 This habitat corresponds with the *Juncus effusus* sub-community of the *Juncus effusus/acutiflorus – Galium palustre* rush pasture NVC community (M23b). It meets the criteria for a Section 7 habitat (HPI), being one of the more species-poor communities within this habitat type.

6.14.36 While a priority habitat, the marshy grassland is of very limited exent and species-poor, and (according to the commoners) has in part developed following the installation of a buried cable (hence the linearity of the areas of this habitat on Figures 6.9 a-c). It is considered to be of **Site importance**. Impacts on marshy grassland are **scoped out** of further assessment.

Acid flush

6.14.37 Two small acid flushes were recorded within the Site boundary, above Cwm Carn. The vegetation is similar to that described above for marshy grassland, being typically species poor and dominated by soft rush but includes some *Sphagnum fallax* which allows referral to acid flush.

6.14.38 This habitat corresponds to the Section 7 HPI 'Upland Flushes, Fens and Swamps'. The areas are small in size and species poor and are considered to be of **local value**. Impacts on acid flushes are **scoped in** to further assessment.

Ponds

6.14.39 There are several ponds within the Site boundary (locations are shown in Figure **6.4: Ponds surveyed for great crested newt)**. These are typically heavily poached at the margins where they have been used for drinking by livestock and have limited marginal vegetation, most frequently consisting of patchy cover of soft rush and occasionally small amounts of small sweet-grass *Glyceria declinata*.

6.14.40 Pond 12 has more extensive cover of soft rush at the margins and had been recently dredged at the time of survey (in 2022) with excavated material left in-situ on the banks. The cluster of ponds at TN 3 is of a different character and is described under wet heath.

6.14.41 Ponds are of **local value**, as there is a limited pond resource in the area and they fall under the local BAP priority habitat 'Wetlands'. Impacts on them are **scoped in** to further assessment.

Poor semi-improved grassland

6.14.42 This habitat type occurs in the enclosed pasture on the northern Site boundary. The grassland has been subject to some level of agricultural improvement and is characterised by species poor vegetation dominated by a mixture of Yorkshire fog *Holcus lanatus*, common bent and perennial rye-grass *Lolium perenne* with occasional crested dog's tail *Cynosurus cristatus*. Herb diversity is low but includes frequent white clover *Trifolium repens*, locally frequent soft rush and small amounts of chickweed *Stellaria media*. Areas where stock have congregated are heavily poached and support occasional broad-leaved dock *Rumex obtusifolius*, common nettle *Urtica dioica* and small amounts of sheep's *sorrel Rumex acetosella*.

6.14.43 A small parcel of poor semi-improved grassland is present on an embanked road verge adjacent to the access route. The sward is rank, dense, and tussocky, similar in composition

to semi-improved grassland elsewhere on-site with scattered immature hawthorn stands encroaching from the adjacent hedgerow.

6.14.44 This vegetation corresponds most closely to the *Anthoxanthum* subcommunity of the *Lolium perenne-Cynosurus cristatus* grassland NVC community (MG6b) and does not match any priority habitat descriptions.

6.14.45 Poor semi-improved grassland is of **negligible** biodiversity value. Impacts on it are **scoped out** of further assessment.

Improved grassland

6.14.46 This habitat type occurs in the enclosed pasture on the northern edge of the Site and either side of the access route. In both instances the sward is tightly grazed by sheep and / or cattle.

6.14.47 The grassland is characterised by species poor vegetation dominated by a mixture of Yorkshire fog, common bent and perennial rye-grass with occasional crested dog's tail. Herbs are limited to occasional common sorrel *Rumex acetosa*, creeping buttercup *Ranunculus repens*, and common mouse-ear *Cerastium fontanum*. This grassland conforms to the MG7 *Lolium perenne* leys NVC community and does not correspond to any priority habitat descriptions.

6.14.48 Improved grassland is of negligble ecological value. Impacts on improved grassland are scoped out of further ecological assessment.

Bracken

6.14.49 Bracken *Pteridium aquilinum* occurs as extensive stands with a thick layer of litter on sloping ground at the edges of the Site.

6.14.50 Bracken is of low botanical value. Some patches of habitat with a bracken component could be considered to correspond to ffridd habitat (defined in the Caerphilly Local Biodiversity Action Plan as, "*a complex mosaic of heath, bracken, woodland, acid grassland, old workings and wet flushes*." However bracken is largely present in large stands as opposed to mosaics, and most of the the local resource is outside the development area.

6.14.51 Bracken is **of Site** value. Impacts on bracken are **scoped out** of further assessment.

Plantation woodland

6.14.52 Mature conifer plantation of Sitka spruce *Picea sitchensis* with occasional larch *Larix* spp. is present within the Site boundary above Nant Gwyddon-fach. The woodland is heavily shaded with no understorey layer other than occasional bilberry and bramble *Rubus fruticosus* agg. at the edges. Ground flora is sparse, including occasional wood sorrel *Oxalis acetosella* and wood sage *Teucrium scorodonia*, or absent, suppressed by a thick layer of litter.

6.14.53 Large blocks of conifer plantation are also directly adjacent to much of the northern and western Site boundary, corresponding with the areas of PAWS. Conifer plantation is also a local BAP priority habitat.

6.14.54 Despite being PAWS, the botanical merit of the plantation woodland is very low, and its importance is assessed as no more than Site value. It is outside of the Site boundary and unlikely to be affected by development, however. It is therefore **scoped out** of further assessment.

Running water

6.14.55 Several narrow gullies occur on slopes on the fringes of the Site. Whilst these develop into small watercourses further downslope, the sections within and immediately adjacent to the Site boundary and along / close to the access held no running water at the time of survey. Streams fall within the local BAP priority habitat 'Wetlands.'

6.14.56 The minor watercourses are of **Site value**. They are **scoped out** of detailed assessment; standard primary and tertiary mitigation measures to avoid impacts on them will be delivered as part of the design, with further measures delivered through the Construction Environmental Management Plan (CEMP).

Drystone walls

6.14.57 Drystone walls occur along part of the northern Site and mark out the enclosed fields and sheep pens of the farm to the north-west of it. The walls are generally intact and unvegetated.

6.14.58 The walls are not an ecological feature, albeit will support lichens, bryophytes and cavity nesting birds. They would not be affected by the proposed wind farm and are **scoped out** of futher assessment.

Hedgerow

6.14.59 The access from Pantside to the Site entrance is bordered by species poor hedgerows / hedgerow with trees. Adjacent to the road the hedgerows are box cut to approximately 1.5 m in height with a hedge bank present along much of their length. Within field boundaries hedgerows are tall and leggy with a grazed out / defunct understory.

6.14.60 The canopy layer comprises dominant hawthorn *Crataegus monogyna* with frequent bramble *Rubus fruticosus* agg and occasional bracken and field maple *Acer campestre*. Where present, hedgerow trees are dominantly beech *Fagus sylvatica* with occasional ash *Fraxinus excelsior*.

6.14.61 Despite their management the hedgerows meet Section 7 HPI criteria (Maddock, 2011). They are of **local importance** and are **scoped in** to further assessment.

Scattered scrub

6.14.62 Two small patches of scattered scrub are present along the westernmost end of the access route. These comprise stands of dominant young hawthorn and field maple, with dense low-lying bramble and occasional silver birch *Betula pendula* and goat willow *Salix caprea*.

6.14.63 The scattered scrub is of **Site value**. Impacts on scrub are **scoped out** of further assessment.

Bats

Desk study data

6.14.64 SEWBReC returned 3,548 records for bats within 10 km of the Site. None of these records were from within the Site boundary, from upland areas similar in character to the Site or from fringing *woodland*. Records were generally clustered in residential areas at the base of valleys and in Newport City, as well as in open arable areas and lowland woodland to the south and east of the Site.

6.14.65 Species that have been recorded within 10 km of the Site are: Brandt's bat *Myotis brandtii*, brown long-eared bat *Plecotus auritus*, common pipistrelle, Daubenton's bat *Myotis daubentonii*, greater horseshoe bat, Leisler's bat *Nyctalus leisleri*, lesser horseshoe bat *Rhinolophus hipposideros*, Nathusius' pipistrelle *Pipistrellus nathusii*, Natterer's bat *Myotis nattereri*, noctule *Nyctalus noctula*, serotine *Eptesicus serotinus*, soprano pipistrelle and whiskered bat *Myotis mystacinus*.

6.14.66 Of these records, 1,008 were for confirmed bat roosts. The nearest bat roost records are approximately 500 m to the south of the Site access (and 2 km to the west of the nearest proposed turbine), at Blaengawney Farm; two brown long-eared bats and nine Natterer's bat were recorded roosting in some barn buildings during an emergence survey in August 2003. All other known bat roost records are over 1 km from the Site boundary. A summary of these records is provided below:

- 976 summer bat roosts have been recorded between 1 - 10 km of the Site, including roost records for all of the species noted from the desk study data.
- Two hibernation roost records were returned by SEWBReC. The first record (dated January 2013) is for 20 hibernating noctule bats at a site in Penperlleni, approximately 8.0 km north-east of the Site. The second record (dated December 2013) is for two hibernating noctule bats at a site between Llanover and Pontypool, approximately 7.5 km north-east of the Site

- 23 maternity roost records were returned by SEWBReC, dated from 1982 – 2008 (with more than half (15 records) being recorded before 2000). These included ten records for an unidentified species of pipistrelle bat, six records for lesser horseshoe bat, five records for brown long-eared bat, one record for soprano pipistrelle and one record for whiskered bat. The nearest record is approximately 1.8 km from the Site boundary (for between 50 – 80 pipistrelle bats recorded in 2005). All other records are beyond built up areas of residential and / or industrial development. All of the maternity roost records are situated near to open areas of farmland with extensive networks of hedgerows, woodland and streams. It is considered likely that bats from these maternity roosts would preferentially use the nearby lowland habitats for foraging and commuting and are unlikely to use the Site as a primary foraging resource but may form part of the bat assemblage recorded at the Site.

Preliminary Roost Assessment and Emergence Survey of Building

6.14.67 The preliminary roost assessment completed in 2021 concluded the building had low potential as a bat roost. This continued to be the case in 2023.

6.14.68 Cavities between the lintels of the ruined building had some limited roosting opportunities for a low number of bats, but were exposed due to the lack of roof and the loss of external bricks around them. The structure is also not connected to suitable roosting or feeding habitat. No bats were recorded emerging from the building during the emergence survey (no bat passes were recorded at all) in 2021. A common pipistrelle pass was noted towards the end of the survey in 2023, but there was no evidence the animal emerged from the building.

Ground Level and Climbed Tree Assessment Results

6.14.69 **Table 2 in Appendix 6.3** provides a description of all recorded PRFs, along with supporting photographs, and an assessment of the suitability of each to support roosting bats (with reference to the criteria presented in **Table 6.8**).

6.14.70 A total of 28 trees with PRFs were identified within the survey area during the survey. All were within the wooded valley at Cwm Lickey in the north-eastern corner of the site. Of these 28 trees, 16 were assessed as having moderate suitability to support roosting bats, with the remaining trees assessed as having low suitability. The locations of trees with PRFs are presented in Figure **6.2 a and 6.2 b: Bat survey: building surveyed and trees inspected**.

6.14.71 No evidence of roosting bats was recorded in these trees; impacts on known roosts can therefore be scoped out of this assessment. However, bats are highly mobile, and move between tree roosts frequently (Andrews, 2018). The trees identified are likely to form part of the roosting resource available to the local bat population, and the potential for them to be used for roosting in future should be considered if works are required to them (at any point during the operational life of the wind farm).

Bat activity survey summary

6.14.72 Static bat detectors recorded for a total of 360 nights, equating to 3,318 hours of survey time during spring, summer and autumn 2021.

6.14.73 A total of 4,621 bat passes from a minimum of nine species of bat were recorded. These species were: common pipistrelle, greater horseshoe bat, lesser horseshoe bat, a long-eared bat species, (one or more) *Myotis* species, Nathusius' pipistrelle, noctule, serotine and soprano pipistrelle.

6.14.74 The number of bat passes (P) and the bat activity (bat passes per hour; P/h) for each species recorded during the survey period is shown in **Table 6.11**.

Table 6.11. Number of bat passes (P) and bat activity (P/h) of all bat species

Species	Number of bat passes (P)	Bat activity (P/h)
Nathusius' pipistrelle	1	< 0.01

Common / Nathusius' pipistrelle	155	< 0.1
Common pipistrelle	3,389	1.0
Common / Soprano pipistrelle	31	< 0.01
Soprano pipistrelle	159	< 0.1
Myotis sp.	118	< 0.1
Myotis / long-eared bat sp.	12	< 0.01
Long-eared bat sp.	83	< 0.1
Nyctalus / long-eared bat sp.	2	< 0.01
Noctule / Leisler's bat	102	< 0.1
Noctule	525	0.2
Serotine / *Nyctalus* sp.	3	< 0.01
Serotine	2	< 0.01
Greater horseshoe bat	2	< 0.01
Lesser horseshoe bat	21	< 0.01
Unidentified bat sp.	16	< 0.01
All bats (total)	**4,621**	**1.4**

6.14.75 Of the bat passes recorded, 305 had parameters that overlapped between species. These could therefore not be confirmed to species level and are displayed as two species, separated by a forward slash (e.g. common / Nathusius' pipistrelle) in the tables that follow. There were also 16 bat calls that could not be identified (labelled as "Unidentified bat sp." in the table). All unidentified bat calls were social calls, likely from bats of the *Pipistrellus* genus, but which had no primary echolocation call (flight call) associated with them. Therefore, although these could confidently be identified as bat calls, it was not possible to attribute them to a particular species.

6.14.76 Common pipistrelle was the most frequently recorded species (3,389 P, 1.0 P/h), and 80.1% of all the recorded passes were identified as pipistrelle bat species. Noctule was recorded at a rate of 0.2 P/h, and all other species were recorded at a rate of ≤ 0.1 P/h.

6.14.77 The proportion of bat activity (P/h) recorded for different species at each automated detector location is illustrated in **Figure 6.10: Bat activity results – All seasons**.

6.14.78 The assemblage of bats recorded at the Site reflects that identified in the desk study. Leisler's bat is the only species that has been recorded nearby (seven records were returned) and not recorded at the Site.

6.14.79 There was some spatial variation in bat activity levels across the Site. These ranged from 0.4 P/h to 3.7 P/h (median 0.8 P/h). These data are shown in **Table 6.12**.

Table 6.12. Number of bat passes (P) and bat activity (P/h) of all bat species

Detector location	Habitat	Number of passes (P)	Bat activity (P/h)
D1	Dry dwarf shrub / heath (acid)	159	0.6
D2	Bracken (continuous)	182	0.7
D3	Bracken (continuous)	187	0.7

D4	Dry dwarf shrub / heath (acid)	1,026	3.7
D5	Dry dwarf shrub / heath (acid)	813	2.9
D6	Bracken (continuous)	118	0.4
D7	Bracken (continuous)	358	1.3
D8	Dry heath / acid grassland	245	0.9
D9	Dry heath / acid grassland	814	2.9
D10	Dry heath / acid grassland	469	1.7
D11	Dry dwarf shrub / heath (acid)	129	0.5
D12	Dry dwarf shrub / heath (acid)	121	0.4

6.14.80 The highest levels of activity was recorded at D4 (3.7 P/h) which was located on a tree within dry dwarf shrub / heath in the north-eastern corner of the Site. This detector location is more than 700 m from the nearest turbine on the edge of plantation habitat (now felled).

6.14.81 The slopes to the north of D4 provide more sheltered conditions which may result in greater densities of invertebrate prey and more sheltered foraging conditions than on the open common. Woodland, scrub and mature treelines relatively local to the detector location also provide a variety of vegetation structure which could also support large and more diverse assemblages of invertebrates. Increased prey availability in this area is likely to account for the increased activity recorded at this location.

6.14.82 The highest levels of combined bat activity were recorded in autumn (3.3 P/h) followed by summer (0.3 P/h) and spring (<0.01 P/h). Activity levels of all species increased in the autumn, although the magnitude of the overall change primarily reflects an increase in common pipistrelle activity.

Table 6.13 Seasonal bat activity

Species	Bat activity spring (P/h)	Bat activity summer (P/h)	Bat activity autumn (P/h)
Nathusius' pipistrelle	0	0	< 0.01
Common / Nathusius' pipistrelle	< 0.01	<0.1	0.1
Common pipistrelle	< 0.01	0.3	2.4
Common / Soprano pipistrelle	0	< 0.01	< 0.1
Soprano pipistrelle	< 0.01	< 0.01	0.1
Myotis sp.	< 0.01	< 0.01	0.1
Myotis / long-eared bat sp.	0	< 0.01	< 0.01
Long-eared bat sp.	0	< 0.01	0.1
Nyctalus / long-eared bat sp.	0	0	< 0.01
Noctule / Leisler's bat	0	0	< 0.01
Noctule	< 0.01	< 0.1	0.4
Serotine / *Nyctalus* sp.	< 0.01	< 0.01	0.1
Serotine	0	0	< 0.01
Greater horseshoe bat	0	0	< 0.01
Lesser horseshoe bat	< 0.01	< 0.01	< 0.1
Unidentified bat sp.	0	0	< 0.1

All bats (total)	**< 0.01**	**0.3**	**3.3**

6.14.83 Some consideration of impacts on the bat assemblage is included in the assessment of construction phase effects (principally with regard to good practice associated with lighting).

6.14.84 Impacts on bats resulting from the operational phase of development are considered on a species-by-species basis, being scoped into or out of further assessment based on their level of use of the Site, empirical information on risk of collision and the sensitivity of populations to any collision fatality that might result.

Bat species accounts

6.14.85 NatureScot *et al.,* (2021) guidance categorises bat species according to collision risk with operational wind turbines and then by the vulnerability of bat species populations to individual fatalities. Bat species accounts below are presented in order of their population vulnerability. Noctule, serotine and Nathusius' pipistrelle are classed as high vulnerability species, common and soprano pipistrelles and horseshoe bats as medium vulnerability species, and other bats as low/medium vulnerability.

Noctule

6.14.86 A total of 525 noctule passes was recorded during the survey period (0.2 P/h). The species was recorded at all bat detector locations. Noctule activity was higher in the autumn (0.4 P/h), than the summer (< 0.1 P/h) or spring (< 0.01 P/h).

6.14.87 The highest activity level (139 P, 0.5 P/h) was recorded at D5; noctule were recorded at this location on all but one night in autumn. D5 is located in dry dwarf shrub / heath in the northern part of the Site, at the top of Cwm Lickey (a wooded stream valley).

6.14.88 Noctule are found in a range of habitats, and forage out in the open, often over trees and with a strong affinity to water (Altringham, 2003). It is likely that noctule forage over the wooded stream corridor and fly up the valley towards the Site; this would account for the increased noctule activity recorded at D5.

6.14.89 The next highest levels of noctule activity were recorded in the central northern part of the Site at D1, D2 and D3 (0.3 P.h, 0.3 P/h and 0.2 P/h, respectively). The area immediately surrounding detector locations D1, D2 and D3 is open upland with a mixture of dry dwarf shrub / heath and bracken habitats. Beyond the Site boundary the ground slopes steeply away to the north, down to a woodland (part of which is ancient woodland) at the base of the valley. There are three small streams, each of which rise near one of the detector locations and run down the slope to woodland (some of which is ancient woodland which may provide roosting as well as foraging opportunities). It is likely that noctule forage over the woodland at the base of the valley, and follow the small streams towards the Site. This behaviour would account for the higher levels of noctule activity recorded at these locations.

6.14.90 A peak in noctule activity (1.3 P/h) was recorded between 20 – 60 minutes after sunset. Noctule are classed as an 'early emerging' species (Collins, 2016), and typically emerge from their roosts between 7 and 11 minutes after sunset (Andrews & Pearson, 2017). The earliest noctule pass was recorded 11 minutes after sunset (at D7, during the autumn deployment). A further 16 'early' passes were recorded for noctule (between 0 – 20 minutes after sunset), all of which were recorded over four nights during the autumn deployment, but were spread across the Site at seven detector locations. One 'late' pass was also recorded 20 minutes after sunrise (at D3). Given that these 'early' and 'late' passes were reasonably infrequent, and did not occur in all seasons, the data indicate that there are no large roosts within or near to the Site. It is possible that there is opportunistic local and / or seasonal roosting by noctule near to (but outside of) the Site.

6.14.91 A further 102 passes were recorded that could have either been noctule or Leisler's bat but could not be determined to species level due to overlapping call parameters. The highest activity levels were recorded in autumn (100 P, 0.1 P/h), with only 1 pass recorded in each of spring and summer. Geographically, the highest activity levels for noctule / Leisler's bat were recorded in the centre of the Site at D9 (36 P, 0.1 P/h). Given that no Leisler's bat

passes were recorded during the survey period, these passes are likely to be very largely attributable to noctule.

6.14.92 Noctule bats are considered to be at high risk of collision with wind turbine blades due to their high flight, hawking feeding strategy and preference for using open habitats (NatureScot *et al.*, 2021). At the population level, noctule has been classed as a highly vulnerable species to wind farm development, due to their relatively uncommon and widespread status and their longevity, which suggests that recruitment to the breeding population is low (Bat Conservation Trust, 2018; The Wildlife Trusts, 2020 a; NatureScot *et al.*, 2021). However, noctule is considered to be common and widespread in Wales according the Article 17 report for the species[21].

6.14.93 With reference to **Table 6.5**, the data indicate that overall use of the Site by noctule was moderate across the survey period. Activity was low in the spring, low to moderate in the summer and moderate to high in the autumn. It is therefore concluded that the Site offers some foraging potential in the late summer / autumn period. The proposed wind farm is considered to be of **local importance** for noctule; impacts on noctule are **scoped in** to further assessment.

Nathusius' pipistrelle

6.14.94 One Nathusius' pipistrelle pass (< 0.01 P/h) was recorded (at D9 on 11 September 2021). The pass was recorded 112 minutes after sunset.

6.14.95 A further 155 passes were recorded that could have been either Nathusius' pipistrelle or common pipistrelle but could not be determined to species level due to overlapping call parameters. The highest activity levels were recorded in autumn (118 P, 0.1 P/h) , with lower levels recorded in summer (36 P, < 0.1 P/h) and spring (1 P, < 0.01 P/h). Geographically, the highest numbers of passes were recorded in the north-eastern corner of the Site at D4 (64 P). This pattern of activity is similar to that recorded for common pipistrelle, and given that only one confirmed Nathusius' pipistrelle pass was recorded at the Site in 2021, these passes are likely to be very largely attributable to common pipistrelle.

6.14.96 Nathusius' pipistrelle is considered a high collision risk species due to its fast flight and hawking feeding strategy. Nathusius' pipistrelle has also been classed as a high vulnerability species to wind farm development at the population level, as it is relatively scarce in Wales (and in the rest of the UK) (NatureScot *et al.*, 2021).

6.14.97 Nathusius' pipistrelle is considered a high collision risk species due to its fast flight and hawking feeding strategy. Nathusius' pipistrelle has also been classed as a high vulnerability species to wind farm development at the population level, as it is relatively scarce in Wales (and in the rest of the UK) (NatureScot *et al.*, 2021).

6.14.98 The use of the airspace over the Site by Nathusius' pipistrelle is very infrequent, suggesting it is of **negligible** importance to the species. Nathusius pipistrelle is scoped out of further assessment.

Serotine

6.14.99 Two serotine passes were recorded during the autumn deployment (< 0.01 P/h), one in the middle of the night period and one pass 93 minutes after sunset. These data suggest that use of the Site by serotine is low, and they do not roost on or near to the Site (given the time of night at which they were recorded).

6.14.100 A further 3 passes were recorded that could have been either serotine or *Nyctalus* sp. These were recorded over three nights during the autumn deployment, at D6, D9 and D10 (one pass at each). The pass at D6 was recorded 26 seconds before a *Nyctalus* sp. pass was recorded, and given this is likely to be *Nyctalus* sp. However, the other two passes were not recorded immediately before or after either a serotine or *Nyctalus* sp. pass, and cannot be confidently assigned to either species.

[21] See: https://jncc.gov.uk/jncc-assets/Art17/S1312-WA-Habitats-Directive-Art17-2019.pdf (accessed 16/08/2023).

6.14.101 Serotine bats are considered to be at medium risk of collision with wind turbine blades due to their high flight, hawking feeding strategy and preference for using open habitats (NatureScot *et al.,* 2021). At the population level, serotine has been classed as a high vulnerability species to wind farm development, as it is relatively scarce in Wales (NatureScot *et al.,* 2021).

6.14.102 The use of the airspace over the Site by serotine is very infrequent, suggesting it is of **negligible** importance to the species. Serotine is **scoped out** of further assessment.

Common pipistrelle

6.14.103 Common pipistrelle was recorded at all static detector locations and was the most frequently enocountered species.A total of 3,389 common pipistrelle passes (1.0 P/h) were recorded during the survey period.

6.14.104 Common pipistrelle activity was higher in autumn (2.4 P/h), than summer (0.3 P/h) or spring (< 0.01 P/h). Activity was highest at D5, on the western edge of Cwm Lickey. The relatively sheltered conditions in this location are likely to result in more energetically efficient foraging than on the open moorland. The woodland, scrub and mature treelines in this area also provide good vegetation structure and potentially a range of prey for foraging animals.

6.14.105 The second highest activity levels were recorded at D9 (673 P, 2.5 P/h); all of the bat passes recorded at D9 were recorded in the autumn survey period. D9 is located in dry heath / acid grassland habitat near the centre of the Site. Immediately to the west of D9, the ground slopes away, down to a plantation woodland. The woodland, particularly any decidous areas within it, may provide some roosting opportunities for common pipistrelle. Furthermore, livestock (cows) were present in the centre of the Site (near to D8 and D9) during the autumn deployment. The presence of cattle (and cow dung) in this area is likely to result in an increase in the number of small flies. Non-biting midges and flies can form a large part of a common pipistrelle's diet (Dietz *et al.,* 2011). Increased prey availability in this area as a result of the topography, nearby woodland and the presence of livestock is likely to be the reason for increased common pipistrelle activity recorded at this location.

6.14.106 A peak in common pipistrelle activity was recorded between 40 – 60 minutes after sunset (Time Code 3). Common pipistrelle are classed as an 'early emerging' species (Collins, 2016) and typically emerge around 25 minutes after sunset (Andrews & Pearson, 2017). The earliest common pipistrelle pass was recorded 14 minutes after sunset (at D3, during the spring deployment). No other 'early' or 'late' passes (i.e. within 20 minutes of sunset or sunrise) were recorded for this species. The data indicate that there are no large common pipistrelle roosts within or near to the Site; it is possible that there is opportunistic local and / or seasonal roosting by common pipistrelle near to but outside the Site boundary.

6.14.107 Common pipistrelle bats are considered to be at high risk of collision with wind turbines (NatureScot *et al.,* 2021). This assessment is based on evidence from the National Bats and Wind Turbines study (Mathews *et al.,* 2016) and Eurobats data, and the physical and behavioural characteristics of this species. However, this species is common and widespread in the UK (Wray *et al.,* 2010). SNH (2021) guidance therefore considers common pipistrelle to be of medium vulnerability to population level effects.

6.14.108 The level of flight activity by common pipistrelle over the Site falls within the low-moderate category in **Table 6.5**, and there is no indication that the proposed wind farm is more than **local value** to the species as a foraging resource. Impacts on common pipistrelle are **scoped in** to further assessment.

Soprano pipistrelle

6.14.109 A total of 159 soprano pipistrelle passes (< 0.1 P/h) was recorded during the survey period. Activity was higher in autumn (0.1 P/h) than in summer and spring (both < 0.01 P/h). The highest activity level for soprano pipistrelle was recorded at D5 (35 P, 0.1 P/h) which is located in dry dwarf shrub / heath on the north-eastern edge of the Site at the top of a wooded stream valley (Cwm Lickey).

6.14.110 Wetland habitats including stream corridors are the preferred foraging habitat for soprano pipistrelle (Collins, 2016); the damp conditions can result in greater densities of invertebrate prey and more sheltered foraging conditions. The woodland at Cwm Lickey may also provide roosting opportunities. Increased foraging along the stream valley is the likely cause for increased soprano pipistrelle activity at this location. Activity levels recorded at all other locations were < 0.1 P/h.

6.14.111 No peaks in activity throughout the night were recorded for soprano pipistrelle.

6.14.112 The earliest soprano pipistrelle pass was recorded 35 minutes after sunset (at D9, during the autumn deployment). A further pass was recorded 39 minutes after sunset (at D2, on a different night during the autumn deployment). All other passes were recorded more than 40 minutes after sunset and more than 40 minutes before sunrise. The data suggest that there are no soprano pipistrelle roosts near to the Site.

6.14.113 Soprano pipistrelle bats are considered to be at high risk of collision with wind turbines (NatureScot *et al.*, 2021). This assessment is based on evidence from the National Bats and Wind Turbines study (Mathews *et al.*, 2016) and Eurobats data, and the physical and behavioural characteristics of this species. However, soprano pipistrelle is common and widespread in the UK (Wray *et al.*, 2010). SNH (2021) guidance therefore considers soprano pipistrelle to be of medium vulnerability to population level effects.

6.14.114 The use of the airspace over the Site by soprano pipistrelle was infrequent, suggesting it is no more than Site importance to the species. Impacts on soprano pipistrelle are scoped out of detailed assessment

Greater horseshoe bat

6.14.115 Two greater horseshoe bat passes were recorded during the autumn deployment (< 0.01 P/h). One pass was recorded at D9 on 8 September 2021, 78 minutes after sunset, and the other at D2 on 11 September 2021, in the middle of the night period (Time Code 7). These data suggest that use of the Site by greater horseshoe bat is very low. There is no indication they roost on or near to the Site (given the time of night at which they were recorded).

6.14.116 Greater horseshoe bat is considered a low collision risk species due to its slow flight and tendency to fly low and hunt close to vegetation (NatureScot *et al.*, 2021). This species has been classed as a medium vulnerability species to wind farm development at population level, as it is relatively scarce in Wales (and the rest of the UK) (NatureScot *et al.*, 2021).

6.14.117 The use of the airspace over the Site by greater horseshoe bat was very low, suggesting the Site is of **negligible importance** to the species. Further consideration of impacts on greater horseshoe bat is **scoped out** of detailed assessment.

Lesser horseshoe bat

6.14.118 Twenty-one lesser horseshoe bat passes (< 0.01 P/h) were recorded during the survey period. One pass was recorded at D4 during the spring deployment, 113 minutes after sunset, and one pass at D5 during the summer deployment, in the middle of the night period (Time Code 7). The remaining 19 passes were recorded over eight nights during the autumn period, at D1 (1 pass), D2 (1 pass), D4 (9 passes) and D5 (8 passes). Activity levels recorded for lesser horseshoe bat were consistently very low (< 0.1 P/h) throughout the night period, with no clear peak in activity. However the majority (81%) of the passes were recorded during the middle of the night (Time Code 7).

6.14.119 Activity was concentrated in the north-eastern corner of the survey area (at D4 and D5 on the Site boundary and on the edge of valley woodland outside the turbine array respectively), where the ground slopes away to woodland and stream habitats, as well as farmland with scrub and mature treelines. The topography and habitats in these areas create suitable conditions for larger assemblages of invertebrate prey. The lesser horseshoe bat passes recorded during the survey period suggest that this species is using peripheral habitats for foraging and / or commuting. Local roosting appears unlikely based on the time of night when the passes were recorded.

6.14.120 Lesser horseshoe bat is considered a low collision risk species due to its slow flight and tendency to fly low and hunt close to vegetation (fNatureScot *et al.,* 2021). However, this species has been classed as a medium vulnerability species to wind farm development at population level as it is relatively scarce in Wales (and the rest of the UK) (NatureScot *et al.,* 2021).

6.14.121 The survey data indicate lesser horseshoe bat uses the Site infrequently, and when present favours the areas around the fringes of it. The proposed wind farm is therefore considered to be of no more than **Site importance** for the species. Further consideration of impacts on lesser horseshoe bat is **scoped out** of detailed assessment.

Myotis sp.

6.14.122 A total of 118 *Myotis* bat passes (< 0.1 P/h) was recorded during the survey period. Activity levels were highest in Autumn (0.1 P/h), and lower in spring and summer (both < 0.01 P/h). Myotis bats were recorded at all detector locations, and activity levels were relatively even across the Site (0.1 P/h at D3, D4, D5 and D10, and < 0.1 P/h at all other locations).

6.14.123 A small peak in activity (0.1 P/h) was recorded between 80 - 120 minutes after sunset. Activity during all other times of night was < 0.1 P/h. The earliest *Myotis* pass recorded was 68 minutes after sunset (at D5 during the autumn deployment) and the latest pass 75 minutes before sunrise (at D3 during the autumn deployment). These peaks (and the lack of any 'early' or 'late' passes) suggests that *Myotis* sp. do not roost within or near to the Site.

6.14.124 All species of the *Myotis* genus are considered to be at low risk of collision with turbines, based on the following aspects of their ecology (NatureScot *et al.,* 2021);

- Their preference for cluttered foraging habitat
- Low flying height
- Slow flight speed
- High manoeuvrability
- Tendency to follow linear / edge habitats
- Gleaning feeding strategy
- Local or regional movements

6.14.125 Each species has been assessed separately in terms of population vulnerability level based on their relative abundance in Wales. It follows that Bechstein's bat *Myotis bechsteinii*, Brandt's bat, and whiskered bat are medium vulnerability species to wind turbine effects, and Daubenton's bat, and Natterer's bat are low vulnerability species. Irrespective of this, however, the low levels of activity indicate that the proposed wind farm is of no more than **Site importance** for *Myotis* species. *Myotis* species are scoped out of further assessment.

Long-eared bat sp.

6.14.126 A total of 83 long-eared bat passes (< 0.1 P/h) were recorded during the survey period. Activity was higher in autumn (0.1 P/h), and lower in spring and summer (both < 0.01 P/h). Long-eared bats were recorded at all detector locations except for D11. The highest number of passes was recorded at D10 (23 P, 0.1 P/h); this location is in dry heath / acid grassland habitat in the southern part of the Site. The top of a dry stream valley is located approximately 190 m to the south of D10, and there is woodland at the bottom of this valley.

6.14.127 No peaks in activity throughout the night were recorded for long-eared bats (activity was < 0.1 P/h throughout the night). However, the majority of bat passes (83%) occurred during the middle of the night period. The earliest bat pass was recorded 34 minutes after sunset (at D10 during the spring deployment), and the latest bat pass was recorded 96 minutes before sunrise (at D9 during the autumn deployment). This would suggest that long-eared bats are not roosting within or near to the Site.

6.14.128 Grey long-eared bat *Plecotus austriacus* is very rare in Wales (Russ, 2012); therefore, all long-eared bat passes recorded at the Site are likely to be brown long-eared bat. Brown

long-eared bat is considered to be at low risk of collision with wind turbine blades due to its strong association with tree cover and preference for woodland habitats (NatureScot *et al.*, 2021; Collins, 2016). At the population level, brown long-eared bat has been classed a low vulnerability species, as it is relatively common in Wales (NatureScot *et al.*, 2021).

6.14.129 Due to the low level of activity recorded and the low risk of collision of brown long-eared bat, the airspace is considered of no more than Site importance, and impacts on the species are **scoped out** of further assessment.

Relationship between bat activity and weather

Meteorological data

6.14.130 **Table 6.14** shows the maximum and minimum figures for wind speed, temperature and rainfall when bats were recorded, and also over the survey period (including when no bats were recorded).

Table 6.14. Minimum and maximum weather variables

	Wind Speed (Mean) (m/s)	Temperature (Mean) (˚C)	Rainfall (mean) (mm)
Maximum values	4.5	20.9	3.0
Maximum values that bats were recorded	3.6	20.1	0.0
Minimum values	0.0	10.0	0.0
Minimum values that bats were recorded	0.0	10.0	0.0

6.14.131 No bat passes were recorded during wind speeds over 3.6 m/s (the maximum value recorded during the deployments was 4.5 m/s). Bats were recorded during temperatures as low as 10.0˚C (the minimum temperature recorded during the deployments). No bats were recorded during periods of rainfall (3.0 mm was the maximum value recorded for rainfall during the summer and autumn deployments).

6.14.132 Correlation coefficients (Pearson's) were run to assess the importance of the relationship between bat activity and individual weather variables. **Table 6.15** gives the R values for the correlations, with a brief description of what these mean. The p-value indicates whether or not the correlation is significant (a p-value < 0.05 is significant, and a p-value ≥ 0.05 is not significant).

Table 6.15. Correlation coefficients* of wind speed, ambient temperature and rainfall

Weather variable	Wind speed	Temperature	Rainfall
R value	-0.166	0.227	-0.042
Correlation	- 16.57% correlation	22.71% positive correlation	- 4.22% correlation
T statistic	3.620	5.023	0.909
P value	3.327^{-04}	7.279^{-07}	0.364
Explanation	Bat activity is lower with higher wind speed	Bat activity is greater with higher temperatures	Bat activity is lower with higher rainfall
Significance	Significant	Significant	Not significant

* +1 = 100% positive correlation, -1 = 100% negative correlation

Great crested newts

6.14.133 SEWBReC holds ten records of great crested newt within 2 km of the Site, including records from ponds within the Site boundary (Ponds 2, 3 and 4). The most recent of these dates from April 2019 and is attributed to Pond 3 (see **Figure 6.4**). The remaining records are from ponds in the wider landscape including those at Pen-y-Cau Farm, immediately to the west of the Site and Mynydd Henllys Reservoir to the south.

6.14.134 The HSI survey found that three of the ponds scored 'good' (Ponds 1, 12 and 15) and four 'average' (Ponds 4, 5, 6 and 11), and the remainder scored 'below average', indicating limited potential for great crested newt. With the exceptions of Ponds 1, 12 and 15, the ponds were either dry or held little water at the time of survey.

6.14.135 eDNA surveys of Ponds 1-12 in 2023 returned positive results for Ponds 1-3 and negative results for Ponds 4-12 inclusive. Over the course of six visit to these ponds (during which egg searching, bottle trapping and torching were completed and surrounding terrestrial habitats searched) a minimum of two great crested newts in Pond 1, two in Pond 2 and none in Pond 3 were recorded. Despite a negative eDNA result for Pond 4, a great crested newt egg was recorded on vegetation; due to the unexpected nature of this result (in the context of previous work) this was independently verified by several licensed surveyors from photographs[22]. Further survey results in no records of great crested newts in the pond. No great crested newts were recorded in the other ponds, which were torched and egg searched where they held water and suitable egg laying plants were present. Breeding was not proven in Ponds 1-3 in 2023, and a lack of suitable vegetation for egg laying was noted.

6.14.136 In 2020 eDNA results were all negative for Ponds 1-12, but follow up surveys of Ponds 1-3 in 2021 to investigate further (due to the lack of coherency between desk study and eDNA results) found a minimum of seven great crested newts associated with Pond 1 and eight with Pond 2, while a juvenile great crested newt was recorded terrestrially close to Pond 3. Breeding was proven in Ponds 1 and 2. The combination of results suggested a small population was associated with all three ponds[23].

6.14.137 In 2022, a medium population of great crested newt was recorded in Pond 15 (which is approximately 160 m from the access route), with a peak count of 36 recorded during torching. GCN eggs were recorded in Pond 15, confirming breeding.

6.14.138 Full survey results are provided in **Appendix 6.3 (Tables 3-5)**.

6.14.139 There is suitable terrestrial habitat across the Site for great crested newt and dry heath, acid grassland (and mosaics of the two), wet heath and bracken close to the GCN ponds are likely to support the species.

6.14.140 In the absence of current information regarding great crested newt populations in Torfaen and Caerphilly, a precautionary approach has been taken to evaluation.

6.14.141 The great crested newt population associated with ponds within and close to the Site boundary are considered to be of **county importance**. Impacts on great crested newt are **scoped in** to further assessment.

Dormouse

6.14.142 SEWBReC holds two records of dormouse within 2 km of the Site. The closer record is from forestry plantation around Cwm Gwyddon approximately 850 m from the south-western Site boundary. A second record is attributed to woodland east of the hill fort at Twmbarlwm, approximately 1.7 km to the south.

[22] Due to the distance of the pond from wind farm infrastructure, further investigation was not completed. The pond is in excess of 500 m from any wind farm infrastructure.

[23] The negative eDNA result in 2020 cannot be explained with certainty. Desk study records indicate that the ponds may not be consistently used, and the variance in animals noted using 'traditional techniques' supports this to a degree. For Pond 2 the desk study data supplied indicates '*two records between 2005 and 2010*'. The negative eDNA result may therefore be due to a genuine absence of great crested newt or potentially a false negative result which can occasionally occur where there are very low numbers of great crested newts (Biggs *et al*, 2014).

6.14.143 Habitats on the high ground within the Site and most of the surrounding slopes are unsuitable or suboptimal for dormice, consisting of open grassland, heath, and bracken. Plantation woodland at the fringes of the Site is also suboptimal habitat for the species (due to a lack of hazel and other key food sources), but has connectivity to areas of broadleaved woodland in the wider landscape which are likely to provide more suitable habitat.

6.14.144 There were no records of dormouse from the survey work along the access road.

6.14.145 Dormouse is likely to be absent from the Site, much of which is cut or heavily grazed and is inherently unsuitable for the species. Dormouse is therefore scoped out of detailed assessment. However, the species will be considered in a precautionary working method statement, given the desk study records from the surrounding area and the presence of woodland close to the Site, which mean that some use of the Site in the future cannot be entirely discounted.

Otter

6.14.146 SEWBReC returned nine records of otter within 2 km of the Site. The closest record is of a road mortality on the A472, approximately 400 m to the north. The remaining records are attributed to the Monmouth and Brecon Canal to the east and the River Ebbw to the west.

6.14.147 There are no watercourses within the Site, but several streams originate on the surrounding slopes. At their upper reaches these offer suboptimal habitat for otter, due to limited opportunities for foraging and shelter. Given they are connected to watercourses in the wider area where the species has been previously recorded, otter may use the lower reaches of the streams but are unlikely to occur regularly within the Site.

6.14.148 There is one watercourse that originates within 10 m of the access route, at the time of survey this was a dry ditch with small areas of standing water. It is likely to carry small amounts of water during wetter periods but is unlikely to support fish. The watercourse is bounded on both sides by an improved pasture field. The lower reaches of the watercourse are bordered by trees, the roots of which could be used for shelter by otter.

6.14.149 No evidence of otter was recorded during the survey visits to the main site or the survey of the access route watercourse. The Site is likely to be of **negligible importance** to the species; impacts on otter are scoped out of further assessment.

Water vole

6.14.150 There is one record of water vole within 2 km of the Site. This is an undetermined record attributed to the Monmouthshire and Brecon Canal, 1.8 km to the east.

6.14.151 The watercourses within the Site are unsuitable for water vole given the lack of marginal vegetation along their upper reaches. The watercourse close to the access track was similarly unsuitable for the species due to heavy grazing of the margins of it.

6.14.152 No evidence of water vole was recorded during the survey visits to the main site or the survey of the access route watercourse.

6.14.153 Water voles are considered to be absent from the Site and are **scoped out** of further assessment.

Reptiles

6.14.154 SEWBReC returned 14 records of reptiles within 2 km of the Site. This includes records of slow worm *Anguis fragilis*, common lizard *Zootoca vivipara* and adder from woodland at Cwmcarn to the south-west of the Site and grass snake *Natrix helvetica* from the edges of Cwmbran to the east.

6.14.155 The Phase 1 survey concluded that the mosaic of habitats within and around the periphery of the Site were likely to support common species of reptile, with the greatest potential for occurrence being along track edges and in mosaics of grassland, heathland and bracken on sloping ground around the Site edges. The series of ponds across the Site provide suitable foraging habitat for grass snake, but most lack significant marginal vegetation and are seasonal in nature.

6.14.156 The reptile habitat assessment found that the eastern and north-eastern fringe of the Site, around Cwm Lickey, Twyn Calch and Mynydd Twyn-Glas provide the best habitat for adder in the area. The combination of slopes / banks with mature heather, bracken, bilberry, localised areas of deep moss and and wet flushes comprise good habitat for the species. However, no signs of adder presence was recorded. Across much of the Site the vegetation lacks the structure to be suitable for the species.

6.14.157 Common lizard was recorded on Mynydd Twyn-Glas and has the potential to occur more widely across the Site in a wider range of habitats than adder. No evidence of other reptile species was noted during the work. All common reptiles are local BAP priority species.

6.14.158 The heathland resource that characterises the higher ground of which the Site forms part is considered to be of **county importance** to reptiles. This is due to its extent and the recorded history of animals in the area from the desk study. Impacts on reptiles are **scoped in** to further assessment.

Badger

6.14.159 The desk study returned 14 records of badger within 2 km of the Site. Most of these records are attributed to the various areas of woodland surrounding the Site to the south and west, and farmland on the edge of Cwmbran to the east. The remainder are road mortalities recorded from the A472.

6.14.160 No setts or other evidence of badger were identified during the extended Phase 1 habitat survey or any other survey work on-site. However, most of the habitats present provide a potential foraging resource for badger, and woodland at the edges of the Site and in the wider landscape offers sufficient cover for sett building.

6.14.161 Badger is a common and widespread species that is protected due to its history of persecution. Further consideration is on the basis of **legal compliance only**.

6.15 Summary Evaluation

6.15.1 **Table 6.16** (below) presents the outcome of the evaluation of resources and indicates those receptors that have been scoped out of further assessment[24].

Table 6.16. Summary of evaluation of resources

Feature		Evaluation	Further Consideration Required
Statutory Designated Sites	All sites listed in Table 6.10	International / national	No
Non-statutory Designated Sites	Mynydd Maen east of Newbridge, Mynydd Maen and Mynydd Llwyd Commons and Edlogan Common (other SINCs are scoped out).	County	Yes
Onsite Habitats	Ancient woodland	County	No
	Dry heath	County	Yes
	Dry heath / acid grassland mosaic	County	Yes
	Acid grassland	Site	No
	Wet heath	County	Yes

[24] For protected sites the geographical value of the designated Site is presented in the evaluation column; for habitats the importance of the resource present is evaluated, while for species the importance of the Site or the airspace above it to the species or population is evaluated.

	Acid flush	Local	Yes
	Ponds	Local	Yes
	Poor semi-improved grassland	Site	No
	Improved grassland	Negligible	No
	Bracken	Site	No
	Plantation woodland (PAWS)	Site	No
	Running water	Site	No
	Drystone walls	Site	No
	Hedgerows	Local	Yes
	Scattered scrub	Site	No
Bats	Noctule	Local	Yes
	Nathusius's pipistrelle	Negligible	No
	Serotine	Negligible	No
	Common pipistrelle	Local	Yes
	Soprano pipistrelle	Site	No
	Greater horseshoe bat	Negligible	No
	Lesser horseshoe bat	Site	No
	Myotis bats	Negligible	No
	Long-eared bat species	Site	No
Other protected species	Great crested newt	County	Yes
	Hazel dormouse	N/a	No
	Otter	Negligible	In context of legislative compliance only
	Water vole	N/a	No
	Reptiles	Local	Yes
	Badger	N/a.	In context of legislative compliance only

6.16 Future Baseline

6.16.1 The Site comprises common land on an open, relatively flat ridge. Within the wind farm this is mainly characterised by a mixture of acid grassland and heather moorland, the westerly areas of which are grazed (by sheep and cattle) and the north-easterly and easterly parts more lightly grazed (the sheep tend to stay further west). Beyond the wind farm area, on sloping ground, the habitats become more structurally diverse, with stands of bracken, areas of heather and grassland occurring in a mosaic and some woodland habitats. To the west of the Site, in areas adjoining the access track, the sward is short and heavily grazed.

6.16.2 The vegetation structure on the common is a product of a combination of grazing (with some overgrazed and some under grazed areas) and occasional burning. In the absence of the proposed wind farm development is it likely that land management will remain consistent and the condition of the heath vegetation will decline. A Commons Innovation Plan covering Mynydd Maen was developed in consultation with the commoners and Torfaen County Borough Council in 2019 (TACP, 2019), but progress in implementing this in a sustained manner has been limited by loss of public funding for the commoners to complete the work (some cutting

of the common continues to be completed to reduce bracken incursion across the heathland and some removal of self-seeded conifers is undertaken, but neither at a scale that is resulting in effective control). Stock numbers are currently below levels necessary to maintain vegetation in favourable condition, parts of the open ground are being colonised by stands of bracken and other areas (mainly to the south of the Site boundary) by conifers. In the absence of intervention, the condition of the common will continue to decline.

6.16.3 Of the protected species recorded, it would appear that there is potential for the great crested newt population to decline to local extinction. The potential of Ponds 1-3 to continue to support the species reduced between 2021 and 2023, with no suitable plants for egg laying noted at the ponds in 2023. The ponds also dry regularly, further limiting the potential for successful breeding.

6.17 Primary Mitigation

6.17.1 The following primary mitigation measures have been built into the design of the scheme:

- Location of turbines, rotation and micro-siting of crane pad locations and routeing of access tracks to minimise impacts on localised deeper peat deposits (and associated habitats).
- The wind farm will avoid/minimise hydrological impacts through designed in mitigation that includes upslope drainage and interception ditches and trackside drains, a culvert system to route water through the built wind farm, and downslope, contour-parallel recharge trenches that will allow ground infiltration during normal flow conditions and diffuse overtopping during significant rainfall events. This will reproduce the cross-slope distribution and nature of the hillslope hydrology pre-construction. This is set out in full in Chapter 9 (and associated appendices) of this document. The result will be that outside the footprint of the wind farm hydrological impacts on habitat will be minimal.

6.18 Mitigation through Design Evolution

6.18.1 The design has been informed by series of team meetings in which ecological constraints and opportunities have been discussed.

6.18.2 The design has therefore evolved to minimise impacts on ecological features through measures including avoidance of and stand offs from:

- Potential Groundwater Dependent Terrestrial Ecosystems (GWDTEs) (including flushes and wet heath communities).
- The heads of stream valleys abutting the Site (as detectors close to valley woodlands have shown locally elevated levels of bat activity).
- Trees with the potential to support roosting bats. There will be no requirement to de-limb or fell any tree with moderate or high bat roost potential as a result of the proposed development, and there will be a minimum stand-off of in excess of 50 m between all trees and turbine blade tips (this accounts for the 50 m micro-siting allowance included in the application[25]).
- Moorland edge habitats. These areas have greater structural diversity than those across the wind farm site, are used more by bats than the open plateau on which the turbines would be located, and are of greater likely value to other species groups such as reptiles based on an assessment of habitat quality.

6.18.3 The result has been that the ecological impact of the scheme has been minimised, as far as is possible given other constraints and viability considerations, through the design process, and demonstrates that the mitigation hierarchy has been followed.

[25] This reflects paragraph 7.1.2 of the joint agency guidance 'Bats and Onshore Wind Turbines – Survey Assessment and Mitigation (NatureScot *et al.*, 2021).

6.19 Tertiary Mitigation

6.19.1 Tertiary mitigation measures to ensure legislative compliance, protect and enhance ecological features through the development process would include (great crested newt is considered in 6.19.2):

- The development of a detailed Site Construction Environmental Management Plan (CEMP) in consultation with stakeholders (i.e. Natural Resources Wales, Caerphilly and Torfaen County Borough Councils) to build on the principles of the outline CEMP submitted as part of this planning application. This would include:
    - Preconstruction ecological survey to update the baseline with regard to habitats and protected species[26] as far as is relevant to the zone of influence of the construction process. This would inform vegetation management objectives in the detailed Habitat Management Plan and protected species licensing (where relevant).
    - A reptile construction method statement. This would aim to ensure that killing and injury of reptiles is avoided, and that any hibernation features (such as walls or stone piles) are avoided or compensated for if impacted.
    - Measures to ensure that larger mammals such as otter and badger do not become entrapped in trenches if commuting across the Site nocturnally.
    - On-site speed limits for all construction vehicles, to minimise the potential for incidental killing of mammals crossing the Site.
    - Appointment of a suitably qualified and experienced Ecological Clerk of Works (ECoW) to oversee the implementation of the CEMP.
    - Confinement of all construction activity to clearly defined working areas and the storage of materials to areas of hardstanding. Vegetation stripping and areas of hardstanding would be kept to a minimum to reduce the need for additional drainage provision.
    - The application of best practice in accordance with Sustainable Drainage (SUDS) Statutory Guidance (Welsh Government, 2019) and NRW *et al* (2018) guidance.
    - Scottish Environmental Protection Agency (SEPA) Guidance for Pollution Prevention (GPP).
    - Sensitive location and containment of storage areas and stockpiles, in order to avoid impacts on priority habitats and areas potentially used by protected species.
    - Refuelling to be limited to hard standings away from sensitive receptors.
- An ecologically-led lighting plan. If lighting is required during the construction phase it would be designed in accordance with industry guidance (Institute of Lighting Engineers and Bat Conservation Trust, 2023).

6.19.2 A European Protected Species mitigation licence will need to be secured with regard to great crested newt. This will be informed by a detailed mitigation strategy and conservation plan to minimise the risk of effects on the species and ensure their long term favourable conservation status. The implementation of the strategy / plan would be overseen by a licensed ecologist. The strategy / plan would include the following:

[26] It is anticipated that surveys of ponds for great crested newt and of the on-site building for bats would be required.

- A tabulated review of the extent, distribution and quality of great crested newt habitat to be removed, retained, enhanced and created based on the detailed scheme design (to build on the assessment and information contained in this chapter).
- Identification of the elements of construction phase work with the greatest potential to result in the incidental killing and injury of the species, and confirmation of measures to practically minimise or avoid this occurring. These measures to include:
    - Details of fence design, specification, location, monitoring, maintenance and removal.
    - Details of the installation and maintenance of an amphibian friendly surface water management system that does not include features likely to trap newts.
    - Details of how habitat functionality and connectivity will be maintained during and post construction.
    - Information on the timescales of the works.
    - Reporting on how effective measures are considered to have been in minimising the potential for killing and injury to have occurred.
- Detailed design and location information with regard to new ponds[27] and associated terrestrial habitat creation following the agreement of final plans with the commoners.
- A commitment to the long term management of new and existing ponds and associated terrestrial habitats[28] for the operational life of the development. This to include short, medium and long term objectives, management prescriptions, a surveillance schedule (to include both determination of the abundance of great crested newts and habitat quality for the species), measures to address issues such as the establishment of invasive non-native fish or flora or fly-tipping into the ponds, a clear schedule of maintenance works that can only be completed under licence, people responsible for implementing management and surveillance (and their required skills and competencies), reporting, review and auditing requirements.
- Details of how biosecurity will be considered through all stages of the process.
- A discrete section of the document setting out the planning and legal drivers, how the work will be funded (short and long term) and provisions made for updating the plan, and land tenure (including how any changes in tenure would be dealt with).
- It is recommended that the great crested newt mitigation strategy and conservation plan is secured by a condition on the planning consent.

6.20 Assessment of Potential Effects

6.20.1 This section of the chapter includes:

- A detailed assessment of potential impacts on each ecological receptor identified in the evaluation of resources section as requiring further assessment.
- Conclusions with regard to the significance of the impacts that could arise in the absence of secondary mitigation (and taking account of primary and tertiary mitigation).

[27] Demonstrable consideration will be given to flood risk, how the proposals reflect green and blue infrastructure design principles and their contribution to achieving ecosystem resilience during the detailed design process. Reference will be made to all of these considerations in the strategy / plan.
[28] This will include consideration of fish management and the installation of numbered posts by the ponds to assist future site management and surveillance.

6.21 Construction Phase Effects

6.21.1 Construction of the proposed wind farm is likely to extend over 15 months, depending on environmental factors such as weather and ground conditions and technical factors. Construction activities would include ground clearance, excavation and construction of turbine bases and access tracks, the erection of turbines, installation of a substation and movement of machinery and construction personnel.

6.21.2 The site boundary covers 376.60 ha, while the total 'permanent' footprint of the proposed wind farm (permanent access tracks, turbine bases and substation) would be 15.8 ha. There would also be temporary disturbance to land surrounding the turbine bases and access tracks that will be subject to restoration or will revegetate naturally once construction is complete. It is estimated that this will cover an area of approximately 51.47 ha.

6.21.3 Connection to the grid falls under a separate consent process. As such it has not been considered as part of this assessment.

Impacts on non-Statutory Sites of Nature Conservation Interest

non-Statutory Sites

6.21.4 The Site is entirely covered by non-statutory SINC designations. SINCS are of county importance for biodiversity conservation.

6.21.5 The proposed wind farm would result in the permanent loss of 12.0 ha of land from Mynydd Maen East of Newbridge SINC, 1.6 ha from Edlogan Common SINC and 2.1 ha from Mynydd Maen and Mynydd Llwyd SINC. This equates to a permanent reduction in the size of the SINCs by 2.57 %, 0.66 % and 2.12 % respectively.

6.21.6 Limited additional areas within affected SINCs would be further impacted by temporary works or disturbed as a result of construction; this land would be immediately adjacent to wind farm tracks and other infrastructure.

6.21.7 Other than Mynydd Maen East of Newbridge SINC, which is designated for its upland habitats and notable bryophytes (these latter are in woodland outside the Site boundary), the remainder of these SINCs are designated for common land (a land classification as opposed to a particular habitat type). Habitats affected within the Mynydd Maen East of Newbridge SINC will predominantly be acid grassland, dry heath and mosaics of dry heath and acid grassland. These are the habitats for which the SINC is designated. Within the remaining SINCs the development would result in a reduction in the extent of common land.

6.21.8 Overall, taking the proportion of the SINCs that would be affected, it is considered that, prior to any secondary mitigation, the proposed wind farm would result in an adverse effect on the Mynydd Maen east of Newbridge, Edlogan Common, Mynydd Maen and Mynydd Llwyd SINCs that is **significant** at the **local level**.

Impacts on Habitats

Impacts on habitats: dry heath

6.21.9 The dry heath habitat within the Site forms part of a wider area of upland heathland that is of county importance.

6.21.10 Dry heath is a priority habitat at the European and regional (Wales) level, and would be the main habitat type to be impacted by the proposed wind farm. Direct, localised impacts on dry heath are anticipated within and immediately adjacent to the works area.

6.21.11 The proposed wind farm is predicted to result in the permanent loss of approximately 9.49 ha of dry heath. Limited additional areas of dry heath are likely to be temporarily affected during construction as a result of e.g. vehicles tracking over it due to its proximity to the development area; however, any habitat disturbed in this area is likely to recover following

completion of the construction phase works (as dry heath vegetation readily regrows following cutting), and therefore a short-term effect is anticipated.

6.21.12 There is 126.65 ha of dry heath within the Site boundary. The vegetation composition and condition varies across the Site, due to a combination of previous management and current grazing levels. It includes moderately-grazed heather-dominated areas of heath on the eastern section of Mynydd Llwydd, Twyn Calch, Mynydd Twyn-glas and parts of Mynydd Maen, and lower-growing bilberry-dominated habitats to the north-west of the Site and to the south of Mynydd Maen, above Cwm Carn. The extent of habitat permanently lost and the peripheral areas of habitat temporarily impacted account for 7.49 % of the dry heath resource within the Site.

6.21.13 Overall, taking the proportion of the total area of dry heath within the Site that would be affected, it is considered that, prior to any secondary mitigation, the proposed wind farm would result in an adverse effect (a permanent loss of dry heath) that is **significant** at the **local level**. Temporary effects are likely to be of negligible significance.

Impacts on habitats: dry heath and acid grassland mosaic

6.21.14 The dry heath / acid grassland mosaic is also considered to be of county importance due to its extent, and its dry heath component.

6.21.15 The proposed wind farm is predicted to result in the permanent loss of approximately 3.23 ha of dry heath / acid grassland mosaic. Limited additional areas of mosaic habitat will be temporarily affected during construction; however, any habitat disturbed in areas immediately adjacent to wind farm infrastructure are likely to recover following completion of the construction phase works, and therefore a short-term effect is anticipated.

6.21.16 There is estimated to be 123.45 ha of dry heath / acid grassland mosaic within the Site boundary. The vegetation is characterised by patchy cover of heather and/or bilberry shrubs growing amongst U5 acid grassland.

6.21.17 Prior to any mitigation, the proposed wind farm would result in an adverse effect (a permanent loss of dry heath / acid grassland mosaic) that is **significant** at the **local level**. Temporary effects are likely to be of negligible significance.

Impacts on habitats: wet heath

6.21.18 The wet heath within the Site is of local importance. It meets the criteria for the Section 7 habitat of principal importance (HPI) 'Upland Heath' which includes vegetation dominated by mixtures of purple moor-grass, cross-leaved heath, heather, and deergrass.

6.21.19 The wind farm design has ensured that wet heath is outside the footprint of the wind farm.

6.21.20 The main potential for an impact on wet habitats is potentially through impacts on flow pathways and local changes in drainage. However, the ecohydrological assessment has concluded that as wind farm infrastructure will generally be downslope of the nearer areas of wet heath, no hydrological effects on wet heath habitats are likely to occur. With proposed primary mitigation outlined in the ecohydrological assessment implemented, a conclusion that no effects will occur can be made with certainty (see Appendix 9.6: Ecohydrology Impact Assessment and Remediation on GWDTEs and Peat).

6.21.21 It is therefore concluded that impacts on wet heath would be negligible.

Impacts on habitats: acid flushes

6.21.22 The acid flush habitats within the Site are important at the local level due to their limited extent. They are limited in size and not of particular botanical quality, but do correspond to the Section 7 HPI 'Upland Flushes, Fens and Swamps'.

6.21.23 The flushes are over 100 m from the development footprint, and are unlikely to be affected by any localised spills of fuel or other liquids during construction. The hydrological assessment indicates that if proposed primary mitigation is implemented impacts on them can be avoided. Mitigation is summarised in Chapter 9 with more detailed context provided in Appendix 9.6.

6.21.24 Impacts on the acid flushes would be negligible.

Impacts on habitats: ponds

6.21.25 No direct or indirect impacts on ponds would take place as a result of the construction of the proposed wind farm. This has been confirmed by the ecohydrological assessment (see Chapter 9 and Appendix 9.6).

Impacts on hedgerows and hedgerow trees

6.21.26 Tree and hedgerow removal and trimming will be locally necessary off-site to allow access for Abnormal Indivisible Loads (AILs) and accommodate blade overrun and oversail. This work will all be along Old Pant Road.

6.21.27 A short section of the access (approximately) will be routed through pasture fields to minimise impacts on local residents using Old Pant Road. This will require three points of hedgerow severance, totalling 53 m of loss. Elsewhere, trimming will largely be similar in nature to normal hedgerow management, albeit may result in some woody vegetation being taken down to ground level as required. This will include some immature beech trees[29] on the southern side of the road junction at Ordnance Survey Grid Reference ST 22386 98348.

6.21.28 The hedgerow network is important at the local level. However the scale of loss and effect on connectivity will be very limited, and unlikely to be significant at more than the Site level.

Impacts on Species

Impacts on species: bats

6.21.29 Construction phase impacts on bats are considered with regard to the bat assemblage rather than by species, reflecting the fact that any impacts are likely to be very limited.

6.21.30 There would be no loss of known or potential bat roosts as a result of the proposed wind farm. Surveys of the on-site building and trees have found no evidence of use by roosting bats. The structure has limited potential as a roosting resource due to exposure caused by the loss of its roof and of bricks from around lintels. No trees with bat roosting potential will be felled or de-limbed as a result of the proposed development.

6.21.31 While bat use of the Site has been found to be limited and biased towards the edges of it where there is greater habitat complexity and shelter, there is some potential for limited disturbance of foraging and commuting bats if night working takes place and lighting is required during construction. Lighting may result in displacement of bat species that favour foraging in low light conditions[30] (such as lesser horseshoe bat) if there is light spillage onto habitats they use; however, such effects would be localised and temporary in nature.

6.21.32 Some construction phase lighting will be required as standard working hours will be 7am-7pm Monday to Friday; and sunset at the end of October is around 5pm. Lighting will be designed in accordance with industry guidance (Institution of Lighting Engineers and Bat Conservation Trust, 2023). This would include careful consideration of the location, orientation and intensity of lighting, the type of lighting and the overall design of the lighting scheme to minimise the potential for impacts on bats.

6.21.33 With the adoption of the embedded mitigation measures outlined above and the adoption of industry standard guidance for lighting design, the effect of construction on bats is assessed to be negligible.

Impacts on species: great crested newt

6.21.34 Ponds 1-3 which are on the edge of the moorland, and are located close to each other, support a low population of great crested newts. They have limited egg laying material for great crested newts, with one of the three being considered 'good' in HSI terms and the other two

[29] As previously noted, none of these trees has bat roost potential.
[30] The most commonly recorded species was common pipistrelle, which is not considered likely to be displaced and uses lighting opportunistically in some situations as it attracts prey (e.g. Rowse *et al*., 2018).

below average. The scores reflect the tendency of the ponds to dry (Ponds 2 and 3 dry regularly and generally hold little water), and none have much macrophyte cover (this was seen to decline over the course of the work which may reflect several consecutive hot spring and early summer periods). The numbers of great crested newts, and the frequency of sightings of the species was also lower in 2023 than in 2021, suggesting a decline.

6.21.35 The access for the proposed wind farm would pass approximately 15 m to the south of and 60 m to the north of Ponds 2 and 3, and would comprise a new (as opposed to upgraded track). This new track is required to avoid multiple crossings of the overhead line that runs over the Site (this is also the principal reason the existing track through the area would not be used).

6.21.36 Pond 15, which is approximately 670 m to the west north-west of Pond 1 lies approximately 160 m to the north of the access road in enclosed pasture fields.

6.21.37 There would be no direct impacts on any ponds as a result of construction, including those that are known to support great crested newt. However, there is the potential for killing and injury of great crested newts when outside of the ponds, for loss of terrestrial habitat used by the newts, and for prevention of access to breeding ponds by newts during access track construction and subsequent use. These might arise from increased construction traffic, as a result of the new track section close to the ponds, and as a result of work to create the track, which may create temporary (localised) barriers or obstacles to movement. These potential impacts will be addressed through tertiary measures (as set out in Section 6.23.2); a European Protected Species licence will be secured and a mitigation approach (that will involve exclusion fencing and pond creation) will be agreed as part of this process. This will minimise the potential for effects to occur and ensure the local favourable conservation status of the species is not affected.

6.21.38 On the assumption that a licence for the works can be secured, effects on the local great crested newt population are likely to be positive. Further information on pond creation areas is contained in the secondary mitigation and enhancement section of this report. As noted in Section 6.23.2 the detailed design and location of the ponds will need to be confirmed post consent in consultation with the commoners.

Impacts on species: dormouse

6.21.39 The Phase 1 habitat survey identified habitats within the Site that were either unsuitable or sub-optimal for dormouse (the bracken and moderately-grazed heather habitats). Surveys of the hedgerow habitats close to the Site access road did not record dormouse or signs of its presence.

6.21.40 Any potential for an impact on dormouse would be addressed through tertiary mitigation. Construction phase impacts on the species are assessed as negligible.

Impacts on species: reptiles

6.21.41 The wider area of upland habitat of which the Site forms a part is considered to be of county importance to reptiles. This reflects its extent, the known presence of four reptile species in the area (from desk study data) and that some of the areas around the periphery of the Site comprise good habitat for several reptile species (while much of the Site has some potential to support common lizard). An assessment of habitat quality for adder is presented in Figure **6.11: Adder habitat quality**.

6.21.42 Habitat loss during construction phase work would affect a very small proportion of the resource available to reptiles, and would predominantly involve land take from dry heath and dry heath and acid grassland mosaics with limited reptile potential (due to levels of grazing and periodic cutting). Measures to minimise the potential for killing and injury during construction would be implemented through tertiary mitigation (a reptile method statement within the CEMP).

6.21.43 The method statement would include habitat manipulation measures to encourage any reptiles within the construction area to disperse into adjacent unaffected areas of habitat prior to works commencing.

6.21.44 On the assumption that the reptile method statement is produced and implemented, killing and injury is considered unlikely to take place, and potential impacts on reptiles would be

limited to localised loss of suboptimal habitat. The effect is therefore likely to be negligible and would not require further mitigation.

6.22 Operational Phase Effects

6.22.1 Permanent features of the proposed wind farm, which include wind turbines, crane pads and access tracks, are not predicted to have any continuing impacts on important ecological features once they have been constructed. The areas surrounding these permanent features would be reinstated as far as possible.

6.22.2 Site activities during the operational phase would be limited to monitoring and maintenance activities by engineers / technicians, with occasional minor excavations possible at the existing borrow workings for track maintenance. During these activities all working areas would be clearly defined and the storage of materials restricted to areas of hard standing. Any maintenance works would take place during the day to minimise the potential for disturbance to protected species such as bats and other nocturnal species (such as badger) that may cross the Site on occasion.

Impacts on non-statutory designated sites

6.22.3 The proposed wind farm site and associated access track are covered by SINC designations. The SINCs are of county importance.

6.22.4 Impact on these non-statutory designated areas wouldlargely occur as a result of habitat loss and damage during the construction phase of the work. There would be no additional operational phase impacts on the SINCs.

6.22.5 Operational phase impacts on the non-statutory designated sites are therefore considered negligible.

Impacts on habitats

Impacts on habitats: dry (dwarf shrub) heath, dry heath / acid grassland mosaic, wet (dwarf shrub) heath and acid flush

6.22.6 Wet heath, dry heath and dry heath / acid grassland mosaic habitats within the Site form part of a wider area of heathland that is of county importance. Acid-neutral flushes are of importance at the local level, as while the habitat is scarce at the county level the examples within the survey area are species-poor.

6.22.7 No further effects on these habitats, such as habitat loss or disturbance, are expected to arise from the proposed wind farm during the operational phase.

6.22.8 The operation of the wind farm wouldtherefore have a negligible effect on dry heath, dry heath / acid grassland mosaic, wet heath and acid flush habitats.

Impacts on species

Assessment of site risk to bats

6.22.9 In order to determine the risk posed to bats by the operational wind farm, guidance set out by NatureScot *et al.*, (2021) has been applied.

6.22.10 The Site has been characterised as of moderate risk to bats based on the criteria listed in **Table 6.16,** but as with most sites has a combination of low and moderate risk charatceristics. A precautionary conclusion of moderate risk has been made because:

- Potential roost features on-site are very limited (no evidence of roosting has been recorded in the single building and it does not have good roosting potential). This accords with the **low site risk** criteria. However there are trees with roosting potential

(albeit no roosts have been found) outside the proposed wind farm site e.g. at Cwm Lickey. This is a **moderate risk** criteria.

- The proposed wind farm would be on an open, elevated plateau with relatively homogeneous vegetation and no prominent habitat corridors across it or features within it. This indicates habitat quality for bats is low (as evidenced by low bat activity levels). This accords with the **low site risk** criteria.
- The site is not 'isolated'. It forms part of an extensive area of upland and upland fringe habitats that continue largely uninterrupted (in terms of the theoretical ability of bats to cross it) north to the Black Mountains and Brecon Beacons, and to woodland and farmland around Cardiff and the Gwent Levels to the south. This accords with the **moderate risk** criteria.
- The scheme is **medium** sized (with reference to **Table 6.16**) at 13 turbines, and towards the bottom of the range provided (10-40 turbines).
- The criteria indicate that to be a small wind farm the site must have "*no other wind energy developments within 10 km*" whereas a medium-sized scheme "*may have some other wind developments within 5km*." The proposed Trecelyn and Mynydd Llanhilleth schemes, if consented, would result in (up to) a further five and eight turbines within 5 km of the Site respectively[31]. There are no consented or operational schemes within 5 km.
- The height of the turbines within the proposed wind farm (149 m to tip) exceed the defined height for medium project size. However the number of proposed turbines within the scheme and combined with other schemes within 5 km is slightly below the middle of the medium project size range.

6.22.11 The scheme therefore conforms most readily to a medium-sized project based on scale, and a low to moderate habitat risk Site based on habitat characteristics.

6.22.12 In addition, activity levels of key bat species considered in this assessment were low-moderate or moderate during survey work (with reference to **Tables 6.5, 6.6 and 6.13**).

Table 6.16. Summary of evaluation of resources

Habitat Risk	Description
Low	Small number of potential roost features, of low quality. Low quality foraging habitat that could be used by small numbers of foraging bats. Isolated site not connected to the wider landscape by prominent linear features.
Moderate	Buildings, trees or other structures with moderate-high potential as roost sites on or near the site. Habitat could be used extensively by foraging bats. Site is connected to the wider landscape by linear features such as scrub, tree lines and streams.
High	Numerous suitable buildings, trees (particularly mature ancient woodland) or other structures with moderate-high potential as roost sites on or near the site, and/or confirmed roosts present close to or on the site. Extensive and diverse habitat mosaic of high quality for foraging bats. Site is connected to the wider landscape by a network of strong linear features such as rivers, blocks of woodland and mature hedgerows.

[31] Both the Trecelyn and Mynydd Llanhilleth schemes are currently at the scoping stage. Any turbines located at Trecelyn, which lies between the site and Newbridge, would be within 5 km of the turbines at Mynydd Maen. It is unlikely that all of the turbines at Mynydd Llanhilleth would be within 5 km of the Site, as the shortest distance between indicative turbine locations for the two schemes is approximately 4.5 km. They would, however, all be within 10 km. Additional wind farms within 10 km include the two operational turbines at Oakdale Business Park, the Mynydd Carn-y-Cefn wind farm (in planning) and the Abertillery wind farm (at scoping stage).

	At/near edge of range and/or on an important flyway. Close to key roost and/or swarming site. Site is connected to the wider landscape by a network of strong linear features such as rivers, blocks of woodland and mature hedgerows. At/near edge of range and/or on an important flyway. Close to key roost and/or swarming site.
Project Size	Description
Small	Small scale development (≤10 turbines). No other wind energy developments within 10km. Comprising turbines <50m in height.
Medium	Larger developments (between 10 and 40 turbines). May have some other wind developments within 5km. Comprising turbines 50-100m in height.
Large	Largest developments (>40 turbines) with other wind energy developments within 5km. Comprising turbines >100m in height.

Table 6.17. Site risk level derived from the outcome of Table 6.10 (taken from NatureScot *et al.*, 2021).

Project Size		**Small**	**Medium**	**Large**
Habitat Risk	Low	1	**2**	3
	Moderate	2	**3**	4
	High	3	4	5

6.22.13 The outcome of applying these criteria is that the scheme is concluded to be of low-moderate risk to bats (see Table 6.17 above) based on scale and habitat quality.

6.22.14 With regard to the matrix presented in **Table 6.6**, if the site risk level is taken as 3, and the activity level as moderate (this reflects the conclusion of the noctule data analysis), this gives a score of 9. NatureScot *et al.*, (2021) conclude this represents a site that poses a medium risk to bats.

6.22.15 Further consideration is given to those bat species scoped into further assessment below.

Vulnerability to collision: species analysis

6.22.16 A study undertaken by the University of Exeter on behalf of Defra indicated the mortality rate of bats at wind turbines in the UK ranged from 0 to 5.25 bats per turbine per month across 46 sites sampled over a three-year period (Mathews *et al.*, 2016). It also demonstrated that bat fatality could not be correlated with activity levels; i.e. higher levels of baseline activity were not found to correlate with a higher risk to bats. Notwithstanding this, the study indicated that the UK bats which were most likely to be killed at wind farm sites were common and soprano pipistrelle and noctule bats.

6.22.17 Table 6.18 below provides a summary of current knowledge of the UK population sizes[32] and the known collisions of common pipistrelle and noctule. It is based on mortality data collated by Dürr (2022), and UK population estimates provided by Matthews *et al.*, (2018). While monitoring of wind farms is not necessarily widespread or intensive, interpreted with caution (i.e. with reference to species range) these data give an indication of relative susceptability of different species and genera to collision fatality.

Table 6.18. UK population sizes of bat

[32] There are currently no reliable estimates of bat population size in Europe.

Species	Known collisions in Europe to date (UK component in brackets)	UK population estimate
Noctule	1616 (11)	656,900 (excl. Scotland)
Common pipistrelle	2569 (46)	3,040,000

Impacts on* species*: noctule

6.22.18 Durr (2022) reported 1,616 collisions of noctule in Europe, including 11 in the UK. This is the third highest number of collisions for a species reported by Durr (following common pipistrelle at 2,569 and Nathusius' pipistrelle at 1,662 collisions). The proportion of collision numbers to population size, particularly in the context of the UK population (656,900 individuals) is low, albeit the extent to which post construction monitoring of fatality at wind farms takes place in the UK and the extent to which those studies that are conducted contribute their fatality data to these figures is unknown.

6.22.19 Activity levels for noctule on the site were low in the spring (<0.01 p/h), low-moderate in summer (<0.1 p/h) and moderate in the autumn (0.4 p/h). The overall conclusion was that the activity level in noctule was moderate. However the seasonal variation is considerable, with a bat recorded every 2.5 hours in autumn, at a rate of less than one every 10 hours in summer, and less than one every 100 hours in spring.

6.22.20 JNCC (2019) report that noctule is considered to be stable in terms of population numbers and range, and has a favourable conservation status. Without further mitigation, fatality may result in a significant effect on the local population during summer and autumn.

Impacts on species: common pipistrelle

6.22.21 Durr (2022) reports 2,569 collisions of common pipistrelle in Europe, with 46 collisions reported in the UK. An additional 412 collisions of unidentified pipistrelle species bats have been reported from mainland Europe (where additional pipistrelle species not present in the UK occur).

6.22.22 Common pipistrelle bats are common and widespread within the UK (Wray *et al*, 2010). With reference to **Table 6.5**, activity fell into the low-moderate category. Common pipistrelle was the most regularly encountered species at the Site with one record every (approximately) 0.4 hours in autumn (the busiest season), a record every 3.3 hours in the summer and less than one record every 100 hours in spring.

6.22.23 Given these rates of activity and the abundance of common pipistrelle, it is concluded that any effects on common pipistrelle would only be significant at the local level. Notwithstanding this, however, the turbine blades would be feathered at idle in order to minimise the potential for incidental bat fatality. Without further mitigation, fatality may result in a significant effect on the site population during summer and autumn.

Impacts on other Protected Species

6.22.24 It is not anticipated that adverse effects on great crested newt or reptiles would occur during the operational phase of the works, and there should be no legislative issues regarding animals such as badger and otter that may cross the site from time to time (i.e. no risk of killing or injury should result and the species are unlikely to be disturbed at places of shelter).

6.22.25 Operational phase effects on protected species are not predicted to occur.

6.23 Decommissioning

6.23.1 The effects of decommissioning have the potential to be similar to those during construction phase but are likely to occur over a shorter time period.

6.23.2 There are unlikely to be any significant ecological effects as a result of decommissioning. Any temporary localised effects on non-statutory sites and on dry heath and other habitats around wind farm infrastructure are likely to be short term. Habitats are likely to regenerate to a

condition representative of the baseline over time. Turbine foundations may be left in situ but are likely to be covered with topsoil to allow colonisation of species present within the surrounding sward.

6.23.3 Species most likely to be disturbed and displaced from the Site during decommissioning are those that breed, shelter or forage within it at that time. Decommissioning would therefore need to be informed by baseline survey work.

6.23.4 It is reasonable to expect that there would be changes in legislation concerning protected species, as well as changes in local populations and distribution over the operational life of the proposed wind farm. These may be driven by climatic change, landscape-scale land management, increased effectiveness/policing of protection, the spread of populations, reintroduction programmes and other factors.

6.23.5 Predictions are not therefore possible, with any confidence, over a 35-year period (particularly given the rate of change in number and distribution of many protected species over the past 35 years). It follows that effects on habitats and species would be best addressed through a decommissioning phase Environmental Management Plan.

6.24 Secondary mitigation and enhancement

Secondary mitigation

6.24.1 The assessment concludes that without secondary mitigation measures the following ecological features would be significantly affected:

- On-site SINCs (significant effect at local level)
- Dry heath (significant effect at local level)
- Dry heath / acid grassland mosaic (significant effect at local level)
- Noctule bat (significant at local level)
- Great crested newt (significant effect at county level)

6.24.2 The effects predicted are due to the extent of the SINCs, and the dominant habitats within the wind farm (dry heath and dry heath / acid grassland mosaic) being reduced in extent. The great crested newt population is a feature of the habitats present on and close to the Site, and dependent on them for shelter. It follows that secondary mitigation and enhancement measures should be aimed at maintaining the existing habitats, and where possible, improving their condition and extent.

Habitats

6.24.3 The biodiversity net benefit solution, the principles of which are set out in the following section, will mitigate the loss of heathland habitats, and provide increases in their extent and condition and enable the long term management of the heathland at Mynydd Maen. This will increase the amount of dry heath, which will be more appropriately managed than it currently is, and provide benefit to reptiles and invertebrates. It will also increase the resilience of populations of other species such as red grouse through providing young heather shoots for feeding.

6.24.4 The extent of common land at Mynydd Maen will be maintained as a result of a land swap arrangement that will be the subject of a parallel planning application. Three peripheral areas will be brought into the common. These are currently subject to varied grazing regimes. However the grassland within all of them is poor semi-improved acid or neutral in character, and heavily agriculturally modified. There is the potential for one of the areas (east of Cwm Lickey and Twyn Calch) to be managed back to a more valuable habitat for biodiversity, due to the acid indicator species present in the sward; however this will be a long term objective. These fields are therefore unlikely to contribute to mitigating loss of heathland or the extent of SINC habitat on the Site in the short term. However, there is potential for them to contribute to the biodiversity net benefit solution and deliver valuable habitats longer term.

Bats

6.24.5 It is proposed to curtail generation at all turbines to minimise the potential for bat fatality to occur.

6.24.6 A cut in speed for generation of 4 m/s at nacelle height is proposed. This would apply in the following circumstances:

- Between April and October inclusive
- Between half an hour before sunset and half an hour after sunrise.

6.24.7 Only 7.5 % of bat activity was recorded above 2.2 m/s at base, which equates to 4 m/s at nacelle height. It is also reasonable to assume that at higher wind speeds bat activity is more likely to be close to the ground if animals are foraging over the site. This curtailment regime is therefore likely to significantly mitigate risk; albeit monitoring is proposed to determine its effectiveness.

***Great crested* newt**

6.24.8 In order to secure a European Protected Species mitigation license, a mitigation strategy would need to be developed, detailing measures to avoid construction phase disturbance, killing or injury of newts and ensuring long term management of any new receptor sites.

6.24.9 As part of the licensing agreement, it is proposed to create two new ponds within land identified as part of the mitigation for loss of common land (which is being dealt with under a parallel application and would involve a 'land swop'. These would be purpose-built ponds in accordance with industry standard guidance; they would be located within 250 m of ponds 1-3 (where use by stock and regular drying appears to be driving a population decline). This is within the ranging distance of individual animals, and would allow natural colonisation by the local population, increasing its resilience.

6.24.10 Given the location of these ponds within common land, their margins would be grazed, which may reduce the potential for egg-laying on emergent and marginal vegetation and the structural quality of the vegetation in nearby terrestrial habitats. To address this the following is proposed:

- Material excavated to create the ponds, along with stone sourced from on-site borrow pits, will be used to create purpose-built hibernacular adjacent to the ponds.
- The ponds would have a varied depth gradient and would include shallow areas well away from their outer margins, and separated from them by deeper water.

6.24.11 The detailed pond design would be led by a suitably experienced ecologist with experience of designing features for great crested newts.

6.24.12 Further ponds will be created as part of the restoration of the on-site borrow pits and on other areas of land swap outside of the site boundary potentially providing further resources for the species.

6.24.13 Hedgerow sections will be reinstated post construction, and replanted with broadleaved shrubs. Berry-bearing species of local provenance will be used to enhance their biodiversity value.

6.25 Biodiversity Net Benefit

6.25.1 Planning Policy Wales 12 sets out that development should not cause any significant loss of habitats or populations of species, locally or nationally, and must provide a net benefit for biodiversity.

6.25.2 A letter from the Welsh Government's Chief Planner[33] has clarified that, "….*a net benefit for biodiversity can be secured through habitat creation and/or long term management*

[33] Hemington, N. Letter to Local Authority Heads of Planning in Wales. Dated 23/10/2019.

arrangements to enhance existing habitats, to improve biodiversity and the resilience of ecosystems."

6.25.3 The approach to delivering Biodiversity Net Benefit at Mynydd Maen would be contained in the Habitat Management Plan. Enhancements will be completed within the Site boundary. Principles of this Plan are set out in this section.

6.25.4 Biodiversity net benefit would be achieved at Mynydd Maen through a management plan based on the Commons Innovation Plan (TACP, 2019). Management would be delivered within the Site boundary.

6.25.5 The management plan would aim to deliver against the following measures:

- Restoration and management of dry heath.
- Bracken control.
- Control of feral (invasive) trees.
- Pond creation and management.
- Hydrological re-naturalisation improving condition of wet heath.

6.25.6 Restoration and management of dry heathland would be achieved through rotational cutting and baling of over-mature heather, and bracken management. The cutting programme should be designed with both biodiversity benefits and fire management in mind. The aim would be to establish patchworks of mixed age heather in areas where over mature stands currently dominate, and to manage a minimum of 100 ha of land in this way each year. Given current (low) cattle stocking rates on the common, a mixed age sward is not expected to be maintained through grazing, and a programme of mechanical cutting would need to be prescribed through the Habitat Management Plan. This management regime has the potential to benefit reptiles, invertebrates and species such as red grouse through providing varied structure to the heathland.

6.25.7 Bracken management would aim to reduce extensive stands that dominate large areas of the common around the edges of the Site. Bracken does have value for invertebrates, breeding birds and other species groups, but its value is reduced as areas of cover become very large and dense and a litter layer accumulates. Bracken outcompetes heather reducing the extent of heathland habitats and has spread onto the open heath in places. Some work has been done to control and reduce bracken by the local commoners, and TACP (2019) note the potential for this to be extended. The aim would be to create more *Ericoid*-dominated habitat and more mosaic habitats around the fringes of the Site. Breaking up the bracken would allow cattle access to some marginal areas of the common, and theoretically reinstate grazing across them. However, given stocking densities at present[34], mechanical intervention is likely to be neeeded to maintain these as open areas.

6.25.8 Feral trees are spreading from the plantation habitats onto the heathland. These need to be systematically removed, with any cone / seed-bearing trees taken from the Site (into the plantation) to prevent further self-seeding. Currently there is no effective control of conifers. Over time this has the potential to result in considerable loss of heathland habitat.

6.25.9 The restoration of the three potential on-Site borrow pits presents an opportunity to create several further ponds / clusters of ponds. These would be designed for amphibians by an experienced ecologist. Hibernacula would be constructed around and between them using rock and soil sourced from the Site. The ponds would also provide invertebrate rich feeding areas and drinking resources for red grouse, and the hibernacula would provide opportunities for reptiles. Further opportunities for pond creation will be investigated in the common land swop areas.

6.25.10 Previous work on the Site undertaken by an ecohydrologist working on behalf of TCBC identified that the main area of bog has been modified by peat-cutting and/or peat movement, such that the original surface is broken, with areas at various elevations separated by steep slopes/sub-vertical edges (Rob Low, pers comm). Completed work to address this,

[34] A legacy of the Glastir system which has reduced sheep and cattle numbers (TACP, 2019).

as far as it was feasible to do so, involved smoothing sub-vertical edges to try to reduce hydraulic gradients.

6.25.11 Hydrological naturalisation will take the form of:

- Damming of the (relatively few) obvious drainage ditches during construction, using clay or similar poorly permeable infill. Regular dams will increase transient water storage, and reduce short-term storm runoff response.
- The resulting pools have the potential to develop a valuable flora, to provide drinking water for birds, wild mammals and livestock (encouraging grazing animals to use different areas of the common), and breeding opportunities for amphibians and invertebrates.

6.25.12 The range of measures to improve the condition of wet and dry heath habitats, including areas where shallow peats exist, will have wider ecosystem service benefits. These include slowing surface water runoff during rainfall events due to the greater 'canopy' storage and hydrological roughness of heath in comparison to grassland. Greater on-site storage of water can is turn can promote groundwater recharge, and wet heath communities and soils also have a higher carbon content than grasslands.

6.26 Residual Effects

6.26.1 The following ecological features were scoped out of detailed impact assessment because they are remote from the Site, have not been recorded on the Site (and are not likely to be present), have been recorded at such low frequency that the Site is unlikely to be important for them / they are not likely to be affected, or are of low conservation importance (either inherently or by virtue of their level of use of the Site):

- Statutory designated sites.
- Off-site SINCs.
- Ancient woodland.
- Acid grassland, poor semi-improved and improved grassland.
- Bracken.
- Plantation woodland.
- Running water.
- Dry stone walls.
- Scattered scrub.
- The bat species Nathusius' pipistrelle, serotine, soprano pipistrelle, greater horseshoe bat, all *Myotis* species and brown long-eared bat (noting some consideration is given to the general bat community in terms of construction phase lighting).
- Dormouse
- Otter (measures proposed for legislative compliance only)
- Water vole
- Badger (measures proposed for legislative compliance only)

6.26.2 Table 6.19 below summarises the habitats and species that have been assessed, and the residual effects of the proposed wind farm upon them for the construction and operational phases. Where a phase is not considered relevant to an ecological feature effects on that feature are omitted from the table (for brevity).

6.26.3 It has been assumed that all the proposed mitigation measures and the enhancement proposals would be implemented / adopted in making the assessment of significance of residual effect. Decommissioning impacts are anticipated to be similar to those during the construction phase.

Table 6.19. Summary of residual ecological effects

Feature	Impact	Importance of Feature / Site to feature	Magnitude of Impact[35]	Significance of Effect (in the absence of further mitigation)	Type of Mitigation (and Enhancement)	Significance of Residual Effect
SINCs	Loss of extent	County	Moderate	Local	Tertiary mitigation (CEMP). Enhancement	Neutral (area) Locally positive (condition)
Dry heath	Loss of extent	County	Moderate	Local	Tertiary mitigation (CEMP). Enhancement	Positive at local level (extent of habitat and condition improved)
Dry heath / acid grassland mosaic	Loss of extent	County	Moderate	Local	Tertiary mitigation (CEMP). Enhancement	Positive at local level (extent of habitat and condition improved)
Wet heath	Loss of extent and condition	County	Moderate	Local	Primary. Design phase avoidance. Tertiary measures (in CEMP) Secondary measures identified to enhance resource.	Locally positive (condition)
Acid flush	Loss of extent and condition	Local	Minor	Site	Primary. Design phase avoidance. Tertiary measures (in CEMP)	Negligible
Ponds	Loss of extent and condition	Local	Minor	Site	Primary. Design phase avoidance. Tertiary measures (in CEMP) and as required by great crested newt licence. Pond creation on and off-site.	Positive at local level
Noctule	Collision fatality	Local	Moderate	Local	Secondary. Curtailment of turbines to commence generation at wind speed of 4 m/s at nacelle height. Monitoring with view to further mitigation.	Negligible
Common pipistrelle	Collision fatality	Local	Moderate	Local	Secondary. Curtailment of turbines to commence generation at wind speed of 4 m/s at nacelle height.	Negligible

[35] This considers factors such as extent, duration and severity, and is expressed as minor, moderate or major.

					Monitoring with view to further mitigation.	
Great crested newt	Killing and injury, loss of breeding and terrestrial habitat	County	Moderate	County	Primary. Design phase avoidance of ponds. Tertiary. Licence to be obtained for work. This would require detailed measures to mitigate killing and injury and ensure favourable conservation status is maintained to be set out. Pond and hibernacula creation initiatives both on and off-site that go well beyond mitigation and would help increase resilience of population.	Positive at County level
Reptiles	Killing and injury, loss of breeding and terrestrial habitat	Local	Minor	Local	Tertiary mitigation. Reptile method statement for construction. Enhancement of heathland habitats and bracken management	Positive at local level.

6.27 Monitoring

6.27.1 In addition to any monitoring relating to great crested newt licencing and biodiversity net benefit (habitat management) proposals, bat monitoring will be undertaken to determine fatality levels at the site.

6.27.2 The details of bat monitoring will be agreed with stakeholders post consent. However the principles would be expected to be as follows:

- Monitoring to involve the use of dogs to detect bat carcasses in the spring, summer and autumn of each year for the first three years post construction.
- All turbines to be sampled for ten consecutive days in each season.
- Searcher efficiency (of the dogs) and scavenger removal trials to be conducted to allow rates of collision fatality to be extrapolated based on observed bat corpses. The latter to involve the deployment of remote-activated cameras.
- Bat activity data to be collected at each of the turbine locations throughout the monitored period.
- Weather data to be collected. This to include (as a minimum) temperature, rainfall and wind speed data.
- An annual report to be produced and supplied to NRW and the ecologists for Caerphilly and Torfaen. This to inform a meeting in which the outcomes of the work are discussed. This might lead to proportionate further mitigation to minimise the potential for bat collision.

6.28 Assessment of Cumulative Effects

6.28.1 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 wind farm and other developments. Cumulative effects are most likely to result with regard to those receptors for which a significant residual effect is predicted, particularly if the core range of these receptors includes other planned, consented or built development. This assessment also includes consideration of effects considered non-significant, as a number of minor effects on ecological features from multiple projects may result in a significant cumulative effect.

6.28.2 Cumulative effects may therefore be:

- Cumulative 'zone of influence' effects whereby two or more developments affect the same specific feature (e.g. two developments within the same SINC or area of heathland).
- 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 affecting the same feature reducing its overall extent or number).

6.28.3 Assessment of cumulative effects is is reliant on the availability of suitable information from other schemes in the wider area and the definition of an appropriate and realistic scope. For the Mynydd Maen wind farm a 10 km EZoI has been considered, as this is considered sufficient to cover the core ranging area for mobile species using the Site.

6.28.4 The main potential for cumulative effects arising from projects in the wider area is with regard to wind farms. There are three proposed, one consented and one operational wind farm within the 10 km EZoI. These proposed wind farms are the Mynydd Llanhilleth, Abertillery and Trecelyn schemes, which are for eight, six and five turbines respectively, and the consented scheme is the eight turbine Mynydd Carn-y-Cefn project. The operational wind farm is the two-turbine Oakdale Business Park project.

6.28.5 The Mynydd Llanhilleth Wind Farm proposal is for moorland (common) and adjoining pasture approximately 4.5 km north of the Site. In addition to eight turbines and other on-site infrastructure there would be an access track that would follow an existing minor road that passes around the former British Colliery to meet the wider road network at Talywain.

6.28.6 Scoping documents contained on the PEDW website indicate that a range of protected species survey work was proposed for the Mynydd Llanhilleth Wind Farm. This included habitat, bat, dormouse, great crested newt, water vole and otter survey. No specific work was proposed for reptiles. The scope of ecological survey was largely agreed with consultees, with Torfaen Council expressing some concern about the potential for cumulative effects on Silurian moth as a result of this and other schemes local to it. It was noted in the scoping report that there was potential to deliver habitat enhancement on-site (Planning Inspectorate, 2021a).

6.28.7 The Abertillery scheme would also be located in moorland (common) habitats, albeit the Site is considerably more elevated than Mynydd Maen (rising to over 550 m). At its nearest point the Abertillery wind farm is approximately 6.3 km to the north of the proposed wind farm.

6.28.8 The scoping documents for the Abertillery scheme indicate a similar scope of work to that for Mynydd Llanhilleth, Mynydd Carn-y-Cefn and Mynydd Maen. Habitat, bat, otter and water vole survey were proposed, all in accordance with industry standard guidance methods. Surveys for dormouse, reptiles and Silurian moth were not proposed by the applicant, as it was contended that there was no suitable habitat for the former, that reptiles could be addressed through a method statement and that loss of suitable breeding habitat for Silurian moth would be limited. The scoping response requested clarification and further detail on various aspects of the survey and assessment work, and in particular noted the concerns of Blaenau Gwent County Borough Council with regard to Silurian moth (from the proposed wind farm alone and cumulatively). The response also stated that the Inspectorate agreed to scope out impacts on water vole from the assessment.

6.28.9 The Trecelyn wind farm proposal is for land to the west of the Site; the eastern red line boundary of the site abuts that of the Mynydd Maen wind farm. The land within the Trecelyn

red line boundary takes in enclosed upland fringe farmland that is different in character to the moorland habitats present on site. No turbine layout was included in the Trecelyn scoping report (Wood Group, 2022).

6.28.10 The applicant has undertaken Phase 1 and Phase 2 botanical surveys. Bat transects and automated detector work have also been completed, and there is an intention to undertake potential roost feature inspections. Surveys have also been carried out for dormouse and great crested newt. The results have shown the habitats are agriculturally improved, and that hedgelines are largely defunct, and are characterised by beech. A minimum of nine species of bat have been recorded, along with a low population of great crested newt. Otter and water vole are assumed absent due to a lack of suitable habitats, and reptiles, if present, occur in low numbers.

6.28.11 The scoping response from PEDW, and the appended comments from NRW directed the applicant to follow available wind farm-related guidance with regard to species survey, while specifically noting the requirement for climbed assessment of trees with roosting potential for bats, and for consideration of impacts on both ponds and terrestrial habitats for great crested newts. There was nothing in the response to indicate significant ecological concerns with regard to the proposals.

6.28.12 The consented Mynydd Carn-y-Cefn wind farm scheme will be constructed on common land approximately 6 km to the north-west of the Site (to the west of the town of Abertillery). The Environmental Statement indicates that a range of relatively standard surveys were completed to inform the scheme, including habitat, bat, great crested newt, dormouse, otter and water vole survey. No dormouse, great crested newt, otter or water vole were recorded. Measures were proposed to limit potential bat fatality (feathering of turbines potentially leading to curtailment) and an outline Habitat Management Plan was submitted as part of the application that identified measures including grazing management and bracken control alongside enhancement of specific features in order to achieve biodiversity net benefit.

6.28.13 The Oakdale scheme is set in an industrial estate with significant areas of surrounding woodland habitats; the turbines are between 5.5 km and 6 km from the proposed wind farm Habitats are unlikely to have been a key concern in the assessment(s) for the turbines. The scale and location of the scheme suggests it may have a localised impact on bat populations, but it is unclear whether any investigation of this has been completed. Otherwise it appears ecologically low impact.

6.28.14 A non-renewables scheme with some potential to have a cumulative effect with Mynydd Maen and other developments is the proposed Secondary Aggregates Extraction application for Tirpentwys Cut, approximately 3 km to the north-west. These quarrying proposals relate to land off-site between the Site and the Mynydd Llanhilleth wind farm proposal.

6.28.15 A scoping response was received from Torfaen County Borough Council to the Tirpentwys aggregates proposals in February 2023. This indicated that NRW's concerns included hydrological impacts on protected sites, and that a range of protected species surveys would be needed to inform the proposals. The response from the local planning authority ecologist included additional direct reference to the need for detailed botanical, breeding and wintering bird, reptile and invertebrate survey, with Gwent Wildlife Trust additionally noting the requirement to consider Silurian moth and emphasising their concerns with regard to SINC habitats being lost.

6.28.16 Potential cumulative effects on SINC habitats, reptile and Silurian moth populations are possible as a result of impacts from the Tirpentwys Cut, Mynydd Llanhilleth, Abertillery and Mynydd Carn-y-Cefn wind farm proposals (as a result of land take for both access tracks and the main development proposals). The Mynydd Maen scheme would not affect the SINCs potentially impacted by these three schemes, or the populations of the species associated with them, being geographically isolated from the proposals. It is also noted that Silurian moth does not occur at Mynydd Maen.

6.28.17 In making a cumulative assessment it is reasonable to assume that to achieve biodiversity net benefit and obtain planning consent each of the schemes would need to deliver proportionate biodiversity enhancement aimed at the features impacted. Without doing so, the development in question should not be consented. It is therefore likely that the developments would deliver better management of moorland habitats to compensate for loss of extent (subject to

agreement on this point with commoners and being able to secure proposals legally). It is also assumed that if the assessments for the wind farms and aggregates applications conclude impacts on SINC habitats, reptiles and Silurian moth are likely, these would be the focus of avoidance, reduction and compensation measures as part of biodiversity net benefit packages.

6.28.18 The primary cumulative effects of multiple wind farms are often considered to be increased collision risk (and hence direct effects on population size). Where information is available for the larger schemes it indicates that the bat communities are similar to those of the Site.

6.28.19 It is also reasonable to assume that, as for Mynydd Maen (and as detailed in the Mynydd Carn-y-Cefn ES Chapter), where the potential for impacts on bats is identified, measures would be taken to minimise risk to them, as informed by data on bat activity in relation to weather parameters. These might include feathering turbines at idle, monitoring of fatality to inform mitigation, or immediate curtailment if a scheme is considered to have a particular potential issue.

6.28.20 It is therefore concluded that if all mitigation proposed in this assessment is applied, and Welsh Government policy on net benefit is applied when determining other schemes, no significant cumulative effects on ecological features would occur.

6.29 Summary

6.29.1 The scope of survey, assessment of ecological impacts and the principles of the biodiversity net benefit solution contained in this chapter have been informed by consultation meetings (where possible) and scoping.

6.29.2 Ecological desk study and survey work to inform the application has been completed over a number of years (2020-2023), with data updated periodically as necessary. The approach to survey has been based on industry standard guidance, and has included Phase 1 habitat and NVC survey, bat, great crested newt, dormouse, otter and water vole survey work. Wind farm-specific guidance relating to bats has been used to inform the approach to bat survey work.

6.29.3 The proposed wind farm would not result in impacts on statutory sites of nature conservation interest. The Site is subject to various non-statutory designations (SINCs), and the extent of several of these would be reduced. The wind farm would result in the loss of dry heath and dry heath acid grassland mosaic habitats, but has been designed to avoid loss of more restricted habitats such as wet heath and acid flush. Potential impacts on bat species, particularly noctule and common pipistrelle, on great crested newt and on reptiles are also likely in the absence of mitigation.

6.29.4 The cut in speed for generation will be curtailed to 4 m/s at nacelle height. Only 7.5 % of bat activity has been recorded above 2.2 m/s at ground level (which equates to 4 m/s at nacelle), so this is likely to substantially mitigate risk of collision. However monitoring is proposted to test this conclusion and inform any further mitigation requried. The on-site great crested newt population is low, and at potential risk of extinction, as the ponds the animals use are in poor condition. The construction of the wind farm has the potential to result in killing and injury of animals by construction traffic and effects on their dispersal. Construction phase mitigation to address this would need to be detailed in a European Protected Species licence application, and pond creation is proposed to improve the local conservation status of the species. Mitigation for reptiles would be through a method statement delivered as part of the CEMP. Mitigation for other protected species would include a precautionary working method statement for dormouse and be informed by pre-construction survey respectively to ensure the baseline hasn't changed in the intervening period.

6.29.5 Biodiversity net benefit would be achieved through implementation of measures to bring the vegetation on the common into better condition. It would involve implementation of measures including bracken control, creation of mixed-age heather and further pond creation initiatives. The extent of common land would be maintained through a land swop application that would bring peripheral land areas into common use. Some complementary habitat creation would be undertaken in these areas.

6.29.6 The residual effects of the proposed wind farm on ecological features do not conflict with any national or local planning policies or any relevant legislative protection. The proposed wind farm would deliver biodiversity net benefit in accordance with planning policy.

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