CENIN

Document History

Author	Heather Scott and Nicole Dunn	18/10/2022
Checked	Laura Shreeve	19/10/2022
Approved	Laura Turner	02/11/2022

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

Issue	Date	Revision Details
A	27/02/2023	Pre-application Consultation

Chapter 6

Ecology

Contents

Glossary

Term	Definition
Baseline	The existing conditions that prevail against which the effects of the proposed development are compared.
eDNA	Environmental DNA: genetic material that is extracted from an environmental sample (such as water) to detect the presence of an organism.
Ecological Impact Assessment (EcIA)	Ecological Impact Assessment is a process of identifying, quantifying and evaluating potential effects of development-related or other proposed actions on habitats, species and ecosystems.
Infrastructure	This is used to describe all parts of Manmoel Wind Farm development that require construction activities, both temporary and permanent; including turbines, hard standings, borrow pits and tracks (where new or widened).
Manmoel Wind Farm	The turbines and all associated infrastructure required for Manmoel Wind Farm (also referred to as the 'proposed development').
Mitigation	Measures, including any process, activity or design to avoid, reduce, remedy or compensate for potential negative effects of a development.
Protected Species	Animals or plants protected by European and/or domestic legislation.
Site boundary	Proposed application boundary for the proposed development.
Site of Importance for Nature Conservation (SINC)	Sites of Importance for Nature Conservation (also known as Wildlife Sites) are non-statutory sites of nature conservation value that are designated locally on biological and/or geological grounds.
Site of Special Scientific Interest (SSSI)	Sites of Special Scientific Interest are protected areas that represent the UK's most important wildlife and/or geological sites.
Section 7 species/habitats	Lists of species and habitats of 'principal importance' for maintaining and enhancing biodiversity, as named under the Environment (Wales) Act 2016[1].
Special Area of Conservation (SAC)	Special Areas of Conservation are sites of international importance that have been adopted by the European Commission and formally designated by the UK government under the Conservation of Habitats and Species Regulations 2017 (as amended) in England and Wales.
Survey Area	The area within which ecological baseline surveys were carried out. This generally refers to the proposed development plus a surrounding buffer, the size of which is determined by the specific survey being described. Details of the area covered are described in the methodology provided for each field survey (See Section 6.2);
Zone of Influence	This is "the area over which ecological features may be subject to significant effects as a result of the proposed project or associated activities" (CIEEM[2]).

List of Abbreviations

Abbreviation	Description
AOD	Above Ordnance Datum (of height)
AWS	Ancient Woodland Site
BCT	Bat Conservation Trust
BGBAP	Blaenau Gwent Biodiversity Action Plan
BGCBC	Blaenau Gwent County Borough Council
CBAP	Caerphilly Biodiversity Action Plan
CCBC	Caerphilly County Borough Council
CEMP	Construction Environmental Management Plan
CMS	Construction Method Statement
CIEEM	Chartered Institute of Ecology and Environmental Management
DEFRA	Department of Environment, Food and Rural Affairs
EcIA	Ecological Impact Assessment
ECoW	Environmental Clerk of Works
EIA	Environmental Impact Assessment
EMP	Ecological Management Plan
ES	Environmental Statement
FCS	Forestry Commission Scotland (now known as Forestry and Land Scotland)
FWPAA	Future Wales Pre-Assessed Area
GIS	Geographical Information Systems
GPS	Global Positioning System
GWDTE	Ground Water Dependent Terrestrial Ecosystem
Habs Regs	The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (the Habitats Regulations)
HMA	Habitat Management Area
HRA	Habitat Regulations Assessment
HSI	Habitat Suitability Index
IEF	Important Ecological Feature
JNCC	Joint Nature Conservation Committee
LBAP	Local Biodiversity Action Plan
LNP	Local Nature Partnership
LNR	Local Nature Reserve
LPA	Local Planning Authority
LWS	Local Wildlife Site
Natural Power	Natural Power Consultants Limited, the lead EIA Co-Ordinator
NNR	National Nature Reserve

[1] Environment (Wales) Act 2016. Available from: http://www.legislation.gov.uk/anaw/2016/3/ [Accessed 27/02/2023]

Abbreviation	Description
NRW	Natural Resources Wales
NVC	National Vegetation Classification
OEMP	Operational Environmental Management Plan
PPW	Planning Policy Wales
PRF	Potential Roost Feature
SAC	Special Area of Conservation
SEPA	Scottish Environment Protection Agency
SEWBReC	South-East Wales Biodiversity Records Centre
SNH	Scottish Natural Heritage (now NatureScot)
SINC	Site of Importance for Nature Conservation
SPP	Species Protection Plan
SR	Scottish Renewables
SSSI	Sites of Special Scientific Interest
UNESCO	United Nations Educational Scientific and Cultural Organisation
WCA	Wildlife and Countryside Act (1981)
ZoI	Zone of Influence

6.1 INTRODUCTION

Summary of Chapter

6.1.1 In order to inform the Ecological Impact Assessment (EcIA), baseline ecology surveys were undertaken in 2020. These included Phase 1 and National Vegetation Classification (NVC) habitat surveys, great crested newt and bat surveys (roost assessment and activity surveys) following standard NatureScot guidance. In 2021 additional Phase 1 and NVC habitat surveys were undertaken in the potential Habitat Management Area (HMA; adjacent to the site boundary) and a badger survey was undertaken within the site boundary.

6.1.2 An assessment has been made of the predicted significance of effects of the proposed Manmoel Wind Farm (hereafter referred to as the proposed development) on ecological interests. This assessment predicted no significant effects on all of the Important Ecological Features (IEFs) recorded and no significant cumulative effects on any IEFs.

6.1.3 Habitat enhancement measures targeted at dry heath are proposed. Embedded mitigation measures to minimise impacts of the construction and operation of the proposed development on IEFs, and to prevent a breach of legislation under the Wildlife and Countryside Act (1981). A Species Protection Plan (SPP) is proposed and good practice guidance regarding protected species and pollution prevention will be followed, with an Environmental Clerk of Works (ECoW) employed during construction. Further mitigation in the form of an Ecological Management Plan (EMP) to restore dry heath habitats and minimise impacts on bats is proposed. It is considered that implementation of these mitigation and habitat enhancement measures will reduce the likelihood of impacts on IEFs at the appropriate biogeographical scale.

Contents of Chapter

6.1.4 This ecological chapter of the Environmental Statement (ES) has been prepared by Natural Power Consultants (Natural Power) on behalf of Cenin (the Applicant) in respect of the proposed development. The proposed development comprises of up to five wind turbines and associated infrastructure on Manmoel Common southeast of Tredegar, South Wales (see Figure 6.1). The site lies mostly within the Blaenau Gwent County Borough Council (BGCBC) area, although its south-western corner lies within the Caerphilly County Borough Council (CCBC) local authority boundary. Four out of the five turbines of the proposed development sit within one of the Future Wales – Pre-Assessed Area 10 (FWPAA)[2].

6.1.5 This chapter provides details of the baseline ecological conditions within the site boundary and the immediate surrounding environment. Baseline ecological conditions have been established for habitats and non-avian fauna through a programme of rigorous ecological field surveys, in addition to a desk-based review to obtain additional relevant ecological data. The identified habitats and species comprising the ecological baseline are described and assessed using recognised criteria, in accordance with industry guidelines (e.g. that produced by the Chartered Institute of Ecology and Environmental Management: CIEEM, 2018[3]).

6.1.6 This ES chapter has been prepared following a scoping process which led to a scoping report issued to consultees in June 2021 and scoping direction received in August 2021.

6.1.7 In line with the principles of proportionate Environmental Impact Assessment (EIA), embedded mitigation is considered at the outset of the assessment (see Section 6.5 of this chapter). Furthermore, to ensure proportionality based on the likelihood of potential effects, only ecological features for which it is considered there may be significant effects in the absence of mitigation are identified as IEFs and are taken forward for a full EcIA.

6.1.8 The potential for ecological impacts (i,e. predicted change to the baseline) as a result of the proposed development during the construction, operational and decommissioning phases have been identified and assessed, with particular attention paid to habitats and species of high vulnerability, conservation concern and those afforded a high level of legal protection. These impacts are then assessed in terms of their significance of effects to each IEF (where effects are the consequence of impacts on environmental resource or receptor). Where potentially adverse ecological effects have been identified and/or predicted for an IEF, appropriate mitigation to avoid or reduce the effects of such impacts are proposed. For IEFs for which greater than negligible residual effects are predicted after the application of this mitigation, cumulative effects with other nearby developments have also been considered within this EcIA.

6.1.9 This chapter is complemented by Chapter 7: Ornithology and Chapter 10: Hydrology, Geology and Hydrogeology.

6.1.10 All Latin names for species mentioned in this chapter are listed in the Technical Appendix A6.1. Summaries of survey times and dates are also given in the technical appendix. Full survey data, including details of survey dates, times and weather conditions, plus results data, can be provided on request.

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

- Appendix A6.1: Ecology Technical Appendix;
- Figure 6.1: Site and Ecological Survey Areas;
- Figure 6.2: Bat Detector Locations;
- Figure 6.3: Great crested newt pond survey locations;
- Figure 6.4: Designated sites with ecological interest;
- Figure 6.5: Preliminary Bat Roost Assessment Results;
- Figure 6.6: Phase 1 Survey Results; and
- Figure 6.7: NVC Survey Results.

6.2 METHOD OF ASSESSMENT

Legislation, Policy and Guidance

6.2.1 The following framework of international, national and local legislation and planning policy guidance, which exists to protect habitats and specific species, has been considered as part of the assessment. See also Chapter 2: Legal and Policy Context.

Legislation

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive)[4];
- The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (the Habitats Regulations), which transposes the Habitats Directive into law in England and Wales[5];

[2] Welsh Government, (2021). [Online]. Available from https://gov.wales/future-wales-national-plan-2040-0 [Accessed 27/02/2023]

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

[4] EUR-Lex. Available from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A31992L0043 [Accessed 27/02/2023]

[5] The Conservation (Natural Habitats, &c.) Regulations 1994. Available from: https://www.legislation.gov.uk/uksi/1994/2716/contents/made [Accessed 27/02/2023]

- Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, which ensures domestic implementation of the Habitats Directive continues from 1 January 2021[6];
- Wildlife and Countryside Act 1981 (as amended);[7]
- The Environment (Wales) Act 2016[1];
- Well-being of Future Generations (Wales) Act 2015[8]; and
- Protection of Badgers Act 1992 (as amended)[9].

Policy

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

Guidance

6.2.2 Particular attention has also been given to the guidance documents listed below, which cover survey methods and assessment of effects of wind farm developments on ecological features. Reference has also been made to these guidance documents across this chapter, where relevant:

- CIEEM (2018). Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland[3];
- Wildlife Sites Guidance Wales: a guide to develop local wildlife systems in Wales[16];
- Scottish Natural Heritage (SNH) (2012) Assessing the cumulative impact of onshore wind energy developments[17];
- SNH (2019)[18]/ NatureScot (2021)[19] Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation; and
- Scottish Renewables, SNH, Scottish Environmental Protection Agency (SEPA, Forestry Commission Scotland (2013) Good Practice during Wind Farm Construction[20].

6.2.3 In addition, particular attention has been paid to the lists of habitats and species of principal importance, as given in Section 7 of the Environment (Wales) Act 2016[21]. Local biodiversity interests have been assessed using the species/habitats listed by the Blaenau Gwent and Torfaen Local Nature Partnership (LNP)[22] and those on the Caerphilly Local Biodiversity Action Plan (LBAP)[23] lists.

6.2.4 Note, that although some guidance referred to above is provided by NatureScot (formerly SNH), for example regarding bats, this guidance is accepted as standard by Natural Resource Wales (NRW).

Data Collection

Desk Study

6.2.5 A desk-based review has been undertaken to collate relevant existing public domain survey data and records of protected and relevant species and habitats from within the site boundary and surrounding environment. This provided background information on the ecological features that are potentially present, to help inform and guide the baseline ecological field surveys and it also provides context to their results. Combined with the results of the ecological field surveys, this information has been utilised to provide a comprehensive ecological baseline on which to base EcIA.

Statutory, National and Locally Designated Sites of Nature Conservation

6.2.6 A web-based search was undertaken to identify and provide information on statutory designated sites of nature conservation, with non-avian species and protected habitats as listed features. The search was carried out using

---

[6] The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations (2019). Available from: https://www.legislation.gov.uk/ukdsi/2019/9780111176573/regulation/30 [Accessed 27/02/2023]

[7] Wildlife and Countryside Act 1981. Available from: https://www.legislation.gov.uk/ukpga/1981/69 Accessed 27/02/2023]

[8] Welsh Government. *The Well-being of Future Generations*. Available from: https://gov.wales/well-being-of-future-generations-wales [Accessed 27/02/2023]

[9] Protection of Badgers Act 1992. Available from: https://www.legislation.gov.uk/ukpga/1992/51/data.htm?wrap=true [Accessed 27/02/2023]

[10] Welsh Government. (2021) *Planning Policy Wales.* Edition 11. Available from: https://gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11_0.pdf [Accessed 27/02/2023]

[11] Welsh Government. Available from: https://gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11_0.pdf [Accessed 27/02/2023]

[12] Welsh Assembly Government. (2009). *5. Nature Conservation and Planning*. Available from: https://gov.wales/sites/default/files/publications/2018-09/tan5-nature-conservation.pdf [Accessed 27/02/2023]

[13] JNCC and Defra (on behalf of the Four Countries' Biodiversity Group). 2012. UK Post-2010 Biodiversity Framework. July 2012. Available from: https://jncc.gov.uk/our-work/uk-post-2010-biodiversity-framework/ [Accessed 27/02/2023]

[14] Blaenau Gwent County Borough Council. *Adopted Local Development Plan 2006-2021.* Available from: https://www.blaenau-gwent.gov.uk/en/resident/planning/local-development-plan/adopted-local-development-plan-2006-2021/adopted-ldp/ [Accessed 27/02/2023]

[15] Caerphilly County Borough Council. *The Adopted LDP.* Available from: https://www.caerphilly.gov.uk/business/planning-and-building-control-for-business/local-development-plan/local-development-plan-2010-(adopted)/the-adopted-ldp [Accessed 27/02/2023]

[16] Wales Biodiversity Partnership. (2008) *Wildlife Sites Guidance Wales: A Guide to Develop Local Wildlife Systems in Wales*. Available from http://biodiversitywales.org.uk/ [Accessed 27/02/2023]

[17] SNH (2012). *Assessing the cumulative impact of onshore wind energy developments*. SNH, Scotland.

[18] SNH, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd., the University of Exeter, and Bat Conservation Trust (BCT) (2019). *Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation*.

[19] NatureScot, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd., the University of Exeter, and Bat Conservation Trust (BCT) (2021). *Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation (updated)*.

[20] Scottish Renewables, SNH, SEPA, Forestry Commission Scotland (2013). *Good practice during windfarm construction*. 2nd edition.

[21] Wales Biodiversity Partnership. (2022). *Environment (Wales) Act.* Available from: https://www.biodiversitywales.org.uk/environment-wales-act [Accessed 27/02/2023]

[22] Blaenau Gwent County Borough Council. (2015). *Local Biodiversity Action Plan*. Available from: https://www.blaenau-gwent.gov.uk/media/q5ifcbc0/lbap_2015.pdf [Accessed 27/02/2023]

[23] Caerphilly County Borough Council. Available from: https://www.caerphilly.gov.uk/caerphillydocs/planning/biodiversity-action-plan-caerphilly-county-borough.asp [Accessed 27/02/2023]

the Multi-Agency Geographic Information for the Countryside (MAGIC) Map application tool[24] and the NRW website[25]. The search focussed on identifying the following sites:

- Special Areas of Conservation (SACs) – within 10 km of site boundary;
- Sites of Special Scientific Interest (SSSIs) – within 5 km of site boundary;
- National Nature Reserves (NNRs) – within 5 km of site boundary; and
- Local Nature Reserves (LNRs) within 2 km of site boundary.

6.2.7 Data has also been obtained from the South East Wales Biodiversity Records Centre (SEWBReC)[26] of locally important (non-statutory) Sites of Importance for Nature Conservation (SINCs), also known as Local Wildlife Sites within 2 km of the site boundary.

Protected Species and Habitats

6.2.8 The SEWBReC data search also requested records of all ecological (non-avian) species of conservation interest recorded within the last ten years (2010-2020) within 2 km of the site boundary, as well as known protected habitats and other priority areas, such as Ancient Woodland Sites (AWS).

Field Surveys

6.2.9 A summary of the baseline ecology surveys undertaken at the proposed development (dates and extent of the area surveyed) is provided in Table 6.1. Details of survey extents including areas where access was available can be found in Figure 6.1. Where access was not available visual surveys were conducted from the nearest location within the site boundary. Further details are provided below and in Appendix A6.1: Ecology Technical Appendix in Volume 3 of the ES.

Table 6.1: Summary of baseline ecological surveys undertaken at Manmoel Wind Farm

Survey	Date	Survey Area
Extended Phase 1 Habitat survey	August and September 2020	Site boundary plus 250 m buffer
National Vegetation Classification (NVC) survey	August and September 2020	Site boundary plus 250 m buffer
Phase 1 Habitat survey and NVC survey	October 2021	Potential HMA
Bat activity survey: static detectors	May to October 2020	Site boundary
Preliminary bat roost assessment	November and December 2020	Site boundary plus 200 m buffer
Protected mammal survey: badger	May 2021	Site boundary plus 150 m buffer
Great-crested newt survey	May and June 2020	Site boundary plus 500 m buffer

6.2.10 Following an assessment of suitability for all protected mammal species during the Phase 1 habitat survey, the only species-specific protected mammal survey undertaken was for badger.

Extended Phase 1 Habitat Survey

6.2.11 Habitats across the survey area were identified and mapped using the standard Joint Nature Conservation Committee (JNCC) Phase 1 habitat classification[27].

6.2.12 The Phase 1 habitat survey methodology provides a standardised system for classifying and mapping semi-natural vegetation and wildlife habitats over large areas of countryside. A Phase 1 habitat survey of the site was undertaken in August and September 2020. The survey covered the site boundary plus 250 m buffer where accessible. Areas accessible within the 250 m buffer were Manmoel Common and adjacent NRW managed St. James Wood (see Figure 6.1). In October 2021, an additional survey was undertaken to identify habitats present within the potential HMA.

6.2.13 The survey was 'extended' to search for and record signs of legally protected or other notable species, and to assess the potential for the habitats to support such species. Target notes were made to record features of interest.

NVC Survey

6.2.14 The NVC is a detailed phytosociological classification system which assesses the full suite of vascular plant, bryophyte and macro-lichen species within a certain vegetation type. The NVC survey was undertaken concurrently with the Phase 1 habitat survey following the standard survey method as described in Rodwell (2006)[28], to assess habitat classification in regard to potential habitats listed on Annex 1 of the Habitats Directive, and Ground Water Dependent Terrestrial Ecosystems (GWDTE).

6.2.15 NVC community and sub-community types were identified in the field (based on extensive surveyor experience) and delineated and mapped using Global Positioning System (GPS). Where areas were considered to comprise mosaics or complexes of different habitat communities, the proportion of each was estimated in percentage terms. Survey methods followed those described in Rodwell (2006)[28], with further guidance taken from Averis *et al*. (2004)[29].

6.2.16 The NVC survey also included the recording of target notes to provide further details, where necessary, and to record any features of ecological interest.

Bat Activity Survey: Static Detectors

6.2.17 All bat surveys were undertaken in 2020 and were based on best practice guidance (SNH (2019)[18], and Collins (2016)[30].

6.2.18 A total of six full spectrum static detectors (SM4s) were utilised to undertake the survey. The number of static detectors that are required is stated in guidance[18]. For developments with less than 10 turbines there should be one detector at/near each proposed turbine location. Based on this guidance and the number of proposed turbines at the time of the survey in 2020 (six turbines), six static detectors were placed within the site boundary, each were as close to a proposed turbine location as possible. Details of the locations of the static detectors can be found in Table 6.2 and on Figure 6.2.

[24] MAGIC. (2022). Available from: https://magic.defra.gov.uk/MagicMap.aspx [Accessed 27/02/2023]

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

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

[27] JNCC. (2010) Handbook for Phase 1 habitat survey – a technique for environmental audit. JNCC, Peterborough.

[28] Rodwell J. S. (2006). National Vegetation Classification: Users' handbook. JNCC, Peterborough.

[29] Averis, A., Averis, B., Birks, J., Horsfield, D., Thompson, D. & Yeo, M. (2004) An Illustrated Guide to British Upland Vegetation, JNCC, Peterborough.

[30] Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). Bat Conservation Trust, London

Table 6.2: Static bat detector deployment locations

Detector	Grid reference	Habitat	Detector elevation (m)	Location description	Closest turbines (distance)	Turbine elevation (m)
1	SO 15780 08526	Woodland; grassland; heathland	420	Along the edge of coniferous woodland on west boundary of Manmoel Common.	T1 (1,340 m)	472
2	SO 16515 07952	Grassland; heathland; mire	390	In a hawthorn tree on common land within a mosaic of open habitats.	T1 (665 m)	472
3	SO 15945 07522	Woodland; grassland;	410	Along the edge of coniferous woodland on west boundary of Manmoel Common.	T1 (450 m)	472
4	SO 16808 07080	Grassland; tall herb and fern; heathland	410	Along a fence line on the east boundary of the common within a mosaic of open habitats.	T2 (235 m)	488
5	SO 16470 06306	Grassland	440	Along a fence line on the east boundary of the common within grassland habitat.	T4 (330 m) T3 (440 m)	453 475
6	SO 16938 06247	Woodland; grassland	435	Along the edge of a semi-natural broadleaved woodland.	T4 (160 m) T5 (230 m)	453 446

Source: Natural Power

6.2.19 Data was collected on a seasonal basis with three deployments in each of spring, summer and autumn. All sample locations were deployed simultaneously in order to allow direct comparisons of bat activity. Detectors were in place for a minimum of 14 nights for each deployment. The dates of the three deployments were as follows:

- Spring deployment: 15 May – 29 May 2020 (14 nights);
- Summer deployment: 1 July – 15 July 2020 (14 nights); and
- Autumn deployment: 17 September – 5 October 2021 (18 nights).

6.2.20 Detectors were programmed to commence recording from half an hour before sunset and continue until half an hour after sunrise, to cover the active period for all species potentially encountered within the site boundary. Detectors recorded data to a memory card which was downloaded and later analysed to identify species present. Activity levels can also be established from this data, based on the number of 'bat passes' recorded.

6.2.21 Analysis was undertaken at species level using Kaleidoscope Pro automatic identification software. *Myotis* sp. were not identified further than genus due to the overlap between species frequency calls. Pipistrelle and *Nyctalus* bats were classified to species, when possible, but were otherwise classified as species groups when it was not possible to distinguish call types to species level. Signal parameters were 16-120 kHz, 2-500 ms, 500 ms maximum inter-syllable gap and with a minimum of two pulses.

6.2.22 Quality assurance checks were performed on each group of manually identified species or noise, whereby all records were checked in groups of 200 records or less, and 10% of records were checked for larger groups.

6.2.23 An individual bat can pass a particular feature on several occasions while foraging. It is therefore important to acknowledge that a bat pass is an index of bat activity that describes the amount of use bats make of an area rather than a measure of the number of individuals in a population.

6.2.24 Following guidance[19], survey data was input into the online tool Ecobat[31] which allows bat activity levels within site boundary to be compared with other sites located within a similar habitat and within a 100 km radius. The recommended reference range is for each species to have more than 200 records within the set radius.

6.2.25 An on-site weather station (Davis Vantage Vue 6250UK) collected site-specific weather data (wind speed, temperature and rainfall) at 30-minute intervals for the duration of each deployment to help in the interpretation of the bat activity data.

Preliminary Bat Roost Assessment

6.2.26 A preliminary bat roost assessment to identify any potential roost features (PRF) was undertaken within the site boundary and a 200 m buffer (where access permitted) in November and December 2020 following methods set out in Hundt (2012)[32]; and Collins (2016)[30]. Forested areas with mature or dead trees, buildings, and open areas were surveyed and their suitability to support roosting bats was determined, along with any evidence of occupation.

Badger Survey

6.2.27 A badger survey following guidance provided in Harris *et al.* (1989)[33], Neal and Cheeseman (1996)[34], Sargeant & Morris (2003)[35] and Bang & Dahlstrøm (2001)[36] was completed by experienced ecologists during May 2021. The survey area covered was site boundary plus a 150 m buffer where accessible on Manmoel Common and St. James Wood (see Figure 6.1).

6.2.28 All suitable habitat within the survey area was surveyed, with a focus on linear features (fences, walls, tracks, rides, forest edges, etc). Any signs of badger presence, such as latrines, feeding signs and runs, were recorded and mapped using a handheld GPS. Runs were followed to determine the presence of any setts. Any signs were photographed to visually catalogue each record.

Great Crested Newt Survey

6.2.29 Aerial imagery was used to identify all ponds present within the site boundary plus 500 m buffer. Ten ponds were identified within 500 m of the site boundary, four of which were not accessible to be surveyed. However, all of these water bodies are greater than 500 m from proposed infrastructure.

6.2.30 The six accessible ponds were assessed during the great crested newt breeding season (April to June 2020 inclusive) for their suitability for great crested newt using Habitat Suitability Index (HSI)[37]. See Figure 6.3 for details

[31] ECOBAT. Available from: http://www.ecobat.org.uk/ [Accessed 27/02/2023]

[32] Hundt, L. (2012). Bat Surveys: Good Practice Guidelines, 2nd edition. The Bat Conservation Trust, London.

[33] Harris S. Cresswell P & Jefferies D., (1989). *Surveying Badgers*. The Mammal Society, London.

[34] Neal, E. and Cheeseman, C. (1996). *Badgers*. T & A D Poyser, London, pp.271.

[35] Sargent G. & Morris P. (2003). *How to Find and Identify Mammals*. The Mammal Society, London.

[36] Bang, P. & Dahlstrøm, P. (2001). *Animal Tracks and Signs*. Oxford University Press, Oxford.

[37] ARG UK (2010) ARG UK Advice Note 5: Great crested newt habitat suitability index.

of pond locations. Any ponds assessed with HSI above 0.49[38] underwent eDNA analysis before the end of the breeding season. eDNA test kits from an approved laboratory (ADAS[39]) are accepted by NRW[40] for the determination of great crested newt presence or absence.

Survey Limitations

6.2.31 The following survey limitations were experienced:

- Bat activity surveys were undertaken in 2020 following the Scottish Natural Heritage guidance[18] that was relevant at that time. Whilst guidance has been updated in the interim [19], there are no changes to the survey methodology in the more recent guidance.
- The static bat detectors could not be placed on the proposed turbine locations as the site boundary is situated on open and exposed common land with public access. As the land is grazed and frequently used by the public it was considered likely that detectors put out on posts within open common land could be disturbed or damaged by livestock or members of the public, thus not providing sufficient data. Hence, they were placed near the boundary of the common land as close as possible to the proposed turbine locations. This ensured that they were less visible to the public and less likely to be damaged by grazing livestock. The locations were situated in a variety of habitats found within the site boundary including woodland edge, heathland, bracken, mire and grassland.
- During the autumn survey period the microphone attached to static bat detector 6 became loose while being deployed or soon afterwards and hence, no audio files were recorded for the whole autumn survey. However, as no other detectors experienced any issues throughout their deployments, the lack of data from one detector for one survey period will not have an impact on the assessment of how bat species use the site.
- Static detectors were deployed in spring, early summer and autumn for 14-18 nights each deployment (Table 10.2). Only nights on which suitable weather conditions (temperature 10°C or above at dusk; ground wind speed 5 m/s or less; little to no rain) were recorded have been used as “effort”. Due to poor weather conditions during the 18-day period that the detectors were deployed in autumn, only nine days of effort were used in the analysis, which is lower than the ten advised in the guidance. However, this is not considered to be a limitation on the assessment of bat activity on site, as activity indexes as calculated by Ecobat are based on actual effort.
- The survey areas for the baseline ecology surveys included the site boundary plus a buffer area. Not all sections of the buffer areas were accessible: only Manmoel Common and St James Wood adjacent to the west boundary of the common were accessible. However, visual surveys were conducted from the nearest location within the site boundary.
- A fishing lake at 315545 207874 and three ponds (316972 207674, 317318 206373 and 317216 206511) within 500 m of the site boundary were not accessible as part of the great crested newt surveys. However, this is not considered a limitation as all of these water bodies are greater than 500 m from the proposed turbine locations and infrastructure.

Approach to Impact Assessment

6.2.32 This section presents the approach taken to the EcIA and provides an overview of how the potential for impact has been determined and the method by which impact significance has been ascertained. The approach to the EcIA adopted within this assessment follows the CIEEM guidelines, and in line with these guidelines professional judgement has been applied where appropriate. The criteria used and the underlying rationale are described further within the following sections.

Determining Important Ecological Features (IEFs)

6.2.33 In accordance with CIEEM guidelines[3], the importance of an ecological feature is based upon its respective elements relating to biodiversity and ecosystem services. The importance of an ecological feature is determined within a geographical frame of reference and the approach used in this EcIA is detailed in Table 6.3.

Table 6.3: Geographical context relating to the evaluation of an IEF

Level of value	Example of IEF
International	An internationally designated site (e.g. SAC), or site meeting criteria for international designations such as a World Heritage Site or United Nations Educational Scientific and Cultural Organisation (UNESCO) Biosphere Reserve. Species populations/habitat areas present with sufficient conservation importance to meet criteria for SAC selection.
National	A nationally designated site such as an SSSI or an NNR, or sites meeting the criteria for national designation (such as the JNCC guidelines). Species populations/habitat areas present with sufficient conservation importance to meet criteria for SSSI selection.
Regional	Sites designated as local nature reserves or Local Biodiversity Sites, including SINCs. Species populations/habitat areas that meet the criteria for SINC classification.
Local	Areas of semi-natural ancient woodland smaller than 0.25 ha. Areas of habitat or species populations considered to appreciably enrich the ecological resource within the local context, e.g. species-rich flushes or evidence of regular otter activity.
Negligible	Widespread and/or common habitats and species. Features falling below Local Importance are not normally considered in detail in the assessment process.

6.2.34 Attributing geographical value to a feature is generally straightforward in the case of designated sites, as the designations themselves are normally indicative of level of value. For example, a SAC designated under the

[38] <0.5 = poor; 0.5 – 0.59 = below average; 0.6 – 0.69 = average; 0.7 – 0.79 = good; > 0.8 = excellent

[39] ADAS. (2022). Available from: https://adas.co.uk/services/edna-analysis-for-great-crested-newt-gcn/ [Accessed 01/12/2022]

[40] Natural Resources Wales. (2022). *The use of environmental DNA test for Great crested newt licensing purposes*. Available from: https://naturalresourceswales.gov.uk/permits-and-permissions/species-licensing/apply-for-a-protected-species-licence/the-use-of-environmental-dna-test-for-great-crested-newt-licensing-purposes/?lang=en [Accessed 27/02/2023]

Habitats Directive is explicitly of European (International) importance. However occasionally a default level of value may not be appropriate in the specific context of the proposed development. Where this is the case, professional judgement has been applied and rationale for decreasing or increasing the geographical level of value of a feature is given. An example of this might be bats, all of which are of international importance due to their protection under Annex IV of the Habitats Directive. However, if only very few foraging/commuting records of common and widespread bat species were made at a site, attributing international importance to the population present at the proposed development would be disproportionate and the importance would be reduced accordingly (noting that this does not change the protection level from a legislative standpoint). For non-designated features, the use of guidelines such as that for assessing SINC criteria (Wales Biodiversity Partnership (2008)[16]) provide information for determining a feature's importance and level of value.

6.2.35 Certain ecological features may be assessed as not being subject to significant effects by a proposed development, but due to their high legal protection they must still be considered in the EcIA within the context of legal and policy implications (for example otter, for which their resting places are legally protected from destruction or obstruction).

6.2.36 Part of the process of attributing importance to a species involves defining the population to be valued and requires professional judgment to identify an ecologically coherent population against which effects on integrity[41] can be assessed (see 'Determining Significance of Ecological Effects'). For example, for wide-ranging species such as otter, it may be more appropriate to consider the otter population in a whole catchment, whereas for more localised species, such as water vole, importance may be attributed to groups of related colonies which function as a meta-population.

6.2.37 In line with the principles of proportionate EIA, embedded mitigation is considered at the outset of the assessment. IEF status has only been assigned where there is still considered to be the potential for significant effects to the integrity of the feature at the assigned value level arising from the proposed development, after the application of embedded measures.

Valuing Bats

6.2.38 For the purposes of this assessment and of assigning value to bats, the guidance set out by NatureScot[19] has been considered. Table 2 in this guidance identifies the population vulnerability of bat species based on the collision risk posed for individual bat species by wind turbines as determined by behavioural characteristics, and by bat population sensitivity based upon species rarity (adapted from Wray *et al*. (2010)[42]). Table 6.4 summarises the risk of turbine impact (i.e. collision risk) and the sensitivity of bat populations within Wales.

Table 6.4: Risk of turbine impact affecting Welsh bat populations

Species	Collision risk	Sensitivity of population
Common pipistrelle	High	Medium
Soprano pipistrelle	High	Medium
Nathusius' pipistrelle	High	High
Noctule bat	High	High
Leisler's bat	High	High
Barbastelle	Medium	High
Serotine	Medium	High
Brown long-eared bat	Low	Low
Daubenton's bat (*Myotis* bat)	Low	Low
Natterer's bat (*Myotis* bat)	Low	Low
Lesser horseshoe	Low	Low
Bechstein's bat (*Myotis* bat)	Low	Medium
Brandt's bat (*Myotis* bat)	Low	Medium
Greater horseshoe	Low	Medium
Grey long-eared bat	Low	Medium
Whiskered bat (*Myotis* bat)	Low	Medium

Source: Welsh Biodiversity Partnership[21]

6.2.39 The guidance provided by Wray *et al*. (2010)[42] includes a framework for identifying the importance of bats in the landscapes through the evaluation of bat roosts and habitats. Applying this framework, bat roosts can be valued according to species rarity and roost status.

Characterising Potential Effects on Features

6.2.40 The magnitude of impact is predicted quantitatively where possible. Where this is not possible, a more qualitative approach is taken. The criteria used in this assessment for describing the overall magnitude of a potential impact is summarised in Table 6.5.

6.2.41 The assessment also considers whether the impact is positive or negative, short-term (for example only during construction) or long-term (throughout the lifetime of the proposed development), reversible or permanent.

Table 6.5: Criteria used within this EcIA to determine the magnitude of ecological impacts

Impact magnitude	Description
Very highly negative	Total or almost complete loss of an ecological feature resulting in a permanent adverse effect on the integrity of the feature. The conservation status of the feature would be permanently affected.
Highly negative	Large-scale, permanent changes in an ecological feature, likely to change its ecological integrity. These impacts are therefore likely to result in overall changes in the conservation status of an ecological feature.
Moderately negative	This includes moderate-scale long-term changes in an ecological feature, or larger-scale temporary changes; however, the integrity of the ecological feature is not likely to be affected. This may result in temporary changes in the conservation status of the ecological feature, but these are reversible and unlikely to be permanent.
Minor negative	This includes small magnitude, long-term impacts, or moderate-scale temporary changes, and where integrity of the ecological feature is not affected. These effects

[41] Note that integrity in this context refers to ecological integrity of a habitat type or population of a species at a defined value level, i.e. the maintenance of the conservation status of a population of a species at a specific location or geographic scale. This should not be confused with the specific term 'Site Integrity' used in Appropriate Assessment for Natura 2000 sites.

[42] Wray, S., Wells, D., Long, E. & Mitchell-Jones, T. (2010) *Valuing Bats in Ecological Impact Assessment.* IEEM In-Practice pp. 23-25.

Impact magnitude	Description
	are unlikely to result in overall changes in the conservation status of an ecological feature.
Negligible	No perceptible change in the ecological feature.
Positive	The changes in the ecological feature are considered to be beneficial to its ecological integrity and/or nature conservation status.

6.2.42 When characterising ecological impacts, it is essential to consider the likelihood that a change/activity will occur as predicted, with a degree of confidence in the impact assessment (in relation to the impact on ecological structure and function). Where possible, the degree of confidence should be predicted quantitatively. However, where this is not possible, a more qualitative approach is taken; particularly where the confidence level can only be based on expert judgement.

Habitat Loss Calculations

6.2.43 The construction of the proposed development would result in some permanent habitat loss by the infrastructure footprint (e.g. access tracks, turbine bases, crane hardstandings, substation etc.), and habitat loss calculations (HLC) are used to quantify the extent of this loss. Some construction areas will be reinstated following construction (for example the construction compound) and therefore only represent temporary loss. Permanent and temporary habitat loss have been differentiated within these calculations. Habitat loss calculations are provided for all Phase 1 habitats and taken on for impact assessment.

6.2.44 Habitat loss has been calculated for the amount of loss within three areas: the site boundary, Mynydd Manmoel SINC boundary, and Mynydd Manmoel, North of Manmoel SINC boundary. The percentage of habitat loss within each area has also been calculated. Full details on the methodology of the HLC and the classification of temporary and permanent infrastructure are provided in Appendix A6.

Determining Significance of Ecological Effects

6.2.45 The CIEEM guidelines[3] use only two categories to classify effects: 'significant' or 'not significant'. A significant effect is defined in ecological terms as an effect on the integrity or conservation status of a defined site, habitat or species. The significance of an effect is determined by considering the value level of the feature and the magnitude of the impact and applying professional judgement as to whether the integrity/conservation status of the feature will be affected at the given value level. This concept can be applied to both designated and undesignated sites and to defined populations.

6.2.46 In this assessment, an effect that threatens the integrity of a feature is considered to be significant. It should be noted that, alongside the criteria provided, professional judgement is applied in determining the significance of a potential effect.

6.2.47 Where appropriate, mitigation and/or compensation measures, including the design process, are identified in order to avoid and reduce potentially significant effects. It is also good practice to propose mitigation measures to reduce negative effects that are not significant. The significance of residual effects on features after the effects of mitigation have been considered can then be determined, along with any monitoring requirements.

Trends and Predicted Future Baseline

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

6.2.49 It is more difficult to predict changes that may occur in the longer-term (i.e. up to 50 years). Climate change and the shift in species and habitat distributions that this may cause, as well as potential land management changes that this may bring about, cannot be predicted at this time. Baseline surveys carried out for the proposed development represent a snapshot of the ecology community present at the time and cannot be extrapolated to predict future population trends in the event of climate change, or a future change in land use at the site.

6.3 CONSULTATION

6.3.1 Manmoel Wind Farm scoping report was submitted to a range of consultees in June 2021. Responses were returned in August 2021. All consultation considered to be relevant to this chapter are summarised in Table 6.6.

Table 6.6: Summary of consultation responses to the scoping report

Consultee	Issues raised and recommendations	Addressed responses/outcomes
Planning Inspectorate	No transect surveys or vantage point surveys have been conducted as part of the bat activity surveys. Guidance is clear that these surveys methods are to complement the information gathered from static detectors surveys.	The proposed development was assessed as being low risk to bats – see Section 6.4. Guidance specifies that the use of bat transect and vantage point surveys is discretionary and site-specific. The site is low risk due to the habitat being low quality for foraging bats and not connected to any prominent linear features. Furthermore, the proposed development is small in size (less than 10 turbines and only one other wind farm development of three or more turbines within 10 km). As the site was assessed as low risk to bats these surveys were not considered necessary as they would provide limited additional information.
NRW	Walked bat transect surveys should be considered to demonstrate patterns of movement across the site.	These surveys were not considered necessary as the site was assessed as low risk to bats (see above) they would provide limited additional information.
Planning Inspectorate	Agrees that the static detector survey limitation in autumn 2020 is minimum and should not prevent the calculation of bat activity index. However, the limitations must be reported in the future ES.	This is addressed in this chapter in in Section 6.2 Survey Limitations. The assessment has been based on the assumption that there would have been a similar level of activity in the autumn as there was during the spring deployment at this detector location.
Planning Inspectorate	Features with moderate bat roost potential were found within the site boundary. Although currently, proposed turbine locations are more than 200 m away from these features, it is possible that future	The proposed turbine locations are over 92 m from key bat features (such as woodland and scrub), including all features offering a moderate or high bat roost potential. This is the buffer distance calculated from the NatureScot guidance[19] that gives at least 50 m between the blade tip and a feature.

Consultee	Issues raised and recommendations	Addressed responses/outcomes
	design and micro-siting will bring the proposed turbines closer to these features. A worst-case scenario should be described in the ES and further survey effort may be required.	Further surveys were not carried out to ascertain the status of potential roosts, however a precautionary approach was taken for the assessment and appropriate mitigation will be put in place.
NRW	Additional static monitoring at turbine locations may be required if the design layout changes significantly.	Based on the number of proposed turbines at the time of the survey in 2020, six static detectors were placed within the site boundary. As the proposed layout has been reduced to five turbines, six static detectors are considered to be adequate to determine levels of bat activity near to the proposed development.
NRW	Analysis of automated bat survey data acquired to date needs to consider the timings of bat calls to show patterns of movement throughout the night across the seasons.	This is addressed in this chapter within Section 6.4.
Planning Inspectorate	As reptile species may be present on site, the ES needs to consider potential harm to reptiles and a detailed mitigation strategy should be presented as part of the ES.	Reptiles are included in the EcIA addressed in this chapter – see Section 6.5.
Planning Inspectorate	It is not agreed to scope out dormice at this stage. If any woodland will be directly affected by the development, presence / absence surveys will be required. In any event, the ES should include avoidance measures and mitigation.	No woodland will be directly impacted by the proposed development. A habitat assessment was undertaken for dormouse on all woodland and scrub within the site boundary and it was concluded that there was no suitable habitat available for dormice. Further information is included in Section 6.4.
NRW	The potential impacts upon dormice in relation to the associated infrastructure works and transport works are not yet clear and we would advise that further consideration is given to these species or full justification as to why they have been scoped out of these works is provided.	No woodland will be directly impacted by the Proposed development. A habitat assessment was undertaken for dormouse on all woodland and scrub within the site boundary and it was concluded that there was no suitable habitat available for dormice. Further information is included in Section 6.4.
Planning Inspectorate	It is not agreed to scope out water voles at this stage. Surveys should be conducted at the appropriate time of the year where proposed infrastructures may affect watercourses. Avoidance and mitigation measures should be considered in the ES, where necessary.	Water voles are included in the EcIA addressed in this chapter – see Section 6.5.
NRW	Advise further consideration is given to water voles when considering turbine locations and associated infrastructure works and transport links or a full justification as to why they have been scoped out of these works is provided.	Water voles are included in the EcIA addressed in this chapter – see Section 6.5.
Planning Inspectorate	The ES should include a draft Construction Environmental Management Plan (CEMP) and a detailed ecological management plan (EMP), including targets and enhancement objectives specific to the habitats and species present on site. The plan should include monitoring and indicate triggers which would prompt changes in the management of the site. Net benefits should be clearly identified. It is recommended that relevant consultees are further engaged once a draft mitigation proposal is emerging.	CEMP and EMP (including monitoring) has been included in this chapter – see Section 6.5.
BGCBC	Construction and operational effects are likely to occur through habitat degradation, disturbance to protected species, mortality and injury to priority and protected species and loss of ecological connectivity through habitat fragmentation. The need for enhancement measures to be implemented has also been highlighted, including net gain to ensure protection/enhancement of ecosystem resilience.	CEMP and EMP has been included in this chapter – see Section 6.5.
NRW	The ecological importance of the development site with regard to key habitat should be fully assessed as part of the ES along with all opportunities for ecological enhancement.	EMP has been included in this chapter – See Section 6.5.
NRW	Where the potential for significant impacts on protected species is identified, we advocate a Conservation Plan is included as an Annex to the EIA.	An EMP, including operational bat monitoring, is included in this chapter.
NRW	Where a European Protected Species is identified and the development will contravene the legal protection they are afforded, the EIA must consider the	An EMP, including operational bat monitoring, is included in this chapter.

Consultee	Issues raised and recommendations	Addressed responses/outcomes
	requirements for a licence and state how regulations shall be met.	
NRW	EIA should set out how the long term site security of any mitigation or compensation will be assured including management and monitoring information and long term financial and management responsibility.	EMP has been included in this chapter – see Section 6.5.
CCBC	CCBC broadly concurs with the methodology used to determine which wind farms are to be included within the cumulative assessment. However, competitor site status and other wind farm activity is now out of date within the Caerphilly County Borough. It is recommended that the cumulative assessment is expanded to include all large scale energy infrastructure, including solar parks of 10 MW and above, within the 15 km study area. This should include operational, consented and in planning.	This has been addressed in the chapter – see Section 6.8.
NRW	We welcome the Habitat Regulations Assessment (HRA) of Usk Bat Sites SAC being undertaken as part of the EIA. We would advise that the hibernation roost identified is included in this consideration as it is likely to include bats that form the SAC population even though it is not within the SAC boundary. This may require additional survey of the hibernation site in 2021.	See Section 6.9 for the information to inform the HRA of Usk Bat Sites SAC. The only potential hibernation site recorded during bat surveys was a row of residential buildings near the proposed cable route. Lesser horseshoe bats (the only bat species designated at Usk Bat Sites SAC) use caves and cave-like places and not in residential buildings. The closest hibernation roost identified in the desk study was 3.4 km from the proposed development.
NRW	The Local Planning Authority (LPA) should be consulted regarding to ensure that regional and local biodiversity issues are adequately considered, particularly Section 7 and LBAP habitats and species.	Section 7 and LBAP habitats and species have been considered in the assessment where relevant, and within the outline Ecological Management Plan.
NRW	All relevant people/organisations should be contacted for biological information/records relevant to the site and its surrounds including the Local Records Centre and any local ecological interest groups (e.g. bat groups, mammal groups).	Records were received from SEWBReC, the Local Records Centre for relevant biological information/records. The local Valleys Bat Group do not provide records and the South Wales Mammal Group inputs their records into SEWBReC.
NRW	Recommends that any peat soils within the application site are identified, and the depths recorded, to ensure peat is avoided when designing the wind farm infrastructure layout.	Data regarding peat depths was collected in 2021 and peatland habitats are assessed in this chapter. See also Chapter 10: Hydrology, Geology and Hydrogeology.

Source: Natural Power

6.4 BASELINE

6.4.1 This section presents the baseline environment from desk-based review and field surveys which we use as basis for assessing the effects from the proposed development.

Desk Study

Statutory, National and Locally Designated Sites of Nature Conservation

6.4.2 A list of designated sites with an ecological interest (habitat or non-avian species) located near to the site boundary is provided in Table 6.7. This includes three sites of international importance (SACs) within 10 km. The nearest site is Usk Bat Sites SAC, the section which incorporates Mynydd Llangatwg SSSI, and it has been designated for the protected species lesser horseshoe bat. Aberbargoed Grassland SAC lies less than 5.5 km south has been designated for the protected habitats and species, marshy grassland and marsh fritillary butterfly. Coeddydd Cwm Clydach SAC about 5.5 km northeast of the site boundary has been designated for the priority habitat, beech woodland.

6.4.3 There are also another two SSSIs within 5 km of the site boundary and three LNRs lie within 2 km of the site boundary. All the sites are listed in Table 6.6. No other designated sites are located within 5 km of the site boundary.

6.4.4 The locations of these sites can be found on Figure 6.4. Designated sites with an ornithological interest are discussed in Chapter 7: Ornithology.

6.4.5 The following designated sites were scoped out of assessment in the scoping report and will not be mentioned further:

- Aberbargoed Grassland and Coeddydd Cwm Clydach SACs;
- Cwm Merddog Woodlands Cefn y Brithdir SSSIs; and
- Silent Valley and Parc Bryn Bach LNRs.

Table 6.7: Designated sites: SACs within 10 km and SSSIs within 5 km & LNRs within 2 km of site boundary

Site	Designation	Distance from Site Boundary	Designation Criteria
Usk Bat Sites SAC including Mynydd Llangatwg SSSI	SAC/SSSI	4.2 km	Usk bat sites SAC encompasses a series of lesser horseshoe bat roosts, upland habitats, woodlands and cave systems around the valley of the River Usk. It is designated for: • Blanket and degraded bog • Mixed woodland associated with rocky slopes

Site	Designation	Distance from Site Boundary	Designation Criteria
			• Calcareous rocky slopes with crevice vegetation • Caves • Dry heath • Lesser horseshoe bats Mynydd Llangatwg SSSI is a very diverse large site with habitats of special interest including base-rich grassland, heather dominated blanket mire and dry heath. The crags, woodland and grassland of the limestone escarpments support important assemblages of rare and scarce vascular plants, bryophytes and lichens. Below the surface lies an extensive and important cave system, parts of which are of special interest providing a winter hibernation site for large numbers of lesser horseshoe bats and other bat species.
Coedydd Cwm Clydach	SAC	5.5 km	Stands of beech woodland, intergrading with more open habitats, which together support rare and scarce vascular plants and important fungal assemblages. The site is designated for: • Beech forests on neutral to rich soils • Beech forests on acid soils
Aberbargoed Grasslands	SAC/SSSI	5.7 km	Designated for: • Marsh fritillary butterfly • Purple moorgrass meadows
Cwm Merddog Woodlands	SSSI	1.5 km	Semi-natural broadleaved woodland with an extensive area of beech woodland near the westerly limit of its geographical range. Part of the site is also the highest known station for beech in Britain.
Cefn y Brithdir	SSSI	3.4 km	The steep north-eastern slopes support the best example in Mid Glamorgan of a dwarf shrub heath community in which crowberry occurs as a co-dominant species.
Sirhowy Hill Woodlands and Cardiff Pond	LNR	0.1 km	A post-industrial site with large areas dominated by planted woodlands, over half being coniferous. Other important habitats include unimproved grassland, dwarf scrub heath, rock habitats, and open water.
Silent Valley	LNR	1.4 km	Once a farm with meadows and an old coal pit, it is now the highest and most westerly beech wood in Britain.
Parc Bryn Bach	LNR	1.6 km	A reclaimed post-industrial site with a range of habitat including woodland, grassland, lake, pond and ditches, heathland and hedgerows, all of which are priority habitats. These support wide variety of priority species.

Source: MAGIC online GIS tool, NRW "Protected areas of land and sea" search engine and Blaenau Gwent County Borough Council website: https://www.blaenaugwent.gov.uk/en/resident/countryside/local-nature-reserves/ Last accessed November 2020

Non-statutory Designated Sites

6.4.6 A total of 64 SINCs lie within the search area (site boundary plus 2 km buffer). See Appendix A6.1 and Figure 6.5 for a full list of SINCs. Of these, there are six SINCs that lie within or immediately adjacent to the site boundary. These are:

- Mynydd Manmoel;
- Mynydd Manmoel, North of Manmoel;
- Drysiog Farm;
- Garden City;
- South of Troedegwair; and
- Upper Troedrhiwgwair Grasslands.

6.4.7 There are an additional five SINCs located within 250 m of the site boundary designated for habitat features. These are:

- Land Surrounding the Wetland Centre;
- St. James Reservoir;
- River Sirhowy;
- Scotch Peter's Pond; and
- Sirhowy Hill Woodlands and Cardiff Pond.

6.4.8 Apart from River Sirhowy SINC there are no other SINCs with protected mammal species as a qualifying feature within 500 m of the site boundary.

6.4.9 The SEWBReC data request also returned additional priority areas as listed in Table 6.8.

Table 6.8: NRW Priority Areas within site boundary and 2 km buffer

Site Type	No. sites	Category	Closest to site boundary (m)	Closest to infrastructure (m)
Ancient semi-natural woodland	43	Priority Area	Adjacent	212
Restored ancient woodland site	10	Priority Area	222	462
Plantation on ancient woodland site	19	Priority Area	80	268
Ancient woodland site of unknown category	9	Priority Area	449	661
NRW priority area (woodland - PAWS)	19	Priority Area	80	268

Source: SEWBReC

Species

6.4.10 The SEWBReC data of priority and protected species within 5 km (10 km for bats) of site boundary is summarised in Table 6.9. The table shows records of vertebrates (mammals, herptiles and fish) from the period 2010 to 2020.

6.4.11 Table 6.9 provides information as to the conservation status of these species, with those (non-avian) species listed on the Wildlife & Countryside Act (WCA Sch. 5), the Habitat Regulations (Habs Regs Sch 2), the Protection of Badgers Act, the Section 7 species list (Sec7), priority species listed by Blaenau Gwent LBAP[43] (BGBAP) and on the Caerphilly LBAP[38] (CBAP) included in this table. Note that priority species listed by Blaenau Gwent LBAP printed in 2010 has been used because the Blaenau Gwent and Torfaen LNP formed in 2017 is currently developing its Local Nature Action Plan and State of Nature Report and it is yet to be published. Unidentified bat records are not included.

Table 6.9: Records of selected ecological features (except bats) within site boundary and 5 km buffer

Sub-group	Species	No. of records	Most recent	Closest record to site boundary	Protection / conservation status
Amphibian	Common frog	20	2019	1.5 km	WCA Sch. 5; BGBAP; CBAP
	Common toad	21	2020	0.9 km	WCA Sch. 5; Sec7; BGBAP; CBAP
	Palmate newt	15	2019	3.1 km	WCA Sch. 5; BGBAP; CBAP
	Smooth newt	3	2020	2.7 km	WCA Sch. 5; BGBAP; CBAP
Reptile	Adder	2	2014	3.5 km	WCA Sch. 5; Sec7; BGBAP; CBAP
	Common lizard	49	2020	3.2 km	WCA Sch. 5; Sec7; BGBAP; CBAP
	Slow worm	14	2016	3.8 km	WCA Sch. 5; Sec7; BGBAP; CBAP
Fish	Atlantic salmon	1	2014	4.7 km	Sec7; BGBAP; CBAP
	Brown/sea trout	1	2010	4.1 km	Sec7; BGBAP; CBAP
Terrestrial Mammal	Badger	3	2017	1.3 km	Protection of Badgers Act; BGBAP; CBAP
	Brown hare	2	2018	2.0 km	Sec7; BGBAP
	Hedgehog	90	2020	4.7 km	WCA Sch. 5; Sec7; BGBAP; CBAP
	Polecat	1	2017	3.4 km	Sec7; BGBAP; CBAP

Source: SEWBReC

Table 6.10: Records of bats within site boundary and 10 km buffer

Species	Record type	No. of records	Most recent record	Closest record to site (km)
Barbastelle	Hibernation roost	4	2017	7.3
	Other	1	2013	9.9
Brandt's bat	Hibernation roost	7	2018	5.9
	Other	2	2011	8.9
	Roost	14	2020	3.1
Brown long-eared bat	Possible roost	3	2018	8.3
	Other	61	2019	3.2
Common pipistrelle	Hibernation roost	3	2014	7.2
	Maternity roost	6	2017	5.3
	Other roost	56	2019	0.7
	Other	153	2019	0.2
Daubenton's bat	Hibernation roost	7	2020	6.2
	Roost	4	2016	4.4
	Other	25	2019	3.1
Greater horseshoe	Hibernation roost	9	2019	6.1
	Other roost	3	2019	6.5
Lesser horseshoe	Hibernation roost	20	2020	3.4
	Maternity roost	5	2018	6.3
	Other roost	30	2018	4.4
	Other	25	2019	3.2
Long-eared sp.	Roost	1	2019	7.6
Myotis sp.	Hibernation roost	3	2018	7.1
	Other roost	3	2015	5.4
	Other	27	2019	1.0
Natterer's bat	Hibernation roost	9	2016	6.2
	Other roost	2	2020	8.4
	Other	4	2018	3.2
Noctule	Roost	3	2011	3.1
	Other	59	2019	0.2
Pipistrelle sp.	Maternity roost	4	2017	5.7
	Hibernation roost	1	2019	6.2
	Other roost	25	2019	3.3
	Other	44	2019	0.9
Serotine	Hibernation roost	1	2016	7.0
	Other	3	2016	3.3
Soprano pipistrelle	Maternity roost	2	2019	9.8
	Other roost	22	2019	2.3
	Other	92	2019	0.2
	Hibernation roost	4	2015	7.1

[43] Blaenau Gwent County Borough Council. (2010). *Blaenau Gwent Local Biodiversity Action Plan*. Available from: https://www.blaenau-gwent.gov.uk/media/wbxbzehr/sd115.pdf [Accessed 27/02/2023]

Species	Record type	No. of records	Most recent record	Closest record to site (km)
Whiskered bat	Other	2	2012	8.8
Whiskered/ Brandt's bat	Hibernation roost	6	2019	6.2

Source: SEWBReC

Field Surveys – Habitats

Overview

6.4.12 Site boundary is located on common land with predominantly grassland and heathland habitats. The common land is grazed all year round with a mix of stock including sheep, cattle and horses.

Phase 1 and NVC Results

6.4.13 Habitats found during the Phase 1/NVC surveys at Manmoel are provided in Table 6.11 and in Figures 6.6 and 6.7. Full habitat descriptions and target notes can be found in Appendix A6.1.

6.4.14 As part of the Extended Phase 1 survey, habitats were assessed for their suitability for protected species, including dormouse, badger, otter and water vole.

6.4.15 The only areas with any potential dormouse habitat within the site boundary are a small area of deciduous woodland in the south-east of the area (134 m from proposed infrastructure), a defunct hedgerow in the south of the area (185 m from proposed infrastructure) and areas of continuous bracken (80 m from proposed infrastructure). However, the deciduous woodland comprises a small area of scattered trees and scrub; the hedgerow is not dense and generally consists of a line of trees; and the areas of continuous bracken contain limited food plants with an understorey mainly of bare ground, acid grassland or heath. Therefore, it is not considered that the habitat within the site boundary is suitable to support dormouse.

6.4.16 The habitat within the site boundary is not considered suitable for water vole or otter as all watercourses within the site are the head of streams that are shallow and dry for most of the year.

6.4.17 The grassland, woodland and scrub habitats within the survey area were considered to be suitable for badger and a further species-specific survey was undertaken (see Paragraph 6.4.31for details of results). No badger signs were found during the Extended Phase 1 survey.

6.4.18 GWDTEs have protection under the Water Framework Directive, to prevent deterioration, protect and enhance the status of terrestrial ecosystems and wetlands and the aquatic ecosystems they depend on. Therefore, mitigation must be undertaken when carrying out any activities that may impact upon any of these ecosystems. The NVC survey results were used to identify potential GWDTEs. These are included in Table 6.11.

6.4.19 Altogether nine NVC communities were present which are classed in guidance (SEPA, 2017)[44] as indicative of potential GWDTEs, meaning that they have moderate or high dependency on groundwater in certain hydrological settings. Classification as a GWDTE does not necessarily confer any additional conservation importance to habitats present. Further details on GWDTE assessment can be found in Chapter 10: Hydrology, Geology and Hydrogeology.

[44] Scottish Environment Protection Agency (SEPA) (2017) Land Use Planning System SEPA Guidance Note 31.

Table 6.11: Phase 1 and NVC communities present within the site boundary plus 250 m where accessible within St. James Wood and Manmoel Common

Phase 1 Habitat Type	NVC Community	Conservation Designation	GWDTE Potential	Habitat in development area (ha)	Permanent habitat loss to the Proposed development		Temporary habitat loss to the Proposed development	
					Area (ha)	%**	Area (ha)	%**
A1.1.1 Broad-leaved woodland: semi-natural	W6 *Alnus glutinosa-Galium palustre* woodland	Sec7: Wet woodland	Moderate	0.46	0	0	0	0
	W7 *Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum* woodland	Sec7: Wet woodland	High					
	W17 *Quercus petraea-Betula pubescens-Dicranum majus* woodland	Sec7: Upland oak woodland	No					
A1.2.2 Coniferous woodland: plantation	n/a	None	No	0.12	0	0	0	0
A1.3.2 Mixed woodland: plantation	n/a	None	No	0*				
A2.1 Scrub: dense/continuous	W25 *Pteridium aquilinum-Rubus fruticosus* underscrub	None	No	0*				
A4.2 Recently felled woodland: coniferous	n/a	None	No	0*				
B1.1 Acid grassland: unimproved	U1 *Festuca ovina-Agrostis capillaris-Rumex acetosella* grassland, U4 *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland	None	No	43.62	0.56	1.27	0.26	0.60
	U6 *Juncus squarrosus-Festuca ovina* grassland	None	Moderate					
B1.2 Acid grassland: semi-improved	U4 *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland	None	No	6.72	0.62	9.25	0.44	6.49
B2.1 Neutral grassland: unimproved	MG5 *Lolium perenne-Cynosurus cristatus* grassland, MG6 *Lolium perenne-Cynosurus cristatus* grassland	None	No	0*				
B5 Marshy grassland	M23 *Juncus effusus/acutiflorus-Galium palustre* rush-pasture	Sec7: Rush pasture	High	13.67	0.06	0.47	0.00	0.02
	M25 *Molinia caerulea-Potentilla erecta* mire,	Sec7: Purple moorgrass pasture	Moderate					
	MG10 *Holcus lanatus-Juncus effusus* rush-pasture	None	Moderate					
B6 Improved grassland	MG6 *Lolium perenne-Cynosurus cristatus* grassland	None	No	0.43	0.05	11.24	0.00	0.00
C1.1 Bracken – dense/continuous	U20 Pteridium aquilinum-Galium saxatile community	None	No	17.02	0	0	0	0
C3.1 Other tall herb & fern: tall ruderal	OV27 *Epilobium angustifolium* community	None	No	0*				
D1.1 Dry dwarf shrub heath: acid	H12 *Calluna vulgaris-Vaccinium myrtillus* heath, H18 *Vaccinium myrtillus-Deschampsia flexuosa* heath	Annex 1: European dry heaths; Sec7: Upland heathland	No	33.36	0.41	1.24	0.06	0.19
D2 Wet dwarf shrub heath	M15 *Scirpus cespitosus-Erica tetralix* wet heath	Annex 1: Northern Atlantic wet heaths with Erica tetralix; Sec7: Upland heathland	Moderate	0.43	0.01	2.99	0.00	0.00

Phase 1 Habitat Type	NVC Community	Conservation Designation	GWDTE Potential	Habitat in development area (ha)	Permanent habitat loss to the Proposed development		Temporary habitat loss to the Proposed development	
					Area (ha)	%**	Area (ha)	%**
D5 Dry heath/acid grassland mosaic	Transitional between or a mosaic of U4 *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland and H18 *Vaccinium myrtillus-Deschampsia flexuosa* heath or H12 *Calluna vulgaris-Vaccinium myrtillus* heath	Annex 1: European dry heaths; Sec7: Upland heathland	No	82.38	1.74	2.11	1.27	1.54
D6 Wet heath/acid grassland mosaic	Transitional between or a mosaic of M15 *Scirpus cespitosus-Erica tetralix* wet heath and M25 *Molinia caerulea-Potentilla erecta* mire	Annex 1: Northern Atlantic wet heaths with Erica tetralix; Sec7: Upland heathland	Moderate	4.73	0.00	0.04	0.00	0.00
E2.1 Flush & spring: acid/neutral	M6 *Carex echinata-Sphagnum recurvum/auriculatum* mire	Sec7: Upland flushes, fens & swamps	High	0*				
G1.2 Standing water: mesotrophic	n/a	Sec7: Ponds	No	0*				

**Habitat not found within the development area – only within 250 m buffer.*
***All values in this table have been rounded to two decimal places. However, percentages are based on full area values and therefore calculations using area values shown may not entirely match those shown above.*

Field Surveys – Species

Bats

6.4.20 Full details of bat roost and bat activity surveys, including photographs are presented in Technical Appendix A6.1.

Preliminary Bat Roost Assessment

6.4.21 A total of 26 features (or groups of features) with potential for roosting bats were recorded during the dedicated survey in 2020. Of these, five were within 50 m of proposed infrastructure or 275 m of a proposed turbine (see Table 6.12 for details).

Table 6.12: Potential bat roosting features (PRFs) recorded during bat roost surveys in 2020 within 50 m of proposed infrastructure or 275 m of a proposed turbine

PRF number	Distance from infrastructure (m)	Distance from turbine (m)	Suitability	Potential type of bat roost	Description
1	32	1540	Low/Moderate	Day roost/ night roost	Group of single storey flat roofed brick construct buildings – numerous access points. No internal access to assess suitability.
13	19	226	Negligible/Low	Day roost/ night roost	Tree with no noted features. Access to western side limited.
14	11	230	Negligible/Low	Day roost/ night roost	As above.
24	22	1190	Moderate	Day roost/ night roost/ maternity roost/ hibernation roost	Residential properties. Cut stone construct with timber and tile clad roof. No access.
26	129	193	Moderate	Day roost/ night roost/ maternity roost	Group of mature trees (mostly beech). No access at time of survey. Viewed from distance with binoculars and no obvious features noted but of age and size likely to support features of interest/ roost potential.

Source: Natural Power

6.4.22 There was one PRF within 275 m of a proposed turbine location that was recorded as having moderate roosting potential: a mature beech and oak woodland on a steep east facing slope, adjacent to the southeast corner of the site. This woodland is outside of the site boundary and was not able to be fully surveyed (surveyed at a distance using binoculars). No bat roost features were recorded, however the trees were considered to be of a size and age that was likely to support bats. This point location for the feature is 193 m from the nearest proposed turbine location (T4), however the southern edge of the woodland is 134 m from T5.

6.4.23 There were also three PRFs within 50 m of proposed tracks to be upgraded: two trees with low/negligible roosting potential and a group of brick buildings associated with telecommunications towers with low/moderate roosting potential. Additionally, residential properties with moderate roosting potential were within 50 m of the proposed cable route. There was no access to telecommunications buildings or residential properties for a full assessment, and access restrictions limited assessment of the two trees.

Bat Activity Surveys: Static Detectors

6.4.24 Static detectors were deployed in spring, early summer and autumn for 14-18 nights each deployment. Only nights on which suitable weather conditions (temperature 10°C or above at dusk; ground wind speed 5m/s or less; little to no rain) were recorded have been used as "effort". These dates have been included in Table 6.13.

Table 6.13: Static bat detector deployment dates

Survey	Deployment period	"Effort" dates	Number of nights of "effort"
1	15 May – 29 May	15-21; 25-28 May	11
2	1 July – 15 July	1-2; 5-9; 12-14 July	10
3	17 September – 5 October	17-22; 28-30 September	9

Source: Natural Power

6.4.25 A total of 31,346 bat passes were recorded, with the highest number of calls associated with common pipistrelle – see Table 6.14.

Table 6.14: Total number of bat passes recorded during the static detector survey by season

Species	Spring	Summer	Autumn*	Total
Myotis sp.	47	37	131	215
Leisler's bat	14	7	4	25
Noctule	328	109	30	467
Nyctalus sp.	11	21	1	33
Nathusius' pipistrelle	259	52	8	319
Common pipistrelle	10,034	11,632	7,199	28,865
Soprano pipistrelle	34	27	156	217
Pipistrellus sp.	683	271	176	1,130
Brown long-eared bat	20	11	22	53
Lesser horseshoe bat	3	3	12	18
Serotine bat	-	2	2	4
Total	11,433	12,172	7,741	31,346

**Autumn results do not include detector 6 due to a malfunctioning microphone during the autumn deployment.*

6.4.26 The habitat around the locations of detectors 2 and 5 was the most similar to the habitat surrounding the proposed turbine locations (in particular detector 5). The number of passes recorded at these locations was lower than average (9 % and 3 % of passes recorded during the survey period respectively). Detector location 6 recorded the highest number of passes (Table 6.15). This detector was located near the base of a mature beech tree on the edge of a small broadleaf woodland and there were no records from this detector during the autumn deployment due to a microphone malfunction. For assessment purposes it has been assumed that the level of activity during the autumn deployment was similar to that recorded during the spring deployment. Detectors 1 and 3 also showed a high number of bat passes compared with the other detectors, which is likely due to their location on woodland edges.

Table 6.15: Number of bat passes recorded during the static detector survey by detector. Bold shows detectors most representative of habitat around proposed turbine locations.

Species	1	2	3	4	5	6*
Myotis sp.	101	**17**	74	9	**7**	7
Leisler's bat	1	**1**	4	1	**2**	16
Noctule	127	**38**	99	41	**27**	135
Nyctalus sp.	2	**0**	5	1	**4**	21
Nathusius' pipistrelle	150	**14**	36	15	**1**	103
Common pipistrelle	8,020	**2,408**	8,253	688	**865**	8,631
Soprano pipistrelle	41	**87**	49	18	**14**	8
Pipistrellus sp.	326	**134**	310	83	**35**	242
Brown long-eared	20	**3**	13	9	**6**	2
Lesser horseshoe	1	**5**	9	0	**3**	0
Serotine bat	0	**0**	0	0	**3**	1
Total	8,789	**2,707**	9,122	865	**967**	9,166

**Detector 6 results do not include the autumn deployment due to a malfunctioning microphone during this deployment.*

6.4.27 Data was submitted to Ecobat to assess the relative activity of bats at the proposed development. This compares the results from the surveys conducted at Manmoel with results of other bat activity surveys within the local area. Following Ecobat guidance, the reference range dataset that was used for comparison included only records that had been submitted within a 30 day period around the survey data, and within 100 km of the site boundary using any make of bat detector. Ecobat guidance only recommends that the relative activity index is valid when there are more than 200 results to allow a comparison. Reference ranges for all seasons and species were above the recommended 200 results, with the exception of Nathusius' pipistrelle. Percentiles, confidence intervals and reference ranges provided by Ecobat of the three static detector deployments (spring, summer and autumn) are provided in Technical Appendix A6.1.

6.4.28 The relative activity indices are provided as both the maximum percentile and also the median level of activity per night (as per NatureScot guidance[19]). This takes into account the fact that specific detectors had different effort depending on the number of nights that they were operating. Full details of relative activity indices are provided in Technical Appendix A6.1.

6.4.29 Using information provided within NatureScot guidance[19], an overall risk assessment has been made in relation to the site and relative activity. The proposed development has been assessed as having a low (1) risk to bats as it is a small site (five turbines proposed with one wind development of three or more turbines[45] within 10 km (Pen Bryn Oer Wind Farm, consisting of three turbines, at a distance of 4 km from the proposed development) and has a low habitat risk, with only a small number of low-quality roosts nearby, low habitat quality for foraging and is isolated without any prominent linear features. This risk level of the site, combined with the level of bat activity identified from the percentile of relative activity provided in Ecobat provides a classification of overall risk to species or species group and is provided in Table 6.16 by season and Table 6.17 by detector. Additionally, the relative activity of bats at detector 6 during spring and summer deployments is provided in Table 6.18. As detector 6 did not work during the autumn deployment the assessment will assume autumn bat activity here was similar to that

[45] As per CIEEM guidance[3] relating to Cumulative Impact Assessment, any wind farm developments of fewer than three turbines were excluded due both to the lack of quantitative environmental information which usually exists in the public domain for such small-scale developments, and also due to the low likelihood that significant adverse effects would be predicted for them.

recorded during the spring deployment. The overall risk assessment was calculated based on criteria given in guidance[19] and is classed as low (green), medium (amber) and high (red).

No species was assessed as being at high risk for the proposed development.

Table 6.16: Ecobat relative activity and overall risk assessment by species for each season

	Spring		Summer		Autumn*		Combined	
Species	**Med**	**Max**	**Med**	**Max**	**Med**	**Max**	**Med**	**Max**
Myotis sp.	1 Low	3 Low	2 Low	3 Low	3 Low	4 Low	1 Low	5 Med
Leisler's bat	1 Low	3 Low	1 Low	2 Low	1 Low	2 Low	1 Low	3 Low
Noctule	2 Low	5 Med	2 Low	4 Low	1 Low	3 Low	2 Low	5 Med
Nathusius' pipistrelle	2 Low	5 Med	2 Low	4 Low	1 Low	2 Low	2 Low	5 Med
Common pipistrelle	5 Med	5 Med	5 Med	5 Med	5 Med	5 Med	5 Med	5 Med
Soprano pipistrelle	1 Low	3 Low	1 Low	3 Low	2 Low	5 Med	1 Low	5 Med
Brown long-eared	1 Low	3 Low	1 Low	2 Low	1 Low	3 Low	1 Low	3 Low
Lesser horseshoe	1 Low	1 Low	1 Low	2 Low	1 Low	2 Low	1 Low	2 Low
Serotine bat	-	-	1 Low	1 Low	1 Low	1 Low	1 Low	1 Low

**Autumn results do not include detector 6 due to a malfunctioning microphone during the autumn deployment.*
Source: Ecobat 2021

Table 6.17: Ecobat relative activity and overall risk assessment by species for detector. Bold shows detectors most representative of habitat around proposed turbine locations.

Detector	1		2		3		4		5		6*	
Species	**Med**	**Max**	**Med**	**Max**	**Med**	**Max**	**Med**	**Max**	**Med**	**Max**	**Med**	**Max**
Myotis sp.	2 Low	5 Med	**1 Low**	**3 Low**	3 Low	3 Low	1 Low	2 Low	**1 Low**	**2 Low**	1 Low	2 Low
Leisler's bat	1 Low	1 Low	**1 Low**	**1 Low**	1 Low	2 Low	1 Low	1 Low	**1 Low**	**1 Low**	1 Low	3 Low
Noctule	2 Low	5 Med	**1 Low**	**4 Low**	2 Low	5 Med	2 Low	3 Low	**1 Low**	**4 Low**	2 Low	4 Low
Nathusius' pipistrelle	3 Low	5 Med	**2 Low**	**2 Low**	2 Low	3 Low	2 Low	5 Med	**1 Low**	**1 Low**	2 Low	4 Low
Common pipistrelle	5 Med	5 Med	**4 Low**	**5 Med**	5 Med	5 Med	4 Low	5 Med	**4 Low**	**5 Med**	5 Med	5 Med
Soprano pipistrelle	2 Low	4 Low	**2 Low**	**5 Med**	2 Low	3 Low	1 Low	2 Low	**1 Low**	**2 Low**	1 Low	2 Low
Brown long-eared	1 Low	3 Low	**1 Low**	**1 Low**	1 Low	3 Low	2 Low	2 Low	**1 Low**	**2 Low**	1 Low	1 Low
Lesser horseshoe	1 Low	1 Low	**1 Low**	**2 Low**	1 Low	2 Low	**-**	**-**	**1 Low**	**1 Low**	-	-
Serotine bat	-	-	**-**	**-**	-	-	**-**	**-**	**1 Low**	**1 Low**	1 Low	1 Low

**Detector 6 results do not include the autumn deployment due to a malfunctioning microphone during this deployment.*
Source: Ecobat 2021

Table 6.18: Ecobat relative activity and overall risk assessment by species for each season at detector 6

Species	Spring		Summer	
	Med	**Max**	**Med**	**Max**
Myotis sp.	1 Low	2 Low	-	-
Leisler's bat	2 Low	3 Low	1 Low	2 Low
Noctule	3 Low	4 Low	1 Low	4 Low
Nathusius' pipistrelle	2 Low	4 Low	3 Low	4 Low
Common pipistrelle	5 Med	5 Med	5 Med	5 Med
Soprano pipistrelle	1 Low	2 Low	1 Low	2 Low
Brown long-eared	1 Low	1 Low	1 Low	1 Low
Serotine bat	-	-	1 Low	1 Low

Source: Ecobat 2021

6.4.30 To determine patterns of bat activity throughout the night and across the seasons the percentage of bat calls recorded around sunrise and sunset are shown in Appendix A6.1. Detectors 2, 4 and 6 had over 10% of bat calls recorded within 30 minutes of sunrise or sunset in at least one season (highest was detector 6 in the summer deployment at 37.2 % of calls being recorded within 30 minutes of sunrise or sunset). Additionally, a total of 352 bat passes were recorded before sunrise:

- Static Bat Detector Number 1: one noctule in autumn;
- Static Bat Detector Number 3: two common pipistrelle and one unidentified pipistrelle in summer and one noctule in autumn;
- Static Bat Detector Number 4: one common pipistrelle and two unidentified pipistrelle bats in spring, two common pipistrelle in summer and three common pipistrelle in autumn; and
- Static Bat Detector Number 6: 30 common pipistrelle and one noctule in spring, and 285 common pipistrelle, 22 unidentified pipistrelle and one Nathusius's pipistrelle in summer.

Badger

6.4.31 No badger setts or signs of badger were recorded during the dedicated survey or Extended Phase 1 habitat surveys.

Great Crested Newt

6.4.32 Six ponds were assessed in late May to early June 2020 for their suitability for great crested newt using the HSI[37] (see Table 6.19). The five shallow ponds on Manmoel Common (Ponds 1,2,4-6) have 'poor' suitability score (<0.5 HSI score) for great crested newt and were all completely dry at the time of survey. Pond 3 is a permanent water

body in St. James Wood (part of Scotch Peter's Pond SINC) and was assessed as having 'good' habitat suitability according to the HSI assessment.

Table 6.19: Great crested newt HSI scores for ponds surveyed (bold HSI score shows good habitat suitability)

Pond number	1	2	3	4	5	6
Grid reference	SO 16360 07234	SO 16535 05702	**SO 15624 09097**	SO 16745 06316	SO 16751 06269	SO 16685 06402
Nearest turbine	T1	T5	**T1**	T4	T4	T4
Distance from infrastructure (m)	0	332	**153**	0	0	66
HSI score	0.33	0.31	**0.72**	0.3	0.26	0.26

Source: Natural Power

6.4.33 Only Pond 3 was subject to eDNA analysis (samples collected 22 June 2020) for detecting presence of great crested newt as the other ponds were dry. The results of the eDNA analysis for this pond were negative.

6.5 ASSESSMENT OF POTENTIAL EFFECTS

6.5.1 The EcIA has been undertaken in accordance with CIEEM guidelines[3] with establishment of baseline ecological conditions within the area of the proposed development and identification of IEFs through a combination of ecological field surveys and a desk-based review. Each identified IEF is assessed separately, with consideration of impact extent, magnitude, duration, timing, frequency and reversibility, along with assessment of the level of confidence in the impact assessment for the determination of significance of effect.

Predicted Effects

6.5.2 Effects may arise for species and habitats at the proposed development via a number of mechanisms:

- Direct impacts associated with habitat loss and/or mortality;
- Direct impacts on protected species associated with resting place destruction;
- Indirect impacts on habitats and species associated with dust, siltation, leaks and spillages;
- Indirect impacts on protected species associated with disturbance; and
- Indirect impacts on species through pollution of habitats/watercourses affecting food sources.

6.5.3 Embedded mitigation measures are proposed at the outset of the proposed development, to reduce impacts associated with construction, operation and decommissioning, as outlined.

Embedded mitigation

6.5.4 During the design process, several aspects were taken into consideration in order to minimise the potential risk to species and habitats arising from the proposed development. See Chapter 4: Site Selection and Design Evolution for detail on the overall design process.

6.5.5 A minimum distance of 50 m has been maintained between the proposed development and watercourses, with the exception of locations where tracks cross watercourses. See Chapter 10: Hydrology, Geology and Hydrogeology for further information regarding watercourse crossings that will be designed to allow otter and fish passage.

6.5.6 The layout of the proposed development has avoided impacts to sensitive habitats where possible (e.g. wet heath), and areas of peat, taking into account other constraints. Where possible, infrastructure has been located on pre-existing tracks and footpaths in order to minimise impact. Where avoidance has not been possible, the infrastructure will be constructed in such a way as to maintain the integrity and connectivity of the hydrology of hydrologically sensitive habitats. Access tracks would be designed in keeping with NatureScot good practice guidance[20]. Further detail on hydrology is provided in Chapter 10: Hydrology, Geology and Hydrogeology.

6.5.7 All proposed turbine locations are over 100 m from key habitat features for bats (such as areas of woodland or scrub), which gives more than the 92 m buffer as set out in current NatureScot guidance[19]. This calculation is based on assumed candidate turbine dimensions set out in Chapter 5: Project Description. The required buffer distance of 92 m is estimated by the equation:

$$\sqrt{(50 + bl)^2 - (hh - fh)^2}$$

6.5.8 Where *bl* = blade length (75 m); *hh* = hub height (105 m); and *fh* = feature (tree) height, estimated here as 20 m.

Construction

6.5.9 A Construction and Environmental Management Plan (CEMP) and Constructions Methods Statement (CMS) will be produced prior to construction works commencing in consultation with the LPA (see Chapter 5: Project Description). The document will be a live document and will be updated throughout the pre-construction and construction and will:

- Include measures to safeguard habitats and species to be implemented prior to construction, during construction and post-construction; and
- Provide details of all pre-construction surveys required including methods and timings.

6.5.10 An Environmental Clerk of Works (ECoW) will be present during enabling works and throughout the construction period of the proposed development. They will be a suitably experienced individual, whose role would be to provide advice so that that works are carried out in accordance with environmental measures detailed in the CEMP, and to monitor compliance with relevant legislation and good practice (see Section 6.2 of this chapter). The ECoW would contribute to all relevant CMS and CEMP documents. Once work has commenced, their role will be to provide ecological and pollution control advice and monitor compliance of all relevant mitigation measures and legislation (see also Chapter 10: Hydrology, Geology and Hydrogeology). The ECoW will also give regular toolbox talks to make site personnel aware of the ecological sensitivities on site. The ECoW would have the authority to stop any construction activity that is having or likely to have a significant environmental impact or be in breach of legislation.

Habitats

6.5.11 Detailed mitigation measures will be provided in the CEMP for the protection of sensitive habitats during the pre-construction, construction and post-construction phases and will consist of:

- Toolbox talks to inform contractors of the sensitive habitats at the proposed development;
- Marking of sensitive areas of habitat close to construction areas, to prevent accidental encroachment;
- No storage of materials or machinery permitted within exclusion zones;
- Supervised vegetation clearance by the ECoW in sensitive areas prior to construction; and
- Construction phase control measures will continue during the operational phase, through the operational management plan, where potential effects exist.

6.5.12 Where possible (and where other constraints allow) an allowance of 50 m micrositing of infrastructure will be undertaken to ensure construction does not impact on the most sensitive habitats and any other identified ecological constraints and will be completed in consultation with the ECoW. This is particularly important when working in close proximity to waterbodies and sensitive habitats. Where micrositing cannot avoid areas of sensitive habitats or features, the ECoW would discuss and agree additional required mitigation to ensure impacts are minimised.

6.5.13 Any land degraded by construction and not required for the operation of the proposed development, such as the construction compound and around areas of tracks, would be restored as soon as possible after construction is completed. Turves would be carefully removed during construction as far as practicable and stored following good practice for re-use in the restoration of areas not required for the operation of the proposed development. As such, any vegetation removed for the construction phase would be reinstated within the area of the proposed development, facilitating natural re-colonisation of vegetation communities. Permanent habitat loss would be limited to that required for the footprint of infrastructure and good site management practices would be implemented to minimise the risk of encroachment of the construction corridor into adjacent habitats. As far as is reasonably practicable, any notable floral species encountered will be marked with an exclusion zone or translocated to other suitable areas of habitat or stored for reuse in reinstatement of temporary infrastructure. The implementation of these measures will reduce the potential for impacts on sensitive habitats.

6.5.14 Site activities have the potential to cause pollution through dust, siltation, leaks and spillages associated with plant and materials during the construction and operational phases. If such incidents were to occur then these pollutants may reach waterbodies and surrounding vegetation. Therefore, these activities may directly or indirectly affect habitats and species, especially where they are hydrologically connected.

6.5.15 Pollution incidents may occur during construction as well as within the operational phase during maintenance works. Pollution prevention measures will be detailed in the CEMP and overseen by the ECoW. Pollution with regards to waterbodies is further discussed in Chapter 10: Hydrology, Geology and Hydrogeology. Measures to control the impact of dust on sensitive habitats would be implemented during the preparation and construction phase. These measures will be adopted when necessary, in dry weather, in areas of active development, and will most likely involve the controlled dampening of tracks utilised by construction vehicles. Material for construction will be imported from local quarry sources, which will have similar chemical properties to stone found within the area of the proposed development to ensure no alteration in soil chemistry. Further detail on the mitigation of potential dust impacts will be detailed within the CEMP.

Watercourses

6.5.16 The pre-construction quality of watercourses and waterbodies would be maintained during construction (see Chapter 10: Hydrology, Geology and Hydrogeology). Watercourse protection measures would be adopted within the CMS/CEMP and include protection against siltation and sedimentation, and pollution incidents such as the implementation of a pollution response plan and the safe storage of chemicals in bunded containers. Robust mitigation measures will be installed prior to works commencing to ensure the impacts on watercourses are minimised. Mitigation throughout the proposed development will be regularly monitored and maintained/replaced as required. Refuelling of vehicles and machinery will be carried out at a central designated area, on an impermeable surface, located at least 50 m away from any watercourse. Monitoring of water quality would be carried out before and during construction. The implementation of these measures would ensure impacts on protected species, such as otter and fish species, are minimised.

GWDTE

6.5.17 Details of how impacts upon groundwater flow are minimised and mitigated are detailed in Chapter 10: Hydrology, Geology and Hydrogeology.

Protected Species

6.5.18 A Species Protection Plan (SPP) will be produced as part of the CEMP and agreed by consultees prior to the commencement of development, detailing measures to be implemented before and during construction to protect species present in the area of the proposed development. This will include good practice measures to prevent accidental mortality of protected species during construction, such as:

- A suitable vehicle speed limit to be enforced within the proposed development;
- Warning signs installed, where appropriate, to reduce risk of collision with protected species;
- Covering of deep excavations, foundations and pipe openings (or a ramp suitable to allow a mammal to escape installed) when not active to prevent entrapment of animals;
- Pre-construction surveys undertaken for protected species, including bats and badger within set buffer areas of the proposed development;
- If a potential resting place (e.g. bat roost) of a protected species is found within set buffer areas of construction then work will cease within appropriate (species-specific) buffers until it can be established whether it is in active use by a protected animal. If presence is confirmed, then NRW will be consulted to discuss possible mitigation measures and/or seek an appropriate licence;
- Lighting design will ensure watercourses and woodland remain unlit at night. Security lighting and lighting associated with the temporary compound will be low lux[46] and directed away from watercourses and woodland to reduce disturbance; and
- All site personnel will be made aware of the presence of protected species through toolbox talks.

Operation

6.5.19 With the exception of the operation of the wind turbines and general maintenance of the turbines, there will be little on-site activity during the operational phase.

6.5.20 Where potential effects exist, control measures will be incorporated into an Operational Environmental Management Plan (OEMP). In particular, the potential for pollution incidents during routine maintenance activities will be minimised by adoption of SEPA good practice guidance[47].

6.5.21 Any routine maintenance works will take place during the day where practicable to minimise the potential for disturbance to protected species within the proposed development (since these are mostly nocturnal/crepuscular) and a speed limit of 15 mph will be enforced for any vehicles going onto the proposed development, in order to reduce the risk of collision with protected species.

6.5.22 The OEMP will detail mitigation measures required during the operational phase relating to protected species to ensure ongoing compliance with relevant environmental legislation.

Decommissioning

6.5.23 Good practice measures as described in the construction stage will be followed including specific guidance for the restoration and decommissioning of wind farms (Welstead *et al.* 2013[48]). New guidance available at the

[46] A standardised unit of measurement of light level intensity (illuminance).

[47] SEPA, (2010). Engineering in the water environment: good practice guide - river crossings (2nd Edition), SEPA.

[48] Welstead, J., Hirst, R., Keogh, D., Robb G. and Bainsfair, R. (2013). Research and guidance on restoration and decommissioning of onshore wind farms. Scottish Natural Heritage Commissioned Report No. 591.

decommissioning phase would be adopted if appropriate, and a decommissioning plan will be drafted for agreement by consultees prior to commencement of decommissioning.

Feature Assessment

6.5.24 On the basis of the description of the ecological baseline and the definitions provided in Table 6.3 above, a summary of the habitats and species within the area of the proposed development is provided in Table 6.20, together with the legislation and guidance.

6.5.25 In identification of designated sites as IEFs, consideration has been given to the existence of pathways for effects to occur. This includes direct effects resulting from impacts on habitats and indirect effects resulting from impacts occurring on habitats that possess downstream hydrological connectivity. Where habitat mosaics have been identified by the baseline survey, the constituent Phase 1 habitat types are taken to be the relevant IEFs. Where no significant effects are likely with the application of embedded mitigation this is specified, and the feature is not considered an IEF requiring EcIA and will therefore not be discussed further in the chapter.

6.5.26 Aberbargoed Grasslands SAC and Coedydd Cwm Clydach SAC are both designated for terrestrial habitats (mainly deciduous woodland). Both sites are over 5 km away from the proposed development and are not hydrologically connected. Therefore, there is no route to impact on these sites (alone or cumulatively). Therefore, both sites are not considered as IEFs in the context of the proposed development and are not considered any further in this chapter.

6.5.27 A total of 64 SINCs lie within the search area (site boundary plus 2 km buffer). All SINCs are listed in the Technical Appendix A6.1 along with designated features and distance from the site boundary. SINCs lying within the site boundary, or immediately abutting it, shall be considered further as an IEF in Table 6.20, irrespective of the qualifying feature. Additionally, SINCs with habitats as a qualifying feature shall be considered if the SINC lies within 250 m of the site boundary; and SINCs with protected mammal species as a qualifying feature shall be considered if the SINC lies within 500 m of the site boundary.

6.5.28 Of these, there are six SINCs that lie within or immediately adjacent to the site boundary. These are:

- Mynydd Manmoel, north of Manmoel within CCBC; and
- Mynydd Manmoel;
- Land adjacent to Drysiog Farm;
- Garden City;
- South of Troedygwair; and
- Upper Troedrhiwgwair grasslands within BGCBC.

6.5.29 There are an additional five SINCs located within 250 m of the site boundary designated for habitat features. All are located within BGCBC. These are:

- Land Surrounding the Wetland Centre;
- St. James Reservoir;
- River Sirhowy;
- Scotch Peter's Pond; and
- Sirhowy Hill Woodlands and Cardiff Pond.

6.5.30 Apart from River Sirhowy SINC, there are no other SINCs with protected mammal species as a qualifying feature within 500 m of the site boundary.

6.5.31 Given the distance from the development activity to the other 53 SINCs listed in Appendix A6.1, the habitat features of the SINCs and lack of hydrological connectivity, it is considered that there is no route to impact for these 53 SINCs and so they are not considered to be IEFs in the context of the proposed development.

6.5.32 Reptiles and amphibians (including great crested newt) were scoped out of assessment as part of the scoping report and are therefore not discussed further. Additionally, dormouse, otter and water vole have been scoped out of the assessment as there is considered to be no suitable habitat for dormouse, otter or water vole within the site boundary. Furthermore, no hedgerows will be removed or trees felled as part of the construction of the proposed development; no water vole, otter or dormouse records were included in the SEWBReC data search within 5 km of the site boundary; and embedded mitigation measures, including protection of watercourses and pre-construction surveys, will be implemented during construction and operation to prevent a breach of legislation.

Table 6.20: Summary of designated sites, habitats and species and their conservation importance. IEFs are shown as bold

Feature	Covering legislation and guidance/conservation status	Geographical level of value	IEF	Rationale
Usk Bat Sites SAC	**SACs are statutory European protected sites designated under the Habitats Regulations. The listed habitat types and species are those considered to be most in need of conservation at a European level (excluding birds that are covered under SPAs and assessed in Chapter 7: Ornithology).**	**International**	**Yes**	**Usk Bat Sites SAC is located 4.2 km northeast of the site boundary and is designated for lesser horseshoe bats. Lesser horseshoe bats were recorded during static bat detector surveys at detector numbers 1-3 and 5, though in very low numbers compared with other bat species recorded at the proposed development (18 passes of lesser horseshoe out of a total of 31,346 identified calls in total). As these bats may be connected to the Usk Bat Sites SAC it is proposed that this statutory site is considered as an IEF in the context of the proposed development as there is potential for Likely Significant Effect on the features of this site. Therefore the site will be taken forward for Screening for Appropriate Assessment (AA) (see Section 6.9).**
Mynydd Llangatwg SSSI	**A SSSI is an area that has been notified as being of special interest due to its flora, fauna or geological or physiographical**	**National**	**Yes**	**Mynydd Llangatwg SSSI is located 4.2 km northeast of the site boundary. It is a very diverse large site with habitats of special interest including base-rich grassland, heather dominated blanket mire and dry heath. Below the surface lies an extensive and important cave system of special interest for providing a winter hibernation site for large numbers of lesser horseshoe bats and other bat species. Given**

Feature	Covering legislation and guidance/conservation status	Geographical level of value	IEF	Rationale
	features under the Wildlife and Countryside Act 1981 (as amended).			**the distance from the development activity to the SSSI, and the lack of hydrological connectivity, it is considered that there is no route to impact the terrestrial habitat features of the SSSI. As these bats may be connected to the SSSI it is considered to be an IEF in the context of the proposed development.**
Sirhowy Hill Woodlands and Cardiff Pond LNR/SINC	LNR are established and managed by local authorities, following consultation with NRW under the National Parks and Access to the Countryside Act 1949. They have natural features of special interest to the local area, and the authority must either have a legal interest in the land or have an agreement with the owner to manage the land as a reserve. SINCs represent the most important places for wildlife outside legally designated sites, and their importance and significance is in the linkages they provide in a local context between internationally and nationally designated sites supporting and re-enforcing the features of statutory designated sites.	Regional	No	Although Sirhowy Hill Woodlands and Cardiff Pond LNR/SINC lies close to the site boundary, with the embedded mitigation measures described in Section 6.5 it is considered unlikely that the development shall have a significant effect on the integrity of the LNR/SINC. The LNR is located 154 m from the existing access track to be upgraded, and over 2 km from the nearest turbine. There are no works proposed that would be considered to impact on the woodland, and there are no hydrological connections to the pond. Therefore, Sirhowy Hill Woodlands and Cardiff Pond LNR/SINC shall not be considered as an IEF in the context of the proposed development.
Mynydd Manmoel SINC	**SINCs represent the most important places for wildlife outside legally designated sites, and their importance and significance is in the linkages they provide in a local context between internationally and nationally designated sites supporting and re-enforcing the features of statutory designated sites.**	**Regional**	**Yes**	**The SINC encompasses the semi-natural upland features that lie within the site boundary, including a mosaic of acid grassland, heath and mire communities. Communities included in the site description are dry heath NVC communities H12 and H18, mire communities M6c and acid grassland communities U4 and U5. Infrastructure for the proposed development will overlap with acid grassland and heath habitats that make up parts of this SINC (mire communities will not be impacted). This site is therefore considered to be an IEF in the context of the proposed development.**
Mynydd Manmoel, north of Manmoel SINC	**SINCs represent the most important places for wildlife outside legally designated sites, and their importance and significance is in the linkages they provide in a local context between internationally and nationally designated sites supporting and re-enforcing the features of statutory designated sites.**	**Regional**	**Yes**	**The SINC encompasses the semi-natural upland features that lie within the site boundary, including acid grassland and heath. Infrastructure for the proposed development will overlap with acid grassland and heath habitats that make up parts of this SINC. This site is therefore considered to be an IEF in the context of the proposed development.**
Land adjacent to Drysiog Farm SINC	SINCs represent the most important places for wildlife outside legally designated sites, and their importance and significance is in the linkages they provide in a local context between internationally and nationally designated sites supporting and re-enforcing the features of statutory designated sites.	Regional	No	The SINC is adjacent to the site boundary and supports semi-improved grassland habitats with ant hills and areas of mature hawthorn and acid flush. No habitat within the SINC will be directly impacted by the proposed development. The proposed cable route is 200 m from the SINC, therefore there is potential for an indirect impact from dust created during construction works, or from accidental pollution. A pollution prevention plan and measures to control dust will be included in the CEMP and monitored by the ECoW, and it is considered that this embedded mitigation is sufficient to prevent negative effects to the habitats for which the site was classified. Therefore, this SINC is not considered to be an IEF in the context of the proposed development.

Feature	Covering legislation and guidance/conservation status	Geographical level of value	IEF	Rationale
Garden City SINC	SINCs represent the most important places for wildlife outside legally designated sites, and their importance and significance is in the linkages they provide in a local context between internationally and nationally designated sites supporting and re-enforcing the features of statutory designated sites.	Regional	No	The SINC is adjacent to the site boundary and is reclaimed land from the coal mining industry. Most of the site has been planted with a mixture of native and non-native tree species. The main botanical interest comprises dry heathland and mire communities and together with the acid grassland present within these habitats qualify the site for local wildlife site (SINC) status. No habitat within the SINC will be directly impacted by the proposed development. The proposed cable route (where the cables will be buried in an existing track) is 2 m from the SINC at its nearest point, however the habitat adjacent to the site boundary in that area is mixed woodland, which is not a qualifying feature of the SINC. From aerial imagery it appears that the nearest open habitats are 5 m from the proposed cable route. Therefore, there is potential for an indirect impact from dust created during construction works, or from accidental pollution. The proposed cable route will be buried under an existing track, meaning that any impact will be minimal and is considered unlikely to result in a significant effect. Furthermore, a pollution prevention plan and measures to control dust will be included in the CEMP and monitored by the ECoW, and it is considered that this embedded mitigation is sufficient to prevent significant negative effects to the habitats for which the site was classified. Therefore, this SINC is not considered to be an IEF in the context of the proposed development.
Upper Troedrhiwgwair Grasslands SINC	SINCs represent the most important places for wildlife outside legally designated sites, and their importance and significance is in the linkages they provide in a local context between internationally and nationally designated sites supporting and re-enforcing the features of statutory designated sites.	Regional	No	The SINC is adjacent to the site boundary and is designated for semi-improved grassland habitats characteristic of the U4 NVC community. No habitat within the SINC will be directly impacted by the proposed development. The proposed upgraded access track is adjacent to the SINC, therefore there is potential for an indirect impact from dust created during construction works, or from accidental pollution. The proposed track is an upgrade of Manmoel Road, meaning that any impact will be minimal and is considered unlikely to result in a significant effect. Furthermore, a pollution prevention plan and measures to control dust will be included in the CEMP and monitored by the ECoW, and it is considered that this embedded mitigation is sufficient to prevent negative effects to the habitats for which the site was classified. Additionally, the level of traffic using the access road during all phases of the proposed development will not be sufficient to result in significant levels of air pollution. Therefore, this SINC is not considered to be an IEF in the context of the proposed development.
South of Troedygwair SINC	SINCs represent the most important places for wildlife outside legally designated sites, and their importance and significance is in the linkages they provide in a local context between internationally and nationally designated sites supporting and re-enforcing the features of statutory designated sites.	Regional	No	The SINC is adjacent to the site boundary and is designated for semi-improved grassland habitats characteristic of the U4 NVC community. No habitat within the SINC will be directly impacted by the proposed development. The SINC is located over 400 m downhill from proposed infrastructure. It is therefore considered that there is small potential for an indirect impact from accidental pollution during construction works due to the site being downhill of the proposed development. A pollution prevention plan will be included in the CEMP and monitored by the ECoW, and it is considered that this embedded mitigation is sufficient to prevent negative effects to the habitats for which the site was classified. Additionally, the level of traffic using the access road during all phases of the proposed development will not be sufficient to result in significant levels of air pollution. Therefore, this SINC is not considered to be an IEF in the context of the proposed development.
Land surrounding the Wetland Centre SINC	SINCs represent the most important places for wildlife outside legally designated sites, and their importance and significance is in the linkages they provide in a local context between internationally and nationally designated sites supporting and re-enforcing the features of statutory designated sites.	Regional	No	The SINC is within 250 m of the site boundary. The main feature of the site is a large lake, with other features including broadleaved woodland/plantation, unmanaged semi improved neutral/poor grassland, scrub and strip of alder and willow. No habitat within the SINC will be directly impacted by the proposed development. The SINC is located over 350 m downhill from proposed infrastructure. It is therefore considered that there is small potential for an indirect impact from accidental pollution during construction works due to the site being downhill of the proposed development. A pollution prevention plan will be included in the CEMP and monitored by the ECoW, and it is considered that this embedded mitigation is sufficient to prevent negative effects to the habitats for which the site was classified. Additionally, the level of traffic using the access road during all phases of the proposed development will not be sufficient to result in significant levels of air pollution. Therefore, this SINC is not considered to be an IEF in the context of the proposed development.
St. James Reservoir SINC	SINCs represent the most important places for wildlife outside legally designated sites, and their importance and significance is in the linkages they provide in a local context between internationally and nationally designated sites supporting and re-enforcing the features of statutory designated sites.	Regional	No	The SINC is within 250 m of the site boundary. The main feature of the site is a large reservoir. Other features include a transitional area with some water margin vegetation, heath/grassland (acidic), wet woodland, pine plantation, species rich grassland and a small area of marshy grassland. No habitat within the SINC will be directly impacted by the proposed development. The SINC is located over 500 m downhill from proposed infrastructure and is likely to be hydrologically connected to the site boundary. It is therefore considered that there is small potential for an indirect impact from accidental pollution during construction works due to the site being downhill of the proposed development. A pollution prevention plan will be included in the CEMP and monitored by the ECoW, and it is considered that this embedded mitigation is sufficient to prevent negative effects to the habitats for which the site was classified. Additionally, the level of traffic using the access road during all phases of the proposed

Feature	Covering legislation and guidance/conservation status	Geographical level of value	IEF	Rationale
				development will not be sufficient to result in significant levels of air pollution. Therefore, this SINC is not considered to be an IEF in the context of the proposed development.
Sirhowy River SINC	SINCs represent the most important places for wildlife outside legally designated sites, and their importance and significance is in the linkages they provide in a local context between internationally and nationally designated sites supporting and re-enforcing the features of statutory designated sites.	Regional	No	The SINC is within 250 m of the site boundary. The SINC is designated for resident populations of sea/river/brook lamprey, sturgeon, allis/twaite shad, Atlantic salmon, grayling, common goby, bullhead, bleak, smelt, brown trout or sea trout. Other features include possibly breeding otter, river features and adjacent semi-natural wetland, grassland and woodland habitats. No habitat within the SINC will be directly impacted by the proposed development. The SINC is located over 700 m away from proposed infrastructure, but is downhill from the proposed development and is therefore likely to be hydrologically connected to the site boundary. It is therefore considered that there is small potential for an indirect impact from accidental pollution during construction works due to the site being downhill of the proposed development. A pollution prevention plan will be included in the CEMP and monitored by the ECoW, and it is considered that this embedded mitigation is sufficient to prevent negative effects to the habitats for which the site was classified. Additionally, the level of traffic using the access road during all phases of the proposed development will not be sufficient to result in significant levels of air pollution. Therefore, this SINC is not considered to be an IEF in the context of the proposed development.
Scotch Peter's Pond SINC	SINCs represent the most important places for wildlife outside legally designated sites, and their importance and significance is in the linkages they provide in a local context between internationally and nationally designated sites supporting and re-enforcing the features of statutory designated sites.	Regional	No	The SINC is within 250 m of the site boundary. The main feature of the site is a large pond located in the forestry block of St. Peter's Reservoir. Other features include acid grassland and dry heath. No habitat within the SINC will be directly impacted by the proposed development. The SINC is located over 131 m from the proposed upgraded access track, therefore there is potential for an indirect impact from dust created during construction works, or from accidental pollution. The proposed track is an upgrade of Manmoel Road, meaning that any impact will be minimal and is considered unlikely to result in a significant effect. Furthermore, a pollution prevention plan and measures to control dust will be included in the CEMP and monitored by the ECoW, and it is considered that this embedded mitigation is sufficient to prevent negative effects to the habitats for which the site was classified. Additionally, the level of traffic using the access road during all phases of the proposed development will not be sufficient to result in significant levels of air pollution. It is therefore predicted that there will be no indirect impacts to the SINC. Therefore, this SINC is not considered to be an IEF in the context of the proposed development.
Semi-natural broadleaved woodland	Section 7; Blaenau Gwent LBAP; Caerphilly LBAP	Local	No	Only one small area of semi-natural broadleaved woodland is present within the southeastern section of the site boundary, which is located over 100 m from proposed infrastructure. There is the potential for an indirect impact from dust created during construction works, or from accidental pollution. A pollution prevention plan and measures to control dust will be included in the CEMP and monitored by the ECoW, and so it is considered that embedded mitigation is sufficient to prevent adverse effects to this habitat. Therefore, this habitat is not considered to be an IEF in the context of the proposed development.
Coniferous/mixed plantation woodland including felling	Caerphilly LBAP	Negligible	No	None of this habitat is present within the site boundary (only present within the 250 m buffer of the site boundary). A pollution prevention plan and measures to control dust will be included in the CEMP and monitored by the ECoW, and so it is considered that embedded mitigation is sufficient to prevent adverse indirect effects to this habitat. This habitat is therefore not considered to be an IEF in the context of the proposed development.
Scrub	NA	Negligible	No	None of this habitat is present within the site boundary (only present within the 250 m buffer of the site boundary). A pollution prevention plan and measures to control dust will be included in the CEMP and monitored by the ECoW, and so it is considered that embedded mitigation is sufficient to prevent adverse indirect effects to this habitat. This habitat is therefore not considered to be an IEF in the context of the proposed development.
Improved grassland	NA	Negligible	No	The habitat in the site boundary holds little to no conservation interest and is widespread throughout Wales. This habitat is therefore not considered to be an IEF in the context of the proposed development.
Unimproved acid grassland	Section 7; Blaenau Gwent LBAP; Caerphilly LBAP. Only where classed as Lowland dry acid grassland	Negligible	No	This habitat covers 21% of the total area within the site boundary. Some of this habitat will be lost as part of the proposed development (0.56 ha/1.27% of habitat within site boundary). As the proposed development is situated in an upland context above 300 m AOD, none of this habitat is classified as priority habitat lowland acid grassland. Furthermore, infrastructure for the proposed development will mostly follow existing tracks and footpaths and hence, very little of this habitat will be lost. Effects resulting from indirect impacts from dust created during construction works, or from accidental pollution will be avoided through implementation of a pollution prevention plan and measures to control dust, which will be included in the CEMP and monitored by the ECoW. It is considered that embedded mitigation is sufficient to prevent negative effects to this habitat as a result of

Feature	Covering legislation and guidance/conservation status	Geographical level of value	IEF	Rationale
				these indirect impacts. Given the relatively small area of habitat loss from the proposed development, which is considered to be not significant, unimproved acid grassland is not considered to be an IEF in the context of the proposed development.
Semi-improved acid grassland	NA	Negligible	No	The habitat in the site boundary holds little to no conservation interest and is widespread throughout Wales. This habitat is therefore not considered to be an IEF in the context of the proposed development.
Unimproved neutral grassland	Section 7; Blaenau Gwent LBAP; Caerphilly LBAP	Negligible	No	None of this habitat is present within the site boundary (only present within the 250 m buffer of the site boundary). A pollution prevention plan and measures to control dust will be included in the CEMP and monitored by the ECoW, and so it is considered that embedded mitigation is sufficient to prevent adverse indirect effects to this habitat. This habitat is therefore not considered to be an IEF in the context of the proposed development.
Marshy grassland	Section 7; GWDTE; Blaenau Gwent LBAP; Caerphilly LBAP	Local	No	This habitat covers 6.63 % of the total area within the site boundary. A very small amount of this habitat will be lost as part of the Proposed development (0.06 ha / 0.47% of habitat within site boundary). The CEMP will include provision for micrositing (50 m allowance) of infrastructure where possible to ensure construction does not impact on the most sensitive areas of this habitat. Effects resulting from indirect impacts from dust created during construction works, or from accidental pollution will be avoided through implementation of a pollution prevention plan and measures to control dust will be included in the CEMP and monitored by the ECoW. Therefore, it is considered that embedded mitigation is sufficient to prevent adverse effects to this habitat and as such, no significant effects of the proposed development on the integrity of this feature are likely. Therefore, this habitat is not considered to be an IEF in the context of the proposed development. NVC habitats M23 have high potential to be a GWDTE with M25 and MG10 moderate potential. Given that some infrastructure will be located within 250 m of these habitats, the proposed development could have an impact on the hydrology of this habitat. Further discussion of GWDTEs is presented in Chapter 10: Hydrology, Geology and Hydrogeology.
Bracken	NA	Negligible	No	The habitat in the site boundary holds little to no conservation interest and is widespread throughout Wales. Furthermore, none of this habitat will be lost to the proposed development. This habitat is therefore not considered to be an IEF in the context of the proposed development.
Tall ruderal	NA	Negligible	No	None of this habitat is present within the site boundary (only present within the 250 m buffer of the site boundary). This habitat is dominated by the non-native rosebay willowherb. The habitat in the site boundary therefore holds little to no conservation interest and is widespread throughout Wales. This habitat is therefore not considered to be an IEF in the context of the proposed development.
Dry heath and dry heath/acid grassland mosaic	**Annex 1 of Habitat's Directive; Section 7; Blaenau Gwent LBAP; Caerphilly LBAP**	**Regional**	**Yes**	**This habitat covers 56.15% of the total area within the survey area. Some of this habitat will be permanently lost as part of the proposed development (2.15 ha/1.86% of dry heath habitat within site boundary). Dry heath is a priority habitat on Annex 1 and Section 7. The dry heath found within the site boundary represents 0.14 % of the upland heath present in the BGCBC Area (1560 ha[49]) and is a designated feature of both Mynyyd Manmoel and Mynydd Manmoel, North of Manmoel SINCs so as such, dry heath at the proposed development is considered to be of regional value. This habitat is therefore considered to be an IEF in the context of the proposed development due to the high conservation value and the amount of habitat loss.**
Wet heath and wet heath/acid grassland mosaic	Annex 1 of Habitat's Directive; Section 7; Blaenau Gwent LBAP; Caerphilly LBAP	Local	No	This habitat covers 2.5% of the total area within the site boundary. A very small amount of this habitat will be lost as part of the proposed development (0.02 ha/0.29% of habitat within site boundary). Wet heath is a priority habitat on Annex 1 and Section 7. The wet heath found within the site boundary represents less than 0.01% of the upland heath present in the BGCBC Area (1560 ha), and as such wet heath at the proposed development is considered to be of only local value as the extent within the site boundary is limited. The CEMP will include provision for micrositing (50 m allowance) of infrastructure where possible to ensure construction does not impact on the most sensitive areas of this habitat. Effects resulting from indirect impacts from dust created during construction works, or from accidental pollution will be avoided through implementation of a pollution prevention plan and measures to control dust will be included in the CEMP and monitored by the ECoW. Therefore, it is considered that embedded mitigation is sufficient to prevent adverse effects to this habitat arising from construction. As only a very small value of this habitat will be lost to the proposed development and indirect impacts are able to be fully mitigated, the habitat is not considered to be an IEF in the context of the proposed development.
Acid flush	Section 7; GWDTE; Blaenau Gwent LBAP; Caerphilly LBAP	Local	No	None of this habitat is present within the site boundary (only present within the 250 m buffer of the site boundary). A pollution prevention plan and measures to control dust will be included in the CEMP and monitored by the ECoW, and so it is considered that embedded mitigation is sufficient to prevent adverse indirect effects to this habitat. This habitat is therefore not considered to be an IEF in the context of the proposed development.

[49] Blaenau Gwent County Borough Council (2010) Blaenau Gwent Local Biodiversity Action Plan. Available from: https://www.blaenau-gwent.gov.uk/media/wbxbzehr/sd115.pdf [Accessed 27/02/2023]

Feature	Covering legislation and guidance/conservation status	Geographical level of value	IEF	Rationale
Pond	Section 7; Blaenau Gwent LBAP; Caerphilly LBAP	Local	No	None of this habitat is present within the site boundary (only present within the 250 m buffer of the site boundary). A pollution prevention plan and measures to control dust will be included in the CEMP and monitored by the ECoW, and so it is considered that embedded mitigation is sufficient to prevent adverse indirect effects to this habitat. This habitat is therefore not considered to be an IEF in the context of the proposed development.
Bats (all)	**Conservation Regulations; Wildlife and Countryside Act; Section 7; Blaenau Gwent LBAP; Caerphilly LBAP**	**Local**	**Yes**	**Potential bat roosts ranging from low to moderate suitability were identified within the site boundary which included mature trees, buildings and stone walls, one of which was located within 200 m of a proposed turbine location. The overall collision risk for bats at the proposed development is considered to be low, with some common species that are vulnerable to wind turbines having a moderate collision risk (such as common pipistrelle). Three species recorded during surveys (Nathusius's pipistrelle, Leisler's and Serotine bats) are considered to be rare in Wales. A low collision risk was predicted for all three species. All other species recorded were common and widespread and known to occur throughout Wales. The proposed development is therefore considered of local conservation importance for all occurring species of bats.** **Due to the proximity of the proposed development to potential bat roosts, the activity level of bat species within the site boundary and the rarity of some bat species recorded, the proposed development has potential to cause a significant effect on bats. Therefore, they are considered to be an IEF in the context of the proposed development.**
Badger	Protection of Badgers Act; Blaenau Gwent LBAP; Caerphilly LBAP	Negligible	No	No badger signs or setts were recorded within the site boundary. As there is some suitable habitat within the site boundary it is possible that badgers may move into the area prior to construction taking place. However, embedded mitigation outlined in Section 6.5, including a CEMP and SPP, will ensure no breach of legislation relating to this species. Therefore, badger are not considered to be an IEF in the context of the proposed development.

Source: Natural Power

Impact Assessment

6.5.33 Six features have been identified as IEFs, requiring EcIA following the application of embedded mitigation (see Paragraphs 6.5.3 to 6.5.23). These are:

- Usk Bat Sites SAC;
- Mynydd Llangatwg SSSI;
- Mynydd Manmoel SINC;
- Mynydd Manmoel, North Manmoel SINC;
- Dry heath habitats; and
- Bats.

6.5.34 Screening for Appropriate Assessment (AA) for Usk Bat Sites SAC is provided in Section 6.9. An assessment of impacts of the proposed development on the remaining IEFs is provided below.

Mynydd Llangatwg SSSI

6.5.35 Mynydd Llangatwg SSSI is located 5.9 km from the nearest proposed turbine. The cave system of Mynydd Llangatwg provides a winter hibernation site for large numbers of lesser horseshoe bats and other bat species, including Brandt's, whiskered, Daubenton's, Natterer's, brown long-eared and, occasionally, greater horseshoe bats. Numbers of roosting bats at the site, particularly lesser horseshoes, are stable or increasing in the system as a whole[50]. The cave system is one of the five most important hibernation sites for lesser horseshoe bats in the UK, and this species is the only species of bat listed on the SSSI citation.

6.5.36 Lesser horseshoe, *Myotis* sp. (including Brandt's, whiskered, Daubenton's and Natterer's bats) and brown long-eared bats were recorded during baseline surveys in low numbers. It is therefore possible that some bats connected with the SSSI may use the site boundary occasionally.

6.5.37 Greater horseshoe bats were not recorded during the baseline surveys. There is therefore no evidence of connectivity between the SSSI and the proposed development for this species.

6.5.38 Lesser horseshoe bats will forage during winter hibernation periods. During this time, the core foraging range is 1.2 km from the hibernation site (reduced from a core foraging range of 2 km from summer roosts). As the site boundary is over 4 km from the SSSI, none of the proposed development is located within the core foraging range of lesser horseshoe bats. Furthermore, due to the flight heights and behaviours of lesser horseshoe bats they are considered to have a low collision risk and a low population vulnerability[19]. It is therefore considered that hibernating bats associated with the SSSI will not be impacted by the proposed development.

6.5.39 Summer roosts (in particular maternity roosts) are usually in larger and older rural houses and stable blocks, most often in the roof spaces, or in heated cellars. No such locations were recorded during the bat roost assessment and PRFs were assessed as having low or moderate suitability for roosting bats (with some having negligible suitability). It is therefore not considered likely that bats associated with the SSSI use the recorded PRFs in a significant capacity. Furthermore, the closest lesser horseshoe bat roost record in the desk study is 3.4 km from the site boundary. It is therefore considered that there are no features within the site boundary or the nearby area with potential for significant lesser horseshoe bat roosts.

6.5.40 It is considered that the proposed development (during construction/decommissioning and operation) will have a **negligible** impact and **not significant** effect on lesser horseshoe bats associated with Mynydd Llangatwg SSSI because there are considered to be no significant lesser horseshoe bat roosts within the site boundary or the

[50] Countryside Council for Wales (2008) Core Management Plan (including conservation objectives) for Mynydd Llangatwg SSSI, Siambre Ddu SSSI, Buckland Coach House and Ice House SSSI and Foxwood SSSI, which together comprise Usk Bat Sites SAC.

nearby area; the proposed development is outside of the core foraging distance from the SSSI; and lesser horseshoe bats have a low population vulnerability to wind turbines.

Mynydd Manmoel SINC

Construction

6.5.41 The proposed development is located within Mynydd Manmoel SINC, with most infrastructure planned within the boundaries of the SINC. Therefore, the principal impact of the proposed development to Mynyndd Manmoel SINC is via permanent loss of habitat. The site is described as a mosaic of acid grassland, heath and mire communities. Habitats of particular importance are dry heath (NVC communities H12 and H18), flush habitats (M6c) and acid grassland communities (U4 and U5).

6.5.42 Habitats included in the description of the SINC on which infrastructure is proposed are dry and acid grassland. The habitat survey area undertaken as part of this assessment included 200.44 ha of the 215.69 ha Mynydd Manmoel SINC. Table 6.21 presents the areas of each SINC designated habitat where surveys were undertaken within Mynydd Manmoel SINC. In addition, this table shows the percentage temporary and permanent habitat loss in various values, as a percentage of SINC designated habitats surveyed, of all habitats surveyed within the SINC, and in the whole area of the SINC.

6.5.43 The majority of the non-mosaic acid grassland habitat that will be lost to the proposed development was defined as being semi-improved. Areas of semi-improved acid grassland were located on paths within the SINC as infrastructure has been located on pre-existing tracks and footpaths in order to minimise impact on more sensitive habitats. Therefore, these habitats are not considered to represent the acid grassland habitats described in the SINC designation. As the only semi-improved grassland habitats recorded within the site boundary were found along footpaths it is assumed that the acid grassland habitats within the dry heath/acid grassland mosaic are unimproved acid grassland.

Table 6.21: Area of designated habitats found within Mynydd Manmoel SINC†

Habitat	Surveyed Area within SINC (ha)	Habitat permanently lost to proposed development		Habitat temporarily lost to proposed development	
		Area in SINC (ha)	% habitat in SINC	Area in SINC (ha)	% habitat in SINC
Semi-improved acid grassland**	10.65		0.44		4.98
Unimproved acid grassland	49.96		0.56		1.64
Dry heath	28.34		0.29		1.27
Dry heath/acid grassland mosaic	60.38		1.70		2.49
					8.92
Total of SINC designated habitats	**149.33**		**2.55**		**14.71**
Total of all habitats surveyed located in SINC	**200.44**		**5.10**		**27.54**
Total SINC area	**215.69**		**2.55***		**14.18**

†All values in this table have been rounded to two decimal places. However, percentages are based on full area values and therefore calculations using area values shown may not entirely match those shown above.

*Includes all habitats within the boundary of the SINC, not just those that are listed on the SINC description.
**Not included in calculations as semi-improved acid grassland is not considered to represent acid grassland habitats described in the SINC designation.

*** Includes only SINC designated habitats

6.5.44 The total temporary habitat loss of all habitat within the SINC is 7.13 ha (3.31 % of the total area of the SINC), however of this, the total temporary loss of habitats as described in the SINC designation is 4.14 ha (1.92 % of the total area of the SINC). As dry heath and acid grassland habitats are considered to restore well after reinstatement of temporary infrastructure this temporary habitat loss is considered to be short-term and reversible.

6.5.45 The total permanent habitat loss within the SINC is 5.10 ha (2.36 % of the total area of the SINC), however the total habitat loss for habitats described in the SINC designation is 2.55 ha (1.18 % of the total area of the SINC). Dry heath communities that will be lost to the proposed development are H12 and H18. Areas of H18 were characterised by a lack of heather and a dominance of bilberry, which is considered likely to be a result of historic burning and grazing that has resulted in a degraded heath. The majority of the dry heath habitat that will be lost to the proposed development was recorded as the degraded H18 community.

6.5.46 As described in Paragraph 6.5.43, the layout of the proposed development has used existing tracks or targeted habitats of low conservation value (such as semi-improved grassland) where possible, taking into account other constraints (for more information see Chapter 4: Site Selection and Design Evolution and Chapter 15: Existing Infrastructure). As such, dry heath and unimproved acid grassland habitat loss has been kept to a minimum as part of the design process and most dry heath habitat loss is comprised of a degraded form of the habitat. Furthermore, acid grassland habitats within the site boundary are not considered to be Blaenau Gwent LBAP or Section 7 priority habitats as they are all upland acid grassland (over 300 m AOD) rather than lowland acid

grassland, as stipulated in Section 7 and the LBAP. The majority of habitat loss will be acid grassland rather than dry heath, meaning that priority habitats have been avoided as far as possible.

6.5.47 Based on the above information, it is considered that the proposed development will have a **moderate negative** impact that will not affect the integrity of habitats found within Mynydd Manmoel SINC. The effect on the SINC will be **not significant**.

6.5.48 Construction activities have the potential to degrade or destroy dry heath and acid grassland habitats directly through excavation, compaction, or modification (e.g. vegetation removal) and indirectly as a result of dewatering or from the accidental release of fuels, lubricants or other chemicals. In addition, dust particles have the potential to interfere with sensitive plants. However, any of these described impacts would be temporary and reversible. Furthermore, application of embedded mitigation measures such as a pollution prevention plan and measures to control dust will be included in the CEMP and monitored by the ECoW. Accordingly, with these measures in place, impacts on the integrity of habitats within the Mynydd Manmoel SINC are considered to be **minor negative** resulting in effects that are **not significant**.

Operation

6.5.49 Operational impacts will be limited to a low risk of minor pollution events through vehicular activity and turbine maintenance on site. However, embedded mitigation measures such as the implementation of an OEMP including pollution prevention and control measures are proposed. It is therefore considered that operational activities will have a **negligible** impact on Mynydd Manmoel SINC, resulting in an effect that is **not significant**.

6.5.50 An outline Ecological Management Plan (EMP) has been provided in Appendix A6.6 and includes measures to mitigate for impacts on dry heath and acid grassland. This comprises restoration of dry heath habitats, resulting in an overall net increase of dry heath and acid grassland habitats (those considered to be impacted within the SINC by the proposed development), and reversing some of the baseline modification which may be expected to continue in the absence of the proposed development.

6.5.51 As such, the proposed development is considered likely to have a minor beneficial impact and not significant effect on Mynydd Manmoel SINC.

Mynydd Manmoel, North of Manmoel SINC

Construction

6.5.52 Some of the proposed development is located within Mynydd Manmoel, North of Manmoel SINC, with a small section of track planned within the boundaries of the SINC. The site is designated for semi-natural upland acid grassland / heath with at least seven indicator species.

6.5.53 The habitat survey area undertaken as part of this assessment included 52.91 ha of the 152.84 ha Mynydd Manmoel, North of Manmoel SINC. Table 6.22 presents the areas of each SINC designated habitat where surveys were undertaken within the SINC. In addition, this table shows the percentage permanent habitat loss in various values, as a percentage of SINC designated habitats surveyed, of all habitats surveyed within the SINC, and in the whole area of the SINC. No temporary habitat loss is anticipated as part of the proposed development.

Table 6.22: Designated habitats found within Mynydd Manmoel, North of Manmoel SINC permanently lost to the proposed development

Phase 1 Habitat	Surveyed Area within SINC (ha)	Area lost to proposed development (ha)	% surveyed habitat in SINC lost
Semi-improved acid grassland	3.59	0.18	4.90
Dry heath	15.46	0.12	0.77
Dry heath/acid grassland mosaic	23.57	0.05	0.20
Total of all habitats surveyed located in SINC	**52.91**	**0.68**	**1.29**
Total SINC habitat	**152.84***	**0.35**	**0.23****

**Consists of the total area of the SINC and includes unsurveyed habitats and habitats that will not be impacted by the proposed development.*
***Percentage of the total area of the SINC lost to the proposed development.*

6.5.54 As described in Paragraph 6.5.6, the layout of the proposed development has used existing footpaths or targeted habitats of low conservation value (such as semi-improved grassland) where possible, taking into account other constraints (for more information see Chapter 4: Site Selection and Design Evolution and Chapter 15: Existing Infrastructure). Furthermore, the extent of this habitat affected by the proposed development is a small proportion of the area of the SINC (0.23 % of the SINC will be lost to the proposed development). The proposed development will not change the overall status of the SINC.

6.5.55 Based on the above information, it is considered that the proposed development will have a **minor negative** effect that will not affect the integrity of habitats found within Mynydd Manmoel, North of Manmoel SINC. The effect on the SINC will be **not significant**.

6.5.56 Furthermore, construction activities have the potential to degrade or destroy dry heath and acid grassland habitats directly through excavation, compaction, or modification (e.g. vegetation removal) and indirectly as a result of dewatering or from the accidental release of fuels, lubricants or other chemicals. In addition, dust particles have the potential to interfere with sensitive plants. However, any of these described impacts would be temporary and reversible. to interfere with sensitive plants. However, any of these described impacts would be temporary and reversible. Furthermore, application of embedded mitigation measures such as a pollution prevention plan and measures to control dust will be included in the CEMP and monitored by the ECoW. Accordingly, with these measures in place, impacts on the integrity of habitats within the on Mynydd Manmoel, North of Manmoel SINC are considered to be **negligible** impact, resulting in an effect that is **not significant**.

Operation

6.5.57 Operational impacts will be limited to a low risk of minor pollution events through vehicular activity and turbine maintenance on site. However, embedded mitigation measures such as the implementation of an OEMP including pollution prevention and control measures are proposed. It is therefore considered that operational activities will have a **negligible** impact on Mynydd Manmoel, North of Manmoel SINC, resulting in an effect that is **not significant**.

6.5.58 An outline Ecological Management Plan (EMP) has been provided in Appendix A6.6 and includes measures to mitigate for impacts on dry heath and acid grassland. This comprises restoration of dry heath habitats, resulting in an overall net increase of dry heath and acid grassland habitats (those considered to be impacted within the SINC by the proposed development), and reversing some of the baseline modification which may be expected to continue in the absence of the proposed development.

6.5.59 As such, the proposed development is considered likely to have a minor beneficial impact and not significant effect on Mynydd Manmoel SINC.

Habitats: Dry heath

Construction

6.5.60 The principal impact of the proposed development to dry heath is via permanent habitat loss. The total extent of dry heath/dry heath acid grassland habitats lost to the footprint of the proposed development is 2.15 ha, which comprises 1.86 % of the habitat within the site boundary and 0.14% of the estimate of all upland heathland habitat (1560 ha) within the BGCBC area, according to the LBAP[49]. However, some of the areas of dry heath are in mosaic with acid grassland and therefore the area calculations are a worst case scenario. The proportion of each habitat type in areas classified as dry heath/acid grassland mosaic was recorded, meaning that an estimate can be made as to how much of each habitat type was present within the mosaic. The majority of the area recorded as dry heath/acid grassland mosaic was described as a transitional habitat between U4e acid grassland (characterised by the presence of heath species) and dry heath. These areas are considered to represent acid grassland habitat as there was less than 25 % cover of dwarf shrub species overall. As such, 10.8 % of the area of dry heath/acid grassland mosaic habitat is considered to represent dry heath habitat. A full breakdown of the proportion of habitats within dry heath/acid grassland mosaic areas can be found in Table 6.8 in Technical Appendix A6.1. Based on these calculations, the total area of dry heath within the site boundary is 90.53 ha (see Table 6.23). It is therefore estimated that actual dry heath habitat loss is 0.6 ha, which comprises 1.43 % of the habitat within the site boundary and 0.04 % of the estimate of all upland heathland habitat within the Blaenau Gwent Council area.

6.5.61 Additionally, some areas of habitat will be temporarily lost to the proposed development (crane pads, cabling and construction compound). These areas will be reinstated at the end of the construction phase and are therefore not considered to be full habitat loss. A total of 1.33 ha of dry heath habitat will be temporarily lost, which comprises 1.15 % of the habitat within the site boundary and 0.09 % of the upland heathland habitat within the Blaenau Gwent Council area[49] (see Table 6.23).

Table 6.23: Proportion of habitats recorded within dry heath/acid grassland mosaic lost to proposed development

Habitat	Total habitat (full mosaic habitat)			Proportion dry heath only (10.8% of mosaic)		
	Habitat in Development Area (ha)	Habitat loss (ha)	Habitat loss (%)	Habitat in Development Area (ha)	Habitat loss (ha)	Habitat loss (%)
Permanent habitat loss						
Dry heath/ acid grassland mosaic	82.38	1.74	2.11	8.90	0.19	2.11
Dry heath	33.36	0.41	1.24	33.36	0.41	1.24
Total	**115.74**	**2.15**	**1.86**	**42.26**	**0.60**	**1.42**
Temporary habitat loss						
Dry heath/ acid grassland mosaic	82.38	1.27	1.54	8.90	0.14	1.54
Dry heath	33.36	0.06	0.19	33.36	0.06	0.19
Total	**115.74**	**1.33**	**1.15**	**42.26**	**0.20**	**0.47**

Source: Natural Power

6.5.62 When looking at dry heath habitats only as based on Table 6.23, the combined permanent and temporary habitat loss is 0.80 ha, which comprises 1.89 % of the habitat within the site boundary and 0.05 % of the upland heathland habitat within the Blaenau Gwent Council area (see Table 6.24). However, dry heath habitats are considered to restore well after reinstatement of temporary infrastructure and therefore temporary habitat loss is considered to be short-term and reversible.

Table 6.24: Total dry heath habitat loss

	Area (ha)	Percentage of site boundary	Percentage of Blaenau Gwent Council area[49]
Permanent loss	0.60	1.42	0.04
Temporary loss	0.20	0.47	0.01
Total	**0.80**	**1.89**	**0.05**

Source: Natural Power

6.5.63 Dry heath communities that will be lost to the proposed development are H12 and H18. Areas of H18 were characterised by a lack of heather and a dominance of bilberry, which is considered likely to be a result of historic burning and grazing that has resulted in a degraded heath. The majority of the dry heath habitat that will be lost to the proposed development was recorded as the degraded H18 community. As described in Paragraph 6.5.6, the layout of the proposed development has used existing tracks or targeted habitats of low conservation value (such as semi-improved grassland) where possible, taking into account other constraints (for more information see Chapter 4: Site Selection and Design Evolution and Chapter 15: Existing Infrastructure). As such, dry heath habitat loss has been kept to a minimum as part of the design process and most habitat loss is comprised of a degraded form of the habitat. Furthermore, the extent of this habitat affected by the proposed development is a very small proportion of that available within the region. The proposed development will not change the overall status of dry heath within the region.

6.5.64 Without compensation, it is considered that impacts associated with loss of dry heath at the proposed development will be **minor negative**, resulting in an effect which is **not significant** on the integrity of this feature at a Regional level. With the application of mitigation through EMP measures the magnitude of residual effect is expected to be **low beneficial** (see Table 6.26).

6.5.65 Furthermore, construction activities have the potential to degrade or destroy dry heath habitats directly through excavation, compaction, or modification (e.g. vegetation removal) and indirectly as a result of dewatering or from the accidental release of fuels, lubricants or other chemicals. In addition, dust particles have the potential to interfere with sensitive plants. However, any of these described impacts would be temporary and reversible. Additionally, embedded mitigation measures such as a pollution prevention plan and measures to control dust will be included in the CEMP and monitored by the ECoW. Therefore, it is considered that embedded mitigation is sufficient to prevent adverse effects to this habitat arising from construction activities (other than direct habitat

loss). It is therefore considered that construction activities will have a **minor negative** impact on dry heath, resulting in an effect that is **not significant**.

Operation

6.5.66 Operational impacts will be limited to a low risk of minor pollution events through vehicular activity and turbine maintenance on site. However, embedded mitigation measures such as the implementation of an OEMP including pollution prevention and control measures are proposed. It is therefore considered that operational activities will have a **negligible** impact on dry heath, resulting in an effect that is **not significant**.

6.5.67 An outline Ecological Management Plan (EMP) has been provided in Appendix A6.6, and includes restoration of dry heath habitats, resulting in an overall net increase of dry heath habitats at the proposed development, and reversing some of the baseline modification which may be expected to continue in the absence of the proposed development.

6.5.68 As such, the proposed development is considered likely to have a minor beneficial impact and not significant effect on dry heath.

Bats

Construction

6.5.69 A number of potential roosting features were found during surveys within the site boundary. However, all but four were over 50 m from proposed infrastructure, with only one of these being of moderate or high roosting potential. This potential roosting feature consists of residential properties with a moderate bat roost potential. No access was available to the properties at the time of the survey to fully assess the roosting potential. These properties are located along a public road, are in use and will not be directly impacted by construction. One other PRF within 50 m of infrastructure had a low-moderate roosting potential. The PRF was a collection of buildings associated with a telecommunications tower next to Manmoel Road. No access was available to the buildings at the time of the survey. Manmoel Road is a public road, and the buildings will not be directly impacted by construction. Therefore, it is unlikely that construction activities will cause any additional disturbance to bats that might roost at either location than they already experience. Other PRFs located near to proposed infrastructure have negligible or low potential to be used by roosting bats and will not be directly impacted by construction. Additionally, the infrastructure that all of these PRFs are close to is existing track that will be upgraded, which means that any disturbance would be minimal. Furthermore, pre-construction surveys of potential bat roosts will be carried out on any trees or structures with potential to support roosting bats within 30 m of working areas, as part of the SPP (as outlined in Paragraph 6.5.18).

6.5.70 The loss of habitat to the proposed development will not significantly reduce the foraging opportunities within the site boundary. However, some foraging and commuting behaviour may be altered as a result of construction, but this is likely to be of short-term temporal magnitude only. Furthermore, the implementation of lighting mitigation as included within CEMP and outlined within embedded mitigation (see Section 6.5) means that any disruption caused by construction works will be minimised.

6.5.71 Bats are considered to be of Local nature conservation importance and after application of embedded mitigation the impact during construction is considered to be **negligible** and **not significant**.

Operation

6.5.72 During the operational phase, rotating turbines present a risk to flying bats resulting in potential collision[51] when flying in close proximity to turbines. Recent research work by Exeter University (DEFRA 2016[52]) found that most bat fatalities at UK wind farms were common pipistrelle, soprano pipistrelle and noctule bats. The study also found that the percentage casualty rates for soprano pipistrelle, common pipistrelle and noctule bats were higher than the relative proportions of their calls recorded from ground level acoustic surveys.

6.5.73 The site boundary offers only limited foraging and commuting corridors as there is little to no tree cover and no significant watercourses within the site. The few watercourses present within the site are stream heads that are generally dry during the summer months. The overall bat activity level within the proposed development is considered to be low. The proposed development is therefore considered of Local conservation importance for all occurring species of bats.

6.5.74 Bat activity levels are classified according to the guidance provided by NatureScot[19] and relative activity levels based on the output provided by Ecobat are presented in Section 6.4.

Common pipistrelle

6.5.75 Common pipistrelle bats were the most regularly recorded bat at the proposed development, accounting for 92% of all recorded bat passes at the proposed development. The species was recorded at all detectors, all of which were assessed as being at a medium collision risk for common pipistrelle.

6.5.76 One potential roost site with moderate roosting potential was found within 200 m of proposed turbines during field surveys. This consisted of a group of mature beech trees, which were not accessible for survey but were inspected from the site boundary with binoculars. No obvious roosting features were recorded, but trees were of a size and age that is likely to support bat roosting features. This woodland was also recorded during the Phase 1 habitat survey and was located 134 m from T5 and 190 m from T4. This is more than the 92 m buffer recommended by NatureScot[19] around areas of woodland (50 m buffer between woodland and blade tip calculated in Paragraph 6.5.7).

6.5.77 Detector 6 was located 30 m from the potential roost site and 285 common pipistrelle passes were recorded before sunset at this detector during the summer survey period (July). The number and percentage of common pipistrelle passes around sunrise and sunset at detector 6 during the summer survey period are shown in Table 6.25. This shows that common pipistrelle passes before sunset and within 30 minutes of sunrise/sunset were spread across the survey period. However, the number of passes recorded around sunrise/sunset each night was higher in the first half of the survey period (1 - 8 July). The percentage of passes recorded around sunrise/sunset peaked on 8 July, when 94 % of passes were recorded within 30 minutes of either sunrise or sunset (compared with 40-60 % on most other nights). The high level of activity before and around sunset in July suggests that a roost may have been located near to the detector.

[51] Barotrauma, injury caused by a change in air pressure, affecting typically the ear or the lung has previously been suggested as a potential cause of bat deaths at wind farms. However it is unlikely to be a significant cause of bat fatalities. Modelling of changes of air pressure caused by rotating turbine blades suggests that the low-pressure region over the blade suction side is extremely localized and bats that experience the low-pressure region are likely to impact the blade. Furthermore, observations showed that most bat deaths occurred at low wind speeds near 5 m/s, when bats are the most active. Fatalities at higher wind speeds (> 5 m/s) are less common, likely because fewer bats are flying in these conditions. Considering that the pressure changes around wind turbine blades at low wind speeds are insignificant and that there are few bat deaths at higher wind speeds, it seems unlikely that barotrauma is a significant cause of bat fatalities around wind turbines, and that most bat fatalities are a result of blade strikes. See Lawson et al. 2018 Estimating the Likelihood of Bat Barotrauma using Computational Simulations and Analytical Calculations. NREL poster presentation to the AWEA siting meeting in March 2018.

[52] DEFRA (2016). Understanding the Risk to European Protected Species (bats) at Onshore Wind Turbine Sites to inform Risk Management. University of Exeter.

Table 6.25: Timings of common pipistrelle passes at detector 6 during the summer deployment

	Passes before sunset		Passes 30 mins after sunset		Total passes within 30 mins of sunset		Total no. nightly passes
Date*	No.	%	No.	%	No.	%	
1 July	22	6.0	136	37.0	158	42.9	368
2 July	17	4.4	132	33.9	149	38.3	389
5 July	17	7.2	141	59.5	158	66.7	237
6 July	1	0.4	79	30.6	80	31.0	258
7 July	-	-	-	-	-	-	-
8 July	57	19.2	184	62.0	241	81.1	297
9 July	52	11.0	154	32.5	206	43.5	474
12 July	71	10.0	189	26.7	260	36.8	707
13 July	1	0.2	28	5.1	29	5.2	553
14 July	47	7.3	162	25.3	209	32.7	640
Total	**285**	**7.3**	**1205**	**30.7**	**1490**	**38.0**	**3923**
Mean	**28.5**	**6.6**	**120.5**	**31.3**	**149**	**37.82**	**392.3**

Source: Natural Power
** missing dates (3, 4, 10 and 11 July) have been excluded due to poor weather conditions (i.e. wind >5 m/s, temperature <8ºC and/or heavy rain*

6.5.78 Detector 6 had a high relative activity level for common pipistrelles during both spring and summer deployments. There was an issue with the microphone at this detector during the autumn deployment, which meant that no data was collected here during autumn. However, detector 6 still had the highest number of common pipistrelle passes recorded out of all the detectors (29.9 % of total passes were recorded at detector 6). It is therefore assumed that activity levels during the autumn deployment at detector 6 were broadly the same as those recorded during the spring deployment. Detectors 1 and 2 also had a high number of common pipistrelle calls (27.8 % and 28.6 % of common pipistrelle passes respectively). Detector 1 was located on the edge of a conifer plantation and was over 1 km from the nearest proposed turbine. Detector 2 was located 665 m from the nearest proposed turbine (T1) near to a stream head that is connected to a network of streams within deciduous woodland. All of these detector locations were assessed as having a medium collision risk for common pipistrelle based on the relative activity levels and the overall site risk. However, none of these detector locations are considered to be representative of the habitat around proposed turbine locations. Detector 5 is considered to have been in the most representative habitat of turbine locations – open grassland above 400 m AOD. This detector had a low number of passes detected, with 3.4 % of common pipistrelle passes recorded here. The lowest number of common pipistrelle passes were recorded at detector 4 (3.0 % of passes). This detector was located 235 m from the nearest proposed turbine (T4) near to a woodland edge, in a mosaic of open habitats. The median relative activity levels recorded at both of these detectors was moderate to high, with a low to moderate collision risk assessment.

6.5.79 The overall population vulnerability of common pipistrelle to wind turbines is medium as assessed by NatureScot guidance[19] and the predicted collision risk for the species is low to moderate in habitats similar to those around proposed turbine locations. There is a possibility that there was a roost in the vicinity of detector 6, however that is located over 92 m from all proposed turbines (calculated 50 m buffer between feature and blade tip). It is therefore considered that collision impacts on common pipistrelles would not affect the integrity of the local population of this species. Therefore impacts from the proposed development are considered to be **moderate negative** and any resultant effect **not significant**.

Soprano Pipistrelle

6.5.80 Soprano pipistrelle was recorded infrequently across the site, with a total of 217 passes recorded across the whole survey period. The species was recorded most frequently during the autumn deployment and at detector 2. The species was assessed as being at a low collision risk in all seasons and at all detectors except for detector 2 during the autumn deployment, where the maximum activity level was assessed as being a medium collision risk. Detector 2 was located 665 m from the nearest proposed turbine (T1) and 40 % of all soprano pipistrelle passes were recorded here. This detector was located near to a stream head that is connected to a network of streams within deciduous woodland. As soprano pipistrelles favour riparian habitat it is considered likely that this is why the species was recorded in the highest numbers at this detector. All proposed turbines are located over 200 m from such riparian areas. Detector 5 is considered to have been in the most representative habitat of turbine locations – open grassland above 400 m AOD. This detector had a low number of passes detected, with 8 % of soprano pipistrelle passes recorded here and a low collision risk. The lowest number of soprano pipistrelle passes were recorded at detector 6 (3 % of passes). However, the microphone on this detector malfunctioned during the autumn deployment, meaning that it did not record anything in that deployment. As soprano pipistrelles were recorded most frequently during the autumn deployment it is likely that soprano pipistrelle calls are underrepresented at this detector, although it is unlikely that the number of calls in the autumn would have been significantly higher than at other detectors.

6.5.81 The overall population vulnerability of soprano pipistrelle to wind turbines is assessed as medium in NatureScot guidance[19]. Furthermore, a low number of passes were recorded and the collision risk across the site boundary was assessed as being low. It is therefore considered that operational impacts of the proposed development on soprano pipistrelle due to collisions would not affect the integrity of the local populations of this species. Therefore, impacts from the proposed development are considered to be **minor negative** and any resultant effect **not significant**.

Nathusius' pipistrelle

6.5.82 Nathusius' pipistrelle was recorded infrequently across the site, with a total of 319 passes recorded across the whole survey period. The species was recorded most frequently during the spring deployment and at detector 1. The species was assessed as being at a low collision risk in all seasons and at all detectors except for detector 1 and 4 during the spring deployment, where the maximum activity level was assessed as being a medium collision risk. Detector 1 was located over a kilometre from the nearest proposed turbine (T1) and detector 4 was located 235 m from the nearest proposed turbine (T2). A total of 79 % of all Nathusius' pipistrelle passes were recorded at these two detectors. Both detectors were located near to a woodland edge. Detector 5 is considered to have been in the most representative habitat of turbine locations and this detector had the lowest number of passes detected. One pass was recorded at this detector throughout the survey period, which comprises 0.3 % of all Nathusius' pipistrelle passes recorded at the proposed development. As such, the collision risk assessment for this detector was low. This indicates that the locations of proposed turbines in open grassland/heathland habitat along the ridge is not commonly used by Nathusius' pipistrelle and are most likely to be using the woodland edges along the boundary of the site boundary.

6.5.83 Nathusius' pipistrelle bats are assessed by NatureScot guidance[19] to be of high risk in terms of collision and threat to national populations. Furthermore, a low number of passes were recorded and the collision risk assessment across the site boundary was low. It is therefore considered that collision impacts on Nathusius' pipistrelles would

not affect the integrity of the local population of this species. Therefore impacts from the proposed development are considered to be **minor negative** and any resultant effect **not significant.**

Nyctalus species (noctule and Leisler's bat)

6.5.84 Leisler's bat and noctule bats were recorded infrequently across the site, with a total of 25 and 467 passes recorded respectively across the whole survey period. Both species were recorded most frequently during the spring deployment and at detector 6. Detector 6 was located on the edge of a patch of semi-natural broadleaved woodland and was 160 m from the nearest proposed turbine location (T05). Leisler's bat was assessed as being at a low collision risk in all seasons and at all detectors. Noctule was assessed as being at a low collision risk in all seasons and at all detectors except for detectors 1 and 3 during the spring deployment, where the maximum activity level was assessed as being a medium collision risk. Detector 1 was located over 1 km from the nearest proposed turbine (T02) and detector 3 was located on a woodland edge 450 m from the nearest turbine (T02). Detector 5 is considered to have been in the most representative habitat of turbine locations – open grassland above 400 m AOD. This detector had a low number of passes of both species detected, with 6 % of noctule passes and 8 % of Leisler's bat recorded here. Furthermore, the risk assessment for both species at detector 5 was low.

6.5.85 The overall population vulnerability of Leisler's and noctule bats is assessed as high in NatureScot guidance[19]. The overall activity levels were low to moderate and collision risk assessment across the site boundary was low to medium. However, the risk assessment at detector 5 was low. This detector was situated in habitat that is the most similar to turbine locations. It is therefore considered that collision impacts on *Nyctalus* bats would not affect the integrity of the local population of this species. Therefore impacts from the proposed development are considered to be **minor negative** and any resultant effect **not significant.**

Lesser horseshoe bat

6.5.86 The overall activity rates of lesser horseshoe bat were low and the species is considered to be at low risk in terms of collision with turbines (NatureScot[19]). A total of 18 lesser horseshoe bat passes were recorded in the site boundary at all detectors except for detectors 4 and 6. The species was recorded in highest numbers at detector 3 (50 % of all records), which was located on a woodland edge 450 m from the nearest turbine (T02). The preferred feeding habitat for lesser horseshoe bat is in lowland valleys in broadleaved woodlands, along woodland edges and in areas of pasture. Therefore, the habitat around the proposed turbine locations is not considered to be suitable for foraging lesser horseshoe. The species was recorded in all seasons, but the highest number of records were recorded during the autumn deployment (12 passes). As the microphone at detector 6 failed during the autumn deployment this species may have been under recorded. However, it is unlikely that the number of calls in the autumn deployment would have been significantly higher than at other detectors. The relative activity of lesser horseshoe bat was low across the site boundary. Given the low numbers of passes recorded it is considered likely that the records account for transitory bats that were not using the site boundary for foraging or roosting.

6.5.87 It is therefore considered that collision impacts on lesser horseshoe bats would not affect the integrity of the local population of this species. Therefore impacts from the proposed development are considered to be **minor negative** and any resultant effect **not significant.**

Serotine bat

6.5.88 The overall activity rates of serotine bat were low and the species is considered to be at high risk in terms of collision with turbines due to the rarity of the species (NatureScot[19]). A total of 4 serotine bat passes were recorded in the site boundary at detectors 5 and 6 only and only during the summer and autumn deployments. As the microphone at detector 6 failed during the autumn deployment this species may have been under recorded. However, it is unlikely that the number of calls in the autumn deployment would have been significantly higher than at other detectors. Given the low number of passes recorded, the relative activity of serotine bat at both detectors was low. Serotine bats are rare in Wales and given the low numbers of passes recorded it is considered likely that the records account for transitory bats that were not using the site boundary for foraging, commuting or roosting.

6.5.89 It is therefore considered that collision impacts on serotine bats would not affect the integrity of the local population of this species. Therefore impacts from the proposed development are considered to be **minor negative** and any resultant effect **not significant.**

Myotis species

6.5.90 *Myotis* sp. are assessed by NatureScot guidance[19] to be of low risk in terms of collision and threat to national populations. This species group was assessed as having a low collision risk at the Proposed development except at detector 1 at maximum activity levels (where the collision risk was assessed as medium). The highest activity levels for *Myotis* sp. were at detector 1, which was located along a woodland edge and was over 1 km from proposed turbine locations. Relative activity levels of *Myotis* sp. at detector 5, located in habitats most similar to turbine locations, were low and as such the collision risk assessment for this detector was low.

6.5.91 It is therefore considered that collision impacts on *Myotis* sp. bats would not affect the integrity of the local population of this species. Therefore impacts from the proposed development are considered to be **minor negative** and any resultant effect **not significant.**

Brown long-eared bat

6.5.92 The overall activity rates of brown long-eared bat were low and the species is considered to be at low risk in terms of collision with turbines (NatureScot[19]). This species was assessed as having a low collision risk at the proposed development. The highest activity levels for brown long-eared bat were at detector 1, which was located along a woodland edge and was over 1 km from proposed turbine locations. Relative activity levels of the species at detector 5, located in habitats most similar to turbine locations, were low and as such the collision risk assessment for this detector was low.

6.5.93 It is therefore considered that collision impacts on brown long-eared bats would not affect the integrity of the local population of this species. Therefore impacts from the proposed development are considered to be **minor negative** and any resultant effect **not significant.**

Predicted Effects – Decommissioning

6.5.94 Decommissioning would be expected to lead to short term, temporary disturbance on habitats and species. For all habitats and species assessed above, decommissioning effects are predicted to be of similar or lower magnitude to the effects during construction. Habitat restoration following removal of infrastructure will lead to an increase of habitats on site in comparison to the operational phase.

Outline Ecological Management Plan (EMP)

6.5.95 As part of a proposed unified land use plan an outline EMP for the proposed development has been prepared and is provided in Appendix A6.6.

6.6 CONCLUSIONS

6.6.1 It is predicted that unmitigated, the proposed development would not have any significant effects on any IEFs.

6.6.2 The proposed development will have a moderate negative impact on Mynydd Manmoel SINC and common pipistrelle bats, and a minor negative impact on other bat species, dry heath and Mynydd Manmoel, North of Manmoel SINC. These impacts are considered to result in effects that are not significant.

6.6.3 Despite the absence of significant effects, an EMP is proposed, with the aim of restoring areas of dry heath and acid grassland habitats within the site boundary, as well as reducing potential collision impacts on bats. It is considered that this will reduce the magnitude of the residual impacts to dry heath habitats to minor beneficial, common pipistrelle bats to minor negative and Mynydd Manmoel SINC to negligible. No significant effects are predicted.

6.7 MITIGATION AND RESIDUAL EFFECTS

6.7.1 The significance of pre-mitigation effects and the significance of residual effects after mitigation on each IEF during the construction and operation phases is detailed in Table 6.26.

Table 6.26: Summary of pre-mitigation impacts and residual effects on each IEF

IEF	Conservation importance	Nature of potential pre-mitigation impact	Magnitude of pre-mitigation impact	Significance of pre-mitigation effect	Specific mitigation/ compensation measure	Magnitude of residual impact	Residual significance	Level of certainty
Construction/Decommissioning								
Usk Bat Sites SAC	International	No predicted impact due to distance from the proposed development.	Negligible	Not significant	None required.	Negligible	Not significant	Certain
Mynydd Llangatwg SSSI	National	No predicted impact due to distance from the proposed development.	Negligible	Not significant	Nothing in addition to embedded mitigation.	Negligible	Not significant	Certain
Mynydd Manmoel SINC	Regional	Permanent and temporary loss of dry heath and acid grassland habitats for which the site is designated. Possible degradation or destruction of habitats through excavation, compaction, or modification (e.g. vegetation removal). Dewatering or from the accidental release of fuels, lubricants or other chemicals. Pollution from dust particles.	Moderate negative	Not significant	An EMP is proposed which will restore areas of dry heath habitat adjacent to the site boundary. Embedded mitigation implemented via construction phase plans such as the CEMP	Negligible	Not significant	Probable
Mynydd Manmoel; North of Manmoel SINC	Regional	Permanent loss of dry heath and acid grassland habitats for which the site is designated. Possible degradation or destruction of habitats through excavation, compaction, or modification (e.g. vegetation removal). Dewatering or from the accidental release of fuels, lubricants or other chemicals. Pollution from dust particles.	Minor negative	Not significant	Nothing in addition to embedded mitigation.	Negligible	Not significant	Certain

IEF	Conservation importance	Nature of potential pre-mitigation impact	Magnitude of pre-mitigation impact	Significance of pre-mitigation effect	Specific mitigation/ compensation measure	Magnitude of residual impact	Residual significance	Level of certainty
Dry heath	Regional	Permanent and temporary habitat loss. Possible degradation or destruction of habitats through excavation, compaction, or modification (e.g. vegetation removal). Dewatering or from the accidental release of fuels, lubricants or other chemicals. Pollution from dust particles.	Minor negative	Not significant	An EMP is proposed which will restore areas of dry heath habitat adjacent to the site boundary. Embedded mitigation implemented via construction phase plans such as the CEMP	Minor beneficial	Not significant	Probable
Bats	Local	Displacement or disturbance to roosting, foraging or commuting bats from construction activity and/or through habitat loss.	Negligible	Not significant	Embedded mitigation implemented via construction phase plans such as the CEMP	Negligible	Not significant	Certain
Operation								
Usk Bat Sites SAC	International	Collision risk to lesser horseshoe bats, for which the sites are designated.	Negligible	Not significant	None required.	Negligible	Not significant	A measurable residual negative effect at an international or national level is considered to be unlikely.
Mynydd Llangatwg SSSI	National	Collision risk to lesser horseshoe bats, for which the sites are designated.	Negligible	Not significant	An EMP to include removal of tree/scrub regeneration within 92 m of turbines to reduce bat collisions. Additionally, blades will be “feathered” to reduce rotation speeds below 2 rpm when idling in order to reduce bat collisions.	Negligible	Not significant	A measurable residual negative effect at an national level is considered to be unlikely.
Mynydd Manmoel SINC	Regional	Accidental pollution incident leading to contamination of habitats.	Minor negative	Not significant	The potential for chance pollution incidents during routine maintenance activities will be minimised by adoption of good practice guidance.	Negligible	Not significant	A measurable residual negative effect at a regional level is considered to be highly unlikely.
Mynydd Manmoel; North of Manmoel SINC	Regional	Accidental pollution incident leading to contamination of habitats.	Minor negative	Not significant	The potential for chance pollution incidents during routine maintenance activities will be minimised by adoption of good practice guidance.	Negligible	Not significant	A measurable residual negative effect at a regional level is considered

IEF	Conservation importance	Nature of potential pre-mitigation impact	Magnitude of pre-mitigation impact	Significance of pre-mitigation effect	Specific mitigation/ compensation measure	Magnitude of residual impact	Residual significance	Level of certainty
								to be highly unlikely.
Dry heath	Local	Accidental pollution incident leading to contamination of habitats.	Minor negative	Not significant	The potential for chance pollution incidents during routine maintenance activities will be minimised by adoption of good practice guidance.	Negligible	Not significant	A measurable residual negative effect at a regional level is considered to be highly unlikely.
Common pipistrelle	Local	Collision risk.	Moderate negative	Not significant	EMP to include removal of tree/scrub regeneration within 92 m of turbines to reduce bat collisions. Additionally, blades will be "feathered" to reduce rotation speeds below 2 rpm when idling in order to reduce bat collisions.	Minor negative	Not significant	Probable
Soprano pipistrelle, Nathusius' pipistrelle, *Nyctalus* sp., lesser horseshoe, serotine, *Myotis* sp. and brown long-eared bats	Local	Collision risk.	Minor negative	Not significant	EMP to include removal of tree/scrub regeneration within 92 m of turbines to reduce bat collisions. Additionally, blades will be "feathered" to reduce rotation speeds below 2 rpm when idling in order to reduce bat collisions.	Negligible	Not significant	Probable

Source: Natural power

6.7.2 The mitigation measures are expected to reduce the magnitude of residual effects for all IEFs to which they apply, in the short and long term, and as such no significant residual effects are predicted as a result of the construction and operation of proposed development.

6.8 CUMULATIVE EFFECTS

6.8.1 Guidance[17] states that assessments should focus on the most significant cumulative impacts and conclude with a clear assessment of those which are likely to influence decision making. As per this guidance, any wind farm developments of fewer than three turbines (small scale wind energy proposals[53]) were excluded from the cumulative assessment. This is due both to the lack of quantitative environmental information which usually exists in the public domain for such small scale developments, and also due to the low likelihood that significant adverse effects would be predicted for them. Only IEFs for which a greater than negligible residual impact is predicted are considered in the cumulative impact assessment, as negligible impacts will not result in a detectable increase in cumulative impacts.

6.8.2 The context in which cumulative effects are considered depends upon the ecology of the species or habitat in question. Of all protected mammal species observed, bats are most likely to be affected by additional wind farm development because of the distances travelled by some species of foraging bat and the cumulative risks to bat populations as a result of collision with wind turbines during operation. The implementation of good practice measures regarding buffer distances of turbines from forestry edges to minimise impacts on commuting and foraging bats minimises likelihood of cumulative impact. Minor negative residual impacts have been predicted for common pipistrelle bats (during operation of the proposed development alone) and Mynydd Manmoel, North of Manmoel SINC (during construction/decommissioning of the proposed development alone). Therefore, these features have been scoped into the cumulative assessment, along with dry heath which also have minor beneficial residual impact predicted during construction/decommissioning of the proposed development alone.

6.8.3 All existing, consented and submitted large scale energy infrastructure developments (three or more turbines for wind farms and over 10 MW for solar farms) within 15 km of the proposed development, were considered as part of the cumulative impacts assessment (CIA).

6.8.4 Within this search area there are a total of 13 developments that have been included in the CIA which include:

- Pen Bryn Oer Wind Farm (operational) – This is a 3-turbine operational wind farm with a tip height of 110 m, located approx. 4 km to the north of the site boundary for which an EIA was not required;
- Penyfan Caravan Park Solar Farm (operational) – This is an operational 50 MW solar farm located approx. 5 km south of the site boundary for which an EIA could not be found, it may be that one was not required at the time;

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

- Twyn Gwyn Solar Farm (operational) – This is an operational 29 MW solar farm located approx. 9 km south of the site boundary for which an EIA was not required;
- Hendai Solar Farm (operational) – This is an operational 13.8 MW solar farm located approx. 9.5 km south west of the site boundary;
- Cwmcaesingrug Solar Farm (operational) – This is an operational 10 MW solar farm located approx. 12.5 km south of the site boundary;
- Hafod y Dafal Solar Farm (operational) – This is an operational 14 MW solar farm located approx. 4 km south of the site boundary. No EIA could be found for this development;
- Penyfan Leisure Park Wind Farm (consented) – This is a consented 3-turbine wind farm with a tip height of 31.5 m, located to the south of the site boundary approx. 5 km for which an EIA was not required;
- Wauntysswg Solar Farm (consented) – This is a consented 30 MW solar farm located approx. 2.5 km north west of the site boundary. No EIA could be found for this development;
- Land to north of Rassau Industrial Estate Solar Farm (consented) – This is a consented 12 ha solar farm located approx. 5 km north of the site boundary. No EIA could be found for this development;
- Mynydd Carn-y-Cefn Wind Farm (scoping) – This is a 8-turbine proposed wind farm, located approx. 1.5 km to the east of the site boundary;
- Mynydd Llanhillieth Wind Farm (scoping) – This is a 12-turbine proposed wind farm, located approx. 8 km to the south east of the site boundary;
- Land North of Rassu Industrial Estate (scoping) – This is a 5-turbine proposed wind farm, located approx. 5 km north of the site boundary; and
- Circuit of Wales Solar Farm (pre-scoping) – This is a 50 - 70 MW proposed solar farm located approx. 5.5 km north of the site boundary.

6.8.5 Pen Bryn Oer Wind Farm, Penyfan Caravan Park Wind Farm and Twyn Gwyn Solar Farm were not required to undergo EIA and are therefore not included in the cumulative assessment (CIA). An EIA could not be found for Penyfan Leisure Park Solar Farm, Hafod y Dafal Solar Farm, Wauntysswg Solar Farm and Land to north of Rassau Industrial Estate Solar Farm and therefore they have not been included in the CIA. The developments at the scoping or pre-scoping stage have also not been included as impacts have not yet been assessed and the projects have yet to go through planning.

Table 6.27: Cumulative Impact Assessment

Site	Manmoel (proposed development)	Hendai Solar Farm	Cwmcaesingrug Solar Farm	Cumulative residual effects
No. Turbines/MW	5 turbines	13.8 MW	10 MW	5 turbines
Site status	Pre-application	Operational since 2015	Operational since 2015	
Baseline surveys undertaken	2020-2021	2013	2014	
Mynydd Manmoel, North of Manmoel SINC	0.14 ha of habitats described in SINC designation lost to the proposed development.	No impact predicted	No impact predicted	No additional cumulative impacts to those predicted for the proposed development.
Common pipistrelle bats	Moderate magnitude of impact predicted for common pipistrelles. Bats considered to be Local value.	No impact predicted	No impact predicted	No additional cumulative impacts to those predicted for the proposed development.
Dry heath	0.6 ha of dry heath to be lost. Dry heath considered to be regional value 5 ha of bracken to be controlled for restoration of dry heath and acid grassland habitats as part of EMP.	No impact predicted	No impact predicted	No additional cumulative impacts to those predicted for the proposed development.

6.8.6 No significant cumulative effects are predicted to result from the proposed development along with other projects and plans due to the lack of additional impacts of the other cumulative developments within 15 km.

6.9 SCREENING FOR APPROPRIATE ASSESSMENT

Usk Bat Sites SAC

6.9.1 Under the Conservation (Natural Habitats, *&c.*) Regulations 2017, as amended (the Habitats Regulations) any development that may have a likely significant effect (LSE) on an SAC, either alone or in combination with other projects or plans, requires an AA to be carried out by the relevant competent authority, to determine whether or not the development would have an adverse effect on the integrity of the SAC.

6.9.2 Before an AA is initiated a screening process is undertaken to determine whether any of the predicted impacts of the development will result in a LSE. This screening assessment is presented here to provide information to the competent authority to allow them to reach a decision on whether or not the development will have a LSE on any SAC and therefore whether an AA is required.

6.9.3 Usk Bat Sites SAC encompasses a series of lesser horseshoe bat roosts, upland habitats, woodlands and cave systems around the valley of the River Usk. Designated features include blanket and degraded bog, mixed woodland associated with rocky slopes, calcareous rocky slopes with crevice vegetation, caves, dry heath and lesser horseshoe bats. The proposed development is 4.2 km from the SAC and the two are not hydrologically linked. Therefore, as there is no connectivity between the habitat features of the SAC and the proposed development, there are no predicted likely significant effects on habitat features of the SAC either alone or in combination with other projects or plans. As lesser horseshoe bat passes were recorded during the bat activity surveys at the proposed development there is a possibility that the proposed development could impact lesser horseshoe bats associated with the SAC. Therefore, a screening assessment has been undertaken for lesser horseshoe bats only.

6.9.4 There is a potential route to impact on the Usk Bat Sites SAC through collision of lesser horseshoe bats. Table 6.28 outlines the predicted impacts on conservation objectives for Usk Bat Sites SAC and sets out where LSE is predicted.

Table 6.28: Assessment of impacts on lesser horseshoe bats qualifying species feature of the Usk Bat Sites SAC

Conservation Objective	Predicted Impacts on Conservation Objectives	LSE?
Maintain a favourable conservation status for the lesser horseshoe bat, where all of the following conditions are satisfied:		
1. The site will support a sustainable population of lesser horseshoe bats in the River Usk area.	No Significant Impact. The proposed development is 4.2 km from the SAC, which is substantially outside the core foraging range for lesser horseshoe bats (1.2 km from a hibernation site or 2 km from summer roosts). Additionally, the bats associated with the SAC mainly feed within and around the SAC areas and land situated in the Usk valley area between Llangorse and Abergavenny50 and the proposed development is outside of this area. Therefore, it is unlikely that bats associated with the SAC will use the site for foraging. Only 18 lesser horseshoe bat passes were recorded in the site and the proposed development was assessed as being low risk to lesser horseshoe bats. Lesser horseshoe bats are considered to have a low population vulnerability to wind turbines19, meaning that the small number of lesser horseshoe bats that use the site are unlikely to collide with turbines. Therefore, it is highly unlikely that the proposed development would affect the integrity of the population of lesser horseshoe bats in the River Usk area.	No
2. The population will be viable in the long term, acknowledging the population fluctuations of the species.	No Significant Impact. Justification as for conservation objective 1 above. It is highly unlikely that the proposed development would affect the integrity of the population of lesser horseshoe bats within the Usk Bat Sites SAC.	No
3. Buildings, structures and habitats on the site will be in optimal condition to support the populations.	No Impact. The proposed development will have no impact on buildings, structures or habitats within the SAC.	No
4. Sufficient foraging habitat is available, in which factors such as disturbance, interruption to flight lines, and mortality from predation or vehicle collision, changes in habitat management that would reduce the available food source are not at levels which could cause any decline in population size or range.	No Significant Impact. Lesser horseshoe bats tend to feed in wooded areas using linear features to navigate their way between roosts and they do not normally fly across open land when foraging50. No wooded habitats or linear features (such as hedgerows) will be lost to the proposed development. Furthermore, all turbines are located over 92 m (distance based on guidance19) from woodland, scrub and hedgerows, thereby reducing the likelihood of bat collisions. The bats associated with the SAC mainly feed within and around the SAC areas and land situated in the Usk valley area between Llangorse and Abergavenny50. As the proposed development is outside of these areas it is not considered likely to comprise a significant foraging area for lesser horseshoe bats associated with the SAC. Therefore, it is highly unlikely that the change in habitat management	No

Conservation Objective	Predicted Impacts on Conservation Objectives	LSE?
	at the proposed development would reduce the available food source for lesser horseshoe bats associated with the SAC.	
5. Management of the surrounding habitats is of the appropriate type and sufficiently secure to ensure there is likely to be no reduction in population size or range, nor any decline in the extent or quality of breeding, foraging or hibernating habitat.	No Significant Impact Justification regarding foraging habitat as for conservation objective 4 above. Additionally, no PRFs suitable for use by lesser horseshoe bats were recorded during the bat roost assessment at the proposed development. Maternity roosts are usually in larger and older rural houses and stable blocks, most often in the roof spaces, or in heated cellars, and hibernation roosts are caves or cave-like structures, none of which were found during the bat roost assessment. Therefore, it is highly unlikely that the proposed development will result in a decline in the extent or quality of breeding or hibernating habitat for lesser horseshoe bats associated with the SAC.	No
6. There will be no loss or decline in quality of linear features (such as hedgerows and tree lines) which the bats use as flight lines - there will be no loss of foraging habitat use by the bats or decline in its quality, such as due to over-intensive woodland management	No Significant Impact. Justification as for conservation objective 4 above.	No

Source: Natural Power

6.9.5 In relation to potential cumulative impacts, sites identified in Section 6.8 were reviewed in relation to horseshoe bats with no additional impacts are anticipated.

6.9.6 Following the above, it is considered that there will be no LSE on the conservation objectives of the Usk Bat Sites SAC from the proposed development. In conclusion, the proposed development is not expected to impact upon the qualifying interest the Usk Bat Sites SAC and therefore **no likely significant effect** can be concluded.

6.9.7 The following embedded mitigation measures will be implemented in order to minimise the potential for impacts on bats:

- A minimum distance of 92 m (calculated distance outlined in guidance[19]) has been maintained between the proposed turbines and areas of high bat activity (such as woodland and scrub);
- A SPP, including measures to protect bats (such as pre-construction surveys and minimising lighting at night), will be included within the CEMP;
- A suitably qualified ECoW will be appointed prior to the commencement of construction in order to implement the agreed CEMP in relation to protected species, including undertaking toolbox talks relating to protected species present on site (such as bats);
- The EMP will include removal of tree/scrub regeneration within 100 m of turbines to reduce bat collisions; and
- Blades will be “feathered” to reduce rotation speeds below 2 rpm when idling in order to reduce bat collisions.

6.10 STATEMENT OF SIGNIFICANCE

6.10.1 An assessment has been made of the potential for significant effects of the proposed development on habitats and non-avian species.

6.10.2 The proposed development is not expected to impact upon the qualifying interest of the Usk Bat Sites SAC or the associated Mynydd Llangatwg SSSI therefore no likely significant effect can be concluded.

6.10.3 The proposed development is considered likely to have a **minor negative** and **not significant** effect on Mynydd Manmoel North of Manmoel SINC and a **moderate negative** and **not significant** effect on Mynydd Manmoel SINC.

6.10.4 The proposed development is considered likely to have a **minor negative** and **not significant** residual effect on dry heath.

6.10.5 In relation to bats, the residual effects as a result of the proposed development are assessed as being **moderate negative** but **not significant** for common pipistrelle and **minor** for all other bat species.

6.10.6 By applying effective mitigation measures, mainly through the design process, and following good practice guidelines during construction including production of an EMP, the magnitude of residual impacts of the proposed development alone and cumulatively with other projects and plans are assessed as being reduced to **minor/negligible** in terms of magnitude, and thus effects are **not significant**.