

RENEWABLE
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Land West of The Energy Coast Business Park – Wind Turbine Repowering

Ecological Impact Assessment

Windlend (Cumbria) Limited



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1. Introduction

1.1. Project description

Locogen Ltd. was commissioned by Windlend (Cumbria) Limited. (*the Client*) to undertake an Ecological Impact Assessment (EcIA) to accompany a planning application to 'repower' a single medium-scale wind turbine on Land West of The Energy Coast Business Park – Wind Turbine Repowering (*the Site*).

This report has been prepared by Jake Walker BSc (Hons) Ecological and Environmental Consultant at Locogen Ltd. (*the Agent*).

The repowering of the existing turbine will involve the installation of a larger dimension replacement turbine, and the replacement of existing ancillary infrastructure (substation). The replacement substation will be sited on the same footprint as the existing station. The existing turbine is sited within a parcel of species-poor modified grassland. The surrounding landscape is agricultural land, consisting of permanent pasture and arable-land in active use. The site location is shown on Figure 1.

The purpose of the EcIA is to assess the potential impact of the development on ecological receptors, such as protected species, designated nature conservation sites and sensitive habitats.

This report details the findings of both the desk-based survey and fieldwork, considers the requirement for protected species mitigation and outlines any suggested measures to reduce the potential impact on habitats and species. Recommendations consider the need for further survey work.



Figure 1: Site location and boundary.

1.2. Locogen experience

Locogen's inhouse ecology and environmental team have substantial experience of delivering environmental compliance and ecological assessment for a variety of renewables projects across the United Kingdom.

Locogen's assigned project team for Yeorton Hall Repowering are outlined below.

Jack Bell, Head of Ecology & Environmental Compliance – Locogen.

Jack is an ecologist and environmental professional within seven years' experience in the renewables sector, and currently leads Locogen's Ecology & Environmental Department. Jack has an in-depth knowledge of both ecological and environmental legislation in the United Kingdom. He has provided both Ecological / Environmental Clerk of Works (ECoW & EnCoW) roles on a number of wind farm projects across Scotland and is an approved Planning Monitoring Officer (PMO) for a number of local councils, he regularly audits wind energy construction projects for environmental compliance.

Further to this, Jack has extensive experience of Ecological Impact Assessments (EcIA), undertakes and oversees the relevant chapters of Environmental Impact Assessment Reports (EIAR) and Habitat Regulations Appraisal (HRA) for major renewables developments across the United Kingdom (UK).

Jake Walker, Ecology and Environmental Consultant - Locogen

The site surveys and reporting were undertaken by Jake Walker who is an Ecology and Environmental Consultant for Locogen and a qualifying member of CIEEM. He holds a Class Survey Licence WLM-A34 (Bat Survey Level 1) registration number 2021-51430-CLS-CLS; and a Level 1 Class Survey Great Crested Newt Licence 2022-10177-CL08-GCN. Jake has over 3 years' experience in professional ecological consultancy and has provided specialist advice on a range of projects, both within residential and industrial development. He has extensive experience in protected species surveys and has provided ECoW services for a variety of projects.

2. Methodology

2.1. Guidance

NatureScot guidance for assessing impacts from wind farm developments on ornithological and ecological receptors is regarded as the industry standard within the United Kingdom. As such relevant NatureScot guidance has been adopted for this project and is referenced throughout this report. Best practice guidance includes:

- NatureScot - *Bats and onshore wind turbines - survey, assessment and mitigation*¹
- NatureScot - *Recommended bird survey methods to inform impact assessment of onshore windfarms*².
- *NatureScot pre-application guidance for onshore wind farms*³
- Scottish Natural Heritage - *Assessing the impact of repowered wind farms on nature*⁴
- NatureScot - *Guidance - Good practice during Wind Farm construction*⁵

The Bat Conservation Trust (BCT), bat survey guidelines⁶ does not provide guidance for bat surveys regarding proposed wind developments. Instead NatureScot guidance⁷ should be followed for assessing impacts on bats.

2.2. Desktop study

Cumbria Biodiversity Data Centre (CBDC) were commissioned to provide records of protected or notable species within 2km of the site. The search was extended to include any statutory, non-statutory sites and notable habitats.

In addition, the Royal Society for Protection of Birds (RSPB) were commissioned to provide records for Schedule 1 and Birds of Conservation Concern (BoCC) Red and Amber species within 10km of the site.

The Department for Environment, Farming and Rural Affairs (DEFRA) interactive MAGIC Map⁸ was used for a baseline assessment of available environmental information of over 300 datasets including Joint Nature Conservation Committee (JNCC) Biodiversity Action Plan (BAP) priority

¹ NatureScot (2017) Recommended bird survey methods to inform impact assessment of onshore windfarms. Available at: <https://www.nature.scot/doc/recommended-bird-survey-methods-inform-impact-assessment-onshore-windfarms>

² NatureScot (2021) *Bats and onshore wind turbines - survey, assessment and mitigation*. Available at: <https://www.nature.scot/doc/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation>

³ NatureScot (2023) *NatureScot pre-application guidance for onshore wind farms*. Available at: <https://www.nature.scot/doc/naturescot-pre-application-guidance-onshore-wind-farms>

⁴ Scottish Natural Heritage (2018) *Assessing the impact of repowered wind farms on nature* [online]. Available at: <https://www.nature.scot/sites/default/files/2018-06/Guidance%20-%20Assessing%20the%20impact%20of%20repowered%20wind%20farms%20on%20nature%20-%20consultation%20draft%20-%20June%202018.pdf>

⁵ NatureScot (2019) *Guidance - Good practice during Wind Farm construction*. Available at: <https://www.nature.scot/doc/guidance-good-practice-during-wind-farm-construction>

⁶ Collins, J. (ed) (2023) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (4th Edition). The Bat Conservation Trust, London. ISBN-978-1-7395126-0-6

⁷ Natural England (2014) *Natural England Technical Information Note TIN051 Bats and onshore wind turbines*.

⁸ Magic Map Application. Available at: <https://magic.defra.gov.uk/MagicMap.aspx> (Accessed: 09 November 2023).

habitats⁹ & species inventories, nature conservation designations, Environmental & Historic Landscape Agreements, Sites of Special Scientific Interest (SSSI) impact zones, and wildlife licenses.

Aerial imagery from Google Earth and MAGIC Map and were used to search for ponds within 250m of the site.

Note: Full desk study records have not been included within this document, however they can be provided or request, if required. The results section of this report refers to notable desk study records were applicable.

2.3. Field study

A walkover of the site was conducted to carry out the extended UK Habitat Classification (UK-HAB) survey and protected species surveys. The walkover survey included land within the Red Line Boundary (RLB), and a 250m survey buffer to account for any badger setts or otter potential.

The area was surveyed for the presence of protected/notable species, including considering the habitats potential value for protected species. Standard survey techniques were applied throughout the walkover survey to determine presence of protected species¹⁰.

Habitat mapping was undertaken following UK-HAB V2.0 methodology¹¹. Mapping all habitats which fall into the appropriate Minimum Mapping Units (MMU). MMU's were determined pre-survey, available MMU's include:

Small scale MMU's:

- Area: 25m².
- Linear feature: 5m.

Large scale MMU:

- Area: 400m².
- Linear feature: 20m.

The small MMU was used during habitat mapping.

⁹ UK BAP priority habitats (2019) JNCC. Available at: <https://jncc.gov.uk/our-work/uk-bap-priority-habitats/#list-of-uk-bap-priority-habitats> (Accessed: 09 November 2023).

¹⁰ Hill, D. et al (eds.). 2005. *Handbook of Biodiversity Methods – Survey, Evaluation and Monitoring*. Cambridge University Press.

¹¹ Butcher, B., Carey, P., Edmonds, R., Norton, L. Treweek, J. (2020). *UK Habitat Classification – Habitat Definitions V2.0* at <http://ukhab.org>

Species proportions were recorded where possible using the Dominant, Abundant, Frequent, Occasional or Rare (DAFOR) scale. Any invasive plant species listed on Schedule 9 of the Wildlife and Countryside Act¹² were also recorded.

Consideration was given to the potential, within the survey area, to support the following legally protected animals: birds, badger, bat, red squirrel and reptiles as these species have the greatest potential to be disturbed by the proposed development.

2.4. General ecological survey constraints

Ecological surveys are limited by factors which affect the presence of plants and animals, such as the time of year, migration patterns and behaviour. Therefore, the absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future. Nevertheless, the results of this ecological survey have allowed an evaluation of the likely use of the site by protected and controlled species and the requirement for licensing and mitigation works.

There are no significant constraints on the survey in relation to access to the site nor in available methodology.

¹² *Wildlife and Countryside Act 1981, c.69, Schedule 9.* Available at: <https://www.legislation.gov.uk/ukpga/1981/69/schedule/9> [Accessed 10/11/2023].

3. Baseline ecological conditions

3.1. Desk survey results

3.1.1. Designated sites

There are eight statutory designated sites within 5km of the site. Table 1 provides further detail on site location, designation, and distance from the proposed development.

Table 1: Designated sites within 5km.

Site Name	Designation	Approximate distance from site (Km)	Citation interest
Haile Great Wood	SSSI	0.86km	Habitats: Ancient woodland
Florence Mine	SSSI	1.9km	Geological
Black Moss	SSSI	2.3km	Habitats
Silver Tarn, Hollas & Harnsey Mosses	SSSI	2.7km	Habitats & community structure
Low Church Moss	SSSI	2.5km	Habitats, flora, and invertebrate richness
Clints Quarry	SSSI	4km	Geological & Habitats
River Ehen	SSSI	4.7km	Freshwater Pearl Mussel populations
River Ehen	Special Area of Conservation (SAC)	4.7km	Freshwater Pearl Mussel populations

St Bees Head SSSI

St Bees Head SSSI is just outside of the 5km search radius for designated sites (5.6km at its closest point), however, it is a notable SSSI within the surroundings, designated for its sea cliffs and seabird colonies as such has been considered within the assessment. The SSSI citation for St Bees Head details that it is an important breeding site for seabirds, supporting guillemots, fulmar, kittiwake, puffin and herring gull. Additionally, the cliffs are the only breeding site on the coast of England for black guillemots. In addition to its seabird colonies, the SSSI citation also states that St Bees Head SSSI supports regular breeding for other notable species including tawny owl, sparrowhawk, peregrine falcon, and rock pipit.

3.1.2. Non-statutory sites

Results of the CBDC data search showed that there are two County Wildlife Sites (CWS) located within 2km of the proposed development: Oxenriggs Ponds and Carletonmoor Wood. Figure 2 show the location of the non-statutory sites in relation to the proposed development.

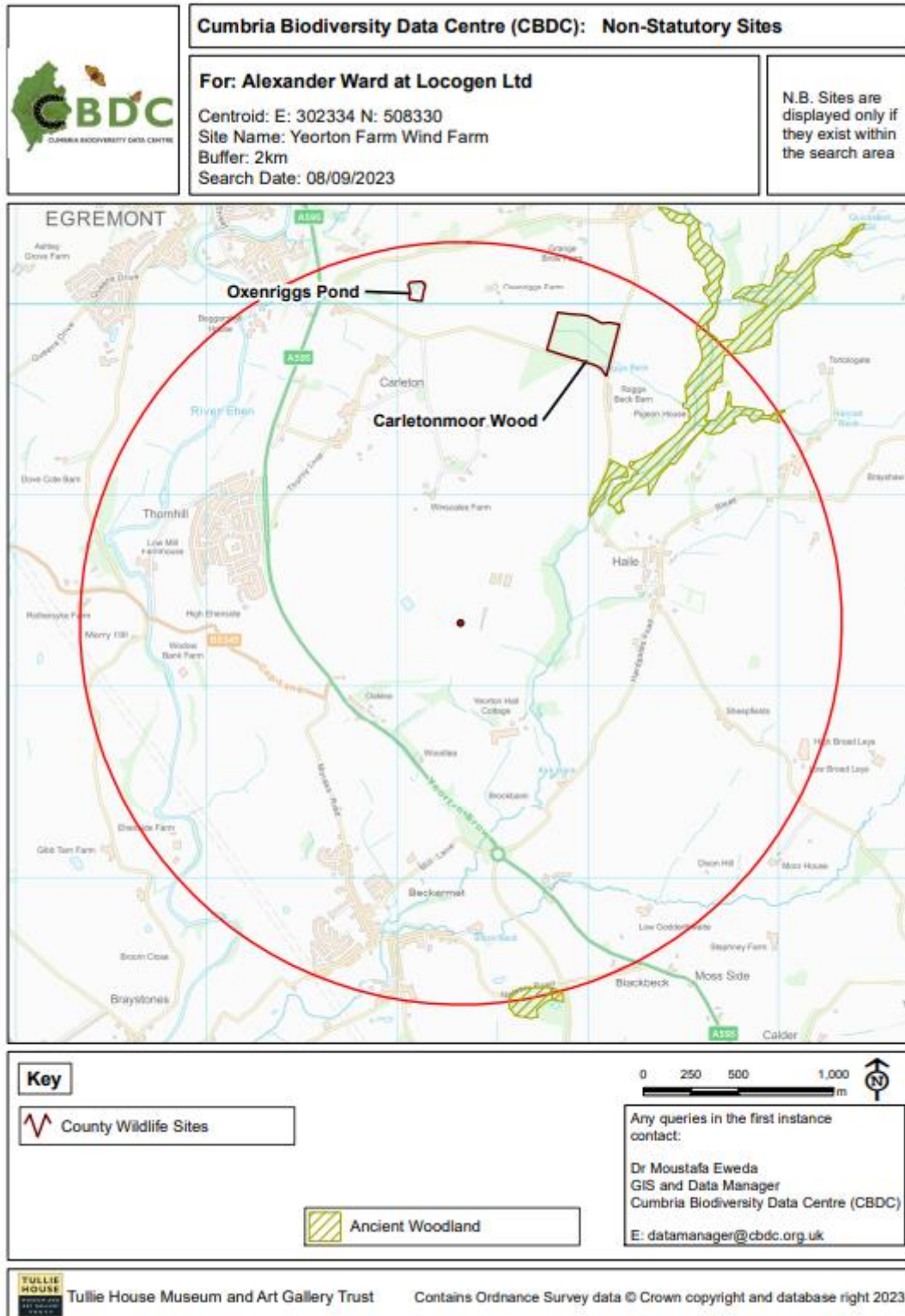


Figure 2: Non-statutory sites within 2km.

3.1.3. Priority habitats

Priority habitats identified within 2km of the site using MAGIC Maps include deciduous woodland, calaminarian grassland, and ancient woodland. Haile Great Wood is a large expanse of ancient woodland approximately 860m northeast of the site, this is the closest priority habitat to the site.

3.1.4. Ponds

There are no natural ponds within 250m of the site, however, there is a manmade agricultural reservoir within 100m of the site (Grid ref: NY02050843).

3.2. Field survey

3.2.1. Habitats: on site

Habitats on-site and within the 250m buffer are shown below in Figure 3. Table 3 details target notes within the UK-HAB map.

Overall, four habitat categories were recorded within and along the proposed development sites boundaries, further detail on recorded habitats can be found below:

Modified grassland – g4

Modified grassland is the dominant habitat within the site. This habitat category is indicative of grassland that has been subject to nutrient enrichment, it has thick sward which is homogenous in height and species poor. Grass species are restricted to a low number of fast-growing palatable grasses, with cocks' foot (*Dactylis glomerata*) and perennial ryegrass (*Lolium perenne*) dominant. Forb species are restricted to creeping buttercup (*Ranunculus repens*), creeping thistle (*Cirsium arvense*) and curled dock (*Rumex crispus*). The site is bounded by stock fencing along the east, south and west boundaries. The existing operational turbine is sited within the grassland (Target note 1).

Other neutral grassland – g3c

Within the site there is a small patch of other neutral grassland in the southwest corner of the site, which is more botanically and structurally diverse than the rest of the site; species recorded but not limited to, include red fescue (*Festuca rubra*), red clover (*Trifolium pratense*), and black medick (*Medicago lupulina*). Species noted are widespread and are of low conservation value.

Native hedgerow – h2a

A native hedgerow runs along the west boundary of the site; the hedgerow classes as a priority habitat, meeting the required 70% native species composition. However, it is generally species-poor with hawthorn (*Crataegus monogyna*) the dominant species. The hedgerow is lined with fencing along both aspects which has enabled dense bracken (*Pteridium aquilinum*) to dominate the understory. The hedgerow does not appear to be regularly managed and is beginning to develop into a line of trees, particularly towards the southern boundary of the site.

Bramble scrub – h3d

Dense bramble (*Rubus fruticosus*) scrub has colonised a raised bank directly adjacent to the site along the eastern boundary.

3.2.2. Habitats: 250m buffer area

Habitats within the 250m buffer are predominantly agricultural, consisting of arable fields and permanent pasture which are subject to regular disturbance. Arable land directly adjacent to the site is currently winter stubble, aerial imagery indicates that the field is in rotation and has previously been used as grazing pasture.

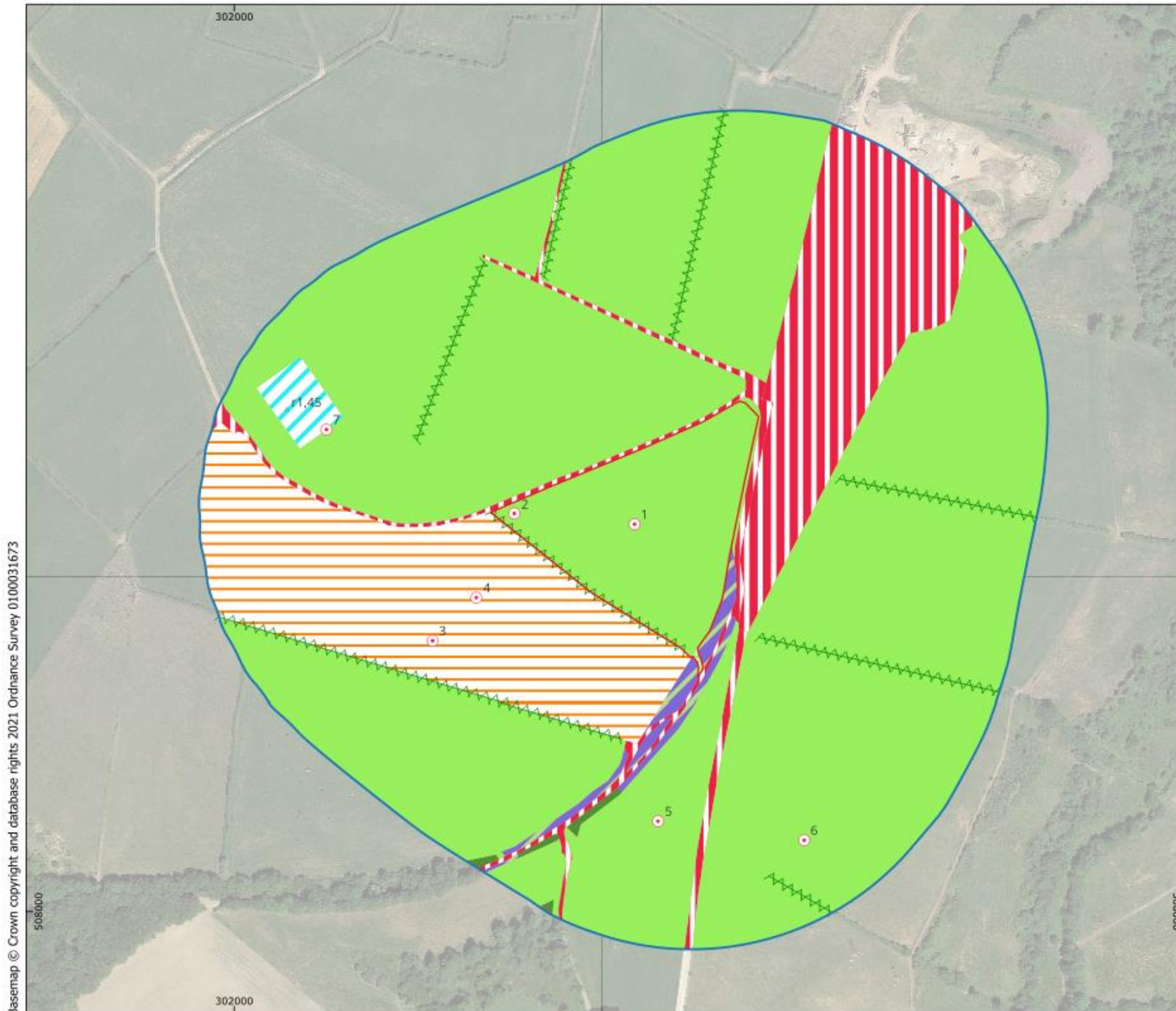
The permanent pasture is generally mono-specific, with low botanical value; scattered rushes are present within a low number of the fields, particularly east of the site where pasture is adjacent to Kirk Beck. Potentially a result of hydrological influences from the beck.

Native hedgerows bound several of the fields, however, these are generally species-poor with hawthorn the dominant species. Dense bramble scrub borders several of the surrounding fields, colonising earth banks along the boundaries

Habitats of greater value include small polygons of broadleaved woodland which bound agricultural fields southwest of the site. The woodlands are sited on raised banks and are likely the remnants of historical field boundaries. Species within the canopy layer include oak, silver birch (*Betula pendula*), hazel (*Corylus avellana*), and hawthorn. Bramble is abundant throughout the ground layer.

Beckermets industrial estate is directly east of the site. The site is completely urbanised consisting of sealed surface and industrial units.

The proposed development will not impact on any of the semi-natural habitats found in the survey buffer.



Basemap © Crown copyright and database rights 2021 Ordnance Survey 0100031673



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Legend

- 250m Ecology Buffer
- On-site
- Target note
- Hedgerow (Priority Habitat) (h2a)
- c1c5 - cereal crops, winter stubble
- g3c - other neutral grassland
- g4 - modified grassland
- h3d - bramble scrub
- r1 - standing open water and canals
- u1b - developed land, sealed surface
- wig - other woodland-broadleaved



A3 Horizontal Scale 1:3,000

CRS: British National Grid (EPSG:27700)

Produced: Jake Walker
 Reviewed: Jack Bell
 Approved: Jack Bell

Date: 09/11/23 Revision: 1.0

8382-DRW-0001-Yeorton UK HAB Map
 -V1.0

Yeorton UK HAB Map

Locogen Ltd

Figure 3: UK HAB Map.

Table 2: Essential UK HAB secondary codes

Code	Description
45	Reservoir

Table 3: Target note.

Target Note	National Grid Reference	Description
1	NY 0233 0832	Existing operational turbine & infrastructure
2	NY 0223 0834	Earth bank, potential habitat for badger sett establishment. No signs of use.
3	NY 0211 0824	Whooper swan (<i>Cygnus cygnus</i>), schedule 1 species, feeding in adjacent arable field.
4	NY 0216 0825 (field)	Sparrowhawk (<i>Accipiter nisus</i>) hunting in adjacent arable field.
5	NY 0236 0808	Mature oak (<i>Quercus robur</i>) is set within agricultural grassland. Moderate bat roost potential: potential roost features noted include knot holes, split limbs and tear out wounds.
6	NY 0249 0807	Rush (<i>Juncus</i>) dominated section of grassland.
7	NY 0208 0841	Brown hare (<i>Lepus lepus</i>) lying up in tussocky grass adjacent to agricultural reservoir

3.2.3. Protected species

Amphibians

Records for common frogs (*Rana temporaria*), palmate newt (*Lissotriton helveticus*) and smooth newt (*Lissotriton vulgaris*) were returned from the 2km data search. All records are over 800m from the site, and there are no natural/semi-natural ponds with 250m. The agricultural reservoir is generally unsuitable for amphibian habitation and the smooth steep sides of the reservoir will likely preclude use. Furthermore, the reservoir is set within agricultural land which will be of low value for amphibian species.

Subsequently, amphibians are scoped out of the assessment at this stage.

Reptiles

All reptile records held by the CBDC are over 1km from the site. Habitats on-site will have little value for reptile species, failing to offer the habitat structure/mosaic required for supporting reptile populations. Furthermore, the site is located within an agricultural landscape, encompassed by modified and regularly disturbed habitats which will likely preclude reptile habitation. There are habitats of greater value further afield of the site (Haille Great Wood) which are likely to support reptile populations, however, the regular disturbance and homogeneity of agricultural land will be largely inimical to reptile habitat and limit dispersal throughout the surroundings. Additionally, no signs of reptiles were noted on-site or within the 250m ecology buffer.

Reptiles have been scoped out of the assessment at this stage.

Ornithology

The desk survey scope covered a broad assessment of local ornithological records, habitats within the proposed development site and surrounding landscape to determine the potential to support notable ornithological interest.

Ornithological data searches from CBDC and RSPB returned no records within 1km of the site; most of the records related to the St Bees Head SSSI for its seabird colonies. Overall, it is considered there are habitats of value within 250m of the site, predominantly native hedgerows, dense bramble scrub and small sections of broadleaved woodland which will support nesting passerine species. Permanent pasture on-site and within the surrounding landscape are likely to be of low value for ground nesting species, due to regular disturbance and short uniformed sward height.

The arable field directly adjacent to the proposed development, could possibly be of a value for limited periods of time for foraging and hunting birds. During the site walkover, a whooper swan, a schedule 1 species of the Wildlife and Countryside Act and flocks of yellowhammer (*Emberiza citrinella*), were recorded foraging within the winter stubble; a sparrowhawk was also recorded hunting within the field, targeting foraging passerine flocks. However, it is considered that the dominant habitat within the site's vicinity (agricultural grassland) will generally be of low ornithological value.

Direct habitat loss will be limited to species poor modified grassland. Furthermore, due to the small scale of the proposed development habitat loss will be minor, therefore, it is considered that impacts on ornithological interests from direct habitat loss will be negligible. There is a risk of associated disturbance during the construction phase of the development. However, disturbance impacts (displacement from the site) are likely to be short term¹³. Post construction, the level of disturbance on-site will be comparable to the current operational turbine – therefore no further impacts are considered for this effect.

The proposed development will increase the overall height and swept area of the turbine, which could result in a potential increase in collision risk. The current turbine has been operational for several years, as a result it is likely that local ornithological interests have adapted to display a degree of avoidance behaviour for the site. At the time of writing there has been no recorded instances of collision for the operational turbine. The site and surrounding landscape are unlikely to support significant populations of notable species with intensively managed agricultural grassland being of limited value for ground nesting species, waders, and raptors. Subsequently, it is considered unlikely that the proposed turbine will significantly increase potential collision risk.

Overall, the repowering of the existing turbine is unlikely to present any significant risks to local ornithological receptors through either direct habitat loss, displacement or mortality through collision.

Bats

There are local records for maternity roosts within 2km of the site, with nursery roosts of soprano pipistrelle, common pipistrelle and brown long-eared bats recorded. The closest maternity roost is for soprano pipistrelles approximately 0.7km from the site, along Kirk Beck, consequently, the

¹³ Scottish Natural Heritage (2018) *Assessing the cumulative impacts of onshore wind farms on birds, Guidance*

known roost is beyond the recommended buffer (200m+rotor diameter) for additional roost surveys¹⁴.

There are no potential bat roost features within the site, and species poor modified grassland will provide sub-optimal foraging habitat. However, native hedgerows and bramble scrub along the sites east and west boundary will provide suitable linear foraging and commuting habitat. The previous turbine was sited at least 61m from the key linear features within the site, meeting the minimal buffer distance (50m between turbine blade tip and key features) recommend by NatureScot and Natural England¹⁵.

Other broadleaved woodland and bramble scrub within the 250m buffer will be of greater value for foraging bats, these habitats are functionally linked via hedgerows and tree belts to Kirk Beck which will be of high value for bat species. Approximately 140m south of the site boundary is a mature Oak tree which exhibits several Potential Roost Features (PRF) for roosting bats; PRF's include knot holes, and small tear-out wounds. Preliminary ground inspections did not indicate that potential roost features could support larger maternity roosts, instead it is considered that roosting will likely be restricted to small numbers/individual bats; as such they are classed as PRF-I features¹⁶. NatureScot guidance¹⁷ stipulates that features within 200m (plus rotor diameter) of turbines which could support significant maternity or hibernation roosts should be subject to additional survey effort. Considering the low likelihood of the oak tree supporting significant roosts, additional survey effort is not required.

Industrial buildings within Beckermat industrial park are likely to be of negligible value for roosting bats. Modern material used in construction likely failing to exhibit suitable crevice habitat to support roosting bats.

Badgers

The CBDC record search returned 29 records for badger (*Meles meles*). Most of the records are historical dating from the 1990's. The closest record is for a main sett in 1991, approximately 0.5km from the site. The most recent record is from 2009 for a dead badger 0.9km from the site.

On-site and the surrounding landscape offers suitable habitat for both sett excavation and foraging/commuting. There are several raised embankments within the 250m buffer, and an earth mound within the site that would offer suitable habitat for sett establishment. However, no signs badger, or setts was identified within the site or survey area during the walkover survey. Dense bramble scrub constrained access to some areas within the 250m buffer, therefore, could conceal evidence of badger use. However, there were no obvious tracks or trails within the site or surrounding buffer which would denote regular usage.

In conclusion, no signs of badger were identified during the walkover survey. However, due to the suitability of the site and surrounding landscape for foraging & commuting badgers, and the presence of mature broadleaved woodland within 500m of the site, badger presence within the surrounding landscape is assumed. It is likely that habitats within the site and 250m buffer are used on an infrequent basis by badgers as part of a wider territorial range.

¹⁴ NatureScot (2021) *Bats and onshore wind turbines - survey, assessment and mitigation*. Available at: <https://www.nature.scot/doc/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation>

¹⁵ Natural England (2014) *Natural England Technical Information Note TIN051 Bats and onshore wind turbines*.

¹⁶ Collins, J. (ed) (2023) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (4th Edition). The Bat Conservation Trust, London. ISBN-978-1-7395126-0-6

Red squirrel

The 2km data search identified 44 records for red squirrel (*Sciurus vulgaris*) in this surrounding landscape. All records are over 800m from the site. There is no suitable habitat on-site for red squirrel, and the surrounding agricultural land will be of low value for the species. Broadleaved woodland within 250m survey buffer has the potential to support red squirrel, however, no signs of habitation was recorded during the walkover survey.

The proposed turbine repowering will not directly impact red squirrel habitat. Due to no likelihood of impacts red squirrel have been scoped out of the assessment at this stage.

Other mammals

A brown hare was noted within an adjacent field, the site offers potential for the species including supporting resting up.

Bramble scrub and modified grassland will provide suitable habitat for nesting and foraging hedgehog (*Erinaceus europaeus*) No evidence of hedgehog was identified during the walkover survey, but due to their widespread distribution and local records, presence is assumed.

4. Potential Impacts and mitigation

4.1. Impacts

The following potential impacts have been identified.

- Potential impacts on bat foraging and commuting habitat within the site. Potential for adverse impact to bat populations through collision risk, and fragmentation of commuting/foraging habitat.
- Potential disruption to breeding birds if construction works are undertaken during the bird breeding season (mid-March – August)
- Suitable habitat for badger sett establishment within the site and 250m boundary, dense bramble scrub may conceal evidence of use. Potential for badger to be impacted during construction phase of the development.
- Potential impacts during construction phase to small mammal species
- Minor loss of modified grassland habitat

4.2. Mitigation

Bats

To ensure that the proposed repowering does not adversely impact foraging or commuting habitat within the site, the location of the replacement turbine has been designed following statutory guidance¹⁸. The minimum buffer distance between turbines and key features (hedgerows), should be calculated as follows:

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

b = the minimum distance

bl = Blade length (30.5m)

hh = hub height (46m)

fh = hedge height (2m)

$$B = \sqrt{(50 + 30.5)^2 - (46 - 2)^2} = 67m$$

The minimum calculated buffer distance for the proposed turbine is 67m. This has been achieved on-site. As a result, the proposed turbine is unlikely to impact any foraging or commuting routes and no further survey effort is required.

¹⁸ NatureScot (2021) *Bats and onshore wind turbines - survey, assessment and mitigation*. Available at: <https://www.nature.scot/doc/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation>

4.3. Recommendations

The following pre-construction recommendations are relevant for the proposed development:

- Implementation of standard construction best practice guidance.
- Pre-construction badger survey of development site and suitable habitat within 200m for sett establishment to determine any change in protected species constraints.
- Species protection plan should be produced to ensure that there are no adverse impact on species during the construction, implementation and decommissioning phases of the development.

It is recommended that recommendations are covered by an appropriately worded planning condition to the Local Planning Authorities (LPA's) satisfaction.

4.4. Effects

Due to the scale of the development, embedded mitigation and the production of species protection plans it is considered that there will be no likely significant effects on ecological or ornithological receptors.

5. Biodiversity Net Gain

Due to the scale of the development (single turbine) and the presence of the existing access road, the repowering project is unlikely to reach the de-minimis of 25m² permanent habitat loss required for mandatory Biodiversity Net Gain. The replacement substation will be sited on the same footprint as the existing station, as a result there will be no additional habitat loss. There is likely to be some short-term habitat loss from disturbance during construction, however, grassland habitat will be re-instated within 2 years post development and subsequently, will not contribute to overall habitat loss. Permanent habitat loss is likely to be limited to the footprint of the proposed turbine, which is unlikely to be greater than 25m².

Additionally, decommissioning of the existing turbine will result in a small area that can re-instated to grassland. As a result, it is considered that there will be no net loss from the development.

6. Conclusion

The site is located a considerable distance away from any designated nature conservation sites that qualify for ornithological or protected species interest. Most designated sites within 5km are cited for habitat and geological interest which will not be affected by the proposed repowering project.

Habitats on-site and within the immediate surroundings are predominantly agricultural, consisting of species poor intensively managed grassland and arable land. Subsequently, they are generally of low conservation and ecological value, failing to provide suitable habitat for a range of protected species (red squirrel, amphibians and reptiles).

No evidence of badger was identified during the walkover survey, and no setts were found within 250m of the site despite suitable conditions. Presence within the wider area is assumed due to local records, and high-quality habitat further afield. Overall, the proposed development will have a minor risk of impacting badger, which can be mitigated for via the pre-construction surveys and adoption of precautionary measures during construction.

The walkover survey indicated that surrounding habitat, particularly arable land is of ornithological value. However, local species appear to have adapted to existing turbine and are actively utilising the surrounding landscape and on-site hedgerows. Consequently, it is not envisioned that the proposed repowering turbine will adversely affect local ornithological interests through habitat loss, displacement or collision risk.

Hedgerows and bramble scrub along the site's boundaries offer potential foraging and commuting habitat for bats. The proposed turbine has been sited within the site to ensure that the minimum recommended buffer (67m) between key features and the turbine is met. As a result, no further survey effort for bats is required.

Overall, whilst there may be minor displacement of species during the construction phase of the development, proposed repowering is unlikely to have significant effects on local ornithological and ecological interests.

7. Protected species legislation

7.1. Badger

Both badgers and their setts are protected under the Protection of Badgers Act 1992 as amended by the Wildlife and Natural Environment (Scotland) Act 2011.

Offences under the Act include:

- wilfully taking, injuring or killing a badger
- cruelty to a badger
- intentional or reckless interference with a badger sett
- sale or possession of a badger
- marking or ringing of a badger

Interfering with a badger sett includes:

- damaging or destroying a sett or any part of it
- obstructing access to a sett
- disturbing a badger while it is in a sett
- causing or allowing a dog to enter a badger sett

7.2. Bats

All bat species found in Scotland are classed as European protected species. They receive full protection under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).

For any wild bat species, it is an offence to deliberately or recklessly:

- capture, injure or kill a bat
- harass a bat or group of bats
- disturb a bat in a roost (any structure or place it uses for shelter or protection)
- disturb a bat while it is rearing or otherwise caring for its young
- obstruct access to a bat roost or otherwise deny an animal use of a roost
- disturb a bat in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species
- disturb a bat in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young
- disturb a bat while it is migrating or hibernating

It's also an offence to:

- damage or destroy a breeding site or resting place of such an animal (whether or not deliberately or recklessly)
- keep, transport, sell or exchange, or offer for sale or exchange any wild bat (or any part or derivative of one) obtained after 10 June 1994

7.3. Otter

As a European protected species, the otter is fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).

It is an offence to deliberately or recklessly:

- capture, injure or kill an otter
- harass an otter or group of otters
- disturb an otter in a holt or any other structure or place it uses for shelter or protection
- disturb an otter while it is rearing or otherwise caring for its young
- obstruct access to a holt or other structure or place otters use for shelter or protection, or otherwise deny the animal use of that place
- disturb an otter in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species
- disturb an otter in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young

It is also an offence to:

- damage or destroy a breeding site or resting place of such an animal (whether or not deliberately or recklessly)
- keep, transport, sell or exchange, or offer for sale or exchange any wild otter (or any part or derivative of one) obtained after 10 June 1994

Otter shelters are legally protected whether or not an otter is present.

7.4. Birds

All wild birds in Great Britain are protected under the Wildlife and Countryside Act 1981 (as amended). This includes even common species like pigeons and blackbirds.

Further protection is given to some rarer species and to species vulnerable to disturbance and/or persecution. This is done through various schedules attached to the Act.

For any wild bird species, it is an offence to intentionally or recklessly:

- kill, injure or take a bird
- take, damage, destroy or interfere with a nest of any bird while it is in use or being built
- obstruct or prevent any bird from using its nest
- take or destroy an egg of any bird

For any wild bird species listed on Schedule 1, it's an offence to disturb:

- any bird while it is building a nest
- any bird while is in, on, or near a nest containing eggs or young
- any bird while lekking
- the dependent young of any bird

For any wild bird species listed on Schedule 1A, it's an offence to intentionally or recklessly harass any bird.

For any wild bird species listed on Schedule A1, it's an offence to intentionally or recklessly take, damage, destroy or interfere at any time with a nest habitually used by any bird.

It is also an offence to:

- possess or control a living or dead wild bird
- possess or control an egg of a wild bird (or any such derivatives)
- knowingly cause or permit any of the above acts to be carried out

There are additional offences in relation to:

- use of prohibited methods of killing or taking wild birds
- the sale of live and dead wild birds listed on Schedule 3
- the registration and keeping of captive wild birds listed on Schedule 4

Exceptions to these offences include the shooting of certain Schedule 2 species outside the closed season.

7.5. Wild mammals

Under the Wild Mammals (Protection) Act 1996, it is an offence to kill or injure any wild mammals by various means, including crushing and suffocating; therefore, consideration must be given to the humane exclusion or destruction of foxes and rabbits before work starts.

Appendix A. Site photos



Photo 1: on-site habitat, g4.



Photo 2: T5, PRF.



Photo 3: Native boundary hedgerow.



Photo 4: Bramble scrub.



Photo 5: Agricultural reservoir.



Photo 6: T5, Mature Oak.



Photo 7: T1, existing turbine.