

9.0 ECOLOGY AND NATURE CONSERVATION

INTRODUCTION

- 9.1 This chapter of the ES assesses the likely significant impacts of the proposed development on the environment with regard to Ecology and Nature Conservation. It also describes the methods used to assess the impacts; the baseline conditions currently existing at the site and in the surrounding area; the mitigation measures required to prevent, reduce or offset any significant adverse effects; and the likely residual impacts after these measures have been adopted.
- 9.2 This Ecology and Nature Conservation chapter has been prepared by Hayden Torr BSc (Hons) CEnv MCIEEM who has 23 years of experience as an ecological consultant specialising in ecology survey and ecological impact assessment.

POLICY AND LEGISLATIVE CONTEXT

National Planning Policy

- 9.3 The Government's key national planning policy for development is set out in the National Planning Policy Framework (NPPF), published in 2023. The NPPF includes the Government's policy on the protection of biodiversity through the planning system. It states that local plan policies and planning decisions should seek to minimise impacts on biodiversity and provide net gains in biodiversity. Planning policies should promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species populations (e.g. Habitats and Species of Principal Importance under the NERC Act 2006), linked to national and local targets.
- 9.4 The NPPF states "when determining planning applications, local planning authorities should apply the following principles:
- a) if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
 - b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
 - c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and

- d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.”

Local Planning Policy

Cornwall Local Plan 2010-2030 (Adopted 2016)

- 9.5 Cornwall council's policy requirements for planning applications are set out in the Cornwall Local Plan. The below policies relate to ecology and nature conservation.
- 9.6 *Policy 22- European Protected Sites* sets out mitigation measures required for residential development and is not therefore relevant to this assessment.
- 9.7 *Policy 23- Natural Environment* is relevant to this assessment and states that development should conserve, protect and where possible enhance biodiversity interests commensurate with their status and giving appropriate weight to their importance. All development must ensure that the importance of habitats and designated sites are taken into account and consider opportunities for the creation of a local and county-wide biodiversity network of wildlife corridors which link County Wildlife Sites and other areas of biodiversity importance, helping to deliver the actions set out in the Cornwall Biodiversity Action Plan. The relevant sub-sections of Policy 23 are summarised below:
- European Sites: The highest level of protection will be given to Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites.
 - National sites: Development proposals within or outside a Site of Special Scientific Interest (SSSI) which would be likely to adversely affect the site will not be permitted unless the benefits of the development, at this site, clearly outweigh both the adverse impacts on the site and any adverse impacts on the wider network of SSSIs.
 - Local Sites: Development likely to adversely affect locally designated sites, including County Wildlife Sites, and sites supporting Biodiversity Action Plan habitats and species, will only be permitted where the need and benefits of the development clearly outweigh the loss and the coherence of the local ecological network is maintained.
 - Priority species and habitats: Adverse impacts on protected species and Biodiversity Action Plan habitats and species must be avoided wherever possible (i) subject to the legal tests afforded to them, where applicable (ii) otherwise, unless the need for and benefits clearly outweigh the loss.
 - Ancient woodland and veteran trees: Development must avoid the loss or deterioration of ancient woodland and veteran trees, unless the need for, or benefits of, development on that site clearly outweigh the loss.
 - Avoidance, mitigation and compensation for landscape, biodiversity and geodiversity impacts Development should avoid adverse impact on existing features as a first principle and enable net gains by designing in landscape and biodiversity features and

enhancements, and opportunities for geological conservation alongside new development. Where adverse impacts are unavoidable they must be adequately and proportionately mitigated. If full mitigation cannot be provided, compensation will be required as a last resort.

- 9.8 Policy 25: Green Infrastructure is also relevant to this assessment. This policy encourages developments to contribute to an enhanced connected and functional network of habitat, open spaces and waterscapes through: retaining and enhancing the most important environmental infrastructure assets and connections, demonstrating that these assets and corridors have been taken into account during the design of the development, providing appropriate buffers, restoring or enhancing connectivity, providing accessible and good quality open space and providing clear arrangements for the long term maintenance and management of these assets and connections. Where these assets and corridors cannot be retained they should be replaced by equivalent or better provisions.

Cornwall Planning for Biodiversity Guide Supplementary Planning Document

- 9.9 The Cornwall Planning for Biodiversity Guide SPD was adopted in October 2018 and is a material consideration in planning decisions. The guide sets out a new approach by Cornwall Council for achieving a gain for nature within development sites. It does this by encouraging more biodiverse green and blue space within development sites, such as parks, ponds and corridors of open green space along rivers and hedges. It also gives prescriptive measures for the provision of bat and bird boxes, and bee bricks to make space for nature and the expected quality of ecological reporting for planning applications.

Chief Advice Note and the Climate Emergency DPD

- 9.10 The Draft Chief Officers Advice Note (March 2020) and the Climate Emergency Development Plan Document (Adopted February 2023) require 10% net gain to be achieved for all major planning applications within Cornwall through the use of the DEFRA Biodiversity Metric 3.1. Both these documents carry weight within the planning system, although they are not yet approved.

Local Biodiversity Action Plan

- 9.11 Following The Convention on Biological Diversity (1992), the UK Biodiversity Action Plan (BAP) was published in 1994 to guide national strategy for the conservation of biodiversity. Biodiversity issues have subsequently been devolved to the individual countries. Within England, the former UK BAP habitats and species are now described as 'species and habitats of principal importance for conservation in England', or 'Priority Habitats' and 'Priority Species'.
- 9.12 The Cornwall Biodiversity Action Plan identifies habitats and species that are priorities for conservation within the county.

Legislation

Conservation of Habitats and Species Regulations 2017 (as amended)

9.13 These Regulations, also referred to as the ‘Habitats Regulations’, originally implement the EC Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (92/43/EEC) and the EC Directive on the Conservation of Wild Birds (79/409/EEC). These Regulations were amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. The Habitats Regulations provide for the designation and protection of ‘European Sites’ (Natura 2000 sites). They convey a statutory requirement for local planning authorities to undertake a ‘Habitats Regulations Assessment’ of the potential impacts of plans and projects, including development proposals, on European Sites. The provisions also include protection of ‘European Protected Species’ (EPS). Under the regulations, local planning authorities have to consider three ‘derogation tests’ when deciding whether to grant permission for a development that affects an EPS, which are as follows:

- the development must be for over-riding public interest or for public health and safety;
- there are no satisfactory alternatives to the Proposed Development; and
- the favourable conservation status of the EPS concerned must be maintained.

Wildlife and Countryside Act 1981 (as amended)

9.14 This Act is the principal wildlife legislation in England. It includes provisions for important habitats to be designated and protected as SSSIs. Numerous plant and animal species, and the places that they use for shelter and protection, are also protected under the act, including all birds, their nests and eggs.

Countryside and Rights of Way Act 2000

9.15 Referred to as the CROW Act, this legislation increases the protection of SSSIs and strengthens wildlife enforcement action. The act also strengthens the protection of protected species under the Wildlife and Countryside Act 1981 (as amended) through the introduction of a new offence of ‘reckless disturbance’.

Natural Environment and Rural Communities Act 2006

9.16 This act places a duty on all public bodies and statutory undertakers to have due regard to the conservation of biodiversity in all their functions. It also requires the publication of a list of habitats and species of principal importance for the conservation of biodiversity. This list, known as the Section 41 list, includes all priority habitats and species of principal importance for the conservation of biodiversity in England.

Protection of Badgers Act 1992

9.17 This act was introduced primarily for animal welfare reasons, as opposed to species conservation. It provides protection of badgers and their setts.

Hedgerow Regulations 1997 (as amended)

- 9.18 These regulations include provisions for the protection of hedgerows and make it an offence to remove 'important' hedgerows without consent from the local planning authority. Where planning permission is granted for a development proposal, the removal of 'important' hedgerows is deemed to be permitted.

Environment Act 2021

- 9.19 The Environment Act 2021 was passed into legislation in 2021 and will be completing its transitional phase in autumn 2023. The act contains legislation relating to air and water quality, waste and recycling. It aims to strengthened biodiversity duty and ensure 10% biodiversity net gain is delivered on development sites. It will also ensure Local Authorities create Local Nature Recovery Strategies to support a Nature Recovery Network.

ASSESSMENT METHODOLOGY

Baseline Data

- 9.20 Baseline ecological information was determined through desk study and site survey.

Desk Study

- 9.21 Biodiversity information was obtained for a 2km area around the site boundary (extended to 10km for birds and bats) from the Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS) (hereafter referred to as the 'desk study area'). Information was received in March 2020 and updated for bats and birds in December 2022. Information included the location and details of the following:

- designated sites of nature conservation value (statutory and non-statutory). Extended to 10km for former European Sites and SSSIs notified for bats and birds using the DEFRA Magic website; and
- previous records of protected and/or notable species, including Priority Species (Species of Principal Importance for Conservation in England listed on Section 41 of the Natural Environment and Rural Communities [NERC] Act 2006) and Cornwall Biodiversity Action Plan (BAP) Priority Species. The legislation and conservation status that applies to the species is provided in Appendix 9.1.

- 9.22 In addition, the following reports relevant to the site were also reviewed:

- Chapter 7 of the Environmental Statement (1990) for the existing wind turbines undertaken by the Cornwall Trust for Nature Conservation Environmental Consultancy.

Site Survey

- 9.23 An Extended Phase 1 Habitat survey of the survey area was undertaken between 9 March and 9 April 2020, and updated on 15 December 2022 (Figure 9.1). The survey followed guidelines published by Joint Nature Conservancy Council (2010) and Institute of

Environmental Assessment (1995) and identified the main habitat types within the survey area and the presence/potential presence of protected and notable species. A UK Habitat Classification Survey (UK Habs) of the site (UK Habitat Classification Working Group, 2018) was also undertaken at the same time as the Phase 1 survey. Target Notes were used to identify specific features of ecological interest and these were detailed on Figure 9.1. A Phase 1 Habitat and UK Habs Survey was also undertaken of a proposed Biodiversity Offsetting Site at Otterham Mill on 13 January 2023 to identify current habitats (Figure 9.2) and inform the proposed habitat enhancements of this site (Figure 9.3).

9.24 The Extended Phase 1 Habitat survey identified the potential for protected and notable species within the site. Further (Phase 2) surveys were subsequently undertaken to determine if such species were present. A summary of these surveys is provided in Table 9.1 below; full details of methodologies and results are contained within Appendices 9.2 to 9.4. All surveys were carried out following standard published methods.

Table 9.1 Summary of Phase 2 Ecological Surveys

Survey	Date	Details
Reptiles	May to July 2021	Deployment of refugia 'tiles' in suitable habitat in May checked on seven occasions following Froglife Advice Sheet 10: Reptile survey (1999) ¹ . Refer to Appendix 9.2.
Breeding birds (breeding season)	Mid-March to September 2021	Vantage point surveys undertaken from three vantage points. Survey effort of 36 hrs from each vantage point (gov.uk 2015 ² , Scottish Natural Heritage 2017 ³). Appendix 9.3
	May – July 2021	Three nightjar survey sessions undertaken at local sites either known to, or with suitable habitat to, support nightjar. The survey was based on guidance in Gilbert et al (2012) ⁴ .
Birds (non-breeding season)	October 2020 to Early March 2021	Vantage point surveys undertaken from three vantage points. Survey effort of 36 hrs from each vantage point (gov.uk 2015 ² , Scottish Natural Heritage 2017 ³) Appendix 9.3
	December 2020 – March 2021	Four survey sessions for nocturnal wading bird activity undertaken using infrared camera
Badger	March to April 2020 and December 2022	Badger survey of the site following the Mammal Society publication Surveying Badgers (Harris 1999 ⁵). Refer to the 'Baseline Conditions' section within this chapter.
Bat activity transects	July to October 2020 and April to June 2021	Six activity surveys undertaken in accordance with the Bat Conservation Trust's Good Practice

¹ Froglife, 1999. Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Froglife.

² gov.uk, 2015 <https://www.gov.uk/guidance/wild-birds-surveys-and-monitoring-for-onshore-wind-farms> accessed 01/10/2020

³ Scottish Natural Heritage 2017 Recommended bird survey methods to inform impact assessment of onshore wind farms, Scottish Natural Heritage (now NatureScot), Inverness

⁴ Gilbert G., Gibbons D. W., and Evans J. 2012, Bird Monitoring Methods, RSPB, Sandy, Bedfordshire

⁵ Harris S, Cresswell P & Jeffries D (1989) Surveying Badgers. The Mammal Society, London.

Survey	Date	Details
		Guidelines (Collins 2016 ⁶) and the Bats and Onshore Wind Turbines Survey Guidelines (SNH et al, 2019) ⁷ . Refer to Appendix 9.4
Static bat detector surveys	Summer and Autumn 2020, and Spring and Autumn 2021	11 detectors deployed in summer 2020, 12 detectors deployed in autumn 2020 and 13 detectors deployed in spring and autumn 2021. Detectors recorded for at least 10 nights in each survey period in accordance with the Bats and Onshore Wind Turbines Survey Guidelines. Refer to Appendix 9.4.

Evaluation of Ecological Features

9.25 An ecological evaluation of the baseline was undertaken using the framework provided by CIEEM (2018)⁸. This provided an evaluation for ecological features as follows (refer to Appendix 9.5 for further information):

- International value (High);
- National value (High);
- Regional value (High to Medium);
- County value (Medium);
- District value (Medium to Low);
- Parish value (Low); and
- Sub-Parish (Low).

Identification of Ecological Effects

9.26 In addition to evaluating the importance of the ecological features identified, this section characterises predicted potential ecological effects arising from the proposed scheme. It does so by assessing the anticipated effects for each key ecological feature in light of the available information. Where appropriate, the effects identified to be acting on each ecological feature are assessed in terms of the factors listed below:

- direction (adverse, beneficial, neutral or negligible effect);
- magnitude (the amount or level of effect);

⁶ Collins, J. (ed.) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edn)*. Bat Conservation Trust, London.

⁷ SNH, NE, NRW, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, University of Exeter and the Bat Conservation Trust (2019 current at the time of survey). *Bats and onshore wind turbines: Survey, Assessment and Mitigation*.

⁸ CIEEM, 2018. *Guidelines for ecological impact assessment. Third Edition*. Chartered Institute of Ecology and Environmental Management.

- extent (area in hectares, linear metres, etc.);
- reversibility (i.e. is the effect permanent or temporary); and
- duration/timescale of the effect which is given as either (i) acute, (ii) short-term: 0-3 years, (iii) medium term 3-10 years, and (iv) long term: 10 years +.

9.27 These factors provide a means of characterising the effects on the ecological features identified, thereby allowing the significance of an effect to be assessed. Particular attention was given to the direction and duration of an effect.

9.28 The impacts of the current 22 two-blade wind turbines and the upgrade to the approved three-blade wind turbines are considered as part of the operational impact assessment for bats and birds.

9.29 An effect on an ecological feature is considered to be significant if it has an adverse or beneficial effect on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographical area. Effects identified at 'Sub-Parish' scale or below were not considered 'Significant'.

Mitigation, Compensation and Enhancement Measures

9.30 The location of the proposed turbines, cabling route and construction area avoided sensitive ecological features present within and adjacent the site. Therefore, the impact assessment was of a partially-mitigated scheme. Additional mitigation, compensation and enhancement measures for the construction and operational phases of the scheme were identified, where appropriate.

Residual Effects

9.31 Effects that were predicted to occur after mitigation were also assessed using the above method. A Biodiversity Offsetting Metric (DEFRA, 2022) has been produced for the residual assessment which compares the number of biodiversity units to be lost with the number gained.

Limitations

9.32 All surveys were undertaken following best practice guidelines and no significant limitations were therefore noted. Where bat detectors failed or surveys were undertaken in sub-optimal weather conditions, then these surveys were repeated at other times of the year to ensure sufficient survey data was collected (refer to the Survey Limitation section within Appendix 9.3 and 9.4).

Consultation

9.33 Consultation has been undertaken with the following consultees as summarised within the below Table.

Table 9.2: Summary of Consultations

Summary of Matter Raised	Reference in ES Chapter
Cornwall Council Ecologist (H. Fearnley) email dated 8/4/22	
River Camel SAC considerations – confirmation proposal/activity is outside of the boundary on CC website - River Camel SAC	Confirmation site is outside of River Camel SAC catchment included in the Ecological Baseline Section below
UK Hab survey or convert Phase 1 to UKHab for the metric	Phase 1 Habitat Survey used in the Baseline Conditions Assessment. Converted to UKHab within the Biodiversity Metric in Appendix 9.6
Reference to nightjar surveys in scoping report, did these take place	Surveys undertaken in 2021. Refer to Table 9.1 and Appendix 9.3
Please ensure impacts to barn owls are adequately considered.	The Barn Owl Trust's position statement (2015) on wind turbines states the following: <i>'Based on available evidence, it is thought that wind farms that are positioned appropriately within the landscape do not pose a significant hazard for Barn Owls. This is because Barn Owl home range varies between 350 hectares in summer and 5000 hectares in winter, thereby reducing the amount of time spent in the vicinity of a turbine in comparison with many other species. Furthermore, foraging predominantly takes place within 3-4m (10-13 feet) of the ground yet most turbines afford a rotor tip ground clearance well in excess of this elevation.'</i> Based on the above, no impacts on barn owl are anticipated
Collision risk of birds and bats – like to see risk to bat collision risk included in EIA.	Collision risk for birds has been calculated using the 'Band Model' in accordance with best practice (Scottish Natural Heritage 2017) ⁹ . Collision risk to bats has been undertaken in accordance with Scottish Natural Heritage et al, 2019. ¹⁰
Plover species are the most sensitive to turbines due to their flight behaviour but this can be mitigated by managing the land to encourage the birds to fly/feed away from the turbines (e.g. adjacent arable for leatherjacket food) so we could add in this type of detail to the mitigation/BNG strategy.	It is unclear from the available academic literature whether golden plover preferentially select arable habitats over pasture. Indeed, certain publications indicate that golden plover are more likely to feed on grassland than arable land through most of the winter (Fuller and Youngman, 1979 ¹¹). In the absence of robust evidence for this approach to mitigation it has not been put forward for this site.
Bats are harder in terms of collision risk– its usually determined through	Static detector and transect surveys undertaken. refer to Baseline Conditions section below.

⁹ Scottish Natural Heritage 2017 Recommended bird survey methods to inform impact assessment of onshore wind farms, Scottish Natural Heritage (now NatureScot), Inverness

¹⁰ Scottish Natural Heritage, Natural England, Natural Resources Wales, Renewable UK, ScottishPower Renewables, Ecotricity Ltd, the University of Exeter and the Bat Conservation Trust (2019): Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation. Version: January 2019.

¹¹ R. J. Fuller & R. E. Youngman (1979) The utilisation of farmland by Golden Plovers wintering in southern England, Bird Study, 26:1, 37-46

Summary of Matter Raised	Reference in ES Chapter
use of static detectors (plus some transect to try and observe) on the turbine bases to assess	Collision risk assessment for high risk bats undertaken and summarised in the Operational Effects section.
BNG strategy and proposal that allows for maintenance / repair of turbines	BNG Strategy included (refer to the 'Mitigation, Compensation and Enhancement' section and Appendix 9.6 and Figure 9.2 and 9.3)
Natural England (Appendix C of Cornwall Council Scoping Opinion Dated 14/6/2021)	
General Advice letter stating that ecology features should be considered within the ES, including designated sites of nature conservation value.	Information on Designated sites and other ecology features included Baseline Conditions section below. Full assessment of impacts included within in the Construction and Operational Phase Impacts section below

BASELINE CONDITIONS

Designated Sites of Nature Conservation Value

Statutory Designated Sites

- 9.34 No statutory designated sites of nature conservation value occurred within or immediately adjacent the survey area. The following six SSSIs occur within 5km of the survey area:
- Bodmin Moor North SSSI occurs approximately 1.6km to the south east of the survey area boundary and is designated for its wintering golden plover population;
 - Ottery Valley SSSI occurs approximately 1.8km to the north west of the survey area and is designated for its acid/marshy grassland and bog habitats and for supporting important populations of otter and marsh fritillary butterfly;
 - Lidcott Mine SSSI and Polyphant SSSI which occur 1.6km and 4km to the east respectively and are both designated for their geological interest;
 - Kernick and Ottery Meadows SSSI located approximately 4km to the north of the site and is designated for its culm grassland; and
 - River Camel Valley and Tributaries SSSI designated for its dry heath, woodlands and for supporting important populations of bullhead, salmon and otter.
- 9.35 The survey area lies within the Natural England SSSI Impact Zone for each of the above SSSIs. According to planning guidance any proposed wind turbine development within this zone has the potential to impact on these SSSIs. A full assessment of the impacts of the proposed development is included within the Construction and Operational Impacts section below.

- 9.36 The following SSSIs occur within 10km of the survey area and are designated for their bird and bat interest:
- Minster Church SSSI occurs approximately 6.7km to the northwest of the survey area and is designated for its greater horseshoe bat maternity roost; and
 - Tintagel Cliffs SSSI located approximately 7.2km to the northwest of the survey area and is designated for its geological features, habitats and nesting birds, including seabirds, peregrine falcon and house martin.
- 9.37 The following four European sites occur within 10km of the survey area:
- Crowdy Marsh Special Area of Conservation (SAC) which occurs 2.8km to the south west of the survey area and is designated for its transition mires and quaking bogs;
 - Tintagel-Marsland-Clovelly Coast Special Area of Conservation (SAC) occurs 8km to the north west of the survey area and is designated for its vegetated sea cliffs, oak woodland and dry heaths
 - River Camel SAC occurs 4.5km to the west and is designated for its dry heath, woodlands and for supporting important populations of bullhead, salmon and otter; and
 - Bristol Channel Approaches SAC which occurs 8.5km to the north west of the survey area and is designated for its population of harbour porpoise.
- 9.38 Six non-statutory designated sites of nature conservation value occur within the survey area (refer to Figure 9.4). These are as follows:
- Napp's Moor County Wildlife Site (CWS) occurs in the east of the survey area and is designated for its mosaic of lowland heathland and culm/marshy grassland;
 - Laneast and Badgall Downs CWS is designated for its mosaic of heathland and culm/marshy grassland– a small section of this CWS was located in the far north east of the survey area;
 - Abbott's Hendra CWS which occurs along a tributary of the River Inny in the east of the survey area. The site is designated for its culm grassland and unimproved grassland along the river valley;
 - Two Cornwall Roadside Verge Inventory Sites (CRVIS) alongside the A395 which ran through the centre of the survey area. These sites are designated for supporting populations of goat's-beard plant and chimney sweeper moth, which are both rare in Cornwall and *Ceutorhynchus punctiger* which is a Nationally Scarce species of weevil. The road verges are not affected by this scheme and therefore did not form part of the survey area; and
 - A CRVIS adjacent St Clether in the far south of the survey area. This site supports populations of jasione pug and double line, both of which are Nationally Scarce moths.

- 9.39 A further six CWSs and three CRVIS occur within 2km of the survey area boundary including Abbot's Hendra CWS which occurs along a tributary of the River Inny immediately adjacent the survey area. This site is designated for its culm grassland and unimproved grassland along the river valley in the north of the survey area. The remaining CWS and CRVIS are all over 200m from the survey area boundary.
- 9.40 The survey area does not lie within a Wind Turbine Bird Sensitive Site. These sites were identified by the RSPB to assist with selection of wind turbine sites (RSPB, 2009¹²).

Habitats within the Site

- 9.41 The majority of habitats within the survey area comprised large improved grassland fields surrounded by 'Cornish' hedges. Semi-natural broadleaved woodland lined the watercourses that flowed through the valleys and species-rich marshy grassland occurred on the higher areas around Napp's Moor. Species-poor marshy grassland was frequent within waterlogged parts of the improved grassland field.

Improved grassland

- 9.42 This was the most extensive habitat within the survey area which comprised primarily sheep-grazed fields with a short sward that was dominated by perennial rye-grass with frequent Yorkshire fog, broadleaved dock, spear thistle, mouse-ear, and common sorrel. This habitat was categorised as 'modified grassland' in 'moderate' condition; under the UK Habs Assessment.

Species-poor semi-improved grassland

- 9.43 This habitat occurred occasionally within the east of the survey area. Plant species were similar to those within the improved grassland but with more diverse grass species including creeping-bent and abundant herb species including common sorrel, ribwort plantain, white clover and creeping buttercup. This habitat was categorised as 'modified grassland' in 'good' condition; under the UK Habs Assessment.

Species-poor hedgerows

- 9.44 'Cornish' hedges comprising stone and earth banks formed the majority of the field boundaries. Shrub species were tightly flailed and typically limited to European gorse, blackthorn and bramble. Most of the hedgerows were defunct with gaps between the shrubs, although the hedgerows adjacent roads and in the north east of the survey area were typically more established. Ground-flora included common nettle, bracken, foxglove, red campion, polypody and common sorrel. Occasional beech, pedunculate oak and ash trees occurred on the hedgebanks.

Species-rich hedgerow

- 9.45 Species-rich hedgerows with stone and earth banks formed field boundaries, primarily on the lower ground and in the north east of the survey area. Shrub species were dominated by blackthorn with frequent European gorse, holly, elder, grey willow, pedunculate oak,

¹² Bright J.A., Langston R. H. W., Anthony S., 2009 Mapped and written guidance in relation to birds and onshore wind energy, development in England. RSPB, Sandy, Bedfordshire.

hawthorn, hazel and ash. Mature and semi-mature beech, pedunculate oak and ash also occurred occasionally. Ground-flora included common nettle, foxglove, greater stitchwort, lesser celandine, red campion, lords-and-ladies, primrose and bluebell.

Broadleaved woodland - semi-natural

- 9.46 Semi-natural broadleaved woodland typically lined the watercourses which ran along the bottom of valleys (Target Notes [TN] 44 and 54; refer to Figure 9.1). Smaller woodland blocks occurred throughout the survey area; these appeared to have been established from former unmanaged hedgerows (TN41, 47, 48). The woodland canopy was typically dominated by mature and semi-mature pedunculate oak with frequent to occasional beech, grey willow and ash. The understorey was generally dominated by bramble with occasional holly and hazel. The ground flora was limited to species typical of improved grassland within parts of woodland subject to sheep grazing, and where sheep were excluded ground flora species comprised common nettle, herb-Robert, wood avens and red campion. Bryophytes and opposite-leaved golden saxifrage occurred in wetter parts of the woodland.
- 9.47 A small block of wet woodland dominated by goat willow ('willow carr') occurred within Napp's Moor CWS (TN 46). Ground flora species included hard fern, wild angelica and abundant bryophytes.

Coniferous woodland – plantation

- 9.48 A semi-mature conifer plantation was located in the northwest of the survey area with ground flora limited to ivy, bramble and common nettle.

Running water

- 9.49 Streams occurred throughout the survey area particularly along the bottom of the valleys. These were typically surrounded by broadleaved woodland along the bottom of valleys or surrounded by marshy grassland on higher ground. The banks were typically earth and stone banks with a clay to cobble bed substrate. Aquatic vegetation was limited at the time of survey.

Marshy grassland

- 9.50 Species-poor marshy grassland occurred throughout the survey area in sections of improved grassland fields with poorly draining soils. This habitat was dominated by soft-rush with frequent marsh thistle and bryophytes. This habitat was classified as 'modified grassland' in accordance with the UK Habs Classification.
- 9.51 Species-rich marshy grassland occurred throughout Napp's Moor CWS (TN 32 and 50) and within the small strip of the Laneast and Badgall Downs CWS which occurred within the survey area (TN 1). This grassland is known locally as 'culm grassland' and was dominated by purple moor-grass tussocks with frequent bramble, European gorse, western gorse, marsh thistle, occasional heath milkwort, bristle bent grass, soft-rush and spearwort.

- 9.52 The northern block of Napp's Moor CWS contained species-rich marshy grassland with a more open sward and affinity with mire vegetation communities (TN 33). This habitat was dominated by purple moor-grass with locally abundant toad-rush and frequent bristle bent, common sorrel, spearwort, marsh thistle, water crowfoot, lousewort, bell heather, common spike-rush, jointed rush.

Wet dwarf shrub heath

- 9.53 Heathland occurred in the west of Napp's moor CWS (TN 34). This habitat was dominated by common heather which covered approximately 40% of the ground. Bristle bent and European gorse were all locally abundant with frequent purple moor-grass.

Buildings

- 9.54 Buildings within the survey area generally comprised stone farmhouses and outbuildings with slate roofs and concrete agricultural buildings with corrugated steel or asbestos roofs.

Scattered scrub

- 9.55 Scattered scrub occurred throughout the survey area in places with limited access by livestock. This habitat was dominated by European gorse and bramble with occasional blackthorn, grey and goat willow.

Scattered broadleaved trees

- 9.56 Mature and semi-mature oak, beech and ash trees occurred in hedgerows. Lines of trees also occasionally formed field boundaries where hedgerows had become outgrown.

Standing water

- 9.57 Several ponds occurred throughout the survey area, particularly on higher ground on Kittow's Moor and Napp's Moors. These typically contained limited aquatic vegetation and were surrounded by soft-rush and grassland. The pond at TN 16 in the south contained a more diverse vegetation community and a small island in the southern extent with trees and a bird box. Emergent vegetation included common figwort, reedmace, water forget-me-not, water lily, common duckweed and hornwort. Marginal vegetation included soft-rush, white clover, hard rush and European gorse.

Arable

- 9.58 Several arable fields were located within the survey area. These typically contained small field margins with limited plant species diversity.

Habitats surrounding the survey area

- 9.59 The survey area was surrounded by the following habitats:
- Grassland pasture fields surrounded by hedgerows to the west;
 - The River Inny and associated broadleaved woodland to the south;

- Laneast and Badgall Downs CWS and additional grassland fields to the east; and
- Grassland fields, conifer plantation within Wilsey Down and Abbots Hendra CWS to the north of the survey area.

Protected and Notable Species

Notable plants

Desk study

- 9.60 Numerous notable plant species were recorded within the desk study area, including lesser butterfly-orchid and pale dog-violet which were both recorded within Laneast Downs CWS, part of which occurs within the survey area. These are both Priority Species and Cornwall BAP Species.
- 9.61 Montbretia, an invasive species subject to legal controls, was recorded within the survey area (TN 13) and several other invasive species including Japanese knotweed were identified by the desk study.

Survey area

- 9.62 Bluebell, which is partially protected (against sale) under the Wildlife and Countryside Act 1981 (as amended) was recorded within the survey area. No other notable plants were recorded. No notable plants were recorded during the survey; however, notable species could potentially occur within the habitat mosaic of Napp's Moor CWS, and Laneast and Badgall Downs CWS. Lesser butterfly-orchid and pale dog-violet were not recorded within the survey area although only a small strip of Laneast Downs, where these species were recorded previously, occurred within the survey area.

Invertebrates

Desk study

- 9.63 The desk study identified several previous records of notable invertebrates including several marsh fritillary butterfly records. The closest record is of a 1973 record from Laneast and Badgall Downs CWS on eastern boundary of the survey area. A more recent record from 2011 was located approximately 50m south of the survey area. Marsh fritillary are fully legally protected, a Priority Species and Cornwall BAP Species.

Site survey

- 9.64 The habitats within the survey area provided for a diverse range of common and widespread invertebrate species. Notable invertebrate species could occur within the CWS and the broadleaved woodland and water courses that run along the valleys. Marsh fritillary butterfly are strongly dependent on marshy/culm grassland and could occur in suitable habitat within Napp's Moor CWS, and Laneast and Badgall Downs CWS.

Amphibians and Reptiles

Desk study

- 9.65 The datasearch found previous records of slow-worm, adder, common lizard and grass snake within the desk study area. All reptiles are legally protected and Priority Species. Common toad, a Priority Species, was also recorded within the desk study area.

Site survey

- 9.66 Common lizard was recorded from the following three separate areas within the site during the reptile survey (refer to Appendix 9.2):
- A 'Low' population (maximum count of a single common lizard recorded during any one visit) was observed within Napp's Moor CWS in the east of the site;
 - A 'Low' population (maximum count of one) was also recorded along a field margin in the centre of the site; and
 - A 'Good' population (maximum count of 11 individuals) was recorded adjacent a track in the east of the site.
- 9.67 The reptiles that occurred in these three areas are considered to be from separate populations. No other reptile species were recorded within the site, although, given the size of the site, it is possible that other species, particularly slow-worm, occur in low densities elsewhere within the sites
- 9.68 Common toad is likely to occur within the site and their presence in suitable habitats are assumed.

Birds

Desk study

- 9.69 The desk study found 60,515 records since the year 2000 of 246 bird species within 10km of the proposed development site, 178 of which are either legally protected, listed as Priority Species in England, and/or appear on the Red or Amber lists of Birds of Conservation Concern (BoCC).¹³ Table 3 in Appendix 9.3 lists these 178 species along with their conservation status.
- 9.70 The peak counts of golden plover and lapwing at Bodmin Moor recorded in the Cornwall Bird Reports for 2014-2020 are presented in Table 4 in Appendix 9.3

¹³ Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. 2021. *The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds 114: 723-747.*

Site survey

- 9.71 The population status in Cornwall of each species discussed below is taken from Birds in Cornwall 2020, the most recently available bird report for the county. The report defines county populations using the terms presented in Table 9.3.

Table 9.3: Species Status in Cornwall

Abundance	Non-breeding individuals	Breeding Pairs
Very Common	>100,000	>50,000
Common	20,001 - 100,000	10,0001 – 50,000
Fairly Common	5001 - 20,000	2501 – 10,000
Uncommon	101 - 5000	51 – 2500
Fairly Rare	11 – 100	6-50
Rare	2 – 10	1-5
Very rare	≤1	<1

- 9.72 Detailed survey data for all surveys undertaken is provided in Appendix 9.3

Vantage point surveys

- 9.73 The summary of results in Tables 9.4 and 9.5 below include data for species listed on at least one of the following:
- Annex 1 of the Birds Directive;
 - Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)
 - Section 40 of the Natural Environment and Rural Communities Act (NERC) Act 2006 (Priority Species)
 - Birds of Conservation Concern 4 (BoCC 4) Red List (Eaton *et al.* 2015)^{14,15}
 - BoCC 4 Amber List

¹⁴ N.b. The baseline surveys were undertaken prior to the publication of BoCC 5 (Stanbury *et al.* 2021); refer to survey limitations in Appendix 9.3.

¹⁵ Eaton M., Aebischer N., Brown A., Hearn R., Lock L., Musgrove A., Noble D., Stroud D. & Gregory R. 2015 *Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man*, British Trust for Ornithology, Thetford

Table 9.4: Non-breeding season vantage point survey results summary

Species	Data summary	Status
Golden Plover	Regularly recorded in flocks of varying sizes from a few individuals up to 500 birds	Annex 1 Fairly common winter visitor
Lapwing	A single flock of 25 lapwing	Priority Species BoCC 4 and 5- Red Fairly common winter visitor
Kestrel	Individual birds occasionally recorded hovering and flying across the site at low level.	BoCC 4 and 5 – Amber Uncommon winter resident
Peregrine	Individual birds recorded flying across the site on six occasions	Annex 1 Schedule 1 Uncommon winter resident and visitor
Snipe	Two records of individual birds in flight	BoCC 4 and 5 Amber Common winter visitor
Starling	Usually recorded in small flocks with larger flocks of up to 20,000 birds occasionally recorded flying at low level through the site	Priority Species BoCC 4 and 5 – Red Very common winter resident and visitor
Common gull	Infrequently recorded in flocks of up to 5 birds	BoCC 4 and 5 - Amber Uncommon winter visitor
Great black-backed gull	Occasionally recorded in ones and twos	BoCC 4 and 5 - Amber Uncommon winter resident and visitor
Herring gull	Frequently recorded in flocks of up to 50 birds	Priority Species BoCC 4 and 5 Red Fairly common winter resident and visitor
Lesser black-backed gull	Regularly recoded as individuals and flocks of up to five birds	BoCC 4 and 5 – Amber Uncommon winter resident and visitor
Fieldfare	Occasionally recorded in flocks of up to 40 birds	Schedule 1 BoCC 4 and 5 – Red Common winter visitor
Redwing	Rarely recorded in flocks with fieldfare of up to 40 birds	Schedule 1 BoCC 4 – Red BoCC 5 – Amber

Species	Data summary	Status
		Common winter visitor
Song thrush	A single record of an individual making a low-level flight	Priority Species BoCC 4 and 5 – Red Common winter resident
Linnet	Regularly recorded in flocks of up to 50 birds	BoCC 4 and 5 – Red Fairly common winter resident
Meadow pipit	Frequently recorded as individuals and groups of up to seven birds	Priority species BoCC 4 and 5 - Amber Common winter resident and visitor
Skylark	Regularly recorded as individuals and groups of up to three birds	Priority species BoCC 4 and 5 – Red Common winter resident and visitor
Stock dove	Regularly recorded in ones and twos	BoCC 4 and 5 – Amber Uncommon winter resident

Table 9.5: Breeding season vantage point survey results summary

Species	Data summary	Status
Red kite	One individual making a low-level flight.	Annex 1 Schedule 1 Uncommon passage migrant
Kestrel	Individual birds rarely recorded hovering and flying across the site at low level.	BoCC 4 and 5 –Amber Uncommon breeding resident
Peregrine	Individual birds recorded flying across the site on three occasions.	Annex 1 Schedule 1 Fairly rare breeding resident
Curlew	One individual recorded making a low-level flight.	BoCC 4 and 5 - Red Fairly rare resident
Common gull	Rarely recorded in ones and twos	BoCC 4 and 5 - Amber Uncommon passage migrant
Great black-backed gull	Occasionally recorded in ones and twos	BoCC 4 and 5 - Amber Uncommon breeding resident

Species	Data summary	Status
Herring gull	Frequently recorded in flocks of up to 31 birds	Priority Species BoCC 4 and 5 Red Fairly common breeding resident
Lesser black-backed gull	Occasionally recorded as individuals and groups of up to four birds	BoCC 4 and 5 – Amber Uncommon winter resident and visitor
House martin	A group of three birds recorded on a single occasion	BoCC 4 – Amber BoCC 5 - Red Fairly common breeding summer visitor
Linnet	Regularly recorded in flocks of up to 100 birds	BoCC 4 and 5 – Red Fairly common breeding resident
Meadow pipit	Frequently recorded as individuals and flocks of up to 17 birds	Priority species BoCC 4 and 5 - Amber Fairly common breeding resident
Skylark	Frequently recorded as ones and twos, often making display flights	Priority species BoCC 4 and 5 – Red Common breeding resident
Stock dove	Regularly recorded in ones and twos	BoCC 4 and 5 – Amber Uncommon winter resident
Swift	A single individual recorded making a flight across the site	BoCC 4 – Amber BoCC 5 - Red Uncommon breeding resident
Yellowhammer	A single individual recorded making a low-level flight	Priority Species BoCC 4 and 5 – Red Fairly common breeding resident

Nocturnal wader surveys

- 9.74 Three flocks of nocturnal golden plover were recorded during the nocturnal wader surveys. These numbered six, 15 and 44 individuals. The locations of these flocks are shown in Figure 6 of Appendix 9.3

Nightjar survey

- 9.75 A maximum count of six nightjar were recorded at Wilsey Down Plantation. No nightjar were recorded at Napps Moor, Laneast Downs, or Land East of Laneast Downs. Full survey results are shown in Appendix 9.3.

Bats

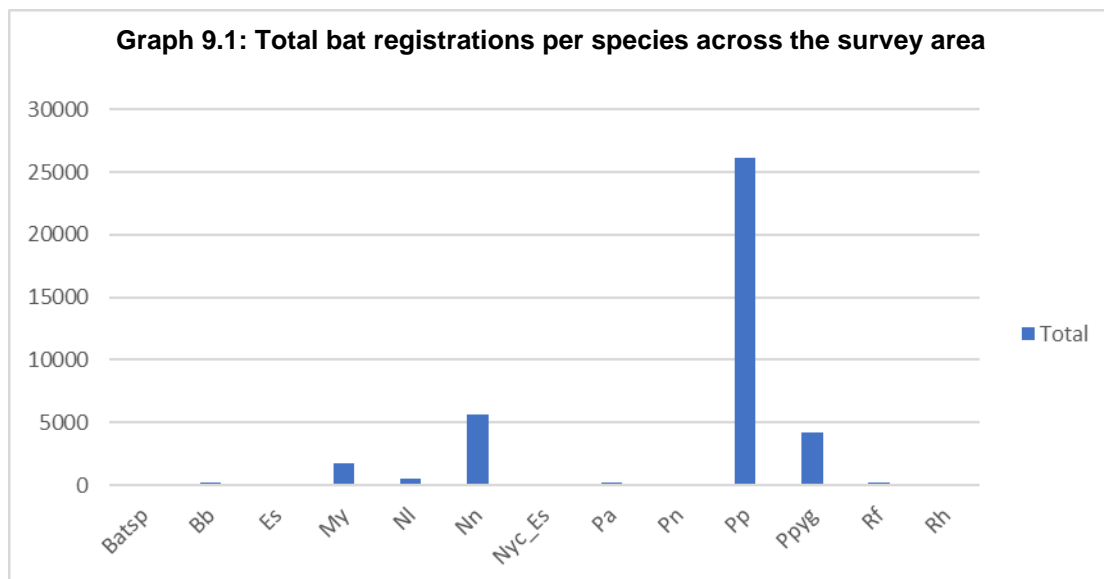
Desk study

- 9.76 The data search identified several bat species within the desk study area including common, soprano and Nathusius' pipistrelle, serotine, barbastelle and noctule which are of medium to high risk of wind turbine collision (SNH, 2019). This species assemblage is typical for this part of Cornwall. Sixty-six bat roosts of medium and high collision risk species occurred within 10km of the site. These were all either pipistrelle bats (soprano, common or unidentified pipistrelle). The closest roost belonged to an unidentified pipistrelle bat which was located approximately 2.3km to the south west of the site (number of bats not recorded). The next closest was of a soprano pipistrelle breeding roost containing 56 bats which was located approximately 2.8km to the north east of the site (refer to Appendix 9.4 for further desk study information). All bats are legally protected and some are Priority Species and Cornwall BAP Priority Species.

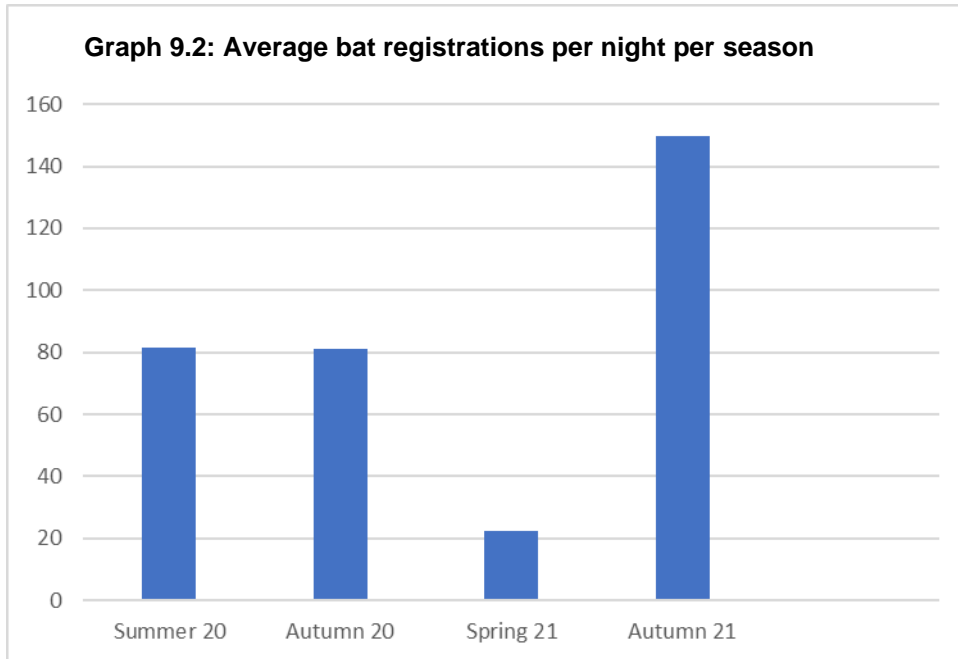
Site survey

- 9.77 *Roost survey:* No buildings suitable for roosting bats were recorded within 200m of the tip of the proposed wind turbine blades. None of the trees within 200m of the blade tip were assessed as having High suitability for roosting bats.
- 9.78 *Bat Activity – Transect Survey:* Ten species were recorded on the bat transect surveys with over half the activity recorded from common pipistrelle (55% of all registrations), and noctule calls registering a further 27%. Soprano pipistrelle, lesser horseshoe and serotine were all also regularly recorded (7.2%, 5% and 3.1% respectively). Three greater horseshoe bat registrations were recorded throughout the transect surveys (1.4%). Single barbastelle and Nathusius' pipistrelle were also recorded (0.45%). Between listening points, low levels of bat activity were also recorded, with low numbers of Myotis and long-eared bats also recorded.
- 9.79 Overall, 'low' levels of bat activity were recorded at the listening stations (0.038 bat registrations per minute on average). The highest levels of activity occurred around Transect 1 in the far west of the site which recorded an average of 0.076 bat registrations per minute. The Listening Station on the road that leads to Treglasta in the west of the survey area recorded the highest number of bats (0.21 bat registrations per minute which were primarily common pipistrelle). This is likely to be due to the parallel hedgerow that border the road forming a sheltered corridor. This LS was approximately 900m to the west of the nearest turbine. A single noctule bats was recorded regularly foraging in the field to the west of this LS (near to Static Position 1; see below) and also along the river valley adjacent Laneast Downs in the far east of the survey area. Transect 5 in the north of the survey area recorded the lowest bat activity with an average of 0.008 bat passes per minute. Refer to Appendix 9.3 for full details.

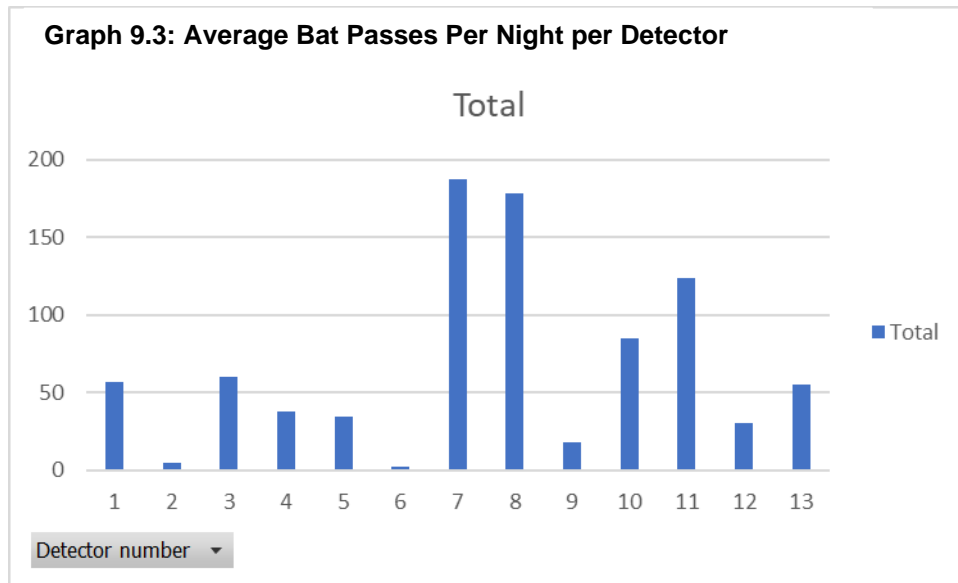
9.80 **Bat Activity – Static Survey.** At least 11 species were recorded during the static detector survey; common pipistrelle was the most abundant species comprising approximately 66.9% of all recordings (total of 26,121 bat registrations recorded on site), followed by noctule (14.42%), soprano pipistrelle (10.66%), *Myotis* bats (4.42%) and Leisler’s bat (1.35%). Other species recorded on static detectors but accounting for less than 1% of registrations were barbastelle, serotine, long-eared bat, lesser horseshoe and greater horseshoe.



9.81 The peak season for bat activity was autumn 2021 with an average of 149.59 bat passes per detector per night. Autumn 2020 by contrast was lower with 81.27 average bat passes per detector per night. Summer 2020 recorded a similar number of passes to autumn 2020 with 81.6 average passes per detector per night. Spring 21 recorded the lowest number of passes with 22.53 average passes per night which may have been partially due to the lower temperatures recorded in spring in comparison to other survey periods.



9.82 Position 7 and 8 recorded by far the most bat activity (refer to Figure 2 in Appendix 9.4). The majority of registrations were from common pipistrelle bats (86% at Position 7 and 79% at Position 8). Both these detectors were positioned on top of a hedgebank with tall hedgerows at the time of survey; a mature tree was also present directly adjacent to the detector at Position 8. The majority of the hedgerows within the site were ‘Cornish Hedges’ which contained limited shrub cover and tall hedgerows were therefore an unusual feature within the site. Also, both these hedgerows bordered a road/track with a second parallel hedgerow the other side of the track. These features are optimal as they provide a sheltered corridor for foraging and commuting bats. By contrast, very low levels of activity were recorded at Position 2 and 6. Position 2 was sited in a low defunct hedgerow which is likely to explain the low number of bat registrations. However, Position 6 was deployed on an anemometer at 4m height; siting the detector at height was expected to record higher levels of bat activity so the low number of recordings is likely to be due to fluctuations in activity within the site. The low number of registrations collected from Position 6 indicates that deploying the detector at height on this site does not seem to significantly increase the number of bat registrations.



Badger

Desk study

9.83 Badger, which is a legally protected species, was recorded within the desk study area.

Survey area

9.84 The following badger setts were recorded within the survey area:

- A single 'outlier' badger setts in the woodland at Target Note 45;
- A single inactive 'outlier' badger sett along a hedgebank at Target Note 49 near the A395 towards the east of the site; and
- A subsidiary/annexe badger sett with four active entrances (Target Note 56).

9.85 The fields within the site contained suitable foraging habitat for badgers and it is likely they forage throughout the survey area. Hedgerows, scrub and woodland within the survey area provided suitable sett building habitat and additional setts could occur within the survey area.

Hazel dormouse

Desk study

9.86 The desk study identified several previous records of hazel dormouse within the locality including a record at Trefranck Farm in the south of the survey area (adjacent Target Note 19). This species is fully protected and is a Priority Species and a Cornwall BAP Species.

Survey area

- 9.87 Hedgerows, scrub and woodland within the survey area provided suitable habitat for hazel dormouse. The majority of the Cornish Hedges, particularly on the higher ground was fragmented and sub-optimal for dormouse. However, they are assumed to be present within the survey area due to the presence of previous records for this species.

Otter*Desk study*

- 9.88 Several previous records of otter occurred within the desk study area.

Survey area

- 9.89 Streams and ponds within the survey area provided potential foraging and commuting habitat for this species. This species is legally protected, a Priority Species and Cornwall BAP Species.

Other mammals*Desk study*

- 9.90 The desk study identified previous records of hedgehog, brown hare and harvest mouse within the locality. These are all Priority Species and Cornwall BAP Species.

Survey area

- 9.91 Hedgerows, scrub and woodland within the survey area could provide sheltering habitat for hedgehog. The grassland and arable fields could provide sheltering habitat for brown hare. Areas of tall grassland and arable crops could provide suitable habitat for harvest mouse

Evaluation

- 9.92 An evaluation of the ecological features within and adjacent the site is provided in Table 9.6. Each ecological feature has been assigned a level of importance in accordance with the geographical scale outlined in the Evaluation of Ecological Features section above. Table 9.6 Evaluation of Ecological Features

Ecological Feature	Ecological Importance	Reason
<i>Designated Sites of Nature Conservation Value</i>		
Special Area of Conservation	International (High)	Importance reflects designations.
Site of Special Scientific Interest	National (High)	Importance reflects designations.
Napp's Moor, and Laneast/Bagdall Downs County Wildlife Sites	County (Medium)	Importance reflects designations.

Ecological Feature	Ecological Importance	Reason
Cornwall Roadside Verge Inventory Sites	District (Medium to Low)	Importance reflects designations.
<i>Habitats within the Site</i>		
Improved grassland, and species-poor semi-improved grassland	Sub-Parish (Low)	A common and widespread habitat with limited plant diversity.
Hedgerow	Parish	Species-rich and species-poor hedgerows (including 'Cornish Hedges') are a both Priority Habitats and act as ecological corridors around the site.
Broadleaved woodland – Semi-Natural	Parish to District (Low to Moderate)	Woodland provides breeding, foraging and sheltering habitat for a range of species. Parts of this habitat was analogous with 'Lowland Mixed Deciduous woodland' which is a Priority Habitat.
Coniferous woodland - plantation	Sub-Parish (Low)	Common habitat with limited plant diversity and is easily replaceable.
Scattered trees	Sub-Parish to Parish (Low)	Mature broadleaved trees provide an ecological resources for a range of species.
Running water	District (Low to Medium)	Acts as an ecological corridor and supports a range of plant species. 'Rivers' are a Priority Habitat.
Marshy grassland – species-poor	Sub-Parish (Low)	Common species-poor habitat with limited plant diversity.
Marshy grassland – species-rich	County (Medium)	Species-rich marshy grassland which is analogous with Purple Moor Grass & Rush Pastures Lowland Fens Priority Habitat and forms part of a CWS.
West dwarf shrub heath	County (Medium)	Heathland which is analogous with Lowland Heather Priority Habitat and forms part of a CWS.
Buildings	Negligible	Artificial habitat of low ecological value.
Scattered scrub	Sub-Parish (Low)	Common and widespread habitats of limited biodiversity importance.
Standing water	Parish (Low)	Typically species-poor, although some of which were analogous with 'Pond' Priority Habitat.
Arable	Sub-Parish (Low)	Common habitat with limited plant species diversity.
<i>Adjacent habitats</i>		
Laneast and Badgall Downs CWS	County (Medium)	Value reflects designation.
River Inny	District (Low to Medium)	Potential Priority Habitat.
Agricultural habitats	Sub-Parish to Parish (Low)	Arable/pasture fields are generally of low ecological importance, but hedgerows provide important wildlife corridors through the landscape.
<i>Protected / notable species</i>		

Ecological Feature	Ecological Importance	Reason
Notable plants	Sub-Parish (Low)	No notable plant species were recorded within the site, although potential for notable species to occur within the CWS that occur within the survey area.
Invertebrates	Sub-Parish to District (Low to Moderate)	The CWS, broadleaved woodland and watercourse could support notable species. Marsh fritillary butterfly could occur within the CWS. These habitats are considered to be of District value for invertebrates. Remaining habitats likely to be Sub-Parish value.
Amphibians	Sub-Parish (Low)	Suitable habitat existed for common toad which is a Priority Species.
Reptiles	Parish (Low)	A 'Good' population of common lizard were recorded within part of the survey area. This is a Priority Species and legally protected.
Golden Plover	County (Moderate)	Golden plover is a notified feature of the Bodmin Moor North SSSI due to the wintering population of this species. However, it is unlikely that the proposed project site represents a critical resource for the Bodmin Moor population, as the habitats on site are broadly similar to those in the local landscape and much of the North Cornwall area. Golden plover is a fairly common winter visitor and passage migrant in Cornwall with the County population estimated at 10,000. The peak count for this species during the field surveys was 500 birds which represents 5% of the county's population. Therefore, the site's wintering golden plover population is considered to be of county value.
Peregrine	County (Moderate)	Peregrine is a fairly rare breeding species in Cornwall as defined by Table 9.3. It is likely that the records of peregrine recorded during the field surveys represent at least 1% of the County's breeding population. Therefore, this receptor is considered to be of county value.
Starling	County (Moderate)	Starling is a very common resident species in Cornwall; refer to Table 9.3 however over winter this population can be highly localised at winter roost sites including Lower Moor Plantation on Bodmin Moor to the south-west of the site. This site can hold up to 500,000 birds and when it does this can account for around 90% of the Cornish starling population. As flocks of over wintering birds of up to 20,000 birds were recorded passing through the site this could represent 3-4% of the Cornish wintering population. Therefore, starling is considered to be a County value receptor
Nightjar	County (Moderate)	The breeding population at Wilsey Plantation likely represents a significant proportion of the Cornish breeding nightjar population and is therefore considered to be of County Value, However no nightjar were recorded breeding within the site, and

Ecological Feature	Ecological Importance	Reason
		the vast majority of the site sub-optimal breeding habitat for this species.
Red kite Kestrel Common gull Great black-backed gull Lesser black-backed gull Stock dove Swift	District (Moderate)	These species are uncommon in Cornwall as defined by Table 9.3. The numbers of each recorded during the surveys do not represent a significant proportion of their Cornish populations, and therefore these receptors are of no more than district value.
Herring gull House martin Meadow pipit Linnet Yellowhammer	Parish (Low)	These species are fairly common in Cornwall as defined by Table 9.3 and are widespread within the North Cornwall area, therefore these receptors are considered to be of no more than Parish value
Lapwing	Sub-Parish (Low)	Field records for this species are limited to a single sighting of 25 birds. Lapwing is a fairly common winter visitor to Cornwall with a wintering population estimated at 6000 birds. As this species was so rarely recorded, the sites population is considered to be of Sub-Parish value
Curlew	Sub-parish (Low)	A fairly rare resident species in Cornwall; refer to Table 9.3, with no recent evidence of breeding. However, field records for this species are limited to a single sighting of one bird. Therefore, the site does not appear to be important for the Cornish or local population.
Snipe Fieldfare Redwing Song thrush Skylark	Sub-parish (Low)	These species are common in Cornwall as defined by Table 9.3. and widespread in the local area. The site's populations are therefore considered to be of no more than Sub-parish value
Bats	Parish to District (Low)	At least 11 species were recorded flying within the site including noctule and soprano pipistrelle which are Priority Species. The species assemblage is considered typical of a site in this locality. No bat roosts were recorded.
Hazel Dormouse	Parish to District (Low to Moderate)	Likely to occur in suitable hedgerow and woodlands within the survey area. Dormouse are a legally protected Priority Species.

Ecological Feature	Ecological Importance	Reason
Otter	Parish (Low)	This species occurs in the locality and likely utilize the rivers and streams that run through the survey area. Otter is a legally protected Priority Species.
Badgers	Parish (Low)	Three setts recorded within the survey area and this species is likely to forage throughout the site. Badgers are legally protected.
Other mammals	Sub-Parish (Low)	Habitats suitable for brown hare, harvest mouse and hedgehog present within the survey area which are all Priority Species.

CONSTRUCTION PHASE EFFECTS

- 9.93 The following paragraphs provide an assessment of the ecological effects of the proposed development during the construction phase.

Designated Sites of Nature Conservation Value

- 9.94 No adverse effects on statutory designated sites of nature conservation value are predicted during construction due to distance.
- 9.95 There would be no direct loss of habitats within non-statutory designated sites during construction. The base of Turbines 17 and 20 and the associated cabling are proposed immediately adjacent to Napp's Moor CWS. The location of turbines and cabling has been designed to avoid direct impacts on this designated site. The cabling route runs through Abbott's Hendra CWS; however, the route would be located along an existing track and therefore no direct damage to the designated features of the CWS are predicted. Existing cabling that runs beneath Napp's Moor CWS would be used to avoid digging within this area.
- 9.96 Construction could lead to potential indirect effects on Napp's Moor CWS and Abbott's Hendra CWS through vehicular transgression into the designated site, resulting in habitat damage and soil compaction. There is also potential that construction could have an effect on the marshy grassland habitats within these two CWS by contaminants entering the site through surface water run-off. This could result in habitat degradation to the water dependent marshy habitats. Without mitigation, these effects are predicted to be an **Adverse**, long-term effect which would be significant at the **District** scale.

Habitats within and adjacent the construction area

- 9.97 Each turbine base would be no more than 20m x 20m which would result in the permanent loss of approximately 0.04ha per base. Construction of the turbine footings would result in the permanent loss of approximately 0.68ha of improved/modified grassland, 0.16ha of arable habitat and 0.04ha of species-poor semi-improved/modified grassland. The construction of the proposed sub-station would result in the loss of approximately 0.25ha of improved grassland. Overall the loss of these common and low value habitats would have a long-term **Adverse** effect at the **Sub-Parish** scale which is not significant overall.

- 9.98 The proposed cabling route would use existing gateways or be directionally drilled beneath the hedgerows and streams and no hedgerow removal or stream redirection would therefore be necessary. The proposed cabling would require up to a 10m wide easement with a 1m wide trench dug in the centre of the easement; the affected area would be reduced where it goes through gateways or close to sensitive features. This would lead to the temporary loss of 10.095ha of improved grassland, 1.755ha of arable and 0.35ha of species-poor semi-improved grassland.
- 9.99 The temporary haul road would run through existing gateways to access most turbine bases. Limited and temporary alterations to some gateways are proposed (below 5m length of hedgerow to be removed and replaced), with approximately three temporary new openings in the hedgerows (approx. 5m hedge length to be removed and replaced) to enable construction of T12, T15/16 and T21. In addition to the temporary hedgerow loss, the haul road and temporary construction area around the turbine bases would result in the temporary loss of approximately 4ha of improved grassland, 1ha of arable land and 0.2ha of species-poor semi-improved grassland. This is predicted to be a short-term **Adverse** effect at the **Sub-Parish** scale and therefore not significant overall.
- 9.100 In addition, construction could lead to potential effects on retained vegetation through vehicular damage to Root Protection Zones around hedgerows and trees. Without mitigation, this would be an **Adverse**, long-term effect which is significant at the **Parish** scale.

Protected and Notable Species

Notable plants

- 9.101 No effects on notable plants are predicted.

Invertebrates

- 9.102 Adverse effects on protected or notable invertebrate species are considered to be highly unlikely.

Amphibians

- 9.103 Without mitigation, there is the potential for common toads to be killed or injured during construction. This would decrease the population on the site and would be an acute and adverse effect at Sub-Parish (Low) scale. The removal of these habitats would reduce the amount of suitable habitat on the site for common amphibians. This would be a short-term and **Adverse** effect at **Sub-Parish** (Low) scale.

Reptiles

- 9.104 Without mitigation, there is the potential for common lizards to be killed or injured during site clearance. This would decrease the population on the site and would be an acute and adverse effect at Sub-Parish (Low) scale. The removal of these habitats would reduce the amount of suitable habitat on the site for reptiles. This would be a short-term and **Adverse** effect at **Sub-Parish** (Low) scale.

Birds

Disturbance/displacement

- 9.105 During construction, the potential effect of associated noise and visual disturbance on golden plover is likely to displace foraging and roosting flocks from the immediate locality of ongoing works. The potential effects associated with construction activities are expected to be short-term, and, due to the fact that there is ample alternative habitat within the local landscape, of no more than low magnitude. **Adverse** effects on this county value receptor would be short-term at the **Sub-Parish** scale and therefore not significant overall. For the same reasons, construction phase impacts on the Golden Plover population of the North Bodmin Moor SSSI would be short-term at the **Sub-Parish** scale and therefore not significant.
- 9.106 Peregrine overflying the site may avoid the immediate area of construction due to human activity and associated visual disturbance. However individual peregrines have extensive home ranges with radii of up to 6km¹⁶, therefore it is unlikely that any individual peregrine would be displaced from a significant proportion of its home range and any disturbance would be short-term and of no more than low magnitude. Any **Adverse** effects on this county value receptor would be short-term at the **Sub-Parish** scale and therefore not significant. For the same reasons, construction phase impacts on the peregrine population of the Tintagel Cliffs SSSI would also be short-term, at the **Sub-Parish** scale and therefore not significant.
- 9.107 Studies of kestrel response to human behaviour indicate that away from nest sites, kestrels have low to medium sensitivity to human disturbance with disturbance usually observed at distances of less than 50m¹⁷. Therefore, kestrel is only likely to be displaced from areas within 50m of ongoing construction works. Given the availability of similar habitat in the local landscape and the short-term nature of the potential impact any Adverse effect would be of low magnitude. Any **Adverse** effects on this county value receptor would be short-term at the **Sub-Parish** scale and therefore not significant.
- 9.108 To protect breeding birds from disturbance SNH guidance suggests a buffer of at least 150m should be maintained around nightjar breeding habitat. As the position of all the proposed turbines and associated infrastructure are in excess of this distance from Wilsey Plantation, no construction phase impacts on nightjar as a result of disturbance/displacement are anticipated. Any effect on this county value receptor would be negligible and therefore not significant.
- 9.109 A number of the bird species listed in Table 9.6 are farmland bird species belonging to groups (passerines and pigeons/doves) which are not generally considered to be vulnerable to construction phase disturbance and therefore no effect on these species are predicted.

¹⁶ Hardey J., Crick H., Wernham C., Riley H., Etheridge B., Thompson D. 2013 *Raptors: A Field Guide for Surveys and Monitoring*, TSO, London

¹⁷ Goodship, N.M. and Furness, R.W. (MacArthur Green) 2022 *Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species*. NatureScot Research Report 1283

- 9.110 Gull species are generally tolerant of human activity and are often found in close proximity to ongoing agricultural work as well as around busy harbours and in urban areas. These species are therefore not considered to be vulnerable to construction phase disturbance.
- 9.111 Of the bird species listed in Table 9.6 lapwing, curlew, red kite, swift, house martin, song thrush and yellow hammer were only recorded on three or fewer occasions as individuals and/or in very small numbers. Given the small number of records for each of the above, it is considered unlikely that any of these species would be adversely affected by construction phase impacts.

Habitat loss

- 9.112 Permanent habitat loss would be limited to 0.93ha of improved grassland, 0.16 ha of arable and 0.04ha of semi-improved grassland. Additional temporary habitat loss would consist of 10.095ha of improved grassland, 1.755ha of arable and 0.35ha of poor semi-improved grassland. All hedgerows would be retained with the exception of a few small lengths of temporary hedgerow loss (<5m) to accommodate the haul road.. Given the low value and the abundance of these habitats in the local area this represents only a very minor reduction in habitat availability for all birds. Any **Adverse** effect on any avian receptor would be long-term at the **Sub-Parish** scale and therefore not significant.

Direct impacts on nest sites

- 9.113 The construction works have the potential to result in the damage/destruction of birds' nests and/or the abandonment of eggs and chicks. As the works do not require the removal of hedgerow, the impacts are likely to be limited to ground nesting species only, in this case the affected receptors would be meadow pipit and skylark. However, the habitats within the construction area are predominantly tightly grazed grassland fields which are unsuitable for ground nesting species. Ground nesting birds are therefore likely to either be absent from the construction area or nesting in very low numbers. Therefore, any **Adverse** effect on these receptors is likely to be acute at the **Sub-Parish** scale and not significant.

Bats

- 9.114 Construction would result in clearance of improved grassland, arable and species-poor marshy grassland. This would decrease habitat for night-flying invertebrates, thereby slightly reducing the value of the site for foraging bats. This would be an **Adverse**, short-term effect at **Sub-Parish** scale.
- 9.115 Minimal temporary hedgerow loss would occur during construction (i.e. <5m) and no fragmentation to commuting bats is therefore predicted. Effects to commuting bats are therefore predicted to be negligible.

Badger

- 9.116 The badger setts were all over 20m from the construction area. It is considered unlikely that construction would lead to the disturbance of badgers or the setts. Site clearance for the turbine footings would lead to the removal of badger foraging habitat although it is unlikely that this would result in a change in the overall territory size for the badger group. This would be a short-term and **Adverse** effect at **Sub-Parish** scale.
- 9.117 Without mitigation, open excavations during the cable trenching operations could lead to the entrapment of badgers. This would be an **Adverse** and acute effect at **Sub-Parish** scale.

Hazel dormouse

- 9.118 The cables would be installed through existing gateways or directionally drilled beneath the hedgerows. Limited and temporary alterations to some gateways may be required to enable turbine construction (under 5m length of hedgerow affected per existing opening), with approximately 3 new/temporary openings within the hedgerow of between 5m and 8m (to T12, T15/16 and T21). Construction could also lead to potential effects on retained hedgerows through vehicular damage to the Root Protection Zones around hedgerows. Without mitigation, this would be an **Adverse**, long-term effect at the **Parish** scale.
- 9.119 The directional drilling beneath hedgerows could result in noise and vibration disturbance to dormouse. This noise and vibration is predicted to be low level and acute. Dormouse regularly nest in vegetation immediately adjacent motorways and railways and are tolerant of low levels noise and vibration effects. Directional drilling operations beneath hedgerows are predicted to have a negligible effect on dormouse.

Otter

- 9.120 The watercourses would be unaffected during construction. The cabling would be directionally drilled beneath the streams to avoid impacting this feature. No suitable otter 'lying-up' habitat would be impacted. No effects on otter are therefore predicted.

Other mammals

- 9.121 Construction could lead to the temporary disturbance of brown hare within improved grassland and arable fields through vehicle movement and associated noise. This would, however, be of negligible significance.
- 9.122 The habitats to be removed comprise tightly grazed grassland or arable habitats with limited field margins and therefore no suitable habitats for sheltering hedgehog or harvest mouse would be removed.
- 9.123 Site clearance may lead to the loss of suitable foraging habitat for hedgehog and brown hare, however this is also considered to be of negligible significance given the presence of ample alternative habitat in the locality.

OPERATIONAL PHASE EFFECTS

9.124 The following paragraphs provide an assessment of the ecological effects of the proposed turbines during the operational phase. The 22 two-blade turbines present on-site and the approved three-blade Vesta V29 turbines are both considered in this section as part of the collision assessment for bats and birds.

Designated site

9.125 The Tintagel Cliffs SSSI is designated in part for its breeding bird assemblage and the following species listed below are included within the SSSI citation¹⁸. They are listed here along with their relevance, in terms of occurrence during surveys, the site's habitat suitability for relevant species, and likelihood of impact by the proposed development, to this impact assessment:

- Shag, razorbill, kittiwake, fulmar, puffin and rock pipit - not recorded during the field survey/unsuitable habitat within site
- Great black-backed gull, lesser black-backed gull, herring gull – screened out of assessment; refer to the 'Birds' section below.
- House Martin – screened out of assessment; refer to 'Birds' section below.
- Raven *Corvus corax*, jackdaw *C. monedula*, and stonechat *Saxicola torquata* – species common and widespread (BoCC Green list) and not known to be sensitive to impacts from wind turbines.
- Peregrine – Operational phase impacts on the Tintagel Cliffs SSSI peregrine population are considered in paragraphs 9.143 and 9.146.

9.126 Operational phase impacts on the North Bodmin Moor SSSI's golden plover population are considered in the 'Birds' section below.

9.127 Minster Church SSSI occurs approximately 6.7km and is designated for its greater horseshoe bat population. No effect on this SSSI is likely due to distance and as this species of bat is not considered to be of collision risk.

9.128 No post-construction impacts to the habitats within the surrounding designated sites are anticipated. It is considered to be highly unlikely that the wind farm proposals would result in hydrological changes that could affect the adjacent County Wildlife Sites.

Habitats

9.129 All the improved, semi-improved and marshy grassland habitats, with the exception of the area around the base of the turbines, would be reinstated following completion of construction. This will reduce the effect of the habitat lost during construction, although

¹⁸ Natural England 1988, <https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1000544.pdf> accessed 01/10/2020

due to the permanent loss of habitat around the base of the turbine an **Adverse Sub-Parish** scale effect would remain in the long-term (not significant).

Protected and Notable Species

Birds

Screening avian receptors

- 9.130 A number of the bird species listed in Table 9.3 are farmland bird species belonging to groups (passerines and pigeons/doves) which are not generally considered to be vulnerable to adverse interactions with turbines, either through disturbance/displacement effects or through collision^{19, 20, 21}. Therefore, these effects on these species are not considered further in this ES chapter. However, due to the high numbers of starling recorded flying across the site there is the potential for this species to be negatively affected by collision and therefore collision impacts on starling are included within the assessment.
- 9.131 Gull species are not known to be vulnerable to displacement/disturbance effects from wind turbines, and gulls are known to roost at offshore wind energy projects²². Gulls have been shown to collide with wind turbines²³, however, such occurrences are very rare. One study²⁴ estimated that 526,047 herring gulls passed through seven wind energy sites over the course of their respective study periods. From this data set it was calculated that 2,157 collisions should have occurred. However, in total only nine herring gull collisions were recorded across all sites during their respective study periods. Similarly, very low rates of collision were recorded for great black-backed gull, lesser black-backed gull and common gull²⁴. Therefore, whilst gull collisions with the proposed turbines may occur, this type of event would be extremely rare and no impact at the population level is anticipated. No significant effect on gull species is therefore identified.
- 9.132 Of the bird species listed in Table 9.3, the following species were only recorded on three or fewer occasions as individuals and/or in very small numbers:
- lapwing;
 - curlew
 - red kite;
 - swift;

¹⁹ Devereux, C.L., Denny, M.J.H., & Whittingham M.J. (2008) Minimal effects of wind turbines on the distribution of wintering farmland birds. *Journal of Applied Ecology*, 45, 1689-1694

²⁰ Farfán, M.A., Vargas, J.M., Duarte J., & Real, R. (2009) What is the impact of wind farms on birds? A case study in southern Spain. *Biodiversity and Conservation* 18: 3743-3758

²¹ De Lucas, M., Janss, G.F.E., And Ferrer M. (2005) A bird and small mammal BACI and IG design studies in a windfarm in Malpica (Spain), *Biodiversity and Conservation* 14:3289-3303

²² Chamberlain D.E., Refisch M.R., Fox A.D., Desholm M., And Anthony S.J., (2006) The Effect of avoidance rate on bird mortality predictions made by wind turbine collision risk models. *Ibis* 148 198-202

²³ Laurence E.S., Painter S., And Little B. (2007) Responses of birds to the wind farm at Blyth Harbour, in *Birds and Windfarms – Risk Assessment and Mitigation* Ch 2: 47 – 70 Quercus, Barcelona

²⁴ Cook A.S.C.P., Humphreys E.M., Masden E.A., and Burton N.H.K. (2014) The avoidance rates of collision between birds and offshore turbines, BTO, Thetford

- house martin
- song thrush
- yellowhammer

9.133 Given the small number of records for each of the above, it is considered that the site does not represent an important area of habitat for these species and that they are unlikely to occur at the project site with any regularity. Therefore, it is considered unlikely that any of these species would be significantly adversely affected by operation phase effects, and as such they are not considered further.

9.134 Taking the above into account the following Valued Ecological Receptors are subject to further assessment:

- golden plover;
- peregrine;
- kestrel;
- nightjar;
- starling – collision only;

Disturbance/displacement

9.135 Golden plover is widely considered to be behaviourally sensitive to the presence of turbines, and the RSPB consider that wintering golden plover is vulnerable to displacement to up to 850m from wind turbines²⁵. Hötter *et al.*²⁶ identified negative effects on golden plover density in 21 out of 29 studies at wind farms during the non-breeding season across Europe, with most effects being limited to within approximately 200m. The median distance of negative effect recorded was 135m, with a mean of 175m. Only one study reported a distance greater than 400m.

9.136 Winkelman²⁷ looked at an experimental wind park in the Netherlands, considering breeding, feeding, resting and migratory birds, using a Before–After Control Impact (BACI) study design. The study found that almost all waders, including golden plover, occurred up to 100m from turbines. Similarly, Nairn²⁸ looked at three coastal wind farm sites in Ireland in a multi-site study and recorded golden plover within 100m of turbines at all three sites.

²⁵ Bright J.A., Langston R.H.W., and Anthony S., (2009) *Mapped and written guidance in relation to birds and onshore wind energy development in England*, RSPB, Bedfordshire

²⁶ Hötter, H., Thomsen, K.-M. & H. Jeromin (2006) *Impacts on biodiversity of exploitation of renewable energy sources: the example of birds and bats - facts, gaps in knowledge, demands for further research, and ornithological guidelines for the development of renewable energy exploitation*. Michael-Otto-Institut im NABU, Bergenhusen

²⁷ Winkelman, J.E. (1992): *[The impacts of the Sep wind farm near Oosterbierum (Fr.), The Netherlands, on birds, 4: disturbance]* RIN rep. 92/5. DLO-Instituut voor Bos-an Natuuronderzoek, Arnhem, The Netherlands. [Dutch, English summary].

²⁸ http://www.cieem.net/data/files/Resource_Library/Conferences/2012_Autumn_Renewables/11_Richard_Nairn.pdf

- 9.137 Sinning and Gerjets²⁹ examined the impacts of wind farms on resting birds near the German coast. Golden plover flocks were recorded with minimum distances of 120 to 150m to turbines, but single birds approached turbines up to 30m, showing almost no displacement effect.
- 9.138 Monitoring of golden plover at five operational wind farm sites using thermal imaging, recorded wintering golden plover foraging at night directly around the base of operating turbines, showing no avoidance of the area³⁰. This concurs with the findings of the nocturnal wading bird surveys undertaken at the proposed development site during Winter 2020/21 which also recorded flocks of golden plover around wind turbine bases.
- 9.139 Furthermore, golden plover displacement was found to be confined to within 50m at Siddick and Haverigg Wind Farms in Cumbria³¹.
- 9.140 The only study showing a higher rate of displacement was at Tjaereborg, in Denmark³² (Pedersen and Poulsen 1991), where a minimum displacement distance of 400m was recorded for golden plover, with some displacement out to 800m.
- 9.141 Based on the above, it is considered that displacement distances of this species from turbines of >400m are rare and that displacement of between 50 and 100m from turbines is a more realistic figure.
- 9.142 Taking all of the above into account, it is considered that any disturbance/displacement impact on golden plover would have a low magnitude. The effects to this county value receptor would be adverse in the long-term at the Sub-Parish scale and therefore not significant. For the same reasons, disturbance/displacement impacts on the golden plover population of the North Bodmin Moor SSSI are considered to be long-term and **Adverse** at the **Sub-Parish** scale and therefore not significant overall.
- 9.143 Peregrine is considered to be potentially sensitive to disturbance/displacement by wind turbines at distances of between 400 and 800m of a nest site^{33,34}. However, away from breeding sites there is little evidence within the literature of disturbance/displacement of this species by wind turbines³⁴. Additionally, the bird surveyor observed peregrine flying within and around existing wind energy sites with no obvious signs of disturbance³⁵. Therefore disturbance/displacement effects on this receptor are considered to be negligible and not significant. For the same reasons, disturbance/displacement impacts on the peregrine population of the Tintagel Cliffs SSSI is also considered to be of negligible magnitude and not significant.

²⁹ Sinning, F. & Gerjets, D. (1999): *Untersuchungen zur Annaeherung rastender Voegel an Windparks in Nordwestdeutschland. Bremer Beitr. Naturkde. Naturschutz* 4, 53-60

³⁰ <http://www.snh.gov.uk/docs/A698158.pdf>

³¹ Percival, S.M. (2007) *Wintering Waders and Wind Farms, and the Proposed Langham Wind Farm. In Langham Wind Farm Supplementary Environmental Information, RWE npower Renewables*

³² Pederson M.B., Poulsen E. 1991 *Impact of a 90m/2MW wind turbine on birds: Avian response to the implementation of the Tjaereborg Wind Turbine at the Danish Wadden Sea, Danmarks Miljoeundersoegelser*

³³ Bright J.A., Langston R.H.W., and Anthony S., (2009) *Mapped and written guidance in relation to birds and onshore wind energy development in England, RSPB, Bedfordshire*

³⁴ Madders, M., & Whitfield, D.P., (2006), *Upland raptors and the assessment of windfarm impacts. Natural Research Ltd, Gruinart*

³⁵ Campbell, A. *Director/Principal Ecologist with AC Ecology Ltd, Pers Obs*

- 9.144 A literature review undertaken by Whitfield and Madders³⁶ indicated that kestrel has low sensitivity to disturbance by wind turbines. Additionally, this species was recorded within the existing wind turbine site. On this basis, it is considered that any disturbance/displacement effect on this receptor would be negligible.
- 9.145 To protect breeding birds from disturbance, NatureScot guidance³⁷ suggests a buffer of at least 150m should be maintained around nightjar breeding habitat. As the position of all the proposed turbines and associated infrastructure are in excess of 250m from Wilsey Plantation, disturbance/displacement impacts on nightjar as a result of disturbance/displacement are not anticipated. Any effect on this county value receptor would be negligible and not significant.

Collision

- 9.146 Collision Risk Modelling was only undertaken for receptors for which greater than 200 seconds of flight activity within the collision risk zone of the candidate turbine. Where flight activity is below 200 seconds the predicted number of collisions output from the collision risk model are typically so low that they would represent fewer than one collision over the 25-year lifetime of the proposed development and therefore no significant effect would occur. The only species for which greater than 200 seconds was recorded was wintering golden plover; data for wintering starling is also presented due to the large flocks which were occasionally recorded during the field survey. As nightjar is a nocturnal species it was not possible to undertake vantage point surveys for this species there the assessment of collision risk for this receptor is based on this species' flight ecology.
- 9.147 The predicted number of collisions for golden plover are as follows:
- Existing two blade turbine – 7.53 per winter
 - Approved three blade turbine (Vesta V29) - 6.03 per winter
 - Candidate turbine (EWT61) – 4.59 per winter
- 9.148 The proposed development would therefore result in a reduction in predicted golden plover collisions of between 2.94 and 1.44 collisions per winter, or a reduction of between 73.54 and 35.97 collisions of the 25-year life of the proposed development. Therefore, any effect on golden plover would be beneficial and long term at the Sub-Parish scale and not significant. For the same reasons, effects on the golden plover population of the North Bodmin Moor SSSI are also assessed as **Beneficial** and long term at the **Sub-Parish** scale and not significant overall.
- 9.149 The predicted number of collisions for starling are as follows:
- Existing 2 blade turbine – 24.07 per winter

³⁶ Madders, M. and Whitfield, D.P. (2006), *Upland raptors and the assessment of wind farm impacts*. *Ibis*, 148: 43-56. <https://doi.org/10.1111/j.1474-919X.2006.00506.x>

³⁷ Goodship, N.M. and Furness, R.W. (MacArthur Green) (2022) *Disturbance Distances Review: An updated literature review of disturbance distances of selected birdspecies*. NatureScot Research Report 1283

- Baseline turbine (Vesta V29) – 20.76 per winter
- Candidate turbine (EWT61) – 0 per winter

9.150 As starling was not recorded flying at the height of the candidate turbine rotors, the proposed development would reduce the collision risk to starling to zero. This would result in a **Beneficial** and long-term effect at the **Sub-Parish** scale (non-significant).

9.151 Nightjars generally fly close to the ground in open habitat, but along woodland edge birds will fly at canopy level³⁸. In forestry plantation nightjar generally forage close to the tree canopies approximately 10-15m above ground level³⁹. Nightjar flight altitudes have been assessed using thermal imaging cameras and image intensifiers at two wind energy sites. Some 17 nightjars were recorded in 60 hours of observation time At Clocaenog Forest, Wales. The study did not record a single occurrence of nightjar flying above 20m⁴⁰. Some 90 nightjars were recorded over 134 hours at Alaska Wind Farm⁴¹, Dorset; again, all the flights were below 20m. In a study of the Pen y Cymoedd Wind Farm site, Wales, radio tracked nightjars were found to spend 72.5% of their time below 20m⁴². The empirical evidence therefore suggests that nightjars predominantly fly below 20m which is well below the lowest point of the turbine sweep of the proposed turbine rotors. Impacts on nightjar are therefore considered to be of negligible magnitude and not significant.

Barrier to Movement

9.152 Barrier to movement effects can occur when a wind energy development is placed between key habitat features for a particular receptor. For example, wind turbines positioned between a roost site and foraging grounds of flocks of wintering geese could either prevent geese moving between these locations or cause them to expend additional energy to do so by flying around the wind turbines. This could result in an adverse effect on a local wintering goose population.

9.153 The only receptor which could potentially be affected by this impact is starling, which was occasionally recorded crossing the site in large flocks when moving to and from the known winter roost site in plantations around Crowdy Reservoir. However, starling flocks were observed to move through the site despite the presence of the existing turbines. Given that the proposed turbines will be at least 250m apart it is considered that any potential barrier effect would be significantly reduced. Any impact on this county value receptor is considered to be negligible and not significant.

³⁸ Cramp, S., ed. 1985. *The Birds of the Western Palearctic, Vol 4*, Oxford, , UK: Oxford Univeristy Press

³⁹ Cleere, N., and Nurney, D. (1998). *Nightjars : a guide to Nightjars and related nightbirds*. Pica Press, East Sussex, UK

⁴⁰ Calbrade N.A., and Henderson I. (2009) *A Survey of Nightjar Flight Heights in Clocaenog Forest in 2009*, British Trust for Ornithology.

⁴¹ Morrison C. 2007 *Project Alaska Windfarm Nightjar Activity Survey report*, RPS report for Infinergy

⁴² Natural Power (2010) *Pen y Cymoedd Wind Energy Project Supplementary Environmental Information*

Bats

9.154 The proposed locations of the wind turbines have been assessed against Scottish Natural Heritage (2019) design guidance regarding wind turbines and bats. They advise that a 50m buffer should be maintained between the edge of the nearest feature (trees, hedge, scrub) and any part of a turbine. The following formula has been proposed to calculate the minimum distance that a turbine base should be located from a feature likely to be used by bats:

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

where: b = minimum distance of turbine base from feature.

 bl = blade length, which is 30.5m.

 hh = hub height, which is 84m.

 fh = feature height (hedgerow height), which is a maximum of 8m.

9.155 The closest feature to the turbines is typically the hedgerows, the majority of these are approximately 2m high, however, as a precaution a height of 8m is used as occasional trees occur within the hedgerows. Based on the above calculation, the minimum distance for a turbine base from the feature is 26.54m. All turbine bases are sited over this distance from the closest hedgerow/bank and are therefore all in accordance with this design guidance.

9.156 Guidance on the collision risk of turbines to different bat species is assessed in SNH (2019). The following species are considered to be at High collision risk to wind turbines:

- All pipistrelle species (common, soprano, Nathusius' pipistrelle);
- Noctule; and
- Leisler's bat.

9.157 This is based on the relative percentages of fatalities at wind farms to be soprano pipistrelle (40.6%), common pipistrelle (48.6%), noctule bats (10.7%) with single carcasses of brown long-eared bat, Nathusius' pipistrelle bat and Natterer's bat also recorded (Mathews, 2016⁴³).

9.158 An assessment for each High risk species was undertaken in accordance with survey and assessment guidance published by SNH (2019) and endorsed by Natural England. These guidelines detail a series of steps to combine the 'site risk level' with the bat activity level category'. These criteria are scored between 1 to 5 and multiplied with each other to assign an 'overall assessment classification' of low, medium or high. The aim of this high-level assessment is to provide a tool to identify high risk sites and ensure appropriate mitigation. Full details of this risk assessment are presented in Appendix 9.4 and summarized below.

⁴³ Mathews, F. Richardson, S. Lintott, P. Hosken, D. (2016) *Understanding the Risk to European Protected Species (bats) at Onshore Wind Turbine Sites to inform Risk Management*

- 9.159 The first step in identifying the site risk level is to compare the size of the project against the suitability of the habitats within the site for bats. The project is for 22 turbines which fits into the 'Medium' project size category. The majority of the site comprises large grassland or arable fields of low suitability for bats with limited potential roosting locations. However, parts of the site are connected to the wider landscape by linear features such as hedgerows and therefore the site is identified as of 'Moderate' value for bats. The comparison of the Medium project size with Moderate habitat risk gives an initial site risk assessment as Medium (3 Points).
- 9.160 The final step is to compare the average activity level recorded for each high risk species against the site risk level to give an overall risk assessment for the site. The average activity level for noctule and common pipistrelle bats within the site was 'low to moderate'. The average activity level for Leisler's, Nathusius' and soprano pipistrelle bat within the site was low. When these levels are compared against the site risk level, the overall risk assessment classification for the site is as follows:
- 'Medium' risk (6)- noctule and common pipistrelle; and
 - 'Low' risk (3) - soprano pipistrelle, Leisler's and Nathusius' bat.
- 9.161 It is likely that noctule and common pipistrelle bats are at risk of collision from the proposed turbines and therefore the operation of these turbines would likely result in an adverse effect on these species which is significant at the Parish scale. However, a large proportion of the existing turbine locations within the site are located either within or directly adjacent hedgerows. Common pipistrelle and noctule bats are therefore likely to collide with these existing turbines. The 22 existing turbines would be replaced by the new turbines which would be located away from hedgerows. It is therefore concluded that the proposed turbines would not result in any additional bat fatalities when compared to the existing turbines. Indeed, it is likely that bat collision would be reduced as a result of replacing the existing turbines with the proposed new turbines. Therefore, it is concluded that the replacement of these turbines would result in a long-term **Beneficial** effect at the **Sub-Parish** scale on bat populations.

Badger

- 9.162 Operational phase effects on badgers are considered highly unlikely.

Hazel dormouse

- 9.163 Operational phase effects on dormouse are considered highly unlikely.

DECOMMISSIONING PHASE EFFECTS

- 9.164 The level of visual disturbance and noise associated with the decommissioning phase is anticipated to be comparable to that associated with the construction phase. Therefore, the magnitude of impact on all protected/notable species as a result of disturbance/displacement is likely to be no more than short term and **Adverse** at the **Sub-Parish** scale and not therefore significant.

MITIGATION, COMPENSATION AND ENHANCEMENT

Construction

Designated sites

- 9.165 Construction would also be undertaken in accordance with Chapter 6: Construction Environmental Management Chapter and current government guidelines (www.gov.uk/guidance/pollution-prevention-for-businesses). This would ensure that potential adverse impacts of sediment-loaded run-off onto the adjacent Napp's Moor CWS and Abbot's Hendra CWS would be avoided.
- 9.166 The construction area would be delineated with temporary fencing prior to the start of construction. This would ensure that all habitats including designated sites outside of the construction area would be protected.

Habitats

- 9.167 Construction would be undertaken in accordance with BS 5837 'Trees in relation to construction'. Compounds and storage areas sited away from hedgerows and retained grassland. Cables would be directionally drilled beneath hedgerows to avoid impacting hedgerows. Where hedgerow removal is required to accommodate haul roads then they would be replanted with native shrubs once construction is complete. Construction would also be undertaken in accordance with current government guidelines on pollution prevention.

Amphibians and Reptiles

- 9.168 Due to the small area of suitable reptile habitat requiring removal, the proposed mitigation strategy is based on 'habitat manipulation'. This would allow and encourage reptiles to disperse from the construction area into the adjacent habitats.
- 9.169 The habitat manipulation would be undertaken in a phased approach between March and October. The grassland within the construction area would be cut to 150mm above ground level and left for one week before being cut to ground level. Both cuts would be supervised by an Ecological Clerk of Works (ECoW) who would be appointed prior to the start of construction. The latter cut would be preceded by a destructive search by the ECoW, removing any sheltering materials such as stones. Any individual reptiles or amphibians found would be moved to boundary habitats, outside the area of clearance. Once complete, the vegetation would be maintained at a low-level (<50mm) until the start of development works.

Birds

- 9.170 No significant effect on any of the avian receptors considered in this assessment has been identified. Therefore, no mitigation in order to reduce the magnitude of an impact (and by extension the significance of an effect) is required. Notwithstanding, certain mitigation measures are required to prevent an offence being committed under the Wildlife and Countryside Act (1981).

9.171 Under the provisions of the Act it is illegal to damage or destroy nests of all wild birds whilst they are being built or in use. To take account of this, all vegetation clearance works, including clearance of grassland, would, wherever possible, be conducted outside of the core bird breeding season (March to early September). Where this is not possible, a suitably experienced ecologist would be appointed to oversee the construction phase of the project and would be responsible for ensuring that breeding birds and their young are not killed or injured, or their nests and eggs damaged or destroyed. Nests would only be removed (to facilitate access) once the nesting attempt had been completed. This mitigation measure would be secured by a planning condition.

Badger

9.172 A pre-start survey would be undertaken to confirm that no badger setts were present within 20m of the construction area. If setts are present and affected by the works then a Natural England Badger Licence would be obtained prior to construction commencing. The following badger mitigation measures would also be undertaken during construction:

- Prior to the start of construction, a temporary barrier fence (chestnut-pale fencing) would be established at least 30m from the entrance of the outlier badger sett, between the sett and the proposed works. Installation of this fence would be supervised by an ecologist;
- Fuel, oil and chemicals would only be stored in secure sites within a construction compound; and
- As a precautionary measure, excavations and ducting (>200mm in diameter) would be fenced/capped overnight to deter badgers from entering. Excavations that could not be covered would have a means of escape for any animals that may fall in (e.g. sloping sides/ramps a maximum of 1:2 gradient).

Hazel dormouse

9.173 Dormouse nest tube surveys would be completed in October 2023. Should dormouse be recorded within the hedgerows where small areas are to be temporarily removed then the works would be covered by a Natural England dormouse mitigation licence. The licence would include a Method Statement which would include full details of measures to ensure this species is not adversely impacted during construction.

9.174 Twenty-five heavy duty dormouse nesting boxes would be placed within the site prior to the start of construction.

Operational effects

Habitats

9.175 A biodiversity net gain (BNG) site has been identified approximately 3.2km to the north of the site. An off-site area of approximately 7.16ha was chosen instead of enhancing habitats on-site as a precaution to avoid encouraging bats and birds to a site close to proposed wind turbines. The BNG site was located immediately adjacent the Kernick and Ottery Meadows SSSI and comprised primarily improved/modified grassland with an area

of other neutral grassland/semi-improved and marshy grassland (refer to Figure 9.2 for Habitat Plan). The habitats within the BNG site would be enhanced with the aim of providing a mosaic of ‘other neutral grassland’ and ‘purple moor grass and rush pasture’ (also known as culm grassland) in the long-term (refer to Figure 9.3 for enhancements).

9.176 A Biodiversity Offsetting Metric Version 3.0 (DEFRA, 2021) has been produced for the site which compares the number of Habitat Units to be lost with the number to be gained (refer to Table 9.7 below and Appendix 9.6). No hedgerow enhancements are proposed as no material permanent hedgerow loss would occur during the construction of the proposed wind turbines and the hedgerows within the BNG site are already species-rich.

Table 9.7 Biodiversity Metric 3.1 Summary from DEFRA Metric (refer to Appendix 9.6)

On-site post-intervention (Including habitat retention, creation & enhancement)	Habitat units	0.00
On-site net % change (Including habitat retention, creation & enhancement)	Habitat units	-100.00%
Off-site baseline	Habitat units	25.16
Off-site post-intervention (Including habitat retention, creation & enhancement)	Habitat units	55.87
Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	26.09
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	565.24%
Trading rules Satisfied?	Yes ✓	

9.177 The proposed enhancements within the BNG site would offset the habitat loss during turbine construction and result in an overall increase of 26.09 Habitat Units (565.24%).

Birds

9.178 No significant effect on any of the receptors considered in this assessment has been identified. Therefore no mitigation is required; however, the reduction in rotation speed in idling proposed for the bats is also likely to decrease bird fatalities (refer to the below).

Bats

9.179 As a precaution to reduce potential bat collision, the blade pitch control system will be automated to feather the blades during idling to reduce rotation speed. This recommendation is in accordance with the SNH (2019) Guidelines and Richardson *et al* (2021)⁴⁴.

⁴⁴ Richardson, S.M., Lintott, P.R., Hosken, D.J. *et al*. Peaks in bat activity at turbines and the implications for mitigating the impact of wind energy developments on bats. *Sci Rep* 11, 3636 (2021).

CUMULATIVE EFFECTS

9.180 The assessment of cumulative effects was based on the available information from Cornwall Council's planning portal for the sites listed in Table 9.8 below. The review covers all consented wind energy projects within 2km of the proposed development site and all wind farm projects (2 or more turbines) within 10km of the site.

Table 9.8 Cumulative Assessment Sites

Site	Distance from Application site	Description	Evidence base
Tregenna, Treneglos, Launceston Application number: PA14/06215	109m North	Single microgeneration wind turbine.	No Ecological Impact Assessment undertaken. Planning Officer's report concludes: <i>"There are operational turbines in the wider landscape with the most notable being the Cold Northcott Windfarm. The positioning of this small scale turbine in this particular setting would not however contribute towards a cumulative form of development"</i>
Basil Farm, St Clether, Launceston Application number: PA11/09010	812 m South	An 18 metre (to hub) wind turbine with 13 m rotor diameter.	No Ecological Impact Assessment undertaken. Planning Officer's report concludes: <i>"On balance, the beneficial cumulative consequences for the environment in respect to climate change that is associated with renewable energy schemes is considered to outweigh the low risk to the protected species in this instance"</i> .
Hillcrest, Hallworthy, Camelford. Application number: PA12/04121	230 m North	A single wind turbine on a 20 m monopole tower with a rotor width of 13.1 m.	No Ecological Impact Assessment undertaken. Planning Officer's report concludes: <i>"On balance, the beneficial cumulative consequences for the environment in respect to climate change that is associated with renewable energy schemes is considered to outweigh the low risk to the protected species (namely bats) in this instance"</i> .
Cattle Market, Hallworthy, Camelford Application number: PA13/03004	1.2km North	Installation of a single wind turbine with max height 46m.	No EcIA undertaken. Impacts on birds and bats are not considered in the Planning Officer's report
Lundy View Far,	1.2km North	Installation of a single wind turbine, with	The Ecology report concludes the following: <i>"Based on the assembled evidence and the existing regime of land management the proposed</i>

Hallworthy, Camelford. Application number: PA13/06283		max height 47.1m.	<i>development will not result in any impact on any habitats of high ecological value, protected species or species of ecological importance.</i> No detailed bat or bird surveys undertaken and no assessment of impacts resulting from operation of the turbine is provided. The Planning Officers report concludes that: <i>"the scheme proposes a relatively small scale renewable energy production for a working farm and on balance its impact on the wider landscape does not outweigh the benefits presented."</i>
Trefern Bungalow, Tremail, Camelford Application Number: PA10/04541	1.8km South West	Siting of a single 11 kw wind turbine.	No EclA undertaken. Planning Officer's report concludes: <i>"The proposal is considered to have an acceptable impact on issues such as cumulative landscape effects and visual effects, noise, shadow flicker, telecommunications, ecology and safety"</i>
Lidcott Farm, Egloskerry, Launceston Application Number: PA12/07881	1.34km East	Installation of a single wind turbine with a hub height of 25m and a rotor diameter of 19.2m.	No EclA undertaken, No Planning Officer report present on Cornwall Council's planning portal
Ashgrove Farm, Tremaine, Launceston Application Number: PA12/12060	1.56km North East	Siting of a single 50kW wind turbine with a hub height of 24.6m with a maximum blade tip height of 34.2m with three blades and a rotor diameter of 19.2m	No EclA undertaken. Planning Officer' report concludes: <i>"On balance, the beneficial cumulative consequences for the environment in respect to climate change that is associated with renewable energy schemes is considered to outweigh the low risk to the protected species (namely bats) in this instance."</i>
Lidcutt, Laneast, Launceston Application number: PA14/06531	1.9km East	Installation of a single wind turbine with a 24.4m rotor diameter, on a 37m tower. Decision: Approved with conditions (24 th September 2014).	No bat or bird surveys undertaken. The Ecological Appraisal states: <i>"The overall effect on bird species of a single operational turbine at the proposed location is thought to be negligible. The development may lead to minor negative impacts on commoner bird species due to the loss of a small area of habitat under the development footprint, however in the long term this will be negligible."</i> The Ecology Appraisal goes on to state that an effect on bats is 'considered

			<p><i>unlikely that the presence of a single turbine in this location would represent a population level threat to any bat species, particularly given that the turbine is situated in compliance with recognised guidance (NE TIN051).'</i></p>
<p>Land at Higher Tregunnon, Altarnun, Launceston</p> <p>Application number: PA12/03264</p>	<p>1.7km South-east</p>	<p>Erection of a single 34.6m (to blade tip) wind turbine.</p>	<p>The Ecological Assessment concludes: <i>"The site also supports a suite of wintering birds typical of farmland habitats in the region. Some species of conservation concern were recorded during the surveys and were considered to forage and roost onsite, such as: house sparrow, common buzzard, kestrel and lapwing. However these birds are not present in sufficient numbers or considered vulnerable to wind turbine development schemes. Therefore it is considered they are not likely to represent any significant constraints to development.</i></p> <p>No bat surveys undertaken. Planning Officer' report concludes: <i>'it is considered that the location of the turbine provides only a low risk to birds and bats'</i>.</p>
<p>Higher Basil Farm, Altarnun Road, St Clether, Launceston</p> <p>Application Number: PA13/03402</p>	<p>1.57 km South</p>	<p>Installation of two wind turbines with tower hub heights of 29.3m and blade diameters of 20.8m.</p>	<p>No EclA undertaken. The Planning Officer's report states: <i>"Natural England initially objected to the proposal as the site was 500m from the nearest SSSI and impacts on the bird Golden Plover needed to be assessed. The applicant has carried out an assessment and NE are satisfied with the conclusion that birds will not be affected by the development. It is noted that the proposal site is over 1km from the SSSI and not 500m as stated by NE."</i> The report detailing the findings of this additional assessment is absent from Cornwall Council's planning portal</p>
<p>Higher Penhale, St Clether, Launceston</p> <p>Application Number: PA12/09462</p>	<p>2.3km South-West</p>	<p>Installation of twin 55Kw Endurance wind turbines on 35 metre steel towers providing a hub height of 36 metres with a rotor diameter of 19.2 metres and blade tip height of 45.6 metres and formation of new access</p>	<p>No EclA undertaken. Planning Officer' report concludes: <i>'The location of the turbines at least 50m from hedges or other features that might be used by commuting or foraging bats is in accordance with Natural England current published good practice. In addition, there are no known special environmental or ecological designations in, or in close proximity to, the site'</i>. Impacts on birds are not considered in the Planning Officer's report.</p>

		track linked with public highway.	
Higher Tregunnon, Altarnun, Launceston Application number: PA14/12064	1.7 km South-East	Installation of an endurance A-4660 wind turbine with tip height of 36.6m including control kiosk and temporary crane pad.	The Ecological Appraisal concludes: <i>"No other protected or notable species [including bats and birds] are likely to be present which may be affected by the proposed development."</i>
Tregray Villa, Hallworthy, Camelford Application Number: PA13/09145	173m North	Installation of a single 100kW wind turbine on a 37m tower.	The Ecology report concludes: <i>"With the exception of badgers there will be no impact upon other protected or notable species as a result of this development"</i> .
Treboay Farm, St Clether, Launceston Application number: PA11/01020	1.9 km South	Installation of two wind turbines fitted with a 19.6m diameter rotors with a 24.6m hub height.	No EclA undertaken. Planning Officer' report concludes: <i>"On balance, the beneficial cumulative consequences for the environment in respect to climate change that is associated with renewable energy schemes is considered to outweigh the low risk to the protected species (namely bats) in this instance."</i>
Lower Treen, Davidstow, Camelford Application Numbers: PA13/09438 and PA18/10990	12m North West	Erection of a single wind turbine, 20m to hub, maximum 27.1m to tip.	PA13/09438 - Ecology report concludes: The proposed installation at this site of a single small turbine is unlikely to have a significant impact on bird or bat behaviour; is unlikely to result in significant bird or bat mortality; and will not result in the loss of important habitat.
		Repowering of one existing wind turbine, with maximum blade tip height of 77m.	PA18/10990 - The Ecology Chapter of the Environmental Appraisal Report did not identify any significant impacts on bats and birds and concluded the following regarding cumulative impacts: <i>"Proposals are for a replacement of a single turbine with a larger single turbine. As such there will be no net increase in wind turbines in the local area and no increase in cumulative impact is anticipated."</i> The ecology surveys recorded low numbers of noctule and common pipistrelle bats during the survey. The ecology report does not identify any significant effects on bats as the turbines are over 50m from adjacent habitat features.

Higher Basil Farm, Altarnun, Road, St Clether. Application Number: PA12/04254	1.48 km South	Installation of a 15kW wind turbine.	No EclA undertaken. Planning Officer' report concludes: " <i>On balance, the beneficial cumulative consequences for the environment in respect to climate change that is associated with renewable energy schemes is considered to outweigh the low risk to the protected species (namely bats) in this instance</i> ".
Higher Tremail Farm, Tremail, Camelford Application Number: PA12/08818	1.92 km West	Installation of single wind turbine with a tower height of 25m and rotor diameter of 19m.	No EclA undertaken, No Planning Officer report present on Cornwall Council's planning portal
Rowlands Corner, Egloskerry, Launceston Application Number: PA12/11104	2.64 km East	Erection of a single wind turbine on a 24m tower with a 19.2m rotor diameter.	The committee report states: " <i>The application is supported by an ecological appraisal of the whole site. The appraisal finds not direct harm to any protected species, but does make a series of mitigation recommendations which can be controlled by a condition.</i> " The ecological appraisal is absent from Cornwall Council's planning portal
Wiggaton Farm, North Petherwin, Launceston Application Number: E1/2009/01610	3.64 km North-east	Installation of two 20kw wind turbines mounted on 15 m hub height with three blades with rotor diameters of 10m.	No EclA undertaken, No Planning Officer report present on Cornwall Council's planning portal
Fentrigan, Warbstow, Launceston Application Number: PA13/08668	3.64 km North	The extension of an existing wind energy site via installation of 1 no. wind turbine with an overall tip height of 34.5m.	The desk-based assessment of impacts on bats and birds does not identify any significant impacts on avian receptors. The Planning Officer's report stated: " <i>In accordance with the above guidance and the low risk environment in which this turbine would be sited the proposal is considered to represent a minimal threat to protected species. Furthermore even adopting a precautionary approach to such issues the low risk to bats and birds is further offset by the environmental benefits associated with renewable energy schemes.</i> "

Tredown Farm, Warbstow, Launceston Application Number: E1/2008/01358	3.83 km North	Installation of two wind turbines mounted at a hub height of 15 m with rotor diameter of 10.4 m.	Planning documents unavailable for viewing on Cornwall Council's planning portal
Orchard House, Penhale Road, Otterham, Camelford Application Number: E1/2006/01274	3.1 km North-west	Erection of a windfarm comprising four wind turbines at up to 71m to tip height.	Ecological impact assessment undertaken but not available from Cornwall Council's planning portal. Planning Officers report does not refer to impacts on wildlife
Great Trevillian, Warbstow, Launceston Application Number: E1/2008/01357	4.83 km North	Installation of two micro turbines with a hub height of 15 m and rotor diameter of 10.4 m.	No EclA undertaken, No Planning Officer report present on Cornwall Council's planning portal
Starapark Farm, Camelford Application Number: PA13/01764	4.39 km West	Installation of 2no wind turbines, associated access and works.	No EclA undertaken. Planning Officer's report concludes: <i>"In conclusion the scheme proposes relatively small scale renewable energy production for a working farm and on balance its impact on the wider landscape does not outweigh the benefits submitted."</i>
Winsdon Farm, North Petherwin, Launceston Application Number: E1/2009/01564	7.19 km North-east	Installation of two wind turbines on 18 m masts with a rotor diameter of 13m.	No EclA undertaken, No Planning Officer report present on Cornwall Council's planning portal
Cargurra Farm, St Juliot, Boscastle Application Number: PA10/07516	5.1km North-west	Installation of two wind turbines with a hub height of 18.3 m and a rotor diameter of 13 m	No EclA undertaken. Planning Officer's report concludes: <i>"The proposal is considered to have an acceptable impact on issues such as cumulative landscape effects and visual effects, noise, shadow flicker, telecommunications, ecology and safety"</i>

Cottage Farm Barn, Tobarn, Jacobstow, Bude Application Number: E1/2008/01780	7.65 km North	Installation of 2 wind turbines (height of turbine 6 m and a rotor diameter of 3 m).	No EclA undertaken, No Planning Officer report present on Cornwall Council's planning portal
Creddacott Farm, Week St May, Holsworthy Application Number: E1/2008/01354	7.35 km North	Installation of two wind turbines with 15m hub height and rotor diameters of 10.4m.	No EclA undertaken, No Planning Officer report present on Cornwall Council's planning portal
Deli Wind Farm, Delabole. Application Number: E1/2008/00638	8.4 km South west	Application for planning permission for the erection of 4 no. Wind turbines, sub- station building together with associated access tracks in connection with the re-powering of the existing wind farm and the de-co.	The Ecology Chapter of the Environmental Statement did not identify any significant adverse impacts on birds and bats.
West Nethercott Farm, Whitstone, Holsworthy. Application Number: PA13/06873	9.99 km North-east	Installation and operation of two wind turbines each with a tip height of 46m.	No EclA undertaken. Planning Officer's report concludes: " <i>In conclusion the scheme proposes relatively small scale renewable energy production for a working farm and on balance its impact on the wider landscape does not outweigh the benefits submitted.</i> "

9.181 In exercising their duties under as the local planning authority, under Section 40 of the Natural Environment and Rural Communities Act (2006) Cornwall Council are required to have regard to the purpose of conserving biodiversity. Therefore, it has been assumed that the installation and the operation of wind energy sites listed in Table 9.8 above have not resulted in a significant cumulative adverse effect on Ecological receptors and that the cumulative effect of these site is neutral. As any residual effects of the proposed development on Ecological receptors would only occur at the sub-parish level and are therefore not significant, no significant cumulative effect is possible when these are considered in the context of a neutral baseline.

- 9.182 In addition, the new turbines are sited away from hedgerows and County Wildlife Sites and therefore no increase in bat and bird collision is predicted as a result of this repowering project. Indeed it is likely that the scheme would result in a reduction in collision risk to these species. As there would be no adverse residual effect to bats and birds, no cumulative effect is possible on these species.

SUMMARY AND RESIDUAL EFFECTS

Designated sites

- 9.183 A summary of residual effects on designated sites is contained within Table 9.9. No adverse effects are anticipated on designated sites during construction or operation.

Habitats

- 9.184 A summary of residual effects on habitats is contained within Table 9.9. Turbine installation would have a long-term, **Adverse** effect at the **Sub-Parish** scale (not significant). This would be compensated by the proposed habitat enhancement and creation within the proposed off-site Biodiversity Net Gain site which would include other neutral grassland and culm grassland. Creation of these habitats would offset the construction phase effects and result in a **Beneficial** effect which is significant at the **Parish** scale in the medium-term onwards once the habitats become established. The Biodiversity Metric 3.1 (DEFRA, 2022) calculates that the habitat enhancement site would result in an additional 26.09 Habitat Units overall which amounts to a 565% gain.

Protected/notable species

- 9.185 A summary of residual effects on species is contained within Table 9.9. All potential operational effects are assessed to be not significant. The new wind turbines are predicted to result in fewer bird and bat collisions than the existing wind turbines.

Conclusions

- 9.186 The proposed development would protect, maintain and enhance biodiversity in accordance with policies concerning the conservation of biodiversity in the National Planning Policy Framework (2023) and with Policies 22, 23 and 25 of the Cornwall Local Plan 2010-2030 (Adopted 2016).

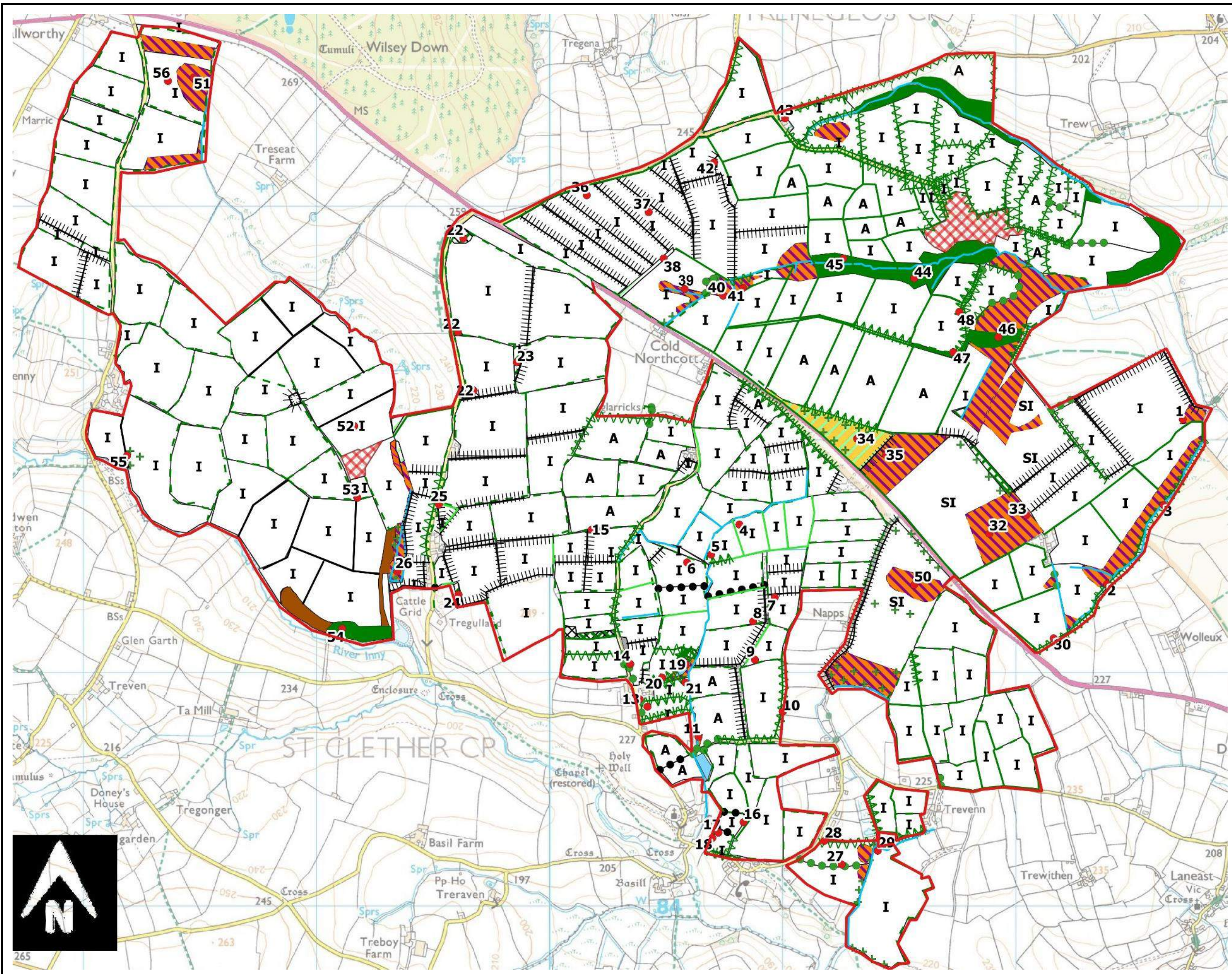
Table 9.9: Summary and Residual Effects

Ecological Feature	Characterisation of Unmitigated Effect on Feature	Effect Significance (pre-mitigation)	Mitigation Measures	Residual Effect Significance (post-mitigation)
<i>Designated sites</i>				
Bodmin Moor SSSI	Disturbance/displacement/collision risk to golden plover (designated feature of SSSI) during operation phase. However, new wind turbines predicted to result in fewer collisions than existing wind turbines	Long-term beneficial Sub-Parish effect in the long-term	No mitigation required	Long-term beneficial Sub-Parish effect in the long-term
Tintagel Cliffs SSSI	Individual peregrine falcon, which are a designated feature of this SSSI, may occasionally fly over the site and therefore potential for some limited disturbance/displacement to peregrine falcon during wind turbine operation.	Negligible significance	No mitigation required	Negligible
Napp's Moor CWS and Abbot's Hendra CWS	Transgression of machinery onto CWS. Run-off during construction	Long-term, adverse effect at District scale.	CWS protected during construction through the use of protective fencing. Compounds and storage areas sited away from hedgerows and retained grassland. Run-off avoided through working in accordance with government guidance on prevention of pollution.	Neutral
<i>Habitats</i>				
Improved grassland, arable, hedgerows and semi-improved grassland	Removal through site clearance to facilitate installation of turbine bases.	Long-term, adverse effect at Sub-Parish scale	An off-site biodiversity enhancement site would be enhanced to create a mosaic of neutral grassland and culm grassland. Management to be undertaken in accordance with a Habitat Management Plan. The proposed enhancements would offset the habitat loss	Short-term adverse effect at Sub-Parish scale. Beneficial effect at the District scale in the

Ecological Feature	Characterisation of Unmitigated Effect on Feature	Effect Significance (pre-mitigation)	Mitigation Measures	Residual Effect Significance (post-mitigation)
	Also temporary damage to habitats during cable installation and haul roads		during turbine construction and result in an overall increase of 26.09 Habitat Units (565.24% gain).	medium-term onwards.
Retained habitats within and adjacent the site.	Transgression of machinery onto other habitats within site.	Long-term, adverse effect at Parish scale.	Retained habitats protected during construction through the use of protective fencing. Compounds and storage areas sited away from hedgerows and retained grassland.	Neutral
<i>Protected and notable species</i>				
Notable Plants and Invertebrates	None considered likely	No effect	NA	No effect
Amphibians and Reptiles	Habitat removal during construction. Potential killing/injury.	Short-term and adverse effect at the Sub-Parish scale.	Removal of vegetation/topsoil would be undertaken using a phased approach under the supervision of an ecologist and any reptiles or amphibians found would be moved to suitable habitat away from the construction zone.	Adverse short-term effect at the Sub-Parish scale in the short-term. Neutral effect in the medium-term onwards.
Birds	Disturbance/displacement arising from construction phase activities	Negligible to short-term adverse and the sub-parish scale (not significant)	No mitigation required	Negligible to short-term adverse and the sub-parish scale (not significant)
	Habitat loss	Long-term adverse at the sub-parish scale (not significant)	No mitigation required	Long-term adverse at the sub-parish scale (not significant)

Ecological Feature	Characterisation of Unmitigated Effect on Feature	Effect Significance (pre-mitigation)	Mitigation Measures	Residual Effect Significance (post-mitigation)
	Direct impacts on nest sites during construction	Acute adverse at the Sub-Parish scale (not significant)	Vegetation clearance works, including clearance of grassland, would, wherever possible, be conducted outside of the core bird breeding season (March to early September). Where this is not possible, a suitably experienced ecologist would be appointed to oversee the construction phase of the project and would be responsible for ensuring that breeding birds and their young are not killed or injured, or their nests and eggs damaged or destroyed.	Neutral
	Disturbance/displacement during operation of new wind turbines.	Long-term adverse at the sub-parish scale (not significant). However,	No mitigation required	Long-term adverse at the sub-parish scale (not significant)
	Collision with turbines. However, new wind turbines predicted to result in fewer collisions than existing wind turbines	Negligible to long-term beneficial at the Sub-Parish scale (not significant)	No mitigation required	Negligible to long-term beneficial at the Sub-Parish scale (not significant)
	Barrier to movement	Negligible	No mitigation required	Negligible
Badger	Potential for direct effects during construction e.g. death/injury through becoming trapped in excavations.	Adverse, short-term effect at Sub-Parish scale	Pre-start survey to confirm that no badger setts are present within the construction area. If any identified, then a Natural England Badger Licence sought. Excavations and piping (>200mm in diameter) fenced/capped overnight to deter badgers from entering. Excavations that could not be covered would have a means of escape for any animals that may fall in.	Short-term adverse effect at the Sub-Parish scale. Negligible effect.

Ecological Feature	Characterisation of Unmitigated Effect on Feature	Effect Significance (pre-mitigation)	Mitigation Measures	Residual Effect Significance (post-mitigation)
Dormouse	Damage to hedgerow and temporary removal of small areas of hedgerow adjacent gateways to accommodate haul roads	Long-term, adverse effect at Parish scale.	Hedgerows protected during construction through the use of protective fencing. Hedgerows to be replanted with species-rich hedgerows following completion of construction. Compounds and storage areas sited away from hedgerows. 25 dormouse boxes installed throughout site.	Short-term Sub-Parish effect during construction. Beneficial at the Sub-Parish scale following dormouse box installation (medium term onwards)
Otter	None considered likely	No effect	NA	
Bats	Collision with turbines. However, new wind turbines predicted to result in fewer collisions than existing wind turbines	Negligible to long-term beneficial at the Sub-Parish scale (not significant)	No mitigation required. However, to reduce potential bat collisions further, the blade pitch control system will be automated to feather the blades during idling to reduce rotation speed. This recommendation is in accordance with the SNH (2019) Guidelines.	Long-term beneficial at the Sub-Parish scale (not significant)
Other mammals	Minor temporary disturbance to brown hare through vehicle movement and noise.	Negligible	NA	Negligible



- Key**
- Target notes
 - Survey area boundary
 - - - Species poor defunct hedgebank
 - Species poor intact hedgebank
 - Species rich intact hedgebank
 - Hedgebank with trees
 - Coniferous hedgerow
 - Line of mature trees
 - Degraded bank
 - Earth bank
 - - - Dry ditch
 - Stream
 - ||||| Fence
 - + Scattered scrub
 - Scattered broadleaved trees
 - Broadleaved woodland
 - Plantation broadleaved woodland
 - Plantation coniferous woodland
 - Standing water
 - Marshy grassland
 - Dry heath
 - Bracken
 - Dense scrub
 - Bare ground
 - Hard standing
 - Building
 - Area not surveyed
 - I Improved grassland
 - A Arable
 - SI Species poor semi-improved grassland



Figure 9.1: **Phase 1 Habitat Survey**

Client: **WMW Consultants Ltd**




Project: **Cold Northcott Windfarm EIA**






Project No: **C2330**













Drawn: HT	Checked: HT	Date: 29/01/23	Scale: See Scale
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Target Note	Photos where appropriate	Description
<p>1. North east green section near Badgall Downs</p>		<p>Marshy grassland, dominated by soft rush with occasional spearwort, water crowfoot, cuckoo flower (forms the western boundary of Laneast and Bagall Downs County Wildlife Site). Stream (shown in the picture) extends from the southern extent of the house 'Meadowside' and flows east to the boundary. Stream near the house is approximately 1m wide with a fast flow, 5-10cm deep and a clay and cobble substrate. Emergent vegetation limited to water crowfoot. Stream starts on the eastern boundary adjacent to a bank topped with mature beech trees and gorse, approximately 1.5m wide, fast flow with a clay and cobble substrate and approx. 5cm deep, looks to have been cleared out recently.</p>
<p>2 - Northeast green section, eastern boundary</p>		<p>Stream looks as though it's been cleared out in the northern section and has no emergence vegetation although hemlock water dropwort on the banks. Fast flow with a clay and cobble substrate and steep earth banks. Stand of mature ash, sycamore and field maple trees extending through 2 fields. Several with <i>low to moderate bat roosting potential</i> e.g. knot holes, open cavities at the base and dead wood.</p>
<p>3 - Eastern boundary of NE green section</p>		<p>Mature oak tree with <i>low to moderate bat roosting potential</i>.</p>





<p>4 - Pink section, deer man's land</p>		<p>Two streams on either side of a hedgebank merge into one, creating an open area of water with brooklime, and soft rush around the edges.</p>
<p>5</p>		<p>Recently created pond with bare ground all round it. Approximately 15m long x 5m wide. Hedge and stream along the eastern boundary. 2x Canada geese on the water.</p>
<p>6</p>		<p>Similar to TN4. Two streams converge into an area of open water with several stands of hemlock water dropwort both on edges and in the water.</p>
<p>7</p>		<p>Mature sycamore in hedge with <i>low potential to support roosting bats.</i></p>
<p>8</p>		<p>Beech tree with bird's nest. <i>Low potential to support roosting bats.</i></p>





9		<p>Sycamore tree in hedge with a very small amount of dead wood. <i>Low potential to support roosting bats.</i></p>
10		<p>Ash tree in hedge. <i>Low to moderate bat roosting potential</i> as has flaking bark and open knot holes.</p>
11	 	<p>Field maple x 2 in hedgebank by road. Ivy on the trunks, dead wood and small splits. <i>Low to moderate bat roosting potential.</i> Manmade pond to the south of the road.</p>
12		<p>Line of mature trees along both sides of the hedgebank. Likely good bat foraging habitat.</p>




13		Invasive plant species –montbretia.
14		Line of mature sycamore along a hedgebank with knot holes and splits in the trunk. <i>Moderate bat roosting potential.</i>
15		Two pill boxes in hedgebank. Concrete structures, approximately 2.5m square and 1.75m high. Crevices around the roof and slate near the top. Possible horseshoe night roost potential
16 – pink section near St Clether		Overgrown green lane with 2 parallel species rich hedgerows.
17		Mature sycamore with several open knot holes. <i>Low to Moderate bat roosting potential.</i>


<p>18</p>		<p>Mature tree with cavities at the base. <i>Moderate bat roosting potential.</i></p>
<p>19</p>	 <p>Stream</p>  <p>Pond & hedgebanks</p>  <p>Pond with island and marshy grassland</p>	<p>Stream/ Pond/ marshy grassland/hedgebanks/scrub/wet woodland</p> <p>Stream: Fast flow, approximately 2m wide with a stone and silt substrate. Marginal vegetation: soft rush, gorse, broadleaved willowherb, Yorkshire fog, common figwort and marsh thistle. Hemlock water dropwort both marginal and emergent. Around the stream banks, lots of bare ground.</p> <p>Pond: 16m long x 6m wide. Small island in the southern extent with 2 trees and a bird box. Emergent vegetation: common figwort, reedmace, water forget me not, water lily, common duckweed, hornwort. Marginals: soft rush, white clover, hard rush and gorse.</p> <p>Marshy grassland: soft rush, gorse, marsh thistle, curled dock, spearwort, white clover, ribwort plantain, birds foot trefoil, creeping buttercup, mouse ear, marsh bedstraw, prickly lettuce, meadow buttercup, cuckoo flower.</p> <p>Surrounded by old hedgebanks topped with trees: hazel, hawthorn, willow, sycamore, blackthorn, beech and holly. Ground flora: common polypod, celandine, harts tongue fern, ivy, foxglove, lady's fern, hard fern, common sorrel, broadleaved willowherb and bramble. North of the pond is an old hedgebank topped with multi-stemmed beech trees, several of</p>

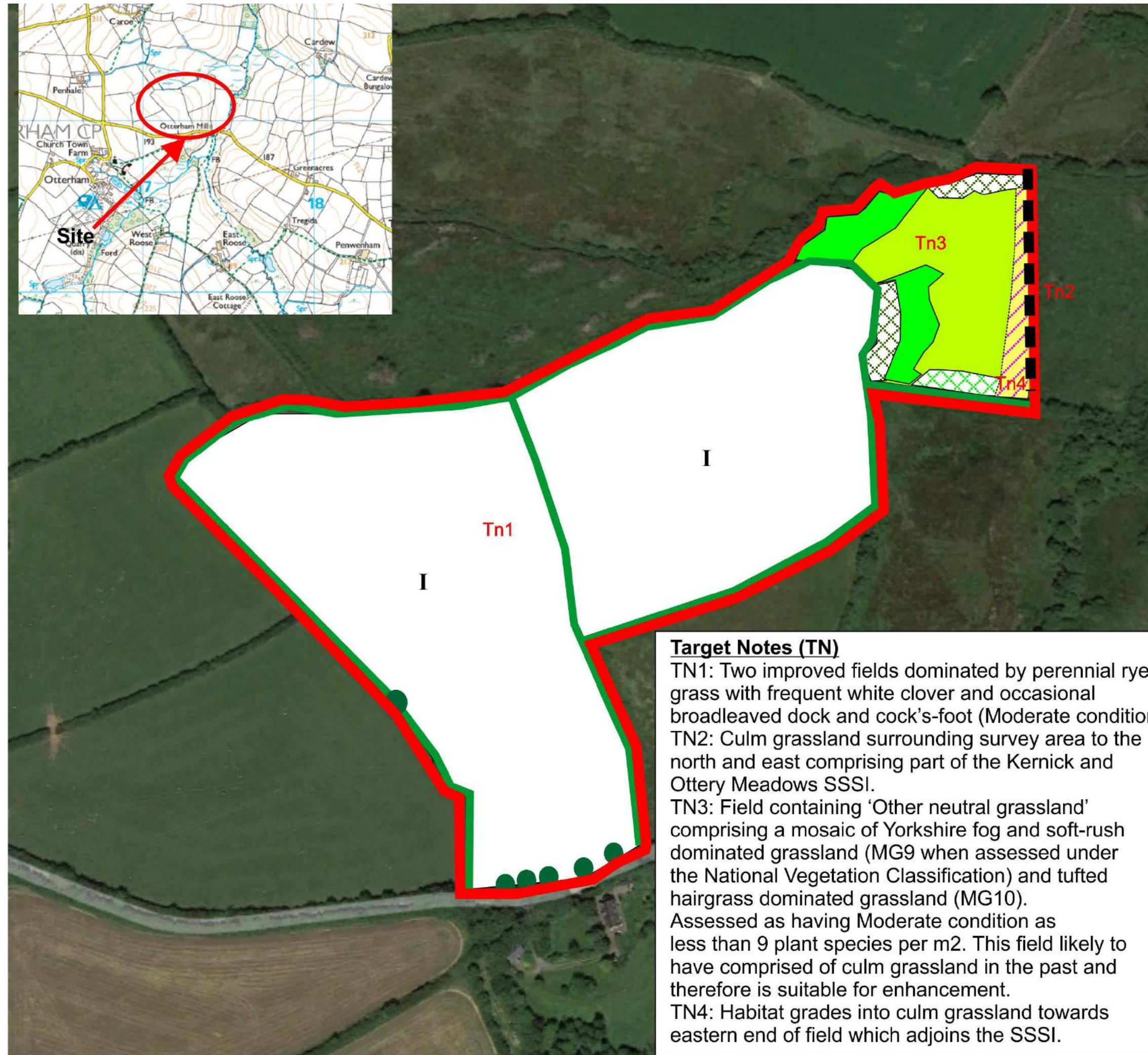
	 <p>Northern hedgebank topped with beech trees</p>  <p>Scrub/wet woodland</p>	<p>which have holes and cavities – <i>Moderate bat roosting potential.</i></p> <p>Scrub/Wet woodland: Dense willow with bramble and holly. Ground flora is limited to soft rush, hard rush, herb Robert and hard fern. Streams to the south and east.</p>
20		<p>Mature sycamore – <i>low bat roosting potential.</i></p>
21		<p>Willow scrub in deer paddock with mud all round.</p>

<p>22 – green area north of Tregulland</p>		<p>Three fenced off copses dominated by immature/semi-mature ash trees - <i>negligible bat roosting potential</i>. Understorey of nettle and broadleaved dock, with occasional red campion.</p>
<p>23</p>		<p>Evenly aged plantation broadleaved woodland. Comprising semi-mature ash, sycamore, hawthorn, rowan and elder. <i>Low bat roosting potential</i> Earth bunds to the east and west dominated by nettles with evidence of rabbit warrens. Southern end grades into bramble scrub Sparse ground flora dominated by bramble, hogweed and nettle with occasional red campion, creeping buttercup, cocksfoot, wood avens, broadleaved willowherb, harts tongue fern common polypody and male fern.</p>
<p>24</p>		<p>Shelter belt of evenly aged ash trees with earth bank to the west. <i>Negligible bat roosting potential</i>. Understorey of bramble, nettle and red campion.</p>
<p>25</p>		<p>Remains of a stone building, primarily fallen down however a few sections of wall remained and lots of slate and rough grass. Suitable for reptiles.</p>

26		<p>Marshy grassland and scrub around a stream. Standing water with tussocks of hard and soft rush, hemlock water dropwort, marsh thistle, bittercress, broadleaved willowherb, goat willow, tufted hair grass, nettle and broadleaved dock.</p>
27 – peach area east of St Clether		<p>Hedgebank with line of mature beech trees.</p>
28		<p>Mature ash tree, multi-stemmed with ivy on the trunks – <i>low bat roosting potential</i>.</p>
29		<p>Mature oak – <i>moderate bat roosting potential</i>. Near stream, approximately 4m wide, fast flow, stone sediment. Eastern banks relatively vertical, western banks flat with marshy grassland dominated by soft rush and bracken. Trees and scrub on the eastern and western banks.</p>
30	<p>Stone shed with corrugated roof and three partially open doors – potential to support night roosting horseshoe bats.</p>	
31	<p>Cornish hedge with locally abundant bell heather on bank.</p>	

32		<p>Species-rich marshy grassland in the east of Napp's Moor CWS (Culm grassland). This grassland was fairly homogenous and dominated by purple moor-grass tussocks with frequent bramble, European gorse, western gorse and marsh thistle. Potential for marsh fritillary butterfly.</p>
33	<p>The northern block of Napp's Moor CWS contained species-rich marshy grassland with a more open sward and affinity with mire vegetation communities. This habitat was dominated by purple moor-grass with locally abundant toad-rush and frequent bristle bent, common sorrel, spearwort, marsh thistle, water crowfoot, lousewort, bell heather, common spike-rush, jointed rush.</p>	
34	<p>This habitat occurred in the west of Napp's Moor CWS and was dominated by common heather which covered approximately 40% of the ground. Bristle bent and European gorse were all locally abundant with frequent purple moor-grass.</p>	
35		<p>Pond surrounded by soft-rush.</p>
36	<p>Pond in field with no aquatic vegetation at the time of survey and surrounded by closely grazed grassland.</p>	
37	<p>Pond in field with no aquatic vegetation at the time of survey and surrounded by closely grazed grassland.</p>	
38	<p>A semi-mature conifer plantation was located in the north west of the survey area with ground flora limited to ivy, bramble and common nettle.</p>	
39		<p>Stream – 20cm deep at the time of survey with frequent reed sweet-grass and soft-rush. Earth banks with sand and occasional cobble bed substrate.</p>
40	<p>Common lizard recorded adjacent stream.</p>	

41	Two unmanaged out-grown hedges which have merged to form a block of broadleaved woodland dominated by grey willow with groundflora of red campion, common nettle, herb-Robert and wood avens.	
42	Open fronted livestock barn with corrugated roof and block walls. Limited bat potential, although could be used as an occasional horseshoe night roost.	
43	Farm building complex with moderate bat potential, slate roof on farmhouse and concrete tiles on barns.	
44	Semi-natural broadleaved woodland dominated by mature and semi-mature pedunculate oak and grey willow with a bramble understorey. Bracken, wood avens, herb-Robert, hard fern and bryophytes dominated the ground layer. Priority Habitat and optimal dormouse habitat.	
45	Badger outlier sett – comprising a single partially active hole.	
46	A small block of wet woodland ('carr') occurred within Napp's Moor CWS. Tree species were dominated by goat willow with hard fern, wild angelica and abundant bryophytes in the ground flora. Situated in the north east of the survey area.	
47	Out-grown hedge.	
48	Semi-natural broadleaved woodland surrounded by hedgerow. Dominated by mature pedunculate oak with beech, holly and honeysuckle with ivy, hard fern and soft-rush in the ground flora. Likely to have previously been a field surrounded by hedgerows.	
49	Outlier badger sett comprising a single active hole.	
50	Species-rich marshy grassland occurred in the south of Napp's Moor CWS (Culm grassland). This grassland was dominated by purple moor-grass tussocks with frequent marsh thistle, occasional bristle bent grass, soft-rush and spearwort. Potential for marsh fritillary butterfly.	
51	Large area of marshy grassland dominated by soft-rush with frequent marsh thistle and bryophytes.	
52	Disused stone quarry comprising primarily bar/ground – no bat roost potential.	
53	Partially collapsed stone building with no roof. Low to moderate bat roost potential due to crevices between stones.	
54	Semi-natural broadleaved woodland comprising semi-mature pedunculate oak and willow species over sheep grazed improved grassland.	
55		Two small concrete shed (pill boxes). No bat evidence recorded although building is suitable for night roosting horseshoe bats.
56	Subsidiary/Annexe badger sett with four active entrances.	



Target Notes (TN)
 TN1: Two improved fields dominated by perennial rye-grass with frequent white clover and occasional broadleaved dock and cock's-foot (Moderate condition)
 TN2: Culm grassland surrounding survey area to the north and east comprising part of the Kernick and Ottery Meadows SSSI.
 TN3: Field containing 'Other neutral grassland' comprising a mosaic of Yorkshire fog and soft-rush dominated grassland (MG9 when assessed under the National Vegetation Classification) and tufted hairgrass dominated grassland (MG10). Assessed as having Moderate condition as less than 9 plant species per m2. This field likely to have comprised of culm grassland in the past and therefore is suitable for enhancement.
 TN4: Habitat grades into culm grassland towards eastern end of field which adjoins the SSSI.

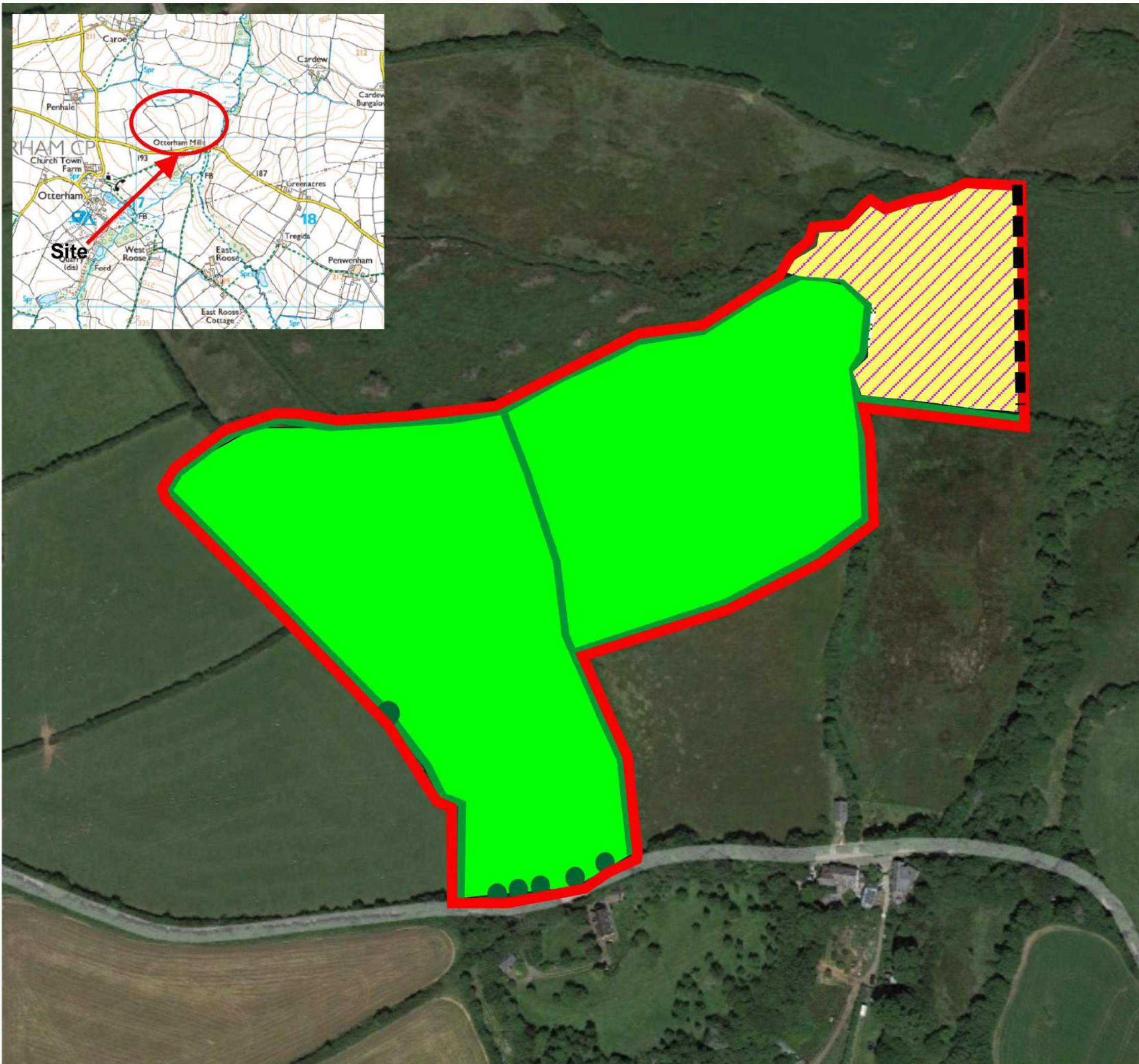
- Key**
- █ Species-rich hedgerows
 - Broadleaved tree
 - Mixed scrub
 - Bramble scrub
 - | Improved / Modified grassland
 - Other neutral grassland: Holcus-Juncus neutral grassland
 - Other neutral grassland: Deschampsia neutral grassland
 - Fen marsh & Swamp
 - - - Fence
 - Site boundary
 - Tn3 Target Note



Figure 9.2: **Otterham Mill Biodiversity Offsetting Site**
 Client: **WMW Consultants Ltd**
 Project: **Cold Northcott Windfarm EIA**
 Project No: **C2330**



Drawn: HT	Checked: HT	Date: 29/01/23	Scale: NTS
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- Key**
- Species-rich hedgerows (existing)
 - Broadleaved tree (existing)
 - Other neutral grassland: (5.86ha in moderate condition)
 - Fen marsh & Swamp(1.3ha in moderate condition)
 - Fence
 - Site boundary



Figure 9.3: **Otterham Mill Proposed Habitat Enhancement**

Client: **WMW Consultants Ltd**

Project: **Cold Northcott Windfarm EIA**

Project No: **C2330**



Drawn: HT	Checked: HT	Date: 29/01/23	Scale: NTS
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