

Cottam Solar Project

Environmental Statement

Appendix 9.5: Bat Survey Report

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BAT SURVEY REPORT
COTTAM SOLAR PROJECT

carried out by



commissioned by

COTTAM SOLAR PROJECT LTD.

OCTOBER 2022



BAT SURVEY REPORT

COTTAM SOLAR PROJECT

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The information, data and advice which has been prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's (CIEEM) Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions. This report and its contents remain the property of Clarkson and Woods Ltd. until payment has been made in full.



1 INTRODUCTION

- 1.1.1 Clarkson and Woods Ltd. was commissioned by Cottam Solar Project Ltd. to carry out bat surveys for the Cottam Solar Project Scheme. The Scheme broadly comprised four sites: Cottam 1, Cottam 2, Cottam 3a and Cottam 3b situated in the West Lindsey District of Lincolnshire. These are referred to hereafter as 'the Sites', or individually as given above. Proposals comprise the development of an NSIP-scale solar park, containing solar energy production and storage components.
- 1.1.2 A series of automated bat detector surveys, ground-based tree inspections and daytime building inspections were carried out by Clarkson and Woods Ltd between June 2021 and June 2022. Surveys followed a scope agreed through consultation with Natural England via a Discretionary Advice Service dialogue, as well as Lincolnshire Wildlife Trust and followed survey methodology specified within the Bat Conservation Trust Bat Conservation Trust¹.
- 1.1.3 Unless the client indicates to the contrary, information on the presence of species collected during the surveys will be passed to the county biological records centre in order to augment their records for the area. This is in line with the CIEEM code of professional conduct².

1.2 Aims and Limitations

- 1.2.1 Given the size of the Scheme and the proposed changes to land use, bat activity surveys were recommended to ascertain a baseline of the level of use by foraging and commuting bats along with species composition and abundance. The objective of these surveys was to establish the likely value of the habitats and features within a Survey Area which encompasses all long-term development activities (solar energy and battery storage) elements of the Scheme to individual species of bats, and bats in general in the context of the wider landscape. Surveys of trees and buildings were carried out within the Zone of Influence of the Sites to assess their potential to support roosting bats. The level of roosting potential within trees and buildings will be used to determine buffers from important features during designing of Site layouts.
- 1.2.2 This report details the methods and results of the surveys and provides a brief overview of the potential impacts that could result from the proposals so as to inform the layout of the Scheme.
- 1.2.3 This information will be used within the eventual Cottam Solar Project Environmental Statement to inform the ecological evaluation of the habitats used by bats and to characterise the impacts on them considered likely to result from the Scheme.
- 1.2.4 While the installation of below-ground electrical cabling will be required beyond the boundaries of the Site in order to connect the disparate land parcels, both to one another and to the National Grid, relevant and proportionate ecological baseline information for this cable route element will be presented within a separate document.

1.3 Description of the Survey Area

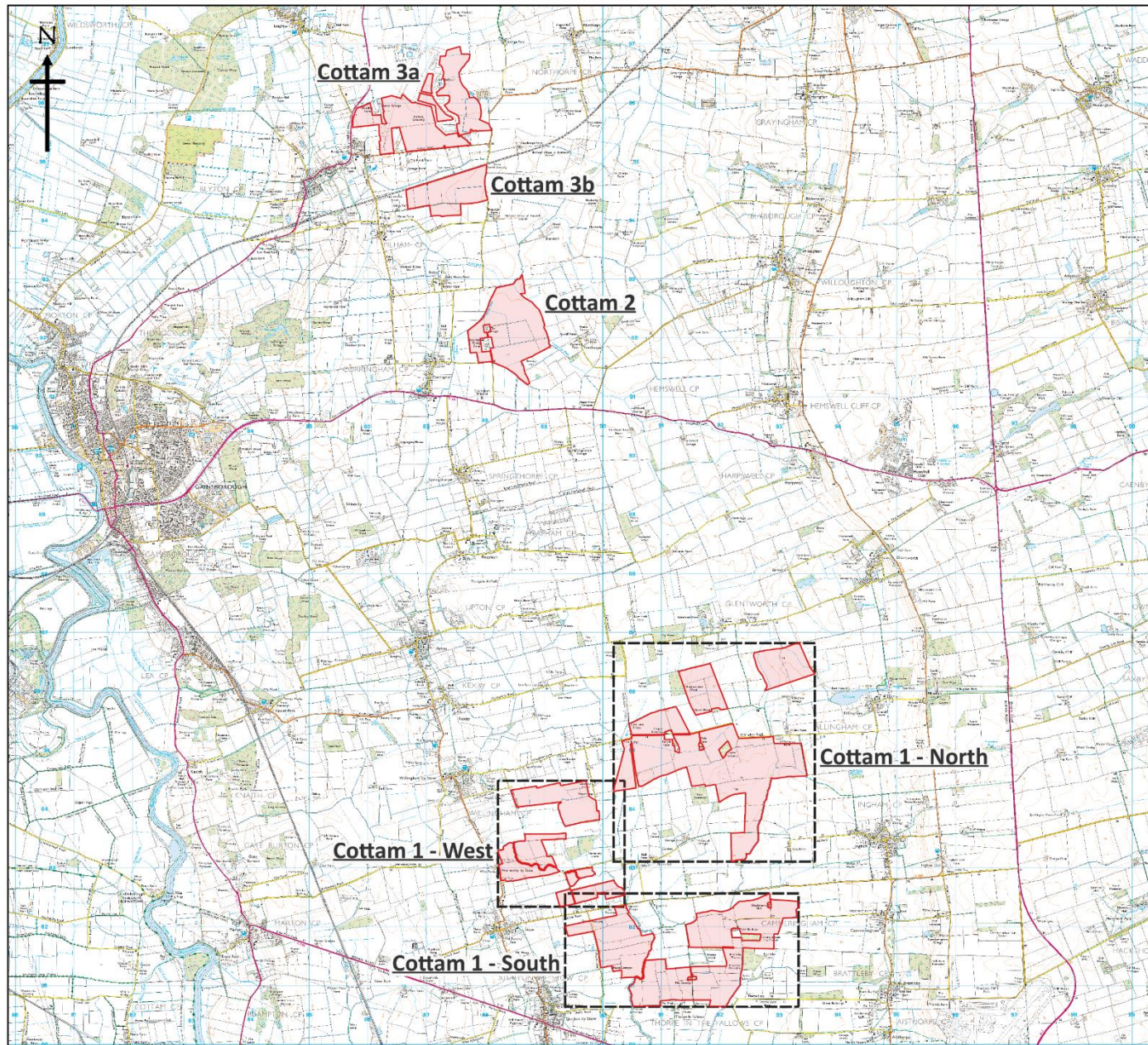
- 1.3.1 Due to refinement of the Scheme extent and design following the completion of these surveys, the Survey Area covers a slightly larger area than the red line boundary of the Scheme (not including the cable route or 'external' construction access routes). However, the extent of the solar and battery elements are entirely contained within the Survey Area and so will have been fully subject to survey. It is therefore considered that the chosen Survey Area is appropriate for deriving a baseline for the Scheme. The Survey Area measures approximately 1,260ha.
- 1.3.2 The Sites are spread over an approximately 17km area stretching from south to north between the settlements of Coates and Thorpe in the Fallows (Cottam 1), Corringham (Cottam 2) and Blyton (Cottam 3a and 3b) as shown in Figure 1 below. For the purposes of this document Cottam 1 was further split into three distinct areas, namely Cottam 1 North, Cottam1 South and Cottam 1 West, as shown in Figure 2.

¹ Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1.



² Code of Professional Conduct. CIEEM, January 2019.



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- 1.3.3 The Sites predominantly comprise large, open and generally flat arable fields characterised by winter-sown cereal crops, bounded by a network of managed hedgerows and ditches with narrow field margins, where present.
- 1.3.4 These habitats are very much typical of the surrounding landscape which is dominated by arable farmland interspersed with small settlements and farmsteads linked by minor and single track roads. The surrounding landscape is mostly flat but becomes more undulating north past Cottam 3a and rises to the east of the Sites at the 'Lincoln Cliff' some 4-5Km away which is a significant north-south escarpment. The River Trent is located approximately 5km west of the Sites as it flows north towards the Humber Estuary, itself some 27km north of Cottam 3a.
- 1.3.5 While no woodland is present within the Sites, several small stands of managed and unmanaged woodland are present adjacent and in the surrounding landscape, often the result of historical game management. Standing water is generally absent from the Sites and the surroundings following the in-filling of traditional livestock drinking ponds, save for a very small number of agricultural pools/pits, decoy ponds or managed recreational fisheries. Flowing water occurs sparsely, centred on the minor River Till (in the case of Cottam 1, and Cottam 2 via the Corringham and Yarthorpe Becks) and River Eau (around Cottam 3a via the Northorpe Beck) and their various feeder streams and managed agricultural drainage ditches which regularly dry out.



Key:

-  Site red line boundaries
-  Site bounding box



Project
Cottam Solar Project

Title
Figure 1 - Cottam sites

Date
03/10/2022

Scale  0 1 2 3 4 km



1.4 Quality Assurance

- 1.4.1 All ecologists employed by Clarkson and Woods are members of the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow the Institute's Code of Professional Conduct³ when undertaking ecological work.
- 1.4.2 The competence of all field surveyors has been assessed by Clarkson and Woods with respect to the CIEEM Competencies for Species Survey (CSS)⁴.
- 1.4.3 This report has been prepared in accordance with the relevant British Standard: BS42020: 2013 – Biodiversity: Code of Practice for Planning and Development⁵. It has been prepared by an experienced ecologist who is a member of CIEEM. The report has also been subject to a two stage quality assurance review by appropriately experienced ecologists who are full members of CIEEM.

1.5 Assessment Scope / Consultation

- 1.5.1 The following consultees were contacted in order to discuss and agree the appropriate scope of the bat surveys for the project.
- **Natural England** – An advisor was assigned at the onset of consultation and the Discretionary Advice Service was utilised outside of statutory consultation process. Natural England raised no concerns after discussing the scope of the bat surveys and made the following comments following the DAS via email on 2nd July 2022:
 - *Regarding the array sites, at this stage Natural England agree that the survey design is proportionate to the predicted level of impact at this stage. This is based on the impacts as described, where physical impacts to the commuting/foraging habitats are considered low, with no predicted severance of linear features or significant loss of foraging habitat.*
 - *We understand there are limitations around undertaking transect surveys and in particular across a wide landscape. However, transect surveys are usually used in combination with static detector surveys (in order to provide context around the number of bats and observation of how they are using the features). The justification for not doing so in this case does appear broadly reasonable, we understand that the sole use of static detectors has enabled you to acquire sufficient data to meet the aims of the survey design. Please note that should (a) licence(s) be applied for, section C3 of the method statement must detail the survey the aims and objectives. Clear justifications in the comments section will reduce the need for further queries at assessment stage.*
 - **Lincolnshire Wildlife Trust (LWT)** – The LWT is the principal adviser to West Lindsey District Council on ecological matters and were consulted in relation to the scheme. The LWT did not raise any concerns regarding the scope of the bat surveys and made the following comments within their consultation letter dated 15th December 2021.
 - *We broadly accept the assumption that arrays generally have a neutral effect on foraging and commuting bats with the potential to offer enhancement where commuting and foraging habitat can be better connected and invertebrate populations can be better supported than in an arable context. We await detailed results from static detector surveys and inspections of older trees for bat potential. We support general recommendations given in the PEAs for mitigation by buffering field boundaries and through lighting design.*

³ CIEEM (2013). Code of Professional Conduct. [REDACTED]

⁴ CIEEM (2013). Competencies for Species Survey (CSS). [REDACTED]

⁵ The British Standards Institution (2013). BS42020: 2013 – Biodiversity: Code of Practice for Planning and Development. BSI Standards Ltd.



2 SURVEY METHODOLOGIES

2.1 Desk Study

- 2.1.1 The Lincolnshire Environmental Records Centre (LERC) was consulted for records of bat species within 2km of the Site.
- 2.1.2 Clarkson and Woods' own database of ecological records derived from past survey work was also consulted for further locally relevant data.
- 2.1.3 The Natural England/DEFRA web-based MAGIC map database was also consulted for records of European Protected Species (EPS) licences issued for mitigation projects concerning bats within 30km of the Site.
- 2.1.4 The data presented within this report constitutes a summary of the data obtained from the local records centre. Should additional detail be required on any of the records described within this report Clarkson and Woods Ltd. should be contacted.

2.2 Field Surveys

Building Inspections for Roosting Bats

- 2.2.1 Efforts were made to access and inspect buildings that were immediately adjacent or deemed to be potentially affected by the scheme should they contain a roost. A number of buildings were outside of the ownership of the Survey Area landowners and efforts were made to contact third party owners, but access was not always granted. As such, only buildings where access was granted were inspected for roosting bats.
- 2.2.2 The exteriors of surveyed buildings were examined through the use of ladders, torches and binoculars for potential roosting features (PRFs). Wherever possible, these points were thoroughly investigated using ladders and a video fibrescope to determine the likelihood of their occupation and evidence of presence. Extra factors taken into consideration included the potential for noise disturbance to the potential roost feature, exposure to the elements, lighting levels, proximity/connectivity of vegetation and water and whether these PRFs led on to cavities further into the structure.
- 2.2.3 Internally, all accessible roof voids and accessible parts of surveyed buildings were entered where safe and possible to do so in order to describe their characteristics and to look for PRFs. A 1 million candle-power torch, ladders and a video fibrescope were used where necessary. Any signs of occupation including urine staining, prey remains, fur rubbing marks and droppings were noted where found. Droppings were compared against reference material to identify likely species, but DNA analysis may be undertaken in certain circumstances to confirm species identification
- 2.2.4 Following the inspections, each surveyed building was assigned a 'high', 'medium', 'low' or 'negligible' category as a guide to inform any necessary further survey effort as stipulated in the Bat Surveys Good Practice Guidelines (Bat Conservation Trust, 2016).

Tree Assessments for Roosting Bats

- 2.2.5 An inspection of all trees within the Survey Area was carried out from the ground, using binoculars, to record any signs of use of the tree by bat species. Features such as frost cracks, rot cavities, flush cuts, split or decaying limbs (including hazard beams), loose bark and dense plates of ivy were inspected and recorded using the methodology set out within the Bat Tree Habitat Key⁶. Any signs of staining (from urine or fur rubbing) and scratch marks below potential access points were noted, and a search was made for droppings underneath these features.
- 2.2.6 All trees were categorised as having either high, moderate, low or negligible bat roost potential according to the Bat Surveys Good Practice Guidelines (Bat Conservation Trust, 2016).

⁶ BTHK 2020. Bat Tree Habitat Key – 4th Edition. AECOL, Bridgwater



Static Detector Surveys

- 2.2.7 Existing habitats within the Survey Area principally comprise large arable fields, with a small number of pasture grassland fields, bounded by a network of hedgerow, ditches and small blocks of woodland. These habitat types are ubiquitous within the local landscape. In general, the most suitable habitat for foraging/commuting bats (woodland and hedgerows) are expected to remain unaffected by the development, although a small number of new field accesses are anticipated (numbers and extent not available at time of writing) to facilitate construction and operational maintenance, as well as the laying of high and low voltage cables. The large arable fields, which comprise the majority of the survey area, were considered to provide sub-optimal habitat for foraging/commuting bats due to monoculture cropping and application of agricultural pesticides, herbicides and fertilisers which are likely to limit the abundance of invertebrate prey.
- 2.2.8 The assessment of the suitability of the Survey Area for foraging and roosting bats was based on current guidance set out by the Bat Conservation Trust⁷. Walked activity survey transects are an alternative survey methodology for the collection of bat activity data typically used in baseline bat activity assessments. Walked activity transects involve the monthly completion of 2-3hr evening survey where a route around a site is walked by a surveyor using a bat detector to collect information on species, location and activity class. As walked transects are comparatively brief survey events, and are considered to represent poor data-collection efficiency in comparison to the longer-term deployment of passive static bat detectors, it was concluded that a more complete and reliable bat species assemblage baseline for the entire Survey Area and whole Sites could be derived from preferentially using automated detectors. This was considered especially appropriate when the relative homogeneity of the habitats within the Survey Area and wider landscape is taken into account, as well as the near-wholesale retention of the likely best foraging and commuting habitat inherent within the Survey Area. Consequently, despite habitats being of 'Low' suitability for bats, it was considered an appropriate precautionary measure to carry out the level of static detector survey usually recommended for 'High' suitability habitats (according to BCT guidelines) in lieu of walked activity transects, thereby obtaining as robust a baseline as practically possible. As such, a total of 22 detector locations were selected and one automated detector survey was carried out per month for each deployment location from April – September.
- 2.2.9 Automated static detectors (Song Meter Mini, Anabat Swift) were deployed at each of the deployment locations for a minimum of seven consecutive nights per deployment between June and September 2021 and between April and May 2022. 22 detector locations covered the Sites as evenly as possible and were selected to focus on key habitat features for bats such as hedgerows and woodland edges. 11 static detectors were used for the survey and detectors would be moved from 'Location 1' to 'Location 2' within each month so that all 22 detector locations were surveyed each month. The detectors were programmed to begin recording at least 30 minutes before sunset and finish recording 30 minutes after sunrise each night.
- 2.2.10 The deployment dates, weather details and durations of the static detector surveys are detailed in Appendix B. Recordings made were subsequently analysed using Kaleidoscope software, and bat species and the number of bat passes recorded was identified. All identified bat calls and 'No ID' files were manually analysed using the analysis software, and a minimum of 10% of the total noise files were also manually checked.

⁷ Collins, J. (ed) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1.



3 LIMITATIONS

3.1 General Bat Survey Limitations

- 3.1.1 Bats are very small creatures, capable of secreting themselves away into extremely small spaces and it is possible that these animals, or their signs, might have been missed during the survey if they are normally present opportunistically or in small numbers for a short period of time each year.
- 3.1.2 Not all features in trees or buildings suitable for use by bats are visible from the ground and there can be no external evidence of use of features by bats; consequently, it is only possible to make a best effort when carrying out such a survey.
- 3.1.3 Bat detectors are known to be more sensitive to certain bat calls than to others for reasons such as varying bat call loudness and directionality of certain calls. For example, a call from a horseshoe bat is directional and a bat detector will only be able to record the call if the bat echo-locates directly at the detector whereas a common pipistrelle call is less directional and can be recorded even when the call is aimed away from the microphone. This can result in certain bat species (notably horseshoe bats and long-eared bats) being under-recorded due to the limitations of the current bat detectors. The difference in recording efficiency may therefore bias any results and this has been taken into account where possible during any assessment of the results.

3.2 Bat Data Analysis Limitations

- 3.2.1 Static detector data has been analysed using the latest Kaleidoscope Pro automated analysis software. This software has been specifically designed to automatically classify the known bat calls of Britain and Ireland.
- 3.2.2 The program automatically identifies bat calls using various algorithms and provides statistical levels of confidence associated with each classified call. The confidence levels reflect the fact that there will be certain classification errors related to every classified bat call. With experience of using the software it appears that, on the whole, it is reliable when identifying certain bat calls (common and soprano pipistrelles, noctule, serotine, Leisler's, lesser and greater horseshoe bats) but less reliable when identifying other species (long-eared and barbastelle bat species).
- 3.2.3 Steps have been taken to ensure sufficient quality assurance considering the relative classification difficulty faced by the software between different species. All records of greater horseshoe, lesser horseshoe, barbastelle, *Myotis* and long-eared species identified by the automated software have been manually verified and where appropriate the call identity corrected.
- 3.2.4 The software does not distinguish between the various *Myotis* species and simply classifies them to genus level (ie *Myotis* sp.). This is in line with classification that would be achieved by manual identification due to the similar nature of *Myotis* calls making species classification subject to a high degree of error.
- 3.2.5 Similarly, the *Nyctalus* genus which comprises noctule and Leisler's bats in the UK can be notoriously difficult to separate to species. Where this occurs, calls were classified down to *Nyctalus* sp. only.
- 3.2.6 Where the software is unsure of a bat call, it will classify the call as 'NoID'. Where a relatively high number of calls are classified as NoID within a deployment's dataset (more than 10% of a data set), these calls were also manually verified by an experienced ecologist. NoID results are included within this report.
- 3.2.7 In conclusion, the classification data produced from Kaleidoscope, along with any manual verification of certain problem/important species, is considered to provide an accurate record of the bat species recorded by a static bat detector and as such has been used with confidence within this report.

3.3 Bat Detector Deployment Limitations

- 3.3.1 The static detector deployment 2 at location CNB2C (Cottam 1 North) had a malfunction and failed to record any data. Due to the large amount of data collected during the static detector survey, this failure is not considered to significantly affect the assessment.



4 RESULTS

4.1 Desk Study Information

Legislation, Local Plans and Policies

- 4.1.1 All 17 species of bat known to breed in England and Wales, and their roost sites, are protected under the Conservation of Habitats and Species Regulations 2017, known as the 'Habitats Regulations'. This makes it an offence to deliberately kill or injure a bat, or to deliberately disturb a bat such that its ability to hibernate, breed or rear young, or such that the species' distribution, were significantly affected. It is also an offence to damage or destroy any breeding site or resting place. Intentional or reckless disturbance of bats in their resting places, and damage to or obstruction of resting places are also offences under the Wildlife and Countryside Act 1981 (as amended). As a result, development works which are likely to involve the loss of or alteration to roost sites, or which could result in killing of or injury to bats, need to take place under licence.
- 4.1.2 The following bat species are listed as species of principal importance under Section 41 of the Natural Environment and Rural Communities Act (2006) in England; barbastelle, Bechstein's, Noctule, soprano pipistrelle, brown long-eared bat, greater horseshoe bat, lesser horseshoe bat.
- 4.1.3 Section 41 of the Natural Environment and Rural Communities Act (2006) in England requires all statutory authorities to produce a list of protected habitats and species, both at a national and county level. These lists continue to be revised and modified from those originally produced as UK BAPs (Biodiversity Action Plans) and detail lists of habitats and species of principal importance for conservation action (i.e. SPI or Species of Principal Importance).
- 4.1.4 Table 1 below includes habitats and species present within the Lincolnshire Biodiversity Action Plan (2011)⁸ which are relevant to bat species in the context of the proposed scheme.

Table 1: Relevant Local BAP Priority Habitats and Species

Broad habitat type	Habitat	Species
Farmland and grassland	Arable field margins	Whiskered bat <i>Myotis mystacinus</i> ,
	Grazing marsh	Brandt's bat <i>Myotis brandti</i> ,
	Lowland calcareous grassland	Natterer's bat <i>Myotis nattereri</i> ,
	Lowland neutral grassland	Daubenton's bat <i>Myotis daubentonii</i> ,
	Lowland meadow	Noctule <i>Nyctalus noctula</i> ,
	Lowland dry acid grassland	Leisler's bat <i>Nyctalus leisleri</i> ,
	Parkland and wood pasture	Common pipistrelle <i>Pipistrellus pipistrellus</i> ,
Waterbodies	Ponds, lakes and reservoirs	Soprano pipistrelle <i>Pipistrellus pygmaeus</i> ,
	Rivers, canals, drains	Nathusius' pipistrelle <i>Pipistrellus nathusii</i> ,
Boundaries	Hedgerows and hedgerow trees	Barbastelle <i>Barbastella barbastellus</i> ,
Trees and woodlands	Lowland mixed deciduous woodland	Brown long-eared bat <i>Plecotus auritus</i>
	Mixed ash-dominated woodland	
	Oak-birch woodland	

⁸ Lincolnshire Biodiversity Partnership (2011) *Lincolnshire Biodiversity Action Plan 2011-2020 (3rd Edition)* [online]. Available at: <http://www.southkesteven.gov.uk/CHttpHandler.ashx?id=7371&p=0> [Accessed 24/11/2021]



Broad habitat type	Habitat	Species
	Planted coniferous woodland	
	Wet (broadleaved) woodland	

Designated Sites

- 4.1.5 Taken from the local environmental data searches, Table 2 includes details of internationally designated sites situated 30km or less, nationally designated sites found within a 5km distance and local designated sites where present within 2km or less, none of which have been specifically designated for bats but are likely to support habitats of good suitability for bats.

Table 2: Summary of Designated Sites for Nature Conservation

Protected Site Name	Site	Distance and Direction from Site	Reason for Designation
Internationally Designated Sites (≤30km)			
Humber Estuary SAC & SPA	Scheme	24km	The Humber is the second-largest coastal plain estuary in the UK, and the largest coastal plain estuary on the east coast of Britain. It is a muddy, macro-tidal estuary, fed by the Rivers Ouse, Trent and Hull, Ancholme and Graveney. Suspended sediment concentrations are high, and are derived from a variety of sources, including marine sediments and eroding boulder clay along the Holderness coast. The estuary supports important breeding populations of bittern, marsh harrier, avocet and little tern during summer as well as important number of overwintering geese, ducks and waders. The SAC is also designated for its populations of sea lamprey <i>Petromyzon marinus</i> , river lamprey <i>Lampetra fluviatilis</i> and grey seal <i>Halichoerus grypus</i> .
2. Birklands & Bilhaugh SAC	Cottam 1	19km south-west	This site is a remnant of the historic Sherwood Forest on freely-draining, acidic, sandy soils and contains the best remaining examples of oak-birch woodland in Nottinghamshire. Birklands and Bilhaugh is notable for its rich invertebrate fauna, particularly spiders, and for a diverse fungal assemblage, including <i>Grifola sulphurea</i> and <i>Fistulina hepatica</i> .
3. Hatfield Moor SAC & SPA	Cottam 3a	SAC 16km north-west; SPA 17km north-west	Hatfield moor consists of raised bog and lies within the former floodplain of the rivers feeding the Humber estuary (Humberhead Levels). The site is designated for its breeding populations of nightjar.
4. Thorne Moor SAC & SPA	Cottam 3a	22km north-west	Thorne Moor is England's largest area of raised bog and lies within the former floodplain of the rivers feeding the Humber estuary (Humberhead Levels). The site is designated for its breeding populations of nightjar.
Nationally Designated Sites (≤5km)			
Scotton Common SSSI	Cottam 3a	1.5km north	Rare example of lowland heathland in Lincolnshire, supporting common lizard, adder, scarce plants and rare moths.



Protected Site Name	Site	Distance and Direction from Site	Reason for Designation
Scotton Beck Fields SSSI	Cottam 3a	1.6km north	Unimproved acidic grassland and heathland botanical communities.
Laughton Common SSSI	Cottam 3a	2.3km northwest	Lowland acid grassland, dune and heath.
Scotton and Laughton Forest Ponds SSSI	Cottam 3a	2.4km north	Peaty heathland pools with open acid grassland and botanically important mire habitats.
Tuetoes Hill SSSI	Cottam 3a	5.0km north	Important mosaic of dry acid grassland including dune grassland.
Owlet LNR	Cottam 3a	2.2km west	Birch, oak and pine woodland interspersed among open heathland. Supports important diversity of invertebrates.
Locally Designated Sites (≤2km)			
Willingham to Fillingham Road Verges LWS	Cottam 1	Adjacent to Cottam 1	A length of road verge that supports a diverse range of grassland species.
Willingham Parish Fields LWS	Cottam 1	165m north west	Two adjacent fields beside Stone Pit Lane that together support a good range of neutral grassland plants, as well as a botanically-rich pond.
Dallison Plantation LWS	Cottam 3a	0.9km north	Botanically important with wide variety of locally rare habitats including dry heathland, wetland and neutral grassland.
Upton Grange Road Verges LWS	Cottam 1	1.1km north	Botanically species-rich verges with neutral grassland and adjacent hedgerows. The invertebrate diversity on these is likely to be high.
Scotton Road Verges LWS	Cottam 3a	1.5km north	A botanically diverse road verge with wet ditch containing county-rare plants and orchids.
Scotton Common, Loates Field LWS	Cottam 3a	1.6km north	Diverse grassland flora
Laughton Forest South-east LWS	Cottam 3a	1.6km north	Diverse beech and pine plantation with botanically rich acidic grassland and fern flora.
Scotton Common East LWS	Cottam 3a	1.6km northeast	Diverse neutral and unimproved acid grassland, as well as ditches and a pond.
Laughton Forest East LWS	Cottam 3a	1.8km north	Large areas of heathland and acid peatland supporting county rare species of flora and fauna, including breeding woodlark and nightjar, and common lizard.

Local Bat Records

- 4.1.6 For **Cottam 1**, approximately 200 records for six species were recorded within the desk study data, none of which were recorded within the red line boundary and the vast majority beyond 250m of the Survey Area. The most commonly recorded species was common pipistrelle, followed by brown-long eared bat, Myotis bats (Natterer's and Daubenton's) and noctule bats. This represents a relatively low diversity of species, all of



which can be expected to roost within buildings and/or trees in the local area. The species present in the data were generally common and widespread. Most records were made post-2000.

- 4.1.7 For **Cottam 2** there were 12 records of bats across two species (common pipistrelle and brown long-eared bat), all of which were located over 1Km from the Site boundary.
- 4.1.8 For **Cottam 3a and 3b**, there were 13 records of bats from six species including common pipistrelle, soprano pipistrelle, noctule, brown long-eared bat, natterer's bat and whiskered bat the closest of which was located 500m west of Cottam 3a.
- 4.1.9 Records of previously issued European Protected Species Licences for bats from within 30km of the Sites were obtained using the MAGIC website and are presented in Table 3 below.

Table 3: Records of previously issued European Protected Species Licences for bats from within 30km of the Sites

EPS Case reference	Licence Start Date	Species Covered	Distance from Site
EPSM2012-4798	27/09/2012	C-PIP;S-PIP;BLE;WHISK;BRAN	2.1km southwest
EPSM2011-3758	01/03/2013	C-PIP;S-PIP	5.9km north east
2015-16415-EPS-	13/10/2015	C-PIP	7.3km north
EPSM2012-5335	14/03/2013	C-PIP;S-PIP;BLE	8.8km south east
EPSM2013-6223	01/01/2014	C-PIP	9.2km north east
2014-88-EPS-MIT	22/04/2014	C-PIP	11.4km north west
2016-24844-EPS-	07/07/2017	C-PIP	11.9km west
2017-28963-EPS-	22/05/2017	C-PIP	11.9km west
EPSM2012-4810	01/10/2012	C-PIP;WHISK;BRAN	11.9km west
2018-37966-EPS-	05/11/2018	C-PIP	12.5km south
EPSM2011-3445	29/09/2011	C-PIP;BLE	13.1km south west
2015-7054-EPS-MIT	09/03/2015	C-PIP	14.3km north east
2018-36921-EPS-	19/10/2018	C-PIP	14.6km south
2018-38476-EPS-	10/01/2019	C-PIP	15.1km north west
2017-28699-EPS-	01/05/2017	BLE,C-PIP	15.9km west
EPSM2010-2663	01/02/2011	C-PIP	15.0km north
2015-16065-EPS-	30/11/2015	C-PIP	15.0km north
EPSM2009-842	09/04/2008	S-PIP	15.0km north east
2018-34513-EPS-	16/05/2018	BLE,C-PIP,S-PIP	16.3km west
EPSM2013-5740	29/04/2013	C-PIP;S-PIP;BLE;BARB	16.4km south
2020-48680-EPS-	28/08/2020	C-PIP	16.8km west
2020-50543-EPS-	04/02/2021	C-PIP	17.7km south
2016-22010-EPS-	29/03/2016	BLE,C-PIP,S-PIP	18.0km west
EPSM2009-1229	01/10/2009	S-PIP	18.2km north east
2015-16751-EPS-	03/12/2015	C-PIP,S-PIP	18.4km west
2020-49404-EPS-	12/10/2020	C-PIP,S-PIP,WHISK	18.5km west
2018-34000-EPS-	01/04/2018	S-PIP	18.7km south west
2017-28577-EPS-	21/03/2017	BLE,C-PIP	18.9km west
2016-27215-EPS-	10/01/2017	BLE,C-PIP,LEIS,NATT	19.2km east
2018-36767-EPS-	01/10/2018	BLE,C-PIP	19.3km west
EPSM2013-6485	28/10/2013	C-PIP;S-PIP;BLE;WHISK;BRAN;DAUB;NATT	19.4km west
2019-40540-EPS-	01/10/2019	BLE,C-PIP	19.5km east
EPSM2009-885	16/06/2009	C-PIP;S-PIP;BLE	19.5km south
2014-2724-EPS-MIT	18/09/2014	BLE,C-PIP	19.6km west
2015-15601-EPS-	18/11/2015	C-PIP	20.1km north
EPSM2010-2636	10/01/2011	BARB;BLE;NATT	20.8km south east
EPSM2012-3981	01/03/2012	C-PIP;BLE	20km south
2018-33960-EPS-	13/04/2018	S-PIP	21.6km south east
2020-48466-EPS-	24/09/2020	BLE,C-PIP	22.2km south



2017-31809-EPS-	30/10/2017	C-PIP	22.2km south
2016-27185-EPS-	10/02/2017	C-PIP	22.2km south
2018-34657-EPS-	18/05/2018	BLE,NATT	22.2km south
2020-44838-EPS-	03/02/2020	BLE	22.4km north west
2019-42799-EPS-	26/09/2019	C-PIP	22.6km south east
2020-49749-EPS-	23/11/2020	BLE,C-PIP,NATT	22.9km east
2020-50282-EPS-	24/11/2020	BLE	22.9km east
2018-36961-EPS-	09/10/2018	BLE,C-PIP,S-PIP	23.0km west
EPSM2011-2744	11/02/2011	C-PIP	23.3km north west
EPSM2011-2767	18/02/2011	C-PIP	23.6km north west
2020-44822-EPS-	01/04/2020	C-PIP	23.7km north west
2016-19951-EPS-	24/02/2016	C-PIP	23.7km west
2015-10822-EPS-	03/07/2015	BARB,C-PIP,NATT,S-PIP	24.1 km south
2018-33701-EPS-	19/03/2018	C-PIP,S-PIP	24.2km north
EPSM2013-6531	31/10/2013	C-PIP;S-PIP;BLE;WHISK	24.3km east
2015-19090-EPS-	15/02/2016	C-PIP	24.4km north west
2015-16457-EPS-	23/11/2015	BLE,C-PIP	24.5km south west
EPSM2010-2489	03/12/2010	C-PIP;S-PIP;NATT	25.1km north west
2014-3125-EPS-MIT	08/10/2014	BLE,C-PIP,S-PIP,WHISK	26.0km south west
2017-32519-EPS-	01/01/2018	C-PIP	26.1 km west
EPSM2011-3379	10/10/2011	C-PIP;DAUB	26.7km north west
2020-49073-EPS-	22/10/2020	BARB,BLE,C-PIP,DAUB,NATT	26.7km south east
EPSM2009-1351	09/12/2009	C-PIP	26.9km north west
2019-44183-EPS-	03/02/2020	DAUB	26.0km north west
EPSM2009-1407	24/11/2009	C-PIP;S-PIP;BLE;NATT	27.2km south west
2015-17779-EPS-	14/12/2015	BLE,C-PIP	27.4km north
2014-5803-EPS-MIT	21/01/2015	BLE,S-PIP	27.4km south west
2014-6111-EPS-MIT	21/01/2015	BLE,S-PIP	27.4km south west
2018-33537-EPS-	07/03/2018	BLE	27.6km north west
EPSM2011-2766	02/02/2011	C-PIP	28.0km north east
EPSM2012-4148	01/04/2012	C-PIP	28.2km south west
2017-27653-EPS-	17/02/2017	C-PIP	28.4km west
2018-33689-EPS-	01/04/2018	C-PIP	28.7km south east
2017-31700-EPS-	24/10/2017	C-PIP	28.9km west
EPSM2012-5333	21/12/2012	C-PIP;BLE;NATT	29.0km south
2019-40403-EPS-	26/04/2019	BLE,C-PIP	29.1 km south

4.2 Field Survey Results

Building Inspections for Roosting Bats

- 4.2.1 Surveys of buildings within the Zone of Influence of the project were carried out where access to granted, to assess their potential to support roosting bats, the results of which are presented in Table 4 and Figures 2 - 4 overleaf. A total of 10 buildings were inspected, all of which were located outside of but in close proximity to the Sites.
- 4.2.2 A small number of bat droppings, morphologically consistent with those of pipistrelle sp. were recorded within one building and was therefore confirmed as a bat roost, no evidence of bat presence was recorded within any other building that was surveyed.
- 4.2.3 Of the remaining buildings three were assessed as having high bat roost potential, five were assessed as having low bat roost potential and one was recorded as having negligible bat roost potential. It is likely that a low number of bat roosts are present within buildings that are in close proximity to the Sites.



Table 4: Results of the Building Inspections

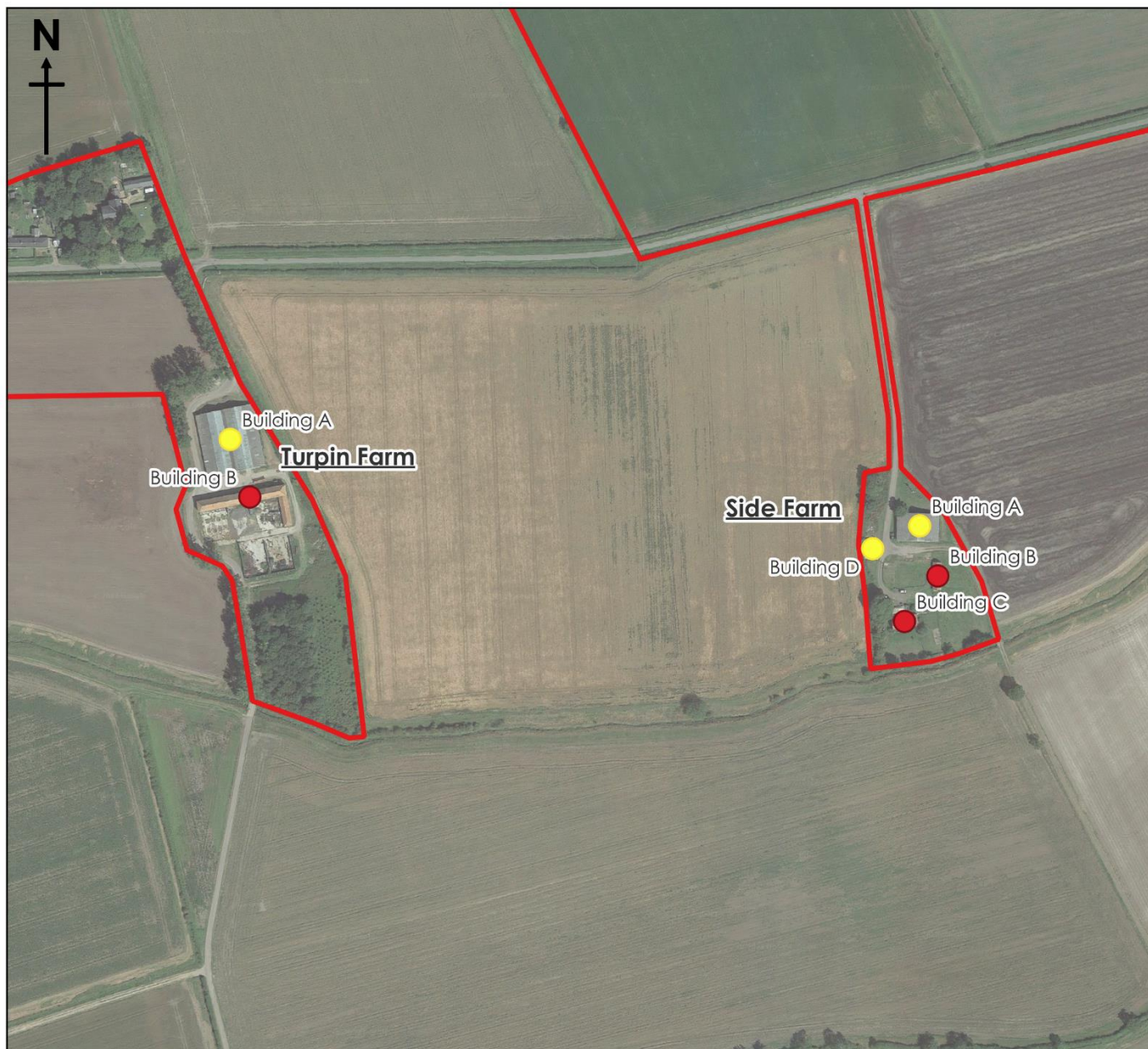
Site	Building and Grid Reference	Description and Survey Evidence	Bat Roost Potential
Cottam (South)	1 Grange Farm Building A SK 91469 81131	Modern silage storage barn in good condition. Walls constructed of brick with corrugated sheet metal pitched roof which was unlined and supported by wooden frame and metal trusses.	Low
Cottam (South)	1 Grange Farm Building B SK 91512 81132	A disused single storey barn constructed of brick and stone with several glass windows. The building contained a pitched roof constructed of corrugated cement fibreboard that was unlined and supported by a timber frame. The building was internally light due to the presence of windows. A small number <5 bat droppings morphologically consistent with pipistrelle sp were recorded within a hessian sack in the centre of the building.	Confirmed Roost
Cottam (South)	1 Grange Farm Building C SK 91506 81173	A single storey, disused farm building in poor condition. The walls were constructed of brick and contained one open window with no glass and one wooden door that was gappy at the edges. A pitched roof was constructed of corrugated metal and the building contained a small inaccessible roof void with a lathe and plaster ceiling. The building had high internal light levels.	Low
Cottam (South)	1 Blackthorn Hill Building A SK 92834 82389	An agricultural storage shed supported by timber beams with a corrugated metal pitched roof and no walls. Internally open to the elements; light and drafty.	Negligible
Cottam (South)	1 Blackthorn Hill Brick Wall SK 92839 82355	1.5m high brick wall topped with clay tiles.	Low
Cottam (South)	1 Cold Harbour Building A SK 92252 81962	A single storey, stone walled storage barn in good condition with an open window on the south side and a timber door that was not well sealed. The stonework had missing mortar in places provide multiple gaps for potential bat access. The building contained a pitched, pan-tiled roof that was lined with whitewashed roofing felt. Internally, the building contained a timber mezzanine floor.	High
Cottam (South)	1 Cold Harbour Building B SK 92259 81938	A single storey, disused farm building with stone walls on the north, east and west elevations and the southern wall had been re-built in brick. Four windows were present that were covered with wooden slats and a timber door was present on the northern elevation with gaps at the edges. The building contained a pitched, pan-tiled, timber framed roof.	High
Cottam (South)	1 Cold Harbour Building C SK 92210 81951	An agricultural storage shed with three elevations constructed of brick and one open sided elevation on the eastern side. The building contained a pitched, corrugated metal roof supported by a timber frame. Internally light and drafty.	Negligible
Cottam (North)	1 Turpin Farm Building A	An agricultural storage shed in good condition with corrugated metal walls. The building contained a triple pitch, corrugated fibreboard roof supported by a timber	Low



		SK 91214 85157	frame. The building contained five doors, not completely intact, all of which were left ajar.	
Cottam (North)	1	Turpin Farm Building B SK 91227 85119	Two storey agricultural storage barn formerly used for rearing birds which was constructed of stone and brick and in good condition. The building contained a pitched, clay pan tiled roof that was lined with bitumen felt repaired in some places with breathable membrane and supported with timber frames. Numerous windows with chicken wire and boarded up in places. Butterfly wings were recorded which were potential bat feeding remains.	High
Cottam (North)	1	Side Farm Building A SK 91669 85100	A modern agricultural storage shed with corrugated metal walls and concrete wall section on the eastern elevation. The building had a pitched, corrugated metal roof that was supported with timber beams. Three large doors were present that were not well sealed.	Low
Cottam (North)	1	Side Farm Building B SK 91681 85067	Not granted internal access. Stone, brick and block stable with a pitched, clay pan-tiled roof.	High
Cottam (North)	1	Side Farm Building C SK 91659 85037	Not granted internal access. Brick house with pitched, pan-tiled roof.	High
Cottam (North)	1	Side Farm Building D SK 91638 85085	Agricultural storage barn with concrete blockwork walls. The building had a pitched, corrugated metal roof which was unlined	Low
Cottam 3a		Tigerfert Warehouse Building A SK 86486 95206	Active large warehouse constructed with a breeze block low wall and metal sheet upper walls and roofs. Internally light with no insulation.	Negligible
Cottam 3a		Tigerfert Warehouse Building B SK 86513 95326	Two adjoining large warehouses constructed with a concrete low walls and metal sheet upper walls and roofs. Internally light with no insulation.	Negligible
Cottam 3a		Wefco Warehouse Building A SK 86176 95854	Active warehouse constructed with a breeze block low wall and metal sheet upper walls and roofs. Internally light with no insulation. Breeze block office attached with false ceiling.	Negligible
Cottam 3a		Unknown Owner Building A SK 86125 95841	Active warehouse constructed with a breeze block low wall and metal sheet upper walls and roofs. No access given for internal inspection.	Negligible
Cottam 3a		Racetrack Warehouse Building A SK 87213 96469	Large warehouse constructed of metal supports and metal sheet walls and roofs. Ancillary cabins used as offices and café.	Negligible



Cottam 3a	Farm Buildings adjacent to Racetrack Building A SK 87221 96318	Farm storage building housing hay, machinery and fertiliser. Breeze block walls with corrugated tin roof. Extension to the west with corrugated cement fibre roof.	Low
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Key:

Building inspection bat roost potential

● High potential

● Low potential

□ Scheme boundary

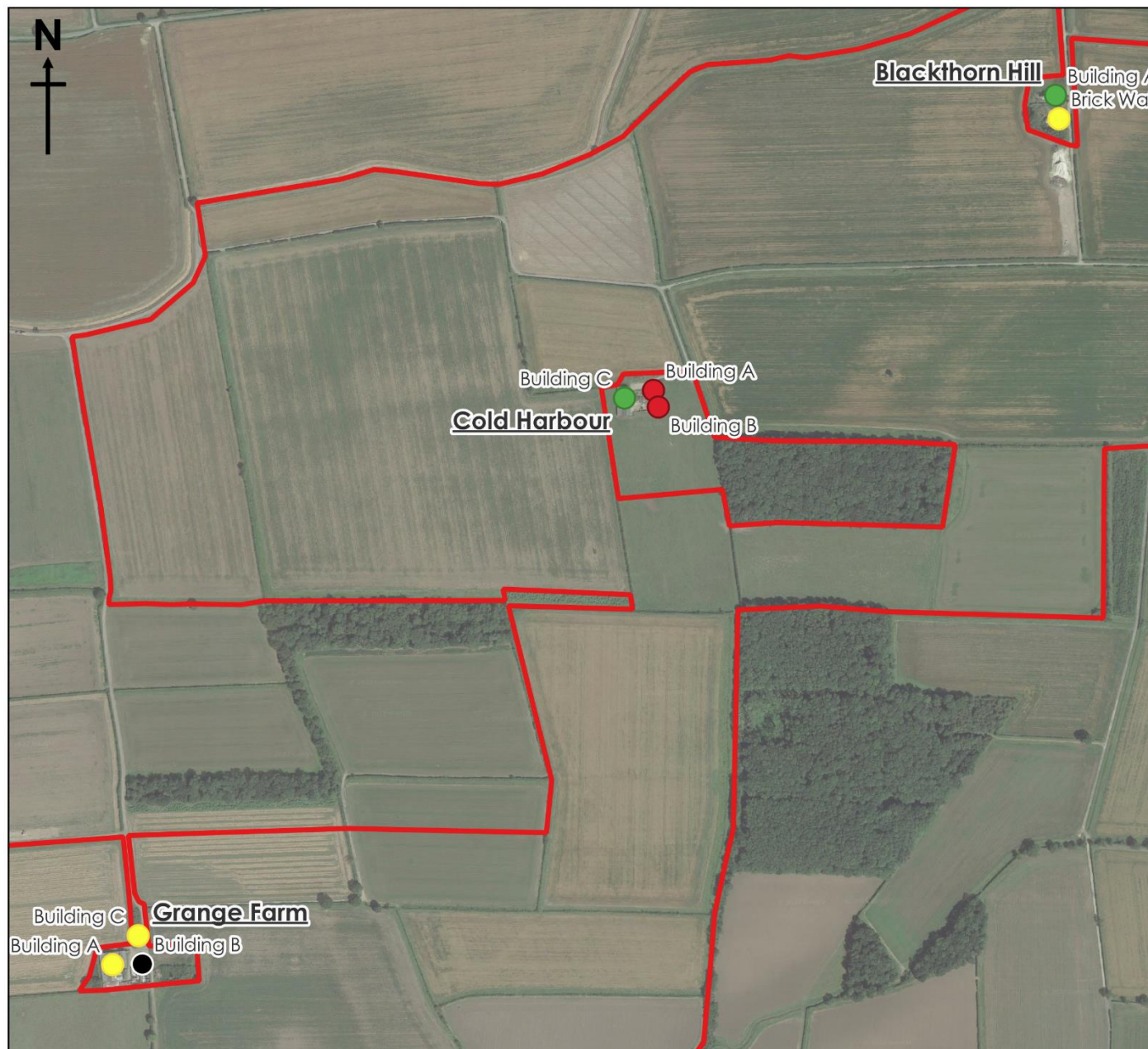


Project
Cottam Solar Project

Title
Results of building inspections at Cottam 1 North

Figure number Date
2 **06/10/2022**

Scale 0 0.07 0.14 km



Key:

Building inspection bat roost potential

- Confirmed Roost
- High potential
- Low potential
- Negligible
- Scheme boundary

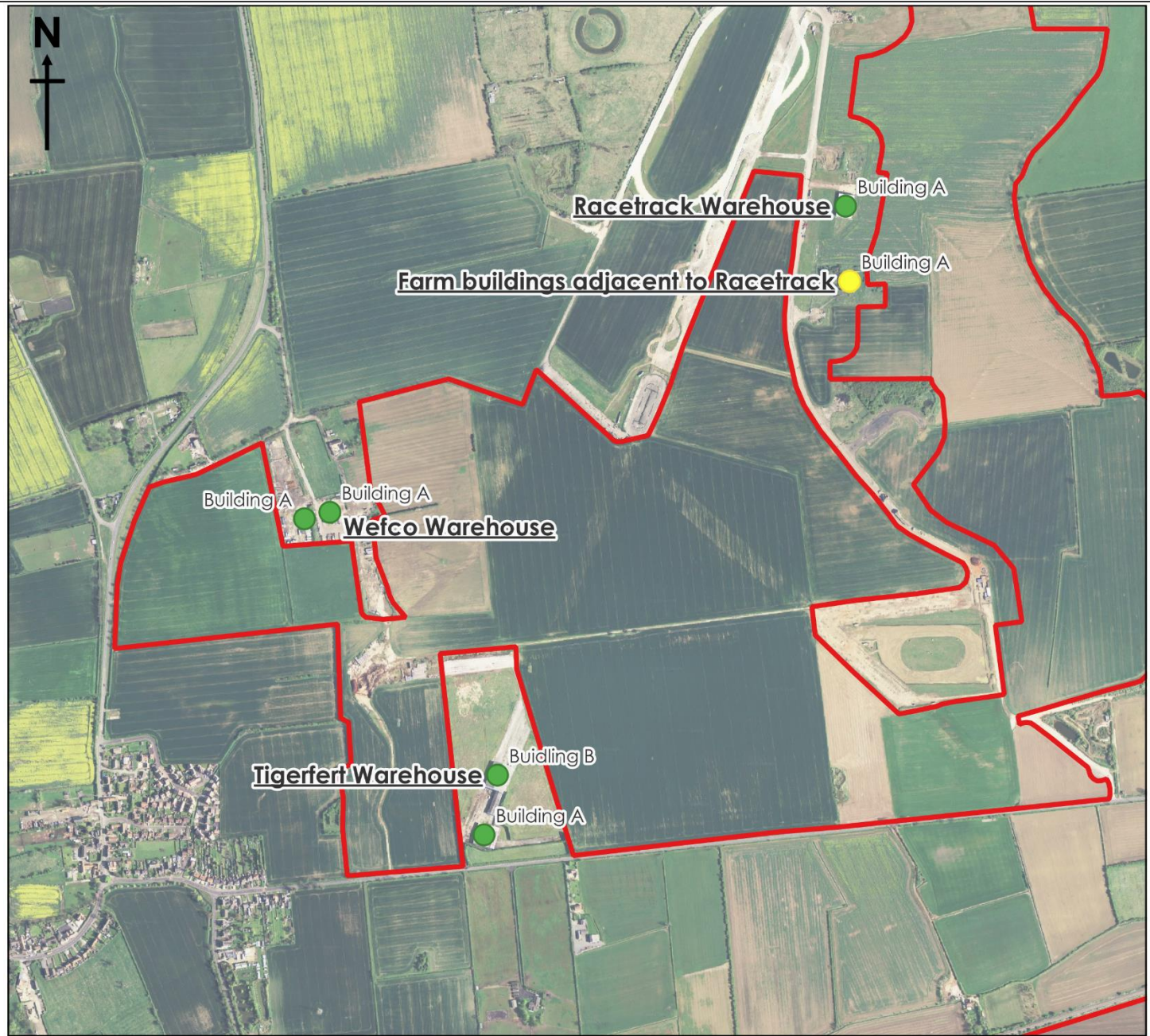


Project
Cottam Solar Project

Title
Results of building inspections at Cottam 1 South

Figure number Date
3 **06/10/2022**

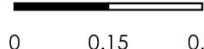
Scale 0 0.15 0.3 km



Key:
Building inspection bat roost potential

- Low potential
- Negligible
- Scheme boundary



Project Cottam Solar Project	
Title Results of building inspections at Cottam 3a	
Figure number 4	Date 06/10/2022
Scale 	

Tree Assessments for Roosting Bats

- 4.2.4 Surveys of all trees within the Survey Area were carried out to assess their potential to support roosting bats and were categorised as having high, moderate, low or negligible bat roost potential. The results of the surveys are presented within Figures 5 - 10.
- 4.2.5 This information was then used to assist in determining the most appropriate size of development-free buffer to impose from the site-ward edge of the field boundary feature, in conjunction with other factors such as botanical species richness and presence of other protected species. The highest bat roost potential class ascribed to any tree within a particular field boundary was used for this purpose. In the absence of other protected species or conservation criteria, where a low potential tree was present a minimum 8m buffer was recommended, with buffers of 10m for moderate and 12m for high also. In addition, all in-field trees were surveyed, recorded and mapped.
- 4.2.6 A total of 50 high bat roost potential trees, 67 moderate bat roost potential trees, 74 low bat roost potential and 118 negligible bat roost potential trees were recorded within the Sites. It is considered reasonably probable that a number of bat roosts are present within trees that are located within the Sites from a range of different species.



Figure 5: Bat Roost Potential of Trees at Cottam 1 (North) (Red: High Potential, Orange: Moderate Potential, Yellow: Low Potential, Green: Negligible Potential)

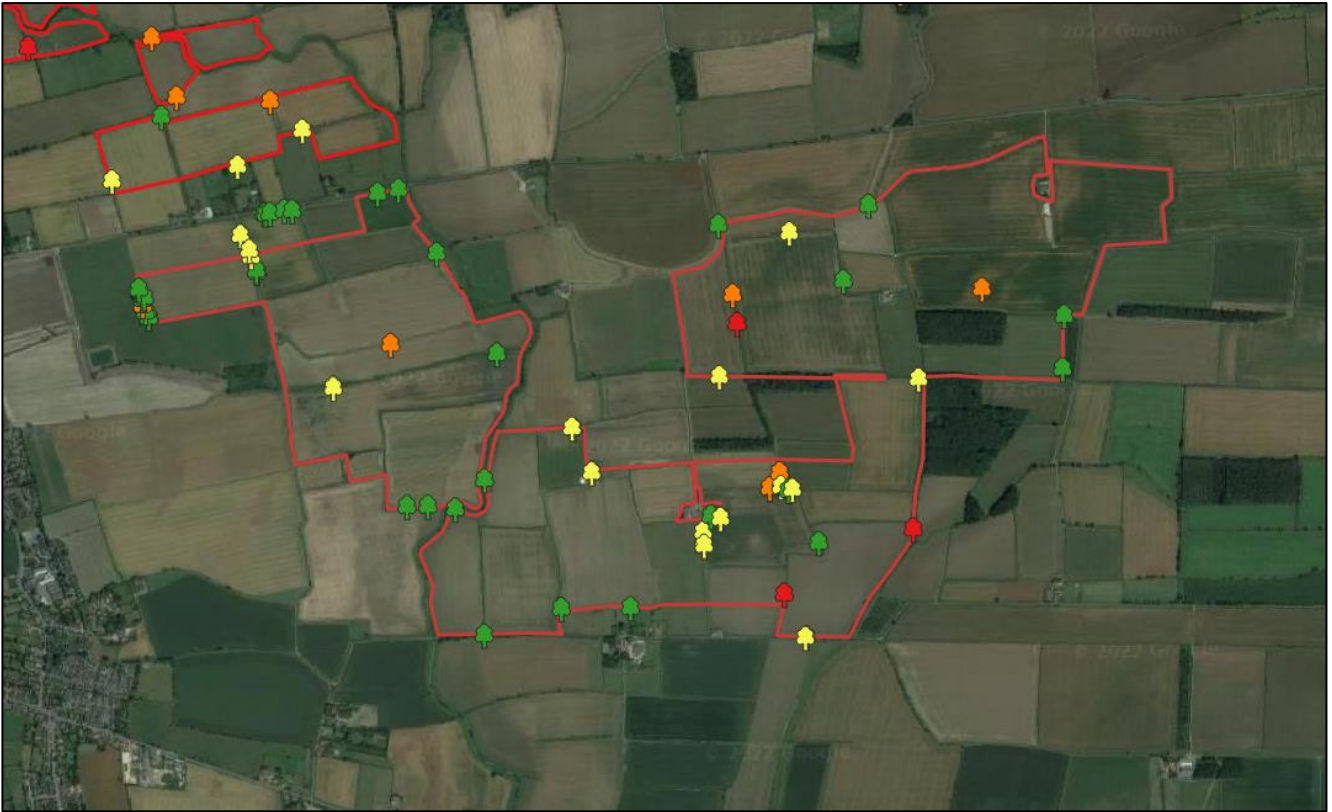


Figure 6: Bat Roost Potential of Trees at Cottam 1 (South) (Red: High Potential, Orange: Moderate Potential, Yellow: Low Potential, Green: Negligible Potential)



Figure 7: Bat Roost Potential of Trees at Cottam 1 (West) (Red: High Potential, Orange: Moderate Potential, Yellow: Low Potential, Green: Negligible Potential)



Figure 8: Bat Roost Potential of Trees at Cottam 2 (Red: High Potential, Orange: Moderate Potential, Yellow: Low Potential, Green: Negligible Potential)

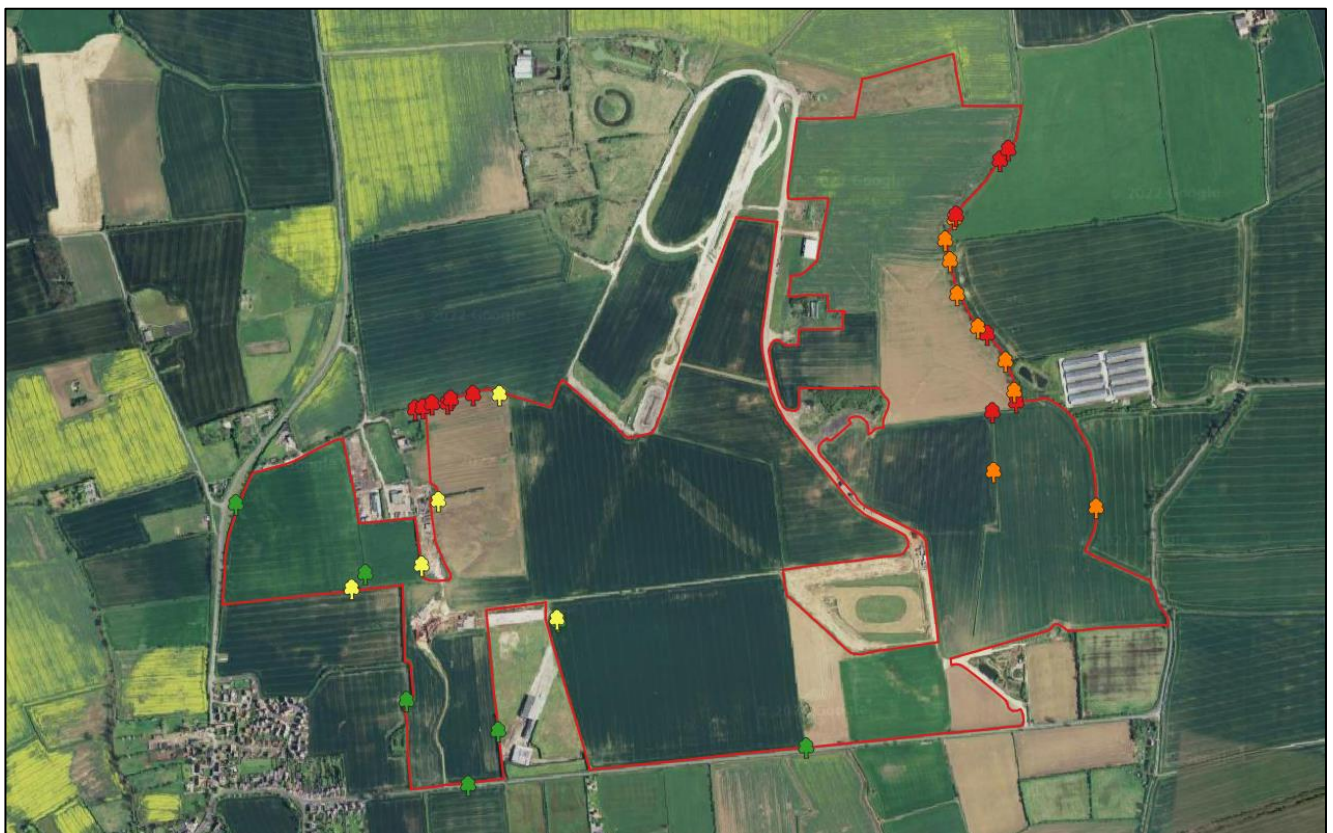


Figure 9: Bat Roost Potential of Trees at Cottam 3a (Red: High Potential, Orange: Moderate Potential, Yellow: Low Potential, Green: Negligible Potential)



Figure 10: Bat Roost Potential of Trees at Cottam 3b (Red: High Potential, Orange: Moderate Potential, Yellow: Low Potential, Green: Negligible Potential)

Static Detector Surveys

4.2.7 Table 6 below provides a summary of the number of passes, average number of passes per night and percentage of activity for each species at each of the Sites. A summary of the passes per night for each species at each deployment location is presented in Table 7. A visual representation of the data is presented Figures 11 – 16 which show the percentage of passes by species and overall passes per night at each deployment location. A full set of results of the static detector survey are provided in Appendix D.

Species Richness

4.2.8 Overall, at least 8 species of bat were recorded during the static detector surveys comprising the following species:

- Barbastelle
- *Myotis* sp (an aggregation of *Myotis* species is likely to include one or more of Natterer's bat *Myotis nattereri*, Daubenton's bat *Myotis daubentonii*, Brandt's bat *Myotis brandtii* and whiskered bat *Myotis mystacinus*)
- Noctule
- Leisler's
- Nathusius' pipistrelle
- Common pipistrelle
- Soprano pipistrelle
- Brown long-eared

4.2.9 *Myotis* Sp are likely to constitute more than one species but these species are grouped due to the similar nature of their calls making classification subject to a high degree of error. As the rare *Myotis* bats, Bechsteins and Alcaethoe are not considered present in Lincolnshire, the potential for these species has been discounted.



4.2.10 Table 5 shows the rarity of the species recorded during the static detector surveys, or possibly recorded in the case of *Myotis* species, using the definition of relative rarity of bat species within England produced by Wray et al⁹ and the current estimated UK population size based on information provided by the Bat Conservation Trust. Species with populations estimated to be under 10,000 were categorised as 'rarest', populations between 10,000 and 100,000 'rarer' and populations over 100,000 'common'.

Table 5: Rarity of the species recorded during the static detector surveys

Species	Rarity within England ¹⁰	UK status (current estimated UK population size) ¹¹
Barbastelle	Rarest	Very rare, found in southern and central England and Wales. UK estimated population 5,000.
Nathusius' pipistrelle	Rarer	Rare but widespread, migratory. No population estimate for UK.
Leisler's bat	Rarer	Uncommon but widespread in UK, more common in Ireland. Estimated England population 9,500 (28,000 in UK).
Brant's bat	Rarer	-uncommon but widespread in England. UK population of 30,000
Noctule	Rarer	Fairly common and widespread (50,000). UK BAP Priority Species
Whiskered bat	Rarer	- uncommon but widespread in England, UK population of 64,000
Natterer's bat	Rarer	- locally common and widespread throughout Britain with a UK estimated population of 148,000 (70,000 in England)
Daubenton's bat	Rarer	Relatively common and widespread throughout Britain with a UK estimated population of 560,000 (95,000 in England)
Brown long-eared	Common	Common and widespread (245,000). UK BAP Priority Species
Soprano pipistrelle	Common	Common and widespread (1,300,000). UK BAP Priority Species
Common pipistrelle	Common	Common and widespread (2,430,000)

4.2.11 The Sites are located at the northern edge of the range for barbastelle, which are listed as uncommon in Lincolnshire according to the Lincolnshire BAP. This species is considered to be most closely linked with woodland edge habitats and tree roosts although they will occasionally roost in buildings. A significant colony of barbastelle bats is known in Norfolk and it is considered possible that members of this population would periodically disperse and migrate at least as far as into neighbouring counties.

4.2.12 The level of species richness was considered to be relatively high for a Site within Lincolnshire as 8+ species were recorded out of the 11 known resident species in Lincolnshire. The 11 known resident species are listed in Table 5 above. The species that have been recorded within Lincolnshire but were not identified during the

⁹ Wray, S., Wells, D., Long, E. and Mitchell-Jones, T. (2010). Valuing Bats in Ecological Impact Assessment. In Practice, December 2010. Chartered Institute of Ecology and Environmental Management.

¹⁰ Wray, S., Wells, D., Long, E. and Mitchell-Jones, T. (2010). Valuing Bats in Ecological Impact Assessment. In Practice, December 2010. Chartered Institute of Ecology and Environmental Management.

¹¹ Based on information provided by the Bat Conservation Trust <http://www.bats.org.uk/>



static detector survey are the four individual *Myotis* species which have not been identified to species level during this assessment but may all be present within the Sites.

- 4.2.13 The species richness was even across all of the Sites with 8+ species being recorded at each Site, except for Cottam 3b which recorded 7+ species with barbastelle not being recorded at this Site.

Bat Activity Analysis

- 4.2.14 A total of 205,816 bat passes were recorded over 1,730 recording nights at 22 deployment locations. This equates to an average of 119 bat passes per recording night, per detector. This is considered to represent a moderate level of bat activity in comparison to other sites Clarkson and Woods have undertaken bat surveys at throughout England.

- 4.2.15 When taken individually the Sites had the following level of bat activity and are ordered highest to lowest in terms of recorded bat activity:

- Cottam 3b – an average of 189 bat passes per night, which was considered to be a moderate level of activity
- Cottam 1 (West) – an average of 171 bat passes per night, which was considered to be a moderate level of activity.
- Cottam 3a - an average of 125 passes per night, which was considered to be a moderate level of activity.
- Cottam 1 (South) – an average of 115 passes per night, which was considered to be a moderate level of activity.
- Cottam 1 (North) – an average of 104.12 passes per night, which was considered to be a moderate level of activity.
- Cottam 2 - an average of 54.59 passes per night, which was considered to be a low level of bat activity.

- 4.2.16 Cottam 3b had the highest average passes per night for three species including noctule, Nathusius pipistrelle and soprano pipistrelle. Cottam 1 South (barbastelle) and Cottam 1 North (Leisler's bat and brown long-eared bat) both had the highest average passes per night for two species. Cottam 1 West (common pipistrelle) and Cottam 3a (*Myotis* sp) both had the highest number of passes for one species and Cottam 2 did not have the highest number of passes for any species.

- 4.2.17 The deployment locations CNB2A (Cottam 1 North) and CSB2A (Cottam 1 South) recorded the highest levels of activity with an average of 379.95 and 339.50 passes per night respectively. CWB1A (Cottam 1 West), BLY2B (Cottam 3a) and BLY1A (Cottam 3b) also recorded high levels of activity with an average of more than 200 passes per night.

- 4.2.18 Temporally, the average number of bat passes per night increased steadily each month throughout the survey period with a peak occurring in September; April (78), May (91), June (117), July (124), August (173), September (260). The higher level of activity later in the survey season may be explained by an increased number of juveniles being weaned later in the active period.

- 4.2.19 Relative activity rates by each species are given in the paragraphs below in order of highest activity to lowest.

Common Pipistrelle

- 4.2.20 A high level of activity was recorded from common pipistrelle, which was unsurprisingly by far the most recorded species overall, and the most recorded species at every individual deployment location, accounting for 78% of all passes with an average of 92 passes per night across the deployment locations. Passes per night for common pipistrelle ranged from 46 (Cottam 2) to 162 (Cottam 1, West). The deployment location CNB2A at Cottam 1 North recorded the highest level of common pipistrelle activity, with an average of 325 passes per night, which is located along a strip of broadleaved woodland that contained a wide uncultivated field margin adjacent to an arable field. A very high level of activity was also recorded at CSB2A



(274 passes per night) which was located within a mature, species-poor hedgerow adjacent to an improved pasture grassland field.

Soprano Pipistrelle

- 4.2.21 Soprano pipistrelle was the next highest recorded species, accounting for 15% of all passes and had an average of 18 passes per night across the deployment locations, which was considered to be a moderate level of activity. The average number of passes per night for this species ranged from 3.7 (Cottam 2 and 3) to 50 (Cottam 3b). The deployment location BLY1A (Cottam 3b) recorded the highest level of soprano pipistrelle activity with an average of 93 passes per night which was located along a mature treeline adjacent to an arable field. CNB1B at Cottam 1 North also recorded a high level of soprano pipistrelle activity with an average of 55 passes per night which was located adjacent to a small area of plantation woodland.

Noctule

- 4.2.22 Noctule were recorded at low levels overall (3.5 passes per night) and at each Site, with the exception of Cottam 3b where a moderate level of activity was recorded. Passes per night for this species ranged from 1.1 (Cottam 1 West) to 12.62 (Cottam 3b). The deployment location BLY2A at Cottam 3b recorded the highest level of noctule activity, with an average of 18.16 passes per night, which was located within an uncut hedgerow adjacent to an arable field.

Myotis Bats

- 4.2.23 Low levels of *Myotis* activity were recorded overall (3 passes per night) and at each Site, with the exception of Cottam 2 where very low level of activity (0.3 passes per night) were recorded. Cottam 3a recorded the highest levels of *Myotis* activity with an average of 7.3 passes per night. The deployment location BLY2B had the highest level of activity from *Myotis* sp with an average of 12 passes per night which was located to a mature, species-poor hedgerow with trees.

Brown Long-Eared

- 4.2.24 Low levels of brown long-eared bat were recorded overall (1 pass per night) and were recorded relatively evenly throughout the Sites, with average passes per night ranging from 0.46 (Cottam 3a) to 1.42 (Cottam 1 North). The deployment location with the highest level of brown long eared activity was CNB1A with an average of 3.51 passes per night. This location was within a wide uncultivated field margin, adjacent to a wet ditch, beyond which was a small area of mixed woodland.

Leisler's

- 4.2.25 Leisler's bat was recorded at very low levels overall (0.24 passes per night) and at each Site ranging from 0.01 (Cottam 3a) to 0.41 passes per night (Cottam 1 North). The deployment location CNB2A recorded significantly higher levels of activity from Leisler's bat than all other locations, where an average of 3.23 passes per night were recorded, which was located adjacent to a strip of broadleaved woodland.

Nathusius' Pipistrelle

- 4.2.26 *Nathusius'* pipistrelle was recorded at very low levels overall (0.28 passes per night) and at each Site with passes per night ranging from 0.01 (Cottam 2) to 1.30 (Cottam 3b). *Nathusius'* pipistrelle was recorded at significantly higher levels during deployments at CSB2A (Cottam 1 South) in September when 25.29 passes per night were recorded and at BLY1A in June when 7.44 passes per night were recorded. *Nathusius'* pipistrelle bats are known to migrate long distances and in the UK it appears that a small summer breeding population is supplemented by migratory individuals during the autumn and winter for hibernation. Breeding strongholds occur in the east and south east of England. The peak of activity at Cottam 3b towards the start of the survey season and Cottam 1 South at the end of the survey period suggests that these areas may constitute a migration commuting route for a larger number of *Nathusius'* pipistrelle with very low levels of activity occurring during the main breeding period.



Barbastelle

4.2.27 Barbastelle were recorded at very low levels overall (0.07 passes per night) and at each Site with the exception of Cottam 3b, where barbastelle was not recorded. At the Sites where barbastelle were recorded, passes per night ranged from 0.01 (Cottam 2 and 3) to 0.19 (Cottam 1 South). Significantly higher levels of barbastelle were recorded at deployment location CSB1C with an average of 1.02 passes per night, although the vast majority of passes at this location occurred during the April 2022 deployment during which 86 passes were recorded between 13th and 20th April and only a maximum of 2 passes occurred during all other deployments. This deployment location is located adjacent to a block of broadleaved woodland which and the higher levels of activity in the early part of the active season may suggest that a hibernation or transitional roost may be nearby.

Table 6: Summary of the Static Bat Detector Survey at Cottam 1 – 3b
(Highlighted Orange = Site with highest passes per night for each species)

Site	Total no. bat species / passes recorded	Species	No. passes	Average no. of passes per night	% of activity
Cottam 1 North	8 species (at least) 64033 passes 615 nights 104.12 (av. passes per night)	Barbastelle	19	0.03	0.03
		<i>Myotis sp</i>	2188	3.56	3.42
		<i>Nyctalus sp</i>	222	0.36	0.35
		Noctule	1891	3.07	2.95
		Leisler's	252	0.41	0.39
		Nathusius' pipistrelle	41	0.07	0.06
		Common pipistrelle	45302	73.66	70.75
		Soprano pipistrelle	13208	21.48	20.63
Cottam 1 South	8 species (at least) 56006 passes 486 nights 115.24 (av. passes per night)	Barbastelle	94	0.19	0.17
		<i>Myotis sp</i>	1297	2.67	2.32
		<i>Nyctalus sp</i>	386	0.79	0.69
		Noctule	1180	2.43	2.11
		Leisler's	82	0.17	0.15
		Nathusius pipistrelle	208	0.43	0.37
		Common pipistrelle	44716	92.01	79.84
		Soprano pipistrelle	7729	15.90	13.80
Cottam 1 West	8 species (at least) 27737 passes 162 Nights 171.22 (av. passes per night)	Barbastelle	5	0.03	0.02
		<i>Myotis sp</i>	341	2.10	1.23
		<i>Nyctalus sp</i>	20	0.12	0.07
		Noctule	184	1.14	0.66
		Leisler's	9	0.06	0.03
		Nathusius pipistrelle	11	0.07	0.04
		Common pipistrelle	26219	161.85	94.53
		Soprano pipistrelle	732	4.52	2.64
Cottam 2	8 species (at least) 8407 passes 154 Nights 54.59 (av. passes per night)	Barbastelle	1	0.01	0.01
		<i>Myotis sp</i>	38	0.25	0.45
		<i>Nyctalus sp</i>	12	0.08	0.14
		Noctule	493	3.20	5.86
		Leisler's	13	0.08	0.15
		Nathusius pipistrelle	1	0.01	0.01
		Common pipistrelle	7134	46.32	84.86
		Soprano pipistrelle	572	3.71	6.80
Cottam 3a	8 species (at least) 18988 passes 151 Nights 125.75 (av. passes per night)	Barbastelle	1	0.01	0.01
		<i>Myotis sp</i>	1098	7.27	5.78
		<i>Nyctalus sp</i>	19	0.13	0.10
		Noctule	314	2.08	1.65
		Leisler's	2	0.01	0.01
		Nathusius pipistrelle	4	0.03	0.02
		Common pipistrelle	16918	112.04	89.10
Soprano pipistrelle	560	3.71	2.95		



Site	Total no. bat species / passes recorded	Species	No. passes	Average no. of passes per night	% of activity
		Brown long-eared	70	0.46	0.37
Cottam 3b	8 species (at least) 30645 passes 162 Nights 189.17 (av. passes per night)	Barbastelle	0	0.00	0.00
		Myotis sp	315	1.94	1.03
		Nyctalus sp	103	0.64	0.34
		Noctule	2044	12.62	6.67
		Leisler's	52	0.32	0.17
		Nathusius pipistrelle	211	1.30	0.69
		Common pipistrelle	19621	121.12	64.03
		Soprano pipistrelle	8136	50.22	26.55
		Brown long-eared	138	0.85	0.45



Table 7: Summary of the passes per night for each species at each deployment location

Site	Location	Survey Nights	Species (at least)	Passes per night									Passes	Av. Passes per night
				Barbastelle	Myotis Sp	Nyctalus Sp	Noctule	Leislars	Nathusius Pipistrelle	Common pipistrelle	Soprano pipistrelle	Brown Long-eared		
Cottam 1 North	CNB1A	88	8	0.02	2.60	0.31	2.09	0.01	0.30	33.55	6.93	3.51	4342	49.34
	CNB2A	73	7	0.00	2.14	1.52	8.42	3.23	0.01	325.25	38.22	1.00	27736	379.95
	CNB1B	88	7	0.02	5.10	0.10	1.02	0.00	0.02	71.34	54.74	2.28	11851	134.67
	CNB2B	73	5	0.00	2.68	0.19	1.33	0.00	0.00	67.48	20.82	0.30	6776	92.82
	CNB1C	88	6	0.14	10.42	0.22	1.98	0.03	0.08	13.11	11.52	0.53	3350	38.07
	CNB2C	65	6	0.00	2.05	0.20	2.29	0.11	0.00	11.52	7.52	0.26	1560	24.00
	CNB1D	67	8	0.01	1.10	0.12	2.54	0.06	0.06	42.78	21.40	2.19	4716	70.39
	CNB2D	73	8	0.03	0.47	0.29	5.64	0.01	0.01	36.08	7.32	0.82	3702	50.71
Cottam 1 South	CSB1A	88	7	0.00	0.47	0.03	0.56	0.01	0.01	51.73	2.44	0.16	4880	55.45
	CSB2A	74	8	0.03	4.51	0.70	3.77	0.22	2.77	274.76	51.78	0.89	25123	339.50
	CSB1B	88	6	0.01	1.95	0.01	0.74	0.00	0.00	23.34	2.20	0.26	2515	28.58
	CSB2B	74	7	0.01	6.53	0.12	1.35	0.05	0.00	121.19	8.84	1.12	10303	139.23
	CSB1C	88	8	1.02	2.90	3.52	6.84	0.66	0.01	76.28	28.28	0.72	10611	120.58
	CSB2C	74	7	0.00	0.16	0.15	1.15	0.04	0.01	28.34	4.66	0.26	2574	34.78
Cottam 1 West	CWB1A	89	7	0.01	0.93	0.11	0.51	0.00	0.07	204.28	5.36	1.04	18896	212.31
	CWB2A	73	8	0.05	3.53	0.14	1.90	0.12	0.07	110.11	3.49	1.62	8841	121.11
Cottam 2	COR1A	76	7	0.00	0.08	0.09	4.86	0.04	0.01	39.16	1.61	0.21	3500	46.05
	COR2A	78	7	0.01	0.41	0.06	1.59	0.13	0.00	53.31	5.77	1.60	4907	62.91
Cottam 3a	BLY1B	83	6	0.00	3.31	0.08	2.22	0.01	0.00	51.42	1.59	0.46	4906	59.11
	BLY2B	68	8	0.01	12.10	0.18	1.91	0.01	0.06	186.03	6.29	0.47	14082	207.09
Cottam 3b	BLY1A	85	7	0.00	2.31	0.94	7.60	0.53	2.44	174.52	93.46	1.27	24070	283.18
	BLY2A	77	7	0.00	1.55	0.30	18.16	0.09	0.05	62.17	2.49	0.39	6575	85.39

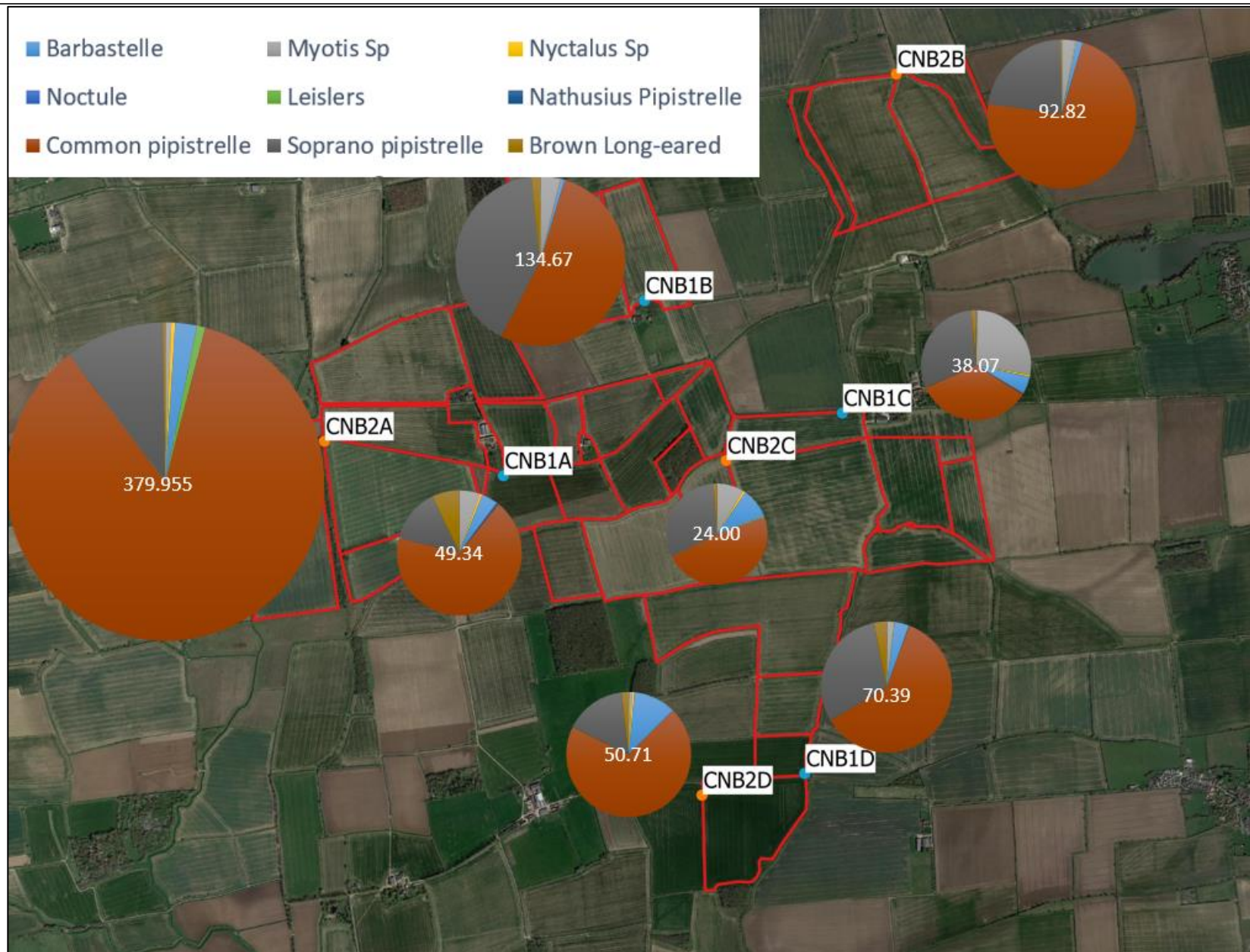


Figure 11: Charts showing Cottam 1 (North) percentage passes by species at each deployment location (with overall passes per night in brackets)

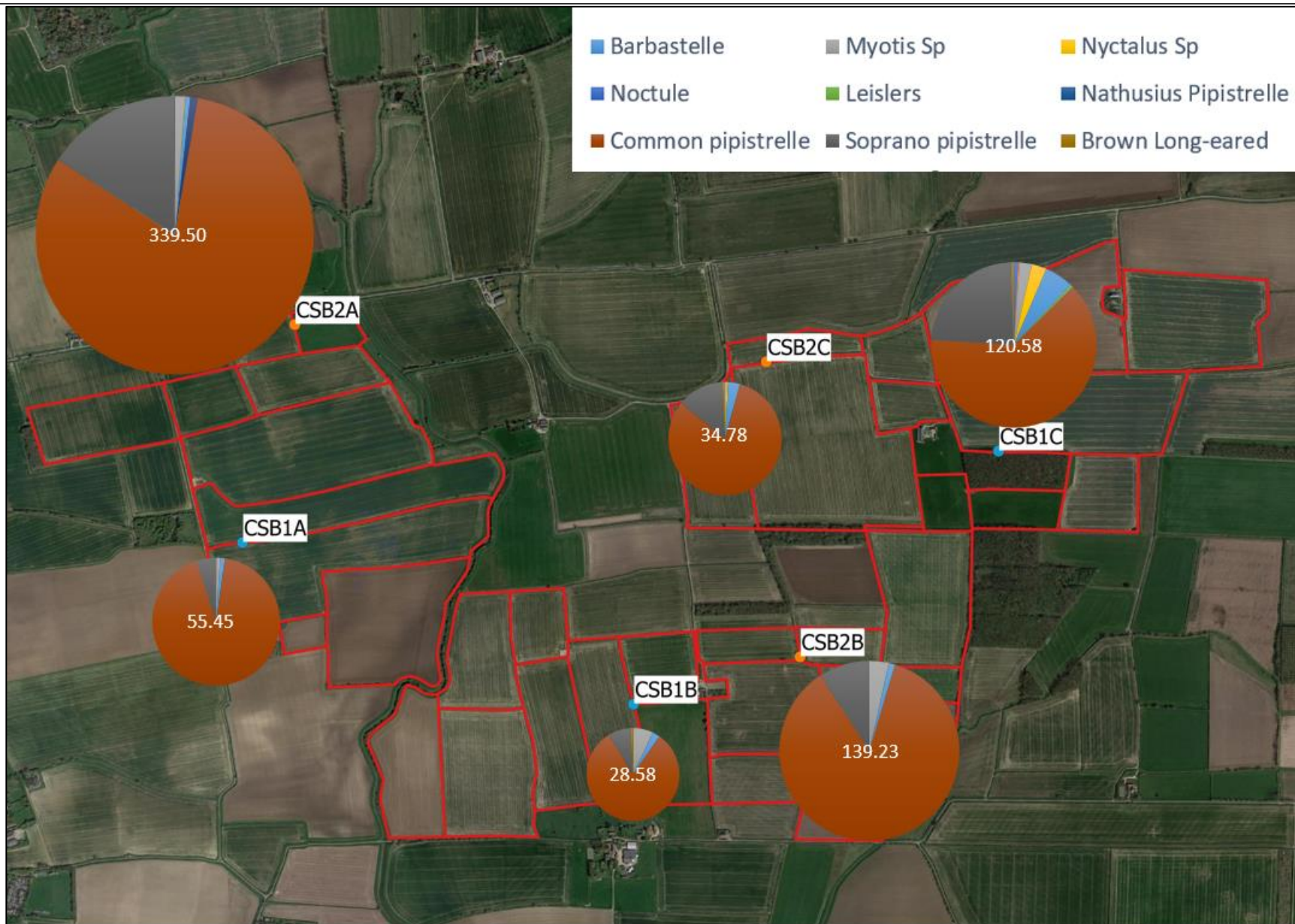


Figure 12: Charts showing Cottam 1 (South) percentage passes by species at each deployment location (with overall passes per night in brackets)

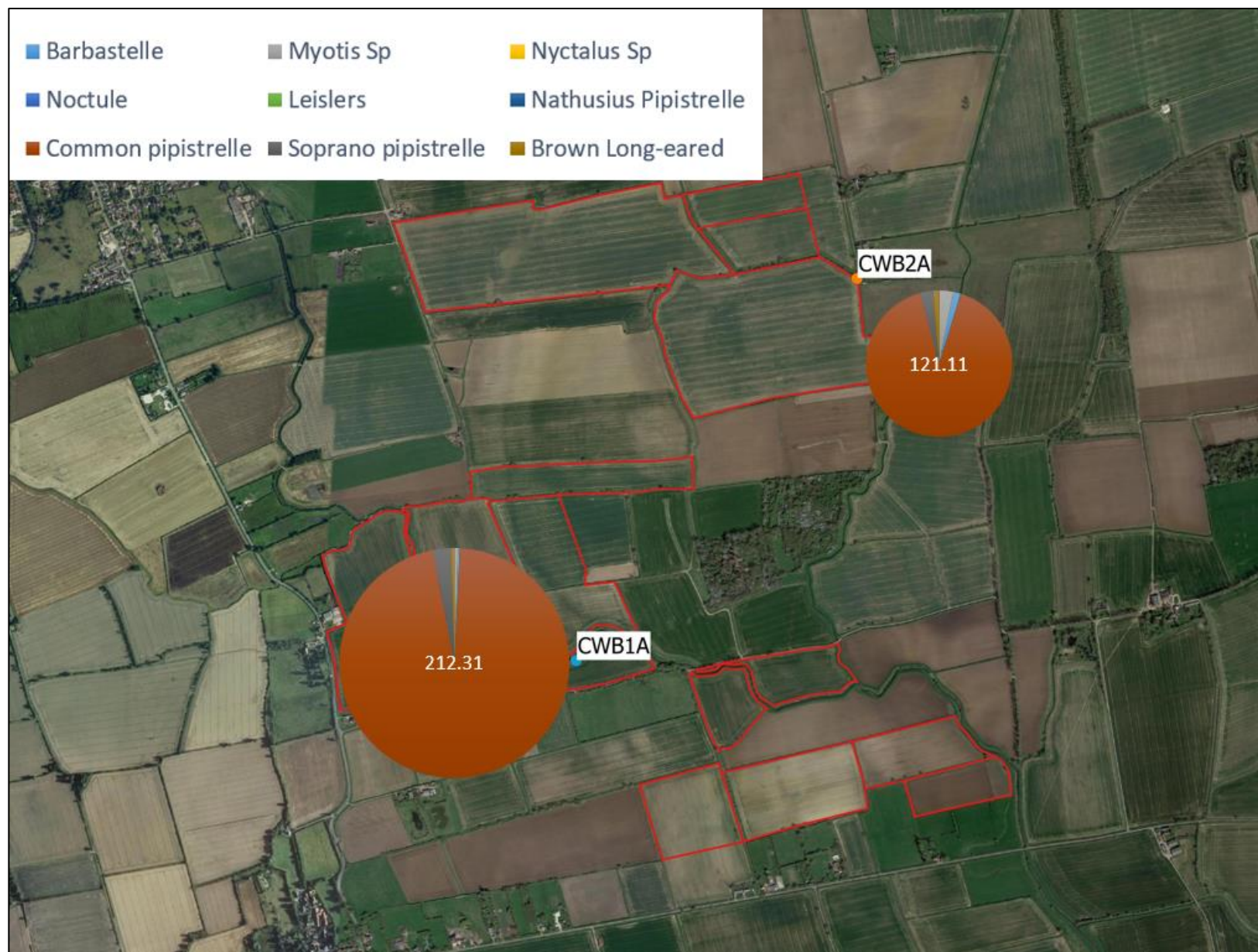


Figure 13: Charts showing Cottam 1 (West) percentage passes by species at each deployment location (with overall passes per night in brackets)



Figure 14: Charts showing Cottam 2 percentage passes by species at each deployment location (with overall passes per night in brackets)

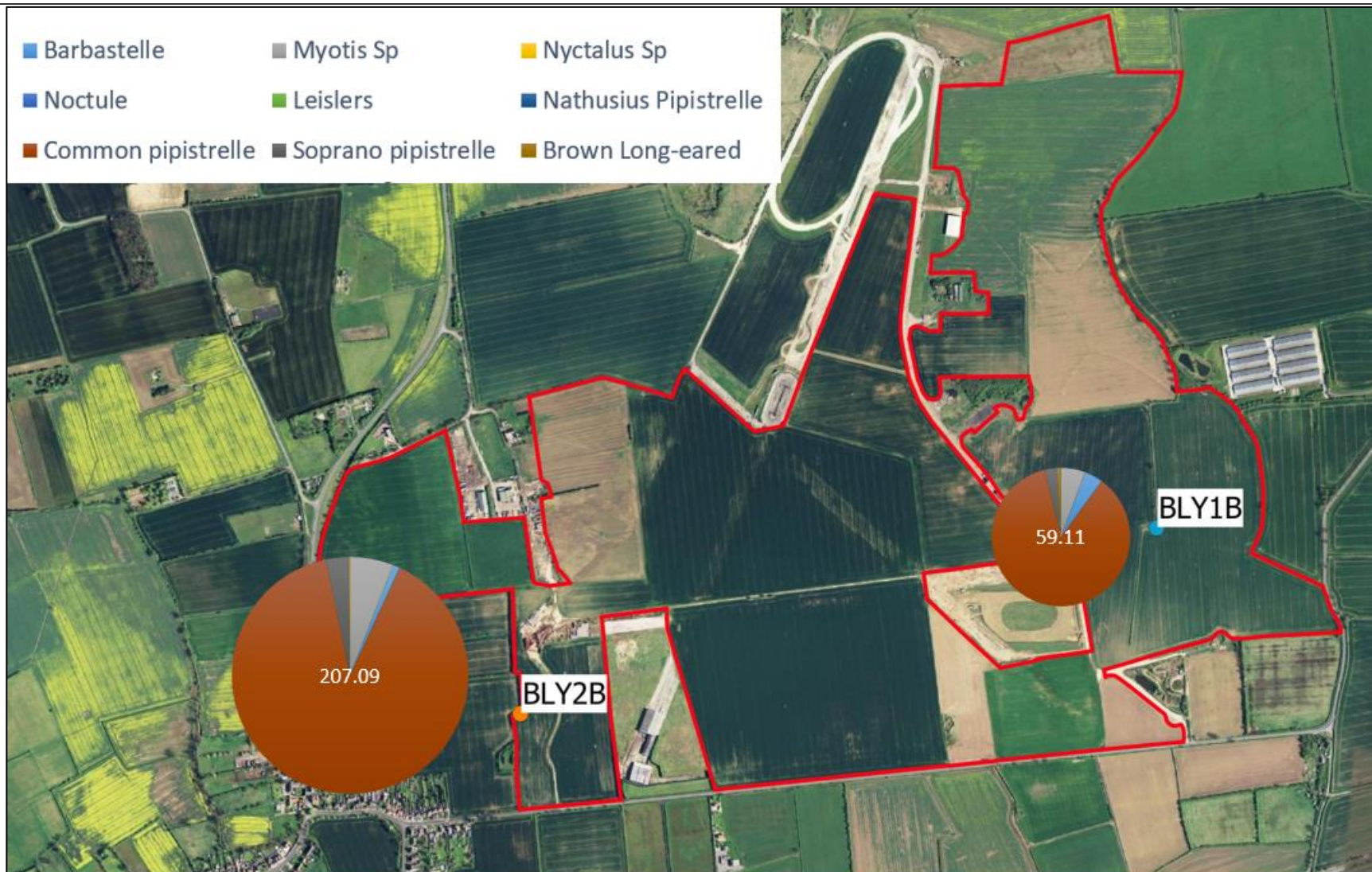


Figure 15: Charts showing Cottam 3a percentage passes by species at each deployment location (with overall passes per night in brackets)



- Barbastelle
- Myotis Sp
- Nyctalus Sp
- Noctule
- Leislars
- Nathusius Pipistrelle
- Common pipistrelle
- Soprano pipistrelle
- Brown Long-eared

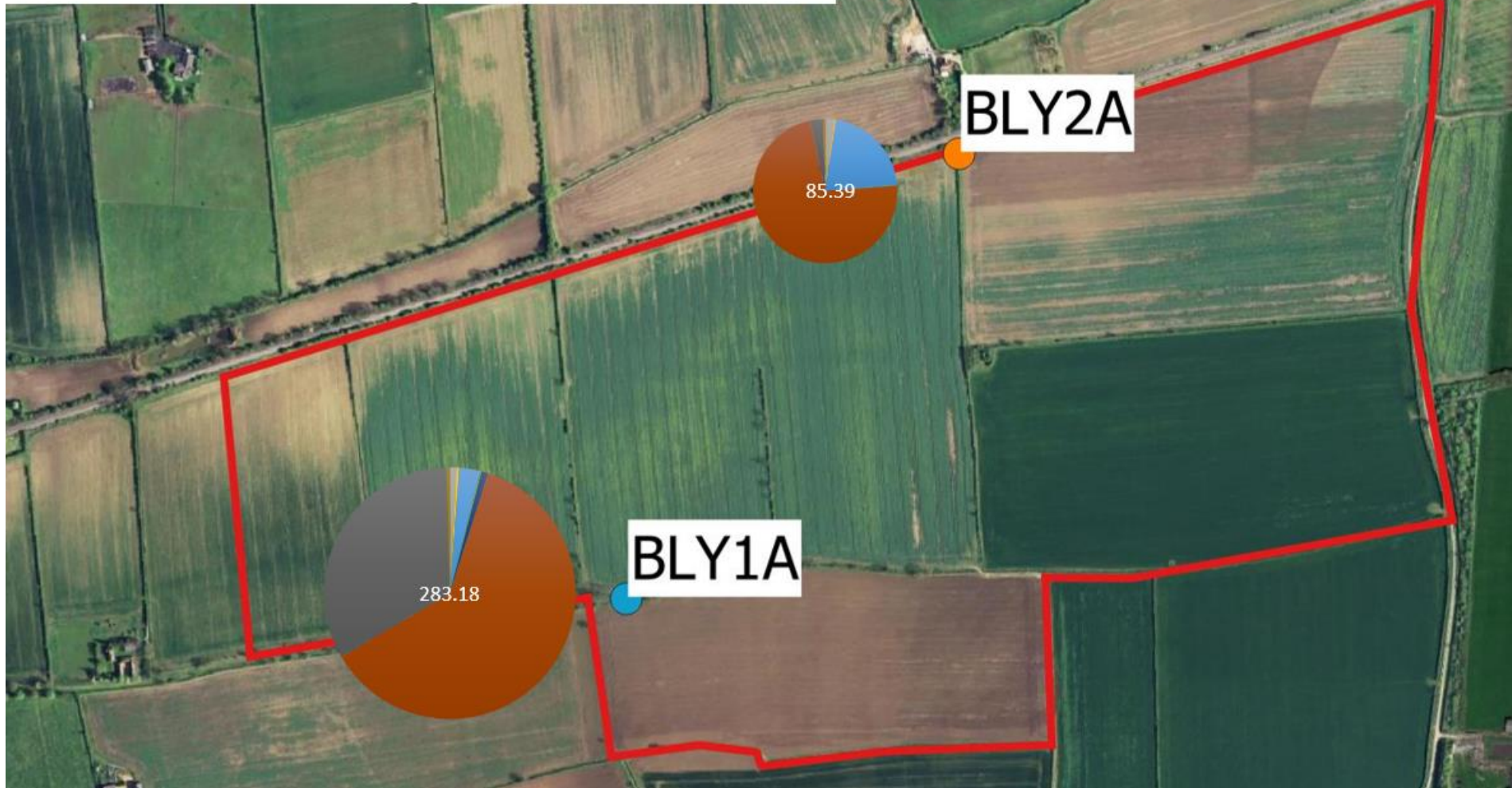


Figure 16: Charts showing Cottam 3b percentage passes by species at each deployment location (with overall passes per night in brackets)



5 ECOLOGICAL EVALUATION

- 5.1.1 This section provides an analysis of the value of ecological receptors (bats) identified as occurring within or in proximity of the site. The valuation of the receptor reflects the rarity and conservation status of each species as well as its relative abundance and activity levels on site.
- 5.1.2 At least 8 species of bat were recorded within the Sites during the static detector survey. Table 8 below provides the status of each bat species recorded and also the importance of the site to each species based on the combined survey results.

Table 8: Ecological Evaluation

Bat species	UK status (current estimated UK population size) ¹²	County status ¹³	Level of activity on site	Ecological Importance
Barbastelle	Very rare, found in southern and central England and Wales. UK estimated population 5,000.	Uncommon and widespread.	Very low activity, average of 0.07 passes per night. Recorded at 13 of 22 deployment locations. Likely one or two individuals at Sites they were recorded.	District
<i>Myotis</i> sp	Daubenton's - relatively common and widespread throughout Britain with a UK estimated population of 560,000 (95,000 in England)	Common and widespread wherever wetland habitat is present	Low activity, average of 3.05 passes per night. Recorded at all deployment locations. Likely small number of individuals	Local
	Natterer's - locally common and widespread throughout Britain with a UK estimated population of 148,000 (70,000 in England)	Local, more common along the western edge of the county		
	Whiskered - uncommon but widespread in England, UK population of 64,000	Fairly common and widespread		
	Brant's - uncommon but widespread in England. UK population of 30,000	Not known possibly quite widespread		

¹² Based on information provided by the Bat Conservation Trust <http://www.bats.org.uk/>

¹³ Based on information provided by the Lincolnshire Biodiversity Action Plan (2011) <https://www.neilincs.gov.uk/wp-content/uploads/2016/02/201110-LincolnshireBAP-3rd-edition.pdf>



Bat species	UK status (current estimated UK population size) ¹²	County status ¹³	Level of activity on site	Ecological Importance
Noctule	Fairly common and widespread (50,000). UK BAP Priority Species	Thought to be declining in some areas, although relatively common in the northern half of the county.	Low activity, average of 3.53 passes per night. Recorded at all deployment locations. Likely small number of individuals.	Local
Leisler's bat	Uncommon but widespread in UK, more common in Ireland. Estimated England population 9,500 (28,000 in UK).	Rare, but thought to be under-recorded.	Very low activity, average of 0.24 passes per night. Recorded at 18 of 22 deployment locations. Likely one or two individuals at Sites they were recorded.	Local
Nathusius' pipistrelle	Rare but widespread, migratory. No population estimate for UK.	Rare. A strongly migratory species.	Very low activity, average of 0.28 passes per night. Recorded at 16 of 22 deployment locations. Deployment location CSB2A at Cottam 1 South had higher levels of activity (6.21 passes per night). Likely one or two individuals at Sites they were recorded.	District
Common pipistrelle	Common and widespread (2,430,000)	Common and widespread	High activity, average of 92.43 passes per night. Recorded at all deployment locations. Likely large number of individuals.	Local
Soprano pipistrelle	Common and widespread (1,300,000). UK BAP Priority Species	Common, (but less so than common pipistrelles) and widespread	Moderate level of activity, average of 17.88 passes per night. Recorded at all deployment locations. Likely moderate number of individuals.	Local
Brown long-eared	Common and widespread (245,000). UK BAP Priority Species	Common, with nationally important colonies in the centre and north	Low level activity, average of 0.98 passes per night. Recorded at all of the deployment locations. Likely small number of individuals at Sites they were recorded.	Local

6 SUMMARY

6.1.1 A large number of trees within the Sites have the potential to support roosting bats. A small number of buildings adjacent to the Sites were assessed as having potential to support roosting bats.



6.1.2 Bat activity from at least nine species was recorded within the Sites. It is considered that the general assemblage and rate of activity recorded was typical for the habitats present on the Sites. The presence of barbastelle and Nathusius' pipistrelle is notable but not unexpected and these species can be considered as being of **District Importance** in the context of the Site. The remaining assemblage of bat species is considered to be of **Local Importance** in terms of their conservation status and activity rates.



APPENDIX A: WILDLIFE LEGISLATION & SPECIES INFORMATION

BATS

All 17 species of bat known to breed in England and Wales, and their roost sites, are protected under the Conservation of Habitats and Species Regulations 2017, known as the 'Habitats Regulations'. This makes it an offence to deliberately kill or injure a bat, or to deliberately disturb a bat such that its ability to hibernate, breed or rear young, or such that the species' distribution, were significantly affected. It is also an offence to damage or destroy any breeding site or resting place. Intentional or reckless disturbance of bats in their resting places, and damage to or obstruction of resting places are also offences under the Wildlife and Countryside Act 1981 (as amended). Under UK law a bat roost is "any structure or place which any wild [bat]...uses for shelter or protection". As bats tend to reuse the same roosts, legal opinion is that the roost is protected whether or not the bats are present at the time. Penalties for offences against bats or their roosts include fines of up to £5,000 and/or up to six months in prison.

As a result, development works which are likely to involve the loss of or alteration to roost sites, or which could result in killing of or injury to bats, need to take place under licence. Works which could disturb bats may also be licensable, though this needs to be assessed on a case by case basis, as bats' sensitivity to disturbance varies depending on normal background levels, and the definition of disturbance offences under the Habitats Regulations is complex. In practice this means that works involving modification or loss of roosts (typically in buildings, trees or underground sites) or significant disturbance to bats in roosts are likely to be licensable.

Licences can be obtained from Natural England or the Welsh Government to permit works that would otherwise be illegal, provided it can be demonstrated that the proposed works are needed to protect public health or safety, or for other reasons of overriding public interest including social and economic reasons. It is also necessary to demonstrate that there is no satisfactory alternative to the proposed works, and that the conservation status of bats in the area will be maintained. Appropriate mitigation and post-construction monitoring are therefore a requirement of all licences.

PLANNING POLICY IN RELATION TO BIODIVERSITY

The National Planning Policy Framework (NPPF), was published in March 2012 and revised in July 2021. Additional guidance can be found online at <http://planningguidance.planningportal.gov.uk/blog/guidance/>. The NPPF simplifies and collates a number of previous planning documents and outlines the government's objective towards biodiversity.

The NPPF identifies ways in which the planning system should contribute to and enhance the natural and local environment (Paragraph 174), including:

- (a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
- (b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;
- (d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;
- (e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and
- (f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate. protecting and enhancing valued landscapes, geological conservation interests and soils;

It also emphasises the importance of conserving biodiversity and areas covered by landscape designations (Paragraph 176):

Great weight should be given to conserving landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to landscape and scenic beauty. The conservation of wildlife and cultural heritage are important considerations in all these areas, and should be given great weight in National Parks and the Broads. The scale and extent of development within all these designated areas should be limited, while development within their setting should be sensitively located and designed to avoid or minimise adverse impacts on the designated areas.

When determining planning applications, the NPPF states that local planning authorities should aim to conserve and enhance biodiversity (Paragraph 175) by applying principles including:

- (a) if significant harm to biodiversity 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 reasons⁶ and a suitable compensation strategy exists; and
- (d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate..

The following should be given the same protection as habitats sites:

- (a) potential Special Protection Areas and possible Special Areas of Conservation;
- (b) listed or proposed Ramsar sites⁷; and
- (c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

There is a general presumption in favour of sustainable development within the NPPF. It is noted in Paragraph 182 that this presumption does not apply where the plan or project is likely to have a significant effect on a habitat site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.

The Natural Environment and Rural Communities Act (2006) states that a public authority must, "in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity; Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat". DEFRA issued further guidance on implementation of this act in the document; Guidance for Local Authorities on Implementing the Biodiversity Duty (May 2007), which notes that "Conserving biodiversity includes restoring and enhancing species populations and habitats, as well as protecting them".

ECOLOGICAL ENHANCEMENTS

The Natural Environment and Rural Communities Act (2006) states that a public authority must, "in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity; Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat". DEFRA issued further guidance on implementation of this act in the document; Guidance for Local Authorities on Implementing the Biodiversity Duty (May 2007), which notes that "Conserving biodiversity can include restoring or enhancing a population or habitat".

In England, the National Planning Policy Framework (NPPF), issued in July 2021, states that the planning system should contribute to "*minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures*;. It also states that "*opportunities to incorporate biodiversity in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity*".

UK BIODIVERSITY ACTION PLANS

The UK Biodiversity Action Plan (UK BAP) 2011 is a policy first published in 1994 to protect biodiversity and stems from the 1992 Rio Biodiversity Earth Summit. The policy is continuously revised to combine new and existing conservation initiatives to conserve and enhance species and habitats, promote public awareness and contribute to international conservation efforts. Each plan details the status, threats and unique conservation strategies for the species or habitat concerned, to encourage spread and promote population numbers.

Species or habitats identified as priorities under the UK Biodiversity Action Plan receive some status in the planning process through their identification as Species/Habitats of Principal Importance in England and Wales, under the Natural Environment and Rural Communities (NERC) Act 2006 (as amended).

Current planning guidance in England, the National Planning Policy Framework, does not specifically refer to Species or Habitats of Principal Importance, though it includes guidance for conservation of biodiversity in general. Supplementary guidance is available online at <http://planningguidance.planningportal.gov.uk/blog/guidance/> and this guidance indicates that it is 'useful to consider' the potential effects of a development on the habitats or species on the Natural Environment and Rural Communities Act 2006 section 41 list.



APPENDIX B: STATIC DETECTOR DEPLOYMENT DATES AND WEATHER CONDITIONS

Table 9: Static detector deployment dates and weather conditions for Cottam 1 (North)

Locations	Deployment Number	Deployment Date	No of Nights Surveyed	Overnight Weather Conditions Summary
CNB1A – 1D	1	16/06/2021	26	Max overnight temp: 11°C - 20°C. Min overnight temp: 6°C - 15°C. Largely dry with light rain occurring on 16/06, 17/06, 19/06, 24/06, 04/07 and heavier rain occurring on 18/06, 05/07. Max wind 4 – 14mph.
CNB2A – 2D	2	12/07/2021	8	Max overnight temp: 16°C - 22°C. Min overnight temp: 11°C - 17°C. Dry throughout the survey period. Max wind 4 – 10mph.
CNB1A – 1D	3	20/07/2021	9	Max overnight temp: 14°C - 21°C. Min overnight temp: 13°C - 16°C. Largely dry with light rain occurring on 27/07. Max wind 5 – 14mph.
CNB2A – 2D	4	29/07/2021	7	Max overnight temp: 13°C - 16°C. Min overnight temp: 10°C - 13°C. Largely dry with light rain occurring on 29/07. Max wind 5 – 11mph
CNB1A – 1D	5	05/08/2021	12	Max overnight temp: 14°C - 19°C. Min overnight temp: 11°C - 15°C. Largely dry with light rain occurring on 05/08 and 08/08. Max wind 5 – 14mph
CNB2A – 2D	6	17/08/2021	10	Max overnight temp: 14°C - 18°C. Min overnight temp: 11°C - 15°C. Largely dry with light rain occurring on 20/08 and 21/08. Max wind 5 – 12mph
CNB1A – 1D	7	07/09/2021	12	Max overnight temp: 13°C - 21°C. Min overnight temp: 11°C - 17°C. Dry throughout the survey period. Max wind 5 – 10mph
CNB2A – 2D	8	21/09/2021	7	Max overnight temp: 13°C - 18°C. Min overnight temp: 9°C - 16°C. Dry throughout the survey period. Max wind 5 – 18mph
CNB1A – 1D	9	06/04/2022	21	Max overnight temp: 6°C - 16°C. Min overnight temp: -1°C - 9°C. Cold period 7 th – 9 th April with temperatures getting down to freezing each night. Dry throughout the survey period. Max wind 5 – 18mph
CNB2A – 2D	10	27/04/2022	21	Max overnight temp: 8°C - 22°C. Min overnight temp: 8°C - 12°C. Largely dry with light rain occurring on 6 th , 15 th May. Max wind 5 – 17mph
CNB1A – 1D	11	18/05/2022	8	Max overnight temp: 13°C - 18°C. Min overnight temp: 2°C - 13°C. Largely dry with light rain occurring on 18 th , 22 nd and 23 rd May. Max wind 7 – 17mph.
CNB2A – 2D	12	26/05/2022	20	Max overnight temp: 11°C - 21°C. Min overnight temp: 5°C - 13°C. Largely dry with light rain occurring on 30 th and 31 st May and 5 th and 7 th June. Max wind 5 – 18mph.

Table 10: Static detector deployment dates and weather conditions for Cottam 1 (South)

Locations	Deployment Number	Deployment Date	No of Nights Surveyed	Overnight Weather Conditions Summary
CSB1A – 1C	1	16/06/2021	26	Max overnight temp: 11°C - 20°C. Min overnight temp: 6°C - 15°C. Largely dry with light rain occurring on 16/06, 17/06, 19/06, 24/06, 04/07 and heavier rain occurring on 18/06, 05/07. Max wind 4 – 14mph.
CSB2A – 2C	2	12/07/2021	8	Max overnight temp: 16°C - 22°C. Min overnight temp: 11°C - 17°C. Dry throughout the survey period. Max wind 4 – 10mph.
CSB1A – 1C	3	20/07/2021	9	Max overnight temp: 14°C - 21°C. Min overnight temp: 13°C - 16°C. Largely dry with light rain occurring on 27/07. Max wind 5 – 14mph.
CSB2A – 2C	4	28/07/2021	8	Max overnight temp: 13°C - 16°C. Min overnight temp: 10°C - 13°C. Largely dry with light rain occurring on 29/07. Max wind 5 – 11mph



CSB1A – 1C	5	05/08/2021	12	Max overnight temp: 14°C - 19°C. Min overnight temp: 11°C - 15°C. Largely dry with light rain occurring on 05/08 and 08/08. Max wind 5 – 14mph
CSB2A – 2C	6	17/08/2021	10	Max overnight temp: 14°C - 18°C. Min overnight temp: 11°C - 15°C. Largely dry with light rain occurring on 20/08 and 21/08. Max wind 5 – 12mph
CSB1A – 1C	7	07/09/2021	12	Max overnight temp: 13°C - 21°C. Min overnight temp: 11°C - 17°C. Dry throughout the survey period. Max wind 5 – 10mph
CSB2A – 2C	8	21/09/2021	7	Max overnight temp: 13°C - 18°C. Min overnight temp: 9°C - 16°C. Dry throughout the survey period. Max wind 5 – 18mph
CSB1A – 1C	9	06/04/2022	21	Max overnight temp: 6°C - 16°C. Min overnight temp: -1°C - 9°C. Cold period 7 th – 9 th April with temperatures getting down to freezing each night. Dry throughout the survey period. Max wind 5 – 18mph
CSB2A – 2C	10	27/04/2022	21	Max overnight temp: 8°C - 22°C. Min overnight temp: 8°C - 12°C. Largely dry with light rain occurring on 6 th , 15 th May. Max wind 5 – 17mph
CSB1A – 1C	11	18/05/2022	8	Max overnight temp: 13°C - 18°C. Min overnight temp: 2°C - 13°C. Largely dry with light rain occurring on , 18 th 22 nd and 23 rd May. Max wind 7 – 17mph.
CSB2A – 2C	12	26/05/2022	20	Max overnight temp: 11°C - 21°C. Min overnight temp: 5°C - 13°C. Largely dry with light rain occurring on 30 th and 31 st May and 5 th and 7 th June. Max wind 5 – 18mph.

Table 11: Static detector deployment dates and weather conditions for Cottam 1 (West)

Locations	Deployment Number	Deployment Date	No of Nights Surveyed	Overnight Weather Conditions Summary
CWB1A	1	16/06/2021	26	Max overnight temp: 11°C - 20°C. Min overnight temp: 6°C - 15°C. Largely dry with light rain occurring on 16/06, 17/06, 19/06, 24/06, 04/07 and heavier rain occurring on 18/06, 05/07. Max wind 4 – 14mph.
CWB2A	2	12/07/2021	8	Max overnight temp: 16°C - 22°C. Min overnight temp: 11°C - 17°C. Dry throughout the survey period. Max wind 4 – 10mph.
CWB1A	3	20/07/2021	9	Max overnight temp: 14°C - 21°C. Min overnight temp: 13°C - 16°C. Largely dry with light rain occurring on 27/07. Max wind 5 – 14mph.
CWB2A	4	29/07/2021	7	Max overnight temp: 13°C - 16°C. Min overnight temp: 10°C - 13°C. Largely dry with light rain occurring on 29/07. Max wind 5 – 11mph
CWB1A	5	05/08/2021	12	Max overnight temp: 14°C - 19°C. Min overnight temp: 11°C - 15°C. Largely dry with light rain occurring on 05/08 and 08/08. Max wind 5 – 14mph
CWB2A	6	17/08/2021	10	Max overnight temp: 14°C - 18°C. Min overnight temp: 11°C - 15°C. Largely dry with light rain occurring on 20/08 and 21/08. Max wind 5 – 12mph
CWB1A	7	07/09/2021	13	Max overnight temp: 13°C - 21°C. Min overnight temp: 11°C - 17°C. Dry throughout the survey period. Max wind 5 – 10mph
CWB2A	8	21/09/2021	7	Max overnight temp: 13°C - 18°C. Min overnight temp: 9°C - 16°C. Dry throughout the survey period. Max wind 5 – 18mph
CWB1A	9	06/04/2022	21	Max overnight temp: 6°C - 16°C. Min overnight temp: -1°C - 9°C. Cold period 7 th – 9 th April with temperatures getting down to freezing each night. Dry throughout the survey period. Max wind 5 – 18mph
CWB2A	10	27/04/2022	21	Max overnight temp: 8°C - 22°C. Min overnight temp: 8°C - 12°C. Largely dry with light rain occurring on 6 th , 15 th May. Max wind 5 – 17mph
CWB1A	11	18/05/2022	8	Max overnight temp: 13°C - 18°C. Min overnight temp: 2°C - 13°C. Largely dry with light rain occurring on 18 th , 22 nd and 23 rd May. Max wind 7 – 17mph.
CWB2A	12	26/05/2022	20	Max overnight temp: 11°C - 21°C. Min overnight temp: 5°C - 13°C. Largely dry with light rain occurring on 30 th and 31 st May and 5 th and 7 th June. Max wind 5 – 18mph.



Table 12: Static detector deployment dates and weather conditions for Cottam 2

Locations	Deployment Number	Deployment Date	No of Nights Surveyed	Overnight Weather Conditions Summary
COR1A	1	15/06/2021	27	Max overnight temp: 11°C - 20°C. Min overnight temp: 6°C - 15°C. Largely dry with light rain occurring on 16/06, 17/06, 19/06, 24/06, 04/07 and heavier rain occurring on 18/06, 05/07. Max wind 4 – 14mph.
COR2A	2	13/07/2021	7	Max overnight temp: 16°C - 22°C. Min overnight temp: 11°C - 17°C. Dry throughout the survey period. Max wind 4 – 10mph.
COR1A	3	21/07/2021	8	Max overnight temp: 14°C - 21°C. Min overnight temp: 13°C - 16°C. Largely dry with light rain occurring on 27/07. Max wind 5 – 14mph.
COR2A	4	29/07/2021	7	Max overnight temp: 13°C - 16°C. Min overnight temp: 10°C - 13°C. Largely dry with light rain occurring on 29/07. Max wind 5 – 11mph
COR1A	5	06/08/2021	11	Max overnight temp: 14°C - 19°C. Min overnight temp: 11°C - 15°C. Largely dry with light rain occurring on 05/08 and 08/08. Max wind 5 – 14mph
COR2A	6	18/08/2021	9	Max overnight temp: 14°C - 18°C. Min overnight temp: 11°C - 15°C. Largely dry with light rain occurring on 20/08 and 21/08. Max wind 5 – 12mph
COR1A	7	08/09/2021	11	Max overnight temp: 13°C - 21°C. Min overnight temp: 11°C - 17°C. Dry throughout the survey period. Max wind 5 – 10mph
COR2A	8	21/09/2021	7	Max overnight temp: 13°C - 18°C. Min overnight temp: 9°C - 16°C. Dry throughout the survey period. Max wind 5 – 18mph
COR1A	9	07/04/2022	20	Max overnight temp: 6°C - 16°C. Min overnight temp: -1°C - 9°C. Cold period 7 th – 9 th April with temperatures getting down to freezing each night. Dry throughout the survey period. Max wind 5 – 18mph
COR2A	10	27/04/2022	20	Max overnight temp: 8°C - 22°C. Min overnight temp: 8°C - 12°C. Largely dry with light rain occurring on 6 th , 15 th , 18 th May. Max wind 5 – 17mph
COR1A	11	19/05/2022	7	Max overnight temp: 13°C - 18°C. Min overnight temp: 2°C - 13°C. Largely dry with light rain occurring on 22 nd and 23 rd May. Max wind 7 – 17mph.
COR2A	12	26/05/2022	20	Max overnight temp: 11°C - 21°C. Min overnight temp: 5°C - 13°C. Largely dry with light rain occurring on 30 th and 31 st May and 5 th and 7 th June. Max wind 5 – 18mph.

Table 13: Static detector deployment dates and weather conditions for Cottam 3a

Locations	Deployment Number	Deployment Date	No of Nights Surveyed	Overnight Weather Conditions Summary
BLY1B	1	15/06/2021	27	Max overnight temp: 11°C - 20°C. Min overnight temp: 6°C - 15°C. Largely dry with light rain occurring on 16/06, 17/06, 19/06, 24/06, 04/07 and heavier rain occurring on 18/06, 05/07. Max wind 4 – 14mph.
BLY2B	2	13/07/2021	7	Max overnight temp: 16°C - 22°C. Min overnight temp: 11°C - 17°C. Dry throughout the survey period. Max wind 4 – 10mph.
BLY1B	3	21/07/2021	8	Max overnight temp: 14°C - 21°C. Min overnight temp: 13°C - 16°C. Largely dry with light rain occurring on 27/07. Max wind 5 – 14mph.
BLY2B	4	29/07/2021	7	Max overnight temp: 13°C - 16°C. Min overnight temp: 10°C - 13°C. Largely dry with light rain occurring on 29/07. Max wind 5 – 11mph
BLY1B	5	06/08/2021	11	Max overnight temp: 14°C - 19°C. Min overnight temp: 11°C - 15°C. Largely dry with light rain occurring on 05/08 and 08/08. Max wind 5 – 14mph
BLY2B	6	18/08/2021	9	Max overnight temp: 14°C - 18°C. Min overnight temp: 11°C - 15°C. Largely dry with light rain occurring on 20/08 and 21/08. Max wind 5 – 12mph
BLY1B	7	08/09/2021	11	Max overnight temp: 13°C - 21°C. Min overnight temp: 11°C - 17°C. Dry throughout the survey period. Max wind 5 – 10mph



BLY2B	8	22/09/2021	11	Max overnight temp: 13°C - 18°C. Min overnight temp: 9°C - 16°C. Dry throughout the survey period. Max wind 5 – 18mph
BLY1B	9	08/04/2022	19	Max overnight temp: 6°C - 16°C. Min overnight temp: -1°C - 9°C. Cold period 8 th – 9 th April with temperatures getting down to freezing each night. Dry throughout the survey period. Max wind 5 – 18mph
BLY2B	10	27/04/2022	18	Max overnight temp: 8°C - 22°C. Min overnight temp: 8°C - 12°C. Largely dry with light rain occurring on 6 th , 15 th , 18 th May. Max wind 5 – 17mph
BLY1B	11	19/05/2022	7	Max overnight temp: 13°C - 18°C. Min overnight temp: 2°C - 13°C. Largely dry with light rain occurring on 22 nd and 23 rd May. Max wind 7 – 17mph.
BLY2B	12	26/05/2022	20	Max overnight temp: 11°C - 21°C. Min overnight temp: 5°C - 13°C. Largely dry with light rain occurring on 30 th and 31 st May and 5 th and 7 th June. Max wind 5 – 18mph.

Table 14: Static detector deployment dates and weather conditions for Cottam 3b

Locations	Deployment Number	Deployment Date	No of Nights Surveyed	Overnight Weather Conditions Summary
BLY1A	1	15/06/2021	27	Max overnight temp: 11°C - 20°C. Min overnight temp: 6°C - 15°C. Largely dry with light rain occurring on 16/06, 17/06, 19/06, 24/06, 04/07 and heavier rain occurring on 18/06, 05/07. Max wind 4 – 14mph.
BLY2A	2	13/07/2021	8	Max overnight temp: 16°C - 22°C. Min overnight temp: 11°C - 17°C. Dry throughout the survey period. Max wind 4 – 10mph.
BLY1A	3	21/07/2021	9	Max overnight temp: 14°C - 21°C. Min overnight temp: 13°C - 16°C. Largely dry with light rain occurring on 27/07. Max wind 5 – 14mph.
BLY2A	4	29/07/2021	7	Max overnight temp: 13°C - 16°C. Min overnight temp: 10°C - 13°C. Largely dry with light rain occurring on 29/07. Max wind 5 – 11mph
BLY1A	5	06/08/2021	12	Max overnight temp: 14°C - 19°C. Min overnight temp: 11°C - 15°C. Largely dry with light rain occurring on 05/08 and 08/08. Max wind 5 – 14mph
BLY2A	6	18/08/2021	9	Max overnight temp: 14°C - 18°C. Min overnight temp: 11°C - 15°C. Largely dry with light rain occurring on 20/08 and 21/08. Max wind 5 – 12mph
BLY1A	7	08/09/2021	11	Max overnight temp: 13°C - 21°C. Min overnight temp: 11°C - 17°C. Dry throughout the survey period. Max wind 5 – 10mph
BLY2A	8	22/09/2021	11	Max overnight temp: 13°C - 18°C. Min overnight temp: 9°C - 16°C. Dry throughout the survey period. Max wind 5 – 18mph
BLY1A	9	08/04/2022	19	Max overnight temp: 6°C - 16°C. Min overnight temp: -1°C - 9°C. Cold period 8 th – 9 th April with temperatures getting down to freezing each night. Dry throughout the survey period. Max wind 5 – 18mph
BLY2A	10	27/04/2022	22	Max overnight temp: 8°C - 22°C. Min overnight temp: 8°C - 12°C. Largely dry with light rain occurring on 6 th , 15 th , 18 th May. Max wind 5 – 17mph
BLY1A	11	19/05/2022	7	Max overnight temp: 13°C - 18°C. Min overnight temp: 2°C - 13°C. Largely dry with light rain occurring on 22 nd and 23 rd May. Max wind 7 – 17mph.
BLY2A	12	26/05/2022	20	Max overnight temp: 11°C - 21°C. Min overnight temp: 5°C - 13°C. Largely dry with light rain occurring on 30 th and 31 st May and 5 th and 7 th June. Max wind 5 – 18mph.



APPENDIX C: STATIC DETECTOR DEPLOYMENT LOCATIONS

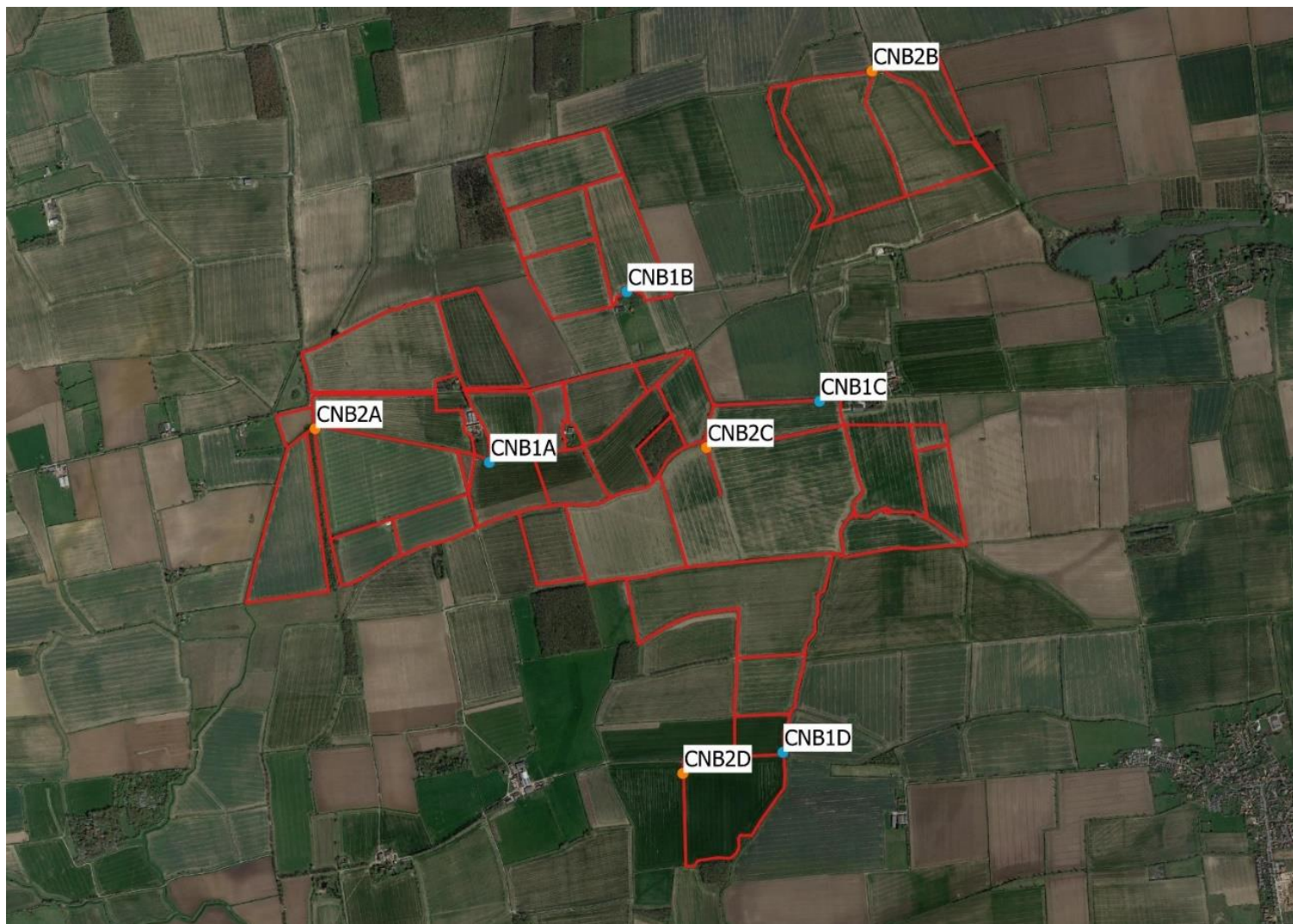


Figure C1: Static Detector Deployment Locations at Cottam 1 (North)

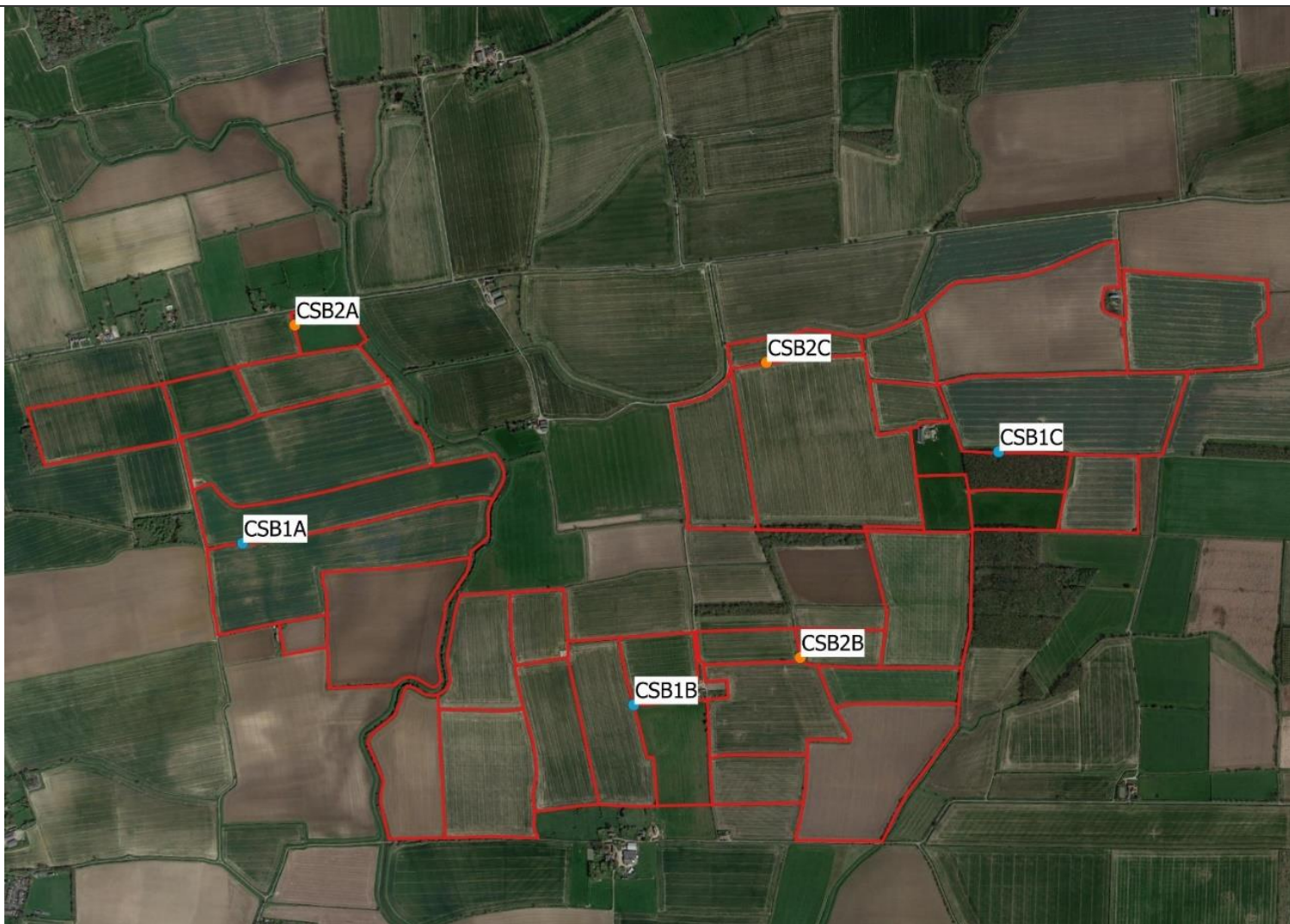


Figure C2: Static Detector Deployment Locations at Cottam 1 (South)



Figure C3: Static Detector Deployment Locations at Cottam 1 (West)



Figure C4: Static Detector Deployment Locations at Cottam 2

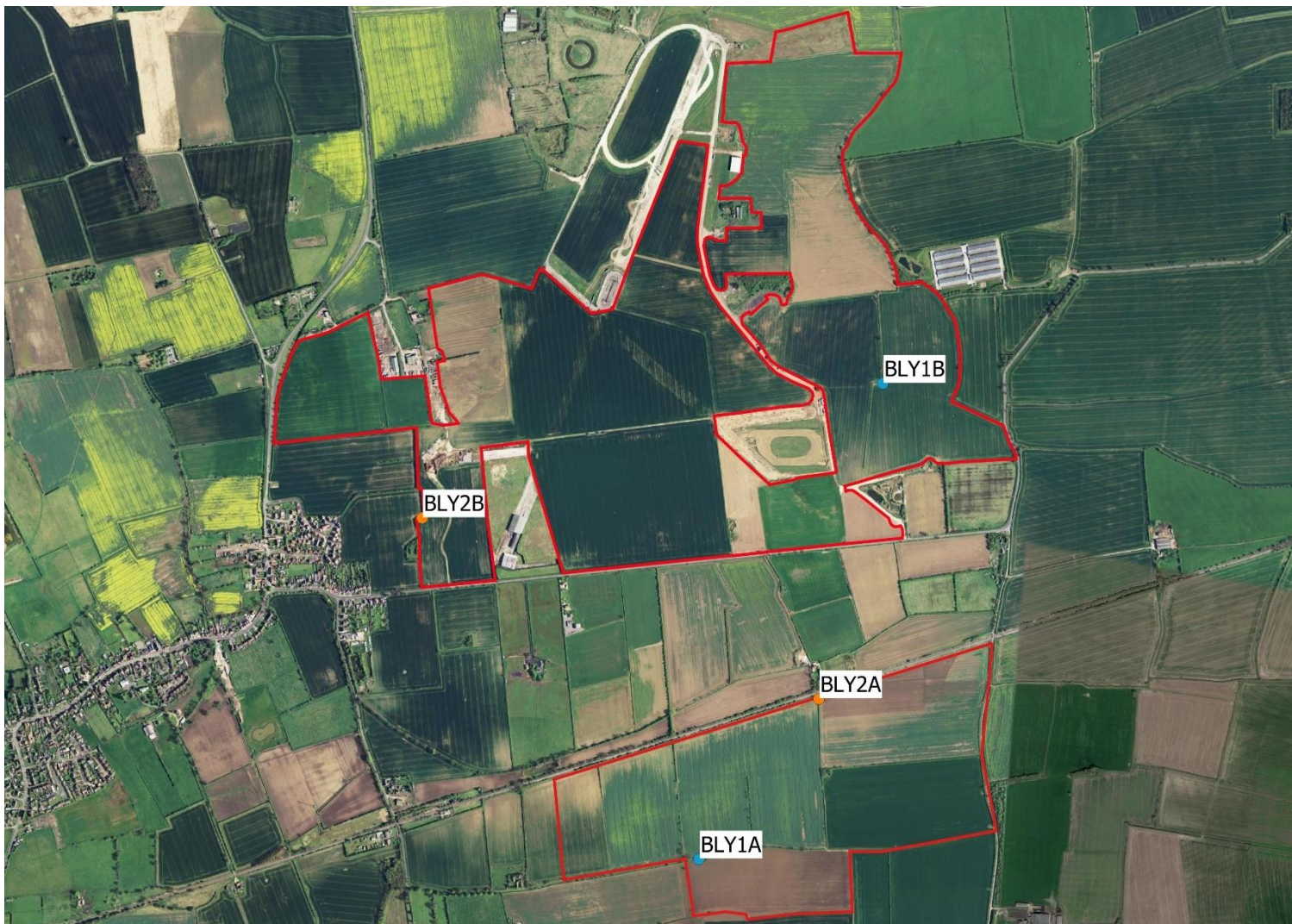


Figure C5: Static Detector Deployment Locations at Cottam 3a and 3b



APPENDIX D: STATIC DETECTOR RESULTS

Table 15: Results of Static Detector Survey at Cottam 1 (North)

Location	Month	Deployment Number	Survey Nights	Barbastelle	Myotis Sp	Nyctalus Sp	Noctule	Leislars	Nathusius Pipistrelle	Common pipistrelle	Soprano pipistrelle	Brown Long-eared	Total Passes	Passes per night
CNB1A	April	9	21	1	9	3	11	0	0	386	134	10	554	26.38
CNB1A	May	11	8	0	12	7	17	1	25	257	50	24	393	49.13
CNB1A	June	1	26	0	27	0	33	0	0	1812	269	115	2256	86.77
CNB1A	July	3	9	0	5	1	12	0	0	157	65	93	334	37.11
CNB1A	August	5	12	0	28	12	18	0	0	87	29	37	212	17.67
CNB1A	September	7	12	1	148	4	93	0	1	253	63	30	593	49.42
TOTAL	N/A	N/A	88	2	229	27	184	1	26	2952	610	309	4342	49.34
CNB2A	April	10	21	0	69	10	28	1	0	8338	743	4	9193	437.76
CNB2A	May	12	20	0	7	0	276	229	0	5191	1401	18	7127	356.35
CNB2A	June/July	2	8	0	5	9	63	0	0	1031	50	12	1170	146.25
CNB2A	July/August	4	7	0	5	0	76	0	1	2214	47	5	2353	336.14
CNB2A	August	6	10	0	65	15	36	6	0	4559	387	12	5081	508.10
CNB2A	September	8	7	0	5	77	136	0	0	2410	162	22	2812	401.71
TOTAL	N/A	N/A	73	0	156	111	615	236	1	23743	2790	73	27736	379.95
CNB1B	April	9	21	2	14	0	0	0	0	296	21	0	333	15.86
CNB1B	May	11	8	0	1	4	0	0	0	146	45	3	199	24.88
CNB1B	June	1	26	0	22	1	10	0	1	682	1136	27	1879	72.27
CNB1B	July	3	9	0	9	2	23	0	0	660	128	24	846	94.00
CNB1B	August	5	12	0	37	2	14	0	0	1884	1413	31	3384	282.00
CNB1B	September	7	12	0	366	0	43	0	1	2610	2074	116	5210	434.17
TOTAL	N/A	N/A	88	2	449	9	90	0	2	6278	4817	201	11851	134.67
CNB2B	April	10	21	0	21	0	25	0	0	1501	278	0	1825	86.90
CNB2B	May	12	20	0	41	2	7	0	0	381	268	3	702	35.10
CNB2B	June/July	2	8	0	31	0	5	0	0	600	150	7	793	99.13
CNB2B	July/August	4	7	0	9	0	11	0	0	291	217	4	532	76.00
CNB2B	August	6	10	0	90	12	36	0	0	1532	394	4	2069	206.90
CNB2B	September	8	7	0	4	0	13	0	0	621	213	4	855	122.14
TOTAL	N/A	N/A	73	0	196	14	97	0	0	4926	1520	22	6776	92.82



CNB1C	April	9	21	0	110	6	19	0	0	66	271	0	472	22.48
CNB1C	May	11	8	0	63	6	30	3	0	155	104	2	364	45.50
CNB1C	June	1	26	1	328	0	13	0	6	326	180	14	868	33.38
CNB1C	July	3	9	9	189	0	45	0	0	146	134	7	530	58.89
CNB1C	August	5	12	1	82	1	17	0	0	101	115	1	319	26.58
CNB1C	September	7	12	1	145	6	50	0	1	360	210	23	797	66.42
TOTAL	N/A	N/A	88	12	917	19	174	3	7	1154	1014	47	3350	38.07
CNB2C	April	10	21	0	36	3	31	0	0	37	60	2	170	8.10
CNB2C	May	12	20	0	25	0	68	7	0	52	198	3	353	17.65
CNB2C	June/July	2	No data – faulty detector											
CNB2C	July/August	4	7	0	16	0	12	0	0	131	67	2	229	32.71
CNB2C	August	6	10	0	44	9	20	0	0	188	132	4	397	39.70
CNB2C	September	8	7	0	12	1	18	0	0	341	32	6	411	58.71
TOTAL	N/A	N/A	65	0	133	13	149	7	0	749	489	17	1560	24.00
CNB1D	April	9	No data – faulty detector											
CNB1D	May	11	8	0	11	5	3	0	0	616	259	5	899	112.38
CNB1D	June	1	26	0	4	0	10	2	0	895	402	52	1366	52.54
CNB1D	July	3	9	0	6	3	34	0	0	242	138	17	440	48.89
CNB1D	August	5	12	0	19	0	15	2	0	350	232	45	670	55.83
CNB1D	September	7	12	1	34	0	108	0	4	763	403	28	1341	111.75
TOTAL	N/A	N/A	67	1	74	8	170	4	4	2866	1434	147	4716	70.39
CNB2D	April	10	21	0	4	3	37	0	0	144	29	0	218	10.38
CNB2D	May	12	20	0	5	0	35	1	1	334	16	2	394	19.70
CNB2D	June/July	2	8	1	0	0	6	0	0	423	110	2	543	67.88
CNB2D	July/August	4	7	0	2	1	7	0	0	451	60	1	522	74.57
CNB2D	August	6	10	1	19	17	43	0	0	664	74	50	869	86.90
CNB2D	September	8	7	0	4	0	284	0	0	618	245	5	1156	165.14
TOTAL	N/A	N/A	73	2	34	21	412	1	1	2634	534	60	3702	50.71
OVERALL TOTAL	N/A	N/A	615	19	2188	222	1891	252	41	45302	13208	876	64033	104.12



Table 16: Results of Static Detector Survey at Cottam 1 (South)

Location	Month	Deployment Number	Survey Nights	Barbastelle	Myotis Sp	Nyctalus Sp	Noctule	Leislars	Nathusius Pipistrelle	Common pipistrelle	Soprano pipistrelle	Brown Long-eared	Total Passes	Passes per night
CSB1A	April	9	21	0	2	0	0	0	0	187	7	2	198	9.43
CSB1A	May	11	8	0	1	2	0	0	0	527	1	0	531	66.38
CSB1A	June	1	26	0	11	1	9	0	0	2889	122	1	3033	116.65
CSB1A	July	3	9	0	6	0	1	0	0	545	36	0	590	65.56
CSB1A	August	5	12	0	6	0	6	1	0	226	17	2	259	21.58
CSB1A	September	7	12	0	15	0	33	0	1	178	32	9	269	22.42
TOTAL	N/A	N/A	88	0	41	3	49	1	1	4552	215	14	4880	55.45
CSB2A	April	10	21	0	49	33	15	0	0	352	38	0	487	23.19
CSB2A	May	12	20	0	13	0	133	12	0	483	6	6	656	32.80
CSB2A	June/July	2	8	0	14	8	9	4	0	490	22	21	568	71.00
CSB2A	July/August†	4	8	0	29	3	2	0	6	593	27	12	674	84.25
CSB2A	August	6	10	1	154	3	4	0	22	16385	2568	20	19157	1915.70
CSB2A	September	8	7	1	75	5	116	0	177	2029	1171	7	3581	511.57
TOTAL	N/A	N/A	74	2	334	52	279	16	205	20332	3832	66	25123	339.50
CSB1B	April	9	21	0	7	0	3	0	0	31	7	2	50	2.38
CSB1B	May	11	8	0	29	0	0	0	0	191	5	0	225	28.13
CSB1B	June	1	26	0	27	1	18	0	0	911	22	13	992	38.15
CSB1B	July	3	9	0	6	0	8	0	0	285	52	2	354	39.33
CSB1B	August	5	12	0	12	0	4	0	0	196	98	1	311	25.92
CSB1B	September	7	12	1	91	0	32	0	0	440	10	5	583	48.58
TOTAL	N/A	N/A	88	1	172	1	65	0	0	2054	194	23	2515	28.58
CSB2B	April	10	21	0	35	8	7	0	0	3117	48	7	3222	153.43
CSB2B	May	12	20	1	226	0	21	4	0	370	26	37	686	34.30
CSB2B	June/July	2	8	0	161	0	7	0	0	786	42	13	1009	126.13
CSB2B	July/August†	4	8	0	8	0	3	0	0	2777	71	2	2861	357.63
CSB2B	August	6	10	0	17	1	5	0	0	1105	97	12	1237	123.70
CSB2B	September	8	7	0	36	0	57	0	0	813	370	12	1288	184.00
TOTAL	N/A	N/A	74	1	483	9	100	4	0	8968	654	83	10303	139.23



CSB1C	April	9	21	86	18	4	12	0	0	4790	1046	0	5959	283.76
CSB1C	May	11	8	0	40	50	16	12	0	397	195	5	723	90.38
CSB1C	June	1	26	1	90	4	137	6	1	392	161	8	802	30.85
CSB1C	July	3	9	0	18	29	8	0	0	21	5	5	91	10.11
CSB1C	August	5	12	1	28	217	147	40	0	915	687	23	2058	171.50
CSB1C	September	7	12	2	61	6	282	0	0	198	395	22	978	81.50
TOTAL	N/A	N/A	88	90	255	310	602	58	1	6713	2489	63	10611	120.58
CSB2C	April	10	21	0	4	6	10	0	0	210	57	0	287	13.67
CSB2C	May	12	20	0	3	0	12	3	0	391	57	2	469	23.45
CSB2C	June/July	2	8	0	1	1	5	0	0	679	50	2	738	92.25
CSB2C	July/August †	4	8	0	3	4	13	0	1	475	24	3	523	65.38
CSB2C	August	6	10	0	0	0	0	0	0	262	115	8	385	38.50
CSB2C	September	8	7	0	1	0	45	0	0	80	42	4	172	24.57
TOTAL	N/A	N/A	74	0	12	11	85	3	1	2097	345	19	2574	34.78
OVERALL TOTAL	N/A	N/A	486	94	1297	386	1180	82	208	44716	7729	268	56006	115.24

Table 17: Results of Static Detector Survey at Cottam 1 (West)

Location	Month	Deployment Number	Survey Nights	Barbastelle	Myotis Sp	Nyctalus Sp	Noctule	Leislers	Nathusius Pipistrelle	Common pipistrelle	Soprano pipistrelle	Brown Long-eared	Total Passes	Passes per night
CWB1A	April	9	21	0	6	0	2	0	0	5292	357	3	5660	269.52
CWB1A	May	11	8	0	2	2	0	0	0	2392	41	8	2445	305.63
CWB1A	June	1	26	0	16	3	0	0	4	3265	36	49	3373	129.73
CWB1A	July	3	9	0	5	0	4	0	0	1080	9	4	1102	122.44
CWB1A	August	5	12	0	21	4	8	0	0	181	14	16	244	20.33
CWB1A	September	7	13	1	33	1	31	0	2	5971	20	13	6072	467.08
TOTAL	N/A	N/A	89	1	83	10	45	0	6	18181	477	93	18896	212.31
CWB2A	April	10	21	0	4	3	4	0	0	2271	36	1	2320	110.48
CWB2A	May	12	20	0	50	0	9	8	1	2728	36	15	2849	142.45
CWB2A	June/July	2	8	0	8	0	74	0	1	569	6	9	667	83.38
CWB2A	July/August	4	7	0	7	2	3	0	3	704	19	8	747	106.71
CWB2A	August	6	10	4	182	2	39	1	0	1279	131	77	1716	171.60
CWB2A	September	8	7	0	7	3	10	0	0	487	27	8	542	77.43



TOTAL	N/A	N/A	73	4	258	10	139	9	5	8038	255	118	8841	121.11
OVERALL TOTAL	N/A	N/A	162	5	341	20	184	9	11	26219	732	211	27737	171.22

Table 18: Results of Static Detector Survey at Cottam 2

Location	Month	Deployment Number	Survey Nights	Barbastelle	Myotis Sp	Nyctalus Sp	Noctule	Leislars	Nathusius Pipistrelle	Common pipistrelle	Soprano pipistrelle	Brown Long-eared	Total Passes	Passes Per Night
COR1A	April	9	20	0	1	0	0	0	0	90	1	0	92	4.60
COR1A	May	11	7	0	0	2	1	1	0	205	4	0	213	30.43
COR1A	June	1	27	0	1	3	285	0	0	1286	15	3	1593	59.00
COR1A	July	3	7	0	0	0	7	0	0	679	28	3	717	102.43
COR1A	August	5	8	0	1	1	13	0	0	361	17	2	395	49.38
COR1A	September	7	7	0	3	1	63	2	1	355	57	8	490	70.00
TOTAL	N/A	N/A	76	0	6	7	369	3	1	2976	122	16	3500	46.05
COR2A	April	10	20	0	4	1	2	0	0	632	86	7	732	36.60
COR2A	May	12	20	0	2	0	13	8	0	1304	185	9	1523	76.15
COR2A	June/July	2	11	1	4	0	12	0	0	1196	95	35	1343	122.09
COR2A	July/August	4	9	0	3	1	8	0	0	836	41	50	939	104.33
COR2A	August	6	11	0	16	3	36	0	0	83	18	11	167	15.18
COR2A	September	8	7	0	3	0	53	2	0	107	25	13	203	29.00
TOTAL	N/A	N/A	78	1	32	5	124	10	0	4158	450	125	4907	62.91
OVERALL TOTAL	N/A	N/A	154	1	38	12	493	13	1	7134	572	141	8407	54.59

Table 19: Results of Static Detector Survey at Cottam 3a

Location	Month	Deployment Number	Survey Nights	Barbastelle	Myotis Sp	Nyctalus Sp	Noctule	Leislars	Nathusius Pipistrelle	Common pipistrelle	Soprano pipistrelle	Brown Long-eared	Total Passes	Passes Per Night
BLY1B	April	9	19	0	27	0	1	0	0	169	5	0	202	10.63
BLY1B	May	11	7	0	11	2	1	1	0	445	6	1	467	66.71
BLY1B	June	1	27	0	43	2	20	0	0	1613	17	2	1698	62.89
BLY1B	July	3	8	0	115	0	8	0	0	280	15	6	424	53.00
BLY1B	August	5	11	0	41	1	40	0	0	742	37	6	867	78.82
BLY1B	September	7	11	0	38	2	114	0	0	1019	52	23	1248	113.45
TOTAL	N/A	N/A	83	0	275	7	184	1	0	4268	132	38	4906	59.11
BLY2B	April	10	18	0	17	3	12	1	0	2342	43	2	2420	134.44



BLY2B	May	12	20	0	18	0	2	0	0	1219	14	2	1255	62.75
BLY2B	June/July	2	7	0	1	0	8	0	2	934	22	0	967	138.14
BLY2B	July/August	4	7	0	23	0	8	0	0	1519	69	6	1625	232.14
BLY2B	August	6	9	0	35	6	68	0	1	760	65	19	955	106.11
BLY2B	September	8	7	1	729	3	32	0	1	5876	215	3	6860	980.00
TOTAL	N/A	N/A	68	1	823	12	130	1	4	12650	428	32	14082	207.09
OVERALL TOTAL	N/A	N/A	151	1	1098	19	314	2	4	16918	560	70	18988	125.75

Table 20: Results of Static Detector Survey at Cottam 3b

Location	Month	Deployment Number	Survey Nights	Barbastelle	<i>Myotis Sp</i>	<i>Nyctalus Sp</i>	Noctule	Leislars	Nathusius Pipistrelle	Common pipistrelle	Soprano pipistrelle	Brown Long-eared	Total Passes	Passes Per Night
BLY1A	April	9	19	0	1	0	0	0	0	40	5	0	46	2.42
BLY1A	May	11	7	0	4	7	5	3	0	748	124	5	896	128.00
BLY1A	June	1	27	0	3	48	47	40	201	6198	4537	13	11089	410.70
BLY1A	July	3	9	0	84	2	40	0	0	1396	1072	27	2625	291.67
BLY1A	August	5	12	0	47	6	120	2	2	1627	545	10	2361	196.75
BLY1A	September	7	11	0	57	17	434	0	4	4825	1661	53	7053	641.18
TOTAL	N/A	N/A	85	0	196	80	646	45	207	14834	7944	108	24070	283.18
BLY2A	April	10	22	0	6	1	24	0	0	551	5	0	587	26.68
BLY2A	May	12	20	0	0	0	11	2	0	337	6	8	364	18.20
BLY2A	June/July	2	8	0	12	12	209	3	2	346	11	6	602	75.25
BLY2A	July/August	4	7	0	21	1	9	0	0	526	10	7	577	82.43
BLY2A	August	6	9	0	65	8	772	2	2	2343	114	8	3325	369.44
BLY2A	September	8	11	0	15	1	373	0	0	684	46	1	1120	101.82
TOTAL	N/A	N/A	77	0	119	23	1398	7	4	4787	192	30	6575	85.39
OVERALL TOTAL	N/A	N/A	162	0	315	103	2044	52	211	19621	8136	138	30645	189.17



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