



Immingham Green Energy Terminal

TR030008

Volume 6

6.4 Environmental Statement Appendices

Appendix 8.C: Bat Survey Report

Planning Act 2008

Regulation 5(2)(a) and 5(2)(l)

Infrastructure Planning (Applications: Prescribed
Forms and Procedure) Regulations 2009 (as
amended)

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Infrastructure Planning

Planning Act 2008

The Infrastructure Planning
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Immingham Green Energy Terminal

Development Consent Order 2023

6.4 Environmental Statement Appendices

Appendix 8.C: Bat Survey Report

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Executive Summary

This Bat Survey Report has been prepared by AECOM on behalf of Associated British Ports, to identify the ecological constraints, specifically pertaining to bat species, in connection with the proposed Immingham Green Energy Terminal (“IGET”) (hereafter referred to as the Project). The requirement for bat activity surveys was first identified as part of the preliminary ecological appraisal for the Project in 2022 by AECOM Ltd.

In total, 54 trees were assessed for their suitability to support roosting bats in the strip of woodland east of Laporte road. Of these 54, one tree, a hawthorn, contained a cavity with bat droppings inside. This was classified as a confirmed roost. Four trees were assessed as having high suitability for roosting bats. A further 20 trees were considered to have moderate suitability for roosting bats and 29 trees were considered to have low suitability for roosting bats.

The bat species assemblage at the Site is considered to be of Local level nature conservation value based on the evaluation using the method of Wray et al (2010). Further bat activity surveys are not considered warranted to inform the DCO application, due to the overall appraisal of the Site likely value for bats. It is unlikely that the Site is used on anything other than an occasional and transient basis by small numbers of common species of bats. This is on the basis that the habitats are generally of low quality for foraging and commuting bats and are poorly connected to bat foraging/commuting habitat in the wider local area.

1 Introduction

1.1 Background

- 1.1.1 This Bat Survey Report has been prepared by AECOM on behalf of Associated British Ports (“The Applicant”), to assess the ecological constraints, specifically pertaining to bat species, in connection with the proposed IGET (hereafter referred to as the Project). The Project is located adjacent to Kings Road, Immingham, as shown by the red line boundary on Figure 1 in **Annex A**. All land situated within this red line boundary is hereafter referred to as the Site.
- 1.1.2 The assessment of ecological constraints pertaining to bat species has been undertaken with reference to current good practice (Ref 1-1) and forms part of the technical information commissioned in connection with the Project.

1.2 Purpose of the Bat Report

- 1.2.1 This bat survey report presents ecological information obtained during the following:
- a. Desk-study undertaken during March 2022 and updated in May 2023 to obtain records of bat species within 2km of the Site (the area covered by the desk study is hereafter referred to as the Study Area);
 - b. A preliminary bat roost and habitat assessment of the Site to determine the potential use of the Site by bat species;
 - c. Bat activity surveys (walked transects and automated detector surveys) of suitable habitats within and adjacent to the Site to identify the bat species present and the levels and patterns of bat activity. For the purpose of this report, a subsection of the Site was chosen for bat activity surveys, which were defined after preliminary bat habitat assessments of the Site. This area is referred to as the Bat Activity Survey Area and is shown in **Figure 1** in **Annex A**; and
 - d. A preliminary roost features appraisal of all mature trees within the Site Boundary (limited to consideration of trees within Long Strip woodland, as no other mature trees with potential to support bats were identified within the Site Boundary).

2 Legislation and Planning Policy

2.1 Legislation

2.1.1 The following wildlife legislation is potentially relevant to bats in relation to the Project:

- a. Wildlife and Countryside Act 1981 (as amended) (the “WCA”) (Ref 1-3);
- b. Countryside and Rights of Way Act 2000 (the “CRoW Act”) (Ref 1-4);
- c. Natural Environment and Rural Communities Act 2006 (the “NERC Act”) (Ref 1-5); and
- d. Conservation of Habitats and Species Regulations 2017 (as amended) (the Habitats and Species Regulations) (Ref 1-6).

2.1.2 The above legislation has been considered when planning and undertaking the commissioned survey work using the methods described in **Section 3**; when identifying potential constraints to the Project; and when making recommendations for further survey, design options and mitigation, as discussed in **Section 4**. Compliance with legislation may require the attainment of relevant protected species licences prior to the implementation of the Project.

2.1.3 All bat species and their roosts are legally protected in the UK under the Habitats and Species Regulations, which implemented the EC Directive 92/43/EEC (the Habitats Directive) (Ref 1-6). In addition, Barbastelle (*Barbastella barbastellus*), Lesser and Greater Horseshoe bats (*Rhinolophus hipposideros* and *Rhinolophus ferrumequinum*) and Bechstein’s bat (*Myotis bechsteinii*) are listed in Annex II of the Habitats Directive, which required sites to be designated in member states for their protection. Although the UK left the European Union, amendments to the Regulations in 2019 provided continuity of legal protection for species and designated sites. Bats and their roosts are also protected under the WCA (Ref 1-3).

2.1.4 Taken together, the Habitats and Species Regulations and the WCA make it illegal to:

- a. Deliberately capture or intentionally take a bat;
- b. Deliberately or intentionally kill or injure a bat;
- c. Be in possession or control of any live or dead bat or any part of, or anything derived from a bat;
- d. Damage or destroy a breeding site or resting place of a bat;
- e. Intentionally or recklessly obstruct access to any place that a bat uses for shelter or protection;
- f. Intentionally or recklessly disturb a bat while it is occupying a structure or place that it uses for shelter or protection; and

- g. Deliberately disturb bats, in particular any disturbance which is likely to (i) impair their ability to survive, breed, reproduce or to rear or nurture their young; or in the case of hibernating or migratory species, to hibernate or migrate; or (ii) affect significantly the local distribution or abundance of the species to which they belong.

2.1.5 A bat roost is defined as any structure a bat uses for breeding, resting, shelter or protection. It is important to note that since bats tend to re-use the same roost sites, current legal opinion is that a bat roost is protected regardless of whether the bats are present at a specific point in time.

2.2 Planning Policy

2.2.1 Section 40 of The NERC Act 2006 (as amended by the Environment Act, 2021) places a legal obligation on public bodies in England to further the general biodiversity objective, which is the conservation and enhancement of biodiversity in England (Ref 1-5). This 'biodiversity duty' includes habitats and species of principal importance for nature conservation in accordance with the requirement set through Section 41 of the Act. Section 41 includes seven bats as species of 'principal importance':

2.2.2 Planning Authorities must be satisfied that the favourable conservation status of bats (and other European Protected Species) can be maintained before granting planning permission. Favourable conservation status describes the situation in which a habitat or species is thriving throughout its natural range and is expected to continue to thrive in the future. It includes all occurrences of a habitat or species, both those in the wider environment and those in protected sites. (Ref 1-7).

2.3 European Protected Species Mitigation Licences

2.3.2 Although the law provides strict protection for bats, it also allows this protection to be set aside (derogated) under Regulation 53 of the Conservation of Habitats and Species Regulations through the issuing of European Protected Species Mitigation Licences ("EPSML") for the purpose of preserving public health; public safety; other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment (Ref 1-6). However, in accordance with the requirements of the Conservation of Habitats and Species Regulations a licence can only be issued where the following requirements are satisfied:

- a. There is no satisfactory alternative.
- b. The action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

2.3.3 An application for an EPSML includes the information required for Natural England to determine the licence, including survey information, assessment and details of working practices and mitigation measures required to ensure that the favourable conservation status of the population of bats using the features which will be affected is not adversely affected.

3 Methodology

3.1 Desk Study

3.1.1 The following sources of information were used to gain background information on the status and distribution of bats in the vicinity of the Project:

- a. Lincolnshire Environmental Records Centre (“LERC”) (Ref 1-9) for bat species records and sites designated in relation to bats, within 2km of the Project; and
- b. MAGIC website (Ref 1-10) - information on granted European Protected Species Mitigation (“EPSM”) licences for bats issued by Natural England within 2km of the Project.

3.2 Competency of Surveyors

3.2.2 All field surveys were led by competent ecologists, familiar with bat ecology and surveying, with the relevant class licences for the survey type.

3.2.3 Prior to start of the night surveys, a daytime site visit was undertaken by the lead surveyor in order to plan the works, assess any health and safety issues on site, and record the context of the survey locations.

3.3 Potential Roost Features Appraisal

3.3.1 A Potential Roost Features appraisal survey was initially carried out on all mature trees identified within the West Site on 21 March 2022. Licensed bat ecologists (with a minimum Level 1 Class Licence) and assistants externally surveyed all relevant trees from ground level for their suitability for roosting bats. There were no buildings or structures on Site to be assessed.

3.3.2 A Potential Roost Features appraisal survey was carried out on the 16 and 17 February 2023 on mature trees within the woodland strip east of Laporte Lane (Long Strip Woodland). This was carried out by licensed bat ecologists (with a minimum Level 2 Class Licence). All trees within the woodland were assessed for Potential Roost Features with suitability for roosting bats, including:

- a. Holes, cankers, cracks, callus rolls, splits or cavities within trees;
- b. Lifted plates of bark;
- c. Crevices under thick-stemmed ivy; and
- d. Dark, sheltered and undisturbed spaces.

3.3.3 During the assessment a search was also undertaken for any evidence of bat use, including:

- a. Presence of any live or dead bats;
- b. Bat droppings within a feature, around an entrance to a feature or underneath a feature;
- c. Feeding remains;
- d. Stains around crevice entrance holes;

- e. Scratch marks or smoothly polished surfaces around entrance holes; and
- f. Odours or noise characteristic of bats.

- 3.3.4 Use of a GPS was made to accurately record the location of trees, along with photos and notes recorded in line with guidance (Ref 1-11). During the survey, any trees were viewed from the ground. If appropriate at this stage, a high-powered torch and an endoscope were used to inspect accessible features (undertaken by appropriately licensed ecologists only). During the surveys, signs of bats, such as staining and droppings were searched for and recorded (see full method in **Annex B, Table B1**).
- 3.3.5 Based on the results of the Potential Roost Features appraisal, buildings and trees were categorised as having Negligible, Low, Moderate, or High suitability for roosting bats, or noted as a Confirmed roost, in accordance with the criteria detailed in **Table 1**.
- 3.3.6 No other mature trees with the potential to support roosting bats were identified in any part of the Site. There are no buildings or structures within the Site Boundary.

Table 1: Criteria for Assessing the Suitability of Potential Roost Features

Suitability for Roosting Bats	Descriptions for Trees
Confirmed	Confirmed signs of bat presence/occupation (droppings, oily staining around entry points, insect remains, odour, scratching) and actual bat presence.
High	A tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potential for longer periods of time due to their size, shelter, protection, conditions (e.g. temperature, humidity, height above ground level, light levels or levels of disturbance) and surrounding habitat.
Moderate	A tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status.
Low	Tree of sufficient size and age to contain potential roost features but with none seen from the ground or features seen have only very limited roosting potential.
Negligible	Trees with no potential to support bats.

Source: Category descriptions drawn from Collins, 2016 (Ref 1-1) to be applied using professional judgement

- 3.3.7 The results informed the requirement for more detailed survey work to confirm the presence or likely absence of bat roosts including potential roost feature survey and/or emergence/re-entry surveys. Where the presence of roosting bats was confirmed through any of the previous surveys roost characterisation surveys were undertaken to attempt to determine the roost type(s) and species present (see full method in **Annex B, Table B2**).

3.4 Bat Activity Surveys

Walked Transect Surveys

- 3.4.1 In accordance with best practice guidance, a combination of walked transect surveys and automated detector surveys were used to characterise bat activity within and adjacent to the Project once per month in June, July, August and September to cover the spring, summer and autumn survey periods.
- 3.4.2 Walked transect surveys were undertaken in three periods (spring- June, summer- July/August and autumn-September) at dusk on accessible land. This survey effort was considered to be suitable, based on the assessed low habitat suitability for bats (see **Annex A, Figure A3**), comprising two strips of woodland, north and south of Laporte Road. The surveys involved walking a defined transect route that provided representative coverage of the habitats of potential value to bats, defined as the Bat Activity Survey Area.
- 3.4.3 Each activity survey involved two surveyors walking the transect route which included a series of 'spot counts' at pre-determined points along the transects (shown as 'P' on **Annex A, Figures A3**). These 'spot count' points were located at potentially important features with regards to foraging or commuting bats. At each point surveyors stopped and recorded bat activity for three minutes using bat echolocation detectors. All activity encountered whilst walking between points was also noted. The survey route was designed to include potential flight paths or foraging areas within the Site, and also potential roost sites. The starting points and walked direction of the transects were varied during each survey visit in order to ensure different areas of the transect were walked close to dusk.
- 3.4.4 Surveyors carried bat echolocation detectors to help determine which species were present. In accordance with survey guidelines (Ref 1-1, Ref 1-11, and the surveys were carried out from sunset to at least two hours after sunset (as summarised in **Annex B**). The time, location, numbers, species (where possible) and direction of flight were recorded for each bat pass (discrete burst of echolocation heard, or bat activity observed) during the survey. Echolocation calls detected were analysed with specialist software comprising Kaleidoscope or Analook W to verify bat calls where required in accordance with AECOM technical review procedures (Ref 1-8). Survey visits were conducted in this way where weather conditions allowed, with surveys scheduled to avoid nights with cold (>7°C), wet or windy conditions.

Table 2: Bat activity Transect Survey Dates and Weather Conditions

Month	Date	Weather Conditions	Sunset Time	Start Time	End Time
June	23/06/2022	17°C, slight breeze, 60% cloud cover, dry.	23:35	21:20	23:35
July	28/07/2022	17°C, breeze, 60% cloud cover, dry.	21:05	20:50	23:05

Month	Date	Weather Conditions	Sunset Time	Start Time	End Time
August	17/08/2022	17°C, no wind, 0% cloud cover, dry,	20:28	20:26	22:28
September	26/09/2022	11°C, no wind, 100% cloud cover, recent rain, dry during survey.	18:50	18:45	20:50

Automated Detector Surveys

- 3.4.5 In addition to the transect surveys, two automated static bat detectors (SM2BAT+ and SM4 automated detectors) were placed in locations that were considered to be representative of the main habitats of value to bats within and adjacent to the Project:
- Location 1 - North of Laporte Road within the linear belt of woodland.
 - Location 2 - South of Laporte Road within the linear belt of woodland.
- 3.4.6 All microphones were located at least 1m above the ground on trees, and clear of vegetation between the adjacent habitats and the microphone. All detectors were set on default settings to record in full spectrum. The locations of the static detectors are shown on **Annex A, Figure A3**.
- 3.4.7 The detectors recorded bats for a minimum of five consecutive nights in June to September 2022. These dates were 9 – 13 June, 27 – 31 July, 17 – 21 August, and 20 – 24 September. (See deployment dates and weather in **Table 3**).
- 3.4.8 Temperature, rain/wind conditions were recorded at the nearest weather station (Humberside Airport) using online resources (i.e. <https://www.wunderground.com/history>). Weather data was taken into consideration in the analysis. Where any prolonged period of strong wind >25mph or rain was experienced the static detectors were left for longer on site to obtain sufficient data during optimum weather conditions for bat activity.

Table 3: Automated Detector Survey Dates and Temperatures for Static Detectors

Month	Date	Temperature Range °C*	Average Wind Speed km/h*	Rain mm*
June	09 June 2022	11-20	15	0
	10 June 2022	12-23	13	0
	11 June 2022	11-21	12	0
	12 June 2022	11-18	15	0
	13 June 2022	10-19	6	0

Month	Date	Temperature Range °C*	Average Wind Speed km/h*	Rain mm*
July	27 July 2022	12-22	14	0
	28 July 2022	14-22	5	0
	29 July 2022	10-22	6	0
	30 July 2022	16-23	16	0
	31 July 2022	13-22	12	0
August	17 August 2022	14-19	13	0
	18 August 2022	15-24	5	0
	19 August 2022	13-22	12	0
	20 August 2022	12-25	10	0
	21 August 2022	14-24	5	0
September	20 September 2022	10-19	7	0
	21 September 2022	12-20	6	0
	22 September 2022	10-20	10	0
	23 September 2022	10-19	12	0
	24 September 2022	9-17	7	0

*Obtained from <https://www.wunderground.com/history>

3.5 Bat Data Analysis

Activity surveys

3.5.1 Bat call recordings were analysed using Kaleidoscope and AnaloookW software. The transect data were described in relation to species, number of passes (and where possible number of bats), observed behaviour, temporal and spatial trends. The static detector data collected were analysed to determine the total number of bat passes for each species or species group (depending on the level of identification possible from the recordings made) and then used to derive a metric - the Bat Activity Index ("BAI") for the bat activity at each survey location.

3.5.2 These analyses provide an indication of:

- a. Seasonal variation in species activity and composition at each survey location.
- b. Relative levels of bat activity across the site.
- c. Potential roosting sites, important foraging areas and commuting routes.

Bat activity index (“BAI”)

3.5.3 BAI values were calculated by averaging the total number of bat passes per hour for each static detector unit at each location per month. The term ‘pass’ is defined as a single file made up of bat pulses of a single species i.e. this may be one bat in a file, or many bats in a single file.

3.5.4 For the purposes of analysis, bat activity has been quantified using the average (mean) number of bat passes per hour of night (actual number of hours between sunset and sunrise). There is currently no published guidance on the categorisation of bat activity levels based on the number of bat passes (Ref 1-11). The following scale has been used in this report:

- a. Very Low Activity = mean of <2 passes per hour (at each survey location);
- b. Low Activity = mean of 2 to 25 passes per hour;
- c. Moderate Activity = mean of 26 to 99 passes per hour; and
- d. High Activity = mean of over 100 passes per hour.

3.6 Evaluation of Nature Biodiversity Value

3.6.1 A hierarchical geographical approach used to assign biodiversity importance (i.e. sensitivity) of any bat roosts, and bat foraging and commuting habitat associated with the site is based upon Guidelines for Ecological Impact Assessment in the UK and Ireland (Ref 1-13), and Valuing Bats in Ecological Assessment (Ref 1-11) and professional judgement. It is acknowledged that in the Guidelines of Ecological Impact Assessment guidelines ‘Importance’ is used as opposed to Valuing Bats in Ecological Assessment which uses ‘Value’. The geographical frames of reference and method of determination used in the assessment is similar and therefore the use of ‘Importance’ and/or ‘Value’ for ecological features is interchangeable in this context. Refer to **Annex B** for full details on the methodology used to determine biodiversity importance.

3.6.2 Reference has also been made where required to:

- a. Natural England Joint Publication JP025: A Review of the Population and Conservation Status of British Mammals (Ref 1-12);
- b. NERC Act S41 list of species of principal importance (Ref 1-5);
- c. Local Biodiversity Action Plans, including Lincolnshire Biodiversity Action Plan (Ref 1-14);
- d. Bat Roosts in Trees: A Guide to Identification and Assessment for Tree-Care and Ecology Professionals (Ref 1-15); and
- e. The State of the UK’s Bats 2017: National Bat Monitoring Programme Populations Trends (Ref 1-16).

3.6.3 The importance presented reflects the currently known distribution within the Study Area.

3.7 Limitations

- 3.7.1 Data collection in May 2022 was missed due to access constraints, therefore a transect was carried out in June 2022. This was not seen as a constraint. An additional transect was then carried out in August 2022 as the weather in 2022 had been unusually dry, which would have affected abundance and activity of insects. As this had been considered a constraint, so additional data was collected.
- 3.7.2 The identification of bat echolocation calls recorded by bat detectors is not always possible due to poor quality recordings, which can be a result of bats recorded at distance, interference caused by weather, or bats altering their calls in response to different environmental factors.
- 3.7.3 In addition, species identification within a genus is not always possible due to the similar echolocation call characteristics of closely related bat species; this is particularly true for different species within the *Myotis* genus. When identification to species level cannot be accurately made, calls are identified to genus level (for example, *Myotis* species) or as 'Unknown'.
- 3.7.4 There were no other limitations that affected the survey results.

4 Results

4.1 Desk Study

- 4.1.1 There are no sites designated with bats as a qualifying feature within 2km of the Project.
- 4.1.2 The desk study returned a small number of desk study records of unidentified species of bats within the wider Immingham area. There were no records of roosts within 2km.
- 4.1.3 There are no records of granted EPSM licence applications for bats within 2km of the Site on the MAGIC website.
- 4.1.4 No bat activity surveys were undertaken for the 2013 planning application on the West Site (Ref: DM/1027/13/OUT) because the habitats were concluded to be sub-optimal for foraging bats, mainly as a result of the lack of connectivity between the habitats on Site, and suitable bat foraging/commuting habitat in the wider local area.

4.2 Preliminary Roost Features Appraisal

- 4.2.1 In February 2023, a total of 54 trees were assessed for their suitability to support roosting bats in the strip of woodland on the northern side of Laporte Road, within the northern section of Tree Preservation Order (“TPO”) woodland referred to as ‘Long Strip Woodland’. Of these 54 trees, one mature hawthorn (*Crataegus monogyna*) was found to contain a cavity with bat droppings inside. This was classified as a confirmed roost.
- 4.2.2 A total of four trees were assessed as having high suitability for roosting bats, and 20 trees were assessed as having moderate suitability for roosting bats. Dusk emergence and dawn re-entry surveys of trees with moderate and high bat roost potential that will be impacted by the Project are ongoing and will be completed by the end of August/early September.
- 4.2.3 A total of 29 trees were assessed to have low suitability for roosting bats and do not require further survey prior to felling/pruning.
- 4.2.4 A plan showing the location of the trees relative to the Site Boundary is shown in **Figure 2** in **Annex A**.
- 4.2.5 Detailed information on the trees and their roost features is provided in **Table C1** in **Annex C**.

4.3 Bat Activity Surveys

Walked Transect Surveys

- 4.3.1 The results of the walked bat activity transects are summarised below. Raw survey data is provided in **Tables D1 – D4** in **Annex D**.
 - a. June 2022 (**Table D1** in **Annex D**) – recorded bat activity was extremely low, with one noctule (*Nyctalus noctula*) recorded at 22:45 hrs and one common pipistrelle (*Pipistrellus pipistrellus*) recorded at 23:36 hrs.

- b. July 2022 (**Table D2 in Annex D**) – no bats were recorded during the survey.
- c. August 2022 (**Table D3 in Annex D**) – bat activity was extremely low, with records limited to one common pipistrelle pass at 22:21 hrs.
- d. September 2022 (**Table D4 in Annex D**)– bat activity was extremely low, with one common pipistrelle recorded at 19:49 hrs and one soprano pipistrelle recorded at 19:55 hrs. Both these species were observed foraging along the woodland strip north of Laporte Road.

Static Automated Detector Surveys

- 4.3.2 A summary of the bat species and the BAI recorded at each static automated detector location are provided below and within **Table 5** with full results in **Annex E, Tables E1 – E2**.
- 4.3.3 Analysis of bat call recordings from the automated detectors revealed the presence of at least five bat species at the Site: common pipistrelle, soprano pipistrelle, noctule, Leisler’s (*Nyctalus leisleri*) and *Myotis* species. The vast majority of recordings at both locations were of common pipistrelle. A very small number of recordings were made of noctule, a single Leisler’s record and unidentified bats in the *Myotis* genus.
- 4.3.4 At Location 1, indicative bat activity levels ranged from very low in June, to low in July and very low in in August and September. The majority of bat activity at this location was by common pipistrelle bats. The single Leisler’s record was recorded in July. This is likely an individual passing through the area.
- 4.3.5 At Location 2, indicative bat activity levels remained very low during the entire survey period. Activity again was mainly that of common pipistrelle, with a spike in noctule activity in September. This is a transitional time of year for noctule, when bats leave summer breeding areas and move to autumn swarming sites and therefore a larger number of post-breeding individuals may have been passing through the area.

Table 4: Summary of Automated Detector Survey Results

Number of Passes per Bat Species (total over 5 nights)							Total bat passes (over 5 nights)	Bat Activity (passes/ hour, mean of 5 nights)	Indicative Bat Activity Level
Month	Common Pipistrelle	Soprano pipistrelle	Pipistrelle sp	Noctule	Leisler	Myotis sp.			
Location 1									
June	526	0	0	14	0	0	540	1.12	Very Low
July	2713	3	0	8	1	0	2725	5.69	Low

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Number of Passes per Bat Species (total over 5 nights)							Total bat passes (over 5 nights)	Bat Activity (passes/ hour, mean of 5 nights)	Indicative Bat Activity Level
Month	Common Pipistrelle	Soprano pipistrelle	Pipistrelle sp	Noctule	Leisler	Myotis sp.			
August	233	6	19	18	0	6	282	0.42	Very Low
September	163	22	0	4	0	3	192	0.3	Very Low
Location 2									
June	449	7	1	12	0	93	562	1.17	Very Low
July	646	2	0	1	0	5	654	1.36	Very Low
August	289	0	8	7	0	1	305	0.46	Very Low
September	384	0	0	122	0	0	506	0.79	Very Low

5 Conclusions and Evaluation

5.1 Roosting Bats

5.1.1 Further surveys are ongoing in the woodland of trees with moderate and high bat roost potential that will be impacted by the Project to establish whether any roosts are present and if so, to establish the species roosting and the status of the roost. However, in the absence of further survey results at this stage, the general lack of bat activity records, particularly around the dusk and dawn periods indicate that there are unlikely to be any significant (e.g. large numbers of bats or rare species) roosting within the trees. The vast majority of activity was by common pipistrelle bats, although activity levels were very low and not indicative of regular roosting within the woodland. The records were not typically associated with the dusk or dawn periods, times when bats would be leaving/entering roosts and would be expected to be recorded if a roost was nearby. Any loss of trees is therefore unlikely to impact anything other than a small number of single/low numbers of common species of roosting bats, mainly common pipistrelle.

5.1.2 The results of further bat emergence and re-entry surveys of trees will be provided once the surveys are completed in late August/ early September. The full results of these surveys will be submitted into the Examination at the first opportunity.

5.2 Foraging/Commuting

5.2.1 A combination of walked bat activity transects and automated detector surveys identified of at least five bat species using the woodland habitat associated within the Site. Very low levels of activity were recorded by all other species, which include those that are considered to be common (noctule, soprano pipistrelle) and rare (Leisler's bat) (Ref 1-11). Leisler's bat was only recorded on a single occasion in July; this is likely to have been an individual migrating through the area.

5.2.2 Average levels of bat activity recorded on automated detectors were very low in most months and this is consistent with the observations made about habitat quality in the initial assessment, and observations made on transect surveys.

5.3 Evaluation

5.3.1 Using the scoring system recommended in Wray *et al* (2010) (Ref 1-11), the bat species assemblage using habitats within the Site for foraging/commuting was valued at a **Local** level. The determination of value using this system is summarised in **Table F1** and further details are provided in **Annex F**.

5.3.2 Although bat roost surveys of trees within Long Strip woodland have not yet been completed, there is at least one confirmed tree roost within the woodland; likely to be a transient summer roost used by single/small numbers of common pipistrelle (or other common species of bat).

5.3.3 The bat species assemblage at the Site is considered to be of **Local** level nature conservation value only. The habitats are generally of low quality for foraging and commuting bats, and are poorly connected to bat foraging/commuting habitat in the wider local area. The woodland, although of potentially higher value for roosting, foraging and commuting bats than other parts of the Site, is relatively isolated within the surrounding industrial and farmed landscape, and supports only small numbers of common species of bats.

Table 5: The Biodiversity value of Bat Species Present within the Survey Area (based on Wray *et. al.*, 2010)

Species	Rarity	Number of Bats	Roosts/potential roosts nearby	Type and complexity of habitat	Score	Value
Common pipistrelle	Common (2)	Small (10)	Small number (3)	Larger or connected woodland blocks, mixed agriculture, and small villages/hamlets (4)	2+10+3+4=19	Local
Soprano pipistrelle	Common (2)	Individual (5)	Small number (3)		2+5+3+4=14	Local
Noctule	Rarer (5)	Individual (5)	Small number (3)		5+5+3+4=17	Local
Leisler's	Rarer (5)	Individual (5)	Small number (3)		5+5+3+4=17	Local
Myotis species	Rarer (5)	Individual (5)	Small number (3)		5+5+3+4=17	Local
Overall Value of Bat Assemblage						Local

6 References

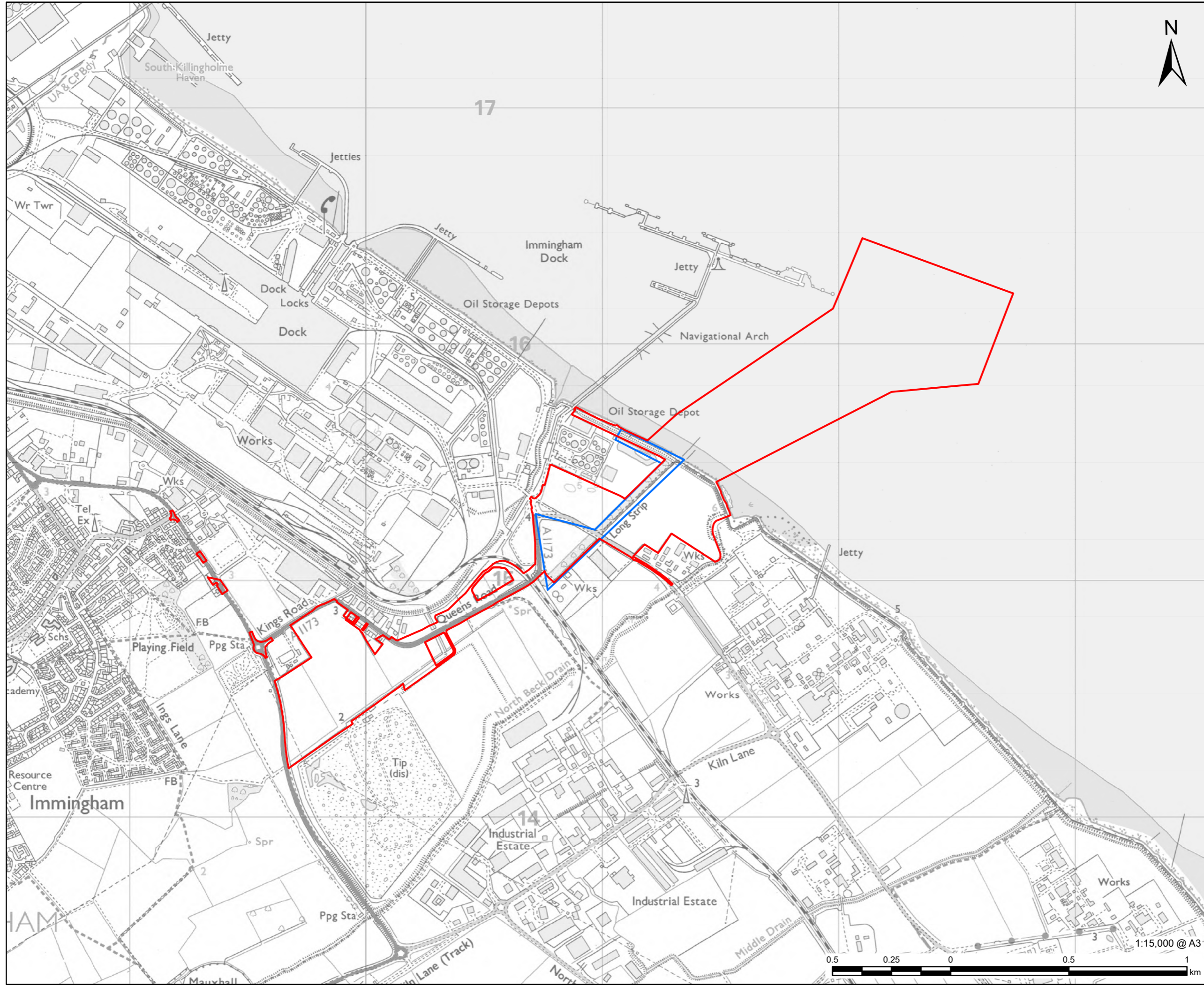
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- Ref 1-4 Countryside and Rights of Way Act 2000
- Ref 1-5 Natural Environment and Rural Communities Act 2006 (as amended by The Environment Act 2021).
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- Ref 1-15 Andrews, H. (2018). Bat Roosts in Trees: A Guide to Identification and Assessment for Tree-Care and Ecology Professionals. (2018)
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Annex A: Figures

Figure 1. Site Boundary and Bat Activity Survey Area

Figure 2. Transect Route and Bat Detector Locations

Figure 3. Preliminary Roost Assessment tree locations



PROJECT
 Immingham Green Energy Terminal

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LEGEND

- Site Boundary
- Bat Activity Survey Area

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 Environmental Statement

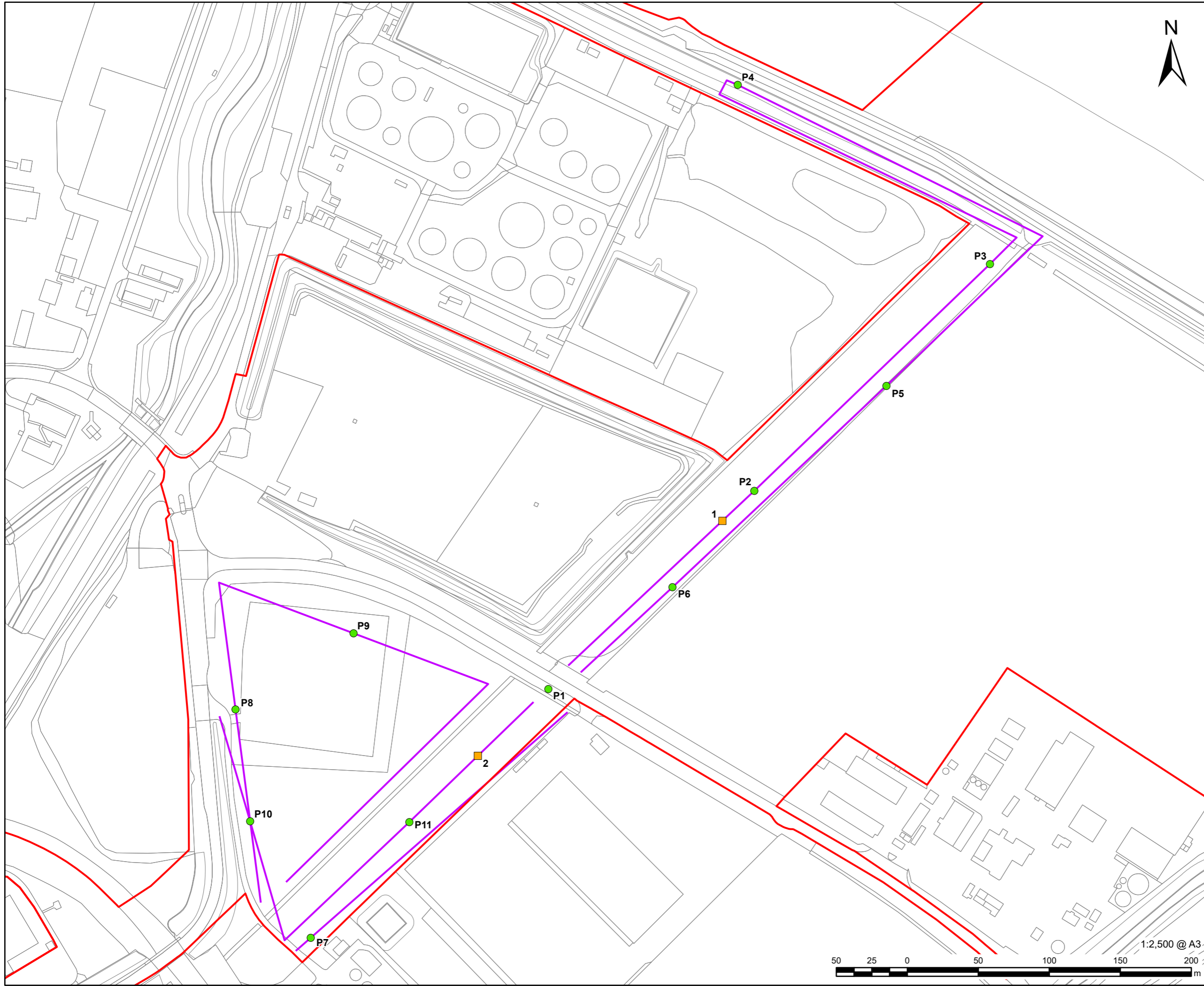
PROJECT NUMBER
 60673509

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FIGURE TITLE
 Site Boundary

FIGURE NUMBER
 Figure 1

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LEGEND

- Site Boundary
- Transect Line
- Stopping Point
- Static Bat Detector

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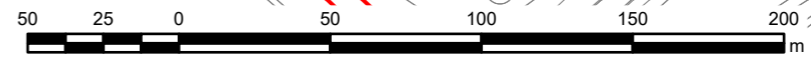
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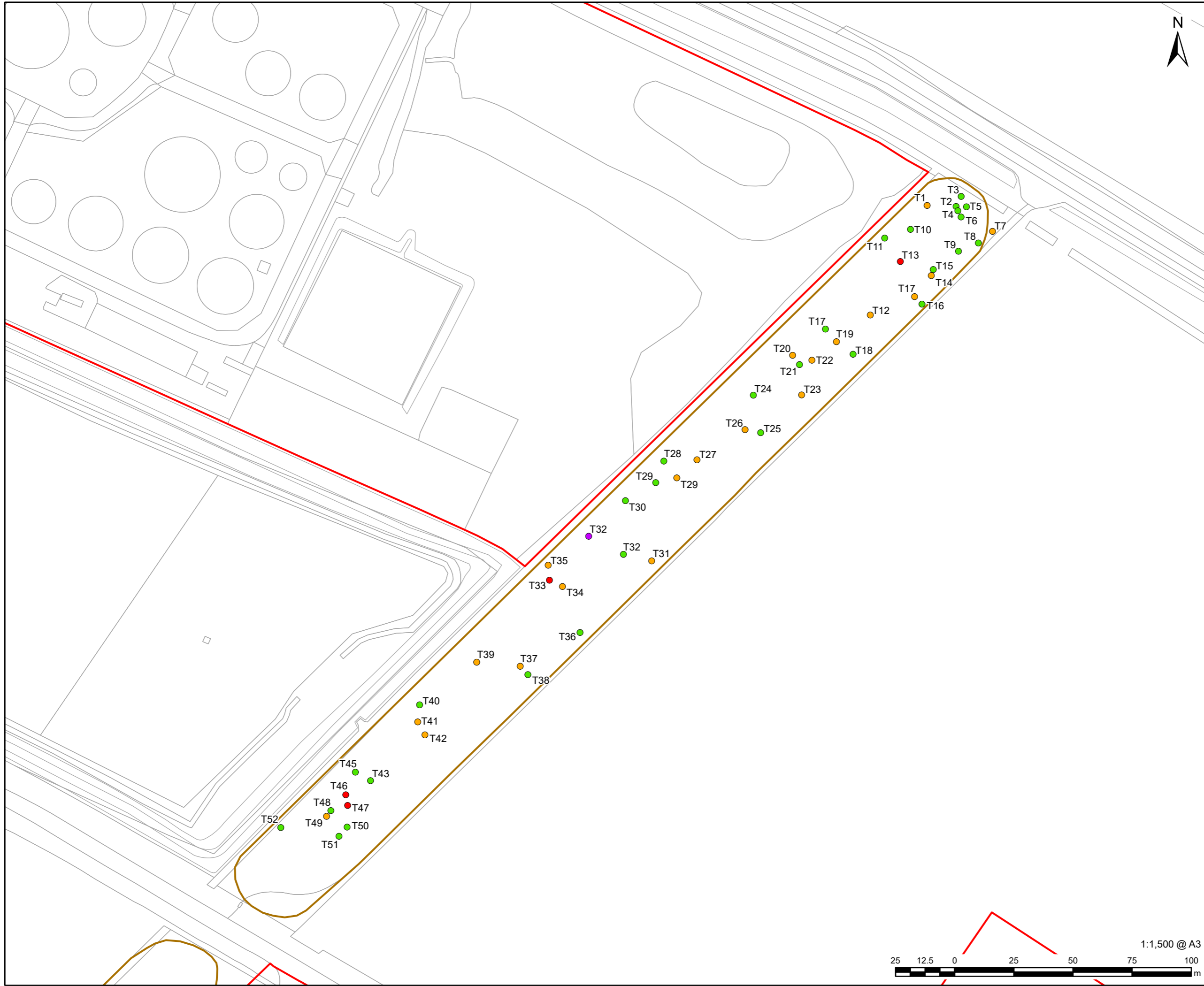
FIGURE TITLE
Transect Route and Static Bat Detector Locations

FIGURE NUMBER
Figure 2



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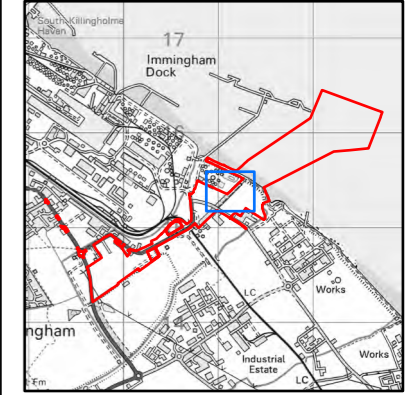


LEGEND

- Site Boundary
- TPO Area Boundary

Bat Roost Suitability:

- Confirmed
- High
- Moderate
- Low



NOTES

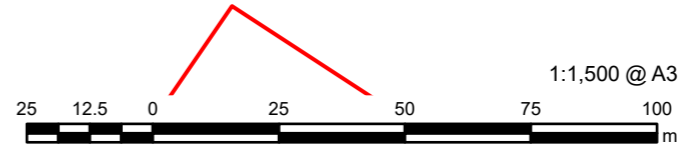
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ISSUE PURPOSE
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PROJECT NUMBER
60673509

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TR030008

FIGURE TITLE
Bat Roost Suitability



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Annex B: Preliminary Bat Roost Assessment Methodology

Table B1. Survey Methodology for Assessing Potential Roost Features (PRFs)

Buildings (also application to other structures)

Bats utilise many different features in buildings for places of shelter and roosting. Features that should be observed, noted and graded (in accordance with criteria in table B2 below) during the external and internal survey of buildings includes:

External

External features associated with each building are visually inspected for their suitability for use by roosting bats. Equipment includes close focusing binoculars and powerful spot-lamps were used to study the walls, eaves and roofs of the buildings. Inspection mirrors and endoscopes are used as required.

Bats are able to enter a roosting cavity through small gaps at least 20mm wide. However, bats usually also require an area to land that is adjacent to the entrance hole and has a rough surface. Such features are looked for during the inspection.

Features include; gaps in ridge tiles (where mortar is missing) gaps under roof tiles or slates, lead flashing around chimney stacks and around dormer windows, gaps under the fascias and soffits, weatherboarding, missing mortar from joints in stone/brickwork, roof valleys and hips.

Special attention is paid to the areas directly below any potential access/ egress point in an attempt to identify any accumulation of bat droppings.

No work involving multi-sectional ladders over 5m in height should be undertaken as part of the external survey.

Internal (not applicable to this survey)

The most effective method of determining the presence of bat activity within a building is by the presence of their droppings. Bats deposit droppings in both roost and social areas, but the use of such sites by bats can change due to prevailing weather conditions or the time of year.

The internal inspection involves surveying all surfaces window ledges, rough wall surfaces, floors, cobwebs, cupboard tops and any relatively undisturbed surface.

Areas of particular interest (but not restricted to) are the tops of gable end walls, top of the ridge beam, hip and other roof beams, mortise joints, junction of roof beams, areas around chimney breasts, between roof tiles and felting.

Other features, such as accumulations of discarded wings of moths or butterflies are also recorded where present. Certain bat species are more likely than others to deal with prey items and leave evidence such as this, and so such features can help identify the species present. Similarly, the location of the droppings are recorded as this can provide an indication of both the species and the type of roost that is present.

Trees

Surveys can be undertaken at any time of year, but should preferably be carried out when the trees are not in full leaf, to aid the viewing of PRFs. Any constraints to surveys should always be noted.

The scoping survey to identify the existence of PRFs should include checks for the presence of the following features that bats might be able to use to determine features with the potential to support bats in accordance with criteria in the table below:

- a. Natural holes (e.g. Knot holes) arising from naturally shed branches, or branches previously pruned back to the branch collar.
- b. Man made holes (e.g. Cavities that have developed from flush cuts) or cavities created by branches tearing out from parent stems.
- c. Woodpecker holes, cracks/splits in stems or branches (both vertical and horizontal).
- d. Partially detached or loose, platy bark.
- e. Cankers (caused by localized bark death) in which cavities have developed.
- f. Other hollows or cavities, including butt rots.
- g. Compression forks with included bark, forming potential cavities.
- h. Crossing stems or branches with suitable space between for roosting;
- i. Ivy stems with diameters in excess of 50mm with suitable roosting space behind (or where a roosting space can be seen where a mat of thinner stems has left a gap between the mat and the trunk).
- j. Bird and bat boxes on trees; or l) other features that offer a place of shelter.

NOTE: Roosts of some species can occur very low on trees so PRFs can be found at all heights.

Table B2. Criteria used to describe the level of suitability/risk of a potential roost feature (PRF) supporting roosting bats

Suitability/Risk	Description of Roosting Habitats
Negligible	Structure or tree with no or very limited roosting opportunities for bats. Feature may be isolated from foraging habitat.
Low	Structure or tree with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain PRF(s) but with none seen from the ground or features seen with only very limited roosting potential with a limited number of roosting opportunities. Low proximity and connectivity to low or moderate quality foraging habitat.
Moderate	Structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only –the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed). Often will have some connectivity and proximity to moderate or high quality foraging habitat.

Suitability/Risk	Description of Roosting Habitats
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially longer periods of time due to their size, shelter one or more species of bat. With good connectivity to high quality foraging habitat.
Confirmed Roost	Presence of bats or evidence of bats. Confirmation of roost status may require further Roost Characterisation Survey.

Notes:

- a. This report uses the terms negligible, low, moderate, etc to assess suitability for bats as per the levels shown in the table above. The BS 8596:2015 Surveying for bats in trees and woodland uses the term 'Risk' when assigning these categories to PRFs. Suitability is the preferred term to use.
- b. The Negligible category is used where a feature has been inspected and found not to contain any features of use to bats, and hence provides confirmation that a feature has been inspected or considered.
- c. For buildings/structures with PRFs assessed as having Low to High suitability, further surveys are likely to be required in accordance with standard survey guidance to attempt to determine roost presence/absence. There is provision for the professional bat ecologist to decide on whether further surveys are needed for low suitability buildings.
- d. For tree PRFs assessed as having Moderate to High suitability, further surveys are likely to be required in accordance with standard survey guidance to attempt to determine roost presence/absence (see Ref 1).
- e. Confirmed Roosts may require Roost Characterisation Surveys to inform planning/mitigation requirements.

Annex C: Preliminary Roost Features Appraisal Survey Data

Table C1: Preliminary Roost Assessment results

Tree ID	Species	Description (see Figure 3 for tree locations)	DBH	Roost Potential
1	Ash	Semi-mature ash tree with ivy-clad up to 4m. PRFs within dead broken branch	40	Moderate
2	Hawthorn	Hawthorn with ivy clad	20	Low
3	Hawthorn	Large hawthorn with ivy-clad	40	Low
4	n/a	Tree stump with ivy clad	50	Low
5	Hawthorn	Large hawthorn with ivy-clad and small cracks in bark	40	Low
6	Ash	Large cavity on east face, inside the cavity there are smaller cavities however they are exposed.	45	Low
7	Ash	Large deep cavity with large trunk cavity facing east.	60	Moderate
8	Hawthorn	Large hawthorn with ivy clad. t309 in gis layer	50	Low
9	Oak	Large semi-mature oak with small cracks in bark and branch	50	Low
10	Hawthorn	Hawthorn with small trunk cavity	15	Low
11	Oak	Small oak with trunk cavity	20	Low
12	Oak	Semi-mature oak with multiple branch holes	50	Moderate
13	Ash	Large semi-mature ash with two branch holes which appear to have staining	55	High
14	Ash	Large semi-mature ash with branch hole and trunk cavity	45	Moderate
15	Oak	Semi-mature oak with small trunk hole	25	Low
16	Ash	Semi-mature ash with exposed trunk cavity	0	Low
17	Oak	Small semi mature oak with branch cavity	20	Low
17.2	Ash	Semi-mature ash with woodpecker hole and branch hole with branch cavity	25	Moderate
18	Ash	Semi-mature ash with branch hole	40	Low

Tree ID	Species	Description (see Figure 3 for tree locations)	DBH	Roost Potential
19	Ash	Semi-mature Ash with large trunk cavity	30	Moderate
20	Oak	Small oak with woodpecker holes	20	Moderate
21	Ash	Large semi-mature Ash with branch exposed cavity	35	Low
22	Ash	Large semi-mature Ash with branch and woodpecker holes	45	Moderate
23	Ash	Large semi-mature Ash with multiple holes in branch	60	Moderate
24	Ash	Large semi-mature Ash with branch hole	40	Low
25	Ash (dead)	Dead ash tree with multiple shallow cavities	30	Low
26	Ash	Large semi-mature Ash with multiple woodpecker holes	40	Moderate
27	Ash	Semi-mature ash with two trunk cavities	45	Moderate
28	Ash	Semi-mature ash with exposed trunk cavities	40	Low
29	Ash (dead)	Small dead tree with small, exposed trunk cavity and cracked in bark	20	Low
29.2	Ash	Semi-mature Ash with large hollow trunk cavity up most of its height, and ivy clad	45	Moderate
30	Hawthorn	Small hawthorn tree with small trunk cavities and exposed hollow trunk	20	Low
31	Ash	Semi-mature Ash with dead branch cavity, ivy clad and partially hollow trunk.	40	Moderate
32	Hawthorn	Large hawthorn, with small trunk cavity leading into trunk hollow. Confirm bat dropping.	30	Confirmed
32.2	Ash	Large mature ash with broken branch, leaving exposed cavity	40	Low
33	Ash	Semi-mature ash tree with trunk hole leading into large cavity.	35	High
34	Ash	Semi-mature ash with branch hole leading into trunk cavity	0	Moderate
35	Oak	Semi-mature oak with trunk hole leading into trunk cavity	40	Moderate

Tree ID	Species	Description (see Figure 3 for tree locations)	DBH	Roost Potential
36	Oak	Mature oak with small hole in branch cutting and small exposed cavities in broken branch	50	Low
37	Ash	Mature ash with wood peck hole and large trunk cavity	40	Moderate
38	Ash	Mature ash with dead branches and exposed trunk cavity	35	Low
39	Oak (dead)	Dead oak tree, partially fell with trunk cavity and branch cavity	40	Moderate
40	Oak	Small semi-mature oak with exposed trunk cavity	30	Low
41	Ash	Mature ash tree with multiple woodpecker holes	60	Moderate
42	Ash	Mature ash with woodpecker holes and branch cavity	40	Moderate
43	Hawthorn	Hawthorn tree with small, exposed trunk hole	30	Low
45	Ash	Semi mature ash with broken trunk leaving exposed trunk cavity	40	Low
46	Ash	Semi-mature ash tree with trunk cavity	40	High
47	Ash	Semi mature ash with sheltered branch hole leading into trunk cavity	40	High
48	Ash	Semi-mature ash with exposed branch hole leading into trunk cavity	35	Low
49	Ash	Large mature ash tree with woodpecker hole	45	Moderate
50	Ash	Semi-mature ash with dead branch and exposed branch hole	40	Low
51	Oak	Small semi mature oak with cracked trunk and bark with sparse ivy cover	20	Low
52	Oak	Semi-mature oak with shallow exposed branch crack	30	Low

Annex D: Walked Transect Survey Data

Table D1: Bat activity transect results June 2022

Date: 23\06\2022		Temperature (°C): 17		Rain (0-5): 0
Sunset time: 21:35		Wind (0-7): 1		Cloud Cover (0-5): 3
Start Time: 21:20	Finish Time: 23:35	Equipment used: Anabat Scout		Weather description (incl. previous evening): Dry and Still
Reference Number	Time	Species ¹	No. of bats	Activity/Description
1	22:45	Noc	1	HNS
2	23:36	Cpip	1	HNS
<p>¹Species: Cpip: common pipistrelle (<i>Pipistrellus pipistrellus</i>); Spip: soprano pipistrelle (<i>Pipistrellus pygmaeus</i>); Myotis: <i>Myotis</i> species; Noc: noctule (<i>Nyctalus noctula</i>)</p> <p>²Rain scale: 0 = none, 1 = drizzle, 2 = shower, 3 = rain, 4 = downpour, 5 = flood</p> <p>³Beaufort wind force scale: 0 No wind, 1 Light air smoke drifts, 2 Light Breeze leaves rustle, 3 Gentle Breeze small twigs move, 4 Mod Breeze small branches move, 5 Fresh Breeze small trees sway, 6 Strong Breeze large branches move, 7 Mod Gale whole trees in motion</p> <p>⁴Percentage scale based on: 1 = 0-20%, 2 = 21--40%, 3 = 41-60%, 4 = 61-80%, 5 = 81-100%</p>				

Table D2: Bat activity transect results dusk July 2022

Date: 28\07\2022		Temperature (°C): 17		Rain (0-5): 0
Sunset time: 21:05		Wind (0-7): 2		Cloud Cover (0-5): 3
Start Time: 20:50	Finish Time: 23:05	Equipment used: Anabat Scout		Weather description (incl. previous evening): Dry, Slight breeze
No bats recorded				
Reference Number	Time	Species¹	No. of bats	Activity/Description
				No bats recorded
<p>¹Species: Cpip: common pipistrelle (<i>Pipistrellus pipistrellus</i>); Spip: soprano pipistrelle (<i>Pipistrellus pygmaeus</i>); Myotis: <i>Myotis</i> species; Noc: noctule (<i>Nyctalus noctula</i>)</p> <p>²Rain scale: 0 = none, 1 = drizzle, 2 = shower, 3 = rain, 4 = downpour, 5 = flood</p> <p>³Beaufort wind force scale: 0 No wind, 1 Light air smoke drifts, 2 Light Breeze leaves rustle, 3 Gentle Breeze small twigs move, 4 Mod Breeze small branches move, 5 Fresh Breeze small trees sway, 6 Strong Breeze large branches move, 7 Mod Gale whole trees in motion</p> <p>⁴Percentage scale based on: 1 = 0-20%, 2 = 21--40%, 3 = 41-60%, 4 = 61-80%, 5 = 81-100%</p>				

Table D3: Bat activity transect results August 2022

Date: 17\08\2022		Temperature (°C): 17		Rain (0-5): 0
Sunset time: 20:28		Wind (0-7): 0		Cloud Cover (0-5): 0
Start Time: 20:26	Finish Time: 22:28	Equipment used: Anabat Scout		Weather description (incl. previous evening): Dry, Still
Reference Number	Time	Species¹	No. of bats	Activity/Description
1	22:21	Cpip	1	HNS
<p>¹Species: Cpip: common pipistrelle (<i>Pipistrellus pipistrellus</i>); Spip: soprano pipistrelle (<i>Pipistrellus pygmaeus</i>); Myotis: <i>Myotis</i> species; Noc: noctule (<i>Nyctalus noctula</i>)</p> <p>²Rain scale: 0 = none, 1 = drizzle, 2 = shower, 3 = rain, 4 = downpour, 5 = flood</p> <p>³Beaufort wind force scale: 0 No wind, 1 Light air smoke drifts, 2 Light Breeze leaves rustle, 3 Gentle Breeze small twigs move, 4 Mod Breeze small branches move, 5 Fresh Breeze small trees sway, 6 Strong Breeze large branches move, 7 Mod Gale whole trees in motion</p> <p>⁴Percentage scale based on: 1 = 0-20%, 2 = 21--40%, 3 = 41-60%, 4 = 61-80%, 5 = 81-100%</p>				

Table D4: Bat activity transect results September 2022

Date: 26\09\2022		Temperature (°C): 11		Rain (0-5): 0
Sunset time: 18:50		Wind (0-7): 0		Cloud Cover (0-5): 5
Start Time: 18:45	Finish Time: 20:50	Equipment used: Anabat Scout		Weather description (incl. previous evening): Recent rain, Dry, Still
Reference Number	Time	Species¹	No. of bats	Activity/Description
1	19:49	Cpip	2	Foraging
2	19:55	Spip	1	Foraging
<p>¹Species: Cpip: common pipistrelle (<i>Pipistrellus pipistrellus</i>); Spip: soprano pipistrelle (<i>Pipistrellus pygmaeus</i>); Myotis: <i>Myotis</i> species; Noc: noctule (<i>Nyctalus noctula</i>)</p> <p>²Rain scale: 0 = none, 1 = drizzle, 2 = shower, 3 = rain, 4 = downpour, 5 = flood</p> <p>³Beaufort wind force scale: 0 No wind, 1 Light air smoke drifts, 2 Light Breeze leaves rustle, 3 Gentle Breeze small twigs move, 4 Mod Breeze small branches move, 5 Fresh Breeze small trees sway, 6 Strong Breeze large branches move, 7 Mod Gale whole trees in motion</p> <p>⁴Percentage scale based on: 1 = 0-20%, 2 = 21--40%, 3 = 41-60%, 4 = 61-80%, 5 = 81-100%</p>				

Annex E: Static Automated Detector Survey Data

Table E1: Bat activity static location 1 results

Session	Number of passes per bat species (total over 5+ full nights)						Total duration over survey period (hrs)	Average total Bat Activity Index (BAI) per month
	Total Common Pipistrelle	Total Soprano Pipistrelle	Total Myotis sp.	Total Noctule	Total Pipistrellus sp.	Total Liesler's		
June (11-16/06/2022)	526	0	0	14	0	0	48	1.875
BAI June	10.958333	0	0	0.2916666	0	0		
July (27/07/2022 - 01/08/2022)	2713	3	6	8	0	1	48	9.482638
BAI July	56.520833	0.0625	0.125	0.1666666	0	0.0208333		
August (17-25/08/2022)	233	6	0	18	19	0	66.5	0.691729
BAI August	3.5037594	0.0902255	0	0.2706766	0.2857142	0		
September (20-24/09/2022)	163	22	3	4	0	0	64	0.5
BAI September	2.546875	0.34375	0.046875	0.0625	0	0		
Average BAI	18.382450	0.1241188	0.0429687	0.1978775	0.0714285	0.0052083	3.137342053	

Table E2: Bat activity static location 2 results

Session	Number of passes per bat species (total over 5+ full nights)						Total duration over survey period (hrs)	Average total Bat Activity Index (BAI) per month
	Total Common Pipistrelle	Total Soprano Pipistrelle	Total Myotis sp.	Total Noctule	Total Pipistrellus sp.	Total Liesler's		
June (11-16/06/2022)	449	7	93	12	1	0	48	1.951388
BAI June	9.3541666	0.1458333	1.9375	0.25	0.0208333	0		
July (27/07/2022 - 01/08/2022)	646	2	5	1	0	0	48	2.270833
BAI July	13.458333	0.0416666	0.1041666	0.0208333	0	0		
August (17-25/08/2022)	289	0	1	7	8	0	66.5	0.764411
BAI August	4.3458646	0	0.0150375	0.1052631	0.1203007	0		
September (20-24/09/2022)	384	0	0	122	0	0	64	1.317708
BAI September	6	0	0	1.90625	0	0		
Average BAI	8.2895911	0.046875	0.5141760	0.5705866	0.0352835	0	1.576085396	

Annex F: Method for Valuing Bats in Ecological Impact Assessment

Tables and valuation method for bat roosts, foraging and commuting habitats are based on Wray *et al* (Ref 1-11) and updated based on more recent guidance on minimum estimate population sizes and IUCN Red List Status in Mathews *et al*. (Ref 1-12).

Table F-1: Categorising bats by distribution and rarity

Rarity within range	England
Rarest (population. under 10,000)	Greater Horseshoe (<i>Rhinolophus ferrumequinum</i>) Bechstein's (<i>Myotis bechsteini</i>) Alcatheo (<i>Myotis alcatheo</i>) (Data Deficient) Greater Mouse-eared (<i>Myotis myotis</i>) (Critically Endangered) Barbastelle (<i>Barbastella barbastellus</i>) (Vulnerable) Grey Long-eared (<i>Plecotus austriacus</i>)
Rarer (population. 10,000 – 100,000)	Lesser Horseshoe (<i>Rhinolophus hipposideros</i>) Whiskered (<i>Myotis mystacinus</i>) (Data Deficient) Brandt's (<i>Myotis brandtii</i>) (Data Deficient) Leisler's (<i>Nyctalus leisleri</i>) (Near Threatened) Nathusius' Pipistrelle (<i>Pipistrellus nathusii</i>) (Near Threatened) Serotine (<i>Eptesicus serotinus</i>) (Vulnerable) Noctule (<i>Nyctalus noctula</i>) Daubenton's (<i>Myotis daubentonii</i>) Natterer's (<i>Myotis nattereri</i>)
Common (population. Over 100,000)	Common Pipistrelle (<i>Pipistrellus pipistrellus</i>) Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>) Brown Long-eared (<i>Plecotus auritus</i>)

Table F-2: Valuing Bat Roosts

Geographic frame of reference	Roost types
District, Local or Parish	Feeding perches (common species) Individual bats (common species) Small numbers of non-breeding bats (common species) Mating sites (common species)
County	Maternity sites (common species) Small numbers of hibernating bats (common and rarer species) Feeding perches (rarer/rarest species) Individual bats (rarer/rarest species) Small numbers of non-breeding bats (rarer/rarest species)
Regional	Mating sites (rarer/rarest species) including well used swarming sites Maternity sites (rarer species) Hibernation sites (rarest species) Significant hibernation sites for rarer/rarest species or all species assemblages
National/UK	Maternity sites (rarest species) Sites meeting SSSI guidelines
International	SAC sites

Table F-3: Valuing commuting routes

Species	Number of bats #	Roosts/potential roosts nearby*	Type and complexity of linear features
Common (2)	Individual bats (5)	None (1)	Absence of (other) linear features (1)
		Small number (3)	Unvegetated fences/walls and large field sizes (2)
Rarer (5)	Small number of bats (10)	Moderate number/Not known (4)	Walls, gappy or flailed hedgerows, isolated well grown hedgerows, and moderate field sizes (3)
		Large number of roosts, or close to a nationally important/protected site for the species (5)	Well-grown and well-connected hedgerows/tree lines, small field sizes (4)
Rarest (20)	Large number of bats (20)	Close to or within an internationally important/ protected site for the species (20)	Complex network of mature well-established hedgerows, tree line, small fields and rivers/streams (5)

Table F-4. Valuing foraging areas

Species	Number of bats #	Roosts/potential roosts nearby	Foraging habitat characteristics
Common (2)	Individual bats (5)	None (1)	Industrial or other site without established vegetation (1)
		Small number (3)	Suburban areas or intensive arable land (2)
Rarer (5)	Small number of bats (10)	Moderate number/Not known (4)	Isolated woodland patches, less intensive arable and/or small towns and villages (3)

Species	Number of bats #	Roosts/potential roosts nearby	Foraging habitat characteristics
		Large number of roosts, or close to a nationally important site for the species (5)	Larger or connected woodland blocks, mixed agriculture, and small villages/hamlets (4)
Rarest (20)	Large number of bats (20)	Close to or within a SAC for the species (20)	Mosaic of pasture, woodlands and wetland areas (5)

Individual bats 1 or 2, Small numbers 3 to 10, Large numbers >10 bats

*Roosts based on those recorded or potentially present within the Project, based on desk study and field survey data. 'Nearby' is defined as up to 500m from the Project.

Scores in the four columns of each table above **Table F-3** and **Table F-4** are added up to provide an overall score to determine the value or importance of commuting routes and foraging areas as per **Table F-5**. See also information in **Table F-6**.

Table F-5. Scoring system for valuing commuting and foraging bats

Geographic frame of reference	Score
International	>50
National	41 – 50
Regional	31 – 40
County/District*	21 – 30
Local	11 – 20
Not important (Site Level only)	1 - 10

*Note that County and District has been combined to correspond to CIEEM 2018 based guidance table below.

Table F-6. Importance of Ecological Features

Importance of ecological features	Typical descriptors and examples of criteria
International or European	<p>An internationally designated site or candidate site including Special Protection Area ("SPA"), potential SPAs ("pSPAs"); Special Area of Conservation ("SAC"), candidate or possible SACs ("cSACs" or pSACs¹) and Ramsar sites (wetlands of international importance).</p> <p>Biogenetic Reserves, World Heritage Sites and Biosphere Reserves.</p> <p>Areas which meet the published selection criteria for those sites listed above but which are not themselves designated as such.</p> <p>Resident or regularly occurring populations of species which may be considered at an international or European level² where:</p>

Importance of ecological features	Typical descriptors and examples of criteria
	<ul style="list-style-type: none"> a. The loss of these populations would adversely affect the conservation status or distribution of the species at this geographic scale. b. The population forms a critical part³ of a wider population at this scale. c. The species is at a critical phase⁴ of its life cycle at this scale.
UK or National	<p>Sites designated at UK or national level e.g. Site of Special Scientific Interest (“SSSI”), Marine Protection Area (“MPA”) including Marine Conservation Zones (“MCZ2) and National Nature Reserve (“NNR”).</p> <p>Areas which meet the published selection criteria for those sites listed above but which are not themselves designated as such.</p> <p>Areas of key or priority habitats identified in the UK Post-2010 Biodiversity Framework i.e. UK Biodiversity Action Plan (“BAP”), including those published in accordance with Section 41 of the Natural Environment and Rural Communities Act (2006) and those considered to be of principal importance for the conservation of biodiversity.</p> <p>Areas of ancient woodland</p> <p>Resident or regularly occurring populations of species which may be considered at a UK or a national level⁵ where:</p> <ul style="list-style-type: none"> a. The loss of these populations would adversely affect the conservation status or distribution of the species at this geographic scale. b. The population forms a critical part of a wider population at this scale. c. The species is at a critical phase of its life cycle at this scale.
Regional	<p>Habitats or populations of species of value at a regional level (i.e. East Anglia).</p> <p>Areas of key or priority habitat identified as being of Regional value in the appropriate National Character Area (“NCA”).</p> <p>Key or priority habitat or species listed within the Highways England (“HE”)/ Highways Agency (“HA”) BAP.</p> <p>Resident or regularly occurring populations of species which may be considered at a regional level 6 where:</p> <ul style="list-style-type: none"> a. The loss of these populations would adversely affect the conservation status or distribution of the species at this geographic scale. b. The population forms a critical part of a wider population at this scale. c. The species is at a critical phase of its life cycle at this scale.
County or Unitary Authority or District	<p>Habitats or populations of species of value at a County (i.e. Lincolnshire) level or District (i.e. Northeast Lincolnshire District Council).</p> <p>Designated sites, such as County Wildlife Site (“CWS”), Local Wildlife Site (“LWS”) or Sites of Importance for Nature Conservation (“SINC2) and Local Nature Reserve (“LNR”) designated in the county or unitary authority area i.e. District context.</p> <p>Areas which meet the published selection criteria for those sites listed above but which are not themselves designated as such.</p>

Importance of ecological features	Typical descriptors and examples of criteria
	<p>Areas of key or priority habitats identified in the Local Biodiversity Action Plan (“LBAP”).</p> <p>Resident or regularly occurring populations of species which may be considered at a County (or District) level⁷ where:</p> <ol style="list-style-type: none"> The loss of these populations would adversely affect the conservation status or distribution of the species at this geographic scale. The population forms a critical part of a wider population at this scale. The species is at a critical phase of its life cycle at this scale.
Local	<p>Habitats or species populations of value in a local (i.e. within ~ 5km of the site) context.</p> <p>Designated sites include LNRs designated in the local context.</p> <p>Trees that are protected by Tree Preservation Orders (“TPOs”).</p> <p>Areas of habitat or populations and, or communities of species considered to appreciably enrich the habitat resource within the local context (such as veteran trees), including features of value for migration, dispersal or genetic exchange.</p>
Site	<p>Habitat that is of value in the context of the site only.</p> <p>Populations of common and widespread species.</p> <p>A degraded/impoverished example of a common or widespread habitat in the local area.</p>

1. pSACs are sites which have been formally advised by to UK Government but have not yet been submitted to the European Commission. These sites should be valued at an international (European) level on the basis that they meet the relevant selection criteria for a SAC but are not yet designated as such.
2. Such species include those listed within the Directive 2009/147/EC on the Conservation of wild birds (i.e. EC Birds Directive) (codified version of Council Directive 79/409/EEC as amended) or animal/plant species listed within Council Directive 92/43/EEC on the Conservation of natural habitats and of wild flora and fauna (i.e. Habitats Directive).
3. Such populations include sub-populations that are essential to maintenance of metapopulation dynamics e.g. critical emigration/ immigration links between otherwise discrete populations.
4. Seasonal activity or behaviour upon which survival or reproduction depends.
5. Species which may be considered at the UK or national level means; birds, other animals and plants which receive legal protection in the basis of their conservation interest (those listed within the Wildlife and Countryside Act 1981 (as amended) Schedule 1, 5 and 8); species listed for their principal importance for biodiversity (in accordance with the Natural Environment and Communities Act 2006 Section 41 England); priority species listed within the UK Post 2010 Biodiversity Framework (i.e. UKBAP); or species listed within the Red Data Book.
6. Such species include those listed in the appropriate Natural Character Area and key/ priority species listed on the 2002 HABAP
7. Such species include those at county level (i.e. Cambridgeshire) including unitary authority area i.e. District level (i.e. South Cambridgeshire); as listed on the LBAPs; and listed as a county designated site.

*As well as assigning importance there is also a need to identify all legally protected species that could be affected by the Project in order that measures can be taken to ensure that adherence to the relevant legislation is observed. This may include the adoption of mitigation and appropriate licensing which is acceptable to Natural England.