East Anglia ONE North Offshore Windfarm

Appendix 22.4

Bat Survey Report

Preliminary Environmental Information
Volume 3
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Revision Summary					
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Glossary of Acronyms

BCT	Bat Conservation Trust
CIEEM	Chartered Institute for Ecology and Environmental Management
EPS	European Protected Species
EPSL	European Protected Species Licence
EU	European Union
ha	Hectare
PEIR	Preliminary Environmental Information Report
TN	Target Note
WCA	Wildlife and Countryside Act

Glossary of Terminology

Applicant	East Anglia ONE North Limited. ScottishPower Renewables is the parent company of East Anglia ONE North limited
Construction consolidation sites	Compounds which will contain laydown, storage and work areas for onshore construction works. The HDD construction compound will also be referred to as a construction consolidation site.
Development Area	Area containing all onshore and offshore infrastructure, transmission works, construction consolidation sites, and mitigation areas.
East Anglia ONE North project	The proposed project consisting of up to 67 wind turbines, up to four offshore electrical platforms, up to one offshore construction operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
European site	Sites designated for nature conservation under the Habitats Directive and Birds Directive, as defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017 and regulation 18 of the Conservation of Offshore Marine Habitats and Species Regulations 2017. These include candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation and Special Protection Areas.
Evidence Plan Process	A voluntary consultation process with specialist stakeholders to agree the approach to the EIA and the information required to support HRA.
Horizontal directional drilling (HDD)	A method of cable installation where the cable is drilled beneath a feature without the need for trenching.
Jointing Bay	Underground structures constructed at regular intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	The area where the offshore export cables would make contact with land, and connect to the onshore cables.
Link boxes	Underground chambers or above ground cabinets next to the cable trench housing electrical earthing links.
Mitigation areas	Areas captured within the Development Area specifically for mitigating expected or anticipated impacts.
National Grid infrastructure	The proposed East Anglia ONE North project will require connection into an additional substation for ultimate connection to national electricity grid. The required National Grid infrastructure comprising a National Grid substation, connection to the existing electricity pylons and associated works will be consented as part of the proposed East Anglia ONE North project Development Consent Order but will be National Grid owned assets.
National Grid overhead line works	Works required to upgrade the existing electricity pylons and overhead lines to transport electricity from the National Grid substation to the national electricity grid
National Grid overhead line works area	The proposed area for National Grid overhead line realignment works.

National Grid substation	The substation (including all of the electrical equipment within it) necessary to connect the proposed East Anglia ONE North project to the national electricity grid which will be owned by National Grid but is being consented as part of the proposed East Anglia ONE North project Development Consent Order.
National Grid substation location	The proposed location of the National Grid substation required to connect the proposed East Anglia ONE North project to the national electricity grid.
Natura 2000 site	A site forming part of the network of sites made up of Special Areas of Conservation and Special Protection Areas designated respectively under the Habitats Directive and Birds Directive.
Onshore cable corridor	The corridor within which the onshore cable route will be located.
Onshore cable route	This is the construction swathe within the onshore cable corridor which would contain onshore cables as well as temporary ground required for construction which includes cable trenches, haul road and spoil storage areas.
Onshore cables	The cables which would bring electricity from landfall to the onshore substation. The onshore cable is comprised of up to six power cables and two fibre optic cables.
Proposed onshore development Area	Onshore transmission works, mitigation areas and temporary construction facilities such as access roads or construction consolidation sites and National Grid infrastructure.
Onshore infrastructure	The combined name for all infrastructure associated with the proposed East Anglia ONE North project from landfall to grid connection.
Onshore substation	The East Anglia ONE North substation and all of the electrical equipment, both within and connecting to the National Grid infrastructure
Onshore substation location	The proposed location of the onshore substation for the proposed East Anglia ONE North project.
Onshore study area	All onshore areas being considered for the placement of onshore infrastructure or temporary construction consolidation sites. This includes areas being considered for National Grid infrastructure, East Anglia ONE North onshore substation, onshore cable corridor and landfall.
Onshore transmission works	Landfall, onshore cable route and onshore substation location and National Grid substation location. This does not include temporary construction facilities such as access roads or construction consolidation sites.
Transition Bay	Underground structures at the landfall that house the joints between the offshore export cables and the onshore cables.

22.4 Bat Survey Report

22.1 Introduction

1. This report documents the results of a suite of bat activity transect surveys, emergence/re-entry surveys and static bat detector surveys (herein referred to as the '2018 bat survey'), which was undertaken by Royal HaskoningDHV ecologists between June and October 2018 with respect to the proposed East Anglia ONE North project.

22.2 Project Background

2. In April 2018, an Extended Phase 1 Habitat Survey was undertaken by Royal HaskoningDHV ecologists, and is presented as ***Appendix 22.1*** of this Preliminary Environmental Information Report (PEIR). It should be noted that at the time of undertaking the 2018 Extended Phase 1 Habitat Survey, the proposed onshore development area was yet to be finalised, and therefore survey and reporting was completed on the indicative onshore development area

3. Therefore, the 2018 bat surveys focused on the indicative onshore development area, the results of which form the basis of this appendix and are shown on ***Figure 22.4.1***. The proposed onshore development area is shown on ***Figure 22.4.1*** as the solid red line for reference.

4. The 2018 Extended Phase 1 Habitat Survey identified and subsequently assessed a total of 58 features for their suitability to support foraging/commuting bats. These 58 features were assessed as having low to high suitability for commuting/foraging bats. In addition to these 58 features, a further 15 features were identified and assessed as having moderate to high suitability to support roosting bats. These assessments were made in accordance with the Bat Conservation Trust (BCT) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition 2016), and as such further surveys to confirm whether or not they are used by roosting, commuting and/or foraging bats are required.

5. The purpose of this report is to present the findings of the 2018 bat survey effort, which includes:

- Monthly activity transect surveys (between June and October, inclusive);
- Emergence/re-entry survey (undertaken concurrently with the monthly activity transect survey); and
- Monthly static bat detector surveys (between July and October, inclusive).

6. This report has been prepared in line with the guidelines as set out in the Chartered Institute of Ecology and Environmental Management's (CIEEM) Guidelines on Ecological Report Writing (2nd Edition December 2017) and the BCT Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition 2016).

22.3 Legislation

7. All bat species are protected by UK law under Schedule 5 of the Wildlife and Countryside Act (WCA) (as amended). All bat species are also European Protected Species (EPS). It is illegal to:

- Intentionally or deliberately kill, injure or capture (take) bats;
- Deliberately disturb bats (whether in a roost or not);
- Recklessly disturb roosting bats or obstruct access to their roosts;
- Damage or destroy bat roosts;
- Possess or transport a bat or any part of a bat, unless acquired legally; and
- Sell, or offer for sale) or exchange bats, or parts of bats.

8. Activities that can affect bats include the following:

- Renovating, converting or demolishing a building;
- Cutting down or removing branches from a mature tree;
- Repairing or replacing a roof;
- Repointing brickwork;
- Insulation or converting a loft;
- Installing lighting in a roost, or outside if it lights up the entrance to the roost;
- Removing 'commuting habitats' like hedgerows, watercourses or woodland;
- Changing or removing bats' foraging areas; and
- Using insecticides or treating timber.

22.4 Methodology

22.4.1 Survey Area

9. Each of the features that had been identified during the 2018 Extended Phase 1 Habitat Survey was grouped into areas, where possible, which in turn enabled a wider transect area to be identified. Each transect area (and the individual features identified during the Extended Phase 1 Habitat Survey in 2018) is shown on ***Figure 22.4.1a*** to ***Figure 22.4.1g***, and denoted by either the purple hatching (transect area) or individual coloured dots (individual features).

22.4.2 Survey Methodology

10. The monthly activity transect surveys and the emergence/re-entry surveys were undertaken concurrently between June and October 2018. The static bat detector surveys were undertaken between July and October 2018. ***Table A22.3*** and ***Table A22.4*** provide further details for each survey.

22.4.2.1 Monthly Activity Transect Surveys

11. Each monthly activity transect survey was designed in accordance with BCT guidelines (Collins 2016) and encompassed all the 58 features that had been recorded during the 2018 Extended Phase 1 Habitat Survey. These features consisted of linear features such as hedgerows, as well as habitat features such as grassland/scrub and woodland (***Figure 22.4.1a*** to ***Figure 22.4.1g).***

12. In total, seven transect areas had been identified, all of which are small to moderate in size and are considered to provide moderate habitat for foraging/commuting bats, with some localised areas providing higher quality habitat which fringe the transect (i.e. Grove wood to the east of Transect 1). Therefore, and in accordance with the BCT guidance, one activity survey per month between April and October as well as one static detector survey covering a five day period per month between April and October (as per Table 8.3 within the BCT Guidelines) were undertaken. As the 2018 Extended Phase 1 Habitat Survey was not completed until May 2018, the earliest opportunity to mobilise the equipment and personnel and obtain landowner access for the monthly activity transect surveys was June 2018. Therefore, a total of five surveys (i.e. one per month between June and October) were undertaken to record and note the level of bat activity within each transect area.

13. In accordance with the current guidance (Collins 2016), each activity transect survey commenced at sunset and continued for up to two hours after sunset. One of the survey visits included a dusk and pre-dawn survey within one 24-hour period.

14. Each activity transect survey included all linear habitats (such as hedgerows or watercourses) within the transect area and was walked at a steady pace by two Royal HaskoningDHV ecologists using a hand-held Bat Box Duet bat detector. Any sightings of bats were recorded, along with the following key details:

- Time of sighting;
- Species;
- Number of individuals;
- Location and direction of flight; and
- Activity observed (foraging, commuting etc.)

15. ***Table A22.1*** summarises the details for the monthly activity transect surveys undertaken between June and October 2018.

Table A22.1 Activity Transect Survey Dates and Weather Data

Survey Month	Date	Sunset	Survey Start	Survey End	Weather	Notes
June	26.06.18	21:18	21.00	00.20	20˚C, light easterly wind (7mph), clear	Lows of 12˚C
	27.06.18	21:18	21.00	00.10	15˚C, light wind	
	28.06.18	21:18	21.00	00.00	15˚C	
July	24.07.18	20:58	21:00	23.45	22˚C, dry, still	
	25.07.18	20:58	20:45	23.30	20˚C, breezy	
	26.07.18	20:54	20.45	23.30	19˚C	
August	28.08.18	19:51	19:40	04:00	16˚C, fine, still. Turning breezier at 10pm. Rain started at 2am, heavy rain at 4am	Dusk to dawn survey, however inclement weather drew in, survey abandoned
	29.08.18	19:49	19.30	23.30	15˚C, dry, still, NW breeze of 11mph	Dusk survey
	29.08.18	05.59	04.00	06.00	12˚C, cloudy, NW wind of 11mph	Dawn survey
	30.08.18	19:49	19.30	23.00	15˚C, cloudy, windy	Dusk survey
	30.08.18	06:03	04:00	06:15	10˚C, clear and still	Dawn survey
September	18.09.18	19:02	18:45	21.30	20˚C, 19mph SW wind, clear	
	24.09.18	18:48	18:30	21.00	12˚C, 10mph SW wind, fine, still	
	25.09.18	18:46	18:30	20.30	13˚C. fine, brisk wind (9mph SW breeze)	
October	09.10.18	18:14	18:00	21.00	17˚C, medium breeze (12mph SW), sunny	

Survey Month	Date	Sunset	Survey Start	Survey End	Weather	Notes
	10.10.18	18:14	18:00	20.30	18˚C, still, fine, 10mph SW	Turned foggy later during survey
	11.10.18	18:10	18:00	20.30	17˚C, medium breeze, overcast	

22.4.2.1.1 Emergence / Re-entry Survey

16. During the 2018 Extended Phase 1 Habitat Survey, a total of 15 features assessed as providing moderate to high suitability for roosting bats were identified, and in accordance with the BCT Guidelines (Collins 2016), were subject to an emergence/re-entry survey in combination with the activity transect survey. The locations of these features can be seen on ***Figures 22.4.1a*** to ***22.4.1g***.

22.4.2.2 Static Bat Detector Survey

17. Static detectors (SM2 bat detectors) were deployed for five days each month between July and October, as detailed in ***Table A22.2***. These were only placed within secure locations available at each transect, and the same location was used each month to maintain survey consistency. Each static bat detector survey commenced 30 minutes before sunset and recorded continuously for two hours after sunset. For the dusk and pre-dawn surveys within one 24hr period, the static detectors recorded continuously for two hours following sunset and then again two hours before dawn. A total of 11 static detectors were deployed each month (between July and October) as follows:

- Transect 1 – two detectors;
- Transect 2 – two detectors;
- Transect 3 – two detectors;
- Transect 4 – two detectors;
- Transect 5 – one detector;
- Transect 6 – one detector; and
- Transect 7 – one detector.

Table A22.2 Static Bat Detector Survey Details

Month	Date	Sunset	Weather
July	25.07.18	20:58	20˚C, breezy
	26.07.18	20:54	19˚C
	27.07.18	20:52	22˚C, scattered clouds, breezy (16mph southwesterly)
	28.07.18	20:51	18˚C, light cloud, breezy (14mph southwesterly)
	29.07.18	20:49	19˚C, medium cloud cover, breezy (16mph southwesterly)
August	29.08.18	19:49	15˚C, dry, still, NW breeze of 11mph
	30.08.18	19:49	15˚C, cloudy, windy
	31.08.18	19:43	14˚C, mild, clear, 5mph southeasterly
September	01.09.18	19:41	15˚C, cool, clear, 8mph southeasterly
	02.09.18	19:39	15˚C, cool, clear, 6mph easterly
	19.09.18	18:59	19˚C, medium cloud cover, breezy (13mph south westerly)
	20.09.18	18:57	19˚C, medium cloud cover, windy (20mph southwesterly)
	21.09.18	18:54	10˚C, light cloud, light wind (9mph easterly)
	22.09.18	18:52	10˚C, overcast, still (3mph south easterly)
	23.09.18	18:50	7˚C, cool, clear, breezy (8mph northwesterly)
October	10.10.18	18:14	18˚C, still, fine, 10mph SW
	11.10.18	18:10	17˚C, medium breeze, overcast
	12.10.18	18:06	20˚C, light cloud, windy (13-20mph southerly)
	13.10.18	18:04	20˚C, mild, breezy (8-13mph southerly)
	14.10.18	18:01	10˚C, cool, low cloud/fog, windy (14-17mph north-easterly)

22.4.3 Surveyors

18. The survey team was led by Charlotte Clements, BSc (Hons) who is an Associate Member of CIEEM (ACIEEM) with four years' experience of undertaking bat activity surveys. She was accompanied by Kitty Taylor, BSc (Hons).

22.4.4 Survey Limitations

19. Weather conditions throughout most of the survey months were clear and considered suitable for undertaking bat surveys in accordance with BCT guidelines (Collins 2016). During the September survey, inclement/stormy weather drew in and as such the September monthly activity transect survey was rescheduled for the following week, once the stormy weather had passed. However, the static bat detectors were left recording during the stormy weather experienced during the September survey. In addition, the dusk to dawn survey of Transects 3 and 4 on the 28th August 2018 was stopped at approximately 4am due to heavy, persistent rain.

20. The majority of the transects were fully accessible throughout the survey period, except for the following:

- Transect 3 – inaccessible during the September and October surveys due to livestock presence and electric fencing barring entry; and
- Transect 4 (east) – surveyors were not permitted access between July and October.

21. The static bat detector survey successfully recorded throughout the majority of the survey period, however there are some small gaps due to technical errors with the equipment. Additionally, a faulty detector was received during the August survey, and as such only 10 detectors were able to be deployed that month.

22. However, and despite the above, the findings of the surveys and the data presented in this report is considered to provide an accurate understanding of each transects usage by roosting and/or foraging/commuting bats.

22.5 Results

22.5.1 Monthly Activity Transect Survey Results

23. The following section describes the bat activity as recorded during the activity transect survey between June and October 2018 (inclusive), and should be read in conjunction with ***Figures 22.4.1a*** to ***Figure 22.4.1g***. ***Table A22.3*** provides a brief description of the key habitats and/or features within each transect area.

24. Given the size of the transect areas and their proximity to each other, they were grouped together so that a number of transects were undertaken within the same survey evening. Each month's survey was undertaken over a three-night period, where:

- Evening 1 – Transect 1 and 2;
- Evening 2 – Transect 3 and 4; and
- Evening 3 – Transects 5 to 7.

Table A22.3 Transect Descriptions

Transect	Description
Transect 1	Transect 1 consists of an open area of arable fields. These fields are typically bordered by hedgerows and field ditches with a woodland to the north and west (Grove Wood) as well as a small coppice in a pit to the east. The hedgerows were recorded as species poor, both intact and defunct throughout the Transect. The fields consisted of a range of cereal crops through to ploughed field depending on the survey month. Size: 27.31 hectares (ha)
Transect 2	Transect 2 consists of arable fields and grassland with hedgerows located throughout. The arable fields were in crop (potato) throughout the survey period. Hedgerows within the Transect were typically species poor and intact to the north of the Transect, and species poor with trees to the south of the Transect. Two fields of grassland to the east of the Transect were thought to be primarily used for turf, the sward was short and regularly watered and mowed. Size: 14.98ha
Transect 3	Transect 3 consists of arable fields with hedgerows throughout alongside a small woodland area to the south, Snape road is to the west. A species poor intact hedgerow runs across the Transect from west to east, alongside a species poor hedge with trees to the south. There is a public byway/footpath to the east of the transect. Size: 12.10ha
Transect 4	Transect 4 consists predominantly of woodland, with publicly accessible footpaths. A section of Transect 4 is currently used as a livestock containment area containing alpacas and goats. Access was not fully granted to Transect 4 for the entire survey period, the section to the east of Aldringham road adjacent to the Hundred river, was only subject to survey in June. Size: 8.2ha
Transect 5	Transect 5 is a small area consisting of arable fields with species poor hedgerows (with trees) to the north and south and a woodland to the east. Size: 3.45ha
Transect 6	Transect 6 consists of hedgerows bordering arable fields and a public byway. The hedgerow running from west to east was recorded as species poor defunct. The hedgerow bordering the public byway was species poor with trees. There is a large woodland to the west of the Transect. Size: 3.0ha

Transect	Description
Transect 7	Transect 7 consists of arable fields, scrub and hedgerows as well as a public byway. The hedgerows are species rich defunct to the east and species poor intact to the south. Size: 2.9ha

Transects 1 and 2

25. Common pipistrelle *Pipistrellus pipistrellus* was the most abundantly observed bat species throughout these transect areas and across the entire five-month survey period. They were observed both commuting and feeding along the edges of Grove Wood, along Grove Road and the hedgerows to the south of Transect 1. Within Transect 2 they were observed along the track to the north of this transect area, along the north/south running hedgerow as well as the public footpath/byway to the south of the transect area. During the September transect survey, two serotine *Eptesicus serotinus* bats were observed feeding along the north/south hedgerow within transect area 2. One social call was heard during the June survey visit, along the public footpath/byway in the south of transect area 2.

26. Numbers of individual sightings of bats observed across the entire evening (covering both transect area 1 and transect area 2), ranged between 10 and 21 individuals, with the highest numbers of individuals observed during the June survey visit.

22.5.1.1 Transects 3 and 4

27. A range of different bat species have been recorded throughout transect areas 3 and 4, with common pipistrelle being the most abundant species recorded. However, soprano pipistrelle *Pipistrellus pygmaeus*, nathusius' pipistrelle *Pipistrellus nathusii* and barbastelle *Barbastella barbastellus* were also recorded. Within transect area 3, bats were observed to be both commuting and feeding along the hedgerow in the south and the footpath/byway to the east. Within transect area 4, bats were observed along the public footpath immediately adjacent to the woodland, as well as within the woodland area to the east of this transect area. No survey was possible within transect area 3 during the September and October survey visits, due to livestock in the field and electric fencing barring entry.

28. Numbers of individual sightings of bats observed across the entire evening (covering both transect area 3 and transect area 4), ranged from 5 to 12 individuals, with the highest number being recorded during the June survey visit.

22.5.1.2 Transects 5, 6 and 7

29. Common pipistrelle *Pipistrellus pipistrellus* was the dominant species recorded throughout the survey period. They were observed to be commuting and feeding along the hedgerows and public footpaths/byways which are present throughout all of the transect areas. During the June survey, a serotine *Eptesicus serotinus* bat was heard commuting along the north/south hedgerow in transect area 6.

30. Numbers of individual sightings of bats observed across the entire evening (covering all three transect areas), ranged from 2 to 13 individuals, with the highest number of individuals observed during the June survey visit.

22.5.2 Emergence / Re-Entry Survey Results

31. A total of 15 features were surveyed concurrently with the monthly activity transect surveys, ***Table A22.3*** summarises the details for each of the surveys undertaken. All 15 features consisted of trees, either within hedgerows or within woodland edges and are described in ***Table A22.4*** below and shown in ***Figures 22.4.1a*** to ***Figure 22.4.1g***.

Table A22.4 Description of Potential Roosting Features as Observed During the Extended Phase 1 Habitat Survey

Target note (TN) reference (read in conjunction with Figure 22.4.1a – 22.4.1g)	Feature and description	Suitability to support roosting bats
TN3b	Scattered scots pine with pealing bark/split limbs	Moderate
TN4b	Dead tree trunk with large holes	Moderate
TN204a	Mature ivy clad oak tree	Moderate
TN206a	Mature ivy clad oak tree with large cracks/holes	Moderate
TN213a	Five mature oaks within house gardens with visible cracks/holes	High
TN218a	Mature ivy clad oak within hedge (TN219a)	Moderate
TN226a	Four mature oak within woodland	Moderate
TN233a	Three mature ivy clad oak around perimeter of pit	Moderate
TN236a	Trees within hedge	Moderate
TN254a	Trees within woodland	High
TN258a	Trees within woodland	High
TN261a	Mature ivy clad oak within hedge (TN260a)	Moderate
TN266a	Mature ivy clad oak in hedge (TN265a)	Moderate

Target note (TN) reference (read in conjunction with Figure 22.4.1a – 22.4.1g)	Feature and description	Suitability to support roosting bats
TN306	Trees within woodland	Moderate
TN311	Mature ivy clad oak in hedge (TN309)	**Moderate**

32. The findings from the 2018 bat surveys indicate a high likelihood of bat roosts located in the following features.

- Transect 1 – References: 306a, 254a, 258a;
- Transect 2 – References: 233a, 226a, 213a;
- Transect 3 – References: 204a and 206a; and
- Transect 4 – References: 154a.

33. No potential bat roost features (of moderate or higher potential) were recorded within Transects 5 to 7 during the Extended Phase 1 Habitat Survey, or during the 2018 bat survey effort.

22.5.3 Static Bat Detector Survey Results

34. The following section describes the bat activity as recorded by the SM2 static bat detectors between July and October 2018 (inclusive), and should be read in conjunction with the tables in ***Annex 1***. Descriptions of each transect area is provided in ***Table A22.3***.

22.5.3.1 Transect 1

35. Two static detectors were used to record bat activity within this transect area, one adjacent to the small coppice situated to the west of the transect (Detector 1a) and another within the edges of the woodland located to the north of the transect (Detector 1b). The static bat detectors were located within the same location for each survey, and their locations are denoted by the black stars on ***Figure 22.4.1a***.

36. A total of five species of bats were recorded by the static detectors. The largest number of passes (i.e. number of times a bat passes the static bat detector) was by common pipistrelle, soprano pipistrelle and serotine (and/or leisler *Nyctalus leisleri*, due to the similarity between the sonograms of serotine/leisler, both have been included as a possibility). Also recorded, in smaller numbers, were noctule *Nyctalus noctula*, and barbastelle bats.

37. The average number of bat passes recorded by both static bat detectors throughout the survey period was:

- July – 122 bat passes;
- August – 34 (just one detector, as per ***Section 22.4.4***) bat passes;
- September – 111 bat passes; and
- October – 31 (just one detector, no data recorded by the second static detector during October) bat passes.

38. The first bat pass recorded by the detectors was on average approximately 40 minutes after sunset.

22.5.3.2 Transect 2

39. Two static detectors were deployed within Transect 2, both within the hedgerow running north to south through the Transect. They were situated in the same location for each survey, and their locations are denoted by the black stars on ***Figure 22.4.1b***.

40. A total of four species of bats were recorded by the static detectors in Transect 2, and similarly to Transect 1 the highest number of bat passes were common pipistrelle and soprano pipstrelle. Also recorded were, serotine/leisler and nathusias' pipistrelle.

41. The average number of bat passes recorded by both static bat detectors throughout the survey period was:

- July – 83 bat passes;
- August – 100 bat passes;
- September – 103 bat passes; and
- October – 247 bat passes.

42. The first bat pass recorded by the detectors was on average approximately 40 minutes to 1 hour after sunset.

22.5.3.3 Transect 3

43. Two static detectors were deployed within Transect 3, one within the hedgerow bordering the southern edge of the Transect (Detector 3a) and one within the hedgerow to the north of the Transect (Detector 3b). They were situated in the same location for each survey, and their locations are denoted by the black stars on ***Figure 22.4.1c***.

44. A total of eight species of bats were recorded by the static detectors in Transect 3 with the highest number of passes from common pipistrelle. Also recorded were *soprano pipistrelle, noctule, Myotis spp, lesser horseshoe Rhinolophus hipposideros, barbastelle, serotine/leisler and nathusias' pipistrelle.*

45. The average number of bat passes recorded by both static bat detectors throughout the survey period was:

- July – 215 bat passes;
- August – 120 bat passes;
- September – five bat passes (only one detector due to livestock presence); and
- October – 14 bat passes (only one detector due to livestock presence).

46. The first bat pass recorded by the detectors was on average approximately 40 minutes after sunset.

22.5.3.4 Transect 4

47. Two static detectors were deployed within Transect 4, one along the footpath south of the woodland area, (Detector 4a) and one within the woodland area to the east (Detector 4b). They were situated in the same location for each survey, and their locations are denoted by the black stars on ***Figure 22.4.1d***.

48. A total of six species of bats were recorded by the static detectors in Transect 4 with the highest number of passes from common and soprano pipistrelle. Also recorded were *noctule, Myotis spp and barbastelle, serotine/leisler.*

49. The average number of bat passes recorded by both static bat detectors throughout the survey period was:

- July – 231 bat passes;
- August – 83 bat passes;
- September – 127 bat passes; and
- October – 28 bat passes.

50. The first bat pass recorded by the detectors was on average approximately 40 minutes to 1 hour after sunset.

22.5.3.5 Transect 5

51. One static detector was deployed within Transect 5, located within the hedgerow to the south of the Transect. It was situated in the same location for each survey, and its location denoted by the black star on ***Figure 22.4.1e***.

52. A total of seven species of bats were recorded by the static detectors in Transect 4 with the highest number of passes from common pipistrelle. Also recorded were *soprano pipistrelle, noctule, Myotis spp, nathusias' pipistrelle, barbastelle and serotine/leisler.*

53. The average passes recorded by both detectors throughout the survey period was as follows:

- July – 126 bat passes;
- August – 99 bat passes;
- September – eight bat passes; and
- October – 17 bat passes.

54. The first bat pass recorded by the static bat detectors was on average approximately 1 hour after sunset.

22.5.3.6 Transect 6

55. One static detector was deployed within Transect 6, within a hedgerow to the west of the Transect. It was situated in the same location for each survey, and its location is denoted by the black star on ***Figure 22.4.1f***.

56. A total of six species of bats were recorded by the static detectors in Transect 4 with the highest number of passes from common pipistrelle. Also recorded were *soprano pipistrelle, noctule, nathusias' pipistrelle, barbastelle and serotine/leisler.*

57. The average number of bat passes recorded by the static bat detector throughout the survey period was:

- July – 15 bat passes;
- August – 91 bat passes;
- September – 22 bat passes; and
- October – one bat pass.

58. The first bat pass recorded by the static bat detector was on average approximately 1 hour after sunset.

22.5.3.7 Transect 7

59. One static detector was deployed within Transect 7, located within the hedgerow running north to south within the Transect. It was situated in the same location for each survey, and its location is denoted by the black star on ***Figure 22.4.1g***.

60. A total of seven species of bats were recorded by the static detectors in Transect 4 with the highest number of passes from common pipistrelle. Also recorded were soprano pipistrelle, noctule, *Myotis* spp, nathusias' pipistrelle, barbastelle and serotine/leisler.

61. The average number of bat passes recorded by the static bat detector throughout the survey period was:

- July – seven bat passes;
- August – 24 bat passes;
- September – four bat passes; and
- October – 14 bat passes.

62. The first bat pass recorded by the static bat detector was on average approximately 1.5 hours after sunset.

22.6 Conclusions and Recommendations

63. An Extended Phase 1 Habitat Survey was undertaken in April/May 2018, during which a total of 58 features were identified and subsequently assessed as having low to high suitability to support commuting/foraging bats. In addition, a total of 15 features were identified and assessed as offering moderate to high suitability to support roosting bats. In accordance with the BCT guidelines (Collins 2016), all of these features formed the basis for the 2018 bat survey, encompassing the following components:

- A monthly activity transect survey (conducted between June and October, inclusive);
- A static bat detector survey (undertaken between July and October, inclusive); and
- An emergence/re-entry survey (conducted concurrently with the activity transect survey).

64. The 2018 bat survey effort confirmed that all transects subject to these surveys do provide and support a diverse population of foraging and/or commuting bats. The higher densities of bats observed during both the activity transect survey and through reviewing the static detector survey data, are in the western transects,

namely Transects 1 to 4. The transects surveyed to the east of the indicative onshore development area, near the coastline, were observed in lower densities, though it should be noted that similar assemblages of species were recorded throughout the survey area as a whole.

65. In addition to the densities and variation of species recorded throughout each of the transects, several rarer species of bats were recorded by the static detectors, namely barbastelle and lesser horseshoe, though at a lower occurrence. Lesser horseshoe was recorded only within Transect 3 (a single pass). Barbastelle were recorded within Transects as follows:

- Transect 1 – eight bat passes;
- Transect 3 – 94 bat passes;
- Transect 4 – 12 bat passes;
- Transect 5 – one bat pass;
- Transect 6 – seven bat passes; and
- Transect 7 – one bat pass.

66. All species of bats in the UK are protected under Schedule 5 of the WCA, and all bat species are an EPS. In addition, seven of the bat species recorded during the 2018 surveys are subject to the Suffolk Biodiversity Action Plan (SDP 2012), namely the barbastelle, common pipistrelle, lesser horseshoe, nathusias' pipistrelle, noctule, serotine and soprano pipistrelle.

67. A suite of emergence/re-entry surveys, focusing on the 15 features identified and assessed as providing moderate and/or high potential to support roosting bats, was undertaken concurrently with the suite of monthly activity transect surveys. These features consisted mainly of trees, either within hedgerows or woodland.

68. The suite of bat surveys undertaken to date indicates a high likelihood of bat roosts located within the following transect areas and specific features:

- Transect 1 – References: 306a, 254a, 258a;
- Transect 2 – References: 233a, 226a, 213a;
- Transect 3 – References: 204a and 206a; and
- Transect 4 – References: 154a.

69. There are no potential bat roost features (of moderate or higher potential) within Transects 5 to 7.

70. In light of the 2018 bat survey findings, dependent on the final onshore cable route location, further emergence/re-entry surveys to fully understand the bat species and size of populations within those features in Transects 1 to 4 may be required to be undertaken within the appropriate survey window of 2019 (i.e. between April and October, weather dependant). These will be agreed with the relevant stakeholders. Where design changes and/or micro-siting of the proposed onshore cable route to avoid significant impacts on bats are not possible, mitigation will be required under a European Protected Species Licence (EPSL) approved by Natural England. Mitigation measures will follow best practice guidelines (Collins 2016) and is likely to include the following:

- Appropriate replacement habitat will be provided where the loss or damage of roosts cannot be avoided. This will be achieved through the creation, restoration or enhancement of nearby habitat for bats;
- Replacement habitat will be managed and maintained to ensure the population will persist; and
- Post-development monitoring of the population will be undertaken to assess the success of any mitigation and compensation measures.

71. The following mitigation measures should also be embedded within the project in order to avoid any long term, adverse impacts to commuting and/or foraging bats, and should be adhered to at all locations where bats have been recorded during the 2018 survey effort.

- A reduction in working width at hedgerow crossings;
- Lighting required during construction works will be designed to minimise light scatter;
- In areas that require 24-hour working (e.g. horizontal directional drilling under watercourses which are of interest to bats) any lighting of the working corridor will be low level and directed to the ground and in accordance with BCT (2019) lighting guidance; and
- Post construction habitat reinstatement to ensure that land is returned to its original use and improvements (for example habitat improvements) will be conducted where possible.

22.7 References

Bat Conservation Trust and Institute of Lighting Engineers, (2009) Bats and Lighting in the UK: Bats and the Built Environment Series, May 2009.

Chartered Institute of Ecology and Environmental Management (CIEEM), (2016) Professional Code of Conduct, Revised June 2016.

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

Royal HaskoningDHV, (2018). Extended Phase 1 Habitat Survey Report (Document reference: I&BPB4842R003D01).

SDP (2012) Suffolk Local Biodiversity Action Plan, Grouped for Bats. Suffolk Biodiversity Partnership (SDP), Suffolk.

Annex 1: Full Static Detector Survey Results

Transect 1 (*Figure 22.4.1a*)

Detector 1a

Species / Date	Barbastelle	Common pipistrelle	Noctule	Soprano pipistrelle	Total passes
25th July		1		21	22
26th July				2	2
27th July		6	1	21	28
28th July		70		48	118
29th July		63		39	102
29th August		13	1	14	28
30th August		15	5	82	102
31st August		13	4	22	39
1st Sept	No data				
2nd Sept	No data				
19th Sept		72	1	148	221
20th Sept		35		165	200
21st Sept		14		10	24
22nd Sept		5	1	5	11
23rd Sept	No data				
10th October		10	4	6	20
11th October	1	63		37	101
12th October	3	2		5	7
13th October		15		26	41
14th October	No data				

Detector 1b

Species / Date	Barbastelle	Common pipistrelle	Serotine /Leisler	Soprano pipistrelle	Total passes
25th July	4	53	29	11	97
26th July		16	7	9	32
27th July		24	2		26
28th July		7	3		10
29th July		15	4	4	23
29th August	No data – faulty microphone/detector received from hire company				
30th August					
31st August					
1st Sept					
2nd Sept					
19th Sept	No data				
20th Sept	No data				
21st Sept	No data				
22nd Sept		1	7	3	11
23rd Sept		1		2	3
10th October	No data – corrupted files				
11th October					
12th October					
13th October					
14th October					

Transect 2 (*Figure 22.4.1b*)

Detector 2a

Species / Date	Common pipistrelle	Nathusias' pipistrelle	Serotine /Leisler	Soprano pipistrelle	Total passess
25th July	89			13	102
26th July	56		2	8	66
27th July	11			4	15
28th July	6			11	17
29th July	8			1	9
29th August	89			34	123
30th August	88			19	107
31st August	47	1		7	55
1st Sept	No data				
2nd Sept	No data				
19th Sept	4			7	11
20th Sept	6		1	17	24
21st Sept	No data				
22nd Sept	No data				
23rd Sept	No data				
10th October	58		1	14	73
11th October	23			7	30
12th October	No data				
13th October	1		5	1	7
14th October				3	3

Detector 2b

Species / Date	Common pipistrelle	Nathusias' pipistrelle	Serotine /Leisler	Soprano pipistrelle	Total passes
25th July	27		10	1	38
26th July	17		1		18
27th July	2			2	4
28th July	No data				
29th July	3				3
29th August	7			1	8
30th August	8			1	9
31st August	12			2	14
1st Sept	No data				
2nd Sept	No data				
19th Sept	9	1		166	176
20th Sept	42			76	118
21st Sept	38			189	227
22nd Sept	15	1		31	47
23rd Sept	5			13	18
10th October	409			8	417
11th October	41		3	16	60
12th October	1			2	3
13th October	4			6	10
14th October	No data				

Transect 3 (*Figure 22.4.1c*)

Detector 3a

Species / Date	Barbastelle	Common pipistrelle	Lesser horseshoe	Myotis spp	Noctule	Serotine /leisler	Soprano pipistrelle	Total passes
25th July		180				4	16	200
26th July		49			5	1	4	59
27th July	1	204			1	3	18	226
28th July		451		4		4	31	490
29th July	1	134	1	3	1	5	34	178
29th August	31	52		2		8	25	87
30th August	38	254		4	2	18	98	376
31st August	23	48		3		1	11	63
1st Sept	No data							
2nd Sept	No data							
19th Sept	No data – livestock in field and electric fencing barring entry							
20th Sept								
21st Sept								
22nd Sept								
23rd Sept								
10th October	No data – livestock in field and electric fencing barring entry							

Species / Date	Barbastelle	Common pipistrelle	Lesser horseshoe	Myotis spp	Noctule	Serotine /leisler	Soprano pipistrelle	Total passes
11th October								
12th October								
13th October								
14th October								

Detector 3b

Species / Date	Common pipistrelle	Nathusias' pipistrelle	Noctule	Serotine/Leisler	Soprano pipistrelle	Total passes
25th July	37				4	41
26th July	11		2		13	26
27th July	46				3	49
28th July	7				2	9
29th July	3				6	9
29th August	12				22	34
30th August	No data					
31st August	No data					
1st Sept	No data					
2nd Sept	No data					
19th Sept	3	1			4	8
20th Sept	8		1		5	14
21st Sept					4	4
22nd Sept	8			1	12	21
23rd Sept					1	1

Species / Date	Common pipistrelle	Nathusias' pipistrelle	Noctule	Serotine/Leisler	Soprano pipistrelle	Total passes
10th October	16				7	23
11th October	72		2	8	281	363
12th October	4				9	13
13th October	6		2	2	180	190
14th October	3				2	5

Transect 4 (*Figure 22.4.1d*)

Detector 4a

Species / Date	Barbastelle	Common pipistrelle	Noctule	Serotine/Leisler	Soprano pipistrelle	Total passes
25th July		4				4
26th July		7		1		8
27th July						
28th July						
29th July						
29th August		6		2	24	32
30th August	1		1	14	72	88
31st August		6		39	58	103
1st September	No data					
2nd September	No data					
19th September					1	1
20th September		1	3		3	7
21st September			1		1	2

Species / Date	Barbastelle	Common pipistrelle	Noctule	Serotine/Leisler	Soprano pipistrelle	Total passes
22nd September			2	8	14	24
23rd September			1		1	2
10th October		6	2	2	10	20
11th October		2			10	12
12th October	No data					
13th October		5	1	6	1	13
14th October			2			2

Detector 4b

Species / Date	Barbastelle	Common pipistrelle	Myotis	Noctule	Serotine/Leisler	Soprano pipistrelle	Total passes
25th July		100		2		78	180
26th July		160		2		17	179
27th July		102				10	112
28th July		471				32	503
29th July		227	2	2		38	269
29th August		35		1		34	70
30th August		68			1	30	99
31st August		39		4	1	11	55
1st September		99			1	41	141
2nd September		40		1	1	21	63
19th September	7	219		3	2	1	232

Species / Date	Barbastelle	Common pipistrelle	Myotis	Noctule	Serotine/Leisler	Soprano pipistrelle	Total passes
20th September	3	59		2	2	4	70
21st September		194			3	10	207
22nd September		8			1	2	11
23rd September		19					19
10th October	1	13		13	1	4	32
11th October	No data						
12th October	No data						
13th October	No data						
14th October		1					1

Transect 5 (*Figure 22.4.1e*)

Detector 5a

Species / Date	Barbastelle	Common pipistrelle	Nathusias' pipistrelle	Myotis	Noctule	Serotine /Leisler	Soprano pipistrelle	Total passes
25th July		17						17
26th July		73					2	75
27th July		163					7	170
28th July		91					6	97
29th July		229					5	234
29th August		70					5	75
30th August		103		1			4	108

Species / Date	Barbastelle	Common pipistrelle	Nathusias' pipistrelle	Myotis	Noctule	Serotine /Leisler	Soprano pipistrelle	Total passes
31st August		41					5	46
1st September		107					2	109
2nd September		119	1				2	122
19th September		3					2	5
20th September		3	1				23	27
21st September		2					1	3
22nd September		16			2		5	23
23rd September		5	1		2		2	10
10th October	1	23					4	28
11th October		64				1	5	70
12th October								
13th October		10	1				10	21
14th October		2				1	1	4

Transect 6 (*Figure 22.4.1f*)

Species / Date	Barbastelle	Common pipistrelle	Nathusias's pipistrelle	Noctule	Serotine /Leisler	Soprano pipistrelle	Total passes
25th July		23	3				26
26th July	2	75	3		1	4	85
27th July		95	10			4	109
28th July		8					8

Species / Date	Barbastelle	Common pipistrelle	Nathusias's pipistrelle	Noctule	Serotine /Leisler	Soprano pipistrelle	Total passes
29th July		3					3
29th August		22					22
30th August		43	8				51
31st August	2	23	10		1	1	37
1st September	3	150	3			3	159
2nd September	No data						
19th September	No data						
20th September	No data						
21st September							0
22nd September				3		2	5
23rd September				3			3
10th October	No data						
11th October		2		1		2	5
12th October	No data						
13th October	No data						
14th October						1	1

Transect 7 (*Figure 22.4.1g*)

Species / Date	Barbastelle	Common pipistrelle	Myotis	Nathusias' pipistrelle	Noctule	Serotine /Leisler	Soprano pipistrelle	Total passes
25th July		5					2	7
26th July	1	42					3	46
27th July		29					4	33
28th July		3					2	5
29th July		5		1				6
29th August		12	2	6	7		8	35
30th August		7					7	14
31st August		6		1		1	2	10
1st September		3					1	4
2nd September		5		4		1	1	11
19th September	No data							
20th September	No data							
21st September		4						4
22nd September		24		2			8	34
23rd September		3					1	4
10th October		24						24
11th October		3			2		1	5
12th October	No data							
13th October		1						1

Species / Date	Barbastelle	Common pipistrelle	Myotis	Nathusias' pipistrelle	Noctule	Serotine /Leisler	Soprano pipistrelle	Total passes
14th October		1					2	3

Annex 2: Full Activity Transect Survey Results

Transects 1 and 2 (*Figure 22.4.1a – Figure 22.4.1b*)

Survey month	Time	Species	kHz	Activity	Notes
June	21.05	Soprano pipistrelle	56	Feeding	Three bats
	21.20	Common pipistrelle	48	Commuting	
	21.34	Common pipistrelle	48	Feeding and commuting	
	22.04	Soprano pipistrelle	55	Feeding	
	22.13	Common pipistrelle	48	Feeding and commuting	
	22.40	Common pipistrelle	48	Social call	
	22.45	Common pipistrelle	48-49	Feeding	
	23.04	Common pipistrelle	45-48	Feeding	
	23.18	Common pipistrelle	48	Feeding	
	23.35	Common pipistrelle	48	Commuting	
	23.45	Common pipistrelle	45	Feeding	
July	22:00	Nathusias' pipstrelle	38	Commuting	One bat
	22.05	Common pipistrelle	45	Commuting	One pass between barn and hedgerow
	22:12	Common pipistrelle	48	Feeding	Several passes; feeding along hedgerow and footpath
	22:28	Common pipistrelle	43	Feeding	Two passes
	22:32	Common pipistrelle	43	Feeding	One pass
	22:35	Common pipistrelle	45	Feeding	One pass
	22:38	Common pipistrelle	43	Foraging	Three passes

Survey month	Time	Species	kHz	Activity	Notes
	22:43	Common pipistrelle	44	Feeding	Multiple passes along hedgerow and footpath
	22:46	Common pipistrelle	46	Feeding	Feeding along hedgerow
	23:00	Common pipistrelle	45	Feeding	Two passes
	23:05	Common pipistrelle	47	Feeding	Two passes
	23:06	Common pipistrelle	45	Commuting	One pass
August	19:51	Common pipistrelle	47	Feeding	2-3 bats emerging from woodland
	20:15	Common pipistrelle	45	Feeding	One bat
	20.18	Common pipistrelle	45	Commuting and feeding	2 bats commuting along road (woodland and hedgerow)
	20:21	Serotine	28	Feeding	Large bat observed along road
	20:35	Common pipistrelle	45	Commuting	One bat
	20:50	Common pipistrelle	45	Commuting	
	21:01	Common pipistrelle	45	Feeding	One bat
	21:12	Common pipistrelle	48	Feeding	One bat
	21:50	Soprano pipistrelle	55	Feeding	Several bats feeding along hedgerow
	21:52	Common pipistrelle	45	Feeding	
	22:22	Common pipistrelle	45	Feeding	One bat
	22:27	Common pipistrelle	45	Feeding	One bat flying from hedge to field
	22:34	Common pipistrelle	45	Commuting	One bat
	22:37	Common pipistrelle	45	Feeding	One bat

Survey month	Time	Species	kHz	Activity	Notes
	22:44	Common pipistrelle	45	Feeding	One bat
	22:55	Common pipistrelle	45	Feeding	Bats feeding along hedgerow
	00:05	Common pipistrelle	45	Feeding	One bat
	00:17	Common pipistrelle	45	Feeding	One bat
	01:20	Common pipistrelle	45	Feeding	One bat feeding across field
	02:42	Common pipistrelle	45		One bat
	02.45	Common pipistrelle	45	Feeding	One bat
September	19:35	Common pipistrelle	47		Tractor cutting hedge during survey
	19:40	Common pipistrelle	45	Feeding	3-4 bats.
	19.46	Common pipistrelle	50	Feeding	Bats using hedgerows
	19:50	Serotine	26	Feeding	
	19:54	Common pipistrelle	46	Commuting	
	19:57	Common pipistrelle	46	Feeding	
	20:15	Common pipistrelle	46	Feeding	
	20:20	Common pipistrelle	49	Feeding	Feeding along edge of woodland
	20:20	Serotine	26	Feeding	2-4 bats feeding along edge of woodland
	20:45	Serotine	27	Feeding	Feeding along hedgerow
	20:49	Common pipistrelle	46	Feeding	
	21:10	Soprano pipistrelle	58	Feeding	Feeding along road/hedgerow//woodland
	21:14	Common pipistrelle	46	Feeding	1-2 bats

Survey month	Time	Species	kHz	Activity	Notes
October	18:42	Serotine	25	Commuting	Flying across field and along hedgerow
	18:50	Serotine	30	Commuting	Flying along hedgerow
	19:00	Serotine	23	Feeding	
	19:04	Serotine	27	Feeding	
	19:40	Common pipistrelle	42	Feeding	
	19:44	Common pipistrelle	55	Feeding	
	19:51	Common pipistrelle	52	Feeding	Feeding along woodland edge and road
	19:55	Common pipistrelle	53	Feeding	Feeding along woodland edge and road
	20:16	Common pipistrelle	42	Feeding	
	20:30	Common pipistrelle	45	Feeding	

Transects 3 and 4 (*Figure 22.4.1c – Figure 22.4.1d*)

Month	Time	Species	kHz	Activity	Notes
June	21.34	Common pipistrelle	46	Feeding	One bat
	21.40	Common pipistrelle	48	Feeding	
	22.01	Common pipistrelle	48	Feeding	One bat
	22.14	Common pipistrelle	48	Feeding	
	22.34	Common pipistrelle	40	Feeding	One bat
	22.56	Soprano pipistrelle	60	Commuting	One bat, commuting to footpath
	23.08	Common pipistrelle	49	Feeding	One bat along the footpath
	23.24	Common pipistrelle	45	Feeding	One bat

Month	Time	Species	kHz	Activity	Notes
	23.40	Common pipistrelle	45	Commuting	
	23.45	Common pipistrelle	48	Commuting	One bat
	23.56	Common pipistrelle	50	Commuting and feeding	Bats along the footpath
July	21.25	Nathusias' pipistrelle	39	Feeding	Four passes along footpath
	22:30	Common pipistrelle	45	Feeding	Three passes feeding in woodland
	22:40	Common pipistrelle	45	Commuting	One pass
	22:45	Common pipistrelle	45	Commuting	Several passes
	23:04	Common pipistrelle	45	Commuting	Two passes
	23:15	Common pipistrelle	45	Feeding	Two passes
	23.30	Common pipistrelle	45	Feeding	One pass
August	20:30	Common pipistrelle	48	Feeding	Two bats in trees/woodland
	20:47	Common pipistrelle	45	Feeding	One bat
	21:01	Common pipistrelle	49	Feeding	One bat
	21:15	Barbastelle	30	Feeding	One bat feeding along road/hedgerow
	21:19	Barbastelle	32	Feeding	One bat
	21:29	Barbastelle	29	Feeding	One bat
	21:59	Common pipistrelle	48	Feeding	One bat
	22:03	Common pipistrelle	50	Feeding	One bat
September	19:20	Common pipistrelle	50		Flying high in trees
	19:39	Common pipistrelle	45		

Month	Time	Species	kHz	Activity	Notes
	19:45	Common pipistrelle	45		Flying in woodland
	19:48	Nathusias' pipistrelle	38	Feeding	
	20:04	Common pipistrelle	45	Feeding	
October	18:38	Common pipistrelle	47	Feeding	
	18:57	Common pipistrelle	46	Feeding	Feeding along hedgerow/road. Two passes observed
	19:01	Barbastelle	30	Feeding	Feeding along road/hedgerow. 2 passes observed
	19:10	Common pipistrelle	50	Feeding	Feeding along hedgerow; 3-4 passes observed
	19:15	Common pipistrelle	48	Feeding	Feeding along hedgerow/road. 4-5 passes observed
	19:25	Common pipistrelle	47	Feeding	
	19:55	Common pipistrelle	46	Commuting	Three to four passes
	19:58	Soprano pipistrelle	55	Commuuting	Three passes

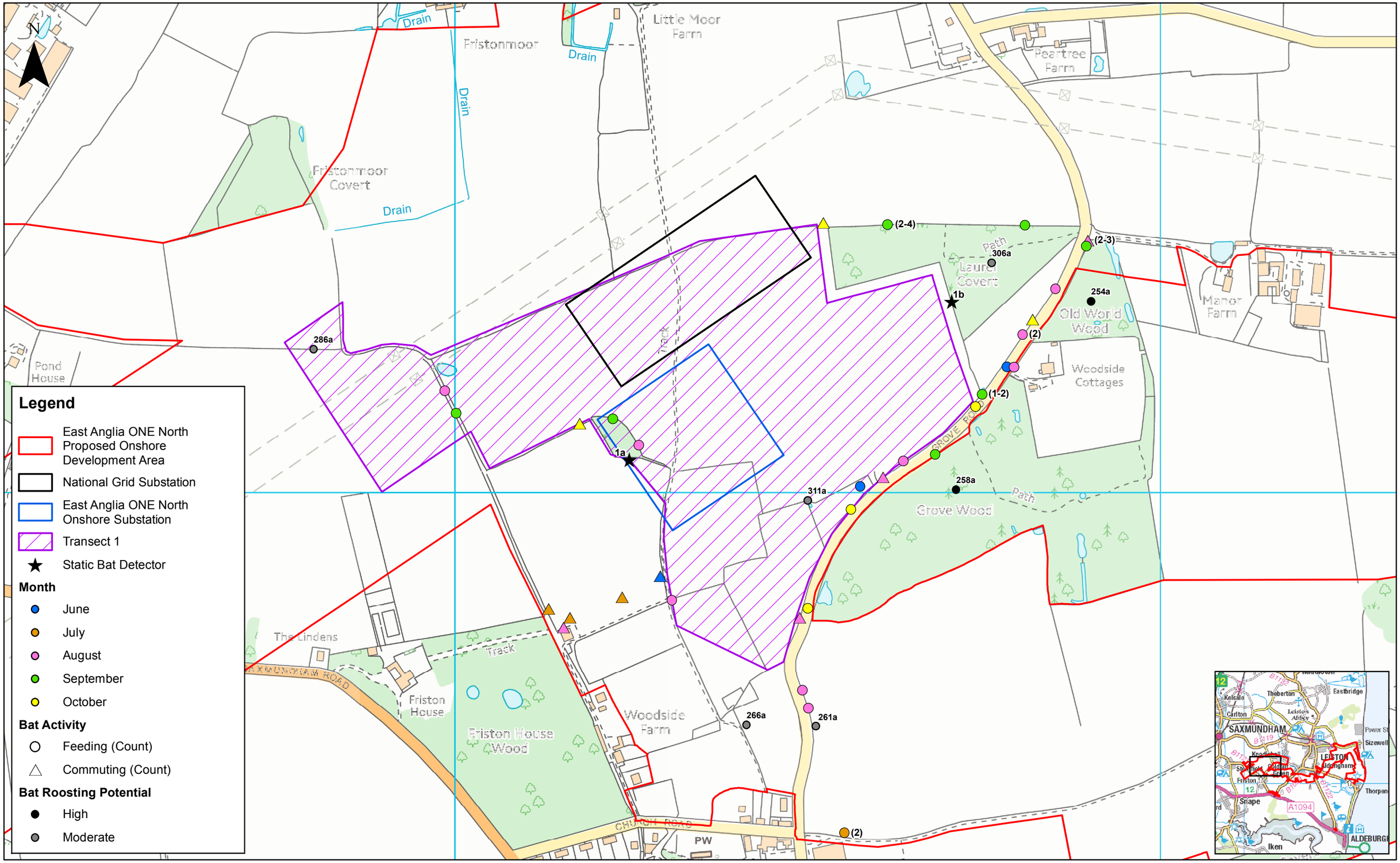
Transects 5,6 and 7 (*Figure 22.4.1e – Figure 22.4.1g*)

Month	Time	Species	kHz	Activity	Notes
June	21.17	Common pipistrelle	45	Feeding	Two feeding in the woodland
	21.34	Common pipistrelle	45	Feeding	One feeding along footpath
	21.40	Common pipistrelle	45	Feeding	One feeding along footpath
	21.56	Common pipistrelle	45	Feeding	One bat
	22.06	Common pipistrelle	42	Commuting	
	22.18	Common pipistrelle	45	Feeding	

Month	Time	Species	kHz	Activity	Notes
	22.35	Common pipistrelle	45	Feeding	
	22.45	Serotine	27	Commuting	
	22.56	Common pipistrelle	48	Feeding	One bat
	23.16	Common pipistrelle	45	Feeding	One bat
	23.26	Soprano pipistrelle	66	Feeding	
	23.34	Common pipistrelle	45	Commuting	One bat along hedgerow
	23.45	Common pipistrelle	46	Feeding	One feeding in corner of field
July	21.08	Common pipistrelle	45	Feeding	Two passes; one bat flying along footpath
	21:40	Common pipistrelle	45	Feeding	One pass
	21:45	Common pipistrelle	45	Commuting	Two bats flying from woodland along hedge
	22.06	Common pipistrelle	45	Feeding	One pass
	22.33	Common pipistrelle	45	Feeding	One pass
	22.45	Common pipistrelle	45	Feeding	One pass
	22.56	Common pipistrelle	45	Feeding	Two passes
	23.09	Common pipistrelle	45	Feeding	One pass feeding along footpath
	23.17	Common pipistrelle	45	Feeding	One pass
	23.20	Common pipistrelle	45	Feeding	One pass
	23.23	Common pipistrelle	45	Commuting	Two passes
August	20:07	Soprano pipistrelle	55	Feeding	Three bats feeding along footpath; four passes observed

Month	Time	Species	kHz	Activity	Notes
	22:20	Common pipistrelle	48	Feeding	One bat; three passes observed
	22:02	Common pipistrelle	45	Feeding	One bat; two passes
	20:26	Common pipistrelle	45	Commuting	One bat
	05:00	Common pipistrelle	45	Commuting	One bat
	05:15	Common pipistrelle	45	Feeding	One bat feeding along hedgerow; two passes
September	19:34	Common pipistrelle	45	Commuting and feeding	Commuting and feeding along hedgerow
	20:10	Common pipistrelle	45	Feeding	Feeding in hedgerow
October	18:56	Common pipistrelle	46	Feeding	One pass at a distance
	19:09	Common pipistrelle	46	Feeding	One pass
	19:44	Common pipistrelle	46	Feeding	Flying along track; 5-6 passes observed.
	19:34	Common pipistrelle	46	Feeding	Five passes observed
	19:45	Common pipistrelle	47	Feeding	Three passes observed

Annex 3: Supporting Figure



SCOTTISHPOWER RENEWABLES

Rev	Date	By	Comment
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Scale @ A3

0 100 200 Metres

East Anglia ONE North

Bat Survey Results

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Rev	1
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Figure	22.4.1a

Coordinate System: BNG
Datum: OSGB36

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N

Laurel Covert

Path

Old World Wood

Woodside Cottages

Manor Farm

GROVE ROAD

Grove Wood

Path

(3)

(3)

(3)

2a

233a

236a

2b

(1)

(3-4)

226a

Ween Walk Wnin

Track

218a

213a

Long Covert

Pit (dis)

Bull's Hall

SNAPE ROAD

Path

Coldfair Green

PW

Depot

Hall

Recr Gd

Tk

FB

Track

POST OFFICE ROAD

MILL ROAD

Playing Field

Knodishall Common

Path

Track

FB

PW

W

THE FITCHES

Legend

East Anglia ONE North Proposed Onshore Development Area

Transect 2

Static Bat Detector

Month

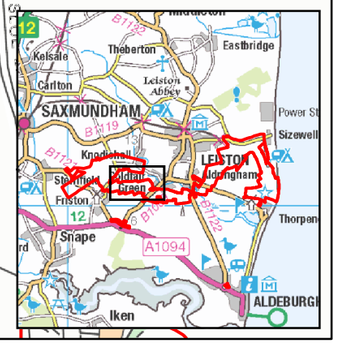
- June
- July
- August
- September
- October

Bat Activity

- Feeding (Count)
- Commuting (Count)
- Social Call (Count)

Bat Roosting Potential

- High
- Moderate



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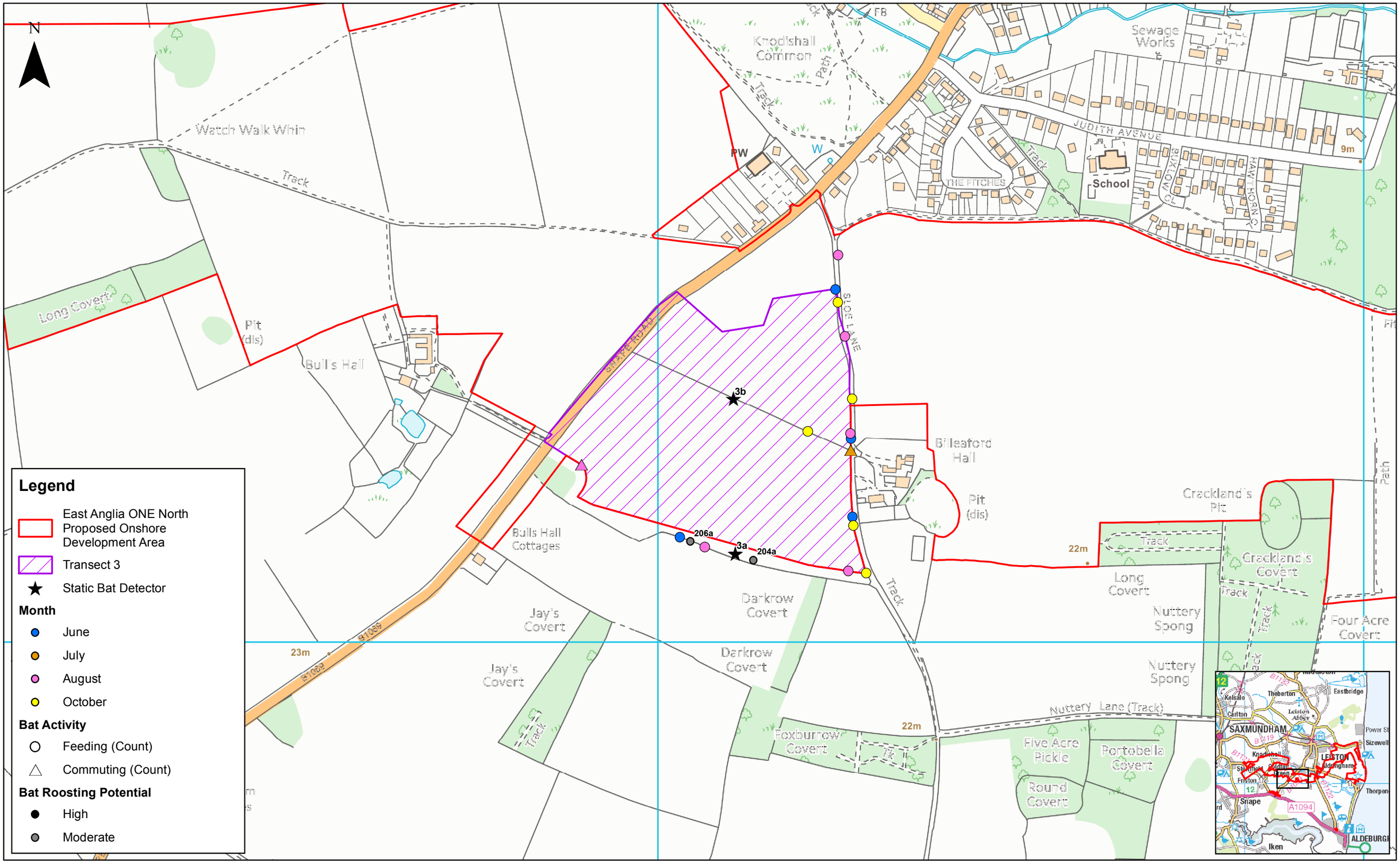

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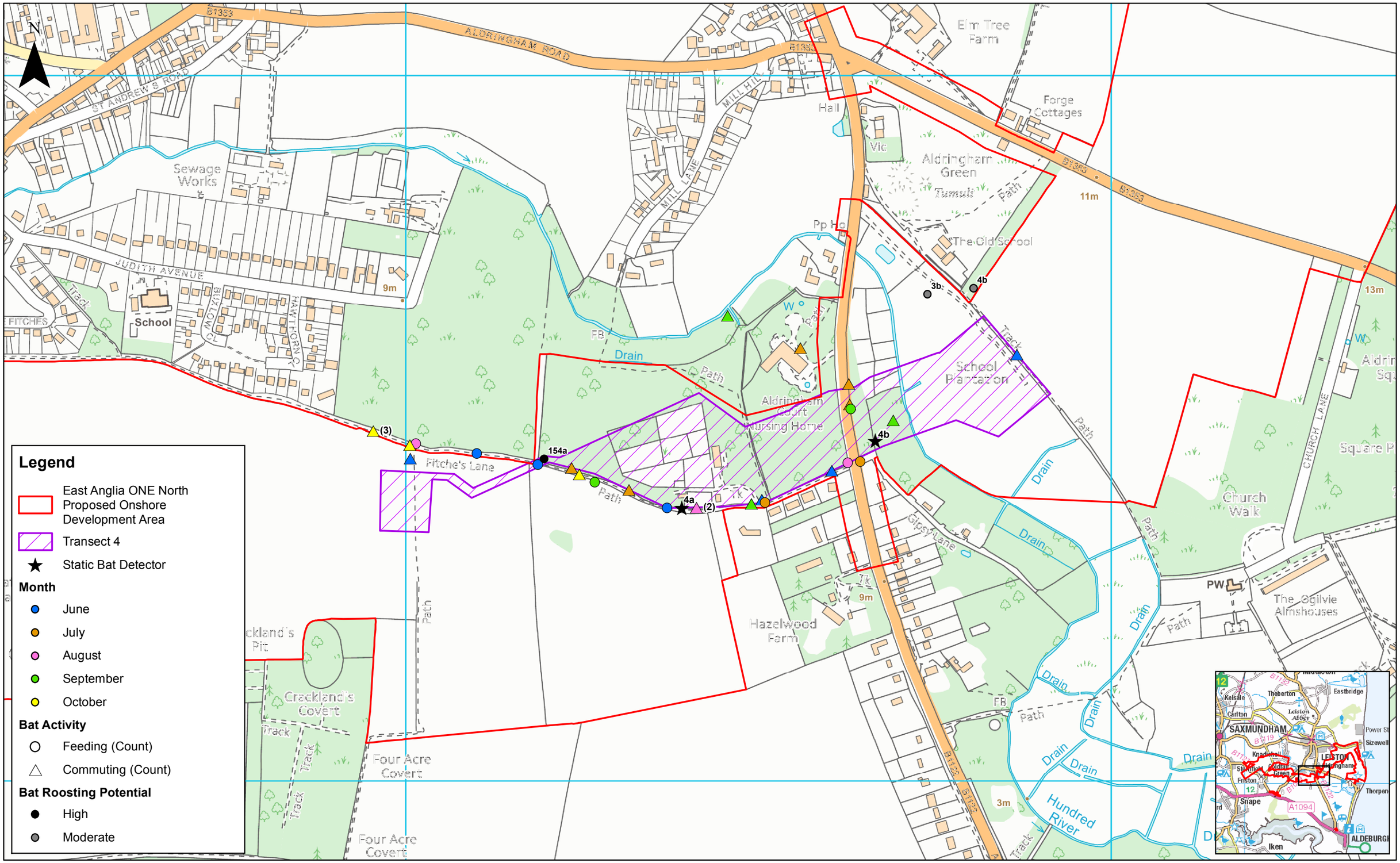

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Bat Survey Results

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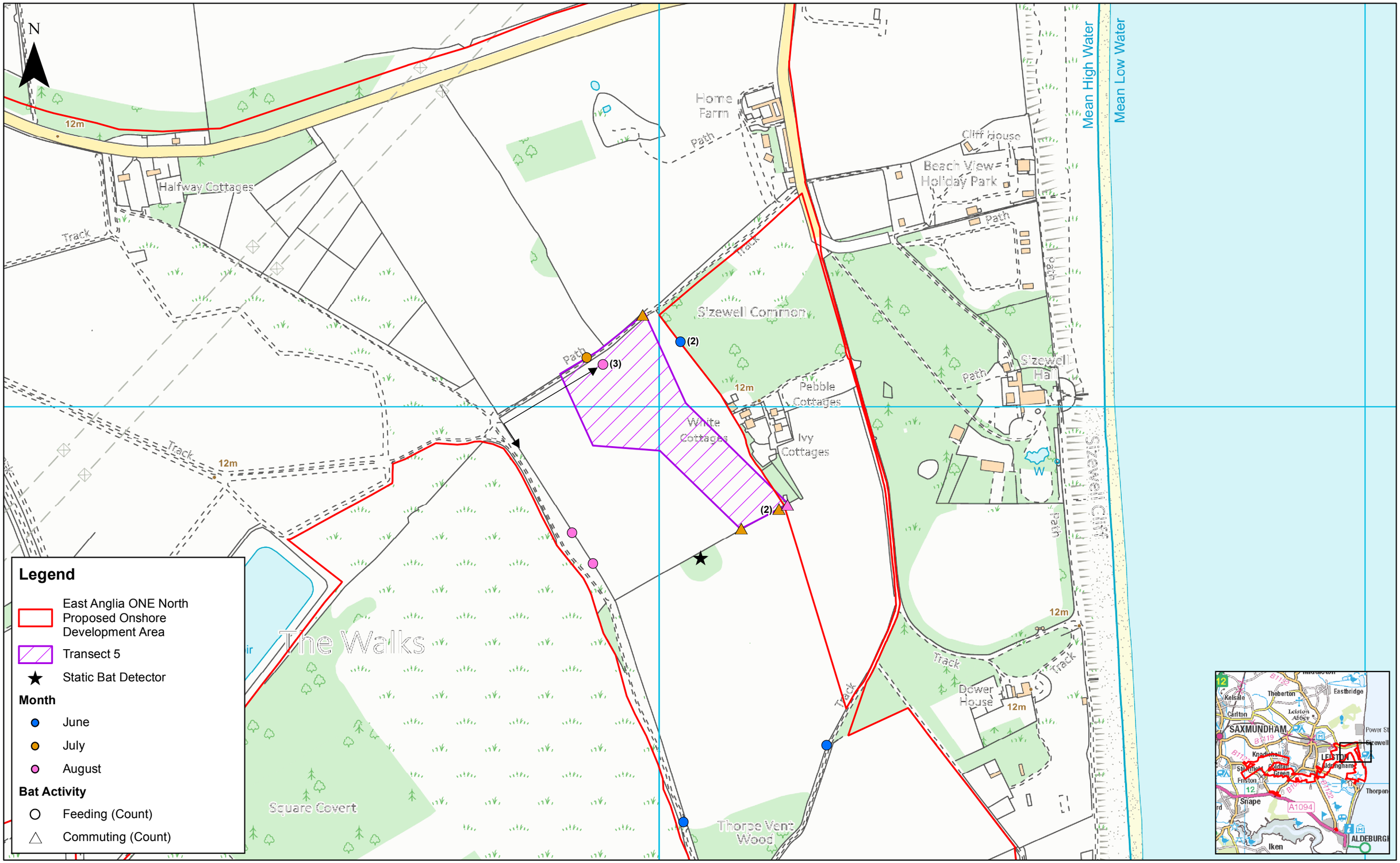

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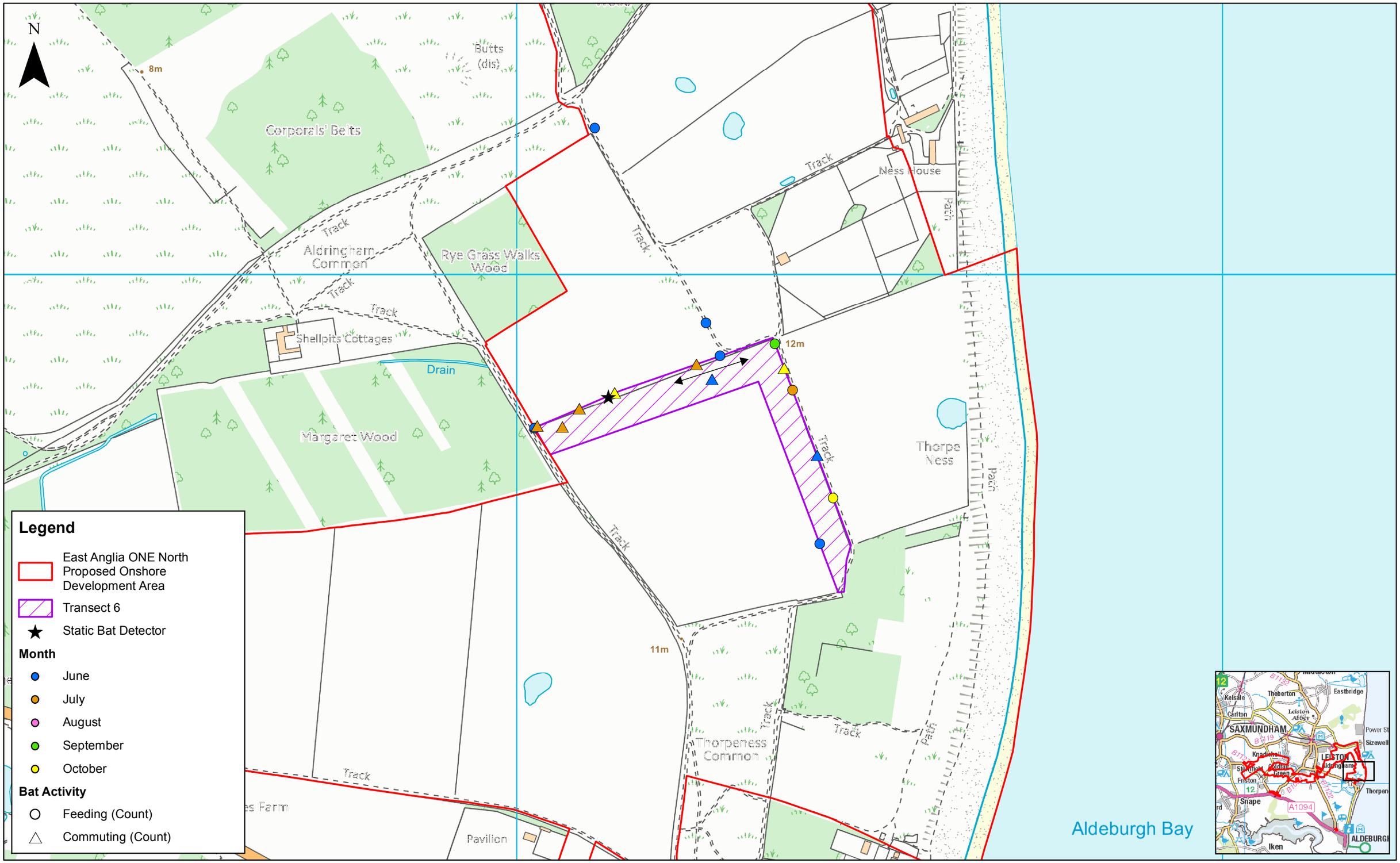

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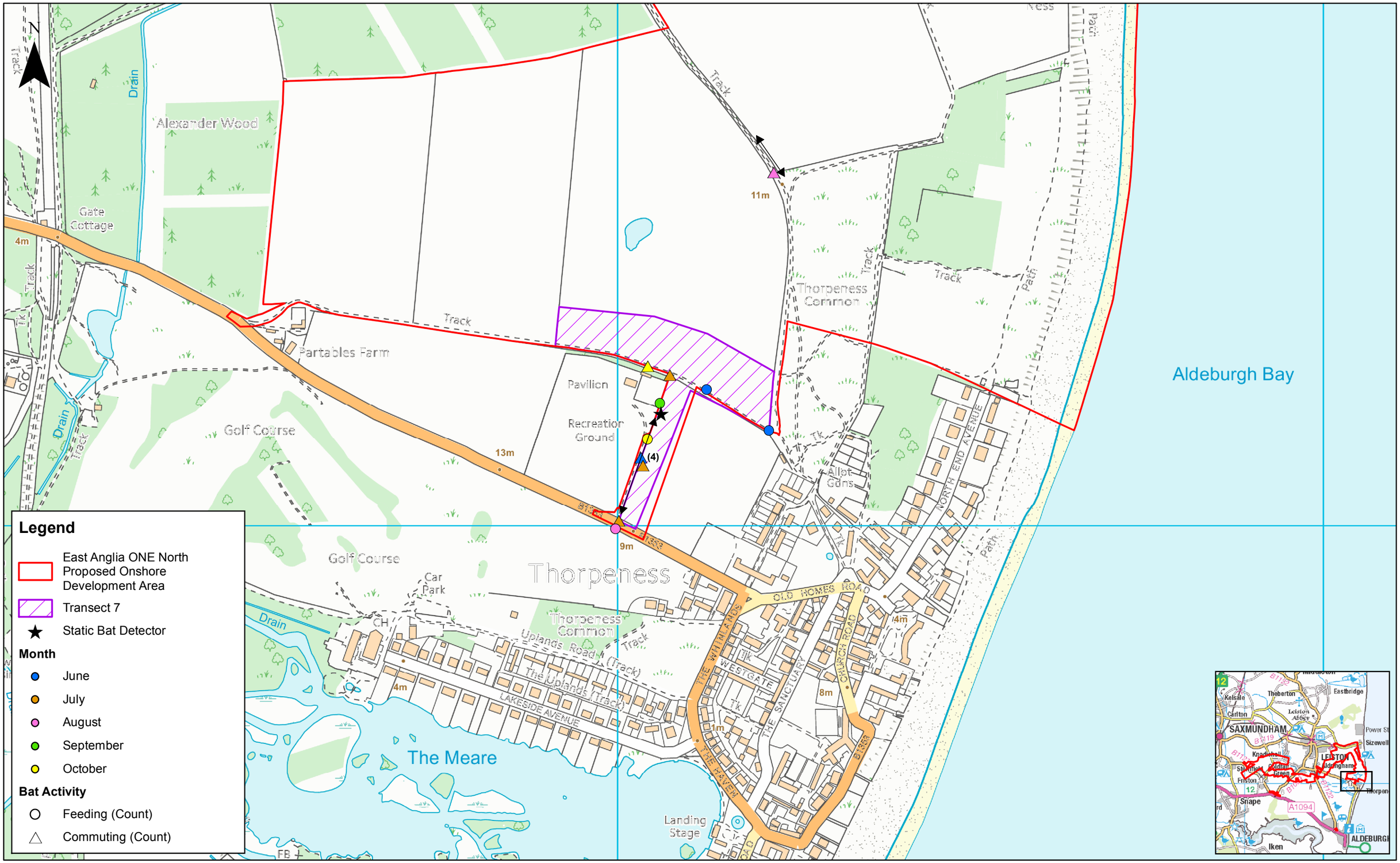

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Bat Survey Results

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