East Anglia TWO Offshore Windfarm

Appendix 22.3

Extended Phase 1 Habitat Survey
Part 1 of 2

Environmental Statement
Volume 3

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Glossary of Acronyms

BAP	Biodiversity Action Plan
BCT	Bat Conservation Trust
BoCC	Birds of Conservation Concern
CCS	Construction Consolidation Sites
CIEEM	Chartered Institute for Ecology and Environmental Management
CWS	County Wildlife Site
EEC	European Economic Community
EIA	Environmental Impact Assessment
EMP	Ecological Management Plan
ES	Environmental Statement
EU	European Union
ha	Hectares
HDD	Horizontal Directional Drilling
HSI	Habitat Suitability Index
IEMA	Institute of Environmental Assessment
JNCC	Joint Nature Conservation Committee
Km	Kilometers
m	Metres
MAGIC	Multi-Agency Geographic Information for the Countryside
OS	Ordnance Survey
PMoW	Precautionary Method of Working
SAC	Special Area of Conservation
SBIS	Suffolk Biodiversity Information Service
SCC	Suffolk County Council
SCDC	Suffolk Coastal District Council
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TN	Target Note
UK BAP	UK Biodiversity Action Plan

Glossary of Terminology

Applicant	East Anglia TWO Limited.
Cable sealing end compound	A compound which allows the safe transition of cables between the overhead lines and underground cables which connect to the National Grid substation.
Cable sealing end (with circuit breaker) compound	A compound (which includes a circuit breaker) which allows the safe transition of cables between the overhead lines and underground cables which connect to the National Grid substation.
Construction consolidation sites	Compounds associated with the onshore works which may include elements such as hard standings, lay down and storage areas for construction materials and equipment, areas for vehicular parking, welfare facilities, wheel washing facilities, workshop facilities and temporary fencing or other means of enclosure.
Development area	The area comprising the onshore development area and the offshore development area (described as the 'order limits' within the Development Consent Order).
East Anglia TWO project	The proposed project consisting of up to 75 wind turbines, up to four offshore electrical platforms, up to one 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.
East Anglia TWO windfarm site	The offshore area within which wind turbines and offshore platforms will be located.
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.
Jointing bay	Underground structures constructed at intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	The area (from Mean Low Water Springs) where the offshore export cables would make contact with land, and connect to the onshore cables.
Link boxes	Underground chambers within the onshore cable route housing electrical earthing links.
Mitigation areas	Areas captured within the onshore Development Area specifically for mitigating expected or anticipated impacts.
National electricity grid	The high voltage electricity transmission network in England and Wales owned and maintained by National Grid Electricity Transmission
National Grid infrastructure	A National Grid substation, cable sealing end compounds, cable sealing end (with circuit breaker) compound, underground cabling and National Grid

	overhead line realignment works to facilitate connection to the national electricity grid, all of which will be consented as part of the proposed East Anglia TWO project Development Consent Order but will be National Grid owned assets.
National Grid substation	The substation (including all of the electrical equipment within it) necessary to connect the electricity generated by the proposed East Anglia TWO project to the national electricity grid which will be owned by National Grid but is being consented as part of the proposed East Anglia TWO project Development Consent Order.
National Grid substation location	The proposed location of the National Grid substation.
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 (which may be laid directly within a trench, or laid in cable ducts or protective covers), up to two fibre optic cables and up to two distributed temperature sensing cables.
Onshore development area	The area in which the landfall, onshore cable corridor, onshore substation, landscaping and ecological mitigation areas, temporary construction facilities (such as access roads and construction consolidation sites), and the National Grid Infrastructure will be located.
Onshore infrastructure	The combined name for all of the onshore infrastructure associated with the proposed East Anglia TWO project from landfall to the connection to the national electricity grid.
Onshore preparation works	Activities to be undertaken prior to formal commencement of onshore construction such as pre–planting of landscaping works, archaeological investigations, environmental and engineering surveys, diversion and laying of services, and highway alterations.
Onshore substation	The East Anglia TWO substation and all of the electrical equipment within the onshore substation and connecting to the National Grid infrastructure.
Onshore substation location	The proposed location of the onshore substation for the proposed East Anglia TWO project.
Transition bay	Underground structures at the landfall that house the joints between the offshore export cables and the onshore cables.

22.3 Extended Phase 1 Habitat Report

22.1 Introduction

22.1.1 Scope of Works

1. This report documents the results of an Extended Phase 1 Habitat Survey, which was undertaken by Royal HaskoningDHV ecologists in April 2018.

2. At the time of undertaking the 2018 Extended Phase 1 Habitat Survey, the onshore development area was yet to be finalised, and therefore the 2018 Extended Phase 1 Habitat Survey and reporting was completed on the wider indicative onshore development area. The information presented in the main body of this report is therefore described in terms of the indicative onshore development area boundary. The indicative onshore development area is shown on ***Figures 22.3.1 – 22.3.5,*** alongside the onshore development area.

3. An additional Phase 1 Habitat Survey (Phase 1 Addendum) was conducted in response to Section 42 consultation. The purpose of this additional survey was to gather habitat information from the small western portion of the onshore development area which was not obtained during the 2018 Extended Phase 1 Habitat Survey. The results of this 2019 Phase 1 Addendum are reported in ***Annex 1*** of this appendix. The relevant data collected from the 2018 Extended Phase 1 Habitat Survey and 2019 Phase 1 Addendum is taken forward and presented in the ES chapter where is relevant specifically to the onshore development area.

22.1.2 Project Background

4. The onshore infrastructure of the proposed East Anglia TWO project will be situated within East Suffolk Council (ESC) wholly within the authority of Suffolk County Council (SCC). To connect the proposed East Anglia TWO project to the National Grid, the following infrastructure will be required within the indicative onshore development area:

   - Landfall;
   - Onshore cable corridor
   - Onshore substation; and
   - National Grid infrastructure.

5. The key onshore components are likely to include:

   - The landfall site with an associated transition bay to connect the onshore and offshore cables;

- Up to six onshore cables and up to two fibre optic cables, associated jointing bays and associated distributed temperature sensing (DTS) cabling (some or all of which may be installed in ducts);
- Onshore underground cable ducts and cable jointing bays, into which the cables will be installed;
- Onshore substation; and
- National Grid infrastructure.

6. Infrastructure will be required by National Grid to connect the proposed East Anglia TWO project to the national electricity grid, this is expected to include:

- National Grid substation;
- Sealing end compounds/gantries; and
- Modifications to overhead lines.

22.1.3 Purpose of this Report

7. The purpose of this report is to present the findings of the Extended Phase 1 Habitat Survey and provide an overall understanding of the existing ecological value of the indicative onshore development area.

8. The Extended Phase 1 Habitat Survey comprises three components, which collectively has enabled a preliminary understanding of the ecological value of the indicative onshore development area. These components are:

- A desktop review that summarises information on existing protected species records and statutory and non-statutory nature conservation designations within and up to 2 km (5km for bat species) of the indicative onshore development area;
- The recording of the habitats within the indicative onshore development area obtained from the field survey; and
- An assessment of the indicative onshore development area for its likelihood of supporting legally protected species or species of conservation concern.

9. 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 2015).

22.2 Legislation and Policy

10. This section summarises the relevant information regarding the legal protection afforded to habitats and species mentioned in this report. However, it should be

noted that this is for information only and is not intended to be exhaustive or to replace specialised legal advice.

11. ***Table A22.1*** below provides a summary of the key legislation and policy relevant to the indicative onshore development area.

Table A22.1 Summary of Key Legislation and Policy Relevant to the Indicative Onshore Development Area

Legislation	Relevance
Wildlife and Countryside Act 1981 (as amended)	Codifies the European Union (EU) Directive 2009/147/EC (the Birds Directive) into UK law; provides legal protection for Ramsar sites and Sites of Special Scientific Interest (SSSI); outlines legal offences in relation to wild birds, animals, and invasive species; provides lists of species which are protected under the Act.
The Conservation of Habitats and Species Regulations 2017 (as amended)	Codifies the EU Directive 92/43/EEC (The Habitats Directive) into UK law; provides legal protection for European designated sites (Special Area of Conservation (SAC) and Special Protection Area (SPA)).
Natural Environment and Rural Communities Act 2006	Details a list of UK habitats and species of 'principle importance' which require protection within the UK.
Protection of Badgers Act 1992	Outlines legal offences in relation to badgers, including taking, injuring or killing badgers, and interfering with badger setts.
The Hedgerow Regulations 1997	Outlines definition of 'important' hedgerows and legal offences in relation to their disturbance or removal.
UK Post-2010 Biodiversity Framework	Supersedes the UK Biodiversity Action Plan (UK BAP), which fulfilled legal obligation under the Convention on Biological Diversity to identify and produce action plans for produce priority habitats and species.

22.3 Methodology

22.3.1 Desk Study

12. The Multi-Agency Geographic Information for the Countryside (MAGIC) website (www.magic.gov.uk) was reviewed in April 2018 for information on statutory sites and notable habitats (e.g. ancient woodlands) of nature conservation value within and up to 3km from the indicative onshore development area.

13. A search for water bodies within 250m of the indicative onshore development area boundary was made using 1:25,000 Ordnance Survey (OS) maps in April 2018 to inform the potential for great crested newt *Triturus cristatus* habitat to be present. A search area of 250m was chosen having taken into account the habitats within and around the indicative onshore development area and because although great crested newts can use suitable terrestrial habitat up to 500m from a breeding pond (English Nature, 2001), research suggests that newts are likely

to travel no more than 250m from ponds where suitable habitats for foraging and hibernation exist (Cresswell and Whitworth, 2004).

14. The water body information derived from the OS maps was then used to identify the potential presence of (and potential for impacts on) great crested newts and other aquatic and semi-aquatic protected species including otter *Lutra lutra*, water vole *Arvicola amphibius* and white clawed crayfish *Austropotamobius pallipes*.

15. An aerial photography exercise was commissioned in March 2018. This exercise comprised the collection of aerial imagery of the indicative onshore development area. The imagery obtained from this survey has been used, in combination with Google Earth aerial photos, to assist in confirming the extent of habitat types identified during the Extended Phase 1 Habitat Survey. These images were reviewed in April 2018.

16. The UK Post-2010 Biodiversity Framework (2012) (which replaces the UK Biodiversity Action Plan (UK BAP)) and the Suffolk Planning BAP were reviewed in April 2018 to identify habitats and species of conservation concern that may be present within the indicative onshore development area.

17. A biological data request from the Suffolk Biodiversity Information Service (SBIS) was undertaken in November 2017 and updated in April 2018.

22.3.2 Field Survey Methodology

22.3.2.1 Extended Phase 1 Habitat Survey Methodology

18. An Extended Phase 1 Habitat Survey was undertaken between 4th and 17th April 2018 to record the habitats within the indicative onshore development area and to identify the presence / likely presence of legally protected and notable species.

19. The Extended Phase 1 Habitat Survey followed the 'Extended Phase 1' methodology as set out in Guidelines for Baseline Ecological Assessment (Institute of Environmental Assessment (IEMA) 1995). This method of survey provides information on the habitats within the indicative onshore development area and assesses the potential for legally protected species to occur on or adjacent to the indicative onshore development area. Habitats have been recorded within the indicative onshore development area using the system set out within the Joint Nature Conservation Committee (JNCC) Handbook for Phase 1 habitat survey: A technique for environmental audit (JNCC 2010).

20. All of the habitats within the indicative onshore development area have been mapped and Target Notes (TN) have been used to provide details of characteristic habitats and species composition, and highlight any features of ecological interest.

21. Following the Guidelines for Baseline Ecological Assessment (IEMA 1995), the habitat survey was 'extended' to make preliminary investigations in respect to the following legally protected and/or notable species.

22.3.2.1.1 Birds

22. It should be noted that specific onshore ornithology surveys have been completed - and have reported upon separately. However, as part of the Extended Phase 1 Habitat Survey, a search for all habitats with suitability to support breeding/wintering birds, with a focus on those habitats with the suitability to support birds listed on Schedule 1 of the Wildlife and Countryside Act and IUCN 'Red' and 'Amber' List species was undertaken. These habitats include trees, hedgerows, water bodies, grazing marsh / fen, lowland heath and agricultural land.

22.3.2.1.2 Badger

23. A search for signs of badger *Meles meles* activity within the indicative onshore development area was undertaken. Signs such as setts, tracks, hairs, bedding and spoil heaps, snuffle holes and latrines, were checked for.

24. Where active setts were found, they were classified using the following categories:

- **Main sett** (Several holes with large spoil heaps and obvious paths emanating from and between sett entrances);
- **Annexe sett** (Normally less than 150m from main sett, comprising several holes. May not be in use all the time, even if main sett is very active);
- **Subsidiary sett** (Usually at least 50m from main sett with no obvious paths connecting to other setts. May only be used intermittently); and
- **Outlier sett** (Little spoil outside holes. No obvious paths connecting to other setts and only used sporadically. May be used by foxes and rabbits).

22.3.2.1.3 Bats

25. All trees, buildings and structures were assessed for their potential to support roosting bats from the ground and using binoculars. Each feature was assigned a classification of negligible, low, moderate or high suitability to support roosting bats following the guidelines set out in Table 4.1 of the Bat Conservation Trust's (BCT) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd ed.) (BCT 2016).

26. All trees, water bodies and hedgerows were also assessed for their potential to provide commuting and foraging habitat for bats, in accordance with the same BCT guidelines referred to above.

22.3.2.1.4 Water vole and Otter

27. Standing and running water bodies within the indicative onshore development area were assessed for their suitability to support water voles and otters.

28. During the Extended Phase 1 Habitat Survey, all water bodies were assessed as to whether they provide optimal or sub-optimal habitat for water voles and/or otters. Those assessed as being sub-optimal will be excluded from any further surveys and/or assessment. Sub-optimal water bodies are typically those with artificial banks, strong evidence of pollution, those which no longer support running water in any season, or where field signs of mink have been observed during the survey (Strachan, Moorhouse and Gelling, 2011). Those water bodies assessed as providing optimal habitat for water voles and/or otters will be subject to further surveys presence/absence surveys. These further surveys were not undertaken during the Extended Phase 1 Habitat Survey. The findings of these surveys are reported within ***Appendix 22.5***.

22.3.2.1.5 Great Crested Newt

29. Standing water bodies within an area wider than the indicative onshore development area were subject to a Habitat Suitability Index (HSI) assessment (following Oldham et al. 2000), to assess their potential to support great crested newt *Triturus cristatus*. eDNA surveys were subsequently undertaken of all identified water bodies within the indicative onshore development area. The findings of which are reported separately (***Appendix 22.4***) and have not been repeated within this document.

22.3.2.1.6 Reptiles

30. Areas of potential reptile habitat were identified during the Extended Phase 1 Habitat Survey. Specifically, habitat mosaics were noted i.e. where a collection of suitable habitats for reptile hibernation, basking, and foraging occur together. Habitats comprising habitat mosaics which may support reptiles include habitats transitions (ecotones), rank grassland, lowland heath, piles of debris (hibernacula), or bare ground (Edgar, P., Foster, J. and Baker, J. 2010).

22.3.2.1.7 Invasive Non-native Species

31. Where present, the location and extent of invasive non-native species was recorded during the Extended Phase 1 Habitat Survey. Due to the many invasive non-native species being present in the UK, the field survey focussed on the species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

22.3.3 Surveyors

32. The Extended Phase 1 Habitat Surveys were conducted by a team of four Royal HaskoningDHV ecologists. The survey team was led by Charlotte Clements, BSc Hons, Associate Member of CIEEM (ACIEEM). Charlotte has 3 years' experience of Extended Phase 1 Habitat Surveying. The survey team included:

- Maria Walentek BSc. MSc. Associate Member of CIEEM (ACIEEM) and Associate Member of the Institute of Environmental Assessment (AIEMA);
- Lorelei Smith BSc Hons; and
- Beth Travis BSc Hons.

22.3.4 Weather Conditions

33. ***Table A22.2*** summarises the weather conditions encountered during the Extended Phase 1 Habitat Survey period.

Table A22.2 Weather Conditions during the 2018 Extended Phase 1 Habitat Survey

Date	Weather conditions
4th April 2018	Fine, windy, 13°C
5th April 2018	Overcast, windy, 11°C
6th April 2018	Fine, windy, 12 °C
9th April 2018	Overcast, light wind, 8 °C
10th April 2018	Fog, light wind, 10 °C
11th April 2018	Fog, light wind, 8 °C
12th April 2018	Fog, light wind, 10 °C
13th April 2018	Overcast, light wind, 10 °C
16th April 2018	Fine, light wind, 14 °C
17th April 2018	Fine, light wind, 20 °C

22.3.5 Survey Limitations

34. The survey team covered all land to which landowner access permission was granted at the time of the Extended Phase 1 Habitat Survey. Where access was not granted, in some locations the habitats were surveyed from public access routes. The total area surveyed during the 2018 field survey equates to approximately 70% of the indicative onshore development area, with the remaining 30% being surveyed from public access routes and/or aerial photography.

35. Some habitats could not be fully accessed during the 2018 onshore survey, due to physical barriers preventing entry, for example dense scrub. However, these areas were encountered infrequently and where they were, they were recorded as potentially providing field signs which could not be picked up during the field survey.

36. The survey was conducted during April 2018, which is within the optimal survey period for identifying ground flora species and hence habitat communities.

37. Whilst the survey team made the utmost effort to cover every habitat and pick up all field signs present during the field survey, on occasion due to human error some field signs can be missed or overlooked. However, despite this, the data presented in this report is considered to provide an accurate description of the habitats within the indicative onshore development area.

22.4 Results

22.4.1 Desk Study Results

22.4.1.1 Statutory and Non-Statutory Designated Sites

38. Designated sites identified during the desk-based review are listed in ***Table A22.3*** and shown on ***Figure 22.3.1*** and ***Figure 22.3.2***.

Table A22.3 Statutory Designated Sites within 2km of the Indicative Onshore Development Area

Designated site	Key features	Proximity to indicative onshore development area
Statutory Designated Sites		
Sandlings SPA	Breeding populations of nightjar and woodlark. Acid grassland, heath, scrub, woodland (including commercial forest), fen, open water and vegetated shingle.	Within indicative onshore development area
Minsmere to Walberswick Ramsar, Special Protection Area (SPA) and Special Area of Conservation (SAC)	Nationally important numbers of breeding and wintering birds. Annual vegetation of drift lines (vegetated shingle). European dry heath.	1.8km
Alde-Ore Estuary Ramsar, SPA, SAC and Site of Special Scientific Interest (SSSI) and Alde-Ore and Butley Estuaries SAC	Nationally important numbers of breeding and wintering birds. Estuaries. Atlantic salt meadows. Mudflats.	2km

Designated site	Key features	Proximity to indicative onshore development area
Leiston to Aldeburgh SSSI	Acid grassland, heath, scrub, woodland, fen, open water and vegetated shingle.	Within indicative onshore development area
Sizewell Marshes SSSI	Lowland unimproved wet meadow	400m
Minsmere to Walberswick Heath and Marshes SSSI	Mudflats, shingle beach, reed beds, heathland and grazing marsh.	1.8km
Non-statutory Designated Sites – County Wildlife Sites (CWS)		
Suffolk Shingle Beaches	Vegetated shingle	Within indicative onshore development area
Dower House	Acid grassland	Within indicative onshore development area
Aldringham to Aldeburgh Disused Railway Line	Species rich grassland	Within indicative onshore development area
Knodishall Common	Acid grassland	Within indicative onshore development area
Grove Wood	Ancient woodland	Within indicative onshore development area
Great Wood	Ancient woodland	480m
Knodishall Whin	Habitat mosaic	600m
Reckham Pits Wood	Habitat mosaic	680m
Leiston Common	Habitat mosaic	680m
Buckle's Wood	Ancient woodland	800m
Sizewell Levels and Associated Areas	Habitat mosaic	1.1km
Benhall Green Meadows	Wet species rich grassland	1.6km
Church Common	Heathland mosaic	1.8km
Kelsale Morio Meadow	Species rich grassland	2km
Southern Minsmere Levels	Grazing marsh	2km

22.4.1.2 UK Habitats of Principle Importance

39. The following UK Habitats of Principal Importance are present within the indicative onshore development area:

- Ancient woodland;
- Lowland dry acid grassland;
- Lowland heathland;
- Deciduous woodland;
- Traditional orchards; and
- Wood pasture and parkland.

40. All UK Habitats of Principal Importance are shown on ***Figure 22.3.3***.

22.4.1.3 Habitats

22.4.1.3.1 Arable Land

41. The largest habitat by area (417 hectares (ha)) within the indicative onshore development area is arable land (JNCC Phase 1 Habitat code J1.1). At the time of the survey these ranged from fields that were either in crop (including beetroot, potato and oilseed rape) or had been ploughed. The 417ha of arable land equates to approximately 78% of habitat within the indicative onshore development area.

22.4.1.3.2 Boundary Features

42. Field boundaries consisted primarily of hedgerows (93 of 99 boundary features recorded), of which the majority (33) are species-poor hedgerows with trees (J2.3.2). However, species-poor intact hedgerows (31) (J2.1.2), species-poor defunct hedgerows (23) (J2.2.2), species-rich hedgerows with trees (5) (J2.3.1) and species-rich defunct hedgerows (1) (J2.2.1) were also recorded. Occasionally fields were bordered by fences (J2.4) or dry ditches (J2.6).

43. Species rich hedgerows (J2.1.1, J2.2.1 and J2.3.1) typically consisted of shrub and tree species including hawthorn *Crataegus monogyna*, oak *Quercus robur*, ash *Fraxinus excelsior*, hornbeam *Carpinus betulus*, willow *Salix spp*., ivy *Hedera helix*, dog rose *Rosa canina*, holly *Ilex aquifolium*, with ground flora typically consisting of common nettle *Urtica dioica*, bramble *Rubus fruticosus*, cow parsley *Anthriscus sylvestris*, red-dead nettle *Lamium purpureum*, cleavers *Galium aparine*, common hogweed *Heracleum sphondylium*, lords and ladies *Arum maculatum*, broad leaf dock *Rumex obtusifolius*, wild clary *Salvia verbenaca*, hedgerow crane's-bill *Geranium pyrenaicum* and herb robert *Geranium robertianum*. Species poor hedgerows (J2.1.2, J2.2.2 and J2.3.2) were

characterised by fewer than five species within a 30m stretch and were typically dominated by hawthorn.

22.4.1.3.3 Semi-natural Woodland

44. Areas of semi-natural woodland (A1.1.1, A1.2.1 and A1.3.1) were recorded in 38 locations within the indicative onshore development area, these ranged from large areas of woodland through to small isolated pockets at field margins and within disused pits. These areas of woodland represent a coverage of approximately 22ha, which in turn represents approximately 5% of this type of habitat within the indicative onshore development area.

45. Broadleaved woodland typically consisted of a mix of ash, sycamore *Acer pseudoplatanus*, oak and silver birch *Betula pendula* with typical understorey and ground flora species including hawthorn, bramble, common nettle, lords and ladies, primrose *Primula vulgaris*, golden saxifrage *Chrysosplenium oppositifolium*, creeping willow *Salix repens* and ground ivy *Glechoma hederacea*. Coniferous woodland species typically included Scots pine *Pinus sylvestris* and juniper *Juniperus communis*.

22.4.1.3.4 Plantation Woodland

46. Plantation woodland (A1.1.2, A1.2.2 and A1.3.2) was recorded in 19 locations within the indicative onshore development area and typically included oak, silver birch, beech *Fagus sylvatica*, sweet chestnut *Castanea sativa* and Scots pine. Pheasant feeders and enclosures were observed within several areas of plantation woodland, with limited understorey and ground flora species consisting mainly of bramble, common nettle and lords and ladies.

22.4.1.3.5 Scrub

47. A total of 22 areas of scrub were recorded within the indicative onshore development area and in total covers an area of 9ha (representing approximately 2% of this type of habitat within the indicative onshore development area). These areas represented a range of habitat sub-types including transitional habitat between woodland and grassland, boundary features, waste ground, field margins and watercourse margins. Species present included bramble, gorse *Ulex spp*., bracken *Pteridium spp*., common nettle, common hogweed, cow parsley and cleavers.

22.4.1.3.6 Scattered Trees

48. Scattered trees are present throughout the indicative onshore development area. Species recorded included Scots pine, sweet chestnut, bird cherry *Prunus padus*, beech and silver birch.

22.4.1.3.7 Improved Grassland

49. Improved grassland (JNCC habitat code B4) was recorded in 33 locations within the indicative onshore development area and in total covers an area of 22ha (representing approximately 4% of habitat within the indicative onshore development area). This habitat typically represents an area being used for either grazing or paddocks and is formed of short sward grasses with areas of scrub vegetation.

22.4.1.3.8 Poor Semi-Improved Grassland

50. Poor semi-improved grassland (habitat code B6) was recorded in 24 locations within the indicative onshore development area, which in total covers an area of 23ha (representing approximately 4% of habitat across the entire indicative onshore development area). These areas were comprised of coarse ruderal grass and herb species such as cock's foot *Dactylis glomerata*, common couch *Elymus repens*, rough meadowgrass *Poa trivialis*, broad leaf dock, red dead nettle and white clover *Trifolium repens*.

22.4.1.3.9 Standing Water

51. A total of 40 standing water bodies (such as ponds and standing water in ditches) are within the indicative onshore development area.

22.4.1.3.10 Coastal Grassland

52. Coastal grassland (H8.4) was recorded along the coastline at the eastern edge of the indicative onshore development area and comprised gorse, bracken, and marram grass *Ammophila arenaria*.

22.4.1.4 Protected Species

53. This section summarises the records of all legally protected species which have been obtained during the desk based assessment and are within the indicative onshore development area.

22.4.1.4.1 Birds

54. SBIS holds records of 181 notable or protected bird species that have been recorded within (and up to 2km from) the indicative onshore development area. Of those 181 records, there are a total of 59 which are listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), 53 are listed on the Birds of Conservation Concern (BoCC4) 'Red List' of threatened species.

55. The following bird species those which have been provided by SBIS: Bullfinch *Pyrrhula pyrrhula*, Hedge accentor (Dunnock) *Prunella modularis*, Common starling *Sturnus vulgaris*, House sparrow *Passer domesticus*, Song thrush *Turdus philomelos*, Spotted flycatcher *Muscicapa striata*, Bittern *Botaurus*

stellaris, Black-tailed godwit *Limosa limosa*, Herring gull *Larus argentatus*, Common cuckoo *Cuculus canorus*, Common grasshopper warbler *Locustella naevia*, Eurasian curlew *Numernius arquata*, Hawfinch *Coccothraustes coccothraustes*, Lesser redpoll *Carduelis cabaret*, Lesser spotted woodpecker *Dendrocopos minor*, Little tern *Sterna albifrons*, Marsh tit *Piecile palustris*, Nightjar *Caprimulgus europaeus*, Savi's warbler *Locustella luscinioides*, Stone curlew *Burhinus oedicnemus*, Tree pipit *Anthus trivialis*, Twite *Carduelis flavirostris*, Willow tit *Poecile montanus*, Wood lark *Lullula arborea*, Wood warbler *Phylloscopus sibilatrix*, Corn bunting *Miliaria calandra*, Eurasian tree sparrow *Passer montanus*, Grey partridge *Perdix perdix*, Yellow wagtail *Motacilla flava*, Northern lapwing *Vanellus vanellus*, Turtle dove *Streptopelia turtur*, Linnet *Carduelis cannabina*, Skylark *Alauda arvensis*, Yellowhammer *Emeriza citronella*, Reed bunting *Emberiza schoeniclus*.

22.4.1.4.2 Badger

56. Records provided in relation to badgers are provided in the Confidential Appendix: Annex 3.

22.4.1.4.3 Bats

57. SBIS holds records of two species of bats within (and up to 5km from) the indicative onshore development area, namely Serotine *Eptesicus serotinus* and Common pipistrelle *Pipistrellus pipistrellus*, found within the heathland habitat east of Thorpeness Golf Course, Aldringham and west of Grove Wood.

58. The following records of bat species have been provided by SBIS: Barbastelle *Barbastella barbastellus,* Brown long-eared bat *Plecotus auritus,* Lesser horseshoe bat *Rhinolophus hipposideros*, Noctule *Nyctalus noctula* and Soprano pipistrelle *Pipistrellus pygmaeus*.

22.4.1.4.4 Water vole

59. SBIS holds three records of water vole within (and up to 2km from) the indicative onshore development area; east of Knodishall Common and north of Aldringham Nursing home.

60. Water vole is a Suffolk priority species.

22.4.1.4.5 Otter

61. SBIS holds five records of otter within (and up to 2km from) the indicative onshore development area; north of Aldringham Nursing home, west of the Aldeburgh road and south of the Meare.

62. Otter is a Suffolk priority species.

22.4.1.4.6 Great Crested Newt

63. SBIS holds a single record of great crested newt, within a pond in Grove Wood.

64. Great crested newt is a Suffolk priority species.

22.4.1.4.7 Reptiles

65. SBIS holds 77 records of reptiles within (and up to 2km from) the indicative onshore development area, with adder *Vipera berus*, common lizard *Zootoca vivipara*, grass snake *Natrix natrix* and slow-worm *Anguis fragilis* being recorded.

22.4.1.4.8 Dormice

66. There are no records of dormice within the indicative onshore development area or the additional 2km buffer.

22.4.1.4.9 Invertebrates

67. SBIS holds 140 records of invertebrates within (and up to 2km from) the indicative onshore development area.

68. Of those 140 records, only the Lunar-yellow underwing moth *Noctua orbona* is on the Suffolk priority species list.

22.4.1.4.10 Invasive Non-Native Species

69. SBIS returned records of a number of different invasive non-native species within (and up to 2km from) the indicative onshore development area, with key records being for Japanese knotweed *Fallopia japonica*, Giant Hogweed *Heracleum mantegazzianum* and Rhododendron *Rhododendron ponticum*.

22.4.2 Field Survey Results

70. The habitats recorded during the 2018 Extended Phase 1 Habitat Survey are summarised in this section. This section should be read in conjunction with ***Figure 22.3.3a – 22.3.3f*** and the Target notes listed in Annex 1.

22.4.2.1 Overview Summary

71. ***Table* A22.4** shows the key habitats which were recorded within the indicative onshore development area (***Figure 22.3.3a – 22.3.3f)***.

Table A22.4 JNCC Phase 1 Habitat Areas (area in km^2) and Boundaries (length in km) Recorded during the Field Survey

JNCC Phase 1 Habitat Survey Code	JNCC Phase 1 Habitat Survey Description	Area in m^2
A1.1.1	Broadleaved woodland – semi-natural	394,763.01
A1.1.2	Broadleaved woodland – plantation	88,236.20
A1.2.2	Coniferous woodland – plantation	132,388.36
A1.3.1	Mixed woodland – semi-natural	11,613.85
A1.3.2	Mixed woodland – plantation	106,177.89
A2.1	Scrub – dense/continuous	214,437.89
A2.2	Scrub – scattered	211.56
B4	Improved grassland	316,659.66
B5	Marsh/marshy grassland	17,185.95
B6	Poor semi-improved grassland	396,717.96
D1.2	Dry dwarf heath – basic	426,330.88
J1.1	Cultivated/disturbed land – arable	5,745,992.08
J1.2	Cultivated/disturbed land – amenity grassland	190,711.63
JNCC Phase 1 Habitat Survey Code	JNCC Phase 1 Habitat Survey Description	Length in m
J2.1.2	Intact hedge – species poor	9,102.73
J2.2.1	Defunct hedge – species rich	176.30
J2.2.2	Defunct hedge – species poor	6,691.36
J2.3.1	Hedge with trees – species rich	1,446.52
J2.3.2	Hedge with trees – species poor	9,300.16
J2.4	Fence	280.71
J2.6	Dry ditch	666.57

22.4.2.1.1 Arable Land

72. The largest habitat by area within the indicative onshore development area is arable land (JNCC Phase 1 Habitat code J1.1). At the time of the survey these

ranged from fields that were in crop (including beetroot, potato and oilseed rape), were ploughed, and those that remained with winter cover.

22.4.2.1.2 Boundary Features

73. Field boundaries consisted primarily of hedgerows (93 of 99 boundary features recorded), of which the majority (33) are species-poor hedgerows with trees (J2.3.2). However, species-poor intact hedgerows (J2.1.2) (31), species-poor defunct hedgerows (J2.2.2) (23), species-rich hedgerows with trees (J2.3.1) (5) and species-rich defunct hedgerows (J2.2.1) (1) were also recorded. Occasionally fields were bordered by fences (J2.4) or dry ditches (J2.6).

74. Species rich hedgerows (J2.1.1, J2.2.1 and J2.3.1) typically consisted of shrub and tree species including hawthorn *Crataegus monogyna*, oak *Quercus robur*, ash *Fraxinus excelsior*, hornbeam *Carpinus betulus*, willow *Salix spp*., ivy *Hedera helix*, dog rose *Rosa canina*, holly *Ilex aquifolium*, with ground flora typically consisting of common nettle *Urtica dioica*, bramble *Rubus fruticosus*, cow parsley *Anthriscus sylvestris*, red-dead nettle *Lamium purpureum*, cleavers *Galium aparine*, common hogweed *Heracleum sphondylium*, lords and ladies *Arum maculatum*, broad leaf dock *Rumex obtusifolius*, wild clary *Salvia verbenaca*, hedgerow crane's-bill *Geranium pyrenaicum* and herb robert *Geranium robertianum*. Species poor hedgerows (J2.1.2, J2.2.2 and J2.3.2) were characterised by fewer than five species within a 30m stretch and were typically dominated by hawthorn.

22.4.2.1.3 Semi-natural Woodland

75. Areas of semi-natural woodland (A1.1.1, A1.2.1 and A1.3.1) were recorded in 38 locations within the indicative onshore development area, these ranged from large areas of woodland through to small isolated pockets at field margins and within disused pits.

76. Broadleaved woodland typically consisted a mix of ash, sycamore *Acer pseudoplatanus*, oak and silver birch *Betula pendula* with typical understorey and ground flora species including hawthorn, bramble, common nettle, lords and ladies, primrose *Primula vulgaris*, golden saxifrage *Chrysosplenium oppositifolium*, creeping willow *Salix repens* and ground ivy *Glechoma hederacea*. Coniferous woodland species typically included Scots pine *Pinus* sylvestris and juniper *Juniperus communis*.

22.4.2.1.4 Plantation Woodland

77. Plantation woodland (A1.1.2, A1.2.2 and A1.3.2) was recorded in 19 locations within the indicative onshore development area and typically included oak, silver birch, beech *Fagus sylvatica*, sweet chestnut *Castanea sativa* and Scots pine. Pheasant feeders and enclosures were observed within several areas of

plantation woodland, with limited understorey and ground flora species consisting mainly of bramble, common nettle and lords and ladies.

22.4.2.1.5 Scrub

78. A total of 22 areas of scrub (A2.1 and A2.2) were recorded within the indicative onshore development area. These areas represented a range of habitat sub-types including transitional habitat between woodland and grassland, boundary features, waste ground, field margins and watercourse margins. Species present included bramble, gorse *Ulex spp.,* bracken *Pteridium spp.,* common nettle, common hogweed, cow parsley and cleavers.

22.4.2.1.6 Improved Grassland

79. Improved grassland (B4) was recorded in 33 locations within the indicative onshore development area. This habitat was formed of short sward grasses with areas of scrub vegetation typically being used for either grazing or paddocks.

22.4.2.1.7 Marsh/marshy Grassland

80. Marshy grassland (B5) was recorded in one location within the indicative onshore development area. *Juncus spp.,* was present as well as broad leaf dock and cow parsley.

22.4.2.1.8 Poor Semi-Improved Grassland

81. Poor semi-improved grassland (B6) was recorded in 24 locations within the indicative onshore development area. These areas were comprised of coarse ruderal grass and herb species such as cock's foot *Dactylis glomerata*, common couch *Elymus repens,* rough meadowgrass *Poa trivialis*, broad leaf dock, red dead nettle and white clover *Trifolium repens*.

22.4.2.1.9 Dry Dwarf Heath – Basic

82. Heath (D1.2) was the second most abundant habitat type recorded within the indicative onshore development area and was predominantly observed within the east of Leiston. These areas comprised common gorse *Ulex europaeus*, bracken *Pteridium spp*., heather *Calluna vulgaris* and mosses with scattered silver birch and Scots pine within woodland/heath successional habitats.

22.4.2.1.10 Standing Water

83. A total of 40 water bodies were recorded during the 2018 Extended Phase 1 Habitat Survey, these included field margin ditches and running water.

22.4.2.2 Protected Species

22.4.2.2.1 Birds

84. BoCC4 Red List species skylark *Alauda arvenisis* were observed in song flight over arable fields in several locations during the field survey. Woodlark *Lullula*

arborea, listed under Schedule 1 of the Wildlife and Countryside Act, was observed within the heathland habitats east of Leiston during the field survey.

85. A number of common bird species were observed during the field survey including nut hatch *Sitta europaea*, wren *Troglodytes troglodytes*, blackbird *Turdus merula* and greenfinch *Carduelis chloris*.

86. All hedgerows, parkland, isolated trees, grassland, heath and woodland habitats were identified as potentially providing suitable nesting habitat for protected and notable species of birds, alongside common bird species.

87. Relic bird nests were recorded within these habitats during the field survey.

88. For further information on bird species, refer to ***Chapter 23 Onshore Ornithology, Appendix 23.3.***

22.4.2.2.2 Badger

89. Field survey results in relation to badgers are provided within a confidential appendix, Annex 3.

22.4.2.2.3 Bats

90. All features (i.e. trees, buildings, structures) noted during the field survey were assessed for their suitability to support roosting bats. In total, 25 features were assessed for their suitability to support roosting bats. ***Table A22.5*** below shows details of each feature and their assessments. The locations are shown on ***Figure 22.3.3a – 22.3.3f*** and further information is provided in the field survey target notes in Annex 2.

Table A22.5 Bat Roosting Habitat Features Recorded during the 2018 Field Survey (read in conjunction with *Figure 22.3.4*)

Target note reference	Feature and description	Bat Potential
TN3b	Scattered scots pine with pealing bark/split limbs	Moderate
TN4b	Dead tree trunk with large holes	Moderate
TN11b	Alder woodland	Moderate
TN13b	Mature ivy clad alder tree	Moderate
TN29b	Four mature ash trees	Moderate
TN36b	Old mature oak	High
TN38b	Mature oak tree within species poor hedge	Moderate
TN39b	Five mature oak trees alongside track	Moderate
TN154	Mature ivy clad oak in hedgerow	High

Target note reference	Feature and description	Bat Potential
TN189a	Broadleaved plantation woodland	Moderate
TN220a	Cluster of mature ivy clad oaks	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
TN250a	Row of five 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
TN306	Trees within woodland	Moderate
TN311	Mature ivy clad oak in hedge (TN309)	Moderate

91. In addition to trees and structures, all linear features (e.g. watercourses, hedgerows) were categorised in terms of their suitability to support commuting or foraging bats. This categorisation was based on the habitat type, qualified by how well connected to surrounding habitat the habitat feature was. The categorisation used was as follows:

- Defunct hedgerows and field drains typically provided low suitability for commuting and foraging bats.
- Intact species rich hedgerows, areas of scrub and small watercourses typically provided moderate suitability for commuting and foraging bats.
- Species-rich hedgerows with trees and large watercourses well connected to the wider landscape typically provided high suitability for commuting and foraging bats.

92. In total, 58 features were assessed for their suitability to support commuting or foraging bats and assessed as providing medium to high suitability. The locations are shown on ***Figure 22.3.3a – 22.3.3f*** and further information is provided in the field survey target notes in Annex 2.

93. All bat roosting and commuting/foraging features are shown on ***Figure 22.3.4a – 22.3.4f*.**

22.4.2.2.4 Water vole and Otter

94. A total of 40 water bodies were assessed for their suitability to support water voles and/or otters. Of these, 27 were dry and as such assessed as being sub-optimal for both water vole and otter. Of the remaining 13 water bodies, two are outside the indicative onshore development area and six were assessed as being sub optimal, therefore leaving a total of five water bodies (ditches) that were assessed as providing optimal habitat for water voles.

95. Those ditches assessed as sub-optimal was primarily due to the watercourse having very little bank for burrowing, very poor water quality observed, very shallow banks, low flows, evidence of regular channel maintenance or isolation from any connecting habitat.

96. Only one water body was assessed as being suitable to support otter (the Hundred River). The remaining 39 water bodies were assessed as sub-optimal habitat for otters, primarily due to them being field drains which are of insufficient size and depth to support otters as well as not being functionally connected to the wider river network.

97. The locations of these water bodies can be seen on ***Appendix 22.4 Figure 22.4.1.***

22.4.2.2.5 Great Crested Newt

98. A total of 38 water bodies were identified within the indicative onshore development area, which were subject to a Habitat Suitability Index (HSI) assessment to determine their suitability to support great crested newts. Suitable terrestrial habitat for supporting foraging and hibernating great crested newts was observed throughout the indicative onshore development area.

99. The findings of these assessments are reported separately (***Chapter 22 Onshore Ecology***: ***Appendix 22.4***) and have not been repeated within this report.

22.4.2.2.6 Reptiles

100. A total of 14 areas of suitable reptile habitat were recorded. These areas comprise habitat mosaics and potential refugia locations for which could potentially support common reptile species. ***Table A22.6*** contains the details of these areas with further information provided in the table of Target Notes in ***Annex 1***.

Table A22.6 Areas of Suitable Reptile Habitat or Potential Refugia as Recorded during the 2018 Field Survey

Target Note Reference	Description
TN9b	Large vegetated mound – optimal feeding/basking area for reptiles
TN22b	Habitat mosaic within scrub vegetation
TN40b	Habitat mosaic within scrub vegetation
TN62a	Habitat mosaic within improved grassland
TN88a	Potential refugia (log piles) and habitat mosaic within woodland area
TN101a	Habitat mosaic within scrub vegetation
TN152a	Habitat mosaic within scrub vegetation
TN162a	Habitat mosaic within woodland area
TN185a	Habitat mosaic within hedgerow and field margin
TN190a	Habitat mosaic within woodland edges
TN198a	Habitat mosaic within grassland area
TN238a	Habitat mosaic within boundary feature
TN283	Habitat mosaic within scrub vegetation
TN310	**Habitat mosaic within grassland area**

101. The locations of these habitat mosaics and potential refugia are shown on ***Figure 22.3.3a – 22.3.3f***. These mosaics contain a range of habitats including scrub, woodland edges, heath and grassland.

22.4.2.2.7 Dormice

102. Although Dormice have been recorded within the wider area of Suffolk, no records were returned during the desk study. Furthermore, no suitable habitat was recorded within the indicative onshore development area during the 2018 Extended Phase 1 Habitat Survey. Consequently, this species is considered to be absent and has not been considered further in this report.

22.4.2.2.8 Invertebrates

103. No evidence of habitat assessed as suitable to support significant populations of invertebrates was noted during the 2018 Extended Phase 1 Habitat Survey. Consequently, these species have not been considered further in this report.

22.4.2.2.9 Invasive Non-Native Species

104. Only one invasive non-native species was recorded during the 2018 Extended Phase 1 Habitat Survey. Himalayan balsam *Impatiens glandulifera* was noted along the Hundred River (***Figure 22.3.3a – 22.3.3f***).

22.4.3 Summary of 2018 Field Survey Results

105. ***Table A22.7*** below included a summary of protected species recorded during the 2018 Extended Phase 1 Habitat Survey, alongside an indication of whether Phase 2 species specific surveys are required.

Table A22.7 Summary of Field Survey Findings and Requirements for Phase 2 Species Specific Surveys

Species	Phase 2 survey required (yes/no)
Birds	Yes - specific bird surveys are being undertaken and are reported separately to this document.
Badger	Information relating to badgers is contained within the confidential Annex C
Bats	Yes – further surveys to establish the presence of roosting bats (dusk/dawn emergence/re-entry surveys) and commuting/foraging bats (monthly activity transect surveys.
Water vole	Yes – presence/absence surveys (two survey visits)
Otter	Yes – presence/absence surveys (two survey visits)
Reptiles	No - no specific survey will be undertaken, however mitigation measures (i.e. Reptile Precautionary Method of Working) will be prepared and adhered to for all areas of habitat that have been assessed as providing optimal habitat for common reptile species.
Invertebrates	No
Dormice	No
Botanical survey	No

22.5 Recommendations

106. ***Section 22.4.1.3*** identified those habitats which have the potential to support legally protected or notable species, and also sightings / field signs for selected legally protected species. In light of these findings and in order to characterise the ecological baseline for the indicative onshore development area, further Phase 2 surveys are recommended for particular legally protected or notable species. This section provides further information regarding these Phase 2 survey requirements and sets out their proposed scope and methodology that will be adhered to, in accordance with industry accepted guidance for these species.

22.5.1 Phase 2 Species Specific Surveys

22.5.1.1 Bat roost emergence/re-entry surveys

107. ***Section 22.4.1.3*** identified trees and structures with the potential to support bat roosts within the indicative onshore development area. In accordance with the Bat Conservation Trust (BCT) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Ed.) (2016), all trees and structures assessed as providing moderate or high suitability to support roosting bats would require additional surveys (i.e. emergence/re-entry surveys) to confirm the likely presence and/or absence of a bat roost.

108. The 2018 field survey identified a total of 25 features as being within this category. The locations of these potential roosts are shown on ***Figure 22.3.4a – Figure 22.3.4f***.

109. The emergence / re-entry surveys will be undertaken in accordance with the methodology outlined in the BCT's Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Ed.) (2016). For each tree/structure, two survey visits (i.e. one dusk emergence survey and one dawn re-entry survey) will be undertaken. Each dusk emergence survey will commence 15 minutes before sunset, and cease 1.5-2 hours after sunset; whereas the dawn re-entry survey will commence 1.5-2 hours before sunrise, and cease 15 minutes after sunrise. The surveys will be at least two weeks apart, and will be undertaken between May and September with one survey visit between May and August.

110. Bat detectors (any type) and recording equipment to record any echolocation calls will be used for each survey. Laboratory sound-analysis will be used to identify the calls of any bat species picked up using the bat detectors. Species, timing, and activity will be noted for each bat picked up during the survey.

111. Weather conditions including temperature, wind speed and precipitation, will be recorded at the start and end of each survey visit. Surveys will not be carried out when the temperature is below 10°C at sunset, or during heavy rain or strong wind unless justified by the surveying ecologist.

112. All trees and structures classified as potentially providing low suitability to support roosting bats will still be considered as potentially supporting opportunistic roosts in the future, but further surveys are not necessary to confirm presence or absence, following the guidelines set out by the BCT in Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Ed.) (2016).

22.5.1.2 Bat Activity Surveys

113. ***Section 22.4.1.3.2*** identified linear habitats (hedgerows and watercourses) with the potential to support commuting and foraging bats within the indicative

onshore development area. In accordance with the BCT's Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Ed.) (2016), all habitats assessed as providing low, moderate or high suitability to support roosting bats will require further bat activity surveys in order to confirm whether or not they are used by foraging and/or commuting bats, and which species and in what numbers.

114. The 2018 field survey identified a total of 58 features as being within this category. The locations of these areas are shown on ***Figure 22.3.4a – 22.3.4f***.

115. The bat activity surveys will be undertaken in accordance with the Bat Conservation Trust (BCT)'s Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Ed.) (2016). Transect surveys will involve walking at a constant speed along each linear bat habitat recording observations such as number of bats, flight direction, flight height, behaviour, appearance and relative speed.

116. Static detector surveys will involve placement of a static detector at locations identified as suitable through judgement of the surveying ecologist whilst on site. Data from these surveys will be recorded and subject to laboratory sound-analysis to identify species and pass numbers following the survey.

117. Each habitat scoped into the survey assessed as providing moderate suitability for commuting or foraging bats will be subject to one transect survey visit per month from April to October (eight visits), including one dusk and pre-dawn survey within a 24-hour period, and static bat detector surveys at two locations within each habitat collected on five consecutive nights per month. Each habitat scoped into the survey assessed as providing high suitability for commuting or foraging bats will be subject to two survey visits per month from April to October (16 visits), including one dusk and pre-dawn survey within a 24-hour period, and static bat detector surveys at three locations within each habitat collected on five consecutive nights per month. The transect surveys will commence at sunset, and cease 2-3 hours after sunset; static detector surveys will commence 30 minutes before sunset, and cease 15 minutes after sunrise.

118. The surveyors will use bat detectors (any type) and recording equipment to record any echolocation calls picked up during the survey. The same model of detector should be used for all surveys. Laboratory sound-analysis will be used to identify the calls of any bat species picked up using the bat detectors.

119. Weather conditions including temperature, wind speed and precipitation, should be recorded for at the start and end of each survey visit. Surveys should not be carried out when the temperature is below 10°C at sunset, or during heavy rain or strong wind, unless justified by the surveying ecologist.

22.5.1.3 Water Vole

120. The water vole presence/absence survey (comprising two separate survey visits) covered all water bodies that are located within the indicative onshore development area that had been assessed during the 2018 Extended Phase 1 Habitat Survey as optimal water vole habitat.

121. The water vole surveys will be undertaken in accordance with the protocol for Environmental Assessment Surveys set out in the Water Vole Conservation Handbook (3rd Ed.) (Strachan, Moorhouse and Gelling, 2011). Surveys will be conducted on one bank for the full length of each optimal watercourse within the survey area (i.e. within the indicative onshore development area, plus 50m upstream and 50m downstream). Each watercourse will be assessed in 100m sections. Each 100m section will be walked by an ecologist, and all field signs of water vole will be recorded. This will include sightings, burrows, latrines, feeding stations, lawns, nests, footprints and runways. The field sign and its location will be recorded. The survey will involve two separate survey visits, one being undertaken between mid-April – June and the second being undertaken between July and September.

122. Habitat information will also be recorded along with the weather conditions experienced during the survey.

22.5.1.4 Otter

123. One water body was assessed as having the potential to support otter.

124. The otter survey (comprising two separate visits) will be undertaken in accordance with the protocol set out by Scottish Natural Heritage (Otters and Development, 2016). Surveys will be conducted on one bank for the full length of each optimal watercourse within the project area, plus an additional 250m upstream and 250m downstream. The watercourse will be walked by an ecologist, and all field signs of otter will be recorded. This will include spraints, holts, couches, prints, feeding remains, anal jelly and sightings. The field sign and its location will be recorded. Field signs of mink will also be recorded. Surveys will not be undertaken following heavy rain.

125. Due to the overlap in survey methodology and in habitats, the otter survey will be conducted concurrently with the water vole survey.

22.5.1.5 Great Crested Newt

126. A total of 39 water bodies were identified within the indicative onshore development area and were initially subject to a HSI assessment to determine their suitability to support great crested newts. Suitable terrestrial habitat for

supporting foraging and hibernating great crested newts was observed throughout the indicative onshore development area.

127. eDNA surveys of these water bodies will be undertaken within the optimal surveying window (15th April to the 30th June).

22.5.2 Survey Programme

128. Based on the results obtained from the 2018 Extended Phase 1 Habitat Survey, ***Table A22.8*** provides an indicative programme for the further species-specific surveys outlined in ***section 22.5.1***.

Table A22.8 Provisional Onshore Survey Programme (based on the findings of the 2018 field survey)

Species Survey Type	Survey dates	Notes
Bat emergence / re-entry surveys	June – September 2018	None
Bat activity survey and Static Detector survey	June – September 2018	None
Water vole presence / absence / population estimate surveys	June and August 2018	None
Otter surveys	June and August 2018	None
Great crested newt eDNA survey	April-June 2018	Details and results from this survey are reported separately to this document

22.5.3 Pre-Construction Mitigation Measures

129. The following sections details the potential mitigation measures for protected species, where although no Phase 2 surveys will be undertaken, good practice is required either pre or during construction to ensure no harm to the species or to their habitats occurs, as well as ensuring legal compliance. This mitigation will be further developed as part of the development of a project specific Ecological Management Plan (EMP), as secured under the requirements of the draft DCO.

22.5.3.1 Reptiles

130. The 2018 Extended Phase 1 Habitat Survey identified a number of areas within the indicative onshore development area as potentially being suitable to support common reptile species. These areas contain a range of mosaic habitats including grassland, scrub, heath, woodland edges, debris piles, fallen logs and dead trees. Should vegetation removal be required within these areas, examples of the types of mitigation measures that may be considered include:

- A Precautionary Method of Working (PMoW) with respect to reptiles will be included within the project EMP and will include the following items:

- Provision of a tool box talk to site operatives prior to works illustrating any risk areas on site for reptile, what the penalties are for killing or injuring reptiles, and the procedure to follow should any reptiles be found on site during construction;
- Dismantling by hand of any potential reptile hibernacula. This should be done by a suitably qualified ecologist during the reptile active season (April (after night time temperatures are above 5°C) to September inclusive); and
- Habitat manipulation of the working area to ensure it is unfavourable to reptiles during the works. This will include a vegetation strim down to 150mm of all vegetation in areas of vehicle tracking or construction works at least 48 hours prior to construction and all cut vegetation removed outside the proposed works area, to give any reptiles present time to leave the area. After this time the vegetation can be strimmed to a closer cut if required. Pre-construction vegetation clearance will be supervised by a suitably qualified ecologist.

22.5.3.2 Nesting Birds

131. A full report on bird species within the indicative onshore development area is being reported separately to this document, however habitats suitable for protected, notable and common species of birds were recorded during the 2018 Extended Phase 1 Habitat Survey. These areas include grassland, scrub, heath, woodland and isolated trees. Examples of the types of mitigation measures that may be considered include:

- Measures will be adopted to minimise noise, light and disturbance on identified breeding birds;
- Works would be subject to visual screening (e.g. opaque fencing) where necessary; and
- Construction activities would be monitored by an Environmental Clerk of Works (ECoW) or suitably qualified ornithologist, who would seek to ensure compliance with the Wildlife and Countryside Act 1981 by avoiding destruction of nests, eggs or young, and affording increased protection from disturbance to Schedule 1 species breeding birds.

22.6 Conclusions

132. An Extended Phase 1 Habitat Survey was undertaken between 4th and 17th April 2018 to record the habitats within the indicative onshore development area and to identify the presence / likely presence of legally protected and notable species.

133. There are two statutory designated sites within the indicative onshore development area, and a further six within a 3km buffer. In addition, there are five non-statutory designated sites within the indicative onshore development area and a further 10 within a 2km buffer.

134. The following UK Habitats of Principal Importance are present within the indicative onshore development area:

- Ancient woodland;
- Lowland dry acid grassland;
- Lowland heathland;
- Deciduous woodland;
- Traditional orchards; and
- Wood pasture and parkland.

135. The 2018 Extended Phase 1 Habitat Survey noted that the indicative onshore development area is dominated by arable fields and heathland. Field boundaries are typically composed of species poor hedges with trees and dry ditches. Habitats present with higher biodiversity value include semi-natural and plantation woodlands, scrub, semi-improved grassland, marshy grassland, water bodies and isolated trees.

136. Key features for protected and notable species have been identified within the indicative onshore development area for a range of protected species and are summarised below.

137. A total of 40 water bodies were identified during the 2018 Extended Phase 1 Habitat Survey and subsequently assessed for their potential to support water voles and otters. Seven water bodies were assessed as providing optimal habitat to support water voles and therefore a water vole presence/absence survey (comprising of two separate visits, where one visit should be undertaken between mid-April – end of June and the second visit is between July to September) will be undertaken of these water bodies.

138. Only one water body was assessed as being optimal otter habitat and has been identified for further survey to confirm the presence or absence of this species. This survey would be undertaken concurrently with the water vole surveys.

139. A total of 58 linear features of moderate/high suitability for commuting/foraging bats and a further 25 features of moderate/high suitability for roosting bats were recorded during the 2018 Extended Phase 1 Habitat Survey. These areas will be subject to monthly bat activity surveys between May and October.

140. A total of 39 water bodies were subject to a great crested newt HSI assessment and subsequent eDNA survey, which is reported separately to this report (***Chapter 22 Onshore Ecology: Appendix 22.4***).

141. During the 2018 Extended Phase 1 Habitat Survey a total of 14 areas were noted as providing optimal habitat for reptiles, including potential refugia. Although no specific reptile surveys will be undertaken, appropriate mitigation with respect to reptiles will be required and this will include the adherence to a reptile PMoW to ensure legal compliance during construction works.

142. Further surveys have been proposed to be undertaken within the appropriate survey periods during 2018 in relation to these species. Findings in relation to badger activity are provided within the Confidential Annex 3.

143. All of the findings from the surveys undertaken to date will be used to inform the location and design of the East Anglia TWO project as well as providing the baseline conditions for which the Environmental Impact Assessment (EIA) will be undertaken.

22.7 References

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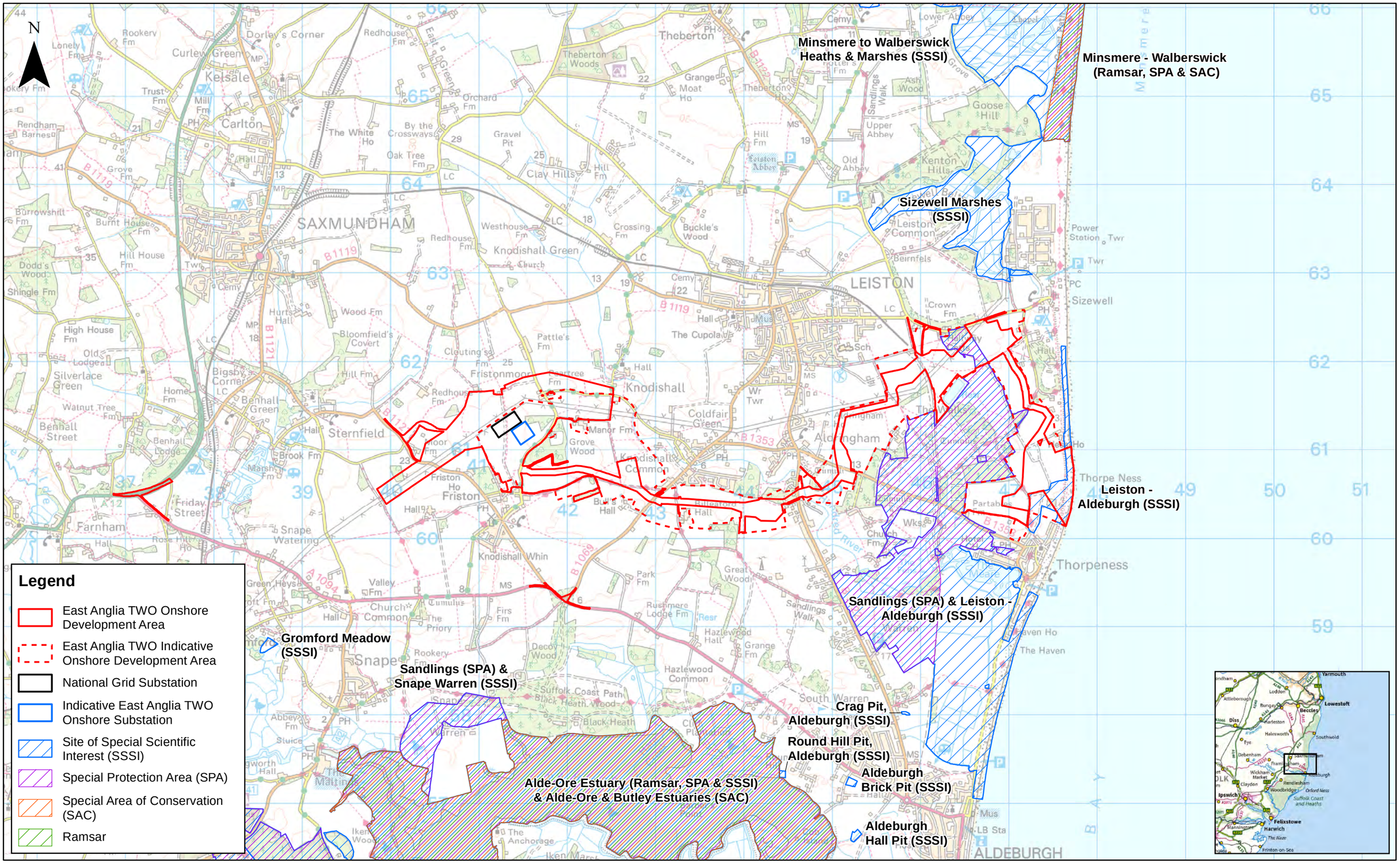

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East Anglia TWO

Designated Sites (Statutory)

Drg No	EA2-DEV-DRG-IBR-000523
Rev	4
Date	12/09/19
Figure	22.3.1

Coordinate System: BNG Datum: OSGB36

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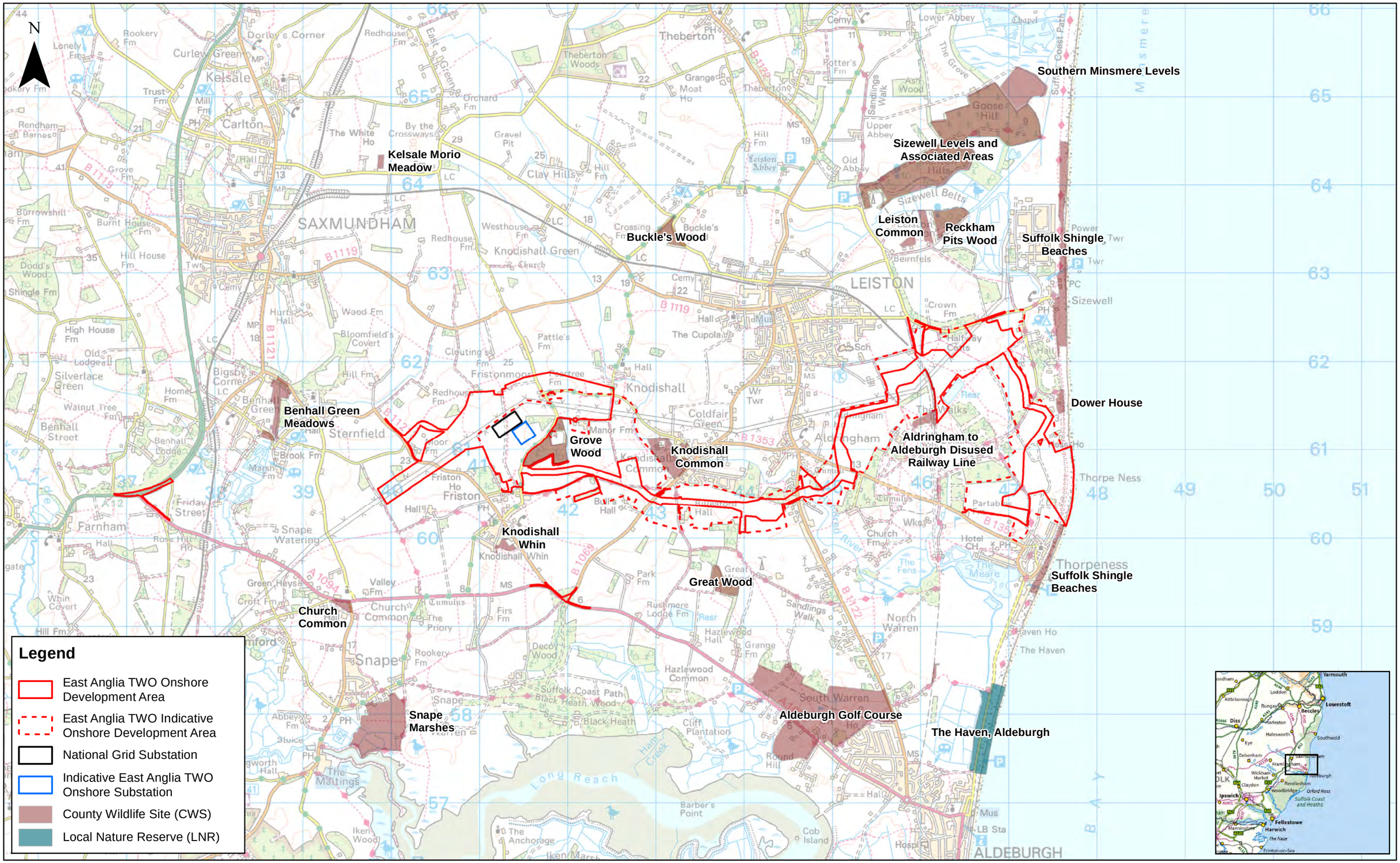

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East Anglia TWO

Designated Sites (Non-Statutory)

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Rev	3
Date	12/09/19
Figure	22.3.2

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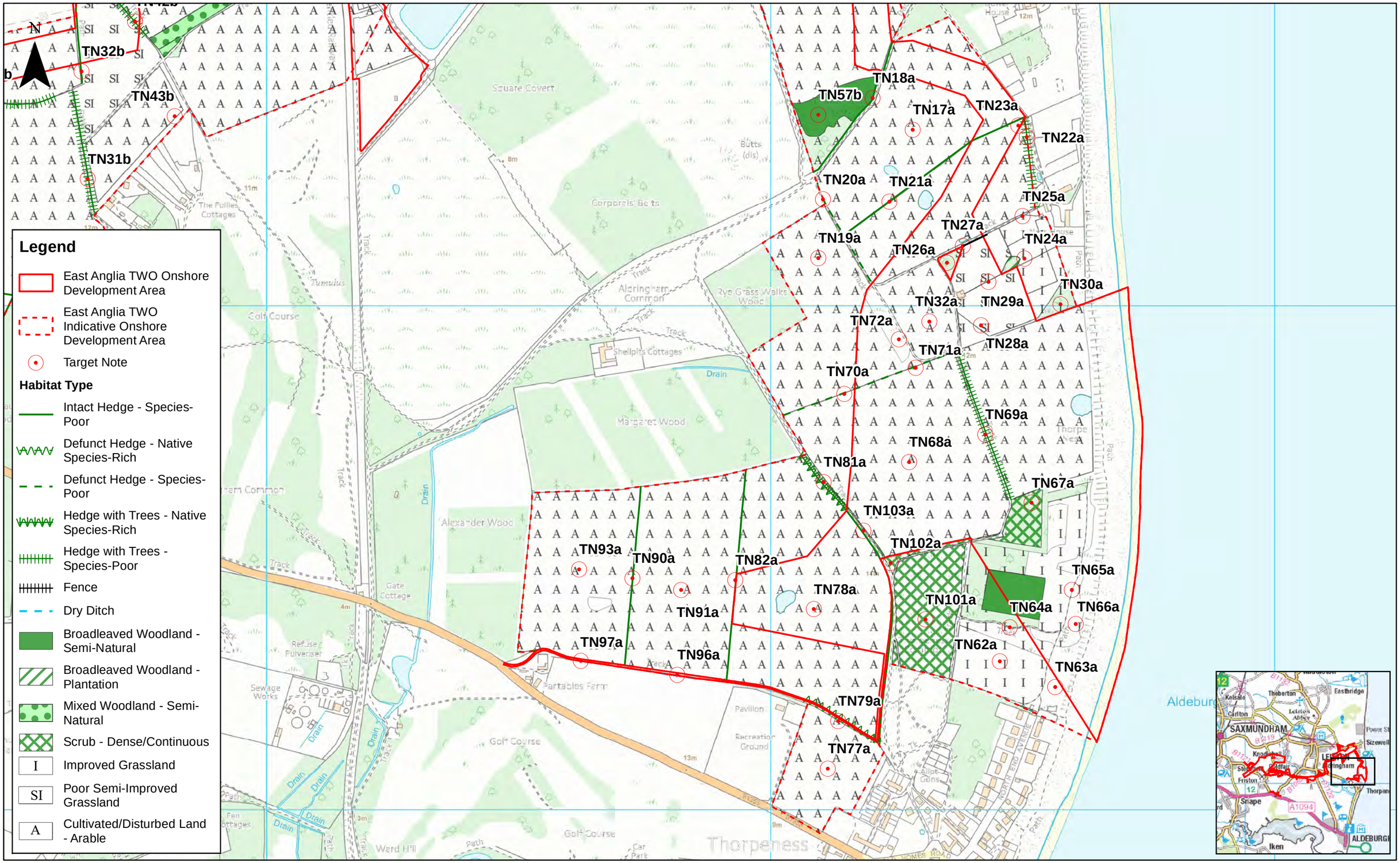

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1	14/05/2019	FC	First Issue.

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East Anglia TWO

Extended Phase 1 Habitat Survey Results

Drg No	EA2-DEV-DRG-IBR-000583
Rev	3
Date	12/09/19
Figure	22.3.3 a

Coordinate System: BNG
Datum: OSGB36

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N

Legend

- East Anglia TWO Onshore Development Area
- East Anglia TWO Indicative Onshore Development Area
- Target Note

Habitat Type

- Intact Hedge - Species-Poor
- Defunct Hedge - Native Species-Rich
- Defunct Hedge - Species-Poor
- Hedge with Trees - Native Species-Rich
- Hedge with Trees - Species-Poor
- Fence
- Dry Ditch
- Broadleaved Woodland - Semi-Natural
- Mixed Woodland - Semi-Natural
- Scrub - Dense/Continuous
- SI — Poor Semi-Improved Grassland
- A — Cultivated/Disturbed Land - Arable

TN53a TN45a TN51a TN49b TN51b TN50b TN50a TN52a TN49a TN38b TN40b TN36b TN54a TN55a TN48a TN35b TN56a TN58a TN57a TN41b TN15a TN42b TN32b TN30b TN43b TN18a TN57b TN17a TN31b

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1	14/05/2019	FC	First Issue.

Prepared: FC
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Approved: AH

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East Anglia TWO

Extended Phase 1 Habitat Survey Results

Drg No	EA2-DEV-DRG-IBR-000583
Rev	3
Date	12/09/19
Figure	22.3.3 b

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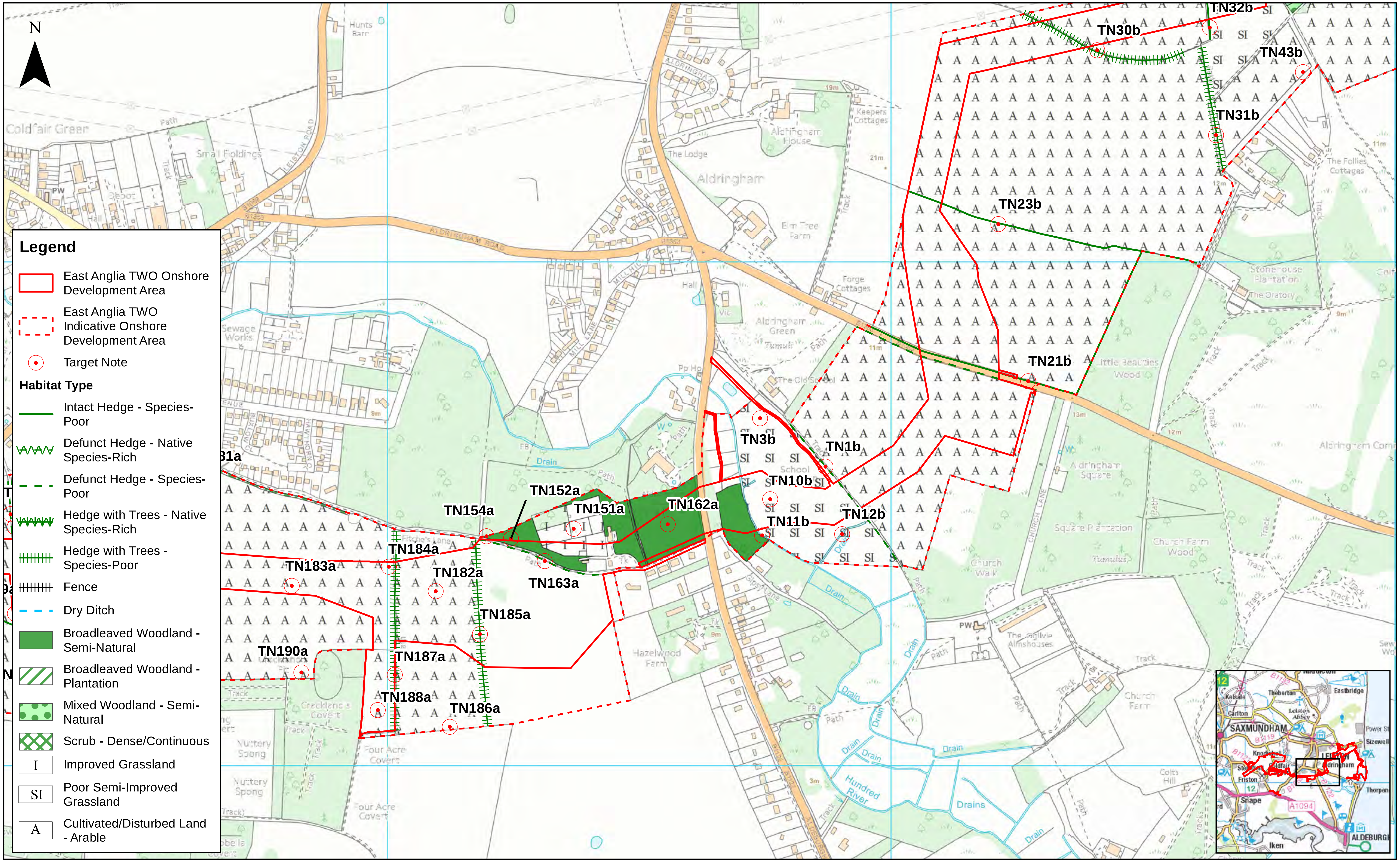

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2	06/08/2019	FC	Second Issue.
1	14/05/2019	FC	First Issue.

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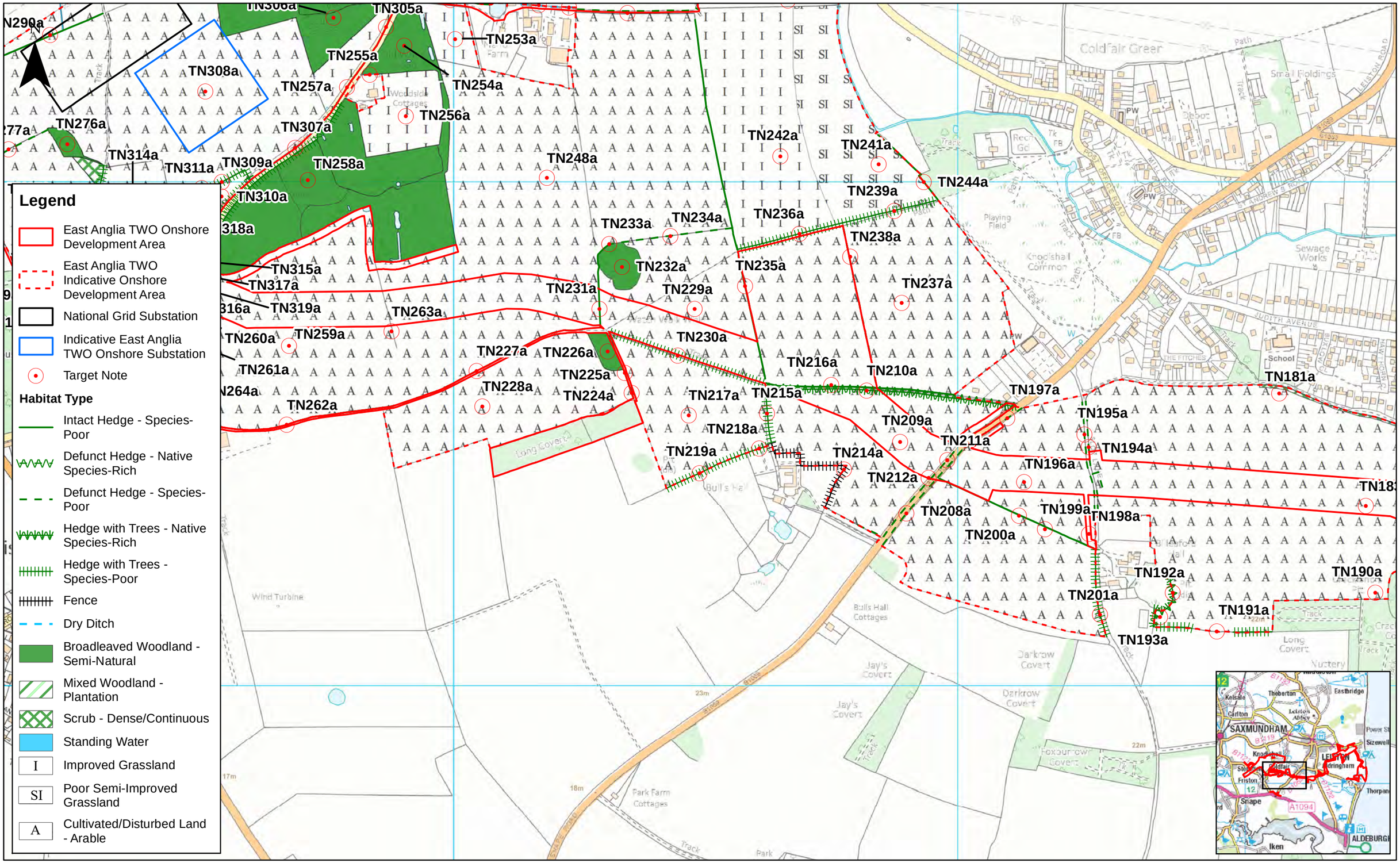

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East Anglia TWO

Extended Phase 1 Habitat Survey Results

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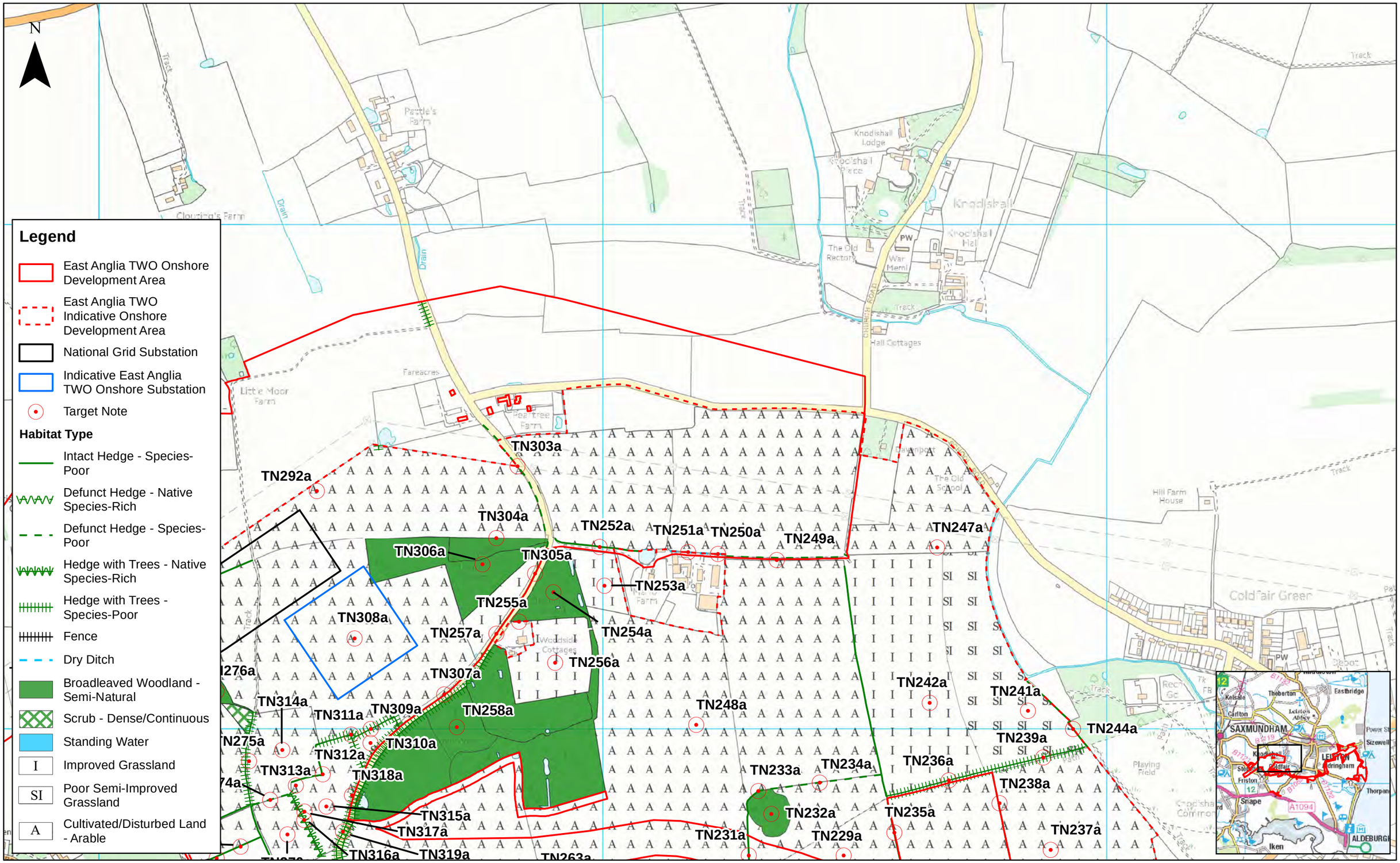

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Legend

- East Anglia TWO Onshore Development Area
- East Anglia TWO Indicative Onshore Development Area
- National Grid Substation
- Indicative East Anglia TWO Onshore Substation
- Target Note

Habitat Type

- Intact Hedge - Species-Poor
- Defunct Hedge - Native Species-Rich
- Defunct Hedge - Species-Poor
- Hedge with Trees - Native Species-Rich
- Hedge with Trees - Species-Poor
- Fence
- Dry Ditch
- Broadleaved Woodland - Semi-Natural
- Scrub - Dense/Continuous
- Standing Water
- I — Improved Grassland
- SI — Poor Semi-Improved Grassland
- A — Cultivated/Disturbed Land - Arable

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Extended Phase 1 Habitat Survey Results

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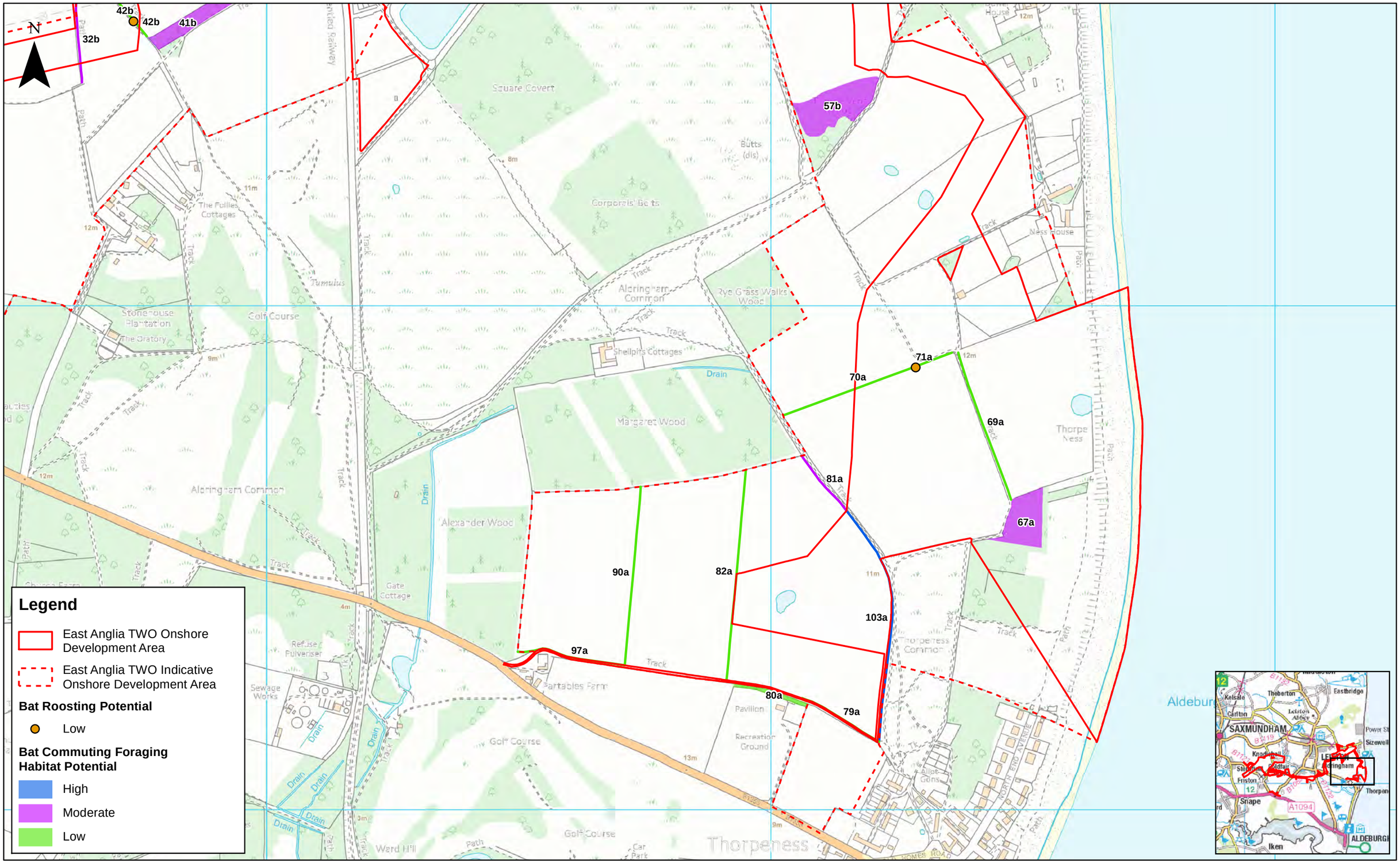

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East Anglia TWO

Bat Roost and Commuting/Foraging Habitat Results

Drg No	EA2-DEV-DRG-IBR-000525
Rev	4
Date	12/09/19
Figure	22.3.4a

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N

Legend

East Anglia TWO Onshore Development Area

East Anglia TWO Indicative Onshore Development Area

Bat Roosting Potential

- High
- Moderate
- Low

Bat Commuting Foraging Habitat Potential

- High
- Moderate
- Low

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East Anglia TWO

Bat Roost and Commuting/Foraging Habitat Results

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Figure	22.3.4b	

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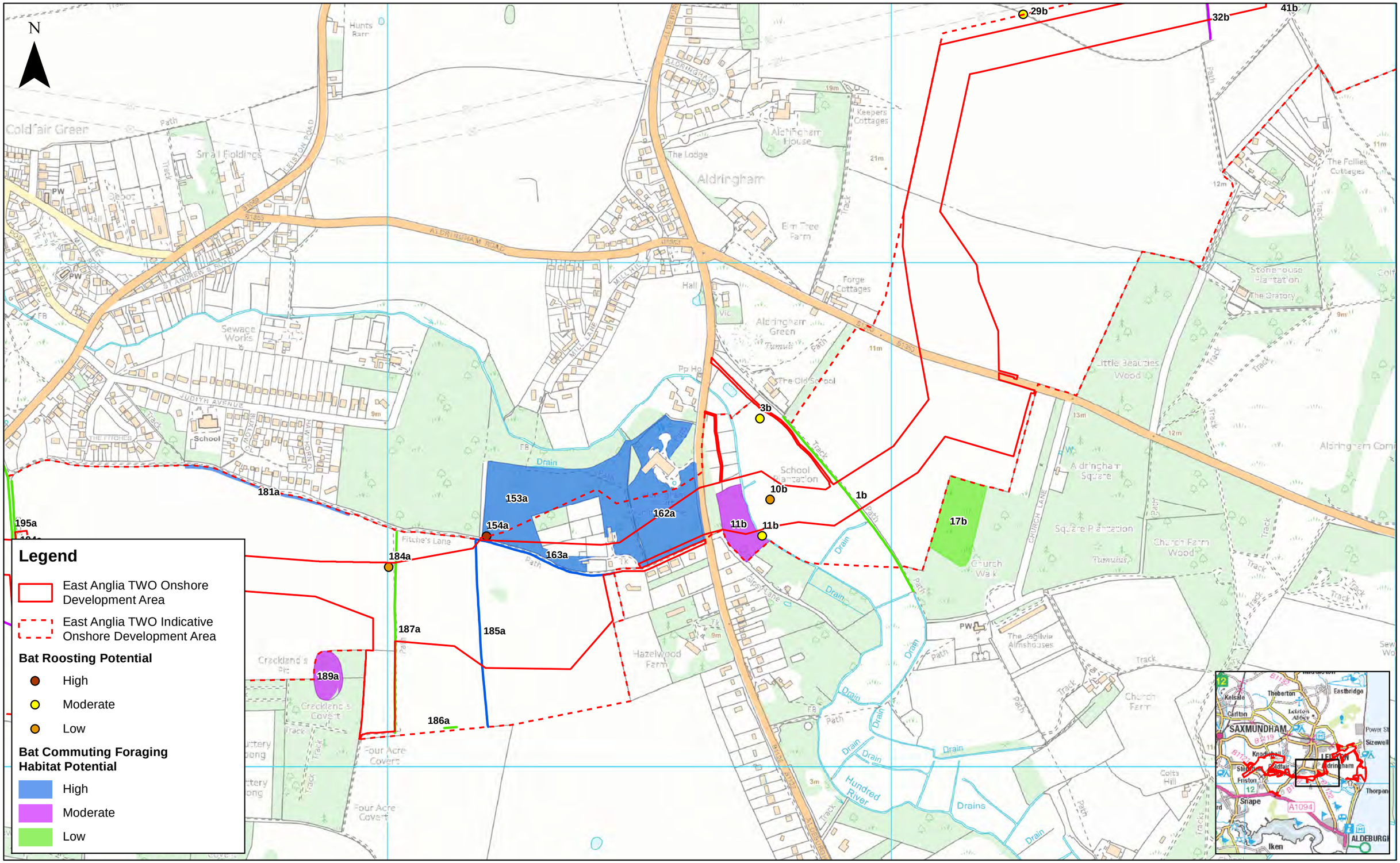

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East Anglia TWO

Bat Roost and Commuting/Foraging Habitat Results

Drg No	EA2-DEV-DRG-IBR-000525
Rev	4
Date	12/09/19
Figure	22.3.4c

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Legend

- East Anglia TWO Onshore Development Area
- East Anglia TWO Indicative Onshore Development Area
- National Grid Substation
- Indicative East Anglia TWO Onshore Substation

Bat Roosting Potential

- High
- Moderate
- Low/Moderate
- Low

Bat Commuting Foraging Habitat Potential

- High
- Moderate
- Low

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East Anglia TWO

Bat Roost and Commuting/Foraging Habitat Results

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N

Legend

- East Anglia TWO Onshore Development Area
- East Anglia TWO Indicative Onshore Development Area
- National Grid Substation
- Indicative East Anglia TWO Onshore Substation

Bat Roosting Potential

- High
- Moderate
- Low/Moderate
- Low

Bat Commuting Foraging Habitat Potential

- High
- Moderate
- Low

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East Anglia TWO

Bat Roost and Commuting/Foraging Habitat Results

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Rev	4
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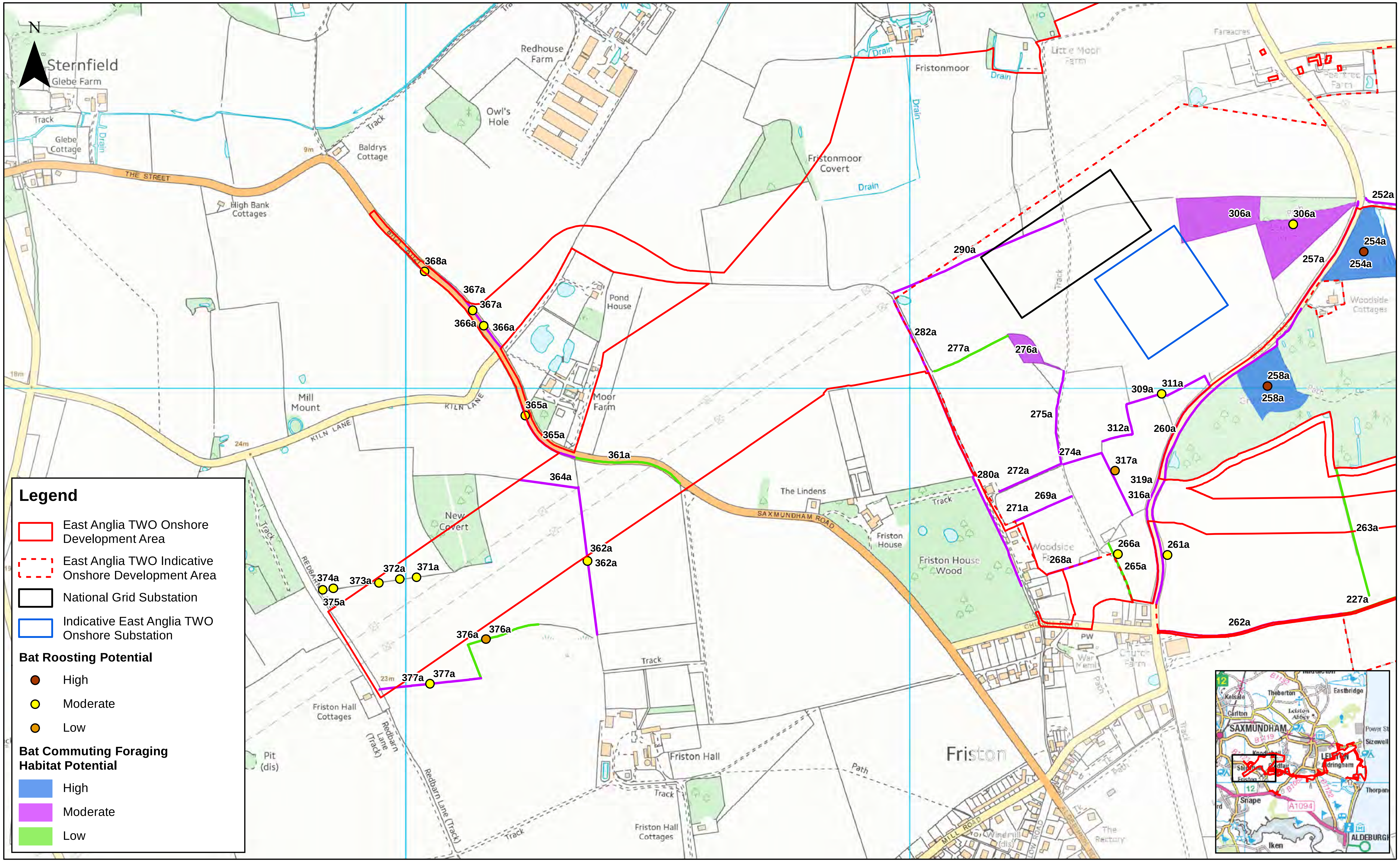

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East Anglia TWO

Bat Roost and Commuting/Foraging Habitat Results

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Date	12/09/19
Figure	22.3.4f

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East Anglia TWO

Badger Survey Results

CONFIDENTIAL

Drg No	EA2-DEV-DRG-IBR-000526
Rev	3
Date	12/09/19
Figure	22.3.5

Coordinate System: BNG
Datum: OSGB36

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Annex 1: 2019 Phase 1 Addendum

1.3 Introduction

144. This annex details the results of the 2019 Phase 1 Addendum, as described in ***section 22.1***. The 2019 Phase 1 Addendum covered a small western portion of the onshore development area which was not surveyed during the 2018 Extended Phase 1 Habitat survey. This annex will herein refer to this area as the 'survey area'. This area is shown on ***Figure 22.3.3a – 22.3.3f ,*** which combines data from this 2019 Phase 1 Addendum and the 2018 Extended Phase 1 Habitat survey.

2.3 Field Survey Methodology

145. The same methodology as that detailed in ***section 22.3.2*** was used to inform this 2019 Phase 1 Addendum.

3.3 Surveyors

146. The 2019 Phase 1 Addendum presented in this annex was conducted by a team of two Royal HaskoningDHV ecologists. The survey was led by Charlotte Clements, BSc Hons, Associate Member of CIEEM (ACIEEM). Charlotte has 3 years' experience of Extended Phase 1 Habitat Surveying. The survey team also included:

- Ella Moseley BSc Hons. Chartered Member of CIWEM (MCIWEM), Chartered Water and Environment Manager (C.WEM) and Chartered Environmentalist (C. Env) (Society for the Environment).

4.3 Weather Conditions

147. ***Table 22.9*** summarises the weather conditions encountered during the 2019 Phase 1 Addendum.

Table A22.9 Weather Conditions during the 2019 Extended Phase 1 Habitat Survey

Date	Weather Conditions
29th March 2019	Fine, partially overcast, windy, 14°C

4.1 Survey Limitations

148. The survey team covered all land to which landowner access permission was granted at the time of the 2019 Phase 1 Addendum. Where access was not granted, in some locations the habitats were surveyed from public access routes. As access was either granted or land was easily viewed from publicly accessible routes (such as roads and footpaths) , the survey area was surveyed in full.

149. The survey was conducted during March 2019, which is within the optimal survey period for identifying ground flora species and hence habitat communities.

150. Whilst the survey team made the utmost effort to cover every habitat and pick up all field signs present during the field survey, on occasion due to human error some field signs can be missed or overlooked. However, despite this, the data presented in this document is considered to provide an accurate description of the habitats within the survey area.

5.3 Results

5.1 Habitats

5.1.1 Arable Land

151. The largest habitat by area (61.36 hectares (ha)) within the survey area is arable land (JNCC Phase 1 Habitat code J1.1). At the time of the survey these ranged from fields that were either in crop (including maize and oilseed rape) or had winter cover. The 61.36ha of arable land equates to approximately 95% of habitat within the survey area.

5.1.2 Boundary Features

152. Field boundaries consisted primarily of hedgerows and trees. Hedgerows recorded were species-poor hedgerows with trees (J2.3.2), species-poor defunct hedgerows (23) (J2.2.2), species-rich defunct hedgerows (1) (J2.2.1) and species-rich hedgerows with trees (5) (J2.3.1). Occasionally fields were bordered by dry ditches (J2.6).

153. Species rich hedgerows (J2.2.1 and J2.3.1) typically consisted of shrub and tree species including hawthorn *Crataegus monogyna*, oak *Quercus robur*, ash *Fraxinus excelsior*, ivy *Hedera helix*, dog rose *Rosa canina*, holly *Ilex aquifolium*, with ground flora typically consisting of common nettle *Urtica dioica*, bramble *Rubus fruticosus*, red-dead nettle *Lamium purpureum*, cleavers *Galium aparine*, common hogweed *Heracleum sphondylium* and broad leaf dock *Rumex obtusifolius*. Species poor hedgerows (J2.1.2, J2.2.2 and J2.3.2) were characterised by fewer than five species within a 30m stretch and were typically dominated by hawthorn, as defined by JNCC guidance (JNCC 2010).

5.1.3 Semi-natural Woodland

154. An area of semi-natural broad-leaved woodland (A1.1.1) was recorded within the survey area. This woodland represents a coverage of approximately 2.07ha, which in turn represents approximately 3% of this type of habitat within the survey area.

155. The woodland consisted primarily of ash *Fraxiunus excelsior* and beech *Fagus sylvatica* with typical understorey and ground flora species including holly *Ilex*

aquifolium, laurel *Prunus laurocerasus*, bramble *Rubus fruticosus* and common nettle *Urtica dioica*.

5.1.4 Scrub

156. One area of scrub (A2.1) was recorded within the survey area and in total covers an area of 0.5ha (representing approximately 1% of this type of habitat within the survey area). This habitat was located between arable fields with bare earth bunds and scattered bramble. This area was comprised of a large depression with debris, bare earth and scattered species such as bramble, gorse *Ulex spp*, bracken *Pteridium spp*. and common nettle.

5.1.5 Summary

157. ***Table A22.10*** shows the key habitats which were recorded within the survey area (***Figure 22.3.3a – 22.3.3f)***.

Table A22.10 JNCC Phase 1 Habitat Areas (area in km^2) and Boundaries (length in km) Recorded in the Survey Area

JNCC Phase 1 Habitat Survey Code	JNCC Phase 1 Habitat Survey Description	Area in m^2
A1.1.1	Broadleaved woodland – semi-natural	20,671
A2.1	Scrub – dense/continuous	5,040
J1.1	Cultivated/disturbed land – arable	613,580
JNCC Phase 1 Habitat Survey Code	**JNCC Phase 1 Habitat Survey Description**	**Length in m**
J2.2.1	Defunct hedge – species rich	217
J2.2.2	Defunct hedge – species poor	228
J2.3.1	Hedge with trees – species rich	999
J2.3.2	Hedge with trees – species poor	458
J2.6	Dry ditch	1,247

5.2 Protected Species

5.2.1 Birds

158. Birds of Conservation Concern 4 (BoCC4) Red List species skylark *Alauda arvenisis* were noted audibly in proximity to the arable fields in several locations throughout the survey area.

159. A number of common bird species were observed in the survey area including wren *Troglodytes troglodytes*, blackbird *Turdus merula* and common gull *Larus canus*.

160. All hedgerows, treelines, and woodland habitats were identified as potentially providing suitable nesting habitat for protected and notable species of birds, alongside common bird species.

161. Relic bird nests were recorded within these habitats; however no signs of recent nesting bird activity or observations of Schedule 1 species were noted. There is an area of broadleaved semi-natural woodland within the survey area that may have the potential to support nesting birds, however it was not possible to access this woodland due to access restrictions (the woodland was surveyed from neighbouring land) meaning that although habitat classification was possible, signs of nesting birds may be missed due to those factors outlined in ***section 4.1***.

162. For further information on bird species, refer to ***Chapter 23 Onshore Ornithology, Appendix 23.3.***

5.2.2 Badger

163. No field signs of badger were present in the survey area. A small area of broadleaved woodland as well as field margins comprised of scrub, hedgerows and grassland, may have the potential to provide foraging habitat for badger, however as much of the survey area was comprised of arable land, it would be considered sub-optimal for this species.

5.2.3 Bats

164. All trees noted during the field survey were assessed for their suitability to support roosting bats. All mature oaks both within hedgerows and in treelines were assessed as having moderate potential to support roosting bats, see ***Figure 22.3.4a – 22.3.4f***. Five individual trees and approximately 47 within hedgerows were identified as having moderate potential to support roosting bats (***Table A22.11***). These trees will not require removal as access for the construction of the onshore substation and National Grid infrastructure is intended to be sought via existing gaps in hedgerows and field access tracks.

165. The area of broad-leaved woodland (***shown in Figure 22.3.3f***) is comprised of trees considered to be too immature to provide roosting potential to bats due to the lack of suitably cracks and crevices.

Table A22.11 Bat Roosting Habitat Features Recorded in the Survey Area (read in conjunction with *Figure 22.3.4*)

Target Note (TN) Reference	Feature and description	Bat Potential
TN360a	Hawthorn *Crataegus monogyna*, oak *Quercus sp*, bramble *Rubus fruticosus*, ash *Fraxinus excelsior*. no breaks, all trees (approx 16) ivy *Hedera helix* clad with moderate bat roost potential. good commuting/foraging opportunities, well connected to wider landscape.	Moderate
TN362a	Mainly defunct hedge between trees, not stock proof. 8 mature trees, potentially veteran, oak with moderate bat roost potential.	Moderate
TN365a	Hedgerow, mostly hawthorn with scattered semi-mature oak (approximately 6)	Moderate
TN366a	Large mature oak in hedge, potentially veteran	Moderate
TN367a	Hawthorn hedge, recently flailed, scattered oak (approximately 6) one potentially veteran	Moderate
TN368a	Boundary formed of scattered semi mature oak (approximately 7)	Moderate
TN371a	Large ash with visible PRFs	Moderate
TN372a	Large ash with visible PRFs	Moderate
TN373a	Large ash with visible PRFs	Moderate
TN374a	Large ash with rot holes and fractured limbs	Moderate
TN375a	Large ash next to dry ditch with large holes visible	Moderate
TN376a	Hedgerow with hazel, elder, self heal, bramble, nettle and field maple (approx. 4) with large gaps	Moderate

166. In addition to trees, all linear features (e.g. hedgerows) were categorised in terms of their suitability to support commuting or foraging bats. This categorisation was based on the habitat type, qualified by how well connected to surrounding habitat the habitat feature was. The categorisation used was as follows:

- Defunct hedgerows typically provided low suitability for commuting and foraging bats;
- Intact species rich hedgerows, areas of scrub typically provided moderate suitability for commuting and foraging bats; and

- Species-rich hedgerows with trees and large watercourses well connected to the wider landscape typically provided high suitability for commuting and foraging bats.

167. In total, nine features were assessed for their suitability to support commuting or foraging bats and assessed as providing low to moderate suitability. Adherence to mitigation measures, as detailed within ***Chapter 22 Onshore Ecology***, will be required. ***Table A22.12*** below shows details of each feature and their assessments. The locations are shown on ***Figure 22.3.4a – 22.3.4f.***

168. All bat roosting and commuting/foraging features are shown on ***Figure 22.3.4a – 22.3.4f.***

Table A22.12 Bat Commuting and Foraging Features Recorded in the Survey Area (read in conjunction with *Figure 22.3.4*)

Target Note (TN) Reference	Feature and description	Bat Potential
TN360a	Hawthorn, oak, bramble, ash. no breaks, all trees (approx 16) ivy clad with moderate bat roost potential. good commuting/foraging opportunities, well connected to wider landscape.	Moderate
TN361a	Hawthorn hedge, large gaps filled with bramble.	Low
TN362a	Mainly defunct hedge between trees, not stock proof. 8 mature trees, potentially veteran, oak with moderate bat roost potential.	Moderate
TN364a	Well connected to woodland, hedge with hawthorn, dog *rose Rosa canina*, oak, blackthorn *Prunus spinosa* and elder *Sambucus nigra*.	Moderate
TN365a	Hedgerow, mostly hawthorn with scattered semi-mature oak (approximately 6)	Moderate
TN366a	Large mature oak in hedge, potentially veteran	Moderate
TN367a	Hawthorn hedge, recently flailed, scattered oak (approximately 6) one potentially veteran	Moderate
TN376a	Hedgerow with hazel, elder, self heal, bramble, nettle and field maple with large gaps	Low
TN377a	Continuation of connected hedge, with several mature oak (approximately 5), potentially veteran	Moderate

5.2.4 Water Vole and Otter

169. Within the survey area, dry ditches along arable field margins were recorded. These were of insufficient size and depth to support otters and were not functionally connected to the wider river network, showed no evidence of maintenance, were vegetated and were isolated from connecting habitat and therefore were not suitable for water vole.

5.2.5 Great Crested Newt

170. Within the survey area dry, ditches along arable field margins were recorded. No water bodies were present and therefore a Habitat Suitability Index (HSI) assessment was not undertaken.

171. No suitable terrestrial habitat for supporting foraging and hibernating great crested newts was observed within the survey area.

5.2.6 Reptiles

172. Two areas of suitable reptile habitat were recorded. These areas comprised habitat mosaics and potential refugia locations for which could potentially support common reptile species. ***Table A22.13*** contains the details of these areas with further information provided in ***Annex 2***.

Table A**22.13 Areas of Suitable Reptile Habitat or Potential Refugia recorded in the Survey Area**

Target Note (TN) Reference	Description
TN363a	Wide field margin, moderate mosaic with varied species
TN369a	Mosaic with hibernation potential for common reptile species

173. The locations of these habitat mosaics and potential refugia are shown on ***Figure 22.3.3a – 22.3.3f***. These mosaics contain habitats including scrub and grassland.

5.2.7 Dormice

174. No habitat suitable to dormice was recorded in the survey area. This species is not considered further within this annex.

5.2.8 Invertebrates

175. No habitat assessed as suitable to support significant populations of invertebrates was noted in the survey area. Invertebrate species are not considered further within this annex.

5.2.9 Invasive Non-Native Species

176. No invasive non-native species were recorded in the survey area. Invasive non-native species are not considered further within this annex.

5.3 Summary

177. ***Table A22.14*** below included a summary of protected species recorded in the survey area, alongside an indication of whether Phase 2 species specific surveys are required.

Table A22.14 Summary of Field Survey Findings and Requirements for Phase 2 Species Specific Surveys

Species	Phase 2 survey required (yes/no)
Birds	Bird surveys are being undertaken and are reported separately to this document. Refer to ***Appendix 23.3*** and ***Appendix 23.4*** of ***Chapter 23 Onshore Ornithology***.
Badger	No
Bats	No - further presence/absence or activity surveys of these features have not been conducted as the results of the 2018 bat surveys are representative of the roosting and foraging support given to bats from the onshore development area as a whole. Survey data from the 2018 surveys is sufficient to undertake the assessment of potential impacts on bats from the proposed East Anglia TWO project. Refer to ***Appendix 22.6*** for further details.
Water Vole	No
Otter	No
Reptiles	No specific survey will be undertaken, however mitigation measures (i.e. Reptile Precautionary Method of Working (PmoW)) will be prepared and adhered to for all areas of habitat that have been assessed as providing optimal habitat for common reptile species.
Invertebrates	No
Dormice	No
Botanical survey	No

5.4 Recommendations

178. As detailed in ***Table A22.14,*** no further Phase 2 surveys are recommended. Pre-construction mitigation detailed in ***section 22.5.3*** should be adhered to.

179. Results of this 2019 Phase 1 Addendum relevant to the onshore development area are carried through into the EcIA presented in ***Chapter 22 Onshore Ecology***.

Annex 2: Target Notes

180. Please use the target note reference within the table below for identifying the relevant plate in relation to the figures that accompany this report.

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
Target Note References from the 2018 Extended Phase 1 Habitat Survey (4th – 17th April 2018)			
TN1B	species poor defunct hedge, dog rese, bramble, large gaps, common nettle, cow parsnip		TM 44914 60543
TN3B	scattered scot pine trees, moderate bat potential, pilling bark, split limbs		TM 44775 60669

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN4B	dead tree (ash?), only tree trunk, large holes, bark nearly gone, moderate bat potential		TM 44804 60708
TN5B	Coniferous planation, mostly scots pine bramble, fern, rabbit holes		TM 44835 60766

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN8B	fast flowing, reeds, shallow banks, suspended sediment, poor water quality, sub optimal for water vole, nettle small alder		TM 44661 60729
TN9B	large vegetated mound (10mx20m), optimal feeding, basking habitat for reptiles		TM 44685 60737

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN10B	group of mature oak trees, no gaps or split limbs, low bat potential, bird nesting potential	 	TM 44739 60568

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN11B	alder woodland, mostly alder and ash and goat willow, moderate bat potential, some trees ivy cladded, river hundred providing good commuting habitat	 	TM 44750 60453

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN12B	dry ditch, alder, nettle, bramble, nesting bird potential		TM 44884 60438

TN13B	mature ivy clad alder tree, moderate bat potential		TM 44925 60354

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN15a	Arable field - in crop (beetroot, under cover)		
TN16a	Plantation broadleaved woodland adjacent to byway; holm oak, gorse, bramble, nettle, laurel	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
			
TN17a	Arable field - in crop (potentially beetroot)		

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN17B	Dry heathland, gorse, broom, bramble, rabbit holes		TM 45126 60471
TN18a	Species poor intact hedge on both sides of byway; predominantly hawthorn with some blackthorn, dog rose, nettle bramble and cow parsley		

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN19a	Arable field - ploughed		
TN20a	Species poor defunct hedge; mainly hawthorn, cow parsley, nettle, white clover, cleavers. Gaps newly planted	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
			

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN21a	Species poor intact hedge; blackthorn, nettle, germander speedwell, cleavers and buckthorn	  	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN21B	hedge on both sides of the road, species poor defunct, mostly hawthorn and black hawthorn		TM 45302 60757
TN22a	Species poor hedge with trees; Wide hedge running alongside driveway, some sections newly planted; oak, laurel, pine	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN22B	scattered scrub mostly bramble, mostly bramble, nettle, daffodils, optimal for reptiles		TM 44961 60876
TN23a	Grassy field margin; common couch, bramble and nettle	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN24a	Horse paddocks	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN25a	Track bound on both sides by bramble and nettle		

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN25B	rabbit holes		TM 45011 61310
TN26a	Small section of broadleaved plantation woodland - some newly planted saplings; Apple, oak, field maple, nut hatch observed in tree tops	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
			
TN27a	Pond 5 - no pond, waterlogged depression in field		

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN28a	Semi-improved grassland adjacent to horse paddocks; rough meadow grass, white clover and cow parsley	 	
TN29a	Small broadleaved plantation woodland; ash, laurel, oak, alder. All trees semi-mature, birds nest in upper canopy	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
			
TN29B	four mature ash trees, one ivy clad, moderate bat potential		TM 45281 61482

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN30a	Small section of scrubby woodland; some saplings newly planted; ash, sycamore, oak, alder buckthorn, cocks foot, bramble, nettle	 	
TN30B	two mature oak trees ivy clad, moderate bat potential	N/A	TM 45409 61416

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
			

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN31B	mature oak tree ivy clad low bat potential		TM 45621 61383
TN32a	Arable field - winter cover		

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN32B	intact species poor hedge mature hawthorn		TM 45628 61486
TN34B	species poor hedge on both sides of the footpath ivy, hawthorn, blackthorn, bramble, oak		TM 45558 61853

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN35B	species poor intact hawthorn, ivy		TM 45558 61853
TN36B	old mature oak tree with high bat potential		TM 45508 61949

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN37a	Species poor intact hedge along roadside, sparse in places; predominantly hawthorn	 	
TN38B	mature oak tree within a species poor hedge consisting mostly of hawthorn, moderate bat potential		TM 45563 62049

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN39B	five mature oak trees on both sides of the track, moderate bat potential		TM 45793 62119

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN40B	scrub and hawthorn hedge bird reptile potential		TM 45955 62051

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN41B	mixed semi mature woodland scots pine, silver birch, oak , bramble, cow parsnip, snuffle holes, some, old large holes recorded but disused		TM 46078 61713
TN42B	species poor hedge with trees, gorse, bramble, oak, trees with low bat potential		TM 45739 61562

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN43B	coniferous planation mostly scots pine		TM 45841 61381
TN44a	Species poor intact hedge; hawthorn, cow parsley, bramble, nettle and bracken	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN44B	young newly planted species rich hedge with trees oak, wild cherry, blackthorn, hawthorn, birch		TM 45849 61366
TN45a	Arable field - cabbage crops with sections of grassland and bare ground	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN45B	heathland gorse fern		TM 45879 61311
TN46B	broadleaved semi-natural woodland alder, ash, goat willow, scots pine, bramble		TM 45909 62177

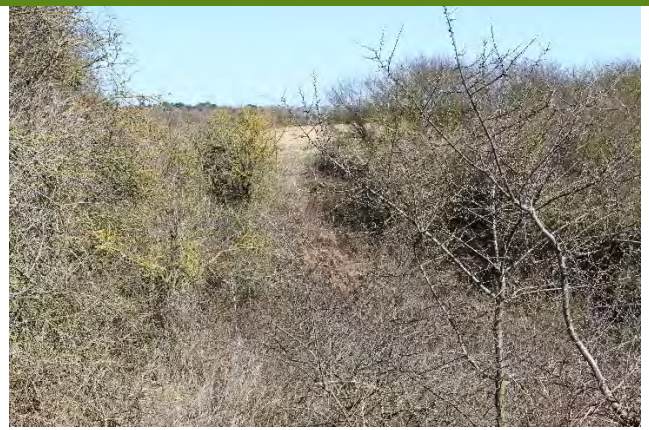
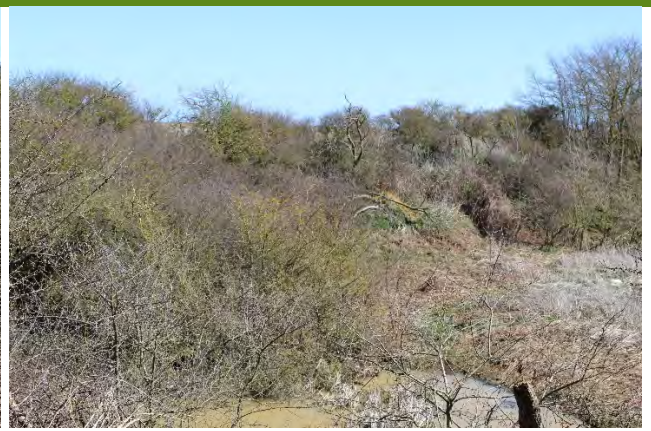
Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN48a	Arable field - ploughed		
TN49a	Species poor hedge with trees; oak, alder buckthorn, hawthorn, cow parsley, nettle	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN49B	species poor hedge with hawthorn ivy, bramble, buttercup, daffodils, nettle		TM 46071 62399
TN50a	Arable field - in crop, electric fencing present so unable to access		

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN50B	Dense scrub, broom, gorse, fern		TM 46243 62264
TN51a	Species poor intact hedge, with defunct sections further north that have been replanted; blackthorn, cow parsley, spear thistle, hawthorn, cocks foot, common hogweed, germander speedwell		

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		  	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN51B	broadleaved woodland, aspen, bramble, silver birch, scots pine		TM 46318 62287
TN52a	New pond (NP1a)	 	

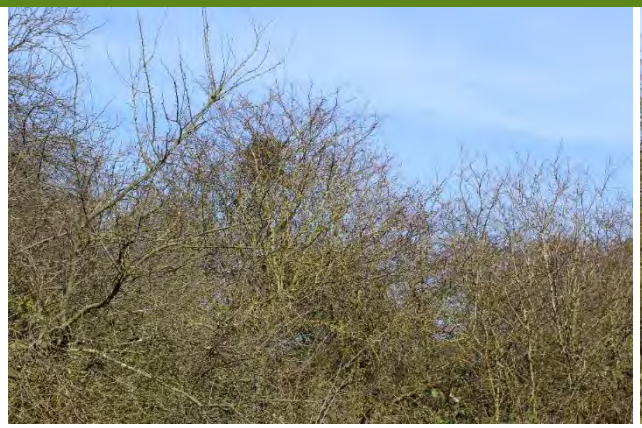
Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		 	
TN53a	Species rich hedge with trees; oak, apple, ash, whitebeam, hawthorn, gorse, bramble, germander speedwell, fenced	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN54a	Species poor defunct hedge with large gaps in sections; ash, hawthorn, dog rose, nettle bramble, cleavers	 	
TN55a	Species poor hedge with trees (on southern side of byway), as per TN54a	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN56a	Dense scrub with scattered trees; hawthorn, whitebeam, grey willow, bramble, nettle, dog rose	  	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN57a	Species poor defunct hedge; hawthorn, thistle, dog rose	  	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN57B	broadleaf woodland silver birch, hole, brambles, fern		TM 47119 61382
TN58a	Small semi natural broadleaved woodland, dense; oak, hawthorn. Full access not possible, dense understorey consisting mainly of bramble and dog rose. Birds nest observed in canopy and passerine birds heard	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		  	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN59a	Dense scrub (as per TN56a), gorse also present	 	
TN61a	Dense scrub	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
			
TN62a	Improved grassland, potentially in rest from arable crops or used for grazing; short sward recently cut back; bramble roots present. Good habitat mosaic for reptiles, no boundaries with adjacent scrub vegetation	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN63a	Scrub; bramble, nettle, gorse	   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
			
TN64a	Scrub with scattered trees; sycamore, hawthorn, bracken, bramble, nettle		

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN65a	Improved grassland with coastal path, short sward with areas of scrub vegetation; spear thistle,	   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
			
TN66a	Scrub/grassland mix; bracken, bramble, nettle. Fenced	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN67a	Semi natural broadleaved woodland with grassy open areas and scattered scrub vegetation; bramble, nettle, hawthorn, holm oak, silver birch, sycamore, white willow, lords and ladies. Birds nests observed in canopy, some pines present, blackbirds and greenfinch observed	   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN68a	Arable field - in crop		
TN69a	Species poor hedge with trees running along track; birch, hawthorn, nettle, white clover, upper sections are defunct with newly planted shrubs	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		 	
TN70a	Species poor defunct hedge; blackthorn, hawthorn with newly planted sections	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
			
TN71a	Small pill box, overgrown with scrub vegetation; bracken, hawthorn, nettle, cleavers. Openings visible but potentially draughty so low bat roost potential, linear features present for commuting/foraging and close proximity to	 	TM 47281 60884

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
	woodland (low potential due to defunct hedge)		
TN72a	Area of scrub/grassland with anoxic black soil; red dead nettle, broad leaf dock, spear thistle, cocks foot and cow parsley	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
			
TN77a	Arable field - winter cover		

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN78a	Arable field - in crop		
TN79a	Species rich defunct hedge; sycamore, hawthorn, dog rose, ash, blackthorn, cow parsley, nettle, cleavers. Some sections newly planted		

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN80a	Narrow section of dense scrub with scattered young trees, some newly planted saplings; oak, hawthorn, blackthorn, sycamore. Rabbit droppings throughout	 	
TN81a	Species rich hedge with trees running between path and arable field, fenced; hornbeam, hazel, oak, buckthorn, bramble, nettle, cleavers, cocks foot. Moderate bat commuting/foraging potential, low bat roost potential	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN82a	Species poor intact hedge; hawthorn, cow parsley, nettle	 	
TN87a	Section of grassland/scrub vegetation with bracken, gorse, meadow grass, mosses, spear thistle	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
			
TN88a	Log piles/debris in woodland - potential reptile hibernacula, optimal mosaic habitat in surrounding area	 	TM 46868 60790

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN90a	Species poor intact hedge; hawthorn, bramble, nettle, cow parsley, white clover		
TN91a	Arable field - winter cover		

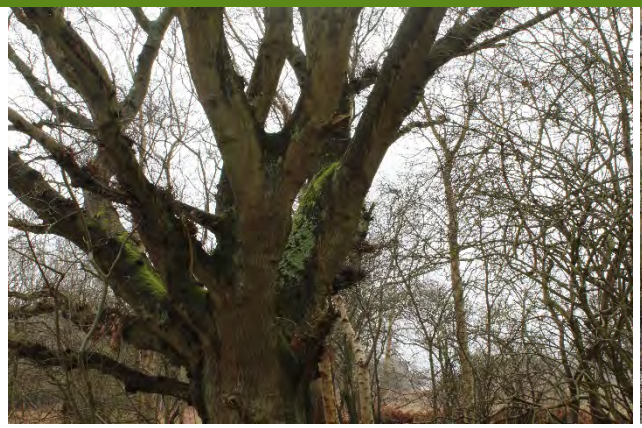
Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN93a	Arable field - ploughed		
TN96a	Dry ditch, sandy with several rabbit holes	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN97a	Species poor defunct hedge consisting mainly of hawthorn, some sections newly planted	  	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN100a	Service pipe/utilities		
TN101a	Dense scrub with gorse, hawthorn, bracken, bramble, nettle, white clover. Passerine birds noted; Good reptile mosaic habitat	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN102a	Wood lark observed, sky lark heard	N/A	
TN103a	Species poor intact hedge on both sides of footpath; hawthorn, bramble, gorse, cow parsley. Moderate to high bat commuting/foraging potential. Birds nests observed	   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		   	

Target Note (TN) Reference	Notes	Photo reference –		GPS ref
				
TN152a	Patches of dense scrub along boundary; hawthorn, bramble, gorse, nettle, spear thistle - optimal mosaic habitat for reptile			

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		 	
TN154a	Mature ivy clad oak in hedgerow	N/A	
TN162a	Woodland with more open spaces with bramble, bracken, gorse. Fallen trees/logs present, optimal reptile habitat mosaic with hibernation options. Moderate to high bat commuting/foraging habitat.	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
	oak, silver birch, hawthorn, gorse and holly, creeping willow, laurel and horse chestnut recorded	   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN163a	Species poor intact hedge; hawthorn, bramble, holly, cleavers, nettle, hedgerow crane's-bill, lords and ladies	   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
			
TN164a	Woodland as per TN162a with scattered scrub and bare ground including bike track/jumps and debris. Scrub areas inaccessible. Creeping willow and lords and ladies present	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		  	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN165a	Mature oak with visible cracks and holes on edge of woodland/footpath - high bat roost potential	 	TM 44101 60481

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN166a	Small areas of heath habitat within woodland, sphagnum moss and fescue species		
TN181a	Strip of dense scrub with scattered trees (ash) running along footpath/field boundary, extends into field with more trees - high bat commuting/foraging potential. Species noted included; hawthorn, common hogweed,	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
	bramble, ivy, gorse, cow parsley, cleavers, bracken, nettle, spear thistle.		
TN182a	Arable field - winter cover		

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN183a	Arable field - in crop		

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN184a	Mature oak in arable field, no visible cracks/holes - low bat roost potential	  	TM 44000 60391

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN185a	Species poor hedge with trees; oak, ash, hawthorn, ivy, bramble, broad leaf dock, cow parsley, lords and ladies. Thick vegetation with some fallen trees/branches - optimal reptile/nesting bird habitat, skylark heard and passerine birds observed. High potential for commuting/foraging bats, low roosting potential due to lack of visible PRFs	   	

TN186a	Scattered oak trees along field boundary. Ground flora consists of broad leaf dock, common hogweed, cow parsley. Low bat roost and commuting/foraging potential; exposed and disconnected and lack of visible PRFs	 	

Target Note (TN) Reference	Notes	Photo reference –		GPS ref
				
TN187a	Species poor hedge with trees; oak, hawthorn, cow parsley, lords and Ladies, spear thistle, red dead nettle, cleavers, dandelions, common hogweed			

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
			
TN188a	Area fenced off with sheep	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN189a	Broadleaved plantation woodland, fenced; oak, sycamore, hawthorn, silver birch. Ivy clad ash, oak and silver birch around woodland perimeter offering moderate to high bat roost and commuting/foraging potential. Pheasant feeders present	   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
			
TN190a	Semi-improved grassland offering optimal habitat for reptiles and ground nesting birds; bramble, nettle, broad leaf dock, spear thistle, dandelions	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
			
TN191a	Species poor hedge with trees; oak, holly, hawthorn, common hogweed, nettle, cow parsley, broad leaf dock, cleavers, bramble, ivy - moderate commuting/foraging bat potential, low bat roosting potential	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN192a	Species poor hedge with trees, fenced; ash, hawthorn, bramble, cow parsley, common hogweed, cleavers, nettle - moderate bat commuting/foraging potential, low bat roost potential	   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
			
TN194a	Species poor defunct hedgerow, mainly hawthorn, only covering small sections of boundary with road. Ground flora consists of cow parsley, dandelion, red dead nettle, wild clary and cleavers. Low to negligible bat		

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
	commuting/foraging potential		
TN195a	Species poor defunct hedgerow; hawthorn, wild cherry, cow parsley, dandelion, red dead nettle, wild clary and cleavers. Low to negligible bat commuting/foraging potential		
TN196a	Arable field - ploughed		

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN197a	Species poor defunct hedge; hawthorn, gorse, cow parsley, nettle, red dead nettle - low to negligible bat commuting/foraging habitat	 	
TN198a	Semi improved grassland with scattered wild cherry trees and telegraph poles; common hogweed, cow parsley, red dead nettle, thistle, cocks foot, bracken. Optimal for reptiles and nesting birds	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		 	
TN199a	Species poor intact hedge; hawthorn, ivy, cow parsley, nettle. Birds nests observed and passerine birds noted. Moderate commuting/foraging bat potential		

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN201a	Species poor hedge with trees; oak, ash, hawthorn, cow parsley, cleavers, red dead nettle, common hogweed, lords and ladies, nettle, daffodils - moderate bat commuting/foraging habitat		
TN202a	Species poor hedge with trees; ash, red dead nettle, cow parsley, bramble, cleavers, broad leaf dock - moderate bat commuting/foraging potential	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
			

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN204a	Mature ivy clad oak in hedgerow with moderate bat roosting potential	 	TM 43137 60117

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN206a	Large mature, ivy clad oak with large cracks/holes - moderate bat roost potential, rabbits present at roots	  	TM 43067 60147

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN207a	Steep sided pit at corner of field; oak, hawthorn, cow parsley, common hogweed - rabbits present	 	
TN208a	Species poor defunct hedge; hawthorn, bramble, nettle, cow parsley, ivy, common hogweed, germander speedwell, dandelions, red dead nettle. Newly planted sections	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
			
TN209a	Arable field - ploughed with wide grassland strip at margin; corn camomile, germander speedwell	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		  	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN210a	Species rich hedge with trees; hawthorn, gorse, broom, goat willow, dog rose, field maple, holly, white dead nettle, wild clary, cocks foot, nettle, spear thistle, broad leaf dock, germander speedwell, hedgerow crane's-bill	   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		 	
TN211a	Species poor defunct hedge; hawthorn, gorse, cow parsley, nettle, red dead nettle, wild clary, common hogweed, bracken, herb Roberts, chickweed	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		  	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN213a	Several (5) mature oak within house gardens, surveyed from field. Visible cracks and holes - high bat roost potential		TM 42753 60371
TN214a	Boundary consists of fence with scattered hawthorn, ivy, cleavers, nettle and sycamore		

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN215a	Species poor hedge with trees and a dry ditch; hawthorn, broad leaf dock, nettle, cleavers, red dead nettle, white clover, hedgerow crane's-bill, spear thistle, common hogweed, cow parsley	   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN216a	Species poor intact hedge; hawthorn, cow parsley, nettle, bramble		
TN217a	Arable field - winter cover		

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN218a	Mature ivy clad oak in hedgerow with moderate bat roost potential and moderate commuting/foraging potential	 	TM 42585 60461

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN219a	Species poor hedge with trees, fenced with sheep on opposite site; oak, hawthorn, bramble, ivy, nettle, cow parsley, hedgerow crane's-bill, lords and ladies, broad leaf dock, spear thistle, common hogweed, cleavers		

TN220a	Cluster of mature ivy clad oaks in hedge with moderate bat roost potential		TM 42414 60386

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN221a	Small copse of semi natural broadleaved woodland; mostly oak and hawthorn, nettle, lords and ladies.	   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		  	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN223a	Mixed plantation woodland, part fenced with pheasant feeders and enclosures; scots pine, oak, sweet chestnut. Understorey/ground flora limited to occasional bramble and lords and ladies. Large birds nest, fallen logs/branches, nettle. Negligible bat roost potential, low commuting/foraging potential. Snuffle holes	   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		  	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN224a	Species poor intact hedge, fenced; hawthorn, nettle, bramble, cleavers, lords and ladies, common hogweed.	  	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN226a	Semi natural broadleaved woodland occupying pit; hawthorn, oak, ash, nettle, ivy, lords and ladies, cleavers, germander speedwell. Whole area enclosed by fence. Several (4) mature oak with moderate bat roost potential	   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		 	
TN227a	Species poor defunct hedge along track; hawthorn, ivy, nettle, hogweed, cleavers, broad leaf dock, cow parsley, red dead nettle, dog rose, oak sapling, white dead nettle	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		 	
TN228a	Arable field - winter cover		

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN229a	Arable field - ploughed		
TN230a	Species poor hedge with trees; oak, hawthorn, ivy, nettle, lords and ladies, cow parsley, dog rose, cleavers, spear thistle, ash. Snuffle holes. Moderate bat commuting/foraging potential, low bat roost potential	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN231a	Species poor intact hedge with borehole/irrigation pipes; hawthorn, bramble, ivy, common hogweed, cow parsley, cleavers, broad leaf dock, lords and ladies, nettle	   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
			
TN232a	Semi natural broadleaved woodland occupying pit, fenced and steep sided; oak, hawthorn, bramble, nettle, common hogweed, lords and ladies, ivy, cow parsley, spear thistle.		

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		 	

TN233a	Several (3) mature ivy clad oak around perimeter of pit with moderate bat roost potential		TM 42332 60893

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN234a	Species poor defunct hedge; hawthorn, lords and ladies, nettle, cleavers, bramble, hedgerow crane's-bill	   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN235a	Species poor intact hedge; hawthorn, ivy, cow parsley, nettle, lords and ladies, cleavers, common hogweed, broad leaf dock. Birds nests	   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN236a	Species poor hedge with trees; oak, hawthorn, nettle, red dead nettle, ivy, lords and ladies, common hogweed, cow parsley, cleavers. Two mature oak trees (one with large bird, potentially kestrel, box) with moderate bat roost potential	   	TM 42682 60891

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN237a	Arable field - winter cover		
TN238a	Boundary consists of scattered hawthorn; grasses (cock's foot), red dead nettle, common hogweed, hedgerow crane's-bill, nettle, cleavers. Piles of wood throughout, rabbit holes present. Optimal reptile mosaic habitat with	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
	hibernation opportunities. Skylark heard	   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN239a	Kestrel box		
TN241a	Semi-improved grassland with scattered scrub; gorse, bracken, bramble, oak sapling, mossy patches; hedgerow crane's-bill, common hogweed, spear thistle	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
			
TN242a	Improved grassland; hedgerow crane's-bill, dandelion, red dead nettle, germander speedwell, white clover	 	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		  	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN243a	Semi-improved grassland with buildings (caravan, shed and old van/rubbish). Shed consists of fabricated steel, considered negligible for roosting bats	  	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN244a	Species poor intact hedge along footpath, fenced; hawthorn, gorse, red dead nettle, dandelions, daffodils, common hogweed, cleavers, curled dock. Section at northern end of hedge consists of mature juniper	  	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN246a	Semi natural broadleaved woodland forming banks of river hundred (dry); hawthorn, nettle, bramble, common hogweed, lords and ladies, meadow buttercup, cleavers	  	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN247a	Arable field - ploughed, no boundary features		
TN248a	Arable field - in crop		

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN249a	Species poor defunct hedge; hawthorn, lords and ladies, common hogweed, cow parsley, dandelion, bramble, nettle, cleavers, ivy	  	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN250a	Row of (5) trees along dry ditch, adjacent to footpath and farm buildings/house; 2 oak and 3 white poplar. 1 ivy clad oak with moderate bat roost potential, the other 4 trees assessed as offering low to negligible roost potential due to lack of visible PRFs	  	TM 42228 61353

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN251a	Dry vegetated ditch; bramble, nettle, spear thistle, hedgerow crane's-bill, curled dock, common hogweed, white dead nettle	 	

TN252a	Species poor hedge with trees and continuation of dry ditch (TN251a); oak, hawthorn, bramble, ivy, nettle, lords and ladies, cleavers, dandelions, meadow buttercup, daisy, primrose, daffodils. 1 mature ivy clad oak with moderate bat roost potential. Hedgerow offering moderate commuting/foraging potential	 	TM 42053 61331

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		 	
TN253a	Improved grassland with electric fencing, potentially used for grazing		

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
TN254a	Semi natural broadleaved woodland, predominantly oak and sycamore with hawthorn. Ground flora consists of ivy, primrose, bramble, nettle, lords and ladies. Snuffle holes throughout. High bat roost potential in multiple trees, high commuting/foraging potential throughout	   	

Target Note (TN) Reference	Notes	Photo reference –	GPS ref
		   	

Continued in Part 2 of 2