East Anglia
Offshore Wind

VATTENFALL

SCOTTISHPOWER RENEWABLES

East Anglia THREE

Appendix 23.5 ól-ú

East Anglia THREE Extended Phase 1 Habitat Survey Report

Environmental Statement
Volume 3
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Author – Royal HaskoningDHV
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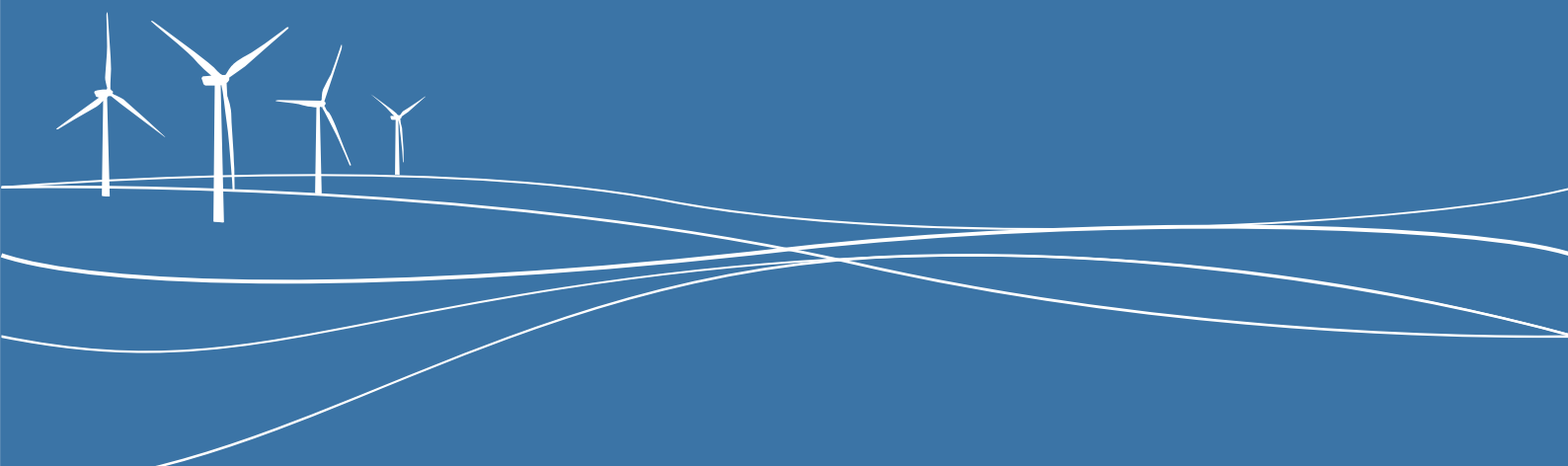

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23.5 EXTENDED PHASE 1 HABITAT SURVEY REPORT

23.5.1 Introduction

23.5.1.1 Background

1. Royal HaskoningDHV was commissioned by East Anglia Offshore Wind Ltd (EAOW) in 2014 to complete an Extended Phase 1 Habitat Survey in relation to the proposed onshore electrical transmission works for the proposed East Anglia THREE project (see *Appendix A, Figure 1*).

2. RSK Environment initially undertook baseline ecological surveys in relation to the East Anglia ONE onshore electrical transmission works in September and October 2011 and February to June 2012. These surveys comprised a Phase 1 Habitat Survey and targeted bat, dormouse *Muscardinus avellanarius*, water vole *Arvicola amphibius*, otter *Lutra lutra*, reptile, badger *Meles meles*, great crested newt *Triturus cristatus* and botanical surveys.

3. Due to landowner access restrictions, a number of areas were not surveyed during these periods. Consequently in June 2014, an Extended Phase 1 Habitat Survey of those inaccessible areas was undertaken by Royal HaskoningDHV ecologists. In addition and whilst on site, a number of badger setts were resurveyed in order to confirm their status (*Appendix B*). This report details the findings of the 2014 Extended Phase 1 surveys.

23.5.1.2 Site Description

4. The onshore electrical transmission works for the proposed East Anglia THREE project consists of up to four onshore buried cables with up to 62 jointing bay locations. The onshore cable route is approximately 37km long, commencing at the landfall location at Bawdsey, on the south Suffolk coast, and connecting to the national grid at the existing Bramford substation to the west of Ipswich (*Appendix A, Figure 1*).

23.5.1.3 Scope of Works

5. The 2014 Extended Phase 1 Habitat Survey (herein the '2014 survey') comprises three components, which collectively enable a preliminary ecological assessment of the survey area (see section 23.5.2.1 for definition) to be undertaken. This includes:

    - A desktop review, utilising the following resources:
        - The Multi-Agency Geographic Information for the Countryside (MAGIC) website (www.magic.gov.uk) for designated sites and habitats information [Accessed 25/07/14];

- The Joint Nature Conservancy Council (JNCC) website (www.jncc.defra.gov.uk) for designated sites information [Accessed 25/07/14]; and
- Biological records data from Suffolk Biological Records Centre (received 22nd January 2014) including information on existing protected species records and nature conservation designations within and surrounding the onshore electrical transmission works. A 2km buffer was used for this with the exception of a 5km buffer for bat data;

- An field survey and assessment of the habitats within and a 50m buffer surrounding the onshore electrical transmission works; and
- A protected species assessment that evaluates the likelihood of protected species or species of conservation concern occurring within and a 50m buffer surrounding the onshore electrical transmission works plus water bodies located within 500m of the onshore electrical transmission works.

23.5.1.4 Purpose of Report

6. This report has been written as part of the submission of an Environmental Statement for the proposed East Anglia THREE project. The purpose of this report is to provide EAOW with an overall understanding of the ecological value of the survey area (see section 23.5.2.1 for definition) by providing a detailed description of the habitats noted at the time of the 2014 survey.

7. This report also clearly identifies the potential for the site to support legally protected species, and hence the potential hazards, restrictions and obligations which may be required to ensure compliance with wildlife legislation. This report will also be used to inform the options appraisal process, ensuring that ecology is given appropriate consideration in the next stages of the project and as the detailed design of the cable route is undertaken.

8. This report should be read in conjunction with the baseline ecological surveys produced by RSK Environment referred to in section 23.5.1.1.

23.5.1.5 Project Background

9. The proposed East Anglia THREE project is being developed by East Anglia THREE Limited (EATL), which is a subsidiary of EAOW. The proposed East Anglia THREE project would consist of between 100 and 172 wind turbines, each having a rated capacity of between 7 and 12MW, with a total installed capacity of up to 1,200MW.

10. Up to four offshore collector stations and two offshore converter stations would collect electricity from the wind turbines and transport it to shore via up to four export cables.

11. Once onshore up to four buried cables with bundled fibre optic (FO) cables would transport electricity to the connection point with the National Grid at Bramford substation in Suffolk.

12. The offshore cable corridor would follow a similar offshore cable corridor to that proposed within the East Anglia ONE Development Consent Order (DCO).

13. The DCO for the East Anglia ONE Offshore Windfarm comprises its offshore and onshore export cables, the converter station at Bramford and onshore cable ducts for two further projects, planned to connect to the grid at Bramford. This ducting will be installed at the same time as the cables are laid for East Anglia ONE.

14. It is expected that construction would commence between 2020 and 2025 and span over 45 months.

15. A Preliminary Environmental Information Report (PEIR) was prepared by Royal HaskoningDHV in May 2014 to for consultation on the project design and predicted impacts prior to applying for a DCO. This report contained background information on the terrestrial ecology identified for the onshore cable route, and has been used to inform the direction of further ecological surveys an assessment for the proposed East Anglia THREE project.

23.5.1.6 Summary of relevant legislation and nature conservation designations

16. United Kingdom (UK) and European Union (EU) legislation is in place which affords legal protection for certain species and habitats. Full details of the relevant legislation to the proposed East Anglia THREE project are provided in *Appendix C*.

17. *Table 23.1* below provides a brief summary of the key legislation and policy relevant to the project.

Table 23.1. Summary of the key legislation relevant to the project

Legislation	Relevance
Wildlife and Countryside Act 1981 (as amended)	Codifies the EU Directive 2009/147/EC (the Birds Directive) into UK law; provides legal protection for European designated sites (Special Protection Areas, Ramsar sites) and Sites of Special Scientific Interest; 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 2010 (as amended)	Codifies the EU Directive 92/43/EEC (The Habitats Directive) into UK law; provides legal protection for European designated sites (Special Areas of Conservation).
Natural Environment and Rural Communities Act 2006	Details a list of UK habitats and species of 'principle importance' which require protection within the UK.

Legislation	Relevance
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.
Policy	**Relevance**
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.

23.5.2 Methodology

23.5.2.1 Survey area

18. This Extended Phase 1 Habitat Survey is concerned with the onshore cable route, which runs from Bawdsey to Bramford, Suffolk. For the purposes of the survey, a survey area was defined which included the onshore cable route plus a 50m buffer area around the onshore electrical transmission works, plus all water bodies located within 500m of the onshore electrical transmission works.

19. This survey was only conducted for certain areas of the onshore cable route and associated 50m buffer (plus water bodies within 500m), namely those not surveyed by RSK Environment in 2011-2012. These areas are herein in referred to collectively as the 'survey area'. These areas are shown in *Appendix A, Figure 4.1-4.11*.

20. In addition, the Badger Survey reported in confidential *Appendix B* reassessed all badger setts identified by RSK Environment in 2012. The survey area for the badger survey includes the 'survey area' outlined above, plus the location of all the previous badger setts identified in 2012.

23.5.2.2 Desk study

21. A desk-based assessment was undertaken in 2011 to inform the East Anglia ONE project. As part of the PEIR, a new desk based assessment was undertaken in January 2014 to update the information collected in 2011. Section 23.5.3.1 of this report presents the findings of 2014 desk-based assessment, and describes where information gathered in 2014 supersedes that collected in 2011.

22. The desk-based assessment was undertaken to provide information on statutory and non-statutory designated sites for nature conservation, and protected and notable species and habitats within 2km of the onshore electrical transmission works (within 5km for bat species).

23. Information was requested from Suffolk Biological Records Centre (SBRC), Suffolk Wildlife Trust (SWLT) and local county recorders. Additional sources such as the MAGIC website, Natural England, the JNCC and Google Maps (including aerial photography) were also used for a search area of within 2km of the onshore electrical transmission works to identify designated sites and within 500m to identify water bodies.

24. The desk-based assessment included a review of the UK BAP (UK Biodiversity Steering Group 1998a-f, Biodiversity Reporting and Information Group 2007) and Suffolk's Local Biodiversity Action Plan (LBAP). The desk-based assessment also included records of protected and invasive species.

25. Prior surveys of the onshore cable route were reviewed for any information which would inform the 2014 survey. This included the surveys undertaken to inform the East Anglia ONE Offshore Wind Farm Environmental Statement (Environmental Resources Management, 2012), all of which are included as appendices within the Environmental Statement for the proposed East Anglia THREE project. A summary of the previous ecological surveys undertaken as part of this submission included in *Table 23.2*.

Table 23.2. Data sources

Data (reference in the ES)	Year	Coverage	Confidence	Notes
National Vegetation Classification (NVC) Surveys *Appendix 23.2*	May - June 2012	Selected locations *(Figure 23.4a – 23.4m)*	High	Focused on potentially valuable botanical sites (as well as representative examples of the common habitat types) identified during the East Anglia ONE Phase 1 Habitat Survey including calcareous grassland, unimproved and semi-improved neutral grassland, marshy grassland, woodland, water bodies and coastal habitats. Habitats at these sites were described using the methodology of the NVC and detailed lists of vascular plants were compiled.
Hedgerow survey *Appendix 23.2*	May 2012	All hedges crossed by onshore cable route	High	Hedgerows were assessed against wildlife and landscape criteria in The Hedgerow Regulations 1997 to identify 'Important' hedgerows.
Water bodies survey *Appendix 23.2*	May - June 2012	All river and stream crossings, selected ditches	High	Water bodies were subjected to a detailed inspection of bank-side, marginal and aquatic vegetation upstream and downstream of the crossing points, and the compilation of species lists.
Invasive plant survey *Appendix 23.2*	March - June 2012	Onshore cable route and converter station compound (*Figure 23.5)*	High	Locations of invasive plant species were recorded.
Daytime bat roost tree assessment survey	February - May 2012	All mature trees suitable for roosting bats	High	All suitable, mature trees were assessed from the ground using binoculars to identify any

Data (reference in the ES)	Year	Coverage	Confidence	Notes
Appendix 23.2		along the Onshore cable route and around the converter station compound (*Figures 23.6a – 23.6m*)		features that might be suitable for roosting bats. All trees were graded using the standard RSK Environment's grading scheme according to their potential to support roosting bats and their location marked on maps.
Daytime bat roost tree assessment survey *Appendix 23.2*	June - July 2012	Trees identified as having features with high potential for roosting bats (*Figures 23.6a – 23.6m*)	High	Trees assessed as having bat potential were climbed for full inspection. The trees were climbed using ladders, ropes and harnesses and features examined in detail for evidence of bats.
Bat activity transect surveys *Appendix 23.2*	June - July 2012	Onshore cable route (*Figures 23.6a –23.6m*)	High	Activity surveys were undertaken on up to three dates in June and July 2012 along linear features located within the onshore cable route and suitable for foraging and commuting bats. A combination of static detectors and manual surveys were used.
Dormouse survey *Appendix 23.2*	January – August 2012	Woods across the onshore cable route *(Figure 23.15)*	High	Nut searches were undertaken in winter in woods across the route. Dormouse tubes and boxes were positioned in suitable habitat located within the proposed cable route and checked for nests over five visits between May and August 2012.
Great crested newt presence/absence survey *Appendix 23.2*	March - June 2012	Water bodies were identified within a 250m buffer of the Onshore cable route and Converter Station Refined Area of Search (*Figure 23.7*)	High	Water bodies within 250m[1] of the East Anglia ONE preferred cable corridor were assessed for their potential to support GCN. Presence / absence surveys were undertaken on all suitable water bodies followed by population assessment surveys if GCN were found to be present.
Otter survey	June - July	100m upstream	High	The watercourses were surveyed

[1] An area of 500m has been used to inform the 2014 survey. This distance is a more conservative search area considering current guidance on great crested newt ecology. Both search areas are considered sufficient to ensure the constraint posed by great crested newts is fully considered.

Data (reference in the ES)	Year	Coverage	Confidence	Notes
Appendix 23.2	2012	and 100m downstream of cable route crossing points on all suitable watercourses (*Figures 23.8a – 23.8m*)		for signs of otter including footprints (padding), droppings (spraints), feeding evidence, slides, paths and holts or lying-up places.
Water vole survey *Appendix 23.2*	June - July 2012	100m upstream and 100m downstream of cable route crossing points on all suitable watercourses	High	Surveys concentrated in areas and involved the systematic searching for water vole field signs including feeding signs, latrines, burrows, footprints, runways, food piles and actual sightings.
Reptile survey *Appendix 23.2*	May - August 2012	Selected locations (*Figures 23.10a – 23.10m*)	High	Protected species presence / absence surveys were undertaken using artificial refuges placed in suitable habitat and checked on five separate occasions between May and August.
Terrestrial invertebrates survey *Appendix 23.2*	July - August 2012	Selected locations (*Figures 23.11a – 23.11m*)	High	Surveys were undertaken for target species in combination with general sampling for all terrestrial invertebrate groups focusing on high value habitats.
Aquatic invertebrates survey *Appendix 23.2*	June 2012	Onshore cable route (*Figures 23.12a – 23.12m*)	High	One-off samples were taken at watercourse crossing points and analysed in the laboratory.
Badger *Confidential Appendix 23.4*	February - June 2012	160m-onshore cable route and around the converter station Refined Area of Search (**Confidential** *Figures 23.13a - 23.13m)*	High	Locations of setts and foraging activity were recorded. Any setts found were mapped and categorised.

23.5.2.3 Field Survey

Ecological surveys were carried out between 23rd June – 4th July 2014 (hereafter referred to as the '2014 survey') in order to identify the habitats and species present within the survey area. The ecological information gathered as part of this environmental baseline collection is presented below with the exception of information on badgers. Due to the sensitivity of this species and ongoing persecution of badgers the results of the 2014 badger surveys are provided in the confidential *Appendix B*.

23.5.2.3.1 Extended Phase 1 Habitat Survey

26. The 2014 survey was undertaken to complement the previous suite of surveys undertaken in September and October 2011 and February to June 2012 by RSK Environment (See Appendix 23.2 of the Environmental Statement). The following protected species were included in the 2014 survey.

23.5.2.3.1.1 Badger

27. See the confidential *Appendix B* for methodology for badger survey.

23.5.2.3.1.2 Bats

28. All trees, buildings and structures were assessed for their potential to support roosting bat populations. Trees were assessed on a 1*-3 scale, in accordance with the guidelines advocated by the Bat Conservation Trust (Hundt, 2012). Under this scale trees are categorized as follows:

- A Category 1* tree contains multiple, highly suitable features;
- A Category 1 tree contains definite bat potential, with fewer suitable features than a Category 1*;
- A Category 2 tree has no obvious potential, although the tree is of a size or age that mean an elevated survey may result in cracks or crevices being found; and
- A Category 3 tree has no potential to support bats.

29. The daytime bat inspection surveys included assessing buildings and structures as containing limited, low, medium or high potential based on the specific features and situation in the landscape with respect to habitats suitable for bats of each building / structure, again, based on guidance in by the Bat Conservation Trust (Hundt, 2012). Trees and hedgerows were also assessed for their potential to provide commuting and foraging habitat for bats.

23.5.2.3.1.3 Water vole and otter

30. Standing and running water bodies within the survey area were assessed for their suitability to support water voles and otters. Detailed surveys for field signs (i.e. in-channel surveys) were not part of the scope of this Extended Phase 1 Habitat Survey.

23.5.2.3.1.4 Great crested newt

31. Standing water bodies identified to be within 500m of the onshore electrical transmission works not surveyed in 2011-2012 were subjected to a Habitat Suitability Index (HSI) assessment (see Oldham et al., 2000), to assess their potential to support great crested newts (GCN).

23.5.2.3.1.5 Reptiles

32. Areas for potential reptile habitat, such as edge habitats, piles of debris or bare ground were assessed for their potential to provide potential reptile basking, foraging, shelter or hibernating opportunities.

23.5.2.3.1.6 Invertebrates

33. High quality and diverse habitats were noted, which would provide good quality habitat for a range of invertebrates. Terrestrial and aquatic invertebrates were considered.

23.5.2.3.1.7 Invasive non-native species

34. A search for invasive non-native species was included in the 2014 surveys. 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).

23.5.2.4 Constraints to survey

35. Access to the land within the survey area has been an ongoing constraint to field surveys since 2011, which in turn has led to areas of land remaining unsurveyed. These areas mainly consisted of private gardens, but occasionally included areas of woodland, fields, ponds and areas which include known badger setts. The areas which have remained unsurveyed in 2014 are shown on *Appendix A, Figures 4.1-4.11*. In addition, those badger setts which were surveyed in 2012 but which could not be accessed in 2014 are indicated within confidential badger *Appendix B*.

36. The existing species information collated during the desk study is predominantly derived from records submitted by members of the public and volunteer groups. It cannot be taken as a definitive list of the species that occur in the local area.

37. Ecological surveys are limited by factors which affect the presence of plants and animals such as the time of year, migration patterns and behaviour. In particular, the badger setts recorded in 2012 were identified in optimal times: Autumn/Winter when

there is fewer vegetation and leaves on trees. Whereas the 2014 badger surveys were undertaken in suboptimal timing (i.e. in July), where dense vegetation was often a limiting factor. Several attempts to relocate badger setts originally located in optimal conditions encountered dense, overgrown hedgerows or nettles in 2014, and subsequently led to the setts not being validated. These are marked in *Appendix B*, *Table B.2* as 'no access'. Sub-optimal timing for the 2014 survey was due to restrictions to access by landowners.

38. The 2014 ecological survey has not produced a complete list of plants and animals and the absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future. Nevertheless, the results of this work have allowed for an initial assessment of the ecological value of the survey area, the potential for ecological constraints to the works and the likely requirements for mitigation.

23.5.3 Results

23.5.3.1 Desk study

39. The findings of the updated desk study conducted in January 2014 are included below. Where the findings of the desk study have changed between 2011 and the 2014 survey, this is noted within each sub-section below.

23.5.3.1.1 Statutory Designated Sites

40. Statutory sites identified within 2km of the onshore electrical transmission works are shown in *Appendix A, Figure 1*. The sites are listed in order of closest proximity to the onshore cable route. Two have multiple designations, namely the Deben Estuary Ramsar site, Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI) and the Alde-Ore Estuary SPA, Ramsar and SSSI. In addition, there are nine SSSIs, another SPA, one SAC, two Local Nature Reserves (LNRs) and one Area of Outstanding Natural Beauty (AONB).

41. Three statutory designated sites are located within the onshore electrical transmission works. These are: Bawdsey Cliff SSSI, Deben Estuary Ramsar SPA & SSSI and Suffolk Coast and Heaths AONB. Bawdsey Cliff SSSI is designated for its geological value and is considered in Chapter 19 Geology and Ground Conditions. Therefore only the Deben Estuary and Suffolk Coast and Heaths are discussed in further detail here.

23.5.3.1.1.1 Deben Estuary Ramsar, SPA and SSSI

42. The Deben Estuary Ramsar, SPA and SSSI is of international and national importance for over-wintering populations of waders and wildfowl. The estuary qualifies under Article 4.1 of the European Commission Bird Directive by regularly supporting 7.5% of the Great British wintering population of pied avocet *Recurvirostra avosetta*, and 0.8% of the north-west European population of dark-bellied Brent goose *Branta bernicla*. The site is also designated as a SSSI. The SSSI also supports 40% of Suffolk's area of saltmarsh.

23.5.3.1.1.2 Suffolk Coast and Heaths AONB

43. The Suffolk Coast and Heaths AONB extends south from Lowestoft to the River Stour. The AONB rich mixture of lowland landscapes and includes ancient open heathland, woodlands, wetlands, saltmarsh, mud-flats and shingle beach habitats. The site is the nearest unspoilt coast to Greater London, indented by the estuaries of the Blyth, Alde, Deben, Orwell and Stour and bounded by the crumbling cliffs and tidal spits of the North Sea coastline.

23.5.3.1.2 Non-statutory designated sites

44. There are 82 non-statutory designated sites within 2km of the onshore electrical transmission works. These sites comprising Ancient Semi Natural Woodlands (ASNWs), Plantation Ancient Woodlands (PAWs), Woodland Trust Sites (WTs), County Wildlife

Sites (CWSs), Suffolk Wildlife Trust Sites (SWTs) and Regionally Important Geological Sites (RIGSs). Five of these sites are located within the onshore electrical transmission works: the River Gipping, Fore and Bushey Groves, Miller's Wood, The Mill River and Suffolk Shingle Beaches. The locations of the sites are shown in *Appendix A, Figure 2***.** Non-statutory sites are considered to be of value at the county level.

23.5.3.1.3 UK BAP Habitats

45. Local biological records show the cable route passes through UK priority BAP habitats including coastal and floodplain grazing marsh, mudflat, deciduous woodland, maritime cliffs and slopes and a traditional orchard. These habitats are also included under the Suffolk LBAP.

46. The majority of the cable route passes through intensively arable land. Habitats of nature conservation value in these areas are generally restricted to linear features such as hedgerows or watercourses, with other habitats occurring in small, often isolated pockets.

23.5.3.1.4 Protected species records

47. This section summarises the records of all legally protected species which have been obtained during the desk study exercise.

23.5.3.1.4.1 Badger

48. Please see the confidential *Appendix B* for information for badger.

23.5.3.1.4.2 Bats

49. Biological records obtained from SBRC show bat presence and activity throughout the (within 5km of the onshore electrical transmission works), namely common pipistrelle *Pipistrellus pipistrellus*, Nathusius's pipistrelle *P. nathusii*, soprano pipistrelle *P. pygmaeus*, and long-eared bats *Plecotus auritus*.

23.5.3.1.4.3 Water vole

50. SBRC provided 40 records of water vole within 2km of the onshore electrical transmission works, particularly in Falkenham Marches and the River Gipping.

23.5.3.1.4.4 Great crested newt

51. There are nine records of GCN within 2km of the onshore electrical transmission works. The most recent record is from 2012 at Burstall, which is approximately 1km south west of the substation site at Bramford.

23.5.3.1.4.5 Birds

52. There are records of 151 notable or protected bird species within 2km of the onshore electrical transmission works, of which 49 are listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). Of these, the following were identified within 100m of the onshore electrical transmission works: *Anas acuta* Northern Pintail, *Crex*

crex Corn Crake, *Larus melanocephalus* Mediterranean Gull, *Melanitta fusca* Velvet Scoter, *Numenius phaeopus* Whimbrel, *Panurus biarmicus* Bearded Tit, *Pernis apivorus* European Honeybuzzard, *Phoenicurus ochruros* Black Redstart, *Podiceps nigricollis* Black-necked Grebe, *Recurvirostra avosetta* Pied Avocet, *Regulus ignicapilla* Firecrest, *Sternula albifrons* Little Tern, *Sylvia undata* Dartford warbler.

23.5.3.1.4.6 Reptiles

53. Reptile records identify 14 sightings of slow worm *Anguis fragilis*, four of grass snake *Natrix natrix*, 11 common lizard *Zootoca vivipara*, and two European adder *Vipera berus* within 2km of the onshore electrical transmission works.

23.5.3.1.4.7 Otter

54. There are 42 records of European otter within 2km of the onshore electrical transmission works, particularly at the River Deben, Martlesham and the River Gipping.

23.5.3.1.4.8 Invertebrates

55. Biological records show no records for terrestrial / aquatic invertebrates legally protected at the European level, however the following species are listed under Section 41 of the Natural Environment and Rural Communities Act (NERC Act 2006), and form the Species of Principal Importance in England list as a Government priority for conservation action.

- Stag beetle *Lucanus cervus*
- Small Heath butterfly *Coenonympha pamphilus*
- Grayling butterfly *Hipparchia semele*
- Wall butterfly *Lasiommata megera*
- Sea-aster Colletes Bee *Colletes halophilus*
- Brown-Banded Carder Bee *Bombus humilis*
- Moss Carder Bee *Bombus muscorum*
- White Admiral *Limenitis camilla*
- White Ermine moth *Spilosoma lubricipeda*
- Buff Ermine *Spilosoma luteum*
- Cinnabar *Tyria jacobaeae*

56. The locations of Bawdsey Manor, Little Blakenham and Woodbridge have high numbers of records of these species.

23.5.3.2 Field survey

23.5.3.2.1 Habitats

57. The habitats recorded during the 2014 survey and within the site are summarised in this section and shown in *Appendix A, Figures 4.1 – 4.11*. Full Target Notes (TN) is provided in *Appendix D*. All plate references are provided in *Appendix E*.

23.5.3.2.1.1 Overview summary

58. *Table 23.3* shows the key habitats within the survey area noted during the 2014 survey. The majority of land was for arable use, with large areas of amenity grassland, broken up by intact and defunct species-rich and poor hedgerows with standards, dense scrub and ruderal vegetation, and pockets of woodland (primarily broadleaved semi-natural, with very small areas of coniferous and plantation woodland). Several water bodies fall within the survey area: a mixture of ponds in woodland, fields, private residences or ditches within hedgerows.

Table 23.3. JNCC Phase 1 habitat areas (hectares) and boundaries (length (m)) as recorded in 2014

JNCC Phase 1 Habitat Survey Code	JNCC Phase 1 Habitat Survey description	Area in hectares
J1.1	Arable	88.48
J1.2	Amenity grassland	9.04
J3.6	Buildings	8.34
A1.1.1	Broadleaved semi-natural woodland	8.15
B4	Improved grassland	6.51
C3.1	Tall ruderal	5.06
A1.3.1	Mixed semi natural	3.84
J5	Other/target note	3.36
J4	Bare ground	2.70
A3.1	Broadleaved parkland/scattered trees	2.49
J2.1.2	Species-poor intact hedgerow	2.24
J2.3.2	Species-poor hedgerow with trees	2.15
A2.1	Dense/continuous scrub	2.12
A1.1.2	Broadleaved plantation woodland	2.10
B1.2	Semi-improved acid grassland	1.94
B2.1	Neutral unimproved grassland	1.75
A1.2.1	Coniferous semi natural	1.72
A1.3.2	Mixed plantation	1.57
A3.3	Coniferous parkland/scattered trees	1.45
B6	Poor semi-improved grassland	0.98
A2.2	Scattered scrub	0.73
A1.2.2	Coniferous plantation	0.60
B1.1	Unimproved acid grassland	0.57
J2.4	Fence	0.51
J1.4	Introduced shrub	0.34
C1.1	Continuous bracken	0.33
E3.2	Fen - basin mire	0.30

JNCC Phase 1 Habitat Survey Code	JNCC Phase 1 Habitat Survey description	Area in hectares
B2.2	Neutral semi-improved grassland	0.21
J2.3.1	Species-rich hedgerow with trees	0.18
G1.1	Eutrophic standing water	0.17
F1	Swamp	0.07
G1	Eutrophic standing water	0.01
Code	**Habitat type**	**Length (m)**
A2.2	Scattered scrub	301.88
A3.1	Broadleaved parkland/scattered trees	2680.02
A3.2	Coniferous parkland/scattered trees	219.42
F2.1	Marginal/inundation	451.21
G2.2	Mesotrophic running water	105.58
J2.1.1	Species-rich intact hedgerow	874.70
J2.1.2	Species-poor intact hedgerow	4309.60
J2.2.1	Species-rich defunct hedgerow	509.84
J2.2.2	Species-poor defunct hedgerow	832.61
J2.3.1	Species-rich hedgerow with trees	3996.85
J2.3.2	Species-poor hedgerow with trees	3264.51
J2.4	Fence	651.73

23.5.3.2.1.2 Arable land

59. The largest habitat within the survey area is arable land. Typical crops (as noted in 2014) consisted of barley, wheat rape seed and sugar beet (TN2; Plate 1).

23.5.3.2.1.3 Boundary features

60. Field boundaries consisted primarily of hedgerows, ranging from defunct (J2.2) to intact (J2.1), with a mixture classified as species-poor or species-rich. Occasionally fields were bordered by fences (J2.4). Species-rich hedgerows (J2.1.1, J2.2.1, J2.3.1) typically consisted of shrub and tree species including field maple *Acer campestre*, elm *Ulmus procera*, wych elm *Ulmus glabra*, hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, rose, hazel *Corylus avellana*, English oak *Quercus robur*, holly *Ilex spp*., ivy *Hedera spp*., with ground flora typically including common nettle *Urtica dioica*, cleavers *Galium aparine*, sorrel *Rumex acetosa,* broad-leaved dock *Rumex obtusifolius*, lesser burdock *Arctium minus*, smooth sow thistle *Sonchus oleraceus*, red dead nettle *Lamium purpureum* and bindweed *Convolvulus arvensis* (e.g. TN8; Plate 7). Species-poor hedgerows (J2.1.2, J2.2.2, J2.3.2) were characterised by fewer than five species in a 30m stretch, and typically were dominated with elm and hawthorn (e.g. TN1, TN3; Plate 1).

61. All hedgerows are UK BAP habitats, hedgerows are also included in the Suffolk LBAP.

23.5.3.2.1.4 Semi-natural woodland

62. The survey area consisted of small pockets of woodland, with the largest being in between Bawdsey Hall and Queens Fleet river (TN4) at 17,211m^2.

63. The most commonly occurring woodland in the survey area was broad-leaved semi-natural woodland (A1.1.1) typically made up of lime *Tilia sp.*, beech *Fagus sylvatica*, field maple, sycamore *Acer pseudoplatanus*, oak with an understorey of elder, hawthorn, elm with larger mature trees. Ground flora typically comprised rough meadowgrass *Poa trivialis*, ground ivy *Glechoma hederacea*, cock's-foot *Dactylis glomerata*, red dead nettle, and red campion *Silene dioica* (TN154; Plate 31).

64. Mixed semi-natural woodland (A1.3.1) areas typically consisted of: hawthorn, ash *Fraxinus spp*., English oak, bramble *Rubus fruticosus*, sweet chestnut *Castanea sativa*, elder *Sambucus nigra*, yew *Taxus baccata*, Scots pine *Pinus sylvestris*, lodgepole pine *Pinus contorta*. Ground flora included common nettle, rough meadowgrass, herb robert *Geranium robertianum*, cleavers, bindweed, (TN4 and TN31; Plate 3).

65. These semi-natural woodlands are considered to fall within the UK BAP and Suffolk LBAP for Lowland Mixed Deciduous Woodland.

23.5.3.2.1.5 Plantation woodland

66. Nine areas of plantation woodland were noted during the 2014 survey, and were broadleaved, coniferous or mixed. The areas of mixed plantation consisted of beech, apple, ash, oak, larch, with ivy and bramble. The areas of broadleaved plantation comprised oak, sycamore, sweet chestnut, cherry *Prunus spp.* and birch *Betula pendula*. One white willow *Salix alba* plantation was found with tussocky ground flora of cock's-foot and Russian comfrey *Symphytum × uplandicum* with potential reptile habitat (TN159). There was one area of coniferous plantation (A1.2.2), made up of lodgepole pine, to the west of the Queens Fleet river (TN17; Plate 10).

23.5.3.2.1.6 Parkland

67. Several private gardens have been classified as parkland (e.g. TN178), where scattered trees were noted e.g. cypress spp., sweet chestnuts, weeping willow, mature oak spp., within managed grassland.

23.5.3.2.1.7 Isolated trees

68. Within hedgerows with trees or along field boundaries, many isolated trees were identified and assessed for their bat roost potential (Section 23.5.3.2.2). A veteran black poplar *Populus nigra* was noted (TN5), as well as veteran oaks (TN58, TN63, TN75 and TN91).

23.5.3.2.1.8 Scrub

69. Scrub or transitional areas were present along the route, for example at the farm entrances such as Sycamore Farm (TN185) near areas of hardstanding or adjacent to strips of tall ruderal vegetation (TN180). Species included common hogweed *Heracleum sphondylium* and bramble.

23.5.3.2.1.9 Grassland

23.5.3.2.1.9.1 Agricultural grasslands

70. The onshore electrical transmission works overlaps with agriculturally improved and very species-poor grassland. It is typically dominated by perennial rye-grass *Lolium perenne* and occasional red fescue *Festuca rubra*, timothy *Phleum pratense* and ribwort plantain *Plantago lanceolata*.

23.5.3.2.1.9.2 Unimproved and Semi-improved neutral grassland

71. Most areas of semi-improved grassland located within the onshore electrical transmission works comprise coarse, ruderal grass species and ruderal herbs. The only species-rich neutral grassland along the onshore cable route is located at TN44.

72. Most forms of unimproved grasslands are considered to fall into the UK BAP and Suffolk LBAP for Lowland Meadow.

23.5.3.2.1.10 Tall ruderal

73. Several areas of tall ruderal habitat were found, typically along boundaries to roads or tracks, or adjacent to scrub land and typically included common nettle *Urtica diotica*, ribbed melilot *Melilotus officinalis*, ribwort plantain *Plantago lanceolata* and red clover *Trifolium pratense*. Several areas were adjacent to small rock piles and gravel areas potentially suitable for reptiles (e.g. TN100).

23.5.3.2.1.11 Standing Water

74. 26 water bodies were identified within the survey area and up to 500m from the onshore electrical transmission works, of which five were assessed for their suitability to support GCN during the survey. One pond (WB59) was rated as 'good' habitat for GCN, the rest ranging from poor to average. A summary of the water bodies surveyed can be found in *Table 23.4* and full results are in *Appendix F, Table F.1*. The remaining 21 water bodies identified within the survey area and up to 500m from the onshore electrical transmission works were not surveyed due to access restrictions.

75. Any standing water which supports protected species (e.g. GCN) is automatically included under the UK BAP and Suffolk LBAP for Ponds.

Table 23.4. Water body information

Water body Reference	National Grid Reference	Description	Distance from onshore electrical transmission works (approx. in metres)	Plate number
WB08	TM 30390 39333	Small pond, shaded by willow, adjacent to longer pond.	126	60
WB48	TM 15611	Very shaded pond with ditch/drain either	10	61

Water body Reference	National Grid Reference	Description	Distance from onshore electrical transmission works (approx. in metres)	Plate number
	48120	side, arable on one side, golf course on other side. Hard to access as overgrown.		
WB54	TM 17393 49316	Ditch with small water body surrounded by road and cattle field. Overgrown with common nettles, hogweed, cleavers, blackthorn, field maple, ash and horse chestnut.	98	62
WB58	TM 17097 49130	Large pond shaded by mature trees, including ash, hawthorn, large oak, willow and ivy. Appears to be a fish pond with ~20 goldfish present, a small jetty and water circulating from a pump.	125	63
WB59	TM 17090 49159	Large pond surrounded by large ash, oak and willow. Diverse ground flora – iris, *Mahonia spp.*, buttercup, sow thistle, also field maple, hawthorn, bramble and ivy.	91	64

23.5.3.2.1.12 Buildings

76. Several built up areas were noted within the survey area. These areas consisted of residential villages, towns, and farms. All buildings were assessed for their suitability to support roosting bats, the results of which are provided in Section 23.5.3.2.2.

23.5.3.2.2 Protected species potential

77. This section provides a summary of the quality of the available habitat resource for legally protected species under UK law. See *Appendix C* for a summary of relevant legislation.

23.5.3.2.2.1 Badger

78. See the *Appendix B* for information for badger.

23.5.3.2.2.2 Bats

79. The findings of the daytime bat roost inspections of the trees which had been assessed as having medium or high bat roost potential were categorised as per the Bat Conservation Trust Guidelines (Hundt, 2012) and are provided in *Table 23.5* below. See also *Appendix E* for photographs of these features, *Appendix A, Figure 5* showing the location of potential bat habitat and *Appendix G* for full results. Note that no bat individuals were observed during the 2014 survey.

Table 23.5. Potential bat habitat categorisation

Target Note reference	Tree Category	Building / structure category	Description	Distance to onshore electrical transmission works (m)
10	1		Mature wych elm with cracks and ivy, medium bat potential.	12
114	1		Standing deadwood with numerous cracks and fissures, medium bat potential.	98
128	2		Mature oak with ivy and large woodpecker hole. Medium bat potential.	463
130	2		Standing deadwood adjacent to road, with flaking bark. Medium bat potential.	314
134	1		Standing deadwood with dead ivy. Numerous crevices. Medium bat potential.	236
151		High	Group of buildings, private residence. Includes a number of buildings with old brickwork and clay tiles. High bat potential.	55
154	2		Large mature beech with broken limbs and ivy - medium bat potential. Upper branches cannot be seen.	19
155	1		Mature oak (two individuals) clad with ivy and broken limbs, medium bat potential.	13
158	1		Mature oak clad in ivy with broken limbs and splits, medium bat potential.	3
165	1		Line of trees with mature alder, standing deadwood. Number of standards with small fissures, cracks, broken limbs and ivy. Medium bat potential, good for foraging and commuting bats.	0.00 (within onshore electrical transmission works)
171	1		Mature oak with broken limbs, small fissures and holes, with ivy, medium bat potential.	0.00 (within onshore electrical transmission works)
178	1		Mature oak with ivy and numerous splits, cracks and holes, medium bat potential.	26
213	2		Species-rich hedge with standards including oak, one with mature ivy and small splits and cracks, medium bat potential.	41
215	2		Mature oak with medium bat potential.	43
219	1*		Mature oak with numerous cracks, splits, broken limbs and central hole in trunk. High bat potential, possible barn owl sighted here in hedgerow adjacent.	3

23.5.3.2.2.3 Water vole and otter

80. 20 watercourses were identified within the survey area. 11 of these watercourses were either dry or filled in, and were assessed as not providing potential habitat for water vole or otter. Of the remaining nine, eight watercourses were assessed as providing sub-optimal habitat for water vole and otter, in light of absence of available bankside habitat or resting places, dense vegetation or poor water quality. One water

body (TN 187, *Appendix A, Figure 4.10*) was identified as providing otter commuting potential due to its good water quality, good mix of bankside vegetation and connectivity with the wider commuting habitat.

81. No field signs of water vole or otter were observed during the 2014 survey.

23.5.3.2.2.4 Great crested newts

82. Standing water bodies within 500m of the onshore electrical transmission works were assessed for their potential to support GCNs. Due to landowner access issues, only five standing water bodies (of the 26 identified) were assessed. Water body 59 (*Appendix E, Plate 63*) was assessed as having 'good' suitability for GCN. Full results are included in *Appendix F*, and plates of each water body included in *Appendix F*. Close proximity to Water body 58 would be unlikely to provide connecting habitat due to Water body 58 being heavily stocked with fish. Water body 59 is within 1km of 11 other water bodies, and is within 250m of, and not separated by any barrier to movement from, Water body 53, which was identified to contain GCN presence by RSK Environment in 2012.

83. Water bodies 54 and 58 are also within 250m of Water body 53, however these water bodies were identified to provide poor and average habitat suitability to support great crested newts respectively. Similarly Water body 48 is within 250m of Water body 46a, which was also identified to contain GCN presence by RSK Environment in 2012, but was identified as being of below average habitat suitability.

84. Great crested newt terrestrial habitat including grassland and woodland / scrub areas were identified throughout the survey area.

23.5.3.2.2.5 Birds

85. Habitats suitable for nesting birds were observed throughout the survey area. This includes 32.52ha of woodland and 13.79km of hedgerow.

86. Barn owl *Tyto alba* was observed during the 2014 survey near a mature oak tree (*Appendix D, TN219*). Barn owl is listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).

23.5.3.2.2.6 Reptiles

87. No reptiles were sighted during the survey period, however areas which were noted as being suitable for reptiles are presented in *Table 23.6* below and *Appendix A Figure 5*. A number of potential basking habitats were present adjacent to the farm buildings where debris piles were present.

Table 23.6. Potential reptile habitat locations

Target Note Reference	Comment
17	Bare ground - reptile basking ground however poor surrounding habitat so low potential.
46	Log pile - medium reptile potential (shelter).
67	Debris pile providing potential reptile shelter.
84	Concrete debris piles, anecdotal evidence from local landowner of slow worms in area. Potential reptile habitat (shelter).
92	Farm buildings, debris pile and rock piles. Potential reptile basking habitat.
100	Large pile of debris, low-med reptile basking habitat.
159	White willow plantation with tussocky ground flora of cocks-foot and Russian comfrey. Reptile foraging potential.
170	Hedge with trees, standards including elm, hawthorn, reptile potential.
172	Outside utility areas with rubble, pallets, log piles, old materials, in a mosaic of tall ruderal herbs. Reptile foraging, basking and sheltering potential.
180	Scrub adjacent tall ruderal vegetation, good reptile foraging potential.
190	Improved grassland and scattered tall herbs, log piles also present. Reptile foraging and sheltering potential.

23.5.3.2.3 Invasive, non-native species

88. No species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) (see *Appendix C*).

23.5.4 Conclusions

89. The desk study identified three statutory designated sites that fall within the onshore electrical transmission works for the proposed East Anglia THREE project. These sites are Bawdsey Cliff SSSI, Deben Estuary Ramsar, SPA & SSSI and Suffolk Coast and Heaths AONB.

90. Ten non-statutory designated sites are located within the survey area, and five are within the onshore electrical transmission works: the River Gipping, Fore and Bushey Groves, Miller's Wood, The Mill River and Suffolk Shingle Beaches.

91. UK BAP and Suffolk LBAP habitat identified from the desk study as being within the survey area included coastal and floodplain grazing marsh, mudflat, deciduous woodland, maritime cliffs and slopes and a traditional orchard.

92. The 2014 survey recorded that the majority of the survey area is dominated by an agricultural landscape, with large areas being arable land.

93. Habitats present with higher biodiversity value include semi-natural and plantation woodlands, parkland, scrub, tall ruderal, unimproved and semi-improved grasslands, water bodies, hedgerows, isolated trees and old farm buildings. The 2014 survey also identified hedgerow and Lowland Mixed Deciduous Woodland UK BAP and Suffolk LBAP habitat as being present within the survey area. Standing water and unimproved grassland identified may qualify under the Ponds and Lowland Meadow UK BAP and Suffolk LBAPs respectively.

94. Key features for protected and notable species have been identified within the survey area for a range of protected species. These include 14 trees with Category 2 or above bat roost potential and one group of farm buildings with high bat roost potential; four water bodies with below average to good status in the HSI undertaken for GCN; and 11 notable locations with reptile potential. One of the watercourses in the survey area was assessed as being suitable for commuting otter; none were assessed as being suitable for water vole. Findings in relation to badger activity are held within confidential *Appendix B.*

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Legend

- East Anglia THREE Red Line Boundary
- Area of Outstanding Natural Beauty (AONB)
- Special Protection Areas (SPA)
- Special Areas of Conservation (SAC)
- Sites of Special Scientific Interest (SSSI)
- Local Nature Reserves (LNR)

Great Blakenham Pit

Great Blakenham Pit

Little Blakenham Pit

Rede Wood

Riverside House Meadow, Hasketon

Ferry Cliff, Sutton

Bramford Meadows

Sinks Valley, Kesgrave

Deben Estuary (SPA, Ramsar, SSSI)

Waldringfield Pit

Newbourn Springs

Ramsholt Cliff

Orfordness - Shingle Street (SAC)

Alde-Ore Estuary (SPA, Ramsar, SSSI)

Suffolk Coast & Heaths (AONB)

Bawdsey Cliff

Datum: OSGB36
Projection: British National Grid

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Rev	Date	By	Comment
02	19/03/15	JE	Second Issue
01	01/08/14	JE	First issue

Original A3 Plot Scale 1:75,000

0 1 2 Kilometers

East Anglia Offshore Wind

East Anglia THREE Statutory Designated Sites

Drg No	6115-530-PK-138
Rev	02
Date	19/03/2015
Layout	A3

Figure 1

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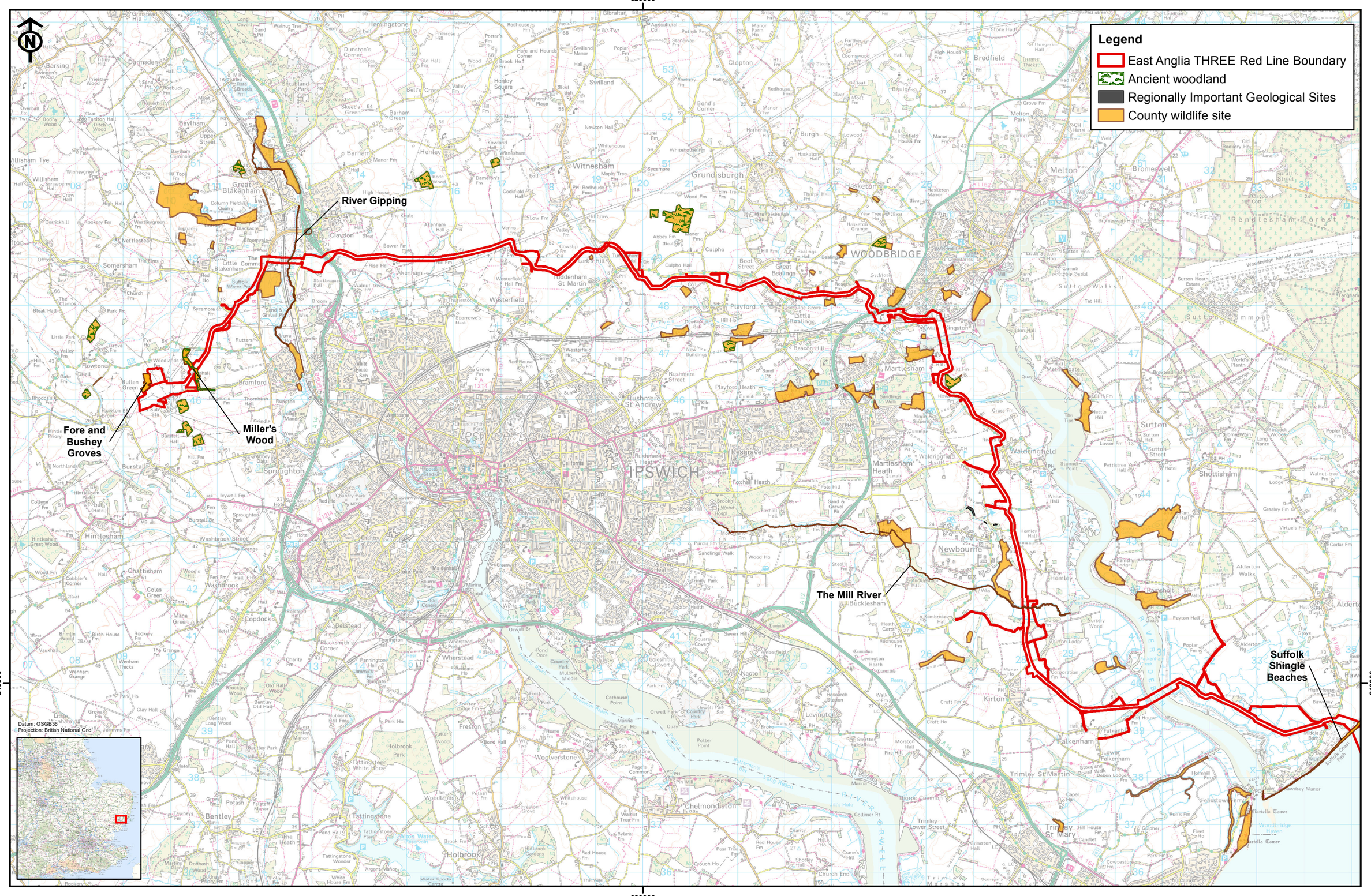

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01	01/08/14	JE	First issue

Original A3 Plot Scale 1:75,000

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East Anglia Offshore Wind

East Anglia THREE Non-statutory Designated Sites

Drg No	6115-530-PK-139
Rev	02
Date	20/03/2015
Layout	A3

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610000 620000 630000

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Legend

East Anglia THREE Red Line Boundary

UK BAP Priority Habitats

- Blanket bog
- Calaminarian grassland
- Coastal and floodplain grazing marsh
- Coastal saltmarsh
- Coastal sand dunes
- Coastal vegetated shingle
- Deciduous woodland
- Fragmented heath
- Good quality semi-improved grassland
- Grass moorland
- Limestone pavement
- Lowland calcareous grassland
- Lowland dry acid grassland
- Lowland fens
- Lowland heathland
- Lowland meadows
- Lowland raised bog
- Maritime cliff and slope
- Mountain heaths and willow scrub
- Mudflats
- No main habitat but additional habitats
- Purple moor grass and rush pastures
- Reedbeds
- Saline lagoons
- Traditional orchard
- Upland calcareous grassland
- Upland flushes, fens and swamps
- Upland hay meadow
- Upland heathland

Datum: OSGB36
Projection: British National Grid

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Rev	Date	By	Comment
02	20/03/15	JE	First issue
01	01/08/14	JE	First issue

Original A3 Plot Scale 1:75,000

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East Anglia Offshore Wind

UK BAP Priority Habitats

Drg No	6115-530-PK-140
Rev	02
Date	20/03/2015
Layout	A3

Figure 3

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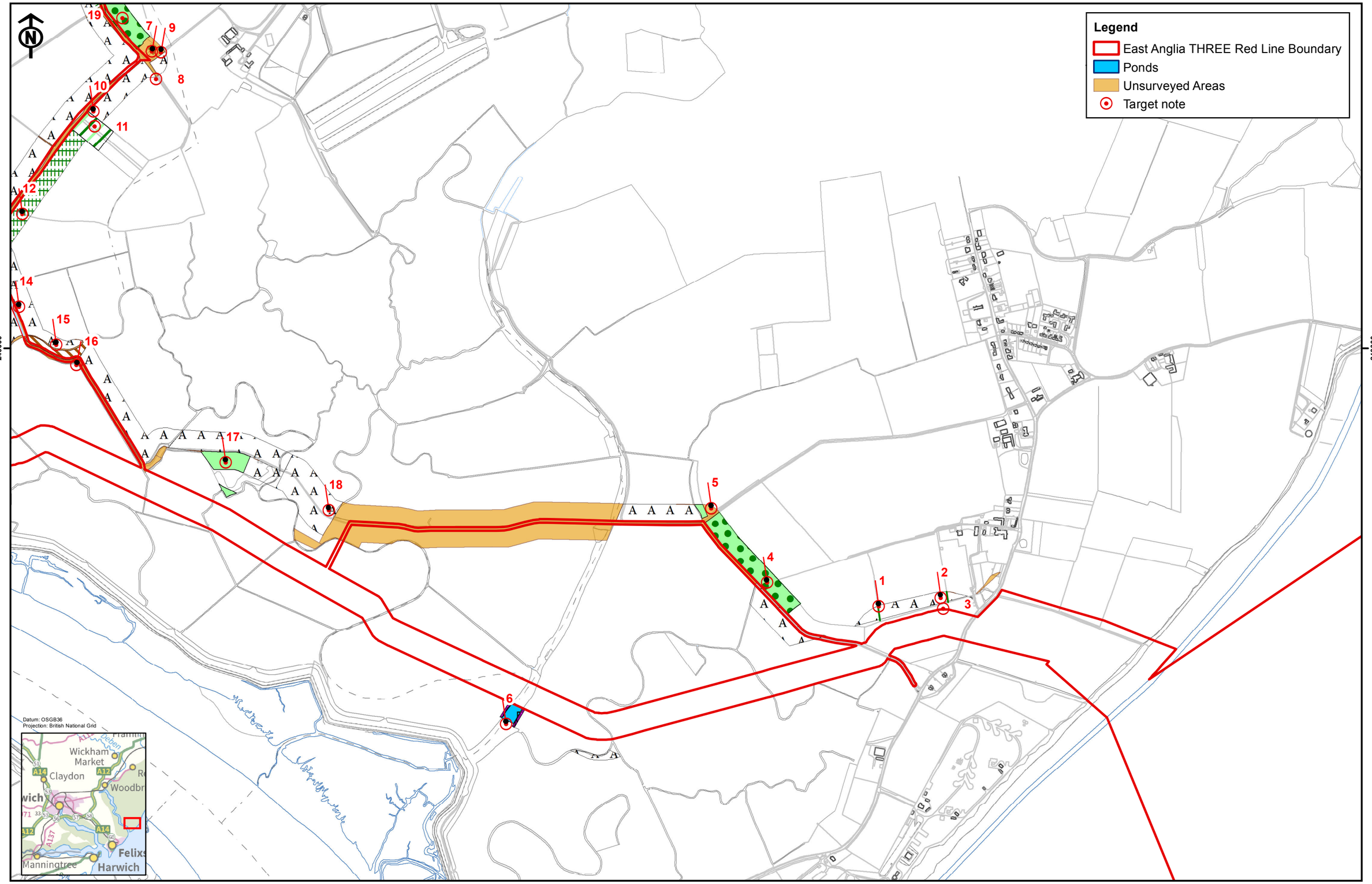
Figure 4 Phase 1 Habitat Survey



SCOTTISHPOWER RENEWABLES VATTENFALL

Rev	Date	By	Comment
02	20/03/15	JE	Second issue
01	01/08/14	JE	First issue

Original A3
Plot Scale
1:10,000

0 200 400 Meters

East Anglia Offshore Wind

East Anglia THREE Phase One Habitat Survey

Drg No	6115-530-PK-137
Rev	02
Date	20/03/2015
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Figure 4

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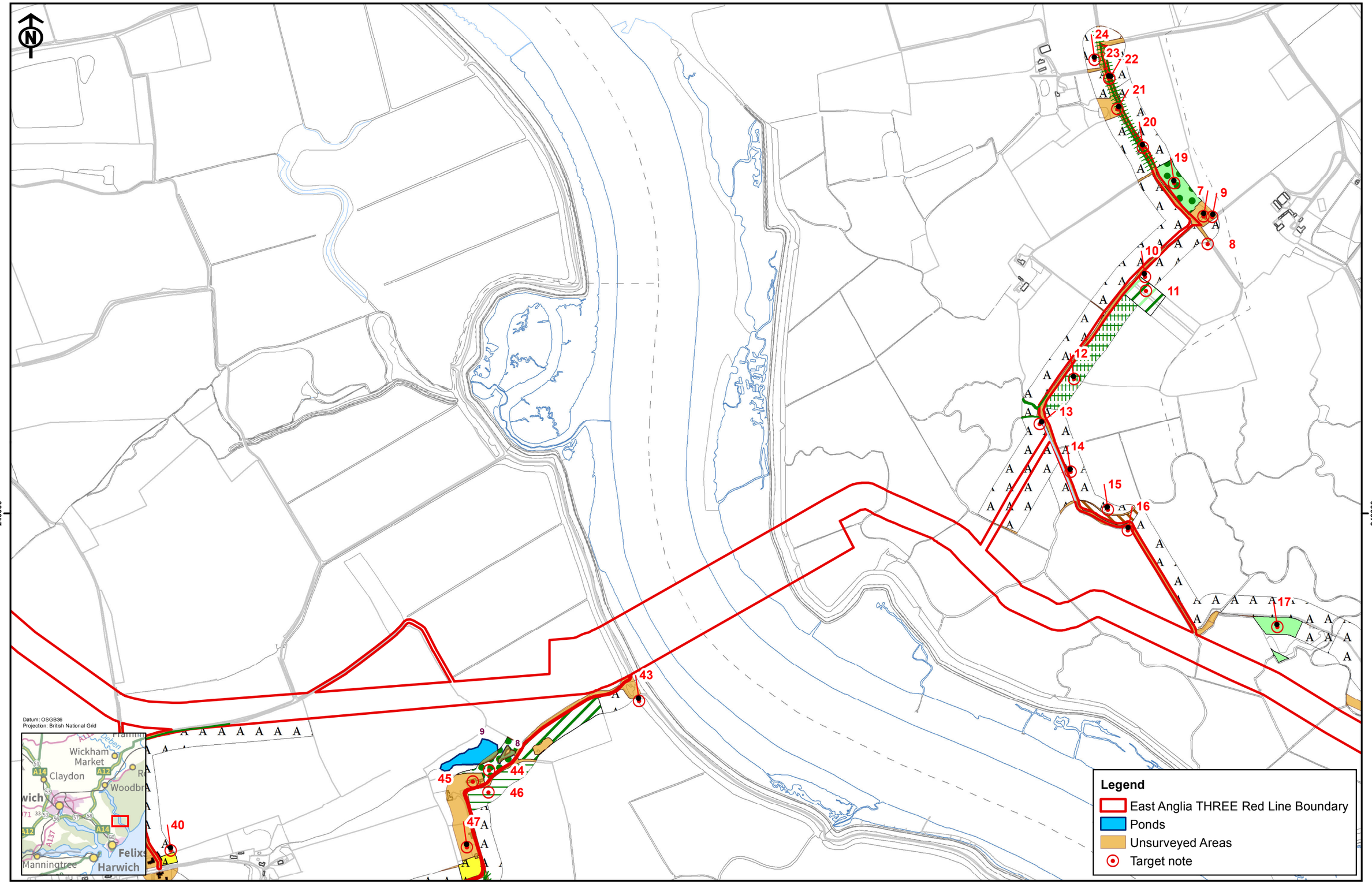

SCOTTISHPOWER RENEWABLES VATTENFALL

Rev	Date	By	Comment
02	20/03/15	JE	Second issue
01	01/08/14	JE	First issue

Original A3
Plot Scale
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East Anglia Offshore Wind

East Anglia THREE Phase One Habitat Survey

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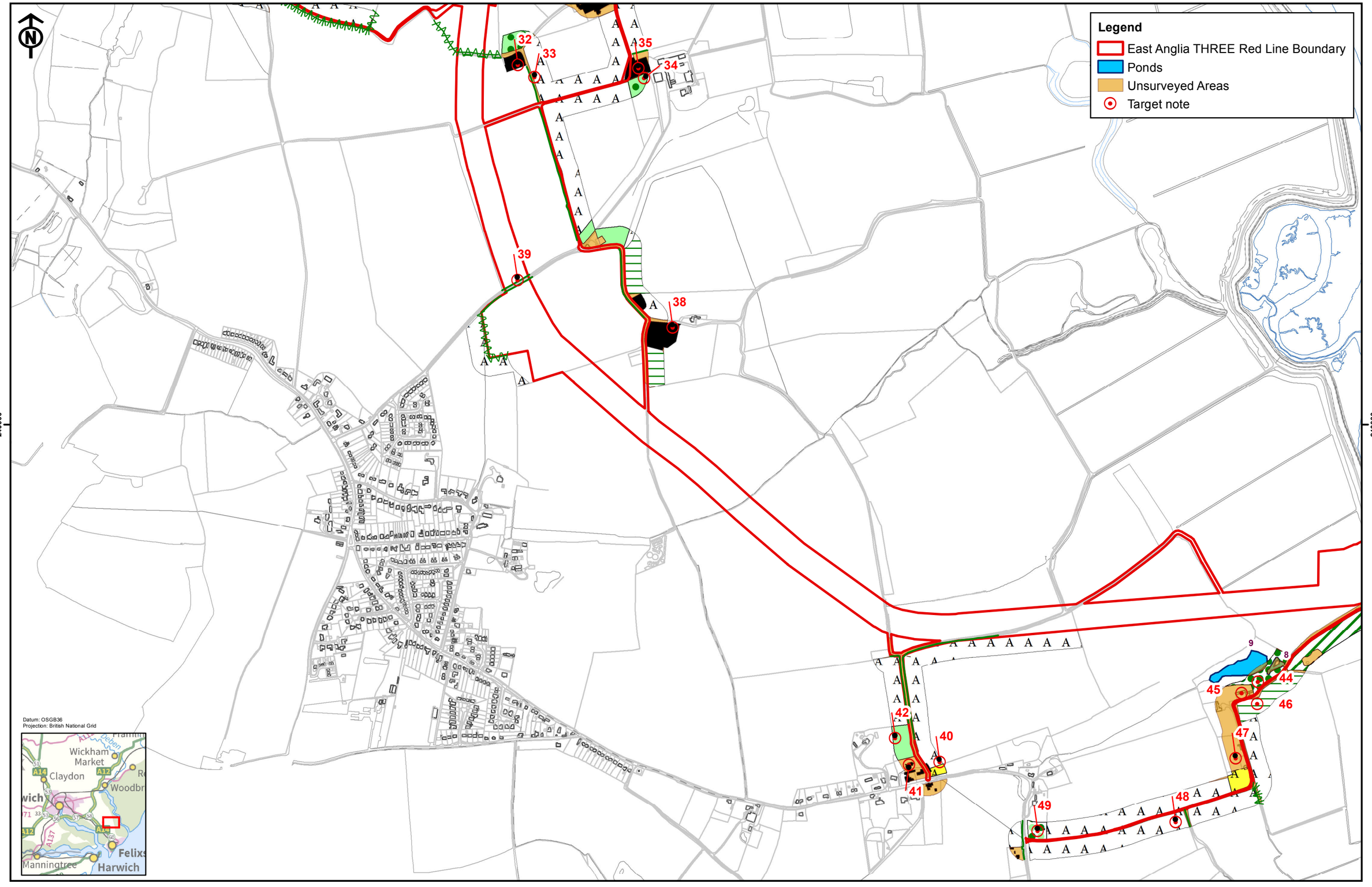

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East Anglia THREE Phase One Habitat Survey

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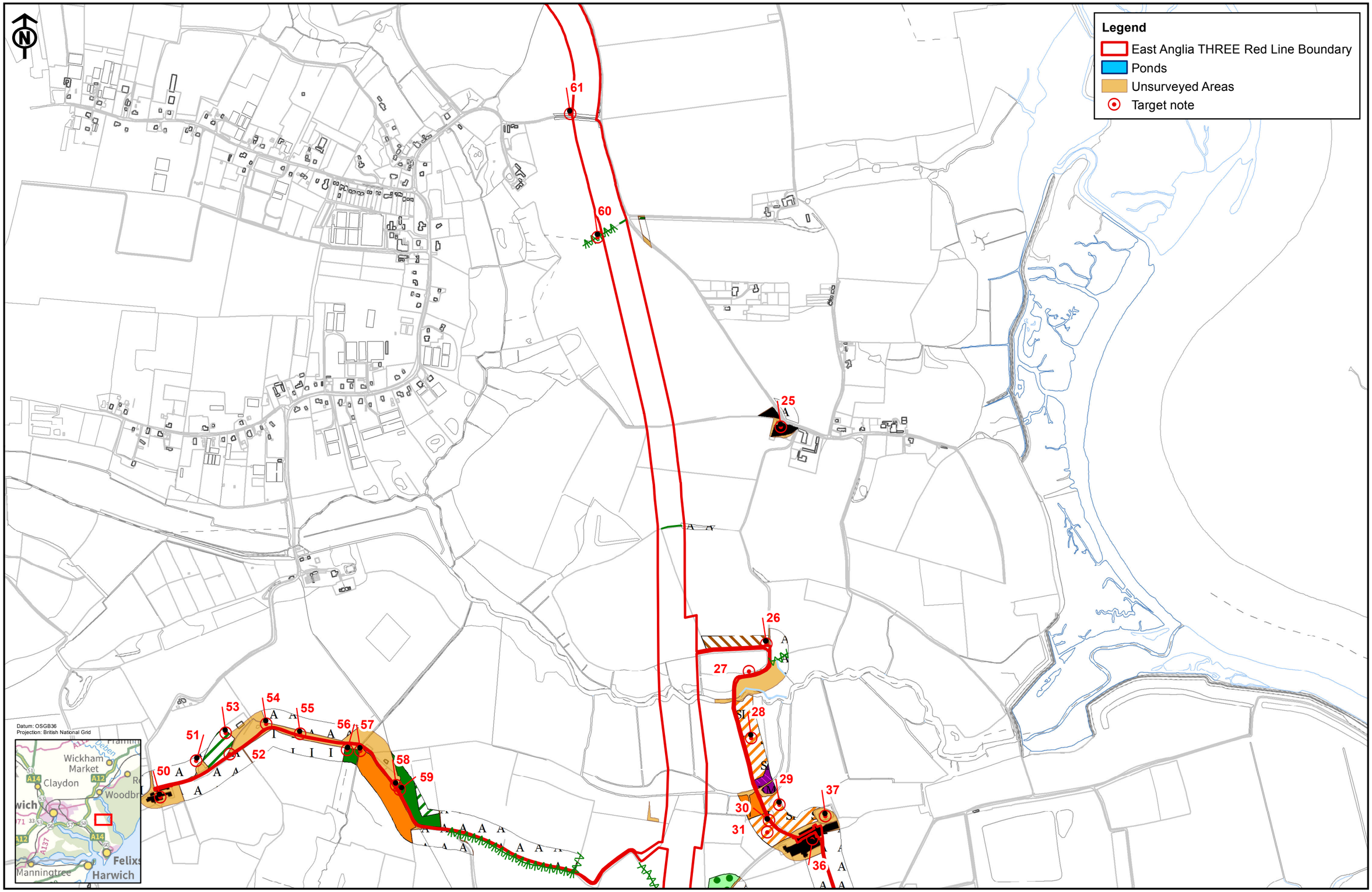

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Rev	Date	By	Comment
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01	01/08/14	JE	First issue

Original A3
Plot Scale
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East Anglia Offshore Wind

East Anglia THREE Phase One Habitat Survey

Drg No	6115-530-PK-137
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Layout	A3

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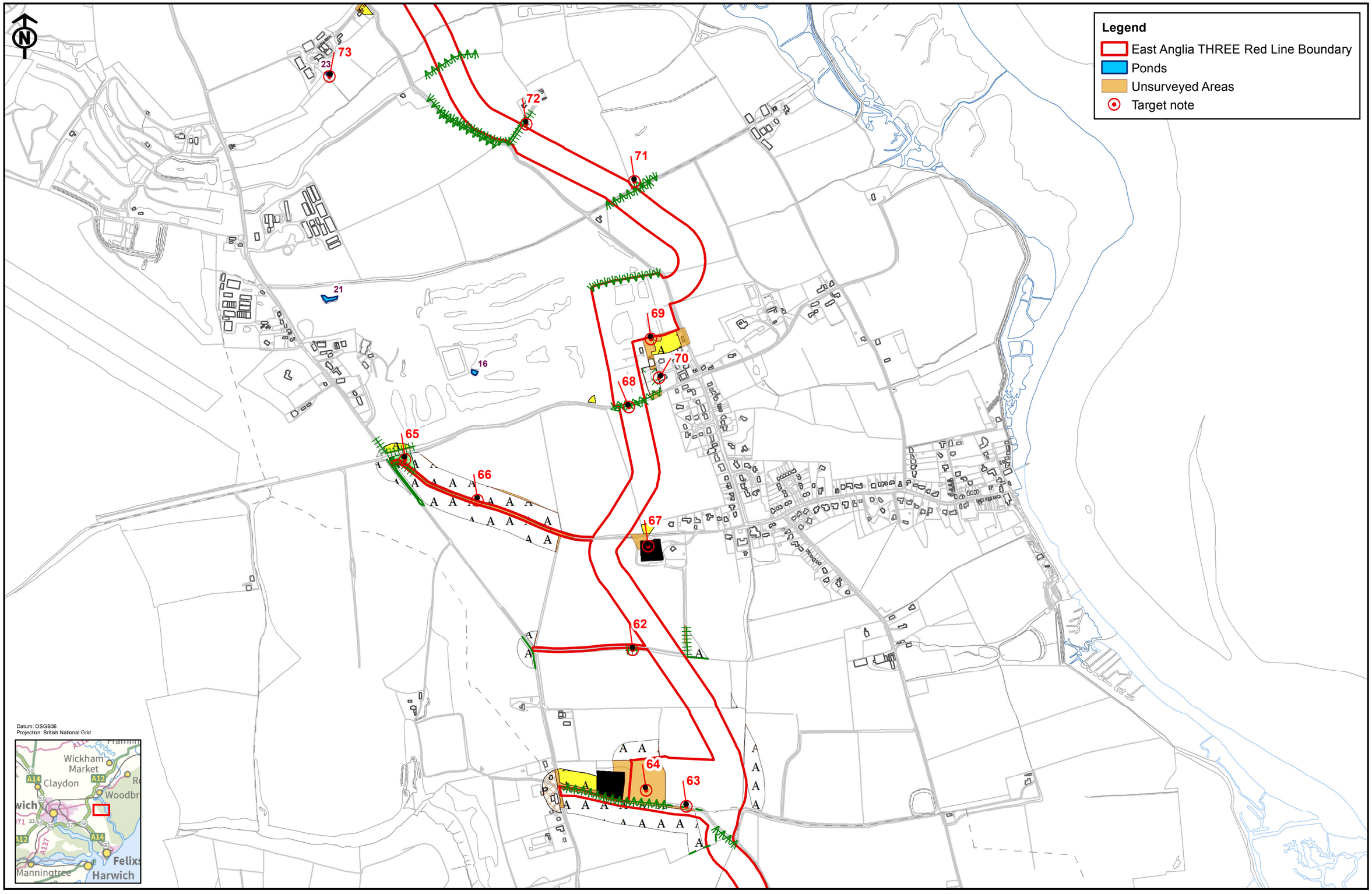

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East Anglia Offshore Wind

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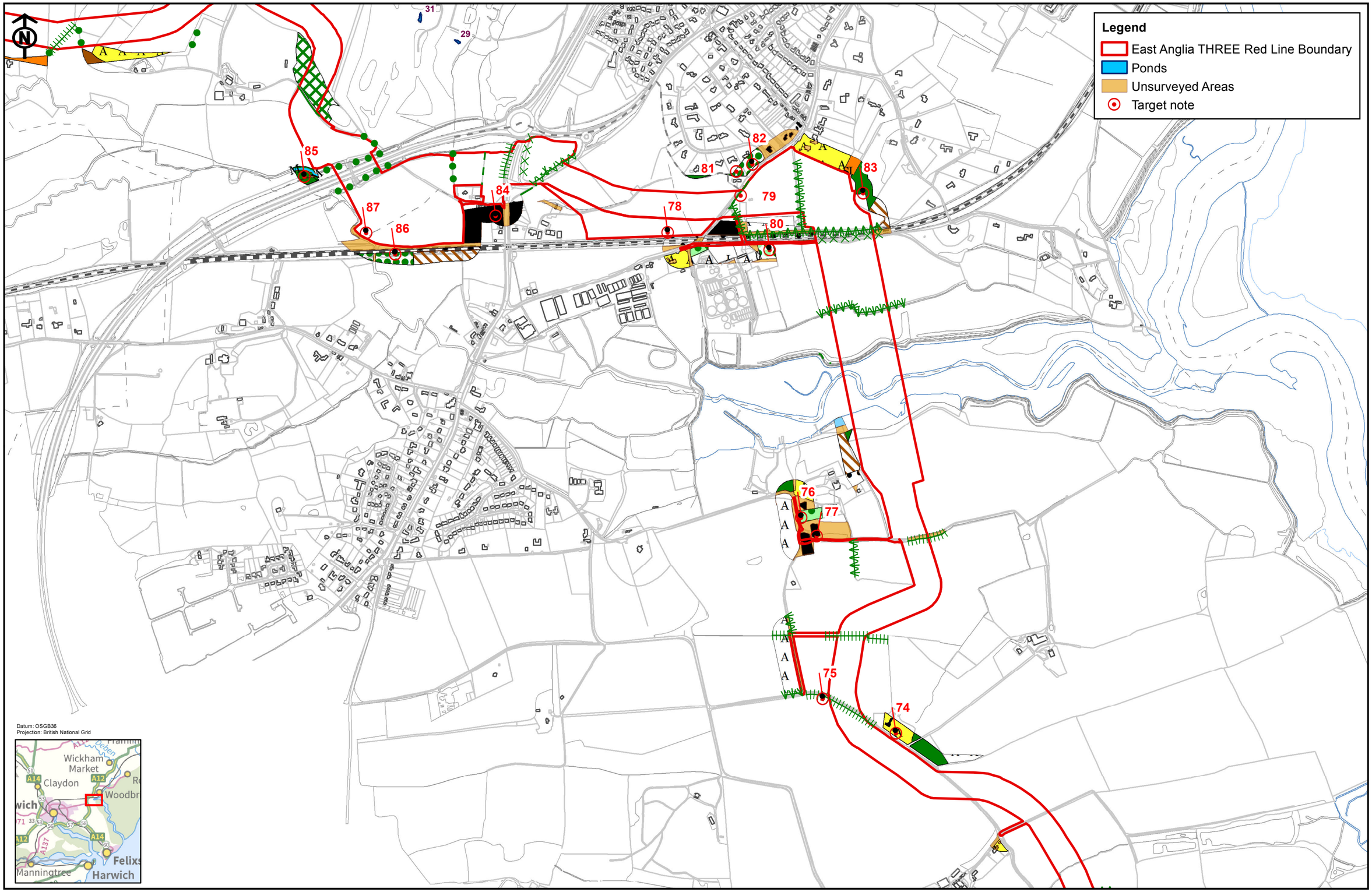

SCOTTISHPOWER RENEWABLES VATTENFALL

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01	01/08/14	JE	First issue

Original A3 Plot Scale 1:10,000

0 200 400 Meters

East Anglia Offshore Wind

East Anglia THREE Phase One Habitat Survey

Drg No	6115-530-PK-137
Rev	02
Date	20/03/2015
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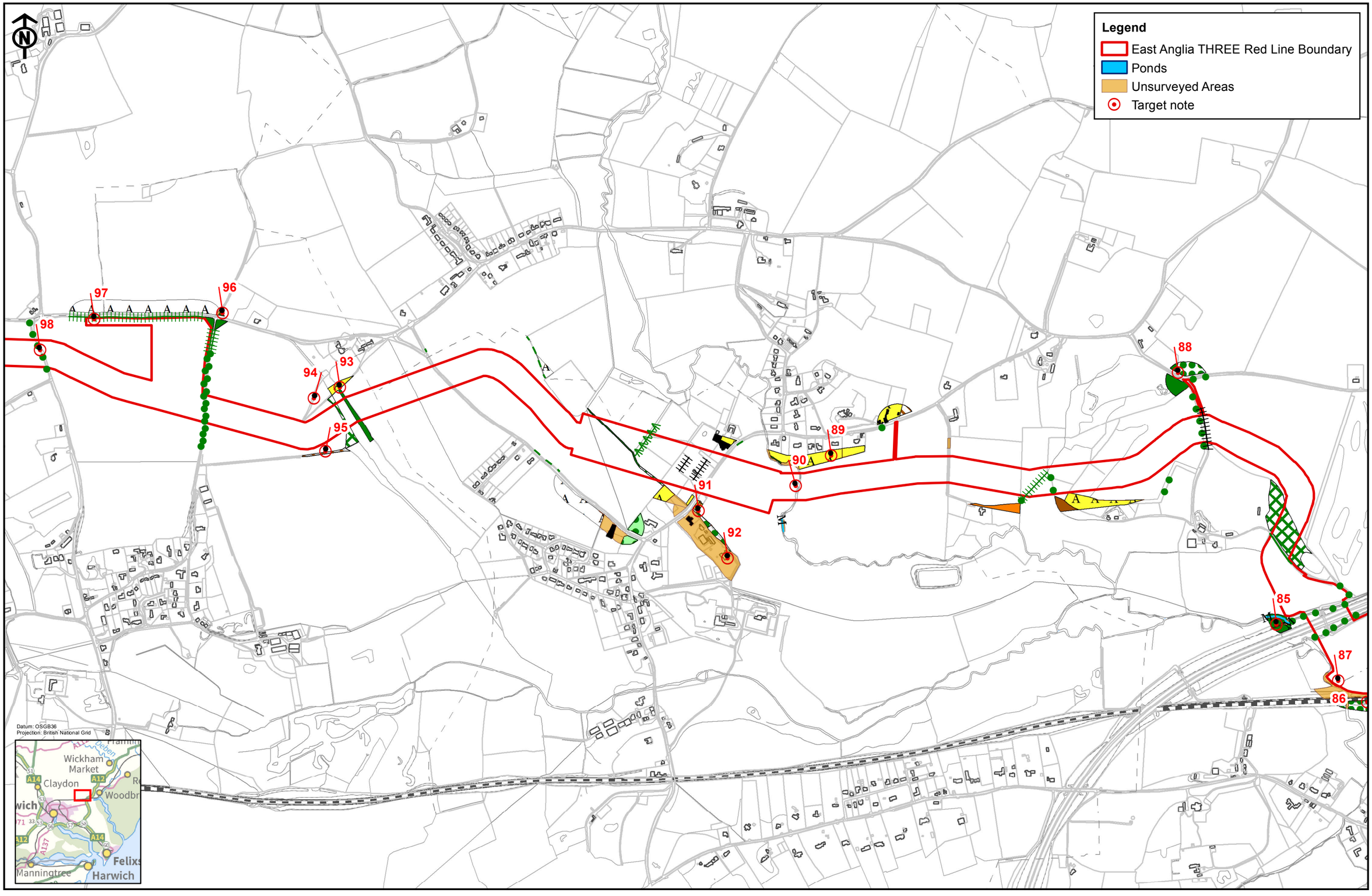

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Original A3
Plot Scale
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East Anglia Offshore Wind

East Anglia THREE Phase One Habitat Survey

Drg No	6115-530-PK-137
Rev	02
Date	20/03/2015
Layout	A3

Figure 4

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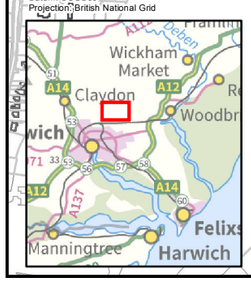
Legend

- East Anglia THREE Red Line Boundary
- Ponds
- Unsurveyed Areas
- Target note

101 102 100 99 103 43 41 178 98 111 110 109 108 105 104 107 106 49 48 50

Datum: OSGB36
Projection: British National Grid



620000

SCOTTISHPOWER RENEWABLES VATTENFALL

Rev	Date	By	Comment
02	20/03/15	JE	Second issue
01	01/08/14	JE	First issue

Original A3 Plot Scale 1:10,000

0 200 400 Meters

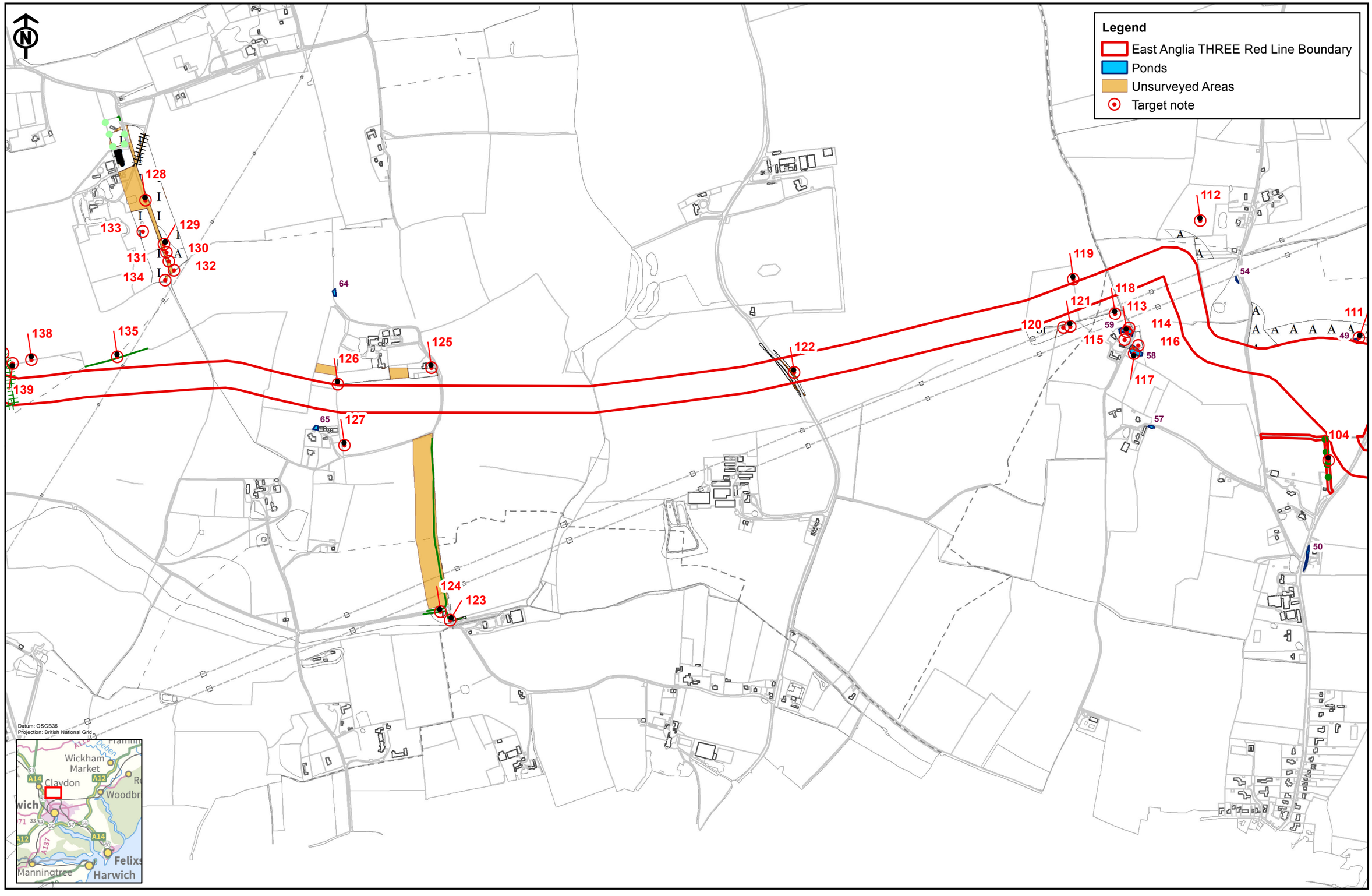
East Anglia Offshore Wind

East Anglia THREE Phase One Habitat Survey

Drg No	6115-530-PK-137
Rev	02
Date	20/03/2015
Layout	A3

Figure 4

Ref:



Rev	Date	By	Comment
02	20/03/15	JE	Second issue
01	01/08/14	JE	First issue

Original A3 Plot Scale 1:10,000

0 200 400 Meters

East Anglia Offshore Wind

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Drg No	6115-530-PK-137
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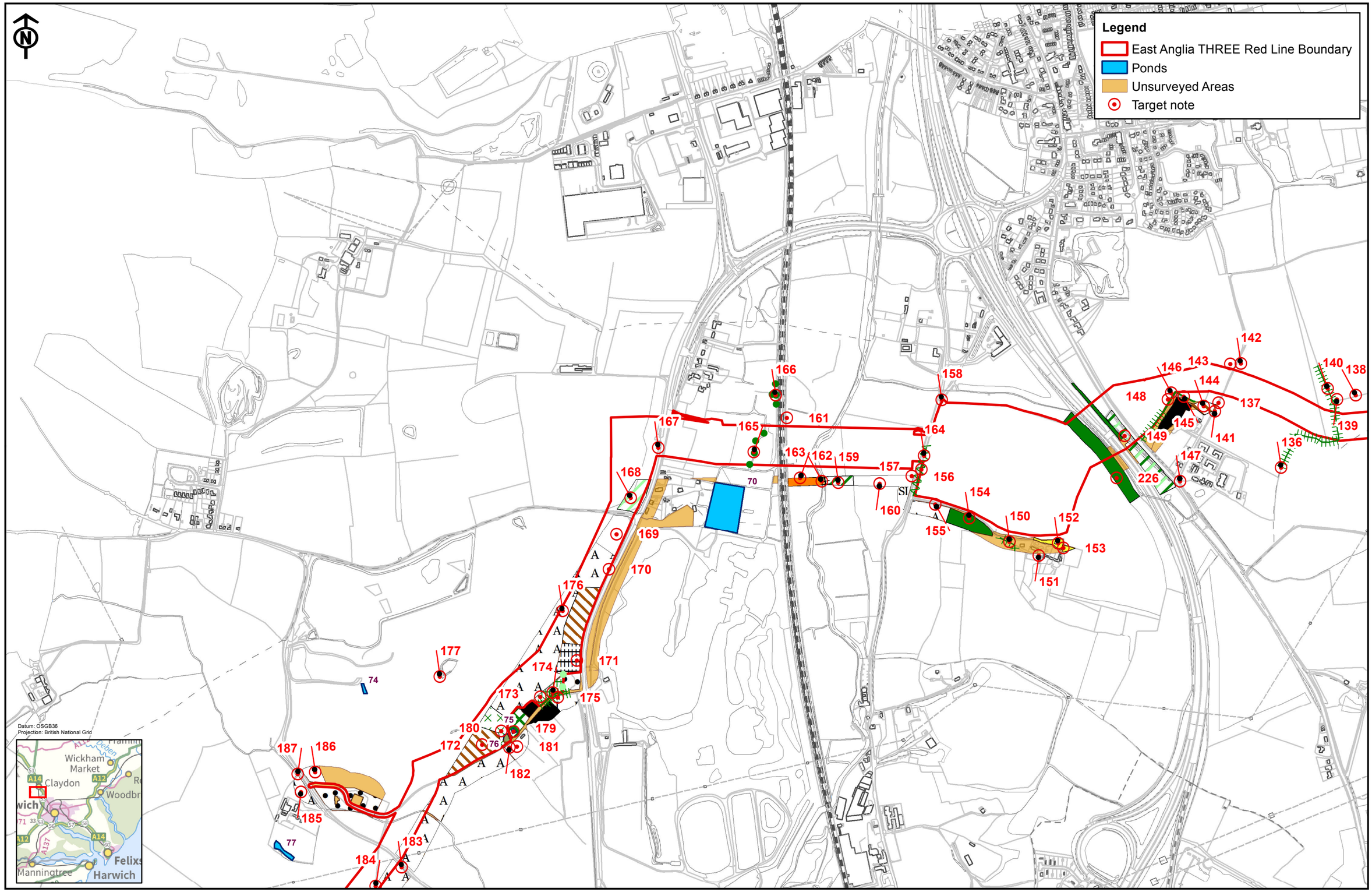
Figure 4

Ref:



Rev	Date	By	Comment
02	20/03/15	JE	Second issue
01	01/08/14	JE	First issue

Original A3
Plot Scale
1:10,000

0 200 400 Meters

East Anglia Offshore Wind

East Anglia THREE Phase One Habitat Survey

Drg No	6115-530-PK-137
Rev	02
Date	20/03/2015
Layout	A3

Figure 4

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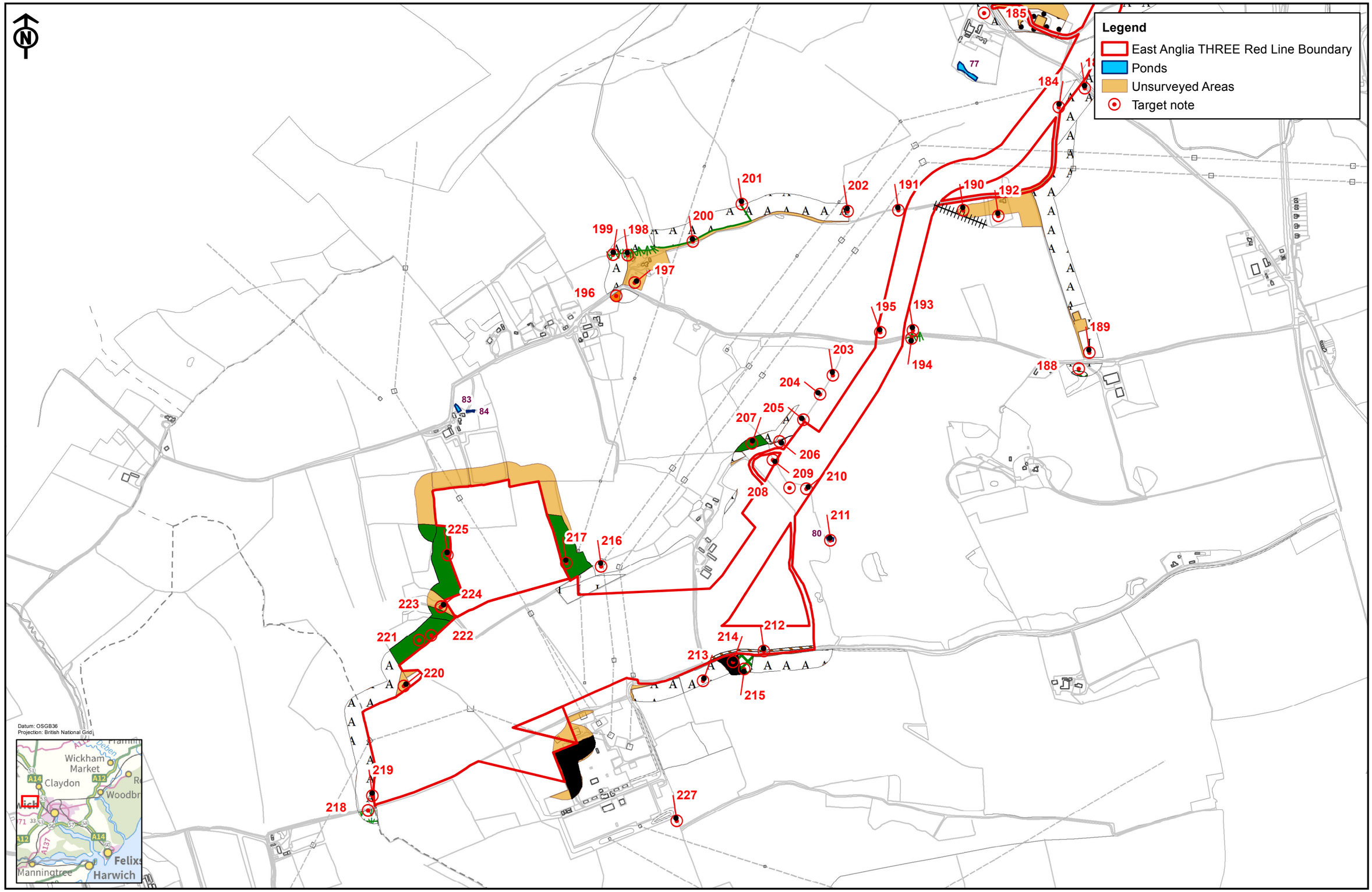


Rev	Date	By	Comment
02	20/03/15	JE	Second issue
01	01/08/14	JE	First issue

Original A3 Plot Scale 1:10,000

0 200 400 Meters

East Anglia Offshore Wind

East Anglia THREE Phase One Habitat Survey

Drg No	6115-530-PK-137
Rev	02
Date	20/03/2015
Layout	A3

Figure 4

Ref:

620000

240000

Legend

East Anglia THREE Red Line Boundary

Reptile potential habitat locations

Potential habitat

Bat potential habitat categories*

1*/Buildings-high

1

2

Datum: OSGB36
Projection: British National Grid

620000

SCOTTISHPOWER RENEWABLES VATTENFALL

Rev	Date	By	Comment
02	20/03/15	JE	First issue
01	01/08/14	JE	First issue

Original A3 Plot Scale 1:70,000

0 1 2 Kilometers

East Anglia Offshore Wind

East Anglia THREE Bat and Reptile location

*Categories based on the Bat Conservation Trust: Bat Surveys Good Practice Guidance 2nd edition (Hundt, 2012)

Drg No	6115-530-PK-148
Rev	02
Date	20/03/2014
Layout	A3

Figure 5

Ref:

APPENDIX B BADGER RESULTS (CONFIDENTIAL)

Introduction

1. The contents of 'Appendix B – Badger Results' are confidential and have been removed from this report.

APPENDIX C LEGISLATION

General note

1. This section briefly describes the information on the most relevant aspects of the legal protection afforded to habitats and species mentioned in this report. It is for information only and is not intended to be comprehensive or to replace specialised legal advice.

Conservation of Habitats and Species Regulations 2010 (as amended)

Habitats

2. The Regulations transpose the Council Directive 92/43/EEC the 'Habitats Directive' into national law (in respect of England and Wales) and requires the state to designate Special Areas of Conservation (SAC).

3. The Regulations require competent authorities to consider or review planning permission, applied for or granted, affecting a European site, and, subject to certain exceptions, restrict or revoke permission where the integrity of the site would be adversely affected.

Species

4. The Regulations make it an offence (subject to exceptions) to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2, or pick, collect, cut, uproot, destroy, or trade in the plants listed in Schedule 4.

Wildlife and Countryside Act 1981 (as amended)

Habitats

5. This Act makes provision for the notification and confirmation of SSSIs. The Act also makes it an offence to intentionally or recklessly destroy or damage any flora, fauna, geological or physiographical features by which a site of scientific interest is of special interest; or to intentionally or recklessly disturb any fauna of the site.

Species

6. This Act makes it an offence (with exception to species listed in Schedule 2 and with additional penalties for species listed in Schedule 1) to intentionally:

- kill, injure, or take any wild bird; take, damage or destroy the nest of any wild bird while that nest is in use or being built; and take or destroy an egg of any wild bird;
- With regards to Schedule 1 species of birds, it is an offence to disturb these species while it is building a nest or is in, on or near a nest containing eggs or young; or to disturb dependent young of such a bird;
- This Act makes it an offence to intentionally kill, injure or take any animal listed in Schedule 5 of the Act and protects occupied and unoccupied places used for shelter or protection;

- This Act makes it an offence (subject to exceptions) to intentionally) pick, uproot or destroy any wild plant listed in Schedule 8 of the Act; and
- This Act makes it a criminal offence to plant or otherwise cause to grow in the wild any non-native, invasive species listed under Schedule 9 of the Act or any species which is not ordinarily resident to Great Britain in a wild state.

Natural Environment and Rural Communities Act 2006

7. Section 41 of the Act requires the Secretary of State to compile a list of habitats and species of principal importance for the conservation of biodiversity in England.

8. Decision makers of public bodies, in the execution of their duties, must have regard to the conservation of biodiversity in England, and the list is intended to guide them.

Protection of Badgers Act 1992

9. The Act makes it an offence to:

- Willfully capture, kill or take a badger;
- Intentionally or recklessly interfere with a badger sett by damaging, destroying, obstructing, causing dog a dog to enter a sett, disturbing an occupied sett.

The Hedgerow Regulations 1997

10. The Regulations make it an offence to remove or destroy certain hedgerows without permission from the local planning authority and the local planning authority is the enforcement body for such offences.

APPENDIX D TARGET NOTES

These target notes should be read in conjunction with Appendix A, Figures 4.1 – 4.11. *NB Badger records have been removed from this table. Please refer to* Appendix F.

Target Note (TN) Reference	Comment
1	Species-poor intact hedgerow with hornbeam, a dry ditch, bindweed, breeding bird potential
2	Arable fields
3	Species-poor intact hedgerow adjacent to dry ditch, with breeding bird potential, one semi mature trees (ash) low-negligible bat potential
4	Mixed semi-natural woodland, species: hawthorn, ash, common oak, bramble, elder, yew, scots pine. Ground flora: common nettle, *Poa trivialis*, herb robert, goose grass, bindweed. Low-med bat potential, breeding bird potential
5	Veteran black poplar
6	Fen: *Phragmatis australis*, rape, pondweed
7	Building with loose tiles, gaps beneath. Low-med bat potential, also potential foraging corridors nearby, Lleylandii nearby.
8	Species-rich hedgerow with trees, some mature trees. Mature oak with low bat potential
9	Species-poor intact hedgerow, alder and unidentified species
10	Mature wych elm with cracks and ivy, medium bat potential
11	Mixed plantation woodland, with beech, apple, ash, oak, larch, ivy, bramble, *brachypodium*, cow parsley
12	Species-poor hedgerow with trees
13	Scrub, wych elm, blackthorn
14	Marginal vegetation alongside of dry ditch, flora: ribwort, rapeseed, cow parsley, *Phragmatis australis*, globe thistle, unidentified, large leafed dock
15	Semi-mature willows with low breading birds potential
16	Tall ruderal with marginal vegetation alongside of dry ditch, flora: ribwort, rapeseed, cow parsley, *Phragmatis australis*, globe thistle, large leafed dock, common nettle
17	Coniferous plantation. Lodge pole Pine. Bare ground- reptile basking ground (poor surrounding habitat, low potential ivy), cotoneaster
18	Arable fields **no access**
19	Mixed plantation woodland immature (low habitat potential, breeding bird potential), ash, larch, beech, bracken, common nettle, bramble, common oak
20	Mature, ivy clad trees in hedge row (oak) , low bat potential
21	House with loose tiles but no staining from droppings, low bat potential
22	Mature trees with ivy low/medium bat potential
23	Species-poor hedgerow
24	Arable (wheat, rapeseed)
25	3 houses with low bat potential, swallow nests under coving, tree of heaven in garden - access plot

Target Note (TN) Reference	Comment
26	Tall ruderal species: red clover, large leaf dock, blue sow thistle, *brachypodium*, common poppy, unidentified grasses from 23/06, ribwort plantain, camomile, unidentified 'mustard', ribbed melilot
27	Mature/semi mature oak trees, low bat potential, breeding bird potential
28	Unimproved grass land 5*unidentified grasses, marsh thistle
29	Inundation Vegetation with mature birch tree, *Phragmatis australis* dominated
30	Drain with no signs of voles and low bat potential, crack willow, semi-mature hedgerow, breeding bird potential
31	Mixed semi-natural woodland, species: hawthorn, ash, elder, sweet chestnut, oak, lodgepole pine (green cones). Ground flora: nettle, *Poa trivialis*, herb robert, goose grass, bindweed. Low-med bat potential, breeding bird potential, potential badger latrine (no further signs)
32	Building with low bat potential
33	Mature ivy clad oak, low bat potential
34	Relic/outlier sett with 5 entrances no new excavation or hairs found
35	Barn/farm building low/medium bat potential no signs found
36	Farm (livestock) buildings - barns
37	Water body dense bankside vegetation no macrophyte cover fish carp, roach 20x15 meters, no water fowl, never dries, moderate quality with no shade
38	Farm buildings low/medium bat potential
39	Isolated mature trees (along road side) low/medium bat potential
40	Amenity grassland by houses
41	Buildings: old barn, new homes, swallows nesting in coving, church with low bat potential, mature sycamore - low bat potential
42	Semi-natural deciduous woodland species: spindle, sycamore, elder, oak, ash, holly, hazel, lime. Ground flora: bluebells, common nettles
43	Water body with poor water vole habitat potential
44	Scattered mature willow and oak surrounding unimproved grassland and fen
45	Old barn with gaps under roof tiles. Low/ medium potential
46	Log pile - medium reptile potential
47	Cottages with gaps under tiles. Low/medium bat potential
48	Artificial water body. Seagulls and migratory birds seen.
49	Mature scattered trees (private garden) low bat potential. Oak, holm oak
50	House and barn with gaps in coving and stains below. Bird droppings and eggshell on ground, not likely to be bat roost therefore low/medium bat potential
51	Mature ivy clad oak low/medium bat potential
52	Species-rich hedgerow with trees species: plum, oak, hawthorn, holly, field maple, elm. Breeding bird potential
53	Plantation broadleaved species: oak, sycamore, sweet chestnut, cherry, birch
54	Established bamboo plant, Indian bean tree
55	Species-rich hedgerow with trees mature ivy clad low/medium bat potential

Target Note (TN) Reference	Comment
56	Tall ruderal: large leafed dock, thistle, Yorkshire fog, white clover, bindweed, unidentified grasses, red campion, creeping buttercup, *Deschampsia cespitosa*
57	Ditch - flowing water but the banks are too shallow for water vole
58	Veteran oak trees in mature semi natural woodland
59	Potential track potential fox latrine (heavy droppings, no smell)
60	Transition from defunct hedgerow to hedgerow with trees
61	Two mature oaks in field margin, ivy clad low/medium bat potential - access at Heath Farm. No clear track used for cultivation.
62	Potential outlier sett unused fresh excavation, rabbit droppings in entrance, no hairs (could not visit south side of hedge - spraying in field)
63	Mature scattered oaks veteran trees low bat potential
64	Burrows found, no hairs or fresh excavation found. Unlikely to be badger NB: couldn't access Welham land to see pit/buildings
65	Semi-mature woodland with gorse and oak
66	Hedgerow with mature trees with ivy low/medium bat potential species: wych elm, holly, oak, gorse
67	Gaps under asbestos coving low/medium bat potential rock/debris pile reptile shelter
68	Species-rich intact hedgerow
69	Buddleia sp. Grid reference taken 20 m south of buddleia, tree of heaven
70	Buildings with scattered trees. Birch ,tree of heaven, Lleylandii, willow, amenity grass land
71	Mature ivy clad oak low/medium bat potential in hedgerow
72	Mature ivy clad oak low/medium bat potential in hedgerow --access at Howes cottage farm.
73	Water body 23, anecdotal evidence of being dry since 1950's
74	Building including cottages and out buildings low bat potential
75	Scattered veteran oaks along hedgerow
76	Parade of mature lime trees
77	historic buildings with gaps in tiles and coving low/medium bat potential some nearby foraging habitat
78	Low bat potential under and around rail bridge, ivy covered birch
79	Mature oak with ivy within species-rich hedgerow
80	Predominantly mature conifer sp. (large brown cones clustered in groups around the stem)
81	Scattered trees (mature). Tree of heaven
82	Buddleia in front garden.
83	Tree of heaven spread along sugar beet field edge, on edge of broadleaved woodland. 10+ individuals, immature
84	Concrete debris piles, anecdotal evidence from Mr Baker of slow worms in area. Potential reptile habitat. Potential low-med bat habitat coving on outbuildings.
85	Wet woodland, mature crack willow, alder, sycamore

Target Note (TN) Reference	Comment
86	Brick railway bridge with watercourse adjacent, steep-sided banks with shelter, and in-channel vegetation
87	Large rabbit warren
88	Mature oak and sycamore on edge of field, ivy-clad sycamore and oak
89	Mature oak with some holes
90	Steep sided banks with some cover, slow moving watercourse, no in-channel vegetation. Sub optimal for water vole. 2.5m wide.
91	Mature horse chestnut tree, lime, conifer, mixed scattered. Veteran ivy-clad low-med bat potential.
92	Farm buildings, debris pile and rock piles. Potential reptile basking habitat
93	Large mature ash tree with 2 small holes. Low-med bat roost potential.
94	Drain almost dry, within scrub
95	No ditch/watercourse visible. No track either.
96	Ivy-clad oak (mature) with low-med bat roost potential.
97	2x Ivy-clad oak (mature) with low-med bat roost potential.
98	Intact species-rich hedgerow
99	Buddleia in middle of tall ruderal on top of suspected landfill.
100	Large pile of debris, low-med reptile basking habitat
101	Barn/buildings with holes near roof, low-med bat roost potential.
102	Broadleaved plantation avenue
103	Outlier badger sett found, likely rabbit hole, no badger hair found, narrow and not d-shaped. RSK badger sett 16
104	Line of trees with mature sycamore. Considered to have low bat potential, smooth trunk, however upper branches cannot be seen.
105	Golf course
106	Defunct species-rich hedgerow with mature field maple, sessile oak, blackthorn, fruit tree sp., hawthorn, wych elm, hazel, ivy, ground flora: common nettle, cleavers, common sorrel, false oat grass, couch sp., unscented mayweed, lesser burdock, broadleaved dock, smooth sow thistle, red dead nettle, nipplewort, scarlet pimpernel, c thistle
107	Pond in between species rich defunct hedgerow. 5 x 10m, 0.5m deep. No fish/ducks/waterfowl.
108	Hedgerow, intact Species-poor. With field maple, ivy, blackthorn, hawthorn, bramble, ivy, cleavers, common nettle, ground ivy, red dead nettle, chickweed.
109	Group of mature trees, no access. Unable to assess bat potential as only dense canopy can be seen.
110	Fenced over area with short sward. Appear to be used for piling timber, bricks and burning vegetation.
111	Hawthorn, elder, blackthorn, wych elm, ground flora: red dead nettle, common nettle, soft brome, cocksfoot, brome sp.

Target Note (TN) Reference	Comment
112	Limited access.
113	Standing water, approx. 50mx20m, approx. <1m deep, moorhen observed, surrounded by mature trees, scrub and tall ruderal, grassland vegetation including mature ash, oak sp., field maple, hawthorn, ivy, ground flora: great willow herb, iris, smooth sow thistle, common sorrel, creeping buttercup, common nettle, greater plantain, water forget-me-not
114	Standing deadwood with numerous cracks and fissures, medium bat potential
115	Private garden
116	Chicken coop, surrounded by tall herbs.
117	Standing water 40m x 30m, depth estimated <1m goldfish observed, approx. 20x individuals. Water turbid, surrounded by mature trees including oak sp. And ash, hawthorn, willow, elm sp., ivy, ground flora: common nettle, lesser burdock, greater plantain, trees including ash with small hole/fissure. Low bat potential, mature oak also with small fissures, low bat potential, with water pump and mallard.
118	Private garden
119	Defunct hedgerow with trees, blackthorn, wych elm, sessile oak, sessile oak 616931 49301 with a couple of fissures high up the trunk, low bat potential. Ground flora: including common hogweed, false oat grass, soft brome, fescue sp. Common couch, field bindweed, cleaver, bramble, cut leaved cranesbill.
120	Poor semi improved grassland with Yorkshire fog, lesser trefoil, meadow grass *Poa annua*, common sorrel, common hogweed, rough meadow grass, meadow buttercup, cats-ear with meadow brown butterfly.
121	Hedge with trees, mature oak (negligible bat potential), field maple, blackthorn, bramble, elder, another semi-mature oak (negligible bat potential) intact. ground flora: common nettle, common hogweed
122	Grass verges, dominated by rank gravel including false oat grass, common couch, brome sp., common hogweed, common mallow and creeping cinquefoil, yarrow.
123	Species-poor intact hedge with dominant hawthorn
124	Species-poor intact overgrown hedge with dominant elm sp.
125	Private garden
126	Intact overgrown hedge, with mature field maple, ash (negligible bat potential) blackthorn, wych elm, rose, bramble, crab apple, hawthorn, elder, ground flora, common nettle, common sorrel, white bryony, hazel, dogwood, ivy, red dead nettle, self heal, daisy
127	Hedge, intact, overgrown with standing deadwood (negligible bat potential), mature elm with ivy (low bat potential), outside utility area with rubble, plant and equipment. Reptile potential
128	Overgrown, species-rich hedge with trees. Standards including ash and wych elm. Hedgerows, shrubs including wych elm, hawthorn, rose, field maple, ivy. Mature ash with ivy, low bat potential. Mature oak with ivy and large woodpecker hole. Medium bat potential.

Target Note (TN) Reference	Comment
129	Hedge with trees, overgrown, intact but gappy. Field maple, standing deadwood, wych elm, elder, rose, blackthorn, ground flora: common nettle, common hogweed, creeping thistle, buttercup sp., smooth meadow grain, false oat grass, cock's-foot, red dead nettle, common sorrel, broad-leaved dock, nipplewort, lesser burdock, snowberry, ground ivy, fog, hedge woundwort, creeping buttercup, cleavers, numerous trees with ivy and low bat potential.
130	Mature oak, few fissures and cracks, appearing shallow, low bat potential. Standing deadwood adjacent to road, with flaking bark. Medium bat potential.
131	Two mature oak with ivy, small cracks and splits, low - medium bat potential.
132	Intact hedge with trees. Standards including oak also field maple, blackthorn, elm, ground flora, nettle, lesser burdock, bramble, cut leaved cranes bill, common couch, brome spp.
133	Tree-limited access. Could have bat roost potential.
134	Standing deadwood with dead ivy. Numerous crevices. Medium bat potential.
135	Short hedgerow, overgrown section of hedgerow hedge with trees, intact but gappy with overgrown sections of mature elm. Some standards with crevices - low bat potential. Shorter section also with elm, alder and ivy, field maple, hawthorn. Standing deadwood at far west end of hedge with small fissures and flaking bark. low bat potential.
136	Species-poor intact hedgerow with elm, elder, ivy and white bryony.
137	Overgrown hedgerow with trees. Standards including sycamore, elm, shrubs including elm also bramble. Ground flora: common nettle, rank grasses e.g. false oat grass. Ivy clad elm with low-med bat potential, standing deadwood present with negligible bat potential
138	Possible entrance, large amounts of spoil. Small hair found, not confident. Entrance narrows to ~15cm wide. Possibly disused entrance of main sett. Sett 18
139	Possible outlier. Under dense scrub and fallen tree and unable to undertake close inspection.
140	Potential outlier under dense bramble.
141	Species-rich hedge including oak, hawthorn, field maple, dogwood, elder, ground flora: agrimony, creeping cinquefoil, ground ivy, bramble, ribwort plantain, black knapweed, white campion, red dead nettle
142	No boundary, edge of arable field
143	No boundary, edge of headland of arable field
144	Tall ruderal with dominant hemlock and frequent common nettle, occasional common mallow
145	Overgrown intact hedge with field maple, elm, white bryony, honeysuckle, ground flora including rank grasses, weld mullein, smooth sow thistle, with semi-mature trees clad in ivy, low bat potential

Target Note (TN) Reference	Comment
146	Overgrown hedge with elm, elder, ivy, rose, good for foraging and commuting bats. Old elm with ivy and crevices - medium bat potential. Other trees, gap with group of ivy clad semi-mature elm with low bat potential. Ground flora of common nettle, lesser burdock, brome sp., soft brome
147	No boundary (gap in hedgerow to north-west)
149	Mixed plantation woodland. Canopy-dominant elm with frequent sycamore, occasional pine sp., oak sp., understorey including hawthorn, elder, ground flora: including bramble, c mallow, false oat grass, cow parsley, red dead nettle.
150	Beech hedge with beech standards
151	Group of buildings, private residence including a number of buildings with old brickwork and clay tiles. High bat potential
152	Overgrown garden
153	Horse paddock/walking area
154	Semi-natural broadleaved woodland. Canopy: c. lime, beech, field maples, sycamore, oak, understorey: elder, hawthorn, elm with large mature trees (2803) and large mature beech with broken limbs and ivy - medium bat potential, ivy, upper branches cannot be seen. Ground flora: including rough meadow grass, ground ivy, cocks-foot, red dead nettle, common nettle, hedge bindweed, red campion, broadleaved dock (woodland edge). Sparse ground flora with woodland. Abundant fallen deadwood and leaf litter.
155	species-rich hedge with trees - elm, field maple, sycamore, blackthorn, hawthorn, dogwood, ivy, honeysuckle, with mature oak (two individuals) clad with ivy and broken limbs, medium bat potential
156	Boundary is verge of tall ruderal vegetation
157	Boundary is grass verge with species typical of improved soils
158	Mature oak clad in ivy with broken limbs and splits, medium bat potential.
159	White willow plantation with tussocky ground flora of cocks-foot and russian comfrey. Reptile potential.
160	Grassland - Species-poor/poor semi improved with red fescue, creeping buttercup, c ragwort, white clover, cats ear, cocksfoot, cut leaved cranes bill, creeping thistle, spear thistle, tufted hair grass, timothy-grass, lesser trefoil, bristly ox-tongue, scarlet pimpernel, cudweed sp., unidentified plant, unidentified plant, vipers bugloss, white campion, nodding thistle and unidentified orchid
161	No boundary, tussocky grassland
162	No boundary, strip of tall ruderal vegetation
163	Poor semi-improved grassland. With wall barley, meadow foxtail, creeping soft grass, common couch, rough meadow grass, meadow brown butterfly, small tortoiseshell, cocks-foot, creeping buttercup, cut-leaved cranes-bill, reptile potential.
164	Defunct hedge with trees, mature alder, hawthorn and willow. Alder with small fissures and cracks. Low bat potential.

Target Note (TN) Reference	Comment
165	Line of trees with mature alder, standing deadwood. Number of standards with small fissures, cracks, broken limbs and ivy. Medium bat potential, good for foraging and commuting bats.
166	Watercourse, choked with vegetation - dominant common reed, bramble, common nettle, grey willow, stagnant, approx. 0.5m wide, <10cm deep. Considered unsuitable for otter and water vole.
167	Line of trees/overgrown/grown out hedge. Elm, with fence to the west of it/behind it. Grass verge with frequent orchid sp.
168	Cypress plantation, very sparse ground flora. Bounded by outgrown strip of broad-leaved woodland, with dominant elm and ivy.
169	Conservation headland with scented mayweed, common poppy, knot grass, willow herb sp. Great plantain, ribwort plantain, goosefoot sp., weld, welted thistle.
170	Hedge with trees, standards including elm, hawthorn, reptile potential.
171	Mature oak with broken limbs, small fissures and holes, with ivy, medium bat potential.
172	Outside utility areas with rubble, pallets, log piles, old materials, in a mosaic of tall ruderal herbs. Reptile potential.
173	Species-rich hedge with trees, with hawthorn, blackthorn, field maple, wayfaring tree, eared willow, bramble, ivy, holly, hazel, ground flora: including white campion, cow parsley, also guelder rose.
174	Line of tall ruderal vegetation
175	Private allotment/poly-tunnels
176	Arable land with high proportion of weeds including under thistle,
177	Two holes found, one disused, one appearing to be used by rabbit - sett 21
178	Parkland with scattered trees, mixed including large cypress sp., sweet chestnuts, weeping willow and mature oak sp., oak with ivy and numerous splits, cracks and holes, medium bat potential.
179	No water body observed, patch of grey willow present
180	Scrub adjacent tall ruderal vegetation, good invertebrate and reptile potential, bat foraging and commuting.
181	Private residence
180	Includes water body 76, small ponds, limited access due to dense willow which surrounds it. HSI unable to be undertaken.
182	Line of semi mature trees with fence with sessile oak, sycamore, hazel, willow, horse chestnut
183	Boundary or ~1.5m strip of tall ruderal vegetation
184	Boundaries on both sides of track of poor semi-improved grassland
185	Entrance to Sycamore Farm, with hardstanding, scattered scrub and trees. One semi-mature sycamore towards road with ivy. Low bat potential.
186	Private residence with scattered shrubs and trees

Target Note (TN) Reference	Comment
187	Watercourse approx. 1-1.5m wide, <20cm deep with steep vegetated banks, vegetation including dominant common nettle, frequent cow parsley, false oat grass, and red dead nettle. Shaded by sycamore trees, semi-mature - mature. Covered in ivy. Watercourse slow moving. Commuting potential for otter. Downstream watercourse more open with some emergent species e.g. yellow iris, but generally with species typical of improved soil. Low water vole potential.
188	Group of mature tree in improved grassland with common lime, limited access. Likely to have bat potential due to age.
189	Grassland dominated by black brome and tufted hair grass, occasional cocks-foot. Bordered by tall ruderal vegetation associated with improved soil including abundant common nettle, creeping thistle
190	Chicken coop, among improved grassland and scattered tall herbs, log piles also present. Reptile potential.
191	Boundary of tall ruderal vegetation.
192	Private garden / orchard with plum, pear, other fruit species
193	Boundary of tall ruderal vegetation.
194	Species-rich hedge with trees including rose, willow, hazel, field maple and hawthorn. Also ivy, elder, ground flora: creeping buttercup, common nettle, cow parsley and garlic mustard. Nesting bird observed.
195	Tree completed covered in ivy, bat potential
196	Semi-improved grassland appears neutral. Detailed species list not possible, as viewed from the road due to no access.
197	Private garden
198	Species-rich hedge with trees including hawthorn, rose sp., dogwood, eared willow, blackthorn, hazel, bramble, ivy and elm. Ground flora: with black knapweed, creeping cinquefoil, timothy, fescue sp., common hogweed, cocksfoot, perennial rye grass
199	Species-rich hedge with hawthorn, blackthorn, dogwood, elm and field maple. Ground flora including black knapweed, creping cinquefoil, c mallow and rank grasses.
201	Species-poor intact hedge with elm and blackthorn with dry ditch
202	Boundary of tall ruderal vegetation.
206	Strip of semi-natural broad leaved woodland approx. 20m across. Canopy including wych elm, sycamore and fallen deadwood present. Understorey of wych elm, blackthorn, appears to have grown out of old hedgerow. Ground flora: including dogs mercury, common nettle, sycamore saplings, willow herb sp., cleavers, rough meadow grass with ditch and embankment.
207	Broadleaved semi natural woodland, maybe continuation of Millers Wood. Canopy dominant sycamore, understorey also sycamore, hazel, elder, horse chestnut. Ground flora: common nettle, c. hogweed, red dead nettle, creeping buttercup, cocks foot, rough meadow grass, ground ivy.

Target Note (TN) Reference	Comment
211	No water body but may have been previously and dried out, filled with fallen deadwood, leaf litter, tall herbs including dominant, common nettle, elder, within Millers Wood
212	Boundary of tall ruderal vegetation of arable field
213	Species-rich hedge with field maple, elm, hawthorn, blackthorn and privet. Ground flora: with species typical of improved soils. Standards including oak, one with mature ivy and small splits and cracks, medium bat potential
214	Group of buildings and mast, couple of buildings with gaps unable to inspect closely. Low-med bat potential
215	Dense/scrub and scattered mature trees. Standards including oak and white willow, scrub including crab apple, blackthorn, plum. Ground flora including common nettle, cow parsley, white dead nettle, common hogweed. Viewed from the road as too dense to enter. At least one oak with medium bat potential.
217	Goberts Grove. Canopy of field maple, ash. Understorey: elder, hazel, field maple, elm, rose, blackthorn. Ground flora: common nettle, false wood brome, enchanters nightshade, cleavers, dogs mercury, broadleaved dock, cocksfoot, rough meadow grass
218	Species-rich hedge with trees, including blackthorn, hazel, dogwood, rose, damson/plum, elder and elm. Also honeysuckle with dry ditch.
219	Mature oak with numerous cracks, splits, broken limbs and central hole in trunk. High bat potential, possible barn owl sighted here in hedgerow adjacent.
220	Mosaic of tufted hair grass, and herbs including abundant honeysuckle, creeping thistle, bristly ox tongue, bramble
221	Fore Grove. Canopy-field maple, ash, wild cherry. Understorey: holly, elder, hazel, hawthorn, ivy. Ground flora-false wood brome, dogs mercury, rough meadow grass, nipplewort, cleavers, wood dock, rhododendron, tufted hair grass, primrose, enchanters nightshade.
225	Bushy Grove - similar in composition to Fore Grove, appearing more mature, with mature oak sp., in canopy, dominant. Sycamore succeeding with abundant deadwood, fallen and standing and high cover of leaf litter.
226	Viewed from the road adjacent to A-road. Appears to be plantation broadleaved woodland.

APPENDIX E PLATES

NB Badger records have been removed from this table. Please refer to Appendix B.

Habitats

Plate Reference	Plate
Plate 1: Arable field and species-poor intact hedgerow (TN1/TN2, *Appendix A, Figure 4*)	
Plate 2: Semi-mature ash with breeding bird potential; low-negligible bat potential (TN3, *Appendix A, Figure 4*)	
Plate 3: Mixed semi-natural broadleaved woodland (TN4, *Appendix A, Figure 4*)	

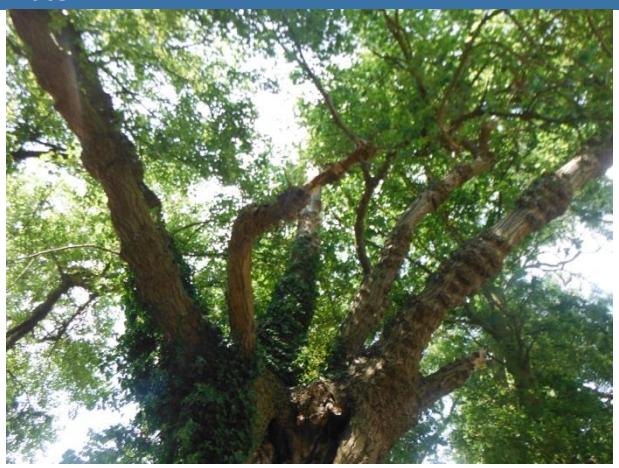
Plate Reference	Plate
Plate 4: Veteran black poplar (TN5, *Appendix A, Figure 4*)	
Plate 5: Fen (TN6, *Appendix A, Figure 4*)	
Plate 6: Building with gaps under tiles, low-medium bat potential. Lleylandii nearby, potential bat foraging corridors nearby (TN7, *Appendix A, Figure 4*)	

Plate Reference	Plate
Plate 7: Species-rich hedgerow with trees/mature oak, low bat potential (TN8, *Appendix A, Figure 4*)	
Plate 8: Mature wych elm, medium bat potential (TN10, *Appendix A, Figure 4*)	

Plate Reference	Plate
Plate 9: Semi-mature willows, low breeding bird potential (TN15, *Appendix A, Figure 4*)	
Plate 10: Bare ground – potential reptile basking habitat within coniferous plantation (TN17, *Appendix A, Figure 4*)	

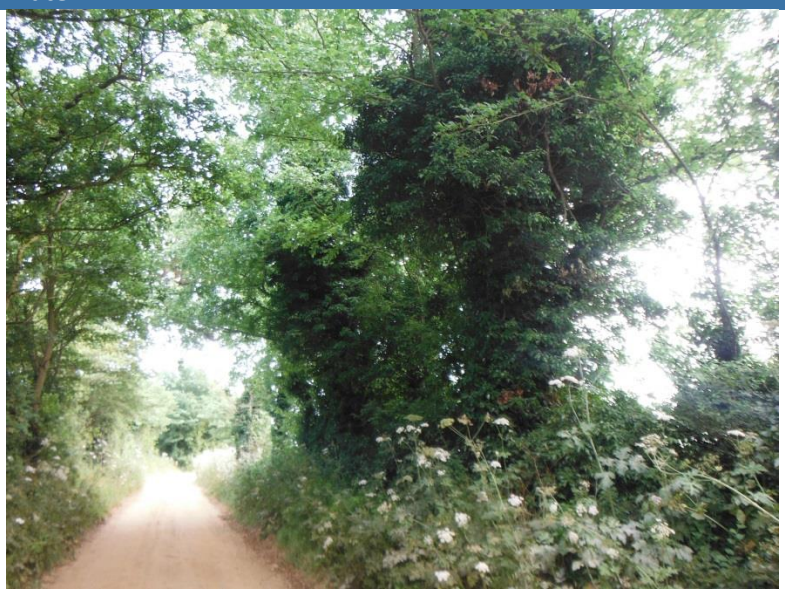
Plate Reference	Plate
Plate 11: Mature ivy-clad oak in hedgerow, low bat potential (TN20, *Appendix A, Figure 4*)	
Plate 12: House with loose tiles, low bat potential, swallow nests under coving, tree of heaven in garden (TN25, *Appendix A, Figure 4*)	

Plate Reference	Plate
Plate 13: Tall ruderal (TN26, *Appendix A, Figure 4*)	
Plate 14: Unimproved grassland (TN28, *Appendix A, Figure 4*)	

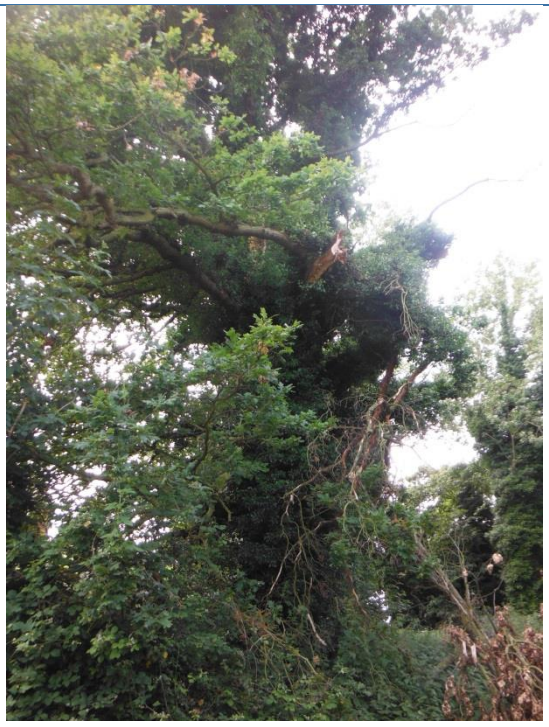
Plate Reference	Plate
Plate 15: Inundated vegetation (TN29, *Appendix A, Figure 4*)	
Plate 16: Mature oak with low-medium bat potential (TN31, *Appendix A, Figure 4*)	

Plate Reference	Plate
Plate 17: Barn/farm buildings, low-medium bat potential, no signs found (TN35, *Appendix A, Figure 4*)	
Plate 18: Barn/farm buildings, low-medium bat potential, no signs found (TN36, *Appendix A, Figure 4*)	

Plate Reference	Plate
Plate 19: Water body N of Sluice Farm, W of Square Wood (TN37, *Appendix A, Figure 4*)	
Plate 20: Isolated mature trees, low-medium bat potential (TN39, *Appendix A, Figure 4*)	

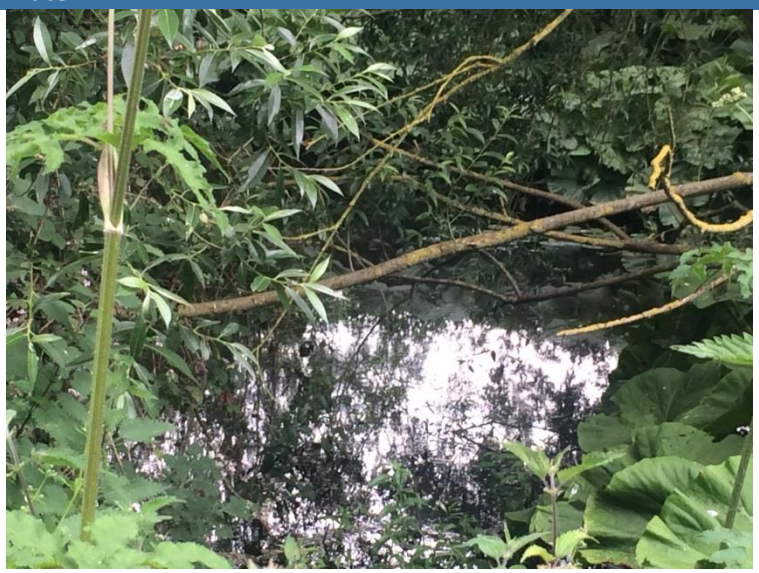
Plate Reference	Plate
Plate 21: Water body (TN43, *Appendix A, Figure 4*)	
Plate 22: Barn buildings with gaps under roof tiles (TN45, *Appendix A, Figure 4*)	

Plate Reference	Plate
Plate 23: Log pile (TN46, *Appendix A, Figure 4*)	
Plate 24: Cottage with gaps under roof tiles (TN47, *Appendix A, Figure 4*)	
Plate 25: Artificial lake (TN48, *Appendix A, Figure 4*)	

Plate Reference	Plate
Plate 26: House with gaps in coving, staining below (TN50, *Appendix A, Figure 4*)	
Plate 27: Barn with gaps under roof (TN50, *Appendix A, Figure 4*)	

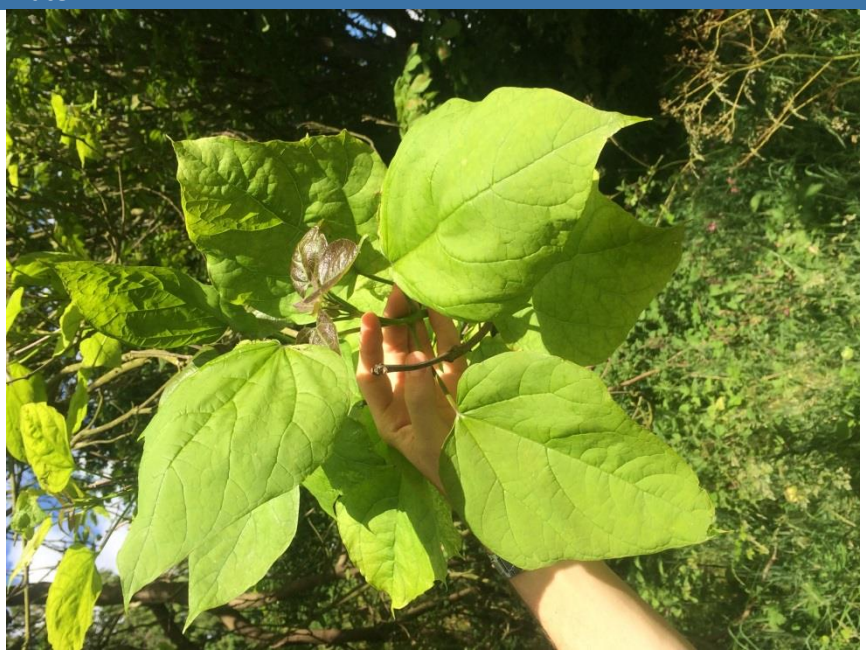
Plate Reference	Plate
Plate 28: Indian bean tree (TN54, *Appendix A, Figure 4*)	
Plate 29: Established bamboo plant (TN54, *Appendix A, Figure 4*)	

Plate Reference	Plate
Plate 30: Species-rich hedgerow with tree (TN55, *Appendix A, Figure 4*)	
Plate 31: Veteran oak tree in mature semi-natural woodland (TN58, *Appendix A, Figure 4*)	

Plate Reference	Plate
Plate 32: Two mature oak trees in field margin (TN61, *Appendix A, Figure 4*)	

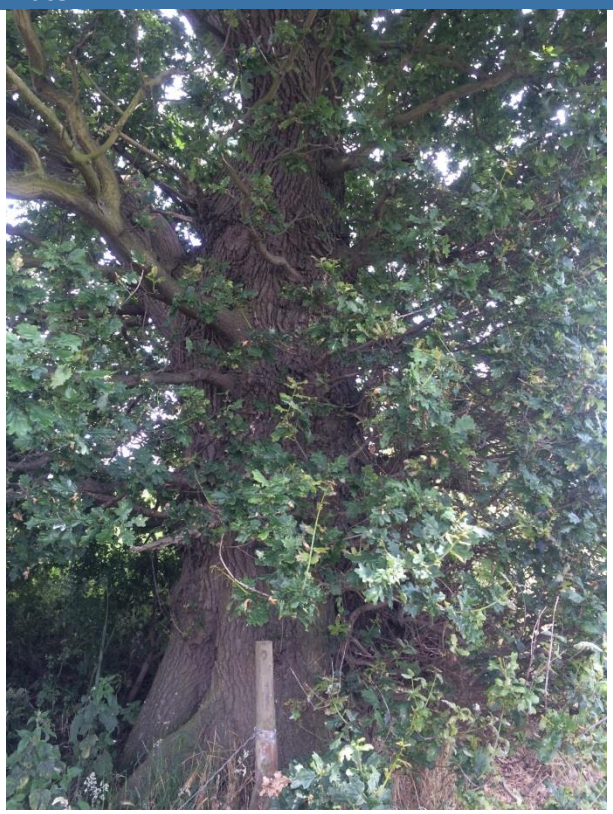
Plate Reference	Plate
Plate 33: Veteran scattered oak trees (TN63, *Appendix A, Figure 4*)	
Plate 34: Farm building with gaps under coving (TN67, *Appendix A, Figure 4*)	

Plate Reference	Plate
Plate 35: Debris piles (TN67, *Appendix A, Figure 4*)	
Plate 36: Buddleia sp. (TN69, *Appendix A, Figure 4*)	
Plate 37: Historic buildings with gaps in tiles and coving. (TN77, *Appendix A, Figure 4*)	 

Plate Reference	Plate
Plate 38: Low bat potential under rail bridge (TN78, *Appendix A, Figure 4*))	
Plate 39: Tree of heaven established along sugar beet field margin and broadleaved woodland (TN83, *Appendix A, Figure 4*)	

Plate Reference	Plate
Plate 40: Debris piles (TN84, *Appendix A, Figure 4*)	
Plate 41: Wet woodland (TN85, *Appendix A, Figure 4*)	

Plate Reference	Plate
Plate 42: Brick railway bridge with watercourse (TN86, *Appendix A, Figure 4*)	
Plate 43: Steep sided watercourse (TN90, *Appendix A, Figure 4*)	
Plate 44: Mature mixed scattered trees (TN91, *Appendix A, Figure 4*)	

Plate Reference	Plate
Plate 45: Farm buildings with debris piles (TN92, *Appendix A, Figure 4*)	
Plate 46: Debris pile (TN100, *Appendix A, Figure 4*)	

Plate Reference	Plate
Plate 47: Barn/buildings with holes near roof (TN101, *Appendix A, Figure 4*)	
Plate 48: Pond in between species-rich defunct hedgerow (TN107, *Appendix A, Figure 4*)	

Plate Reference	Plate
Plate 49: Standing water in private residence (TN117, *Appendix A, Figure 4*)	
Plate 50: Poor semi-improved grassland (TN120, *Appendix A, Figure 4*)	

Plate Reference	Plate
Plate 51: Grass verge (TN120, *Appendix A, Figure 4*)	
Plate 52: Overgrown hedgerow (TN146, *Appendix A, Figure 4*)	

Plate Reference	Plate
Plate 53: Mature ivy-clad oak (TN158, *Appendix A, Figure 4*)	
Plate 54: Defunct hedge with trees (TN164, *Appendix A, Figure 4*)	
Plate 55: Scrub adjacent to tall ruderal vegetation (TN180, *Appendix A, Figure 4*)	

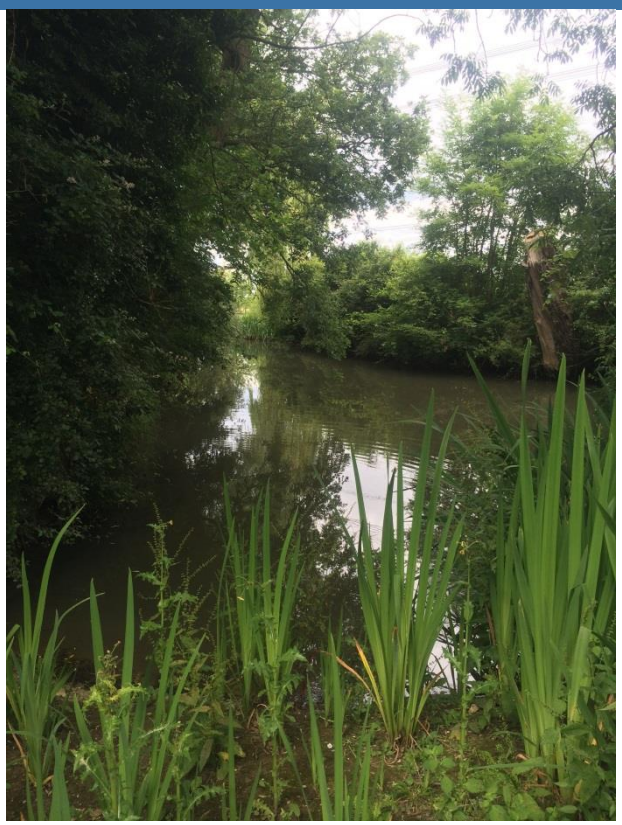
Plate Reference	Plate
Plate 56: Mature trees in improved grassland (TN188, *Appendix A, Figure 4*)	
Plate 57: Dried out water body (TN211, *Appendix A, Figure 4*)	

Plate Reference	Plate
Plate 58: Buildings and rubble piles (TN214, *Appendix A, Figure 4*)	

Water bodies

Water body Number	Plate
Plate 59: Water body 08	
Plate 60: Water body 48	

Water body Number	Plate
Plate 61: Water body 54	
Plate 62: Water body 58	

Water body Number	Plate
Plate 63: Water body 59	

APPENDIX F HABITAT SUITABILITY INDEX SCORING

Table F.7. Habitat Suitability Index Scoring*

HSI Index ---------- Water-body	1 Geographical location	2 Pond area	3 Permanence	4 Water quality	5 Shade	6 Water fowl	7 Fish	8 Pond count	9 Terrestrial habitat	10 Macrophytes	TOTAL HSI SCORE	GCN Suitability	Distance from RLB (m)
WB08	A 1 (TM30390 39333)	0.4	0.9	0.67	0.8	0.67	0.67	0.8	0.67	0.5	0.68	Average	126
WB48	A 1	0.1	0.5	0.67	0.3	1	1	0.9	0.33	0.5	0.50	Below average	10
WB54	A 1 (TM17393 49316)	0.05	0.5	0.33	0.4	1	1	1	0.33	0.3	0.45	Poor	98
WB58	A 1 (TB17097 49130)	1	1	0.33	1	0.67	0.33	1	0.67	0.3	0.65	Average	125
WB59	A 1 (TM17090 49159)	1	1	0.67	0.6	0.67	0.67	1	0.67	0.35	0.72	Good	91

*Based on the Habitat Suitability Index scoring system for GCN developed by Oldham *et al.* (2000). See paper for further information on scoring indices

APPENDIX G BAT ROOST POTENTIAL

Target Note reference	Description
3	Species-poor intact hedgerow adjacent to dry ditch, with breeding bird potential, one semi mature trees (ash) low-negligible bat potential
7	Building with loose tiles, gaps beneath. Low-med bat potential, also potential foraging corridors nearby, Lleylandii nearby.
8	Species-rich hedgerow with trees, some mature trees. Mature oak with low bat potential
10	Mature wych elm with cracks and ivy, medium bat potential
20	Mature, ivy clad trees in hedge row (oak) , low bat potential
21	House with loose tiles but no staining from droppings, low bat potential
22	Mature trees with ivy low/medium bat potential
25	3 houses with low bat potential, swallow nests under coving, tree of heaven in garden - access plot
32	Building with low bat potential
33	Mature ivy clad oak, low bat potential
35	Barn/farm building low/medium bat potential no signs found
38	Farm buildings low/medium bat potential
39	Isolated mature trees (along road side)low/medium bat potential
41	Buildings: old barn, new homes, swallows nesting in coving, church with low bat potential, mature sycamore - low bat potential
45	Old barn with gaps under roof tiles. Low/ medium potential
47	Cottages with gaps under tiles. Low/medium bat potential
49	Mature scattered trees (private garden) low bat potential. Oak, holm oak
50	House and barn with gaps in coving and stains below. Bird droppings and eggshell on ground, not likely to be bat roost therefore low/medium bat potential
51	Mature ivy clad oak low/medium bat potential
55	Species-rich hedgerow with trees mature ivy clad low/medium bat potential
61	Two mature oaks in field margin, ivy clad low/medium bat potential - access at Heath Farm. No clear track used for cultivation.
63	Mature scattered oaks veteran trees low bat potential
66	Hedgerow with mature trees with ivy low/medium bat potential species: wych elm, holly, oak, gorse
71	Mature ivy clad oak low/medium bat potential in hedgerow
72	Mature ivy clad oak low/medium bat potential in hedgerow --access at Howes cottage farm.
74	Building including cottages and out buildings low bat potential
77	historic buildings with gaps in tiles and coving low/medium bat potential some nearby foraging habitat
78	Low bat potential under and around rail bridge, ivy covered birch
91	Mature horse chestnut tree, lime, conifer, mixed scattered, not broadleaf (as GIS pen may show). Veteran ivy-clad low-med bat potential.
93	Large mature ash tree with 2 small holes. Low-med bat roost potential.
96	Ivy-clad oak (mature) with low-med bat roost potential.
97	2x Ivy-clad oak (mature) with low-med bat roost potential.
101	Barn/buildings with holes near roof, low-med bat roost potential.
104	Line of trees with mature sycamore. Considered to have low bat potential, smooth trunk, however upper branches cannot be seen.
114	Standing deadwood with numerous cracks and fissures, medium bat potential
128	Overgrown, species-rich hedge with trees. Standards including ash and wych elm. Hedgerows, shrubs including wych elm, hawthorn, rose, field maple, ivy. Mature ash with ivy, low bat potential. Mature oak with ivy and large woodpecker hole. Medium bat potential. 2772-2773

Target Note reference	Description
129	Hedge with trees, overgrown, intact but gappy. Field maple, standing deadwood, wych elm, elder, rose, blackthorn, ground flora: common nettle, common hogweed, c thistle, buttercup sp., smooth meadow grain, false oat grass, cocks foot, red dead nettle, c sorrel, broad-leaved dock, nipplewort, lesser burdock, snowberry, ground ivy, fog, hedge woundwort, creeping buttercup, cleavers, numerous trees with ivy and low bat potential.
130	Mature oak, few fissures and cracks, appearing shallow, low bat potential. Standing deadwood adjacent to road, with flaking bark. Medium bat potential.
131	Two mature oak with ivy, small cracks and splits, low - medium bat potential.
134	Standing deadwood with dead ivy. Numerous crevices. Medium bat potential.
135	Short hedgerow, overgrown section of hedgerow (2783) hedge with trees, intact but gappy with overgrown sections of mature elm. Some standards with crevices - low bat potential. Shorter section also with elm, alder and ivy, field maple, hawthorn. Standing deadwood at far west end of hedge with small fissures and flaking bark. low bat potential.
137	Overgrown hedgerow with trees. Standards including sycamore, elm, shrubs including elm also bramble. Ground flora: common nettle, rank grasses e.g. false oat grass. Ivy clad elm with low-med bat potential, standing deadwood present with negligible bat potential
145	Overgrown intact hedge with field maple, elm, white bryony, honeysuckle, ground flora including rank grasses, weld mullein, smooth sow thistle, with semi-mature trees clad in ivy, low bat potential
151	Group of buildings, private residence. including a number of buildings with old brickwork and clay tiles. High bat potential
154	Semi-natural broadleaved woodland. Canopy: c. lime, beech, field maples, sycamore, oak, understorey: elder, hawthorn, elm with large mature trees (2803) and large mature beech with broken limbs and ivy - medium bat potential, ivy, upper branches cannot be seen. Ground flora: including rough meadow grass, ground ivy, cocks-foot, red dead nettle, common nettle, hedge bindweed, red campion, broadleaved dock (woodland edge). Sparse ground flora with woodland. Abundant fallen deadwood and leaf litter.
155	species-rich hedge with trees - elm, field maple, sycamore, blackthorn, hawthorn, dogwood, ivy, honeysuckle, with mature oak (two individuals) clad with ivy and broken limbs, medium bat potential
158	Mature oak clad in ivy with broken limbs and splits, medium bat potential.
164	Defunct hedge with trees, mature alder, hawthorn and willow. Alder with small fissures and cracks. Low bat potential.
165	Line of trees with mature alder, standing deadwood. Number of standards with small fissures, cracks, broken limbs and ivy. Medium bat potential, good for foraging and commuting bats.
171	Mature oak with broken limbs, small fissures and holes, with ivy, medium bat potential.
178	Parkland with scattered trees, mixed including large cypress sp., sweet chestnuts, weeping willow and mature oak sp., oak with ivy and numerous splits, cracks and holes, medium bat potential.
185	Entrance to Sycamore Farm, with hardstanding, scattered scrub and trees. One semi-mature sycamore towards road with ivy. Low bat potential.
188	Group of mature tree in improved grassland with common lime, limited access. Likely to have bat potential due to age.
195	Tree completed covered in ivy, bat potential?
213	species-rich hedge with field maple, elm, hawthorn, blackthorn and privet. Ground flora: with species typical of improved soils. Standards including oak, one with mature ivy and small splits and cracks, medium bat potential
214	Group of buildings and mast, couple of buildings with gaps unable to inspect closely. Low-med bat potential

Target Note reference	Description
215	Dense/scrub and scattered mature trees. Standards including oak and white willow, scrub including crab apple, blackthorn, plum. Ground flora including common nettle, cow parsley, white dead nettle, common hogweed. Viewed from the road as too dense to enter. At least one oak with medium bat potential.
219	Mature oak with numerous cracks, splits, broken limbs and central hole in trunk. High bat potential, possible barn owl sighted here in hedgerow adjacent.

APPENDIX H TERRESTRIAL ECOLOGY SURVEY CALENDAR

ECOLOGICAL SURVEY	January	February	March	April	May	June	July	August	September	October	November	December
Badgers	Limited sett/bait surveys	Sett surveys & bait marking			Sett surveys & limited bait marking				Sett surveys			Limited sett/bait surveys
Bats	Hibernation roost inspection			Limited activity	Roost & activity surveys					Limited activity	Hibernation roosts	
Birds	Winter species		Breeding bird/migrant species		Breeding birds		Low activity		Migrant species		Winter species	
Great Crested Newts	Habitat assessment		Pond surveys between mid-March and early June				Habitat assessment only					
Reptiles	No surveys possible (reptiles hibernating)		Surveys possible (optimal: April & May)				Surveys possible		Optimal survey month	Limited activity	No surveys possible (reptiles hibernating)	

Key:

	Optimal survey period
	Sub-optimal survey period
	No surveys possible

Appendix 23.5a Ends Here