

Hornsea Project Four: Environmental Statement (ES)

PINS Document Reference: A6.3.12
APFP Regulation 5(2)(a)

Volume A6, Annex 3.12 – Bat Emergence and Re-Entry Survey Report Part A

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A6.3.12
Version A

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Glossary

Term	Definition
Commitment	<p>A term used interchangeably with mitigation and enhancement measures. The purpose of Commitments is to reduce and/or eliminate Likely Significant Effects (LSEs), in EIA terms.</p> <p>Primary (Design) or Tertiary (Inherent) are both embedded within the assessment at the relevant point in the EIA (e.g. at Scoping, Preliminary Environmental Information Report (PEIR) or ES).</p> <p>Secondary commitments are incorporated to reduce LSE to environmentally acceptable levels following initial assessment i.e. so that residual effects are acceptable.</p>
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Projects (NSIP).
EIA Directive	European Union Directive 85/337/EEC, as amended by Directives 97/11/EC, 2003/35/EC and 2009/31/EC and then codified by Directive 2011/92/EU of 13 December 2011 (as amended in 2014 by Directive 2014/52/EU).
EIA Regulations	Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
Energy balancing infrastructure (EBI)	The onshore substation includes energy balancing Infrastructure. These provide valuable services to the electrical grid, such as storing energy to meet periods of peak demand and improving overall reliability.
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Directive and EIA Regulations, including the publication of an Environmental Statement (ES).
Environmental Statement (ES)	A document reporting the findings of the EIA and produced in accordance with the EIA Directive as transposed into UK law by the EIA Regulations
Export cable corridor (ECC)	The specific corridor of seabed (seaward of Mean High Water Springs (MHWS)) and land (landward of MHWS) from the Hornsea Project Four array area to the Creyke Beck National Grid substation, within which the export cables will be located.
High Voltage Alternating Current (HVAC)	High voltage alternating current is the bulk transmission of electricity by alternating current (AC), whereby the flow of electric charge periodically reverses direction.
High Voltage Direct Current (HVDC)	High voltage direct current is the bulk transmission of electricity by direct current (DC), whereby the flow of electric charge is in one direction.
Hornsea Project Four Offshore Wind Farm	The term covers all elements of the project (i.e. both the offshore and onshore). Hornsea Four infrastructure will include offshore generating stations (wind turbines), electrical export cables to landfall, and connection to the electricity transmission network.. Hereafter referred to as Hornsea Four.
Landfall	The generic term applied to the entire landfall area between Mean Low Water Spring (MLWS) tide and the Transition Joint Bay (TJB) inclusive of all construction works, including the offshore and onshore ECC, intertidal working area and landfall compound. Where the offshore cables come ashore east of Fraisthorpe.

Term	Definition
National Grid Electricity Transmission (NGET) substation	The grid connection location for Hornsea Four at Creyke Beck.
Onshore substation (OnSS)	Comprises a compound containing the electrical components for transforming the power supplied from Hornsea Project Four to 400 kV and to adjust the power quality and power factor, as required to meet the UK Grid Code for supply to the National Grid. If a HVDC system is used the OnSS will also house equipment to convert the power from HVDC to HVAC.
Order Limits	The limits within which Hornsea Project Four (the 'authorised project') may be carried out.
Orsted Hornsea Project Four Ltd.	The Applicant for the proposed Hornsea Project Four Offshore Wind Farm Development Consent Order (DCO).
Planning Inspectorate (PINS)	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects (NSIPs).

Acronyms

Acronym	Definition
ACIEEM	Associate Member of the Chartered Institute of Ecology and Environmental Management
BCT	Bat Conservation Trust
C.Env	Chartered Environmentalist
CIEEM	Chartered Institute of Ecology and Environmental Management
C.WEM	Chartered Water and Environmental Manager
EBI	Energy Balancing Infrastructure
ECC	Export cable corridor
EcIA	Ecological Impact Assessment
EECW	Environmental and Ecological Clerk of Works
EP1HS	Extended Phase 1 Habitat Survey
ERYC	East Riding Yorkshire Council
ES	Environmental Statement
FRGS	Fellow of the Royal Geographical Society
IEMA	Institute of Environmental Management and Assessment
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
MCIWEM	Member of Chartered Institute for Water and Environmental Management
MEECW	Member of the Ecological and Environmental Clerk of Works
MHWS	Mean High Water Spring
MIEMA	Member of Institute of Environmental Management and Assessment
NE	Natural England
NERC	Natural Environment and Rural Communities
NEYEDC	North and East Yorkshire Data Centre
NGET	National Grid Electricity Transmission

Acronym	Definition
OnSS	Onshore substation
OS	Ordnance Survey
PRF	Potential Roost Feature
SoS	Secretary of State
UK BAP	UK Biodiversity Action Plan
WCA	Wildlife and Countryside Act

Units

Unit	Definition
cm	centimetre
km	kilometre
kV	kilovolt
m	metre

1 Introduction

1.1 Project background

- 1.1.1.1 Orsted Hornsea Project Four Limited (the 'Applicant') is proposing to develop Hornsea Project Four Offshore Wind Farm (hereafter 'Hornsea Four'). Hornsea Four will be located approximately 69 km offshore the East Riding of Yorkshire in the Southern North Sea and will be the fourth project to be developed in the former Hornsea Zone. Hornsea Four will include both offshore and onshore infrastructure including an offshore generating station (wind farm), export cables to landfall, and on to an onshore substation (OnSS) with energy balancing infrastructure (EBI), and connection to the electricity transmission network.
- 1.1.1.2 Royal HaskoningDHV was commissioned to undertake a suite of bat emergence/re-entry surveys of all features identified as part of the Extended Phase 1 Habitat Survey (EP1HS) ([Annex 3.1: Extended Phase 1 Habitat Survey Report](#) and [Annex 3.2: Extended Phase 1 Target Note Tables](#)) and assessed as providing high or moderate potential for supporting roosting bats within and up to a 50 m buffer around the onshore Hornsea Four Order Limits (i.e. the landfall, onshore export cable corridor (ECC), OnSS including EBI, and 400 kV National Grid Electricity Transmission (NGET) connection area).
- 1.1.1.3 This technical annex has been produced to characterise the baseline environment to inform and support the ecological impact assessment set out in [Volume A3, Chapter 3: Ecology and Nature Conservation](#) of the Hornsea Four Environmental Statement (ES).
- 1.1.1.4 Due to the amount of data collated during the Hornsea Four bat surveys, this technical report has been split into two parts:
- [Annex 3.12: Bat Emergence and Re-entry Survey Report Part A](#) (this document) – outlines the methodology, survey results, conclusions and mitigation; and
 - [Annex 3.13: Bat Emergence and Re-entry Survey Report Part B](#) – presents the full survey data, including timings for each survey, as well as detailed information on those features that were surveyed for the presence of roosting bats in 2019.
- 1.1.1.5 Bat static detector and bat activity transect surveys have also been undertaken for Hornsea Four, and the findings from these survey are provided in [Annex 3.8: Bat Static Detector Survey Report Part A](#); [Annex 3.9: Bat Static Detector Survey Report Part B](#); [Annex 3.12: Bat Emergence and Re-entry Survey Report Part A](#) and [Annex 3.13: Bat Emergence and Re-entry Survey Report Part B](#), respectively. For a full understanding of the results of the Hornsea Four bat surveys, all bat survey reports require consideration.

1.2 Aims

- 1.2.1.1 The aim of the bat emergence and re-entry survey was to determine the presence or likely absence of roosting bats within and up to 50 m of the onshore Hornsea Four Order Limits.

1.2.1.2 The purpose of this report is to present the findings of the 2019 Hornsea Four bat emergence/re-entry survey and to provide an initial understanding of the presence or likely absence of roosting bats within and up to 50 m of the onshore Hornsea Four Order Limits.

1.2.1.3 This report has been prepared following the guidelines as set out in the Chartered Institute of Ecology and Environmental Management’s (CIEEM) Guidelines on Ecological Report Writing (CIEEM 2017), and the survey reporting guidelines in the Bat Conservation Trust (BCT) Bat Surveys for Professional Ecologists (Collins 2016) and Bat Surveys: Good Practice Guidelines (2nd Edition) (Hundt 2012).

2 Legislation

2.1.1.1 **Table 1** summarises the relevant information regarding the legal protection afforded to bats. It should be noted that this is for information only and is not intended to be comprehensive or to replace specialised legal advice.

Table 1: Summary of key legislation and policy relevant to bats.

Legislation	Relevance
Wildlife and Countryside Act 1981 (as amended) (WCA 1981)	This Act makes it an offence to intentionally kill, injure or take any animal listed in schedule 5 of the Act. All bat species are listed on Schedule 5.
Natural Environment and Rural Communities Act 2006 (NERC 2006)	Section 41 of the Act requires the Secretary of State (SoS) to compile a list of habitats and species of principal importance for the conservation of biodiversity in England. 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. Natural England has compiled a list of species of Principal Importance. The following species are on this list: <ul style="list-style-type: none"> • Barbastelle <i>Barbastella barbastellus</i>; • Bechstein’s <i>Myotis bechsteinii</i>; • Noctule <i>Nyctalus noctule</i>; • Soprano pipistrelle <i>Pipistrellus pygmaeus</i>; • Brown long-eared <i>Plecotus auratus</i>; • Greater horseshoe <i>Rhinolophus ferrumequinum</i>; and • Lesser horseshoe <i>Rhinolophus hipposideros</i>
Conservation of Habitats and Species Regulations 2017 (as amended) (Conservation of Habitats and Species Regulations 2017)	Codifies the EU Directive 92/43/EEC (The Habitats Directive) into UK law, and provides legal protection for European Protected Species (EPS) and designated sites. All bat species are EPS.

Legislation	Relevance
Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019	Makes changes to the Conservation of Habitats and Species Regulations 2017 following the UK's exit from the European Union (EU).
Policy	Relevance
UK Post-2010 Biodiversity Framework (JNCC 2012)	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 priority habitats and species.

3 Methodology

3.1 Survey Area

- 3.1.1.1 The Hornsea Four bat emergence/re-entry survey area consisted of onshore Hornsea Four Order Limits, plus an additional 50 m buffer (see [Figure 1](#)).
- 3.1.1.2 The 50 m buffer was implemented to include any associated habitat and/or features immediately adjacent to the onshore Hornsea Four Order Limits, in line with industry standard survey guidance.

3.2 Survey Methodology

3.2.1 Desk study

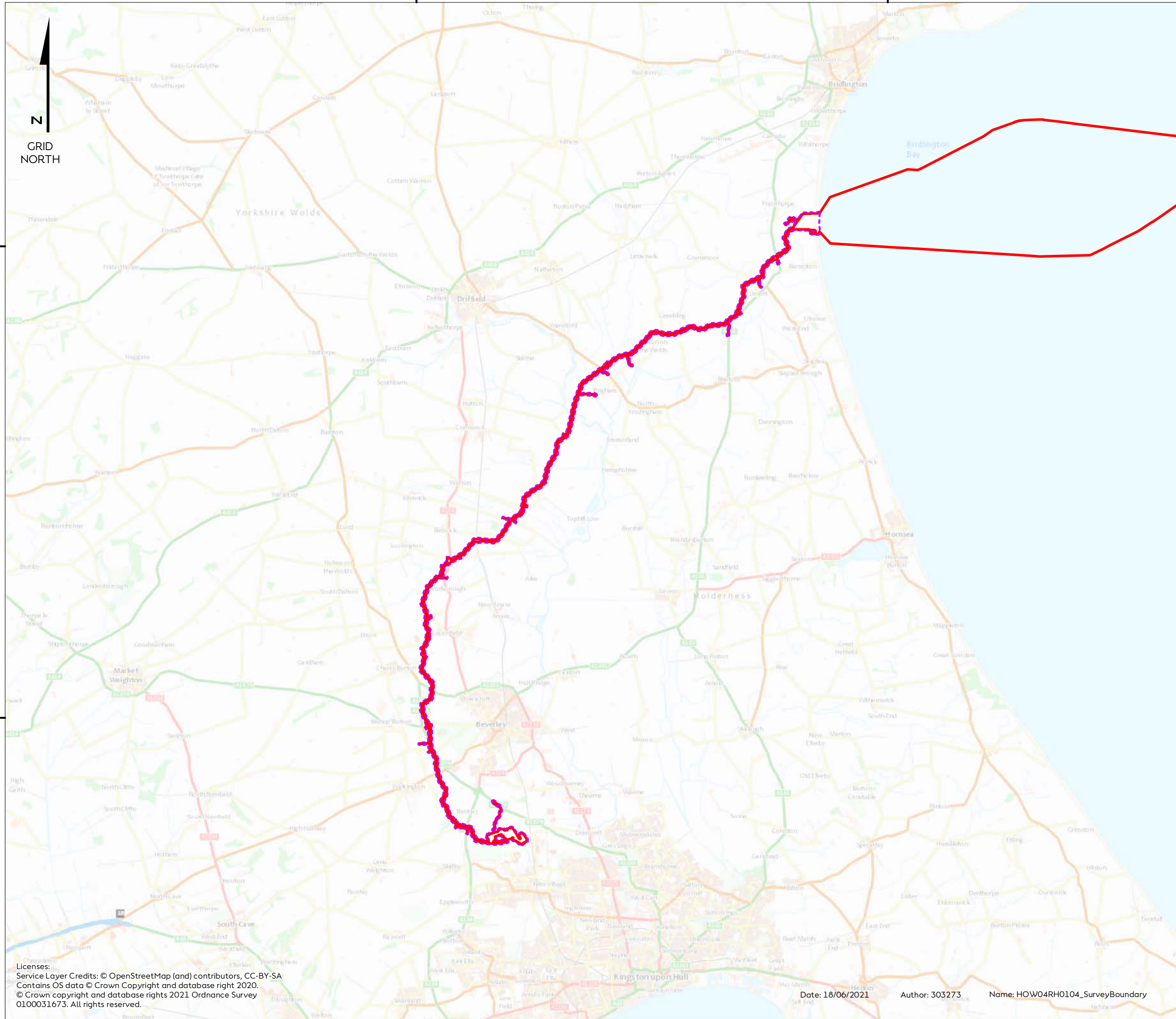
- 3.2.1.1 Biological data received from the North and East Yorkshire Data Centre (NEYEDC) initially obtained during the scoping stages of the project (NEYEDC 2018), and more recently updated in April 2020 was reviewed to identify the records of confirmed roosting bats within the Hornsea Four bat emergence/re-entry study area. There is no specific data for determining that desk study records of a certain age are no longer valid, and therefore each record has been considered on its own merits. As the biological records data was updated in April 2020 it is therefore considered to remain valid.
- 3.2.1.2 During the Updated Extended Phase 1 Habitat Survey (EP1HS), (see [Annex 3.1: Extended Phase 1 Habitat Survey Report](#) and [Annex 3.2: Extended Phase 1 Target Note Tables](#)) undertaken in February 2019, all features present within areas where landowner access had been granted (at the time this constituted approximately 50% of the Hornsea Four Order Limits) were identified and assessed from the ground for their suitability for roosting bats. For the remaining 50% of the Hornsea Four Order Limits where landowner access had not been granted at the time, a review of high resolution (~3 cm) aerial imagery was undertaken and a precautionary approach was undertaken to identify potential bat roost features (see [Section 3.3](#) for further details).
- 3.2.1.3 This approach was agreed with stakeholders (East Riding Yorkshire Council (ERYC), Natural England, Environment Agency (EA) and Yorkshire Wildlife Trust (YWT)) as part of the Hornsea Four onshore Ecology Evidence Plan Technical Panel meeting held on the 8 April 2019 (ON-

ECO-1.7). Agreement was subsequently obtained from Natural England via the Hornsea Four onshore ecology Evidence Plan Technical Panel meeting held on the 1 April 2020 (ON-ECO-1.16).

- 3.2.1.4 Subsequent to the updated EP1HS undertaken in February 2019, further land access was granted and a further EP1HS was undertaken in these areas. This resulted in 95 % EP1HS coverage at the time of the 2019 bat survey effort. See [Annex 3.1: Extended Phase 1 Habitat Survey Report](#) and [Annex 3.2: Extended Phase 1 Target Note Tables](#) for further details.
- 3.2.1.5 Ongoing consultation with landowners has been undertaken by The Applicant's land agents since 2019 and consequently access to the remaining 5 % unsurveyed in 2019 was granted in 2021. See [Annex 3.1: Extended Phase 1 Habitat Survey Report – 2021 Survey Addendum](#) and [Annex 3.2: Extended Phase 1 Target Note Tables – 2021 Survey Addendum](#) for further details.
- 3.2.1.6 At the time of the 2019 bat survey effort, a precautionary approach was undertaken when identifying any potential features from the aerial imagery whereby all potential features identified, were assessed as having a high potential for supporting roosting bats for the purposes of including them within the Hornsea Four bat emergence/re-entry survey effort. Then where landowner access was subsequently obtained, each of these features was subject to a preliminary daytime assessment. This preliminary daytime assessment either confirmed that the bat roost potential initially assigned was correct, or that the bat roost potential was reassigned to either moderate, low or negligible potential, as appropriate.
- 3.2.1.7 No changes or additional features were identified from the 2021 survey effort to those identified and surveyed in 2019.

500000

520000



Hornsea Four

Figure 1

Survey Area

- Order Limits
- Bat Survey Area



Coordinate system: British National Grid

Scale@A3: 1:160,000

0 2 4 8 Kilometres

0 1 2 4 Miles

REV	REMARK	DATE
	First Issue for DCO	18/06/2021

Title: Bat Survey Area
 Document no: HOW04RH0104
 Created by: AZ
 Checked by: CC
 Approved by: CS



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Date: 18/06/2021

Author: 303273

Name: HOW04RH0104_SurveyBoundary

500000

520000

460000

460000

440000

440000

3.2.2 Field survey

- 3.2.2.1 In accordance with BCT guidance (Collins 2016 and Hundt 2012), all features assessed during the updated Extended Phase 1 Habitat Survey (EP1HS) (see [Annex 3.1: Extended Phase 1 Habitat Survey Report](#) and [Annex 3.2: Extended Phase 1 Target Note Tables](#)) as providing moderate or high suitability for supporting roosting bats were subject to a survey(s) within the optimal survey period (May to September, inclusive). A total of 28 features (i.e. 27 trees and one building) were identified (as providing moderate or high potential to support roosting bats) and therefore formed the basis of the 2019 emergence/re-entry survey effort. Of those 28 features, 25 were assessed as providing moderate suitability and three features were assessed as providing high suitability for roosting bats.
- 3.2.2.2 For those 25 features assessed as providing moderate suitability for supporting roosting bats, two surveys were undertaken, consisting of one dusk emergence survey and one dawn re-entry survey. For those three features assessed as providing high suitability for supporting roosting bats, three surveys were undertaken, consisting of one dusk emergence, one dawn re-entry plus an additional dusk emergence or dawn re-entry survey.
- 3.2.2.3 In addition to the 28 features assessed as offering moderate or high potential for roosting bats, a total of 24 features (trees) were assessed as offering low suitability for roosting bats. In line with the industry guidance from the BCT (Collins 2016 and Hundt 2012), no survey is required on trees assessed as providing low suitability for roosting bats, however mitigation measures are required and these are outlined in [Volume F2.3: Outline Ecological Management Plan](#).
- 3.2.2.4 All features scoped in to the Hornsea Four bat emergence/re-entry survey are outlined in [Table 2](#) below and shown on [Figure 2](#) to [Figure 20](#) within this report. Full details of each feature alongside a photograph (where available) is presented in [Annex 3.13: Bat Emergence and Re-entry Survey Report Part B](#).

Table 2: Features scoped in to the 2019 bat roost emergence/re-entry survey effort.

Target Note (TN) Reference assigned to feature	Figure Reference	Bat Roost Suitability	Number of surveys required
TN032	Figure 6	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN042	Figure 6	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN046	Figure 6	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN047	Figure 6	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN071	Figure 7	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN164	Figure 11	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN166	Figure 12	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN170	Figure 12	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN263	Figure 17	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN264	Figure 17	Moderate	Two surveys; one dusk emergence and one dawn re-entry

Target Note (TN) Reference assigned to feature	Figure Reference	Bat Roost Suitability	Number of surveys required
TN265	Figure 17	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN273	Figure 18	High	Three surveys; one dusk emergence, one dawn re-entry plus one additional dusk/dawn survey
TN274	Figure 18	High	Three surveys; one dusk emergence, one dawn re-entry plus one additional dusk/dawn survey
TN279	Figure 18	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN305	Figure 19	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN314	Figure 19	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN315	Figure 19	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN318	Figure 19	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN321	Figure 19	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN322	Figure 19	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN323	Figure 19 / Figure 20	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN335	Figure 20	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN338	Figure 20	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN351	Figure 20	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN353	Figure 20	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN363	Figure 20	Moderate	Two surveys; one dusk emergence and one dawn re-entry
TN368	Figure 20	High	Three surveys; one dusk emergence, one dawn re-entry plus one additional dusk/dawn survey
TN381	Figure 20	Moderate	Two surveys; one dusk emergence and one dawn re-entry

3.2.2.5 All surveys were undertaken in accordance with the methodology outlined in the BCT guidelines (Collins 2016 and Hundt 2012). Each dusk emergence survey commenced 15 minutes before sunset and ceased 1.5 to 2 hours after sunset. Each dawn emergence survey commenced 1.5 to 2 hours before sunrise and ceased 15 minutes after sunrise. All surveys were undertaken within the optimal surveying period of May to September (inclusive), with a minimum gap of two weeks between each individual survey.

3.2.2.6 Handheld bat detectors and recording equipment were used to record any activity during each survey. A combination of the following equipment was used:

- Echo Meter Touch (EMT) 2;
- Bat Box Duet;
- Anabat SD2;
- Anabat Walkabout;
- Echo Meter Touch 2 Pro; and
- Echo Meter 3+.

3.2.3 Data analysis

3.2.3.1 Following each survey, the recordings were downloaded and assessed using the Wildlife Acoustics Kaleidoscope software in order to confirm and further identify the calls of any bat species recorded using the detectors during the survey. The Kaleidoscope software is an integrated suite of bat data tools that has been designed to convert bat recording files quickly, sort and categorise the bat data by species, verify survey findings as well as visually presenting the recorded data. It is the widely accepted software to use when analysing bat recordings. Weather conditions including temperature, wind speed, precipitation and humidity were recorded at the start and end of each survey.

3.2.4 Surveyors

3.2.4.1 The Hornsea Four bat emergence/re-entry surveys were led by Charlotte Clements, Royal HaskoningDHV ecologist with 5 years' experience of undertaking bat surveys. Charlotte is an Associate Member of the Chartered Institute of Ecology and Environmental Management (ACIEEM). Charlotte also undertook all the analysis of the data collected throughout the Hornsea Project Four bat survey effort.

3.2.4.2 Charlotte was supported by two bat licenced ecologists and the following additional surveyors throughout the Hornsea Four bat emergence/re-entry surveys:

- Paul Hiscocks, BSc. (Hons) MCIEEM MEECW, Natural England CL18 Bat Class Level 2 Licence (Licence No 2015-10145-CLS-CLS);
- Marten Hall, Fd.Sc MCIEEM MEECW, Natural England CL18 Bat Class Level 2 Licence (Licence No 2015-13847-CLS-CLS);
- Maria Walentek, BSc MSc, ACIEEM, C.Env, MIEMA;
- Ella Moseley, BSc (Hons), MCIWEM, C.WEM, FRGS; and
- Ashleigh Holmes, BSc (Hons).

3.3 Limitations

3.3.1.1 As set out in [Paragraph 3.2.1.1](#) and [Paragraph 3.2.1.2](#), all identified features were assessed for their potential to support roosting bats within the Hornsea Four bat emergence/re-entry study area.

3.3.1.2 Following the ground level assessment of the features identified using high resolution (~3 cm) aerial imagery, the survey team completed the requisite number of surveys required for each feature assessed as providing moderate or high potential to support roosting bats.

3.3.1.3 The weather conditions during the majority of the survey period were considered optimal for undertaking bat surveys. However, a period of colder than average weather was experienced during some of the surveys undertaken in September ([Table 3](#)). Despite this period of colder weather, bat activity was still recorded within the area surrounding the surveyed features on those occasions. Furthermore, this brief period of colder weather was only experienced on one of the two surveys undertaken on a particular feature. This,

accompanied with the presence of bats within the wider area during those colder periods, indicates that the survey results are still representative of the wider Hornsea Four bat emergence/re-entry survey area and provide a robust and accurate baseline which will inform the Ecological Impact Assessment (EclA) detailed in [Volume A3, Chapter 3: Ecology and Nature Conservation](#) of the Hornsea Four ES.

- 3.3.1.4 Since the initial identification of potential bat roost features (i.e. at the time of submitting the Preliminary Environmental Information Report (PEIR) (Orsted 2019), the Hornsea Four Order Limits has been refined and consequently the total number of features has been recalculated to include those within and up to 50 m of the DCO Hornsea Four Order Limits. No new bat roost features have been identified within the updated Hornsea Four Order Limits, however a number of features that had been previously identified are now located outwith the Hornsea Four bat emergence/re-entry study area and therefore have not been considered any further. Consequently, this report only covers those features that are located within the Hornsea Four bat emergence/re-entry study area, as shown in [Figure 1](#).
- 3.3.1.5 Although a full suite of bat emergence/re-entry surveys were undertaken during the 2019 survey effort, it should be noted that these surveys were undertaken between June and September (inclusive) and therefore were not undertaken during the optimal survey window for transitional and/or hibernating bat roosts. The BCT guidance (Collins 2016 and Hundt 2012) states that transitional and/or hibernating bat roost surveys should be undertaken in March/April or September/October.
- 3.3.1.6 All suitable trees and/or features within and up to a 50 m buffer of the Hornsea Four Order Limits that have been identified will be subject to a further pre-construction survey effort that, where required, will include further surveys to ascertain the presence or likely absence of transitional/hibernating/roosting bats. All surveys will be undertaken in accordance with industry guidance such as but not limited to BCT guidance (Collins 2016 and Hundt 2012) and Bat Tree Habitat Key (Andrews 2018).
- 3.3.1.7 No additional surveys are planned to support the Hornsea Four ES. However, a pre-construction survey effort will be undertaken, as outlined in Section 3.3.2 of [Volume F2, Chapter 3: Outline Ecological Management Plan](#). The pre-construction survey effort will also include further surveys (including an aerial inspection survey, i.e. a tree climbing survey) of two trees (TN338 and TN363, [Figure 20](#)) as a bat was potentially noted as emerging during the 2019 survey effort but this could not be confirmed due to the level of limited light at the time of the survey (as outlined in [Paragraph 4.1.1.2](#)). The aerial (tree climbing) survey will be undertaken by a suitably qualified bat licenced ecologist (who will also be a qualified tree climber) and will use an endoscope to confirm the presence or absence of bats within these two trees. This was discussed and agreed with Natural England in a Hornsea Four ecology Evidence Plan Technical Panel meeting on 1 April 2020 (ON-ECO-3.16).
- 3.3.1.8 The survey team made the utmost effort to determine the presence or likely absence of roosting bats. The data presented in this report is believed to provide an accurate and robust

account of the presence or likely absence of roosting bats within the Hornsea Four bat emergence/re-entry survey area.

3.4 Weather Conditions and Survey Timing

3.4.1.1 **Table 3** summarises the survey dates, type of survey and weather conditions encountered during each of the Hornsea Four bat emergence/re-entry survey visits.

Table 3: Survey dates and weather conditions during the 2019 bat emergence/re-entry survey.

Survey date	Survey type	Weather conditions
19 June 2019	Emergence	14°C, light wind, dry
20 June 2019	Emergence	13°C, dry, clear
15 July 2019	Emergence	15°C, dry, light wind, overcast
16 July 2019	Emergence	18°C, dry, cloudy
17 July 2019	Emergence	14°C, light breeze, intermittent light rain
18 July 2019	Emergence	15°C, dry, light wind, clear
22 July 2019	Emergence	16°C, dry, clear
24 July 2019	Emergence	18°C, still, dry, clear
25 July 2019	Emergence	24°C, dry, light wind, cloudy
12 August 2019	Re-entry	10°C, dry, light wind, clear
13 August 2019	Re-entry	10°C, intermittent light rain, light wind
14 August 2019	Re-entry	15°C, light rain, still
15 August 2019	Re-entry	14°C, dry, light wind, clear
16 August 2019	Re-entry	12°C, light wind, dry and clear
20 August 2019	Emergence	15°C, still, dry, clear
23 August 2019	Re-entry	11°C, dry, light wind, clear
18 September 2019	Emergence	15°C, still, dry, clear
19 September 2019	Re-entry	8°C, still, foggy
21 September 2019	Re-entry	8°C, dry, foggy
23 September 2019	Re-entry	14°C, brisk wind, dry, clear

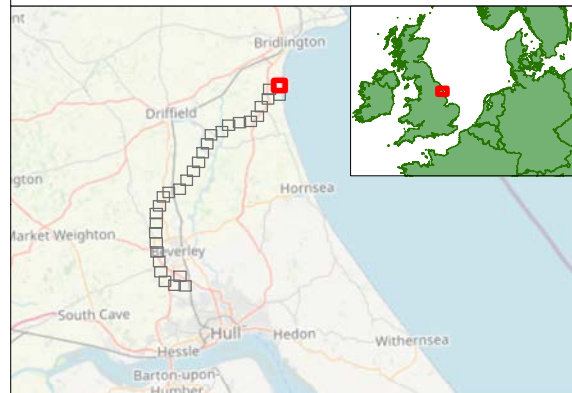


Hornsea Four

Figure 2

Bat Survey Emergence / Re-entry Locations - Sheet 1 of 19

- Order Limits
- Bat Survey Area
- Bat Roosting Potential**
- Negligible
- Low



Coordinate system: British National Grid
 Scale@A3: 1:5,000
 0 50 100 200 Metres
 0 50 100 200 Yards

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Date: 18/06/2021 Author: 303273 Name: HOW04RH0105_BatSurveyEmergence

Title: Bat Survey Emergence
 Document no: HOW04RH0105
 Created by: AZ
 Checked by: CC
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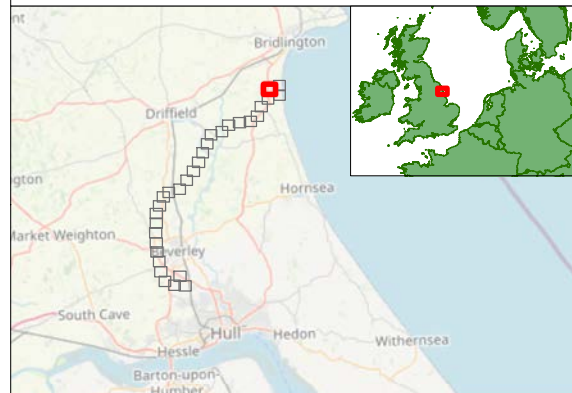


Hornsea Four

Figure 3

Bat Survey Emergence / Re-entry Locations - Sheet 2 of 19

- Order Limits
- Bat Survey Area
- Bat Roosting Potential**
- Negligible
- Low



Coordinate system: British National Grid
 Scale@A3: 1:5,000
 0 50 100 200 Metres
 0 50 100 200 Yards

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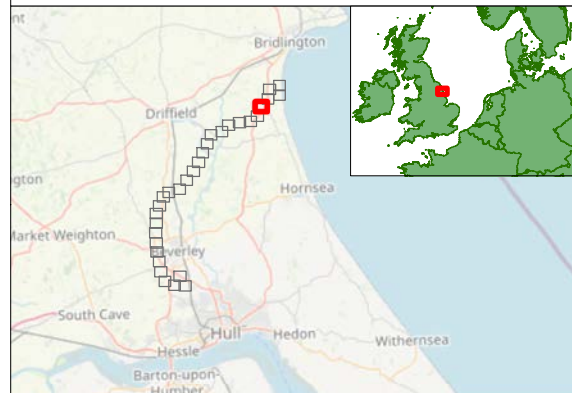


Hornsea Four

Figure 4

Bat Survey Emergence / Re-entry Locations - Sheet 3 of 19

- Order Limits
- Bat Survey Area
- Bat Roosting Potential**
- Negligible
- Low



Coordinate system: British National Grid
 Scale@A3: 1:5,000
 0 50 100 200 Metres
 0 50 100 200 Yards

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Date: 18/06/2021 Author: 303273 Name: HOW04RH0105_BatSurveyEmergence



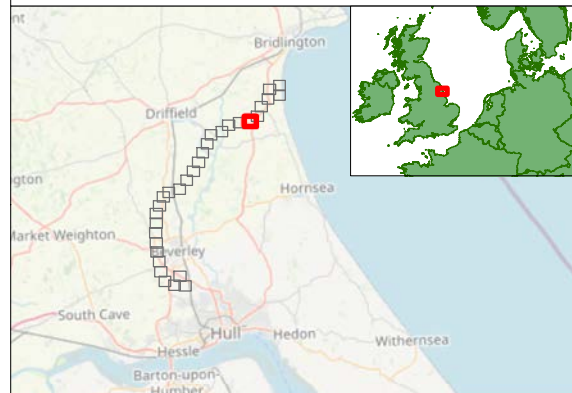


Hornsea Four

Figure 5

Bat Survey Emergence / Re-entry Locations - Sheet 4 of 19

- Order Limits
- Bat Survey Area
- Bat Roosting Potential**
- Negligible



Coordinate system: British National Grid
 Scale@A3: 1:5,000
 0 50 100 200 Metres
 0 50 100 200 Yards

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Title: Bat Survey Emergence
 Document no: HOW04RH0105
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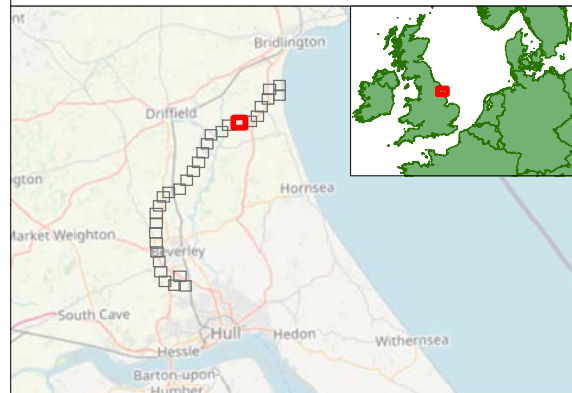




Hornsea Four

Figure 6
Bat Survey Emergence / Re-entry
Locations - Sheet 5 of 19

- Order Limits
 - Bat Survey Area
- Bat Roosting Potential**
- Moderate
 - Negligible
 - Low



Coordinate system: British National Grid
Scale@A3: 1:5,000

0 50 100 200 Metres

0 50 100 200 Yards

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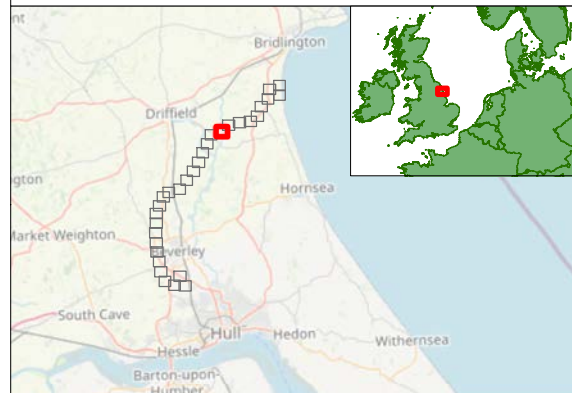


Hornsea Four

Figure 7

Bat Survey Emergence / Re-entry Locations - Sheet 6 of 19

- Order Limits
 - Bat Survey Area
- Bat Roosting Potential**
- Moderate
 - Low



Coordinate system: British National Grid
 Scale@A3: 1:5,000
 0 50 100 200 Metres
 0 50 100 200 Yards

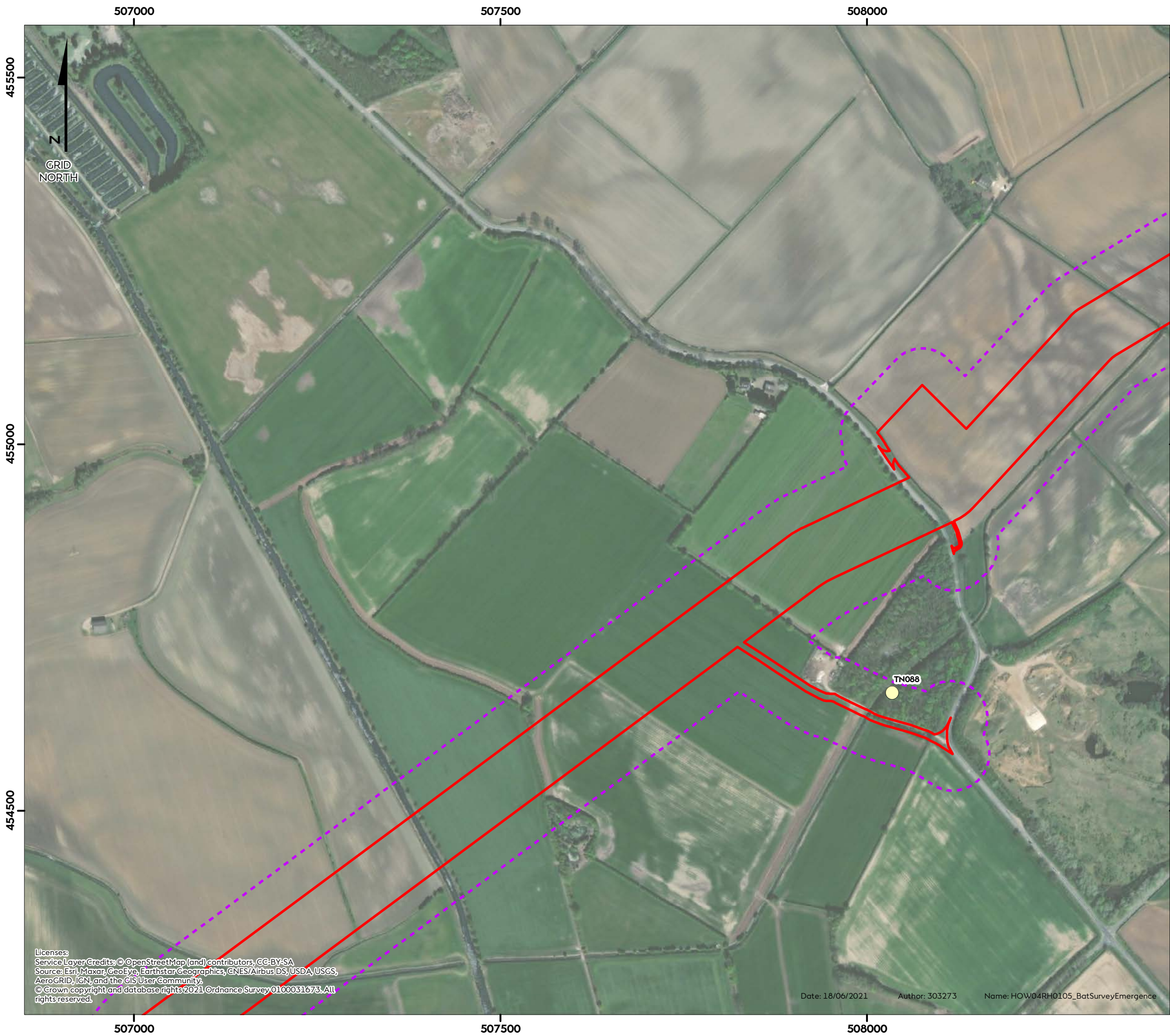
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Title: Bat Survey Emergence
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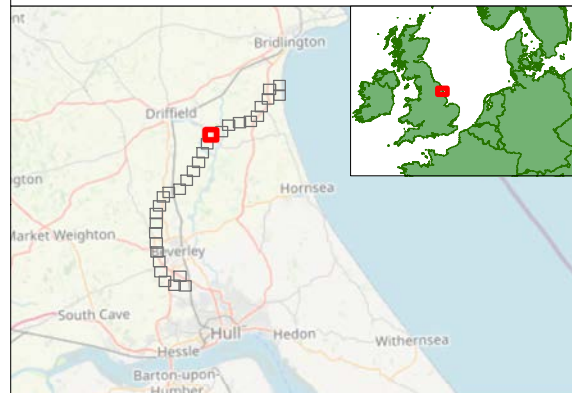




Hornsea Four

Figure 8
Bat Survey Emergence / Re-entry
Locations - Sheet 7 of 19

- Order Limits
- Bat Survey Area
- Bat Roosting Potential**
- Low



Coordinate system: British National Grid
Scale@A3: 1:5,000
0 50 100 200 Metres
0 50 100 200 Yards

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Title: Bat Survey Emergence
Document no: HOW04RH0105
Created by: AZ
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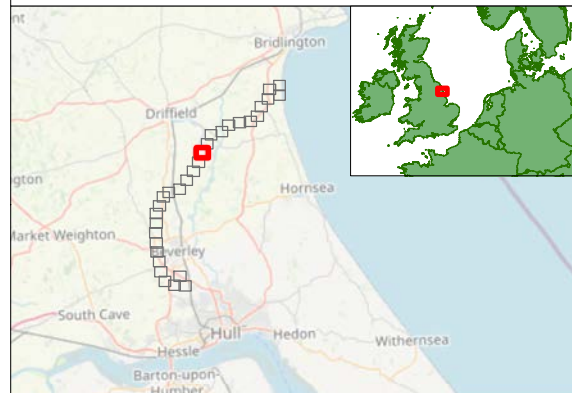


Hornsea Four

Figure 9

Bat Survey Emergence / Re-entry Locations - Sheet 8 of 19

- Order Limits
- Bat Survey Area
- Bat Roosting Potential**
- Negligible



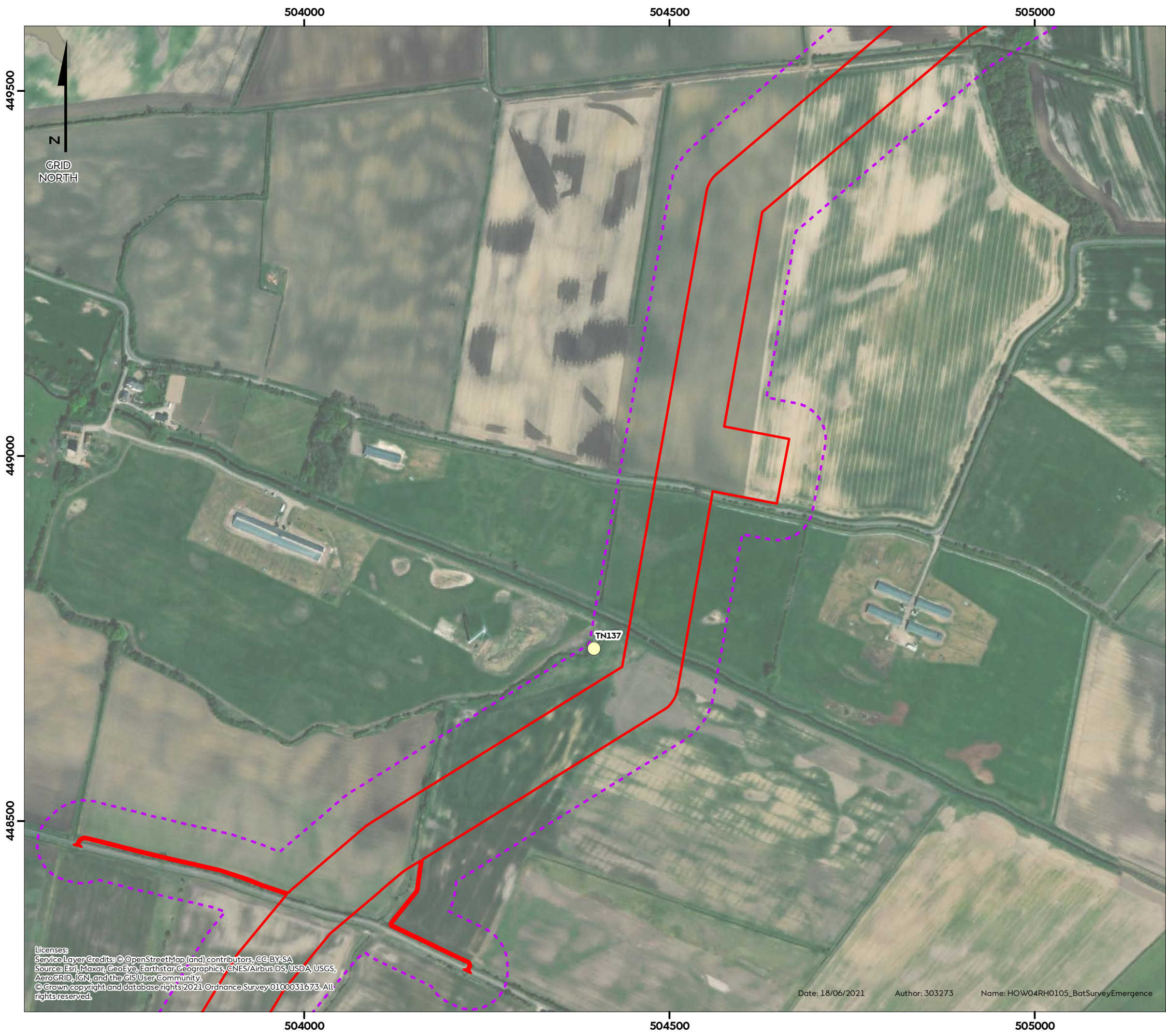
Coordinate system: British National Grid
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 0 50 100 200 Metres
 0 50 100 200 Yards

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Date: 18/06/2021 Author: 303273 Name: HOW04RH0105_BatSurveyEmergence

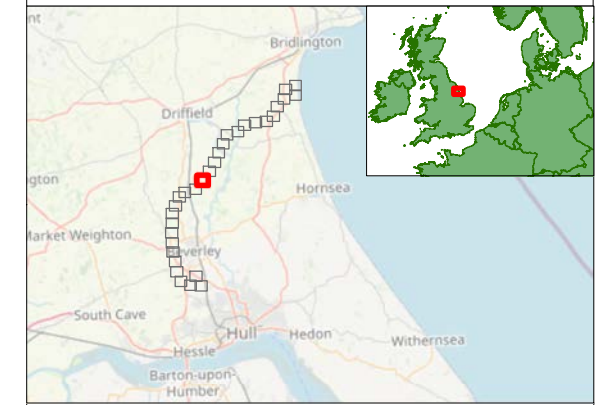




Hornsea Four

Figure 10
Bat Survey Emergence / Re-entry
Locations - Sheet 9 of 19

- Order Limits
- Bat Survey Area
- Bat Roosting Potential**
- Low



Coordinate system: British National Grid
Scale@A3: 1:5,000
0 50 100 200 Metres
0 50 100 200 Yards

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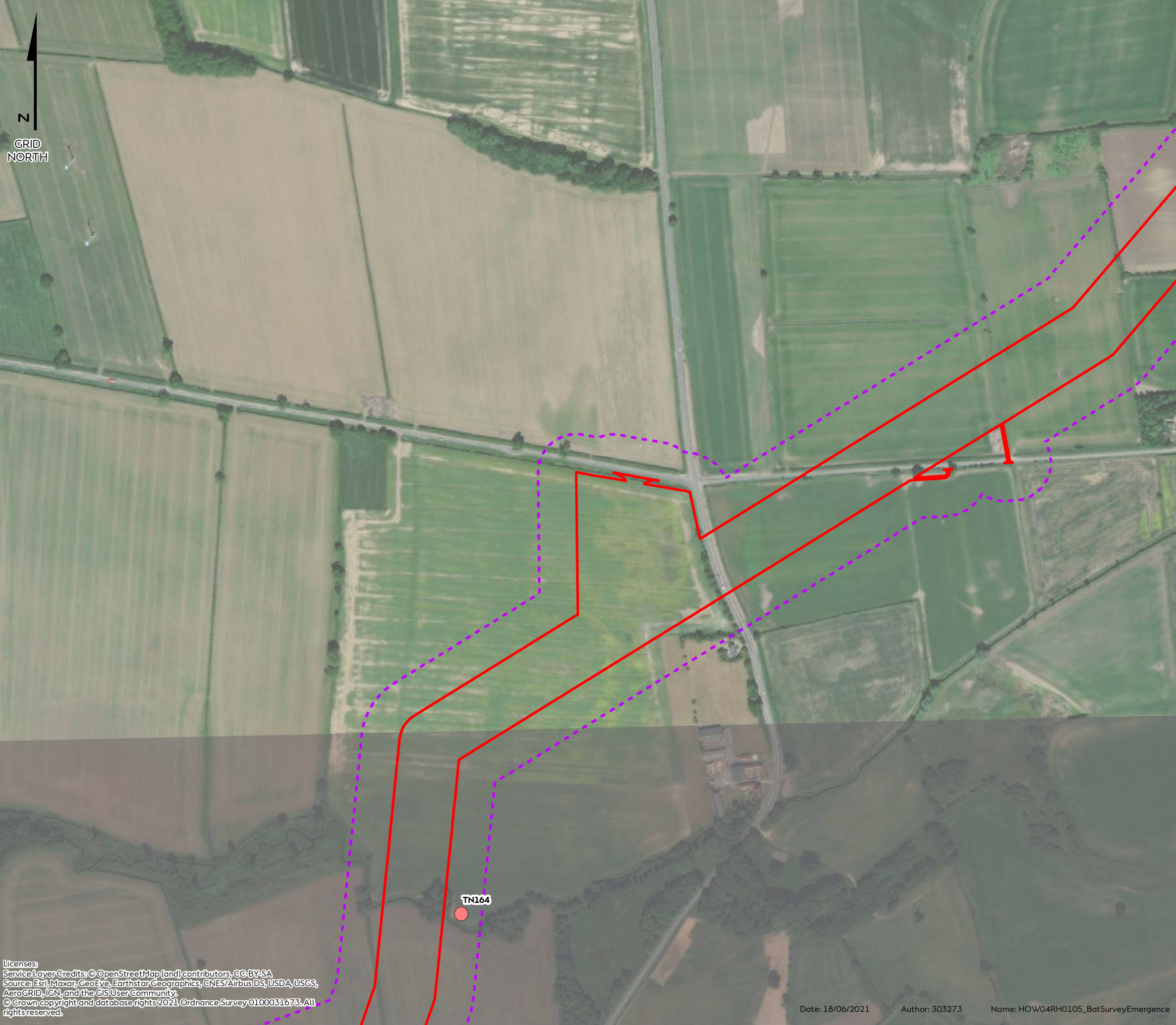
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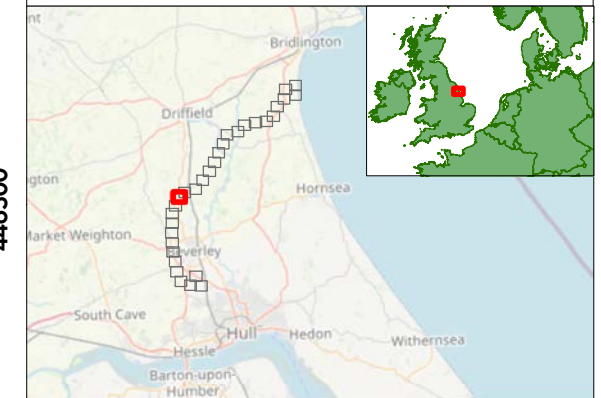
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Hornsea Four

Figure 11

Bat Survey Emergence / Re-entry Locations - Sheet 10 of 19

- Order Limits
- Bat Survey Area
- Bat Roosting Potential**
- Moderate



Coordinate system: British National Grid

Scale@A3: 1:5,000

0 50 100 200 Metres

0 50 100 200 Yards

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Date: 18/06/2021

Author: 303273

Name: HOW04RH0105_BatSurveyEmergence

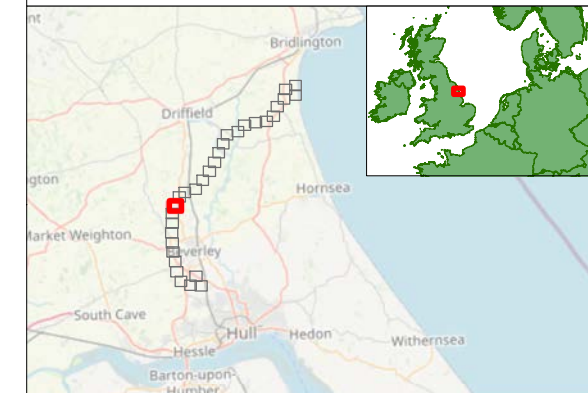


Hornsea Four

Figure 12

Bat Survey Emergence / Re-entry Locations - Sheet 11 of 19

- Order Limits
 - Bat Survey Area
- Bat Roosting Potential**
- Moderate
 - Low



Coordinate system: British National Grid
 Scale@A3: 1:5,000
 0 50 100 200 Metres
 0 50 100 200 Yards

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Date: 18/06/2021 Author: 303273 Name: HOW04RH0105_BatSurveyEmergence

Title: Bat Survey Emergence
 Document no: HOW04RH0105
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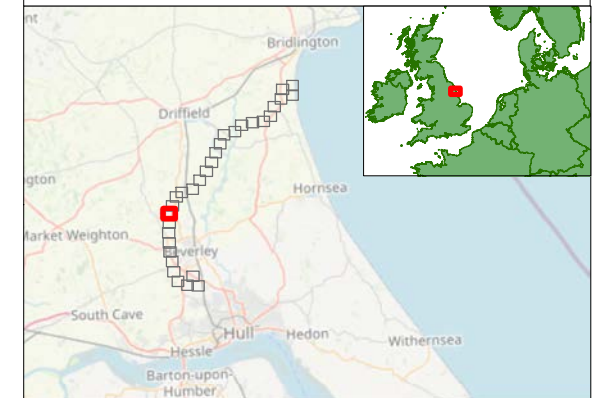


Hornsea Four

Figure 13

Bat Survey Emergence / Re-entry Locations - Sheet 12 of 19

- Order Limits
- Bat Survey Area
- Bat Roosting Potential**
- Negligible



Coordinate system: British National Grid

Scale@A3: 1:5,000

0 50 100 200 Metres

0 50 100 200 Yards

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	First Issue for DCO	18/06/2021

Title: Bat Survey Emergence
 Document no: HOW04RH0105
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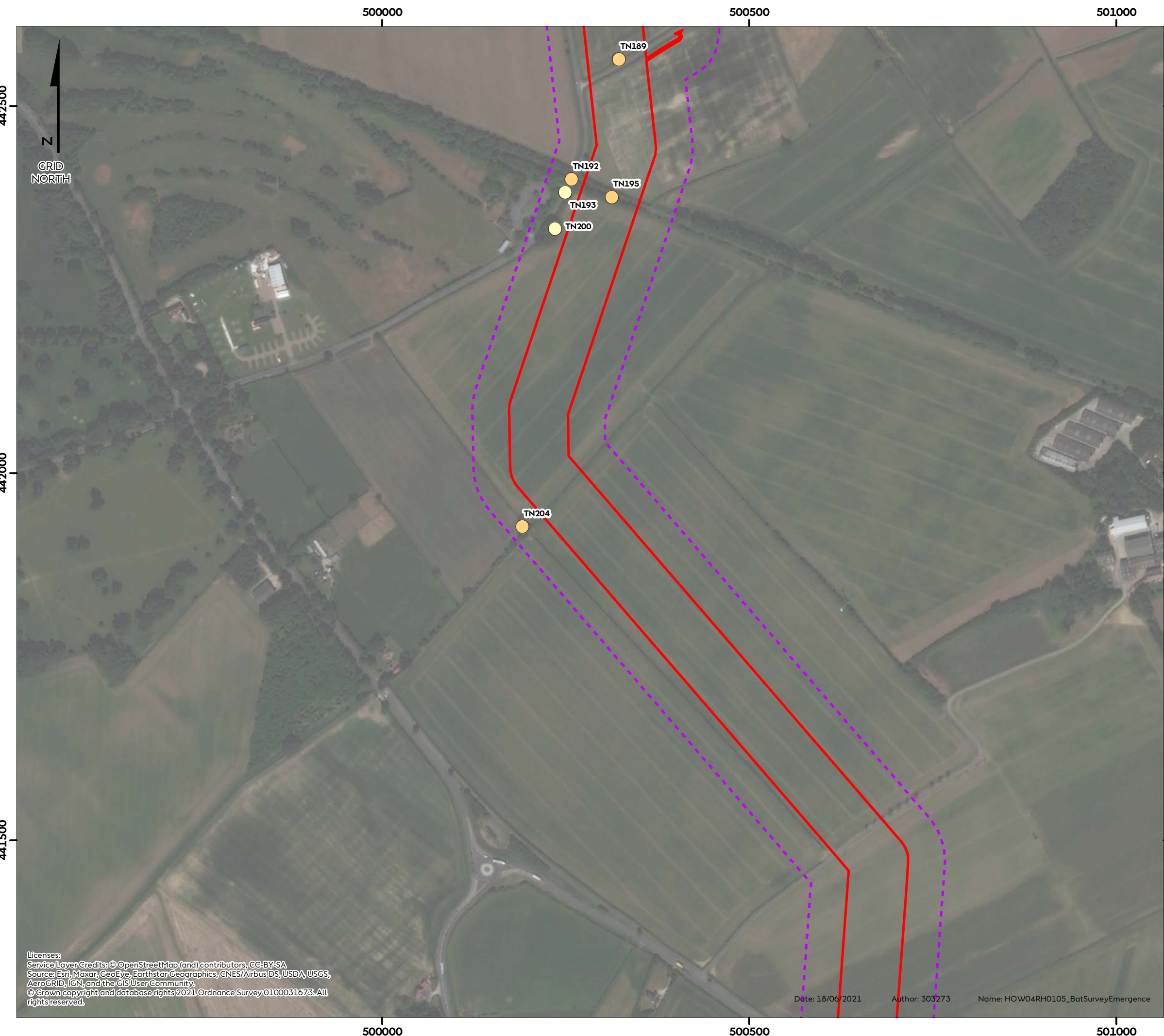


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Date: 18/06/2021

Author: 303273

Name: HOW04RH0105_BatSurveyEmergence

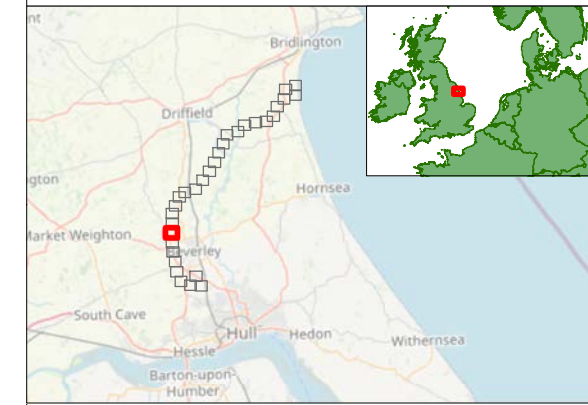


Hornsea Four

Figure 14

Bat Survey Emergence / Re-entry Locations - Sheet 13 of 19

- Order Limits
 - Bat Survey Area
- Bat Roosting Potential**
- Negligible
 - Low



Coordinate system: British National Grid
 Scale@A3: 1:5,000
 0 50 100 200 Metres
 0 50 100 200 Yards

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Date: 18/06/2021 Author: 303273 Name: HOW04RH0105_BatSurveyEmergence

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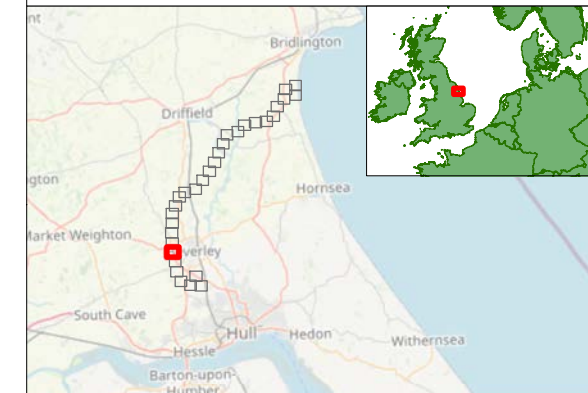
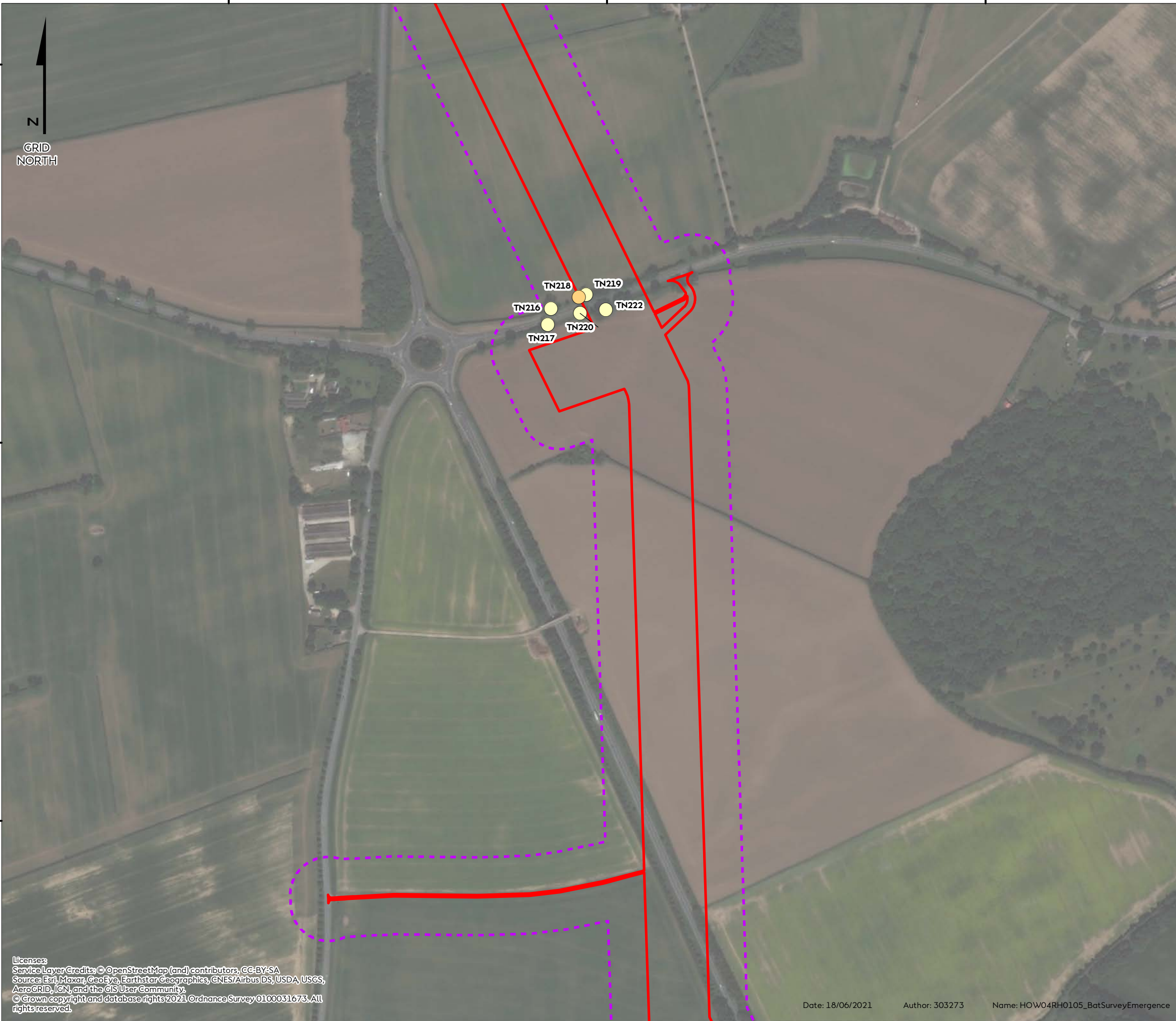
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Hornsea Four

Figure 15

Bat Survey Emergence / Re-entry Locations - Sheet 14 of 19

- Order Limits
 - Bat Survey Area
- Bat Roosting Potential**
- Negligible
 - Low



Coordinate system: British National Grid
 Scale@A3: 1:5,000
 0 50 100 200 Metres
 0 50 100 200 Yards

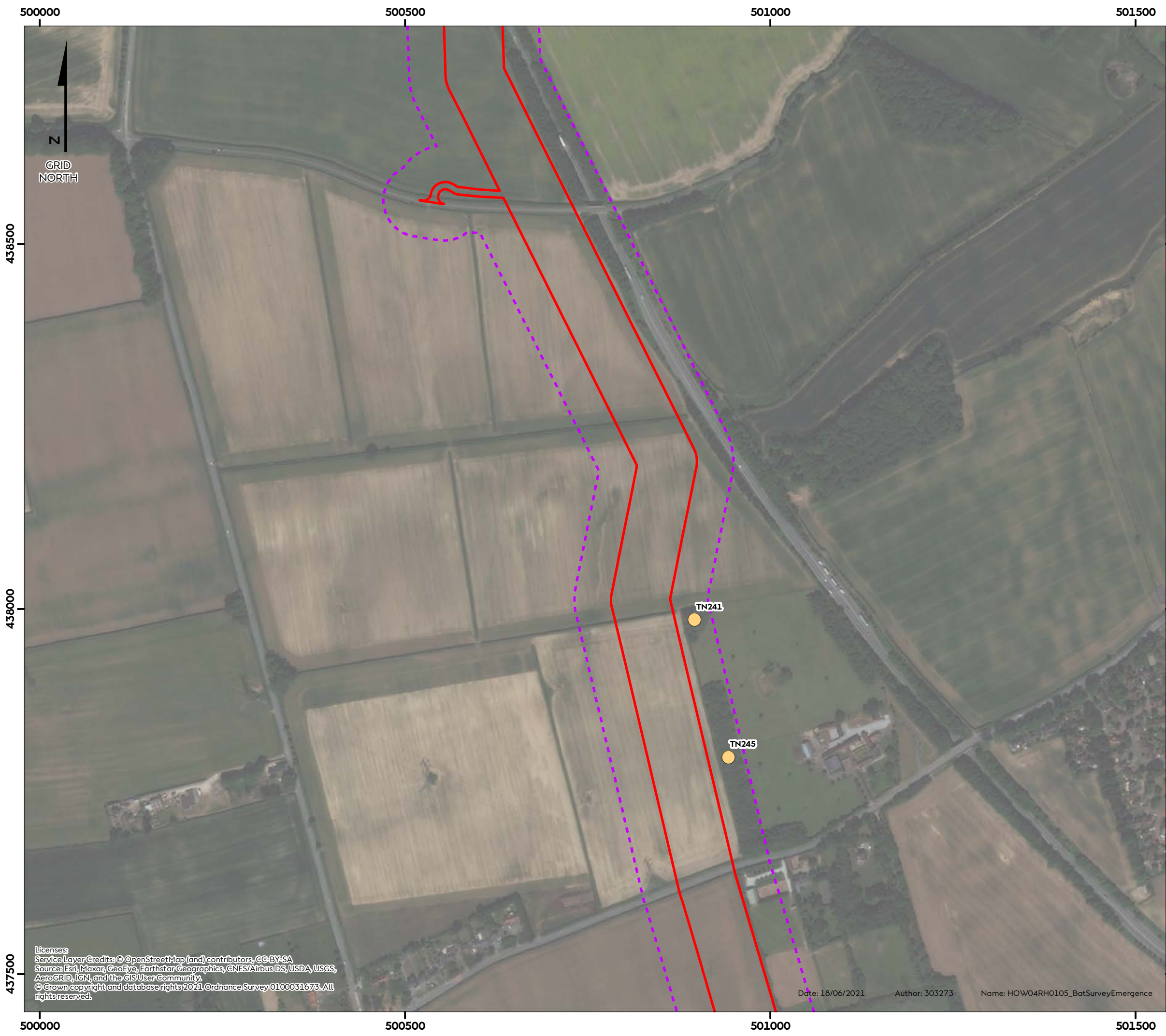
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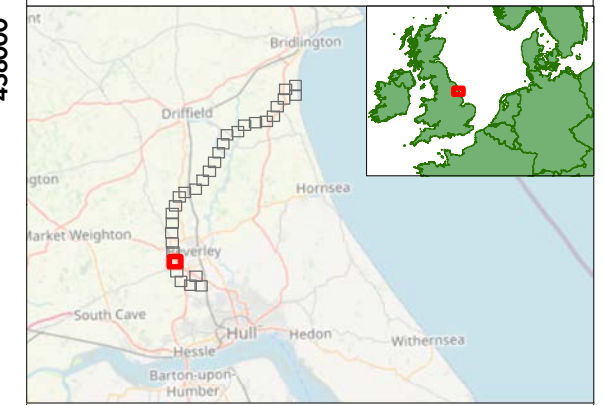


Hornsea Four

Figure 16

Bat Survey Emergence / Re-entry Locations - Sheet 15 of 19

- Order Limits
- Bat Survey Area
- Bat Roosting Potential**
- Negligible




Coordinate system: British National Grid
 Scale@A3: 1:5,000
 0 50 100 200 Metres
 0 50 100 200 Yards

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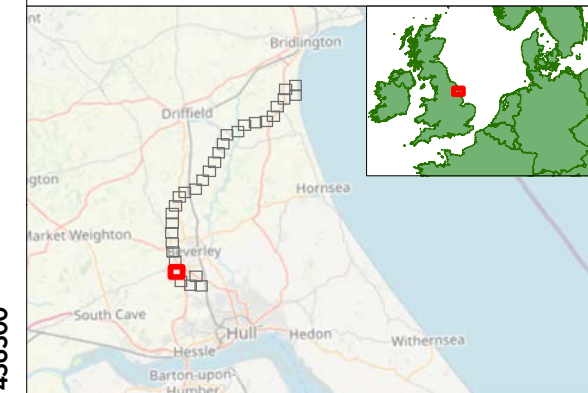


Hornsea Four

Figure 17

Bat Survey Emergence / Re-entry Locations - Sheet 16 of 19

- Order Limits
 - Bat Survey Area
- Bat Roosting Potential**
- Moderate
 - Negligible
 - Low



Coordinate system: British National Grid
 Scale@A3: 1:5,000
 0 50 100 200 Metres
 0 50 100 200 Yards

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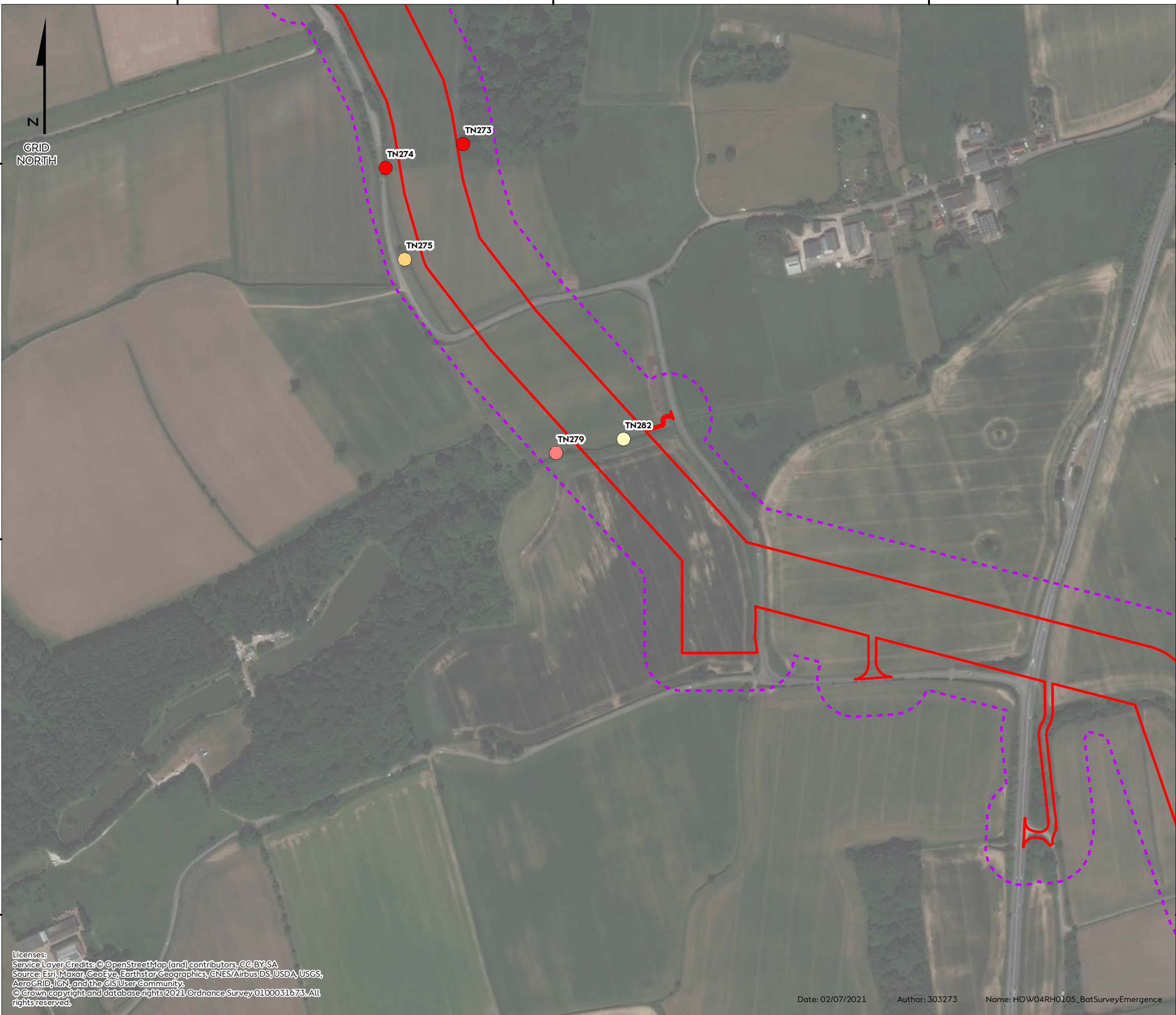
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Hornsea Four

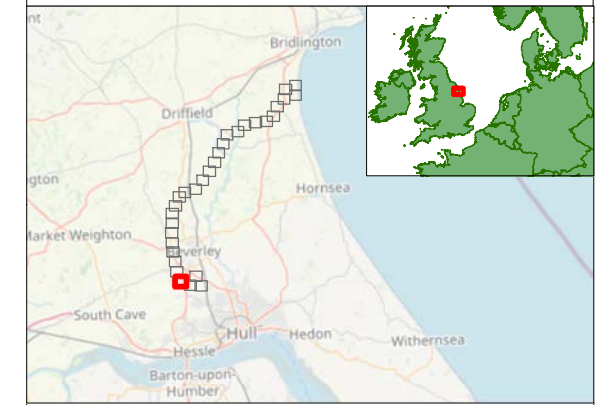
Figure 18

Bat Survey Emergence / Re-entry Locations - Sheet 17 of 19

- Order Limits
 - Bat Survey Area
- Bat Roosting Potential**
- High
 - Moderate
 - Negligible
 - Low



GRID NORTH



Coordinate system: British National Grid
 Scale@A3: 1:5,000
 0 50 100 200 Metres
 0 50 100 200 Yards

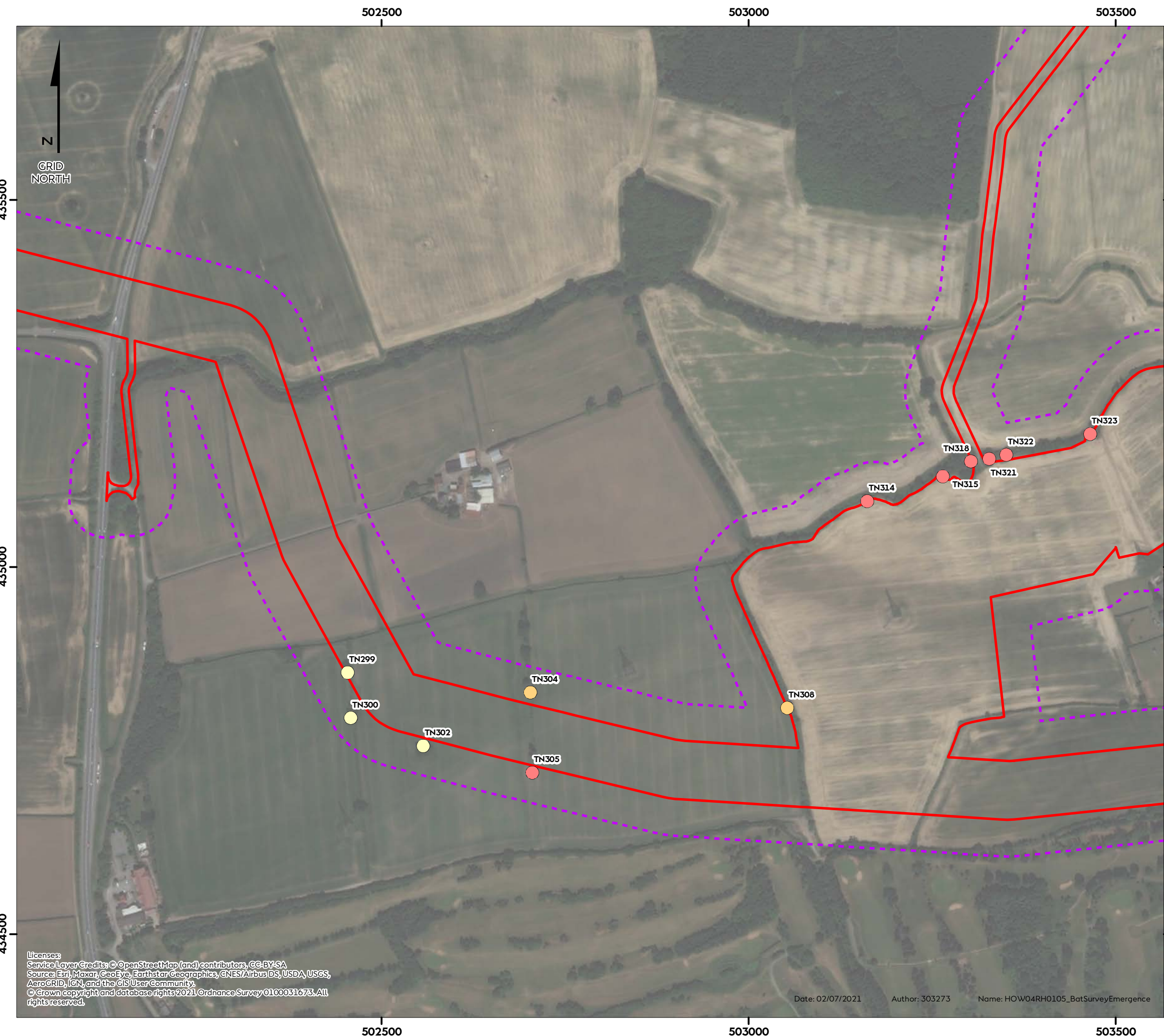
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Date: 02/07/2021 Author: 303273 Name: HOW04RH0105_BatSurveyEmergence

Title: Bat Survey Emergence
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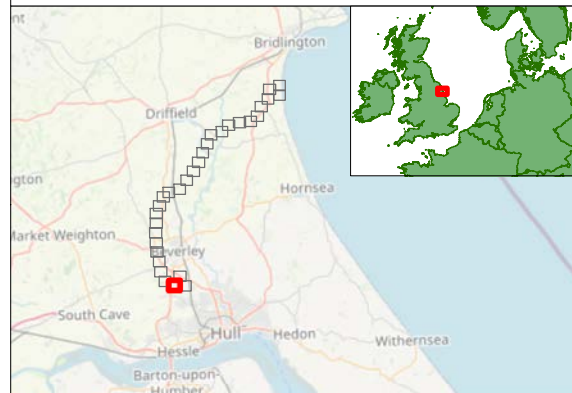




Hornsea Four

Figure 19
Bat Survey Emergence / Re-entry
Locations - Sheet 18 of 19

- Order Limits
 - Bat Survey Area
- Bat Roosting Potential**
- Moderate
 - Negligible
 - Low

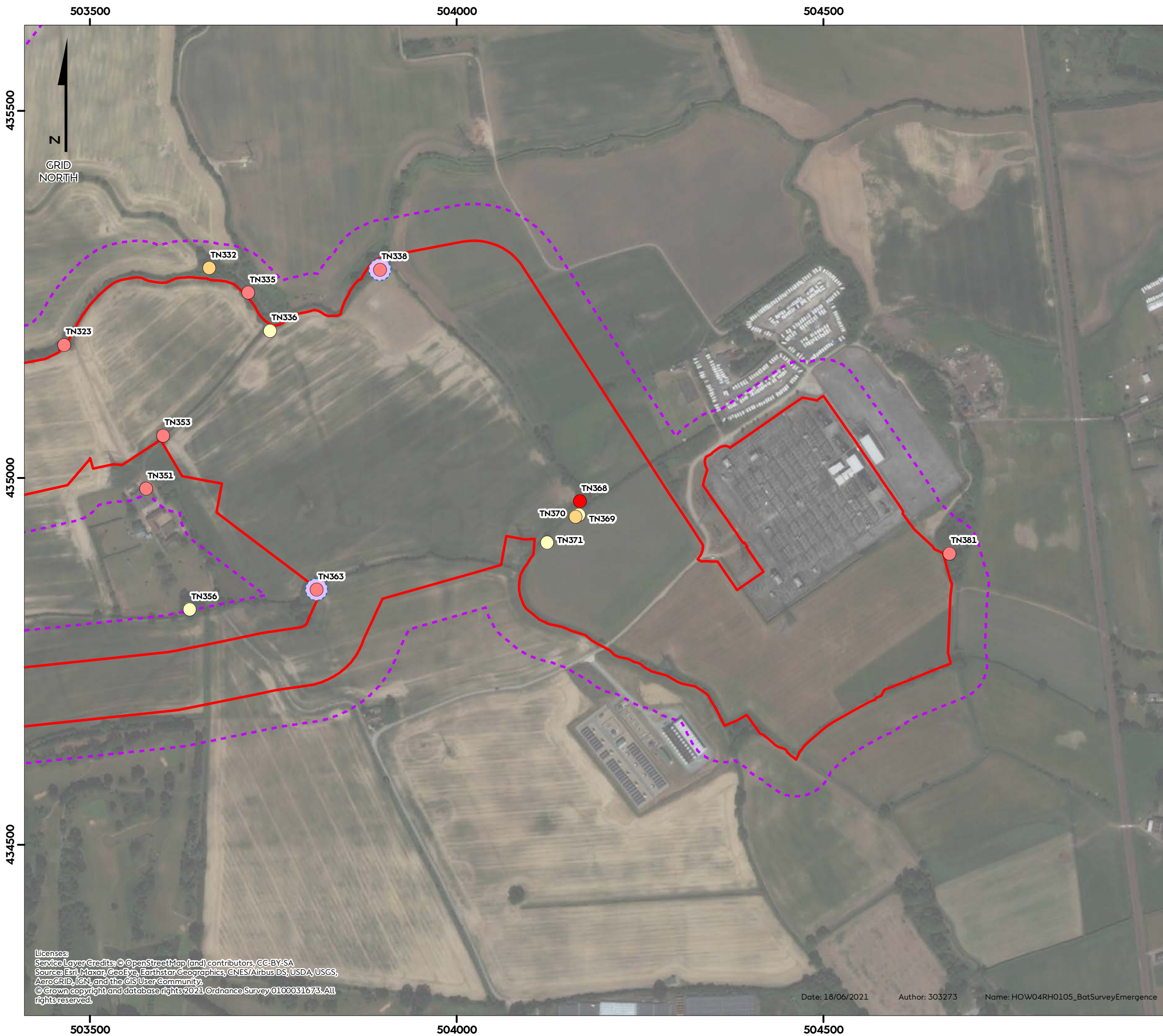


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Hornsea Four

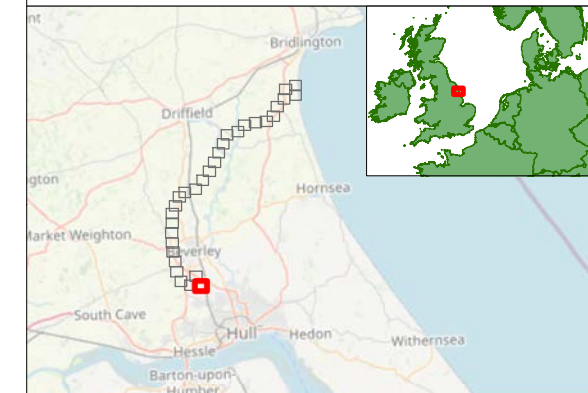
Figure 20

Bat Survey Emergence / Re-entry Locations - Sheet 19 of 19

- Order Limits
- Bat Survey Area
- 15m Bat Exclusion Zone

Bat Roosting Potential

- High
- Moderate
- Negligible
- Low



Coordinate system: British National Grid
 Scale@A3: 1:5,000
 0 50 100 200 Metres
 0 50 100 200 Yards

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4 Results

4.1.1.1 A total of 28 features (27 trees and one building) were surveyed for the presence of roosting bats between June and September (inclusive) 2019. The Target Note (TN) references that have been referenced in this report) are those which were assigned during the EP1HS (see [Annex 3.1: Extended Phase 1 Habitat Survey Report](#) and [Annex 3.2: Extended Phase 1 Target Note Tables](#)).

4.1.1.2 No confirmed bat roosts were recorded during the Hornsea Four bat emergence/re-entry surveys. However, there are two features (trees) where surveyors could not confirm that a bat was seen to emerge, mainly due to the limited light levels at the time when this observation occurred. These two features are as follows and their locations are shown on [Figure 20](#):

- TN338; and
- TN363.

4.1.1.3 No further evidence of bats emerging or re-entering these two trees was observed during the second survey. A full summary of all of the survey results alongside a brief summary of the level of activity noted within the surrounding area is presented in [Table 4](#).

Table 4: Summary of results of the Hornsea Four bat emergence/re-entry survey.

TN Reference assigned to Feature	Emergence / Re-entry observed	Notes
TN032	No	Common pipistrelle <i>Pipistrellus pipistrellus</i> observed commuting along hedgerow
TN042	No	Common pipistrelle observed using surrounding habitats
TN046	No	Noctule <i>Nyctalus noctule</i>
TN047	No	Noctule
TN071	No	No activity recorded during either survey visit
TN164	No	Common pipistrelle observed commuting along watercourse
TN166	No	Common pipistrelle, Daubenton <i>Myotis daubentonii</i> , Noctule and Myotis spp. Observed using surrounding habitats.
TN170	No	Noctule and Daubenton observed flying along adjacent hedgerow
TN263	No	Common pipistrelle using surrounding habitats
TN264	No	Common pipistrelle foraging in surrounding habitats
TN265	No	Common pipistrelle using surrounding habitats
TN273	No	Common pipistrelle using surrounding habitats
TN274	No	Common pipistrelle and Noctule observed within surrounding habitats
TN279	No	Common pipistrelle, Noctule and possible Brown long eared <i>Plectus auritus</i>
TN305	No	Common pipistrelle and Noctule using surrounding habitats
TN314	No	Common pipistrelle observed using surrounding hedgerows and habitats
TN315	No	Common pipistrelle observed using surrounding hedgerows and habitats
TN318	No	Common pipistrelle
TN321	No	Common pipistrelle observed using surrounding hedgerows and habitats

TN Reference assigned to Feature	Emergence / Re-entry observed	Notes
TN322	No	Common pipistrelle
TN323	No	Common pipistrelle
TN335	No	Common pipistrelle observed using surrounding hedgerows and habitats
TN338	Unconfirmed	Noctule and Common pipistrelle. Silent bat observed appearing to emerge however surveyor unclear, no further evidence to support presence of roosting bats observed in second survey.
TN351	No	Common pipistrelle and Noctule observed commuting along adjacent hedgerows and foraging within neighbouring fields.
TN353	No	Common pipistrelle observed commuting and foraging along adjacent hedgerows.
TN363	Unconfirmed	Common pipistrelle and noctule observed commuting and foraging along hedgerow and within adjacent fields. Common pipistrelle observed appearing to emerge however surveyor unclear, no further evidence to support presence of roosting bats observed in second survey.
TN368	No	Common pipistrelle and noctule observed foraging along adjacent hedgerow.
TN381	No	Common pipistrelle observed commuting and foraging along hedgerow.

5 Summary and Conclusion

5.1.1.1 No confirmed bat roosts were recorded during the Hornsea Four bat emergence/re-entry survey effort, however a total of two features (both trees) had a potential bat emerging. The surveying ecologist(s) could not confirm this during the respective survey due to the level of limited light at the time the observation occurred. However, no further evidence of roosting bats was recorded during the subsequent survey visit to these two features. These two features are as follows and their locations are shown on [Figure 20](#):

- TN338; and
- TN363.

5.1.1.2 With regard to the inclement weather that was experienced during some of the survey visits, (as described in [Paragraph 3.3.1.3](#)), although potentially fewer numbers of each particular species were recorded, a diverse range of bat species were found.

5.1.1.3 Additionally, further survey effort will ensure that any changes in the baseline conditions are recorded and allow any updates to the proposed mitigation. The results of the 2019 survey effort therefore provide a robust evidence base to inform the impact assessment presented in [Volume A3, Chapter 3: Ecology and Nature Conservation](#) of the Hornsea Four ES.

5.1.1.4 Neither of these features (trees) will require removal to enable the construction of Hornsea Four. TN363 is situated within an existing hedgerow to the south of the OnSS which is outside of the Hornsea Four Order Limits, however as the 15 m exclusion buffer extends within the Order Limits, TN363 will be retained. TN338 is situated within a hedgerow that will be

retained and incorporated within the OnSS landscaping area. Further information regarding these proposals is provided in [Volume D1, Annex 4.2: Works Plan – Onshore](#), and [Volume F2, Chapter 8: Landscape Management Plan](#).

- 5.1.1.5 However, should any works be required within the 15 m exclusion buffer shown on [Figure 20](#), or in the event any of the branches require trimming, further surveys (as set out in should be undertaken in order to confirm the presence or likely absence of any bat roosts. These further surveys are detailed in [Volume F2, Chapter 3: Outline Ecological Management Plan](#).
- 5.1.1.6 Mitigation measures relating to roosting bats that will be adhered to during the construction works associated with the onshore aspects of Hornsea Four, as agreed with stakeholders through the onshore Evidence Plan Technical Panel meeting process, are presented in [Volume F2, Chapter 3: Outline Ecological Management Plan](#).

6 References

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