Appendix 7.1

APPENDIX 7.1: PHASE 1 HABITAT SURVEY

Project Title:	Eco Assess - West Sussex Sites – Wisborough Green - 1	Job Number:	47064873
Client:	Celtique Energie Weald Ltd	Date:	08/03/13 Updated 22/08/13

PLEASE TREAT THIS REPORT AS CONFIDENTIAL DUE TO THE INCLUSION OF SENSITIVE ECOLOGICAL DATA

1. SCOPE & METHODOLOGIES

1.1 Site Location

Wisborough Green 1 comprises a proposed drilling site centred at grid reference TQ 035 267. The site is located on land south of Boxal Bridge, Kirdford Road, West Sussex. See Figure 1 for the field survey area.

1.2 Purpose of Work

The Proposed Development comprises the siting and construction of a temporary well site including access track and ancillary infrastructure, for the exploration, testing and evaluation of hydrocarbons. An ecological assessment of the site was carried out to identify ecological constraints and support a planning application.

1.3 Desk-based Study

Records Centre	**Y**	MAGIC	**Y**	NBN	N	Wildlife Trust	N
Other (specify)							
Search Area (specify)	**1-5km**		**5km**		**N/A**		**N/A**

1.4 Field Survey

Search Area (specify)	**The proposed site (including the access route) and a buffer was surveyed.**						
Phase 1 Habitat	**Y**	Invasive Plants	**A**	Badger	**A**	Bats	**A**
Dormouse	**A**	Otter	**A**	Water Vole	**A**	Breeding Birds	**A**
Winter Birds	**A**	Reptiles	**A**	Amphibians	**A**	Invertebrates	**A**
Other (specify)							
URS Surveyor(s)	**Y**	Other Surveyor(s)	**N** (specify if Y)				

'Y' = Yes; 'N' = No; 'S' = Survey undertaken'; 'A' = Habitat Appraisal only

1.5 Methodologies

Bat Conservation Trust (2012). *Bat Surveys; Good Practice Guidelines*. Bat Conservation Trust, London

Chanin, P. (2003) *Monitoring the Otter Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No 10, English Nature, Peterborough.

Harris, S., Cresswell, P. & Jeffries, D. (1989). *Surveying Badgers*. An occasional publication of the mammal society. No.9. Mammal Society, London.

Institute for Environmental Assessment (1995). *Guidelines for Baseline Ecological Assessment*. E & FN Spon, London.

Joint Nature Conservation Council (2010). *Handbook for Phase 1 Habitat Survey - a Technique for Environmental Audit.* Joint Nature Conservation Council, Peterborough.

Neal, E. and Cheeseman, C. (1996) *Badgers*. T&AD Poyser Ltd

Strachan R. &Moorhouse T (2006) *Water Vole Conservation Handbook* 2nd Edition. Wildlife and Conservation Research Unit, Oxford

1.6 Report

Written Results	**Y**	Evaluation	**N**	Impacts	**N**	Mitigation	**N**
Other (specify)							

2. LIMITATIONS

Local groups have not been contacted for additional information to date e.g. Sussex Ornithological Society, Badger Trust Sussex and Butterfly Conservation Sussex Branch.

3. SITE DESCRIPTION

The site is situated within an arable field. Ancient woodland lies to the north, west and east of the site. The arable field is bounded by semi-improved grass margins. Blocks of ancient woodland occur in the wider landscape. The proposed access route for the site follows the existing farm track from Kirdford Road.

4. DESK-BASED STUDY RESULTS

Table 1. Results of data search for designated sites relevant to the scheme

Designated Sites within 5km of site			
Site Name	**Ecological Interests**	**Location (OSGR)**	**Distance from Site (km)**
The Mens SSSI/SAC	Rich lichen flora. Ancient woodland. Acidophilous beech forest. Barbastelle Barbastella barbastellus bat.	TQ 025231	~1km south
Ebernoe Common Special Area of Conservation SSSI/SAC	Atlantic acidophilous beech forest. Weald woodland. Barbastelle bat and Bechstein's Myotis bechsteinii bat.	SU 977273	~5km west
South Downs National Park	Chalk downland landscape. Heavily wooded sandstone and clay hills.	Stretches 140km from Winchester to Eastbourne.	~0.6km south
C42. Dunhurst & Northup Copses-SNCI	Ancient woodland.	TQ 037268	15m north

Table 2. Results of data search for protected, notable or invasive species relevant to the scheme

Records	**Within Survey Area**	**Within Search Area**	**Approximate Distance to nearest record (meters)**	**Conservation and Habitats Regulations 2010**	**Wildlife and Countryside Act 1981 (Schedule 1, 5 or 9)**	**NERC Act 2006 Section 41 Species of Principal Importance**
Habitats						
Ancient Woodland		✓				✓
Tree with bat roost potential	✓	✓		Potential		
Plants						
True fox-sedge		✓	1040 South West			✓
Chamomile		✓	1370 South East			✓
Rye brome		✓	315 West			
Japanese knotweed (invasive)		✓	Unknown		✓	

Records	Within Survey Area	Within Search Area	Approximate Distance to nearest record (meters)	Conservation and Habitats Regulations 2010	Wildlife and Countryside Act 1981 (Schedule 1, 5 or 9)	NERC Act 2006 Section 41 Species of Principal Importance
Variegated yellow archangel (invasive)		✓	Unknown		✓	
Mammals						
Bat roost (*Chiroptera sp.*)		✓	920 West	✓	✓	✓
Brown long-eared bat roost		✓	910 North West	✓	✓	✓
Common pipistrelle		✓	310 North West	✓	✓	✓
Daubenton's bat		✓	210 North	✓	✓	✓
Noctule bat		✓	1920 South West	✓	✓	✓
Pipistrelle sp. bat		✓	1920 South West	✓	✓	✓
Serotine		✓	250 North West	✓	✓	✓
Western barbastelle		✓	1760 South West	✓	✓	✓
American mink		✓	1790 North West			
Birds						
Wood warbler***		✓	1000 South			✓
Eurasian hobby		✓	1260 West		✓	
Northern Lapwing		✓	1670 South West			✓
Common snipe**		✓	1740 South			
Common Kingfisher**		✓	Unknown		✓	
Barn owl**		✓	1600 West		✓	
Turtle Dove		✓	710 East			✓
Lesser Spotted Woodpecker		✓	775 South East			✓
Barn swallow**		✓	Unknown			
Amphibians						
None within 1km						
Reptiles						
Grass Snake		✓	1060 West		✓	✓
Common Lizard		✓	1060 West		✓	✓
Slow Worm		✓	892 South East		✓	✓
Invertebrates						

Records	Within Survey Area	Within Search Area	Approximate Distance to nearest record (meters)	Conservation and Habitats Regulations 2010	Wildlife and Countryside Act 1981 (Schedule 1, 5 or 9)	NERC Act 2006 Section 41 Species of Principal Importance
Stag Beetle		✓	1130 South East		✓	✓
Brown hairstreak		✓	272 North East		✓	✓
White admiral		✓	362 North West			✓
Purple emperor		✓	814 North		✓	

**Birds of Conservation Concern 3 (2009) amber status
***Birds of Conservation Concern 3 (2009) red status

5. SITE SURVEY RESULTS

5.1. Vegetation & Habitats

On Site- Arable Land

The site is located within an arable field which, at the time of survey, was under cereal stubble. An update survey in August 2013 showed that the field contained wheat.

On Site Habitat- Improved Neutral Grassland

Grassland areas around the farm building represent improved grassland dominate by perennial rye-grass *Lolium perenne* and white clover *Trifolium repens*. Buttercup *Ranunculus* sp., scentless mayweed *Tripleurospermum inodorum*, dandelion *Taraxacum officinale* agg. and broad-leaved dock *Rumex obtusifolius* were also recorded.

Adjacent Habitats- Semi-Improved Grassland

The arable field margins comprised a narrow improved grass buffer which had recently been mown, at the time of survey in February. In August, the grassland was assessed as semi-improved grassland dominated by false oat-grass *Arrhenatherum elatius*, cock's foot *Dactylis glomerata.*

Adjacent Habitats- Semi-Natural Woodland

To the east, west and north of the arable field lies ancient and semi-natural woodland within Northup Copse SNCI; which comprised of stands of semi-natural broadleaved woodland supporting oak *Quercus robur* and hazel *Corylus avellana* with birch *Betula pendula*, ash *Fraxinus excelsior* and field maple *Acer campestre* (TN1). The ground flora comprised bluebell *Hyacinthoides non-scripta,* wood anemone *Anemone nemorosa*, enchanters'

nightshade *Circaea lutetiana* and ivy *Hedera helix.* There were small stands of wood melick *Melica uniforma* near the road verge. Land adjacent to Boxal Brook was flooded and inaccessible in February 2013 and was reassessed in August 2013.

Directly north of the arable field, following Boxal Brook is a band of deciduous woodland habitat not classified as ancient woodland.

The woodland area had potential to support notable species including bats and hazel dormouse. Trees close to the woodland edge were assessed as having low potential to support roosting bats. The woodland provides habitat for a wide variety of bats, including roosting areas, foraging habitats and commuting routes.

For badger survey results see Confidential Appendix (Appendix 7.6).

Adjacent Habitats- Boxal Brook

Boxal Brook (TN5) flows through the woodland to the north of the site; the stream had flooded the surrounding land, during February and a survey of the brook could not be conducted. In August the water levels were low and due to fallen trees and other debris the brook was not flowing. The banks did not contain any marginal vegetation, but small areas of stinging nettles *Urtica dioica* were recorded.

Adjacent Habitats- Species-Poor Hedgerow

Hedgerows to the north and south of Kirdford Road were classified as species-poor intact hedgerows. These comprised hawthorn *Crataegus monogyna,* hazel *Corylus avellana,* field maple *Acer campestre* and dog rosa *Rosa canina*.

Adjacent Habitats- Dry Ditch

A dry ditch runs parallel with Kirdford Road. It is connected underneath the field entrance by a ceramic pipe. Species present adjacent and within the ditch included bramble and bracken *Pteridium aquilinum*. Other species present included false brome *Brachypodium sylvaticum,* black knapweed *Centaurea nigra* and rosebay willowherb *Chamerion angustifolium*.

Adjacent Habitats- Building

There is one building near to the field entrance. The building is a single-storey metal construction which has no potential to support roosting bats.

Further Information

Two vegetated soil heaps and a chalk pile (TN3 and TN4) were located close to the Application Site entrance.

Please refer to Figure 1, which present the site location and the types and extents of the habitats present in the survey area. Target notes locations are presented on Figure 1 and the features they refer to are described below:

TN 1 – Ancient woodland

TN 2 – Trees with low/moderate bat potential

TN 3 – Soil heaps may have reptile potential

TN 4 – Chalk heap

TN 5 – Boxal Brook

5.2. Protected & Notable Flora and Fauna

This includes species included under Schedules 1, 5 and 8 of the Wildlife and Countryside Act 1981 (as amended); Schedules 2 and 4 of The Conservation of Habitats and Species Regulations 2010 (the Regulations); and Species and Habitats of Principal Importance in England, listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

There are 24 trees located on the woodland edge, within the survey area (TN4) which have cracks and holes that could provide roosting opportunities for bats. Please see Table 3 and Figure 2 for description and locations of trees with bat roost potential.

Table 3. Results of Bat Roost Potential Survey of Trees

Map Ref.	Direction	Feature	Potential*
1	East	Knot-hole on oak tree	1
2	East	Tear-out with upward hole	1
3	East	Ivy branches wrapped around oak tree	2
4	North	Tear-out with large hole. Bird nest located right at base not near hole	1
5		Ivy covered tree leaning out onto site	2
6	S	Protruding knot-hole (donut formation)	1
7	S	A few trees down from 6. Split in branch (hollow looking), S facing hole	1
8	S	Ivy covered tree. Near 6 and 7	2
9	S	Ivy covered tree. Where SM2 is located	2
10	S	Oak near chalk pile with small hole (possibly woodpecker)	1
11	S	Branch with tear-out (hole underneath)	1
12	S	Ivy covered oak tree near entrance to site (east)	2
13		Ivy covered oak tree to the west of site entrance	1
14		Ivy covered oak tree to the west of site entrance / Loose bark	1
15		Ivy covered oak tree to the west of site entrance / Loose bark	1
16		Ivy covered oak tree to the west of site entrance / Loose bark	1
17		Ivy covered oak tree to the west of site entrance / Loose bark	1
18		Mature oak tree with ivy cladding and loose bark	2

19		Mature oak tree with ivy cladding and loose bark	2
20		Mature oak tree with ivy cladding and loose bark	2
21		Mature oak tree with ivy cladding and loose bark	2
22		Mature oak tree near road with ivy cladding and loose bark	1
23		Mature oak tree near road with ivy cladding and loose bark	1
24		Mature oak tree near road with ivy cladding and loose bark	1

*As classified in Table 8.4 BCT Guidelines

It is likely that breeding birds will use the areas of woodland for nesting as well as feeding. Skylark *Alauda arvensis* may nest in the field core. Common species of woodland and farmland birds could use the cereal stubble for foraging during the winter.

The woodlands and hedgerows in the area have the potential to support hazel dormouse *Muscardinus avellanarius*.

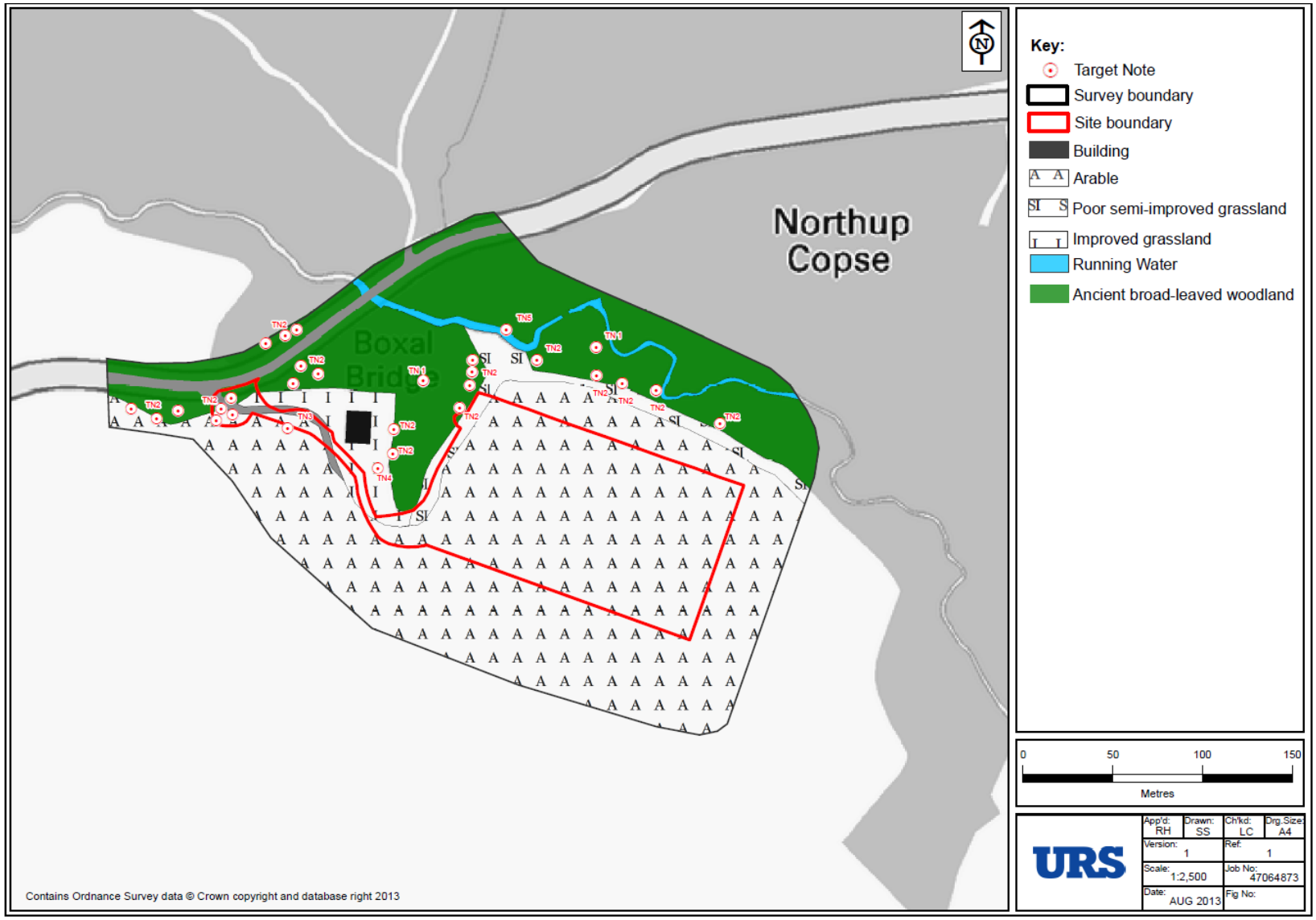
There is little suitable habitat for common reptile species; however, the soil heaps and the improved grassland if the sward could support low numbers of common reptiles, such as slowworms *Anguis fragilis*.

No evidence of otter *Lutra lutra* or water vole *Arvicola terrestris* was found (in the form of spraints, prints burrows or latrines).

6. SUMMARY AND RECOMMENDATIONS

Recommendations		
Item	**Rationale**	**Programme**
Consultation for The Mens SAC	The SAC designation provides for the control of potentially damaging operations, whereby consent from the planning authority may only be granted once it has been shown through Appropriate Assessment (AA) that the proposed operation will not adversely affect the integrity of the site.	Consultation with the Local Planning Authority and Natural England is recommended to determine whether screening for AA is needed.
Bat Survey	European protected species which could potentially be subject to disturbance from noise and light.	If trees that are to be removed/ disturbed have potential to support roosting bats then further surveys will be required. It is recommended that activity surveys are conducted to assess bat activity on and near to the site. Due to proximity to the SAC four visits should be conducted between April and September. Automated detectors should be placed in one location for at least three consecutive nights on four occasions between March and September.
Birds (avoidance of impacts)	Vegetation clearance could destroy the active nests of birds and/or kill or injure birds.	Vegetation clearance to be carried out during winter (October to February) to avoid impacting nesting birds. If this is not possible, then a survey to check for nesting birds will be conducted prior to works. If nesting birds are present any active nests should be protected until the young have fledged.
Dormouse Survey	Cutting of hedges or trees which may destroy or fragment habitat could have adverse effects on this European Protected Species.	Nut searches and a nest tube survey may be necessary if the ancient woodland is directly impacted or high levels of disturbance are predicted.
Badger Monitoring	Disturbance to this species during construction or operation.	All setts should be monitored to evaluate the extent of the badgers use.
Common Reptiles (avoidance of impacts)	Possible killing or injury of protected species during site clearance.	If any habitats suitable for reptiles is to be disturbed or remove, this will be undertaken under the supervision of a qualified ecologist who can move any reptiles to a safe location.

Figure 1. Phase 1 Map



Appendix 7.2

URS

Wisborough Green-1

APPENDIX 7.2: Protected Species Report

August 2013

Prepared for:
Celtique Energy Weald Limited

UNITED KINGDOM & IRELAND

REVISION RECORD					
Rev	**Date**	**Details**	**Prepared by**	**Reviewed by**	**Approved by**
1	August 2013	Final	LG Senior Ecologist	RH Principal Environmental Consultant	EH Principal Ecologist

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The conclusions and recommendations contained in this Report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested and that such information is accurate. Information obtained by URS has not been independently verified by URS, unless otherwise stated in the Report.

The methodology adopted and the sources of information used by URS in providing its services are outlined in this Report. The work described in this Report was undertaken between **April and July 2013** and is based on the conditions encountered and the information available during the said period of time. The scope of this Report and the services are accordingly factually limited by these circumstances.

Where assessments of works or costs identified in this Report are made, such assessments are based upon the information available at the time and where appropriate are subject to further investigations or information which may become available.

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Where field investigations are carried out, these have been restricted to a level of detail required to meet the stated objectives of the services. The results of any measurements taken may vary spatially or with time and further confirmatory measurements should be made after any significant delay in issuing this Report.

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1. INTRODUCTION

1.1 Background

URS Infrastructure and Environment UK Ltd. (URS) was commissioned by Celtique Energy Weald Limited to carry out protected species surveys at a site located in West Sussex in support of a planning application.

The site comprises an area of approximately 1.56 hectares (ha) of land to the north-west of Wisborough Green, West Sussex (hereafter referred to as 'the site') and is centred on Ordnance Survey (OS) grid reference TQ 035 267. The proposed site is situated within an arable field in land south of Boxal Bridge off Kirdford Road.

The Proposed Development comprises the siting and construction of a temporary well site including access track and ancillary infrastructure, for the exploration, testing and evaluation of hydrocarbons.

Habitats identified within the survey area include ancient woodland which lies to the north and west of the site. An arable field forms the main onsite habitat and is bounded by semi-improved grassland field margins which are in turn bordered by ancient woodland to the north, east and south. The proposed access route for the site is planned off Kirdford Road and runs through the arable field and would require the removal of two soil heaps.

The purpose of this report is to inform a planning application for the site and to identify and quantify ecological constraints that might arise as a result of the proposals.

1.2 Scope of Work

Following an extended Phase 1 habitat survey of the site undertaken by URS in March 2013[1], the potential for a number of protected/notable species was noted and recommendations for more detailed survey made. These surveys include:

- Bat habitat assessment;
- Bat activity survey;
- Bat static surveys;
- Badger survey;
- Otter and Watervole survey;
- Dormouse habitat assessment, and;
- Reptile habitat assessment.

This document serves to report the findings of the above suite of surveys undertaken between April and July 2013.

1.3 Planning and Legislative Context

1.3.1 Planning Context

This section reviews wildlife legislation that is considered relevant to the site and its specific ecology. In addition, the national, regional and local planning policy requirements that were considered relevant to the site in relation to ecology are addressed.

1.3.2 National Planning Policy Framework

The National Planning Policy Framework (NPPF)[2] states that the planning system should contribute to and enhance the natural and local environment by minimising impacts on biodiversity and providing net gains in biodiversity where possible, including by establishing coherent ecological networks that are more resilient to current and future pressures. The NPPF should be read in conjunction with the Government Circular: Biodiversity and Geological Conservation, ODPM Circular 06/2005[3].

1.3.3 UK Post-2010 Biodiversity Framework

This document[4] sets a broad enabling structure for action across the UK between now and 2020, including a shared vision and priorities for UK-scale activities to help deliver the Aichi targets and the EU Biodiversity Strategy. A major commitment by Parties to the Convention of Biological Diversity is to produce a National Biodiversity Strategy and/or Action Plan.

The UK Post-Development Framework is relevant in the context of Section 40 of the Natural Environment and Rural Communities (NERC Act) 2006[5], meaning that Priority Species and Habitats are material considerations in planning. These habitats and species are identified as those of conservation concern due to their rarity or a declining population trend. Fifty-six habitats of principal importance are included on the list and include terrestrial habitats such as upland hay meadows to lowland mixed deciduous woodland, and freshwater and marine habitats such as ponds and sub tidal sands and gravels. There are 943 species of principal importance included on the list.

1.3.4 Chichester Local Biodiversity Action Plan

The Local Biodiversity Action Plan (LBAP) for Chichester District is a strategic document bringing together the Council's planned activities to protect our local biodiversity, as well as proposing new areas of activity such as habitat improvements to some of the Biodiversity Opportunity Areas identified by the wider Sussex Biodiversity Action Plan.

1.4 Relevant Legislative Context

The major pieces of legislation relating specifically to the protection of wildlife and nature conservation are as follows:

- The Wildlife and Countryside Act 1981 (as amended) (WCA) [6];
- The Countryside and Rights of Way (CRoW) Act 2000 (as amended) [7];
- NERC Act 2006; and
- The Conservation of Habitats and Species Regulations 2010 (as amended) (Habitats and Species Regulations)[8].

Explanatory notes relating to species that may be of relevance to the site and protected under The Conservation of Habitats and Species Regulations 2010 (as amended) and the Wildlife and Countryside Act 1981 (as amended) are given below.

1.4.1 Bats

All bat species found in the UK are fully protected under the WCA and The Conservation of Habitats and Species Regulations 2010 (as amended), which together make it an offence to intentionally or deliberately capture, kill or injure or disturb bats (whether in a roost or not), and intentionally or recklessly damage, destroy or obstruct access to their roosts.

The following species of bat are listed as species of Principal Importance in England: noctule *Nyctalus noctula*, barbastelle *barbastella barbastellus*, Bechstein's bat *Myotis bechsteinii*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared *Plecotus auritus,* lesser horseshoe *Rhinolophus hipposideros* and greater horseshoe *Rhinolophus ferrumequinum*.

1.4.2 Badger

The Protection of Badgers Act 1992[9] protects badgers against killing, injury or taking. Badger setts are also protected against damage, destruction or obstruction and it is illegal to disturb a badger *Meles meles* whilst it is in its sett.

1.4.3 Dormouse

Dormouse *Muscardinus arvellanarius* is fully protected through its inclusion under Schedule 5 of the WCA 1981 (as amended) and in Schedule 2 of The Conservation of Habitats and Species Regulations 2010 (as amended). Under the legislation, it is an offence to intentionally kill, injure or take a dormouse as well as intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a dormouse or disturb an animal while it is occupying a structure or place which it uses for that purpose.

1.4.4 Reptiles

All common reptiles in the UK, i.e. slow-worm *Anguis fragilis*, common lizard *Zootoca vivipara*, adder *Vipera berus* and grass snake *Natrix natrix*, are listed on Schedule 5 of the WCA 1981 (as amended) in respect of Sections 9(1) and 9(5) which makes it an offence to intentionally kill, injure or sell the animals.

1.4.5 Otter and Watervole

Otter and water voles are both fully protected under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended) due to the protection afforded to their places of shelter and protection. They are afforded protection under Section 9 parts 4(a) and 4(b). This makes it an offence to:

- Intentionally kill, injure or take these species;
- Possess or control live or dead these species or derivatives;
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection;
- Intentionally or recklessly disturb these species whilst occupying a structure or place used for that purpose;
- Sell these species or offer or expose for sale or transport for sale; and
- Publish or cause to be published any advertisement which conveys the buying or selling of these species.

The otter is also classified under the Habitats Directive (92/43/EEC) as a species requiring special protection in Europe. In the UK this is enabled by the Conservation of Habitats and Species Regulations 2010 (as amended). In effect this legal protection makes it an offence to intentionally or recklessly:

- Kill, take or injure and otter;
- Damage destroy or obstruct access to a place of shelter; and

- Disturb an otter whilst using such a place.

Otter and water vole are also identified as a Priority Species under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

1.4.6 Other Mammals

All wild mammals, including red fox, are protected by the Wild Mammals (Protection) Act 1996[10], which makes it an offence to intentionally cause any wild mammal unnecessary suffering.

2 METHODOLOGY

2.1 Bat Habitat Suitability Assessment

A preliminary assessment of the site was undertaken as part of the extended Phase 1 survey in March 2013. This was intended to identify potential roost sites, foraging habitat and navigational routes for bats that may be impacted by the scheme.

A number of trees of potential suitability for roosting bats are located within the survey area. However, only those due to be directly or indirectly impacted by the proposed scheme (i.e. where the tree is to be removed, subject to management measures or where it may be affected by disturbance such as lighting), were scoped into detailed survey works. These trees were then assessed for their potential to support roosting bats in reasonable accordance with Natural England[11] and Bat Conservation trust (BCT) [12].

This assessment of roost potential of trees located on the site was based on the following scale.

- Confirmed roosting - Evidence indicates the buildings or trees are used by bats, e.g. bats seen roosting or observed flying from a roost or freely in the habitat; droppings, carcasses, feeding remains, etc. found; and/or bats heard 'chattering' inside on a warm day or at dusk and bats recorded/observed using an area for foraging or commuting.
- Category 1* – Buildings or trees with features of particular significance for roosting bats, habitat of high quality for foraging bats e.g. broadleaved woodland, tree-lined watercourses and grazed parkland and the Site is connected with the wider landscape by strong linear features that would be used by commuting bats e.g. river/stream valleys or hedgerows, Site is close to known roosts;
- Category 1 - Several potential roosting features in the buildings or trees, habitat could be used by foraging bats e.g. trees, shrub, grassland or water and the Site is connected with the wider landscape by linear features that could be used by commuting bats e.g. lines of trees and scrub or linked back gardens;
- Category 2 – A small number of potential roosting features, isolated habitat that could be used by foraging bats, e.g. a lone tree or patch of scrub but not parkland and an isolated Site not connected by prominent linear features (but if suitable foraging habitat is adjacent it may be valuable if it is all that is available); and
- Category 3 - No features that could be used by bats (for roosting, foraging or commuting).

Linear landscape features and habitats such as verges and hedgerows were also identified and assessed for their potential to support foraging and commuting bats. Landscapes with a good diversity of semi-natural habitats that could provide bats with an important foraging

resource, sheltered conditions and good “flight lines” are particularly important for a number of bat species.

2.2 Bat Survey

Bat activity surveys were undertaken in May, June and July 2013 in line with BCT guidelines. On 13th May and 22nd July, pre-designated transect routes were walked at dusk and all bat activity was identified with the aid of electronic bat detectors and recorded on a scale map of the site. Furthermore, a dusk/pre-dawn survey was conducted on 11th-12th June 2013. The dates, times and weather conditions for each survey visit are presented on Table 1. The activity surveys commenced in May (due to the cold weather in earlier months) and involved two suitably qualified ecologists walking the linear features and stopping at eight vantage points for ten minutes along the transect (Figure 7.2.1) to record and assess any activity. The transects were walked from 15 minutes prior to sunset and for two hours following sunset. For the dawn survey the transect was walked for two hours prior to sunrise. The transect was reversed during the dawn survey and July transect and incorporated a walked line through the arable field.

These surveys will continue once a month until September and include a dusk and pre-dawn survey following BCT guidance.

In addition to the transect surveys, static bat detectors (Wildlife Acoustic SM2) were left at up to five different locations for up to seven consecutive nights each month. The detectors were programmed to record bat activity at their locations between half an hour before dusk and half an hour after dawn during the survey period. At the end of the survey, all bat registrations were uploaded and analysed using the bat sound analysis software Analook. Table 2 presents the dates and locations of the static bat detector survey. The recordings aim to support identification of the bat species (or genera) present, and to quantify the indices of activity (e.g. bat passes/hour) on the site during the surveys.

Transect routes and static detector locations are presented on Figure 7.2.1.

Table 1: Dates and weather of the bat activity survey visits

Survey Visit	Date	Sunset/ Sunrise	Start	Finish	Weather
Survey 1	13/05/13	20:41	20:15	22:40	Dry, warm (~14°C), with 50% cloud cover and still at survey start
Survey 2 (Dusk/dawn)	10/06/13 11/06/13	21:15 04:46	21:00 02:45	23:15 04:50	Clear, dry (~14°C) with 45% cloud cover and still at survey start.
Survey 3	22/07/13	21:03	20:45	23:03	Clear, dry (~25°C) with 10% cloud cover and still

Table 2: Dates and locations of static detector bat detectors

Month	Location	Start Date	Finish Date	Grid Reference
April	Location 1- Within tree located along north western edge of woodland pointing south east.	16/04/13	20/04/13	TQ 03641 26743
April	Location 2- Along northern edge of	16/04/13	20/04/13	TQ 03720

	woodland pointing south within ivy covered tree.			26784
April	Location 3- Within tree eastern edge of woodland pointing west.	16/04/13	20/04/13	TQ 03878 26623
April	Location 4- On southernmost corner of field corner within hedgerow pointing south.	16/04/13	20/04/13	TQ 03862 26530
May	Location 1- Within tree located along north western edge of woodland pointing south east.	01/05/13	07/05/13	TQ 03641 26743
May	Location 2- Along northern edge of woodland pointing south within ivy covered tree.	01/05/13	07/05/13	TQ 03720 26784
May	Location 3- Within tree eastern edge of woodland pointing west	01/05/13	07/05/13	TQ 03878 26623
May	Location 4- On southernmost corner of field corner within hedgerow pointing south.	01/05/13	07/05/13	TQ 03862 26530
June	Location 1- Within tree located along north western edge of woodland pointing south east.	01/06/13	05/06/13	TQ 03641 26743
June	Location 2- Along northern edge of woodland pointing south within ivy covered tree.	01/06/13	05/06/13	TQ 03720 26784
June	Location 5- Along Hedgerow to the south pointing eastward.	11/06/13	17/06/13	TQ 03915 26464
July	Location 1- Within tree located along north western edge of woodland pointing south east.	22/07/13	28/06/13	TQ 03641 26743
July	Location 2- Along northern edge of woodland pointing south within ivy covered tree.	22/07/13	28/06/13	TQ 03720 26784
July	Location 3- Within tree eastern edge of woodland pointing west	22/07/13	28/06/13	TQ 03878 26623
July	Location 4- On southernmost corner of field corner within hedgerow pointing south.	22/07/13	28/06/13	TQ 03862 26530

2.3 Badger Survey

A badger survey was undertaken at Wisborough Green on 16th April 2013 and checks made on subsequent visits in May and June 2013. The site was surveyed following the methodologies of Harris, Cresswell & Jefferies (1989)[13], whereby the site was systematically

searched, for setts and other signs of badger activity, such as spoil, latrines, bedding material, paths, footprints, hairs and feeding signs (holes in the ground and scrapes in the soil). Each sett found was assigned to one of four sett categories (main, annexe, subsidiary and outlying) and the number of disused, partially-used, and well-used holes recorded (See below).The status of the entrances of any setts was assessed according to Roper 2010[14]. The results of the Badger Survey are detailed within a confidential Appendix 2.

- **Main setts**-These are in continuous use; they are large, well-established, often extensive and may have large spoil heaps outside the entrances. There are likely to be well-worn paths leading to the sett. It is where the cubs are most likely to be born. There is generally only one main sett per social group of badgers. Main setts are usually built in very specific positions, where there is the right combination of soil (to facilitate drainage and ease of digging), aspect, slope and cover. Since suitable sett sites are at a premium, main setts are usually long-established, and may have been in use for many years. The average number of holes for a main sett is 15.
- **Annexe setts**-These occur in close association with the main sett (usually within 150m), and are linked to the main sett by clear well-used paths. Annexe setts consist of six holes on average, but they are not necessarily in use all the time, even if the main sett is very active. If a second litter of cubs are born, this may be where they are reared.
- **Subsidiary setts**-These comprise five holes on average, but are not in continuous use and are usually some distance from the main sett (50m or more). There is no obvious path connecting them to the main sett and their 'ownership' can often only be determined by bait-marking.
- **Outlying setts**-These consist of only one or two holes. They can be found anywhere within the territory and usually have small spoil heaps, indicating that they are not very extensive underground. There are no obvious paths connecting them to other setts, they are only used sporadically and often used by foxes or rabbits when not occupied by badgers.

The size, status and level of activity of each sett can be assessed by counting the number of entrance holes. The degree of use of each entrance hole can then be classified as follows:

- **Well-used holes**-These are clear of any debris or vegetation, are obviously in regular use, and may or may not have been excavated recently.
- **Partially-used holes**-These are not in regular use and have debris such as leaves and twigs in the entrance, or have moss and/or other plants growing in or around the entrance. They could be in regular use after a minimal amount of clearance.
- **Disused holes**-These have not been in use for some time, are partially or completely blocked, and could not be used without a considerable amount of clearance. If the hole has been disused for some time, all that may be visible is a depression in the ground where the hole used to be, and the remains of the spoil heap, which may be covered in moss or plants.

In addition to their setts, badgers occasionally lie-up above ground in small depressions lined with dry grass and leaves, usually under a fallen log or dense patch of bramble. These are termed 'day nests', although it is uncommon for badgers to occupy them during the day; the animals more often use them as shelter for short periods during the night. These structures are not usually given the legal protection afforded to setts.

2.4 Dormouse Habitat Assessment Survey

An initial survey for dormice, to determine potential presence, involved a search for characteristically-chewed hazel nuts using the standard surveying technique[15] (Bright et al,

2006). The surveyor searched five 10m by 10m areas associated with hazel trees and especially below the hazel canopy, for a total of 20 minutes each for at least 100 nuts opened by small rodents, or until positive evidence was found. This survey was carried out within the woodland and its edge on the 16th April 2013. An assessment of the habitat suitability was also made during this time.

2.5 Reptile Habitat Assessment Survey

A reptile habitat assessment survey of the site was undertaken during the extended Phase 1 survey, in accordance with National Amphibian and Reptile Recording Scheme NARRS guidance[16] and Natural England's Standing Advice Species Sheet for Reptiles[17].

This survey evaluates key features such as vegetation structure, extent, aspect, topography, connectivity and site history in identifying the level of suitability of the site for reptiles.

2.6 Otter Survey

The survey methodology concentrated on observations for field signs indicating otter presence or use and was carried out in accordance with guidance provided by Chanin (1993)[18]. Such field signs include:

- **Spraints** - Otter faeces usually identified by its tar-like appearance with fish scales/bones present. Old spraints can be grey and crumbly crumbling to ash.
- **Footprints** - Easily identified in a muddy substrate with the print consisting of an asymmetrical shape with five toes (not splayed).
- **Feeding remains** - Shells of crayfish, parts of fish, eels.
- **Slides** - Flattened patches of vegetation entering/exiting the water side often beneath scrub or similar cover.
- **Holts** - Can be discovered along the embankment or away from the water course (especially natal holts). At least one entrance usually under the water surface making identification difficult.

2.7 Watervole Survey

- Surveys were undertaken using the standard methodologies of Strachan and Moorhouse (2006)[19]. This involved searching within at least 5m of the banks of the water course for evidence of water vole activity, including:
- **Latrine sites** - distinct accumulations of water vole faeces found near nest sites, at the ranges of their territorial boundaries and where the animals enter and leave the water.
- **Feeding stations** - areas with distinct neat piles of chewed lengths of vegetation along their pathways.
- **Burrows** - Entrances are typically wider than they are high with a diameter 4 - 8cm usually located at the water's edge.
- **Lawns** - short grazed areas at the entrance of the burrow.
- **Prints** - clear prints in exposed areas of the watercourse.
- **Runways** - Pathways that are identifiable through soft vegetation commonly connected to burrows or feeding stations.

2.8 Limitations

All surveys with the exception of the dormouse nut search were undertaken at an optimal time of year for the species specific survey (March April – September). Although the nut search was carried out during a sub optimal part of the season hazel nuts can persist on the forest floor for over a year and 100 chewed nuts were collected. Additionally a prolonged cold snap during March is likely to have delayed species emergence and potentially skewed surveys. As such surveys were adjusted where possible to take this into account. The level of survey was considered to be sufficient to assess the suitability of the site to support protected and notable species and therefore reasonably confirms the conditions present on site.

During the initial static surveys the static SM2 recorder at location 3 did not record due to a technical fault in the equipment.

3 RESULTS

3.1 Bat Survey

3.1.1 Desk Study Data

Seven species of bats were recorded within 2km of the site and include: brown long-eared bat *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus*, Daubenton's bat *Myotis daubentonii*, Bechstein's *Myotis bechsteinii* and noctule *Nyctalus noctula*, serotine *Eptesicus serotinus* and barbastelle bats *Barbastella barbastellus*. Furthermore, barbastelle bats are a qualifying feature for The Mens SAC which lies approximately 0.6km to the south of the site. The closest identified roost was recorded as an unspecified roost recorded 0.91km north west of the site in 1995. The closest non roost record was identified as a Daubentons bat approximately 0.21km north of the site in 2009. Table 3 below identifies the closest bat records to the site within a 5km radius over the past 20 years.

Table 3: Locations of closest bat Species Records

Bat Species	Grid Reference	Approximate Distance From Site (km)	Date recorded	Type of record
Barbastelle *Barbastella barbastellus*	TQ033249	1.80 south west	2008	Unspecified Roost
Barbastelle *Barbastella barbastellus*	TQ0247023555	3.32 south west	2004	Mating Roost
Barbastelle *Barbastella barbastellus*	TQ0248523769	3.11 south west	2004	Maternity Roost
Barbastelle *Barbastella barbastellus*	TQ0325	1.76 south west	2001	In flight
Bat sp	TQ046259	1.34 south east	2005	In flight
Bat sp	TQ028265	0.92 west	1999	Unspecified Roost

Bat Species	Grid Reference	Approximate Distance From Site (km)	Date recorded	Type of record
Serotine *Eptesicus serotinus*	TQ0353026890	0.25 north west	2009	In flight
Serotine *Eptesicus serotinus*	TQ032229	3.85 south	1995	Unspecified Roost
Myotis sp	TQ084246	5.00 south east	2010	In flight
Myotis sp	TQ070300	4.63 north east	2004	Unspecified roost
Bechstein's *Myotis bechsteinii*	TQ0310024840	1.90 south west	2009	In flight
Bechstein's *Myotis bechsteinii*	SU983258	5.00 east	1999	Maternity Roost
Brandt's *Myotis brandtii*	TQ030245	2.24 south west	2004	In flight
Daubenton's *Myotis daubentonii*	TQ0353026890	0.21 north	2009	In flight
Whiskered *Myotis mystacinus*	TQ0304024550	2.18 south west	2009	In flight
Whiskered *Myotis mystacinus*	TQ030245	2.24 south west	2001	In flight
Natterer's *Myotis nattereri*	TQ0304024550	2.18 south west	2009	In flight
Natterer's *Myotis nattereri*	TQ019234	3.65 south west	2007	Dead Bat
Natterer's *Myotis nattereri*	TQ047311	4.57 north east	1997	Unspecified Roost
Noctule *Nyctalus noctula*	TQ01122438	3.32 south west	2009	Maternity Roost
Noctule *Nyctalus noctula*	TQ023252	1.92 south west	2000	In flight
Pipistrelle sp	TQ018265	1.71 west	2005	Unspecified Roost
Pipistrelle sp	TQ023252	1.92 south west	2000	In flight
Pipistrelle sp	TQ055258	2.19 south east	1995	Grounded bat
Pipistrelle sp	TQ006264	2.90 west	1993	Hibernation Roost

Bat Species	Grid Reference	Approximate Distance From Site (km)	Date recorded	Type of record
Common Pipistrelle *Pipistrellus pipistrellus*	TQ012275	2.65 north west	2010	Dead Bat
Common Pipistrelle *Pipistrellus pipistrellus*	TQ0353026890	0.31 north west	2009	In flight
Common Pipistrelle *Pipistrellus pipistrellus*	TQ014278	2.58 north west	2009	Unspecified Roost
Soprano Pipistrelle *Pipistrellus pygmaeus*	TQ037235	3.12 south	2009	Unspecified Roost
Soprano Pipistrelle *Pipistrellus pygmaeus*	SU98362825	5.00 north west	2009	Maternity Roost
Soprano Pipistrelle *Pipistrellus pygmaeus*	TQ011285	3.20 north west	2009	In flight
Brown long eared sp	TQ084246	5.00 south east	2010	In flight
Brown long eared sp	TQ014278	2.58 north west	2009	Feeding Roost
Brown long eared sp	TQ082277	4.61 north east	2005	Unspecified Roost
Brown long eared *Plecotus auritus*	TQ060278	2.57 north east	2009	Maternity and Hibernation Roost
Brown long eared *Plecotus auritus*	TQ027249	1.99 south west	2008	Dead bat
Brown long eared *Plecotus auritus*	TQ0325	1.77 south west	2001	In flight
Brown long eared *Plecotus auritus*	TQ028268	0.91 north west	1995	Unspecified Roost

3.1.2 Habitat Description and Suitability

The site consists of a mix of species-poor semi-improved grassland, semi-natural broadleaved woodland, scrub, tall ruderals and running water in the form of Boxal Brook. A number of woodland rides and hedgerows provide linkage of the wood to the north of the site (Northup

Copse) and woodland blocks to the south (Nonesuch Copse) providing potential foraging and commuting corridors. These linear features also connect other areas in the wider context such as the Arun Valley and floodplain further east, a complex of woodland blocks to the north and along the Kird River flowing west to east. A number of small urban conurbations are located in the vicinity of the survey area, namely Wisborough Green and Kirdford linked by Kirdford Road.

A study of aerial photography and maps in combination with a scoping survey of the site carried out in April 2013 indicated that the majority of the site is made up of arable land with woodland habitats surrounding the site to the north and east. This ancient woodland habitat could have the potential to contain bat roosts, particularly where mature trees are present. There are no buildings that could be used by roosting bats within the survey area.

There is potential for the linear watercourse and woodland edges to be utilised by commuting and foraging bats. This potential is greatest in areas where there is linear woodland or where grassland vegetation is located adjacent to the woodland edge such as the shelter belt to the north east of the site and to the south east of the survey area where habitat mix is greatest.

3.1.3 Bat Activity Survey

Two suitably qualified bat surveyors (Licence Number CLS02849) visited the site on 13th May 2013 to conduct the first transect survey. During this survey two barbastelle bats were seen flying westwards along the tree line north of the site, and then turning sharply and returning easterly. No foraging behaviour was noted during the survey but the bats were seen to be flying low (approximately 2m above the ground) above the grassland edge of the arable field. These bats were recorded at 21:56 hours, approximately 1hr and 15 minutes following sunset. The first bat recorded during this survey occurred at 21:14 hours, approximately 33* minutes after sunset, and was identified as a soprano pipistrelle recorded commuting northwards towards Northup Copse. No bats were recorded along the arable field section of the transect. A summary of the bat activity for May is shown on Figure 7.2.2a.

The second survey consisted of a dusk and pre-dawn survey and was undertaken by two suitably qualified ecologists between 11th and 12th June 2013. During this survey bat activity levels were relatively high with a total of 87 bat passes recorded consisting of at least three species of bat. No barbastelle were recorded during this survey, however, two *Myotis sp* were recorded at 22:43 hours and at 03:42 hours respectively. The first bat recorded was identified as a soprano pipistrelle at 21:45 hours, approximately 40 minutes after sunset. The last recording was at 03:59 hours consisting of two soprano pipistrelle bats. This occurred at approximately 47 minutes prior to sunrise. Foraging behaviour was recorded predominately in the south-east portion of the transect. No bats were recorded within the walked section through the arable field part of the transect. Figure 7.2.2b shows the locations of bat activity recorded during this survey.

The third survey consisted of a dusk survey undertaken on the 22nd July 2013. During this survey bat activity was concentrated along the woodland edge in the southern part of the transect. A total of 30 bat passes were recorded consisting of at least two species of bat including common pipistrelle and an unidentified pipistrelle species. The majority of passes were identified as common pipistrelle. No barbastelle or *Myotis* species were recorded during this survey. The first bat recorded was identified as a common pipistrelle at 21:45 hours, approximately 42 minutes after sunset. Feeding behaviour was noted predominately in the south-east portion of the transect. No bats were recorded within the walked section through the arable field part of the transect. The activity recorded during this survey is summarised within Figure 7.2.2c.

The results of this survey are summarised below in Table 4.

Table 4: Summary of bat activity surveys

Transect Visit	Number of bat passes recorded						
	Common pipistrelle	Soprano pipistrelle	*Pipistrelle species*	*Myotis species*	*Barbastelle*	Un-identified	**TOTAL**
Transect Visit 1 13/05/13	6	20	0	0	2	0	**28**
Transect Visit 2 11/06/13	38	13	34	2	0	0	**87**
Transect Visit 3 22/07/13	28	0	2	0	0	0	**30**

3.1.4 Bat Static Survey

April

Static detectors were set out and left to record for the period 16th to 20th April 2013. The prevalent weather during this time was cool temperatures with an average maximum of 12°C and a minimum of 6°C and low levels of precipitation. A total of 307 bat passes were recorded for the site with 52% of those records occurring at location 2 (Figure 7.2.3). A further 38% of the passes were recorded at location 4. The lowest number of bat passes per hour occurred at location 1 with an average of 1.13 passes recorded per hour. At least four species of bat were recorded across the site during the April static detector survey with the highest proportion consisting of common pipistrelle. Twenty-two barbastelle passes were recorded at location 4 which was the southern-most point of the survey area. Barbastelle were not recorded at any other of the static detector locations. *Myotis sp*. were only recorded at location 2 on 19th April during the period of survey. No bats were recorded at location 1 and 4 on the 18th April.

The earliest call relative to sunrise occurred at 20:30 hours on the 19th of April identified as a common pipistrelle at location 4. This record occurred approximately 26 minutes following sunset. The earliest barbastelle pass was recorded at 21:22 hours on the 19th April, approximately 1 hour and 18 minutes following sunset. A summary of the barbastelle activity recorded during the April static survey is given in Table 5. The static situated at location 2 was the only detector to record activity over the whole survey period in April.

Table 5: Summary of barbastelle static data for April

Date	Sunset/Sunrise Time	First Recording	Last Recording	No. of Passes
16/04/13	20:00 hours	23:54 hours	23:54 hours	1
17/04/13	06:03/20:01 hours	Continuing from 23:54 hours	03:07 hours	7

Date	Sunset/Sunrise Time	First Recording	Last Recording	No. of Passes
18/04/13	06:01/20:03 hours	N/A	N/A	0
19/04/13	05:59/20:04 hours	21:22 hours	23:51 hours	11
20/04/13	05:57/20:06 hours	00:15 hours	00:58 hours	3

May
Static detectors were set out and left to record for the period 1st of May through to the 7th May. The weather conditions during this week were dry with an average wind speed of 12km/h. Peak temperature was 23°C on the 3rd of May with the lowest night time temperature being 4°C on the 2nd of May. A total of 1061 passes were recorded across the survey area with the highest proportion consisting of common pipistrelle, making up 51% of records. Soprano pipistrelle made up 24% of records. One hundred and eighty-five barbastelle passes were recorded during May with all but one record occurring at location 3. The passes logged at location 3 were spread throughout the week with 37 recorded on the 1st, 23 passes recorded on the 2nd, 13 passes recorded on the 3rd, with no barbastelle passes identified on the 4th of May. Six passes were logged on the 5th with 48 and 57 passes recorded on the 6th and 7th respectively. A high proportion of *Myotis* sp. passes were recorded during this month with *Myotis* identified at locations 1, 2 and 3. Some of the calls at location 1 were identified as daubentons, a common *Myotis* species closely associated with riverine habitats. The highest rate of bat passes per hour occurred at location 3 with an average of over 14 passes per hour. The lowest rate of passes occurred at location 4.

The earliest bat recorded relative to sunset was a common pipistrelle recorded 34 minutes after sunset at location 4. The earliest barbastelle was recorded at 21:03 hours on the 1st May, approximately 39 minutes following sunset. A summary of barbastelle activity across the site is shown below in table 6.

Table 6: Summary of barbastelle static data for May

Date	Sunset/Sunrise	First Recording	Last Recording	No. of Passes
01/05/13	05:36/20:24 hours	21:03 hours	22:42 hours	37
02/05/13	05:32/20:27 hours	21:08 hours	22:18 hours	23
03/05/13	05:32/20:27 hours	21:39 hours	22:53 hours	13
04/05/13	05:30/20:28 hours	0	0	0
05/05/13	05:29/20:30 hours	21:07 hours	23:48 hours	6

Date	Sunset/Sunrise	First Recording	Last Recording	No. of Passes
06/05/13	05:27/20:32 hours	(00:02 hours end of previous night) 21:15 hours	22:28 hours	48
07/05/13	05:25/20:33 hours	21:14 hours	23:08 hours	56
08/05/13	05:23/20:35 hours	03:00 hours (end of previous night)	N/A	1

June
Static detectors were set out and left to record for the period 1st June to the 5th.Over the five day survey period two static detectors were placed out at locations 1 and 2 only. The weather conditions during this survey were predominately dry with an average wind speed of 20km/h. A further detector was placed at location 5 for seven days from the 11th to the 17th of June. The lowest temperature during the June survey was 6°C on the 3rd June and 5°C on the 14th June respectively.

A total of 1086 bat passes were recorded at location 2 with common pipistrelle, soprano pipistrelle and pipistrelle species making up 95% of the records. The 1st June had the most bat passes with an unidentified pipistrelle recorded earliest at 21:26 hours. This was approximately 20 minutes after sunset. A soprano pipistrelle was the last recorded bat on the first dawn at 04:20 hours, approximately 30 minutes before sunrise. The detector placed at location 5 only recorded two soprano pipistrelle bats during the survey period. Five *Myotis* species were recorded primarily at location 2 with a single pass recorded at location 1. A total of four barbastelle were recorded, the earliest of which occurred at 22:35 hours on the 2nd June. This was approximately 1 hour and 28 minutes after sunset.

July
Static detectors were set out and left to record for the period 22nd to 28th July. The prevalent weather during this time was warm temperatures with an average maximum of 22°C and a minimum of ~14°C and low levels of precipitation (consisting of short rain showers).

A total of 3339 bat passes were recorded for the site with 49% of those records occurring at location 4. A further 19% of the passes were recorded at location 2. The lowest number of bat passes per hour occurred at location 1 with an average of 13.81 passes per hour. At least four species of the bat were recorded across the site during the July static detector survey with the highest proportion consisting of common pipistrelle. No barbastelle passes were recorded throughout the July static survey period. *Nyctalus* bats including a single noctule and five Leisler's bat *Nyctalus leisleri* passes were recorded for the first time on site with a Leisler's bat pass recorded at location 2 and both species identified at static location 4. The earliest record of a *Nyctalus* species was identified as a noctule on the 23rd July at 21:57 hours at location 4. This record was approximately 57 minutes after sunset. *Myotis* sp. were recorded across the site at all locations during the July survey period.

Overall there was an increase in the total number of bat passes during this survey and this is likely to reflect the increase in activity during the core maternity period for bats.

Summary

In summary, during the April Static survey at least five species of bat were recorded including common pipistrelle, soprano pipistrelle, barbastelle, Daubenton's and *Myotis*. The highest pass rate was recorded at location 2 with 5.78 passes per hour and the lowest rate was recorded at location 1 with 1.13 passes per hour.
The May static survey identified at least five species of bat including common pipistrelle, soprano pipistrelle, barbastelle, Daubenton's and *Myotis.* The highest pass rate was recorded at location 3 with 14.29 passes per hour and the lowest rate was recorded at location 4 with 0.96 passes per hour.
During June the highest pass rate was recorded at location 2 with 39.49 passes per hour. The lowest pass rate was recorded at location 5 with 0.05 passes per hour. At least four species of bat were recorded including common pipistrelle, soprano pipistrelle, barbastelle and *Myotis*.
In July, species diversity remained the same with at least four species recorded. Species identified during this survey included common pipistrelle, soprano pipistrelle, *Myotis* and *Nyctalus* bats. The highest pass rate was recorded at location 4 with 52.38 passes per hour whilst the lowest pass rate was recorded at location 1 with 13.81 passes per hour.
This data is summarised with Table 7 below.

Table 7: Summary of bat static surveys

Static location	Number of bat passes recorded								
	Common pipistrelle	Soprano pipistrelle	*Pipistrelle species*	*Myotis species*	*Barbastelle*	*Unidentified*	*Nyctalus sp.*	**Pass/ Hour**	**TOTAL**
April Static Location 1	20	3	5	0	0	3	0	**1.13**	**31**
April Static Location 2	147	4	0	6*	0	2	0	**5.78**	**159**
April Static Location 3	N/A	N/A	N/A	N/A	N/A	N/A	0	**N/A**	**N/A**
April Static Location 4	100	14	1	2	22	0	0	**4.25**	**117**
May Static Location 1	73	18	0	6*	1	0	0	**2.55**	**98**
May Static Location 2	218	138	10	10	0	0	0	**9.77**	**376**
May Static Location 3	247	98	0	21	184	0	0	**14.29**	**550**
May Static Location 4	35	2	0	0	0	0	0	**0.96**	**37**
June Static Location 1	160	15	26	1	3	22	0	**8.26**	**227**

* Note that some of the *Myotis* species recorded were identified as Daubenton's bat however *Myotis* bats can be difficult to identify to species level as positive identification of these species is problematic without visual observation of behaviour as well as audio detection.

Static location	Number of bat passes recorded								
	Common pipistrelle	Soprano pipistrelle	*Pipistrelle species*	*Myotis species*	*Barbastelle*	*Unidentified*	*Nyctalus sp.*	**Pass/ Hour**	**TOTAL**
June Static Location 2	453	431	144	4	1	53	0	**39.49**	**1086**
June Static Location 5	0	2	0	0	0	0	0	**0.05**	**2**
July Static Location 1	241	6	33	11	0	144	0	**13.81**	**435**
July Static Location 2	371	128	85	7	0	43	1	**28.22**	**635**
July Static Location 3	278	67	225	5	0	44	0	**19.65**	**619**
July Static Location 4	1062	149	347	10	0	77	5	**52.38**	**1650**

3.1.5 Bat Tree Assessment

An assessment of the trees adjacent to the site for their potential to provide roosting opportunities for bats was carried out by a licenced bat ecologist (Licence Number CLS02849) on the 30th April 2013. Fourteen trees supporting a number of suitable features for use by bats were identified, resulting in the trees being Category 1 in accordance with the BCT (2012) Guidelines. Ten trees with were also categorised as Category 2 in terms of roosting potential. The remaining trees located within the survey area were classified as Category 3 and identified as offering negligible roosting opportunities for bats are not included within this assessment. The details of the bat tree assessment are recorded within Table 8 below and locations shown in Figure 7.2.4.

Table 8: Summary of Tree Assessment Survey

Tree Reference	Feature	Evidence of roosting	Roost potential
1	Knot-hole on oak species tree	Not seen	1
2	Tear-out with upward hole	Not seen	1
3	Ivy branches wrapped around oak tree	Not seen	2
4	Tear-out with large hole. Bird nest located right at base not near hole	Not seen	1
5	Ivy covered tree leaning out onto site	Not seen	2

6	Protruding knot-hole (donut formation)	Not seen	1
7	A few trees down from 6. Split in branch (hollow looking), South facing hole	Not seen	1
8	Ivy covered tree. Close to tree 6 and 7	Not seen	2
9	Ivy covered tree.	Not seen	2
10	Oak near chalk pile with small hole (possibly woodpecker)	Not seen	1
11	Branch with tear-out (hole underneath)	Not seen	1
12	Ivy covered tree by entrance to site (east)	Not seen	2
13	Ivy covered oak tree to the west of site entrance	Not seen	2
14	Ivy covered oak tree to the west of site entrance / Loose bark	Not seen	2
15	Ivy covered oak tree to the west of site entrance / Loose bark	Not seen	2
16	Ivy covered oak tree to the west of site entrance / Loose bark	Not seen	2
17	Ivy covered oak tree to the west of site entrance / Loose bark	Not seen	2
18	Mature oak tree with ivy cladding and loose bark	Not seen	1
19	Mature oak tree with ivy cladding and loose bark	Not seen	1
20	Mature oak tree with ivy cladding and loose bark	Not seen	1
21	Mature oak tree with ivy cladding and loose bark	Not seen	1
22	Mature oak tree near road with ivy cladding and loose bark	Not seen	1
23	Mature oak tree near road with ivy cladding and loose bark	Not seen	1
24	Mature oak tree near road with ivy cladding and loose bark	Not seen	1

3.2 Dormouse

Due to the scarcity in numbers of hazel trees, only one hundred hazelnuts were collected within the woodland and edge habitat (Figure 7.2.5) to the west of the Site. An examination of

each nut by a suitably qualified ecologist revealed no evidence of dormouse activity. Of the 100 nuts 60% had been eaten by small rodents such as voles and wood mice with the remainder showing evidence of use by birds and other rodents. Furthermore, an assessment of the woodland edge habitat revealed that this was gappy with a poor vertical structure, sparse understory vegetation and contained few dormouse food plants on the northern extent. The woodland edge included dominant oak *Quercus robur* and a few occasional stands of hazel *Corylus avellana* with occasional birch *Betula pendula*, frequent ash *Fraxinus excelsior* and rare field maple *Acer campestre*. Teasel *Dipsacus fullonum* and nettle *Urtica dioca* was also identified in a sparse understory.

The surveys identified that the habitat immediately to the north of the proposed site is not suitable to support high numbers of dormouse. The nut search identified no evidence of dormouse activity in the habitats surrounding the site. Furthermore, there are no confirmed records of dormouse within 1km of the site.

3.3 Reptiles

The widespread reptiles, grass snake *Natrix natrix*, slow worm *Anguis fragilis* and common lizard *Zootoca vivipara*, have been recorded within 1km of the site. Whilst grass snakes are associated with aquatic habitats, slow worm and common lizards may be found in areas of scrub and grassland. None of these species are likely to occur sheltering within arable land.

The habitat suitability assessment of the Site identified predominately arable land with associated woodland edge and thin strips of grassland adjacent to the track. Two spoil piles were also identified to the west of the track and contained early growth from ruderal species. The woodland edge and associated patches of grassland are likely to form some suitable vegetation structure to support limited numbers of reptiles such as slow worms and common lizards; however, this is not true of the well managed arable habitat. Additionally the areas of suitable habitat were very small in extent and were relatively well shaded. As such and gauging the extent of habitat features present, the site is thought to offer poor habitat suitability for reptiles.

3.4 Otter and Watervole

Water levels in the stream were considerably high during the Phase 1 survey visit, potentially obscuring or washing away evidence of presence of both species. As such an additional survey for signs of these species on Boxal Brook was carried out on 22nd August 2013. The stream surveyed extends south eastwards approximately 50m from the north eastern part of the proposed development site. Figure 7.2.6 shows the location of the watervole and otter and survey in context to the proposed site.

During the August survey sections of the brook were not in flow with pools of water present along parts of the northern parts of the stream channel. These were approximately 20cm deep with areas of bare mud surrounding them. The stream channel was approximately 3m at its widest with the majority of its bankside being un-vegetated except for occasional woodland species such as enchanter's nightshade *Circaea lutetiana*. The stream banks were compacted (possibly due to previous flooding) and there were no areas of prominent tall high-layered vegetation present that could provide suitable resting cover for otter or watervole. No holes were present within the areas of the brook that were surveyed.

The proposed site is located within arable habitat which is unlikely to support otter and watervole resting places.

The watercourse was searched thoroughly for evidence of otter and watervole presence. No evidence of otter, (such as spraints or prints) or watervole was recorded in association with the habitat adjacent to the brook within the survey area.

4 CONCLUSIONS

4.1 Bats

The site supports at least six species of bat, which use the site for both foraging and commuting purposes. These species include common pipistrelle, soprano pipistrelle, Daubenton's bat and other unidentified *Myotis* species, noctule, Leisler's bat and barbastelle. The dominant species on almost all survey visits were common and soprano pipistrelles. Both species are common and widespread across the UK and in West Sussex; whereas barbastelle prefer deciduous woodland and wet meadows and are very rare in the UK, found predominately in southern and central England and Wales. Daubenton's are found throughout the UK commonly associated with wetland habitat and is fairly widespread up to northern Scotland and Ireland. Noctule bats are a widespread species distributed in much of England, Wales and to south-west Scotland. Leisler's bat is found throughout the British Isles, with the exception of northern Scotland.

There are 18 species of bat in the UK and all species have been recorded in Sussex, in varying degrees of frequency and at different times of the year.

The automated detector survey results showed that barbastelle were using the eastern and south-eastern woodland edge habitats, with the highest proportion of activity occurring along the southern and eastern woodland edges. Due to the short length of the barbastelle echolocation call, it is not possible to rule out foraging on-site as the static detectors may not record feeding activity. However, the high number of passes recorded in May indicate that bats may be circling suggesting that they are using the site for foraging.

During April and May, three out of the four static detector locations recorded barbastelle passes showing quite a widespread range away from their radio-tracked commuting routes (which show the bats flying north from the Mens SAC and eastwards). A small proportion of barbastelle passes were recorded in June to the north of the site. No barbastelle were recorded during the July activity and static surveys.

The timings of first and last recordings of soprano pipistrelle after sunset and before sunrise respectively would indicate that there may be roosts in close proximity of the location at which they were recorded.

Very low numbers of *Myotis* sp. activity was recorded throughout the automated surveys with a peak of 37 passes over the four static locations in May. The activity surveys only recorded *Myotis* sp. during the June transect and these were recorded adjacent to the road to the north of the site. *Myotis* bats were recorded in low numbers at all locations during the July static surveys.

The main foraging areas throughout May to July were along the woodland edge and above adjacent set aside. Foraging behaviour was noted predominately along the east and south of the survey area with limited feeding noted adjacent to the proposed site. No foraging behaviour was recorded above the arable onsite habitat.

Overall the surveys identified that good numbers of passes of relatively common/widespread bat species were recorded (common pipistrelle, soprano pipistrelle). In comparison, fewer passes by rarer bats were also recorded (barbastelle and *Myotis* species) along the woodland edge to the east of the site. It is probable that a proportion of barbastelle bats from The Mens SAC use the woodland edge for commuting and foraging. The proposed development is sited within arable habitat with a proposed buffer of 20m from the woodland proposed. No bats were recorded using the onsite habitat for foraging or commuting. As such it is unlikely that there

would be any impact on bats as a result of direct habitat loss. Some *Myotis* sp. are known to be more sensitive to light compared to soprano and common pipistrelle species and there is some potential for impacts as a result of changes to ambient lighting.

4.2 Dormouse

The woodland adjacent to the site is not likely to be directly impacted by the proposed works which are proposed within the arable field to the south and east of the woodland and no fragmentation will occur during the development. Based on a preliminary habitat suitability assessment and nut search the woodland edge was identified as offering poor structure to support dormouse and that they are unlikely to be using the woodland edge as a foraging resource.

4.3 Reptile

If present, reptiles are likely to be limited to marginal areas where scrub and ruderal plants have colonised adjacent to the woodland and within spoil heaps adjacent to the Site entrance. Where possible these areas should be retained and enhanced within the development scheme. Enhancement could include linking up areas of suitable vegetation to allow reptiles to move through the Site and into the wider countryside. Encouraging a diverse sward of tussocky grasses and herbs would further attract the invertebrates that reptiles feed on. These measures would increase the carrying capacity of the land in respect of reptiles and allow these areas to act as recipient sites for any reptiles displaced by works on other parts of the Site.

4.4 Otter and Watervole

Due to the absence of local records and field signs the site was considered to be of negligible interest for otter or watervole. Therefore, these species are not considered to represent a statutory constraint and no further survey or mitigation is considered necessary.

5 MITIGATION AND ENHANCEMENT

5.1 Bats

Bats receive full legal protection under the WCA and The Conservation of Habitats and Species Regulations 2010 (as amended). It is considered unlikely that any roosts are present on the proposed Site itself which consists of arable habitat; although it has been confirmed that adjacent woodland habitat is of importance for commuting bats that use the wider survey area. There is potential for commuting bats to be disturbed if the level of disturbance caused by the proposed development was deemed to be significant, that is it would impair their ability of bats to survive, breed, reproduce, or to rear or nurture young and/or to hibernate or migrate and/or affect the local distribution or abundance of that species.

Therefore, this mitigation scheme aims to help ensure that the level of disturbance to commuting bats, especially along the woodland edge, by lighting is kept to a minimum and is not considered to be significant. The following mitigation has been recommended using the guidance provided in Jones (2000)[20] and the Institute of Lighting Engineers (2009)[21].

5.1.1 Pre-Construction

The following works could be implemented prior to construction:

- Specifying the use of low pressure sodium lamps instead of mercury or metal halide lamps where glass glazing is preferred due to its Ultra Violet filtration characteristics.

- Lighting to be designed to direct to required locations and light spillage avoided/minimised. The use of luminaires and accessories such as hoods, cowls, louvers and shields would direct light to the intended areas only. The use of lighting design computer programs is recommended in order to simulate lighting levels and light spill on the site prior to installation and to better inform the mitigation process.

- The height of lighting columns should be designed as to reduce the ecological impacts on bats.

- If any trees are to be impacted by the development then they should be subject to further surveys to determine whether they support roosting bats.

5.1.2 During Construction and operation

The following measures could be implemented during construction and operation works:

- Ecological tool box talks for all contractors.

- Installation of lighting and works associated with this should be carried out outside the active bat season (Late March to late September) to insure limited disturbance to active bats and to allow appropriate mitigation to be in place and established prior to the next active season. Carrying out works during pre-breeding (March-April) and pre hibernation (September-October) would allow for a low relative impact of disturbance.

- Lighting levels to be as low as legally possible and should fall below 3 lux at ground level and lighting should only be used where necessary. Lighting levels should be reduced or lights switched off when not needed;

- Maintain a watching brief throughout construction and ensure that no impacts on commuting routes arise;

- Implementation of a code of construction practice including measures to prevent adverse effects on bats;

5.1.3 Post Construction

The following measures could be implemented after construction works:

- Bat boxes could be installed on the outside of trees and structures on site;

- General landscape proposals could be implemented to promote the occurrence of bats. Measures could include the planting of species (Night flowering species) that encourage the presence of insects.

- Post installation monitoring of bat activity should be carried out to ensure that proposed mitigation remains effective and to inform any on-going management.

5.2 Reptiles

The following recommendations are based on the likely absence of common reptiles within the Site;

- Every effort should be made to retain suitable reptile habitat in the final design and construction of the proposed scheme

- Where possible, works and storage compounds should be placed away from potential reptile habitat, to avoid unnecessary damage during construction.

- The small areas of more optimal reptile habitat should be subject to habitat manipulation. This should occur during the active season (March-September) and when ambient temperatures are between 9°C and 20°C. This manipulation should take place in one direction towards suitable adjacent habitat in order to give any reptiles an opportunity to leave the area.

- Watching brief and destructive searches within the limited suitable terrestrial habitat. This should include hand searches by an Ecologist prior to works. Piles of debris, wood, brash or rubble within the working area will need to be dismantled by hand by the contractor under the supervision of an Ecologist.

- All excavations will be backfilled as soon as possible to prevent animals falling into, and becoming trapped in the excavations.

- Should a reptile species be encountered at any time during the works, all works should cease immediately and ecological advice be sought.

5.3 General Mitigation

There are also some general mitigation recommendations that should be implemented during the works phase to ensure that no indirect harm comes to protected or notable species. Such measures include standard best working practice guidelines as outlined below:

- All site works must be carried out in accordance with best environmental working practices e.g. CIRIA and should be legally compliant. This should include compliance with all wildlife legalisation.
- Toolbox talks to be given to all contractors, to make them aware of the presence of protected species nearby, and the legal implications of their presence. All site workers should be instructed to stop works and consult a suitably qualified ecologist if they see or disturb any notable species while working on site;
- The areas which will be disturbed should be kept to a minimum and should be clearly defined prior to commencement of works. This could necessitate the erection of fencing;
- If vehicles have to be temporarily parked onsite, they must be kept within the site construction area to minimise disturbance to the surrounding area; and
- Consideration should be given to any potential noise pollution, especially that arising from construction, and mitigation to minimise noise pollution in the vicinity of the woodland must be employed.

Appendix 1. Figures

Appendix 2. Badger Survey (Confidential)

6.1 Badger Survey

One badger sett was recorded in the woodland opposite the Site boundary. There were at least 28 disused entrances, at least nine partially used entrances and at least two entrances with signs of recent activity. A latrine was recorded close to the active holes and several well-worn paths noted going north, south and west of the sett into the woodland. No paths were recorded heading eastward into the field towards the Site. Two disused outlier setts were present along the eastern field edge.

Table 9 below provides a summary of the statuses of the setts and the locations of these is shown in Figure 7.2.7.

Table 9 Descriptions of badger setts

Sett Number	Classification	Status
1	Main Sett	2 active holes, 9 partial and 28 disused.
2	Outlier	1 disused hole.
3	Outlier	1 disused hole.

6.2 Badger Survey Conclusion

It is clear that the distribution of badgers has changed with activity levels very low compared to the extent of holes present. Evidence of recent use of the woodland by mountain bikers with trails and tracks noted adjacent to the badger sett is likely to have had an effect on the distribution of this species. The scheme will need to consider the retention of the badger sett, commuting routes and key foraging areas in order to accommodate this species.

The habitats within the site boundary would provide few opportunities for badgers due to the small area involved and the potentially temporary nature of the works. Badgers are a widespread and common species in West Sussex.

All main badger setts should be retained within the development. It should be noted that any works which could impact occupied badger setts should be undertaken under a Natural England licence. All setts should be buffered by at least twenty meters of undeveloped land.

6.3 Badger Survey Mitigation and Enhancement

The badger sett located adjacent to the site should be monitored for levels of use as the sett could become more active over time.

Where practicable within the scheme design, it is recommended works are planned so they occur as far from the main badger sett as possible. Logistical features of the scheme, such as the access road and features that may cause disturbance should be planned to avoid the vicinity of the sett.

Site preparation work (i.e. any vegetation clearance, ground preparation and installation of the access road and site infrastructure) should take place within the period 1st July to 30th November and works should be supervised by a suitably experienced ecologist. This is to prevent disturbance to badgers during their breeding season. If any badgers, badger setts or evidence of badgers is found during other site surveys or works advice from ecologists should be sought immediately.

In line with best practice, in all areas where badgers may access the location of the works areas, trenches should be covered or fenced overnight to prevent badgers from falling into them or trenches should include an earth ramp to allow badgers to climb out.

Works close to badger setts should be restricted at night to reduce disturbance to any badgers which may be leaving or returning to setts. If night works are essential, they should be completed under ecological supervision.

Recommendations for enhancements could include the planting of berry producing species, in order to provide additional foraging resource and cover and to increase the ecological value of the area for this species.

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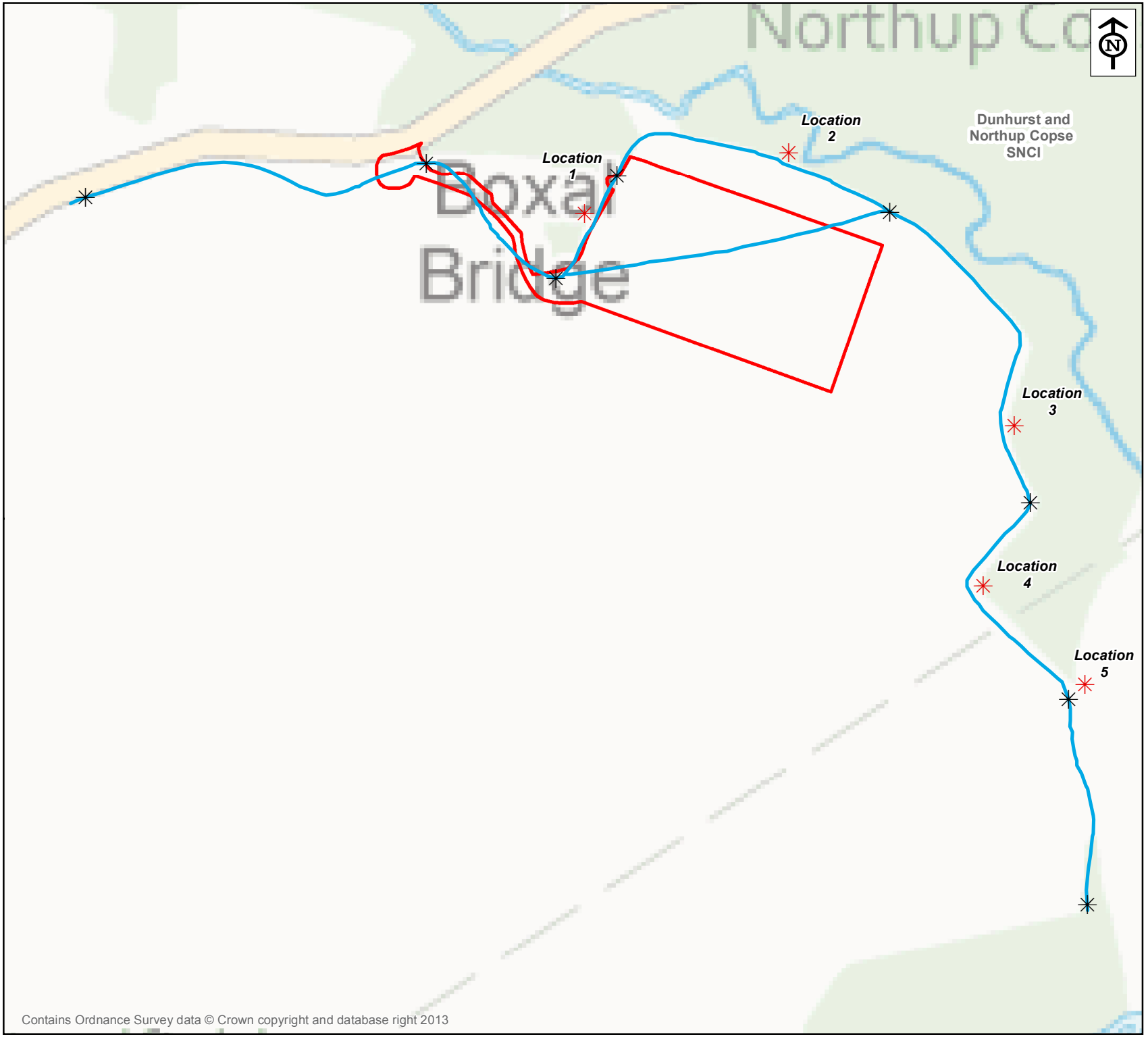

Bat Static Survey

Key

- Static Location
- Stopping Point
- Transect Route
- Site Boundary

0 40 80 120 160

Metres

Title	Location of Static Detectors and Activity Transect Route
Project	Wisborough Green 1
Client	Celtique Energie

URS

App'd:	Drawn:	Ch'kd:	Drg.Size:
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Version: 1		Ref: 1	
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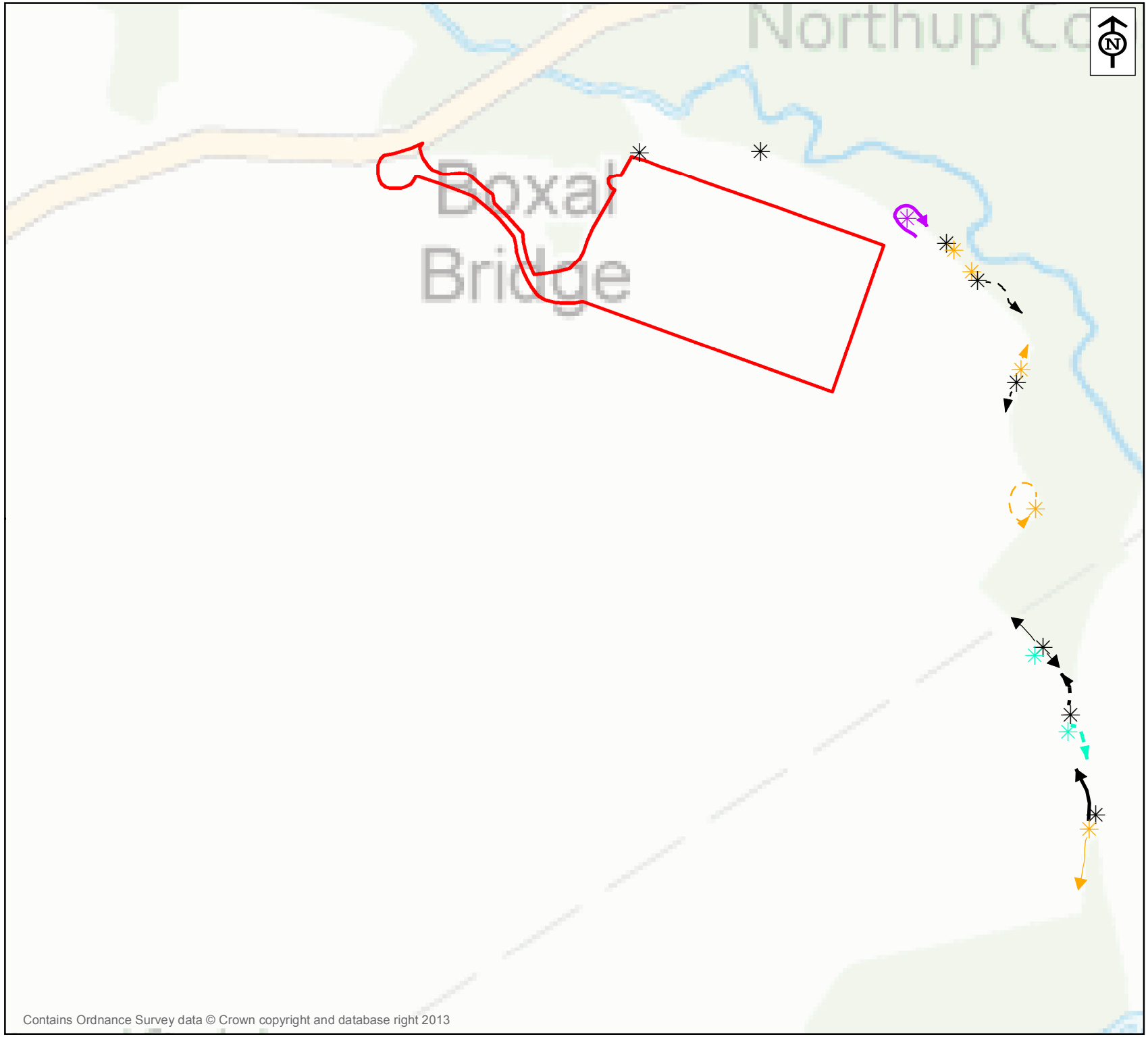
Date: 07/2013		Fig No:	



Key

Species

- Barbastelle
- Common Pipistrelle
- Pipistrelle Species
- Soprano Pipistrelle

Bat Activity

Species, Activity, Number

- Barbastelle, Commuting, 2 or more
- Common Pipistrelle, Commuting, 1
- Common Pipistrelle, Commuting, 2 or more
- Common Pipistrelle, Foraging, 1
- Common Pipistrelle, Foraging, 2 or more
- Pipistrelle Species, Foraging, 2 or more
- Soprano Pipistrelle, Commuting, 1
- Soprano Pipistrelle, Foraging, 1
- Site Boundary

0 50 100 150

Metres

Title	May Bat Activity
Project	Wisborough Green 1
Client	Celtique Energie

URS

App'd:	Drawn:	Ch'kd:	Drg.Size:
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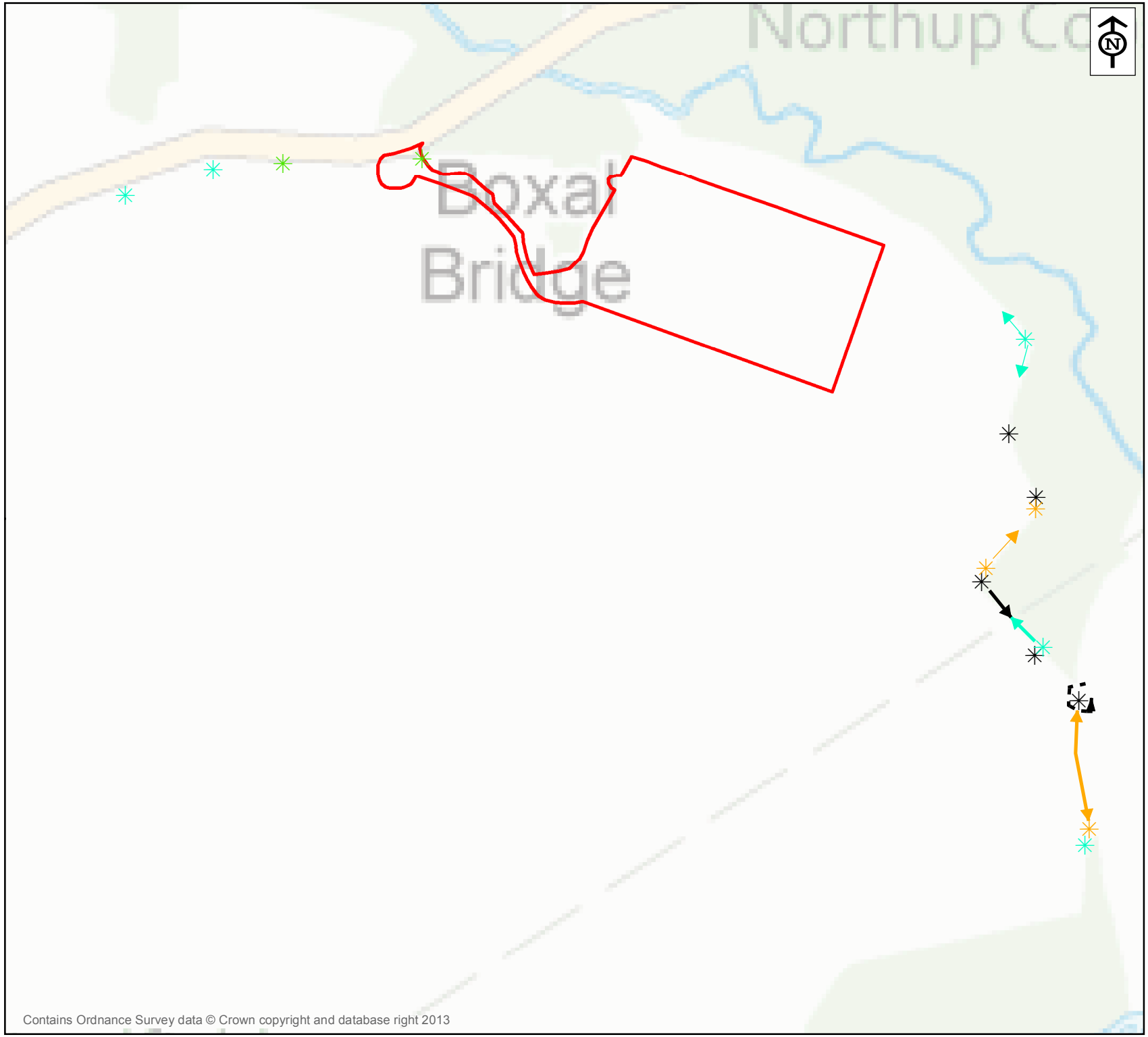
Date: AUG 2013		Fig No:	



Key

Species

- Common Pipistrelle
- Myotis Species
- Pipistrelle Species
- Soprano Pipistrelle

Bat Activity

Species, Activity, Number

- Common Pipistrelle, Commuting, 2 or more
- Common Pipistrelle, Foraging, 2 or more
- Pipistrelle Species, Commuting, 1
- Pipistrelle Species, Commuting, 2 or more
- Soprano Pipistrelle, Commuting, 1
- Soprano Pipistrelle, Commuting, 2 or more
- Site Boundary

0 50 100 150

Metres

Title	June Bat Activity
Project	Wisborough Green 1
Client	Celtique Energie

URS

App'd:	Drawn:	Ch'kd:	Drg.Size:
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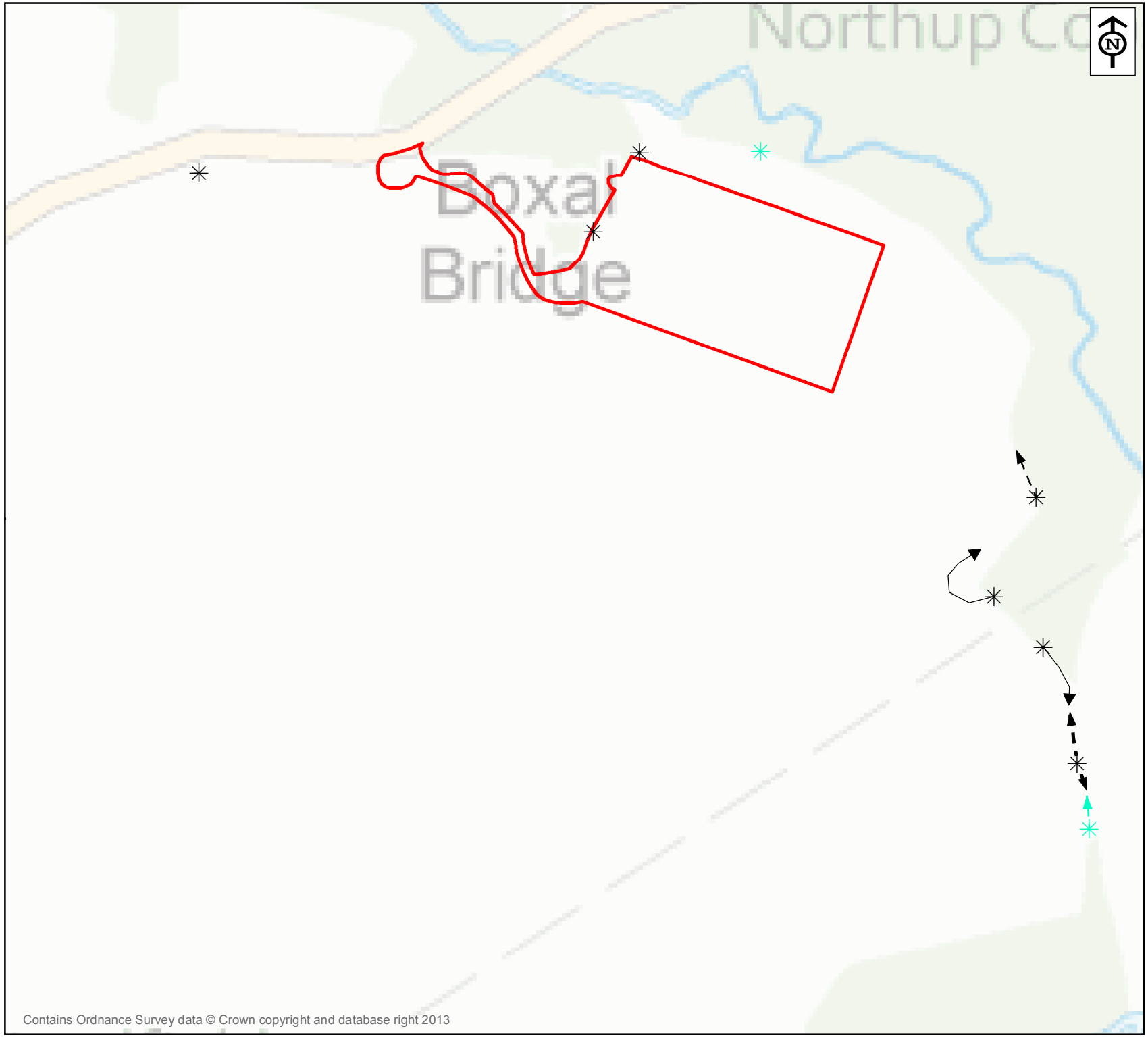

Key

Species

- Common Pipistrelle
- Pipistrelle Species

Bat Activity

Species, Activity, Number

- Common Pipistrelle, Commuting, 1
- Common Pipistrelle, Foraging, 1
- Common Pipistrelle, Foraging, 2 or more
- Pipistrelle Species, Foraging, 1
- Site Boundary

0 50 100 150

Metres

Title	July Bat Activity
Project	Wisborough Green 1
Client	Celtique Energie

URS

App'd:	Drawn:	Ch'kd:	Drg.Size:
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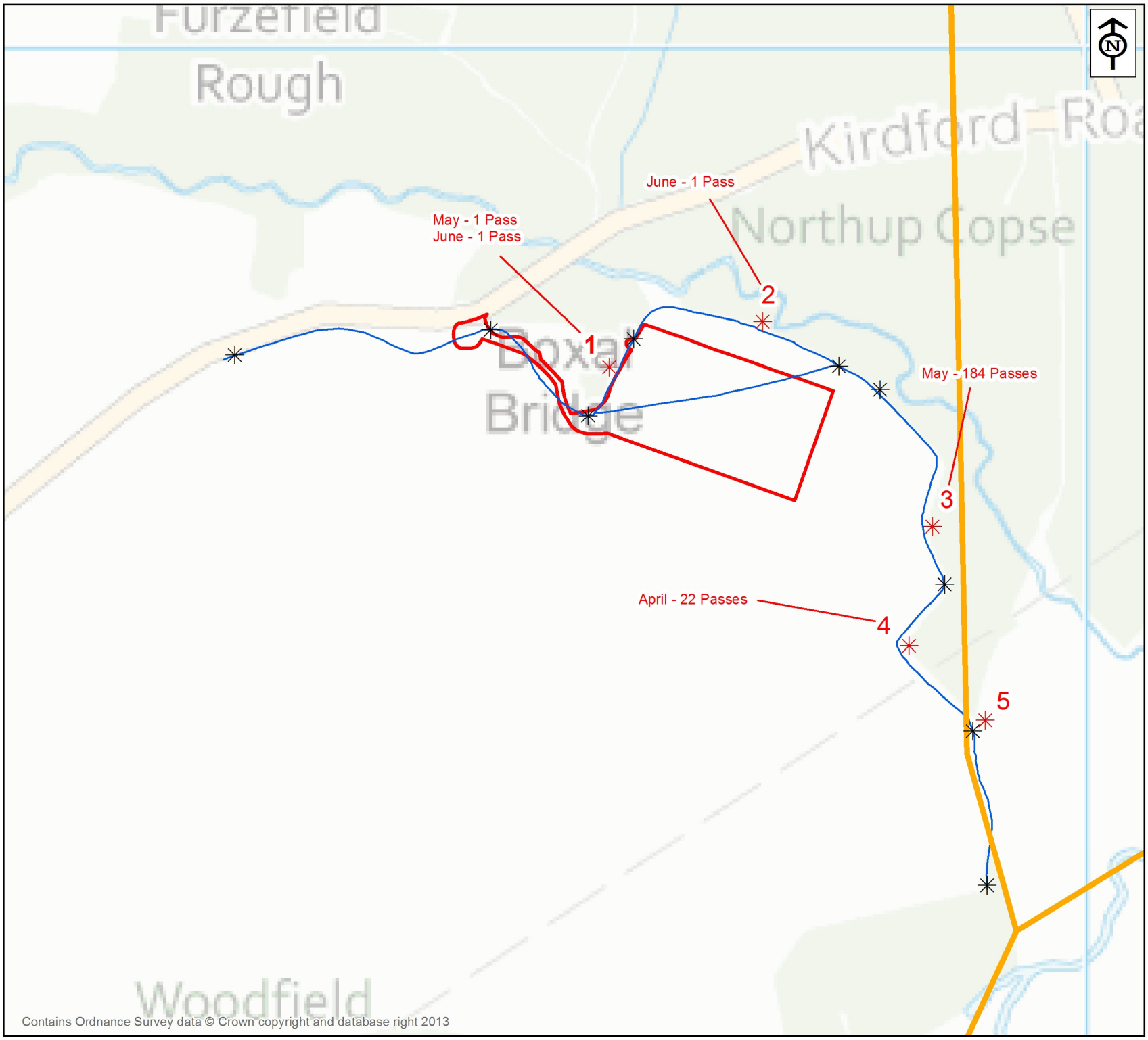
Date: AUG 2013		Fig No:	



Bat Static Survey

Key

- Static Location
- Stopping Point
- Common Pipistrelle
- Mens 2008 Barbastelle Flightlines
- Transect Route
- Site Boundary

0 50 100 150 200

Metres

Title	Figure 2 - Bat Activity Plan
Project	Wisborough Green 1
Client	Celtique Energie

URS

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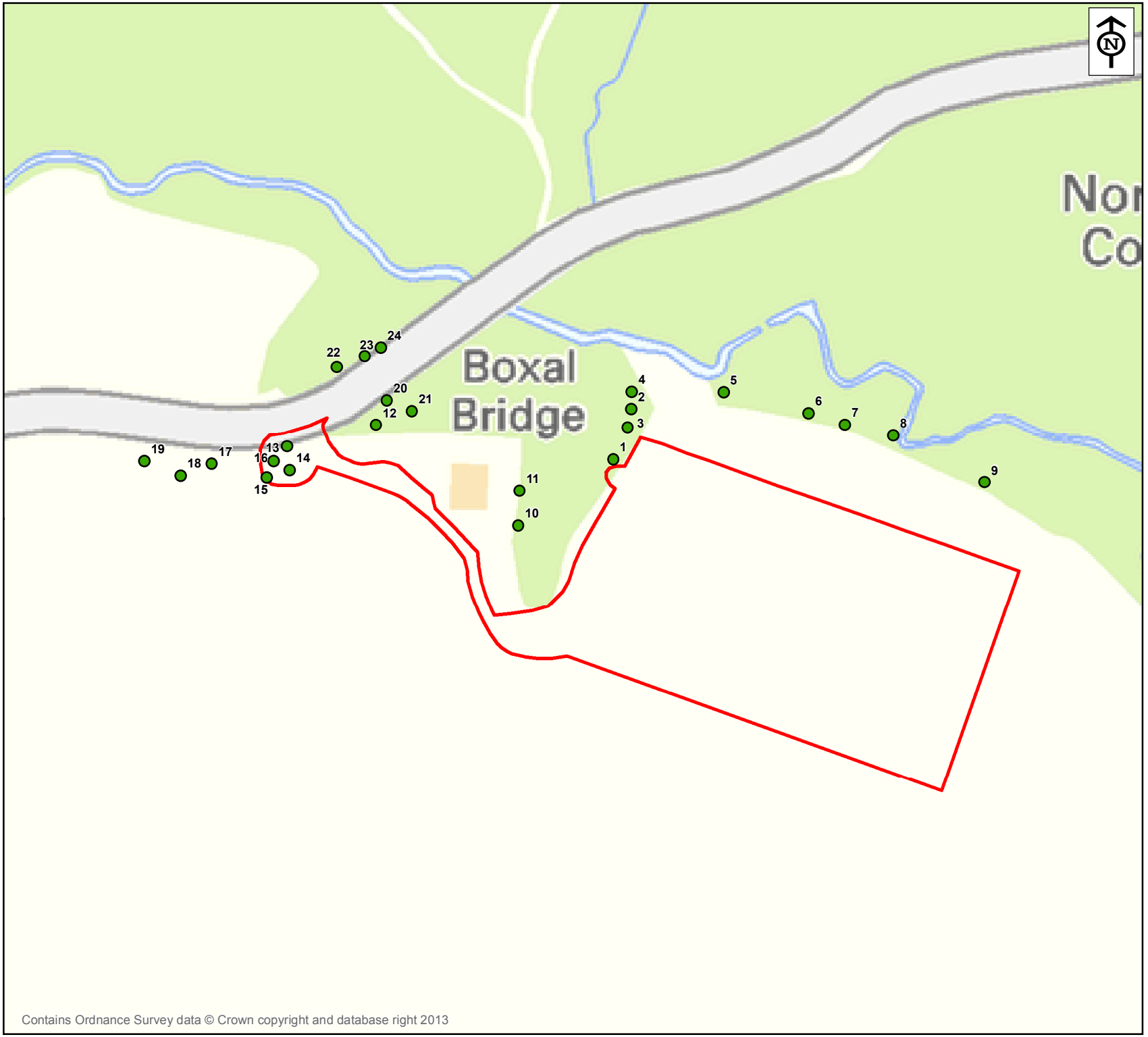
Date: 08/2013		Fig No:	



Key:

- Trees with bat roost potential
- Site Boundary

0 25 50 75 100

Metres

Title: Trees with the potential to support roosting bats

Project: Wisborough Green 1

Client: Celtique Energie

URS

App'd: DT	Drawn: SS	Ch'kd: LG	Drg.Size: A4
Version: 1		Ref: 1	
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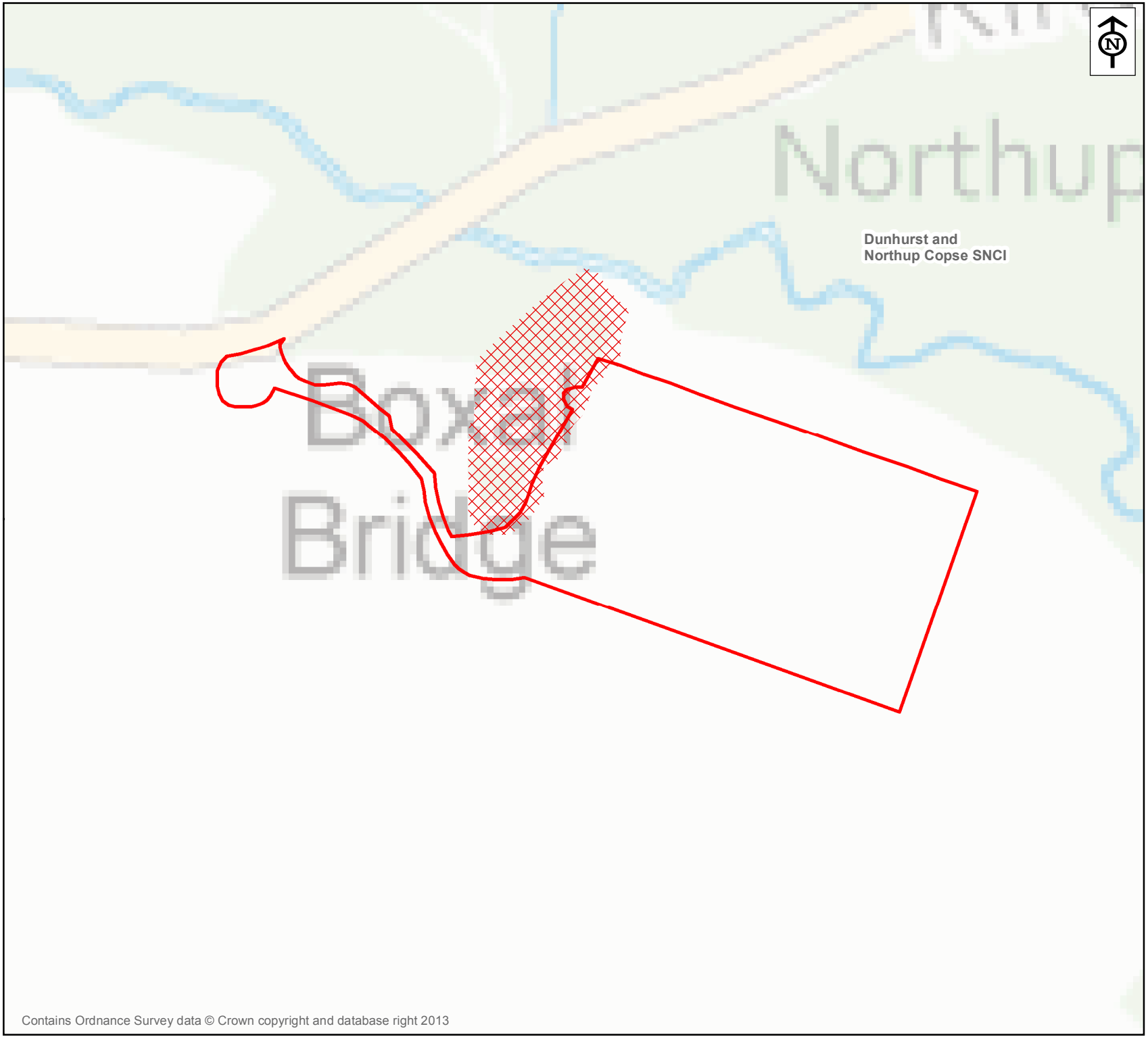

Key

Nut Search and Habitat Assessment Area

Site Boundary

0 25 50 75 100

Metres

Title	Dormouse Survey
Project	Wisborough Green 1
Client	Celtique Energie

URS

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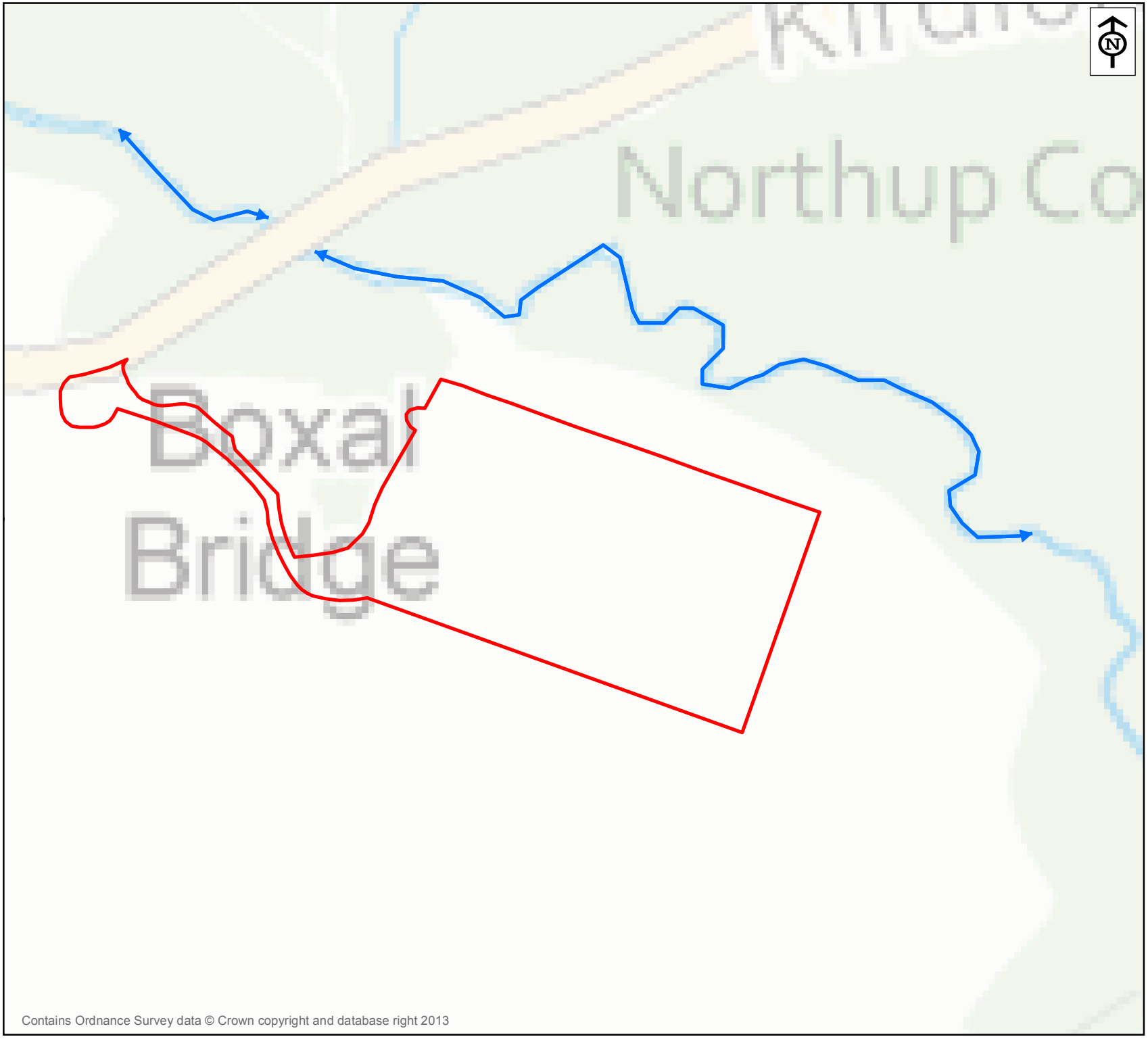


Key

Otter and Watervole Survey Area

Site Boundary

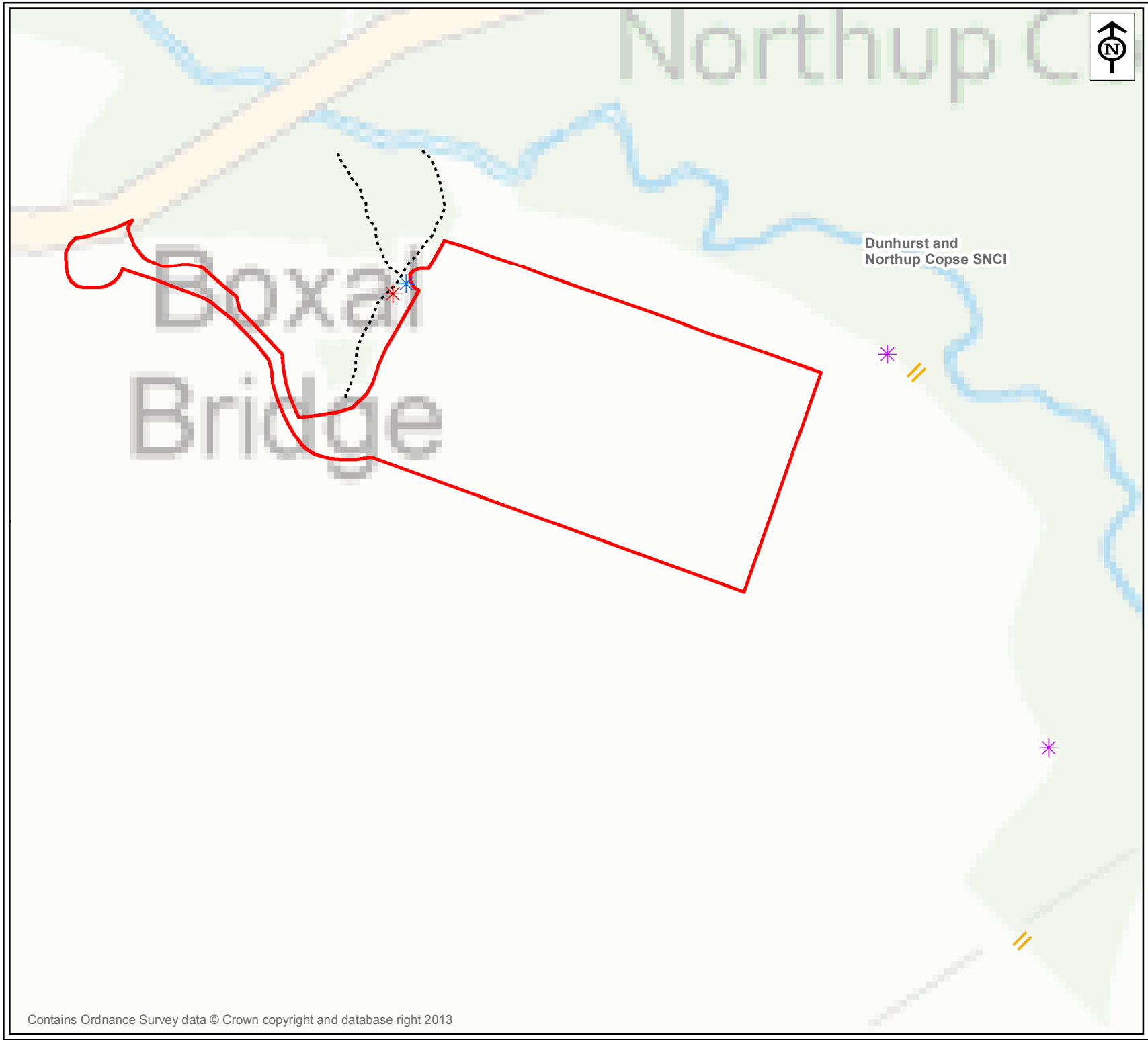
0 25 50 75 100

Metres

Title	Otter and Watervole Survey Area
Project	Wisborough Green 1
Client	Celtique Energie

URS

App'd:	Drawn:	Ch'kd:	Drg.Size:
DT	SS	LG	A4
Version: 1		Ref: 1	
Scale: 1:2,000		Job No: 47064873	
Date: AUG 2013		Fig No:	



Badger Survey

Key

- Latrine
- Main Sett
- Outlier Sett
- Push Under
- Mammal Path
- Site Boundary

0 25 50 75 100

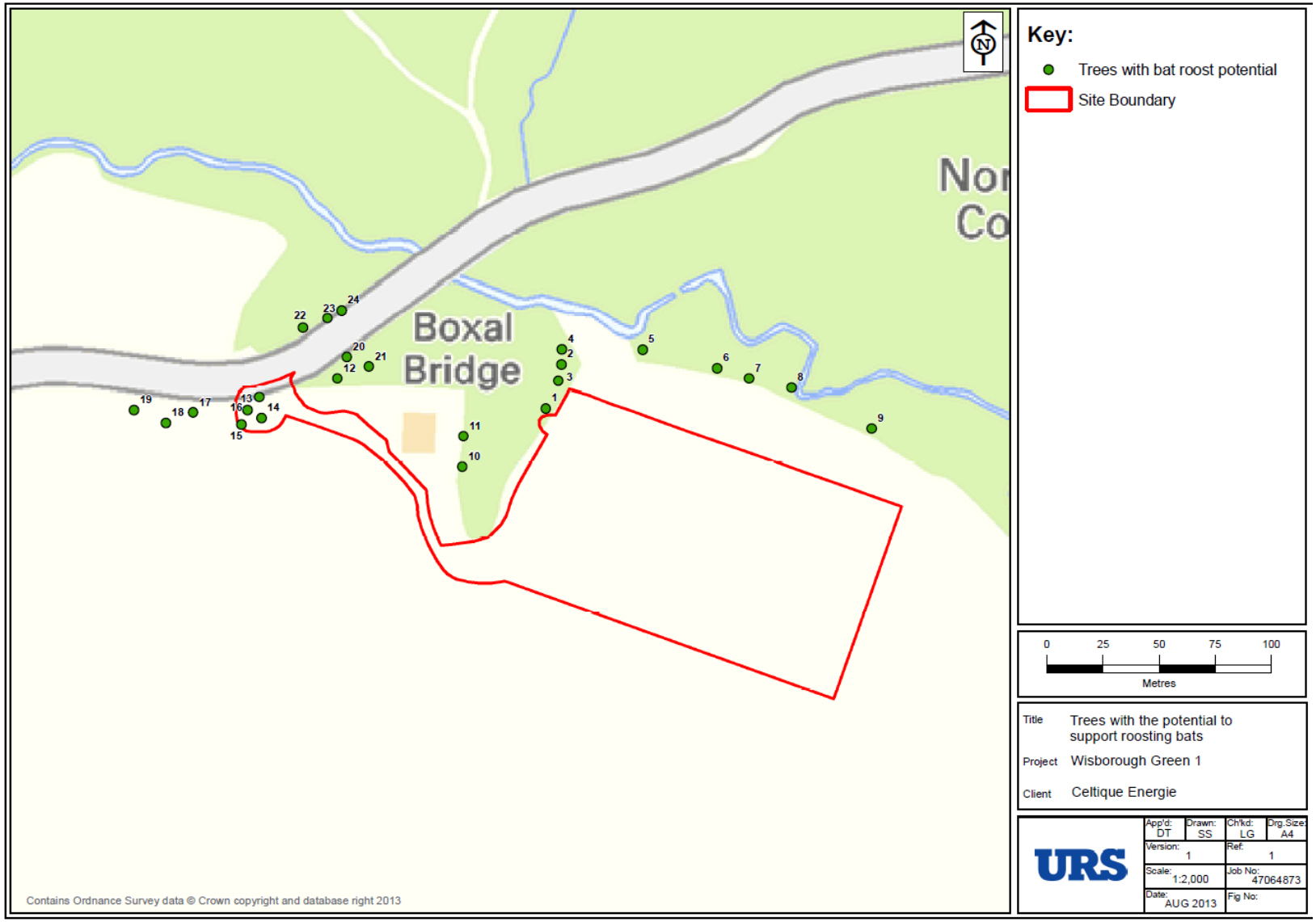
Metres

Title	Badger Survey (Confidential)
Project	Wisborough Green 1
Client	Celtique Energie

URS

App'd: DT	Drawn: JS	Ch'kd: LG	Drg.Size: A4
Version: 1		Ref: 1	
Scale: 1:2,000		Job No: 47064873	
Date: 07/2013		Fig No:	

Figure 2. Trees with Bat Roost Potential



Appendix 7.3

Appendix 7.3: Consultation Log

Organisation	Contact	Date Sent	Date Received	Communication	Notes
Natural England	Ms Marian Ashdown Protected Species and Environmental Planning Adviser	12/06/2013		Telephone Conversation 12/06/13	URS spoke to Marian Ashdown of Natural England on 12th June 2013 in order to discuss the level of bat survey effort appropriate for the scheme. It was agreed that monthly activity surveys between April and August 2013 would be appropriate. The conversation was followed up by an email to confirm the agreed scope of works, the email confirmation is included below; Hi Rachel Yes that sounds fine although as discussed on the phone, we would need time to respond to the further bat surveys before the application is determined. Kind regards Marian Hi Marian, Further to our conversation this morning, I have spoken with the client and it seems unlikely that they would be able to commit to limiting works requiring illumination to the winter months. The main reason for this is the availability of drill rigs, which need to be hired from third parties. Given this, we understand that further bat surveys will be required to provide bat activity data for the months of July and August. Due to time constraints, the data from these surveys would need to be submitted after the planning application has been submitted, but during the determination period; however the Ecology Chapter will contain bat survey data from April, May and June and extensive data search data. Please can you confirm that this approach is acceptable? Many thanks Rachel

West Sussex County Council	Mr Don Baker County Ecologist	24/06/2013		Email	Hi Don, I have consulted with Marian Ashdown at NE regarding the bat survey effort required to inform the Appropriate Assessment for the proposed drill site at Wisborough Green. We have agreed that because of the proximity to the SACs and the cold start to the season, it would be appropriate to undertake bat surveys through to August. The surveys in July and August would take place after the ES has been submitted, but Marian stated that this would be acceptable to her, providing it was within the determination period. If you are also happy to receive some survey data after the ES has been submitted, we will proceed on this basis. Please let me know if you are happy with this approach. Many thanks Rachel
West Sussex County Council	Mr Don Baker County Ecologist	10/04/2013		Email	Hi Don, Further to our conversation last month, I have spoken to Celtique Energie regarding designing out potential impacts on dormice. CE have agreed to move the well sites to at least 15m from any hedgerow or woodland and keep the access tracks 10-15m from these features at Wisborough Green. We feel that this is sufficient to ameliorate impacts of disturbance on dormice and negate the need for a dormouse tube survey. We will however conduct a nut search and review our scope if evidence of dormouse is found. I hope this approach meets with your approval. Please contact me if you have any concerns. Many thanks Rachel
West Sussex County Council	Mr Don Baker County Ecologist		13/03/2013	Email	Rachel Thank you for travelling over to WSCC today, it was nice to meet you and discuss these sites.

					I've attached the NE Dormouse Handbook and extracted the following section: 5.3 Possible impacts from development Dormice may be threatened by destruction of their habitat, for example when woodland is cleared for development or conversion to other uses. Hedgerows may be removed as part of such developments or in the course of farm management. Radiotracking and surveys have demonstrated clearly the importance for dormice of linear features in the landscape, especially hedges. The loss of hedges, leaving remnant groups of dormice isolated in the landscape, can be very damaging. A typical example may be where a small copse is protected from development but is left isolated from larger areas of habitat and useful food resources. New roads and the widening of existing ones are also a threat, not just because of the destruction of dormouse habitat (for example, by removal of roadside hedges), but also because a new road is likely to be wider than the old. This constitutes a greater barrier to dispersal and will probably reduce movements between local populations. In the long term, this fragmentation of habitat and reduction of dispersal potential may be a greater danger than the more obvious threat posed by the destruction of a woodland site. The long-term impact of increased human activity should also be considered when deciding on appropriate mitigation, particularly where high density housing is being built adjacent to habitat that previously was rarely visited by people. Direct modifications to sites, including the felling of trees or scrub clearance, can have a significant impact on dormice. Even where trees and shrubs remain largely unaffected, or where work is done in winter, there may still be significant implications for hibernating dormice and the places where they overwinter. Activities associated with development works are likely to lead to an increase in human presence at the site, extra noise and changes in the site layout and local environment. All these may have a detrimental effect on dormice, their needs for particular environmental conditions (such as specific temperature and humidity regimes), and a stable landscape that allows them to follow established routes to feed (see below). Sometimes it may be possible to lessen the impact, or measures may be taken to help the dormice through a difficult period.
West Sussex County Council	Mr Don Baker County Ecologist			Meeting on 14th March at WSCC Offices	URS met with Don Baker on the 14th March 2013 and the following principals were agreed;

					HRA Wisborough-1 is close to SACs and that bats from the SACs may use the sites for foraging/ commuting and screening for HRAs should be undertaken. As extensive information on these bat populations is available and the HRA screening can be based on this information.

					Bats BCT 2012 guidelines for bat activity surveys should be followed. A pragmatic approach can be taken, whereby an early season survey would be undertaken and if only low numbers of common bats are recorded, further survey effort could be reduced. **Dormouse** RH questioned whether dormouse would be likely to use the woodland edge. DB confirmed that if the habitat structure was appropriate dormouse would use the woodland edge for foraging and nesting; however woodland edges and hedgerows leave dormouse more exposed and are more suitable for commuting. RH and DB agreed the dormouse using the woodland edges may be exposed to high levels of noise and illumination although it was not known how they would respond. There is no known threshold for noise impacts on dormouse, but it was acknowledged that mammals quickly adapt to constant low level noise, but sudden, unfamiliar noise is likely to cause a negative response. RH and DB agreed that monitoring dormouse distribution around early schemes could provide information useful to assess impacts of later schemes. RH and DB agreed that where there is no loss or degradation of dormouse habitat, works could proceed under a method statement without dormouse tube survey data, although nut search data should be collected, where possible. Scheme design could also be used to scope dormouse out of assessment by moving the rig away from dormouse habitat or doing noisy operations in the winter. Where no sensitive animals are present then woodland buffers can be restricted to the tree root protection zone. **Enhancements** Any enhancements would be largely restricted to native planting in marginal areas. Enhancements should be targeted to provide resources for species known to be present. Bat boxes may also be appropriate. **Breeding Birds** Breeding bird surveys were not necessary. A search for the nests of Schedule 1 birds prior to construction works would be sufficient meet legislation.
West Weald Landscape Project (WWLP)	Dr Petra Billings Landscape Projects Officer West Weald	05/07/2013	08/07/2013	Telephone and Email	URS contacted WWLP on 5th July 2013 by telephone and email to inform them that URS was undertaking an Ecological Impact Assessment for the proposed scheme and ask if they held any data for the site which should be included in our assessment.

	Landscape Project				On 8th July 2013 WWLP replied by email and provided URS with the following documents: • Links to the online publications- Baseline Audit of Bat Activity in the West Weald Landscape, 2010 and 2011, • Baseline Audit of Bat Activity in the West Weald Landscape 2010, Barbastelle Bats in the Sussex West Weald 1997-2008, • Field Survey of Barbastelle Bat Flightlines' Condition from Ebernoe SAC 2008 and Bat Activity Monitoring Project using Anabat remote loggers near Ebernoe in 2009. Dear Petra, URS are undertaking an Ecological Impact Assessment of an exploratory well site in West Sussex and we understand, from a recent article in the Brighton Argus, that you have some concerns about this project. As you will be aware, projects of this type are subject to Environmental Impact Assessments, which include a robust and impartial assessment of any impacts on ecological receptors using the guidelines set out by the Institute of Ecology and Environmental Management. We are currently in the process of undertaking this assessment and the full document will be made public in due course. In the mean time I would like to reassure you that we have considered impacts on both the ancient woodland and the bats within it. Baseline data on bats has been gathered through targeted surveys and a desk study. We have undertaken extensive bat activity surveys across the site in line with current Bat Conservation Trust guidelines. Furthermore, we have undertaken a consultation exercise with West Sussex County Council and Natural England to ensure that sufficient data is collected to allow a robust assessment. We recently contacted the Sussex Wildlife Trust for information on the distribution of bats in West Sussex and you very kindly sent us reports of a number of studies on bats which we will use to inform our assessment. However, should you be aware of any further information pertinent to this assessment, please could you direct us to it so that we can include it. Should you have any further concerns or comments on the scheme, please contact me directly, either by email or on the telephone number below. Yours sincerely, Rachel

					Dear Rachel, Thank you for your time this morning to discuss the EIA you are carrying out at Wisborough Green. It appears there has been some confusion about the communications with Sussex Wildlife Trust. Just to be clear, we have had no communication about their plans from your client. I understand that you had requested information on their behalf from the Sussex Biodiversity Records Centre (SxBRC) but this is a separate organisation from SWT and it operates a strict code of confidentiality. Your email is our first communication about the exploratory well plan. We are pleased to hear that such extensive surveys are underway, particularly the bat surveys, and pleased to hear too that your client is sensitive to the potential impacts of oil drilling both on wildlife and on the local communities. As you will be aware local landowners, including Sussex Wildlife Trust, are extremely worried about not just the impacts of the exploratory drilling but of the potential for much greater impacts should oil reserves be discovered, and presumably your client would not be carrying out the exploratory work should they not be hoping for this. I've had a look through the various bat reports I have and another one which may be useful is the 'Baseline Audit of Bat Activity in the West Weald Landscape 2010 and 2011' on the West Weald Landscape Project's website at http://www.westweald.org.uk/docs/Baseline%20Audit%20of%20Bat%20Activity%20in%20the%20West%20Weald%20Landscape%20Area%202010%20and%202011.pdf I also attach a short separate report on the findings on bat activity on the key flightline past the proposed drill site - this one is not in the public domain. Thank you for your offer to include our suggestions for post-works landscape enhancements in your report - I will give this some thought and get back to you. In the meantime, thank you again for getting in touch. I am copying in Mark Monk-Terry, Reserves Officer, and if you would like permission for access to Northup Copse, please don't hesitate to contact Mark direct. Kind regards, Petra Petra Billings PhD MCIEEM

					Landscape Projects Officer West Weald Landscape Project
West Weald Landscape Project (WWLP)	Dr Petra Billings Landscape Projects Officer West Weald Landscape Project	09/07/2013 06/08/2013 17/08/2013	10/07/2013 06/08/2013 07/08/2103 19/08/2013	Email	URS contacted WWLP to discuss potential enhancements to be instated for bats. WWLP provided advice on enhancement measures. Hi Petra, Further to our conversation yesterday, I have spoken with the client and they have confirmed that the landowner is unlikely to accept the field at Wisborough Green being reverted to grassland. I have prepared a map showing my initial thoughts on how the marginal areas of the field could be enhanced for wildlife. Please could you review the attached map and let me know if you have any recommendation on what other measures may be beneficial to wildlife? Many thanks Rachel Rachel, Thanks for this. I think these are all good suggestions. Just a couple of thoughts - to my mind it would make sense to have the beetle bank dividing the field down the middle north/south rather than east/west so that it provides a parallel corridor to the eastern field boundary. Also, could you go further and suggest this as a native hedgerow with margins either side rather than just the beetle bank - this would further strengthen the connectivity of the landscape and provide an alternative bat flightline? Kind regards, Petra Hi Petra, I just wanted to update you on the enhancement strategy for bats at Wisborough Green.

					We've spoken to the farmer and he doesn't feel that he can accommodate any of the enhancements that we discussed, as this would constitute a long-term commitment on his part. Obviously we are keen to provide something that would contribute to the conservation of bats from the SAC and I wondered if it might be appropriate to support some of the current research into bat foraging habits, as this would further the studies that the West Weald Partnership has already started. I've just been looking at the 1997-2008 study on the status of barbastelle bats and I note that it recommends some further studies. As these studies are designed to map the key commuting routes and foraging areas for the SAC bats and this in turn can be used to target conservation measures and inform planning policy, a contribution to this scheme would be of benefit to the bat population in the long-term. Are you planning to conduct any further research on The Mens bat population in the near future? Rachel Hi Rachel, Thank you for the update. It's disappointing that the landowner is unwilling to implement the minor wildlife-friendly measures for the field we discussed post-drilling. I've spoken to colleagues about your offer to contribute to further research on The Mens bat population and we're not comfortable with the concept of research as mitigation or compensation for likely damage to wildlife populations at this stage of the process. The 2008 study demonstrates well the importance of flightlines to the Barbastelles and the 2011 survey shows that the flightline past the proposed drill-site continues to be actively used. Not having had details of the drilling proposal yet, we can't assess its impacts but if it impacts on the flightline use, as seems highly likely, we will object. If the plans are approved, we will of course seek mitigation at that stage but I'm not sure that further research would be sufficient. In overview we think it would be premature of us to discuss these sorts of measures at this stage. Whilst we're happy to continue to liaise with you on this, we reserve our right to object to the plans if they affect the use of Northup Copse as a nature reserve or its wildlife populations, particularly such highly protected species as the bats. Reference my previous email, as we've had no requests for access to Northup Copse, we

					assume your surveyors haven't begun work yet. I'd be grateful if they would contact either myself or Mark Monk-Terry, the Northup Copse Reserves Officer, to let us know when they wish to go. Regards, Petra Hi Petra, Thank you for your response to my email. To clarify the situation, we are not seeking to mitigate or compensate for impacts on bats. As discussed in our telephone conversation last month, the scheme has been moved away from the woodland so that Northup Copse, and the animals that use it will not be affected. The offer to support further research was simply an enhancement to aid understanding of bat use of the wider landscape which would promote future conservation. Our feeling is that this might have more benefits to wildlife in the long-term as it would inform future planning and conservation strategies for the whole area. Rachel Hi Rachel, Our problem is that, having had no consultation or communications of any kind from Celtique, we have no details on their plans. You mention that the scheme is to be moved away from the woodland. Please could you clarify this. We would like to know exactly where the scheme might be before we can make a decision. I'd be grateful if you would send me a more detailed proposal so that we can understand better what you are offering. Also I'm not clear if your offer to fund research is part of the development proposal or how it links to Celtique's interests in the wider area (including Fernhurst). Regards, Petra Hi Petra,

					Thanks for your email, we understand that you may not feel comfortable advising on this project. Due to time constraints we have agreed that enhancement measures will be in the form of installing bat boxes on trees belonging to the landowner, in order to provide additional roost sites for bats. This level of enhancement is considered appropriate given the small scale and temporary nature of the project. We would still welcome your input into the project, and if you have any suggestions on the type or location of boxes, please let me know. We will monitor the boxes in future years to determine whether bats have used them to roost and we will submit our results to the local records centre so that they are publically available.
Sussex Biological Record Centre (SBRC)	Ms Penny Green Ms Helen Hodson	15/04/13 13/06/13	15/04/13 09/07/13	Email	URS contacted SBRC on 15/04/13 requesting information on protected and notable species and in particular any information available for the features of primary/secondary reasons for designation for The Mens SAC as well as any other pertinent data that would help to ensure all important receptors are taken into account when assessing potential impacts of the scheme. SBRC replied on 15th April via email asking URS to make a formal data request for information. A data request for information on bat records, designations, Priority habitats and ownership/management up to 5km radius was made by URS on 13/06/13 A desk Study report was sent from SBRC via email on 09/07/13.
Sussex Wildlife Trust	enquiries@sussexwt.org.uk Mr Mark Monk-Terry Mr Graham Lyons	15/04/13	09/05/13	Email	URS contacted Sussex Wildlife Trust (SWT) by email on 15/04/13 to request for information held on protected and notable species as well as any information available for the features of primary/secondary reasons for designation for The Mens SAC. A request was also made for other pertinent data or information that would help to ensure all important receptors are taken into account when assessing potential impacts of the scheme. SWT replied by email on the 22nd April requesting further information about the data required. URS replied with clarification on 26/04/13. SWT sent information for Ebernoe and Mens on 09/05/13.
Sussex Bat Group	Ms Sheila Wright	15/04/13	No response	Email	URS emailed Sussex Bat Group (SBG) on the 15/04/13 seeking to engage with the SBG to ensure that all relevant information on bats is taken into account. A request for information held on records of bat species or any other pertinent data or information within a 4 km study area.
Sussex Ornithological	Mr Adam Webster	15/04/13	15/04/13	Email	URS contacted Sussex Ornithological Society (SOS) on the 15/04/13 seeking to engage with SOS in order to ensure that all relevant information about the site is included in the

Society					ecological assessment. A request for records of protected and notable bird species, such as barn owls, for a 2 km study area was made. Adam Webster responded by email on 15/04/13 indicating that URS apply for the information required from the Sussex Biodiversity Record Centre (SBRC) as they hold all Sussex Ornithology Society (SOS) records and should provide URS with all the data required
Natural England East and West Sussex Teams	enquiries.southeast@naturalengland.org.uk Ms Marion Ashdown	15/04/13	15/05/13	Email/ Telephone conversation	On 15th April 2013 URS contacted Natural England enquiries requesting relevant information on designation features for the site so as to inform the scoping process as well as any pertinent information held to ensure that all important receptors are taken into account through the process. In addition any advice on the necessary scale and level of detail required for the assessment was sought. Natural England replied 15/05/13 where Marion Ashdown asking URS to use new Discretionary Advice Service (DAS) (See Natural England Consultation 12/06/13).

Appendix 7.4

APPENDIX 7.4 - HABITATS REGULATIONS ASSESSMENT

Introduction

1. URS was appointed by Celtique Energie ('the Client') to produce a report to inform a Habitats Regulations Assessment (HRA) of the proposed development of a temporary well site, including an access track and ancillary infrastructure, at a location near Wisborough Green, West Sussex (the Proposed Development).
2. The aim of this report is to identify any aspects of the Proposed Development that would be likely to lead to significant effects upon sites afforded protection under Article 6(3) of the Habitats Directive, referred to collectively in this Report as "European Sites" (please see paragraph 6 below for a full definition of "European Sites").
3. This Report accompanies and supports the Environmental Statement (ES) and has therefore avoided unnecessarily reproducing information already contained within the ES. This Report should be read in conjunction with Chapter 7 Ecology of the ES and the supporting technical information (specifically relating to bats) contained within Appendix 7.2.

Legislative Context

4. The need for Habitats Regulations Assessment (HRA) is set out within Article 6 of the Habitats Directive (92/43/EEC), and transposed into UK law by the Conservation of Habitats and Species Regulations 2010 (as amended) (the Habitats Regulations). The ultimate aim of the Habitats Directive is to "maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest" (Article 2(2)). This aim relates to habitats and species, not the European Sites themselves, although the European Sites have a significant role in delivering favourable conservation status.

Box 1 The legislative basis for Appropriate Assessment

Habitats Directive 1992

Article 6 (3) states that:

"Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives."

Conservation of Habitats and Species Regulations 2010

The Regulations state that:

"A competent authority, before deciding to ... give any consent for a plan or project which is likely to have a significant effect on a European site ... shall make an appropriate assessment of the implications for the site in view of that sites conservation objectives... The authority shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site".

Key Definitions

5. **Competent Authority** – A "Competent Authority" is not strictly defined in the legislation but for development projects that require planning permission is generally taken to be the local planning authority. Regulation 61(3) requires the competent authority to consult with the appropriate nature conservation body (in this case Natural England[1]) in order to carry out the Appropriate Assessment.

6. **European Site** - The legal definition of "European site" is those sites designated under the EC Birds Directive 1979 (Special Protection Areas, or SPA's) and EC Habitats Directive 1992 (Special Areas of Conservation, or SAC's). The Habitats Regulations do not provide statutory protection for potential Special Protection Areas (pSPAs) or candidate Special Areas of Conservation (cSACs) before they have been agreed with the European Commission. Nor do the Regulations provide statutory protection for sites designated under the Convention on Wetlands 1975 (known as Ramsar sites). However, the National Planning Policy Statement makes clear that for the purposes of considering development proposals affecting them, the Government wishes pSPAs and

[1] Natural England, Countryside Council for Wales or Scottish Natural Heritage

cSACs, that are included in a list sent to the European Commission, to be considered in the same way as if they had already been classified or designated. It is also Government policy that listed Ramsar sites should receive the same protection as designated SPAs and SACs.

7. **Integrity of a European Site** - As with the term "competent authority", the integrity of a European site is not defined in legislation. However it is generally regarded as the coherence of the site's structure and function.

8. In the past, the term "Appropriate Assessment" has been used to describe both the overall process and a particular stage of that process (see below). However, over the years, the term Habitat Regulations Assessment has come into use in order to refer to the process that leads to an "Appropriate Assessment", thus avoiding confusion. Throughout the remainder of this report, Habitat Regulations Assessment (HRA) is used to refer to the overall procedure required by the Habitats Regulations.

Methodology

The HRA Process

9. In practice, HRA of projects can be broken down into three discrete stages, each of which effectively culminates in a test. The stages are sequential, and it is only necessary to progress to the following stage if a test is failed. The stages are:

Stage 1 – Screening (Likely Significant Effects Test)

10. This is essentially a risk assessment, typically utilising existing data (although bespoke data may be used where appropriate and available), records and specialist knowledge. The purpose of the test is to decide whether 'full' Appropriate Assessment is required. The essential question is:

"Is the project, either alone or in combination with other relevant projects and plans, likely to result in a significant adverse effect upon a European site?"

11. If it can be demonstrated that significant effects are unlikely, no further assessment is required.

Stage 2 – Appropriate Assessment

12. If it cannot be satisfactorily demonstrated that significant effects are unlikely, a full "Appropriate Assessment" will be required. In many ways this is analogous to an Ecological Impact Assessment, but is focussed entirely upon the designated interest features of the European sites in question. Bespoke survey work and original modelling and data collation are often required. The essential question here is:

"Will the project, either alone or in combination with other relevant projects and plans, actually result in a significant adverse effect upon European sites, without mitigation?"

13. If it is concluded that significant adverse effects will occur, measures will be required to either avoid the impact in the first place, or to mitigate the ecological effect to such an extent that it is no longer significant. Note that, unlike standard Ecological Impact Assessment, compensation for significant adverse effects (i.e. creation of alternative habitat) is not permitted at the Appropriate Assessment stage.

Stage 3 – Imperative Reasons of Overriding Public Interest (IROPI) Test

14. If a project will have a significant adverse effect upon a European site, and this effect cannot be either avoided or mitigated, the project cannot proceed unless it passes the IROPI test. In order to pass the test it must be objectively concluded that no alternative solutions exist. The project must be referred to Secretary of State on the grounds that there are Imperative Reasons of Overriding Public Interest as to why the plan should nonetheless proceed. The case will ultimately be decided by the European Commission.

Approach to Stage 1 – Screening

15. This Report therefore addresses the first test in the HRA process, Stage 1 – Screening. The following approach has been adopted for this assessment:

1. Identification of European Sites to be scoped into the assessment;
2. Description of the European Sites and their qualifying features;
3. Description of the Proposed Development and identification of potential impact pathways;
4. The likely significant effects test; and,
5. The in-combination test.

Identification of European Sites

16. Through consideration of likely impacts associated with the Proposed Development and consultation with Natural England and West Sussex County Council (WSSCC), two European sites have been scoped into the assessment:

- The Mens SAC located approximately 1km south of the Proposed Development; and
- Ebernoe Common SAC located approximately 5km west of the Proposed Development.

Description of European Sites

The Mens SAC

17. The Mens SAC is comprised of extensive, mature beech *Fagus sylvatica* woodland rich in lichens, bryophytes, fungi and saproxylic invertebrates, and is one of the largest tracts of Atlantic acidophilous beech forests in the south-eastern part of the habitats UK range. It has been designated under the EU Habitats Directive for the following features:

- Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion robori-petraeae* or *Illici-Fagenion*) (the primary reason for the site's designation as a SAC); and,
- Barbastelle bat, for which the area is considered to support a significant presence (a secondary reason for the site's designation).

18. At the last condition survey, compiled on 1 June 2009, Natural England recorded that all of the site's 204.69 hectares were found to be in a 'Favourable' condition.

Ebernoe Common SAC

19. Ebernoe Common supports an extensive block of beech *Fagus sylvatica* high forest and former wood-pasture over dense holly *Ilex aquifolium*, and has a very rich epiphytic lichen flora, including *Agonimia octospora* and *Catillaria atropurpurea*. It represents Atlantic acidophilous beech forests in the south-eastern part of the habitat's UK range. The beech woodland is associated with other woodland types, open glades and pools, which contribute to a high overall diversity. The woods are important for a number of bat species, in particular Bechstein's bat and the Barbastelle bat. It has been designated under the EU Habitats Directive for the following features:

- Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion robori-petraeae or Illici-Fagenion*) (a primary reason for the site's designation as an SAC);
- Barbastelle bat, for which the area is considered to support a significant presence (a primary reason for the site's designation as an SAC);
- Bechstein's bat, a maternity colony of Bechstein's bat is associated with the woodland. Roosts are mainly in old woodpecker holes in the stems of live mature oak trees (a primary reason for the site's designation as an SAC).

The Proposed Development

20. The Proposed Development involves the siting and construction of a temporary well site with key infrastructure including:

- An access track created from crushed stone;
- A drilling rig and ancillary drilling equipment for an exploratory borehole;
- Staff car park providing up to 12 spaces within the compound;
- Concrete chamber sunk into the ground acting as a cellar including large diameter pipework;
- Purpose built tanks to store semi-dry drilling mud and cutting rocks;
- Water storage tankers and a portable skip for onsite water and refuse collection; and,
- Five portable cabins to provide temporary office accommodation and essential 24-hourstaff living accommodation and laboratories.

21. The Proposed Development will be sited within an arable field and will not be located closer than 15m from the edge of the woodland habitats at any point.

22. Construction of the temporary well site will require the excavation and removal of top soil throughout the Application Site totalling an area of approximately 1.43ha.

Avoidance and Mitigation Measures

23. Lighting for the Proposed Development has been designed to minimise unnecessary illumination and prevent light spill into adjacent habitats (See Chapter 12 Lighting). There will be no lighting during the construction or restoration phases of the Proposed Development. During operation lighting will comprise of six freestanding 3m high fluorescent lights facing inwards towards the site and pointing downwards, eight tungsten filament bulkhead lights located on site cabins, two horizontal strip lights at cabin level adjacent to the rig; and inward and downward facing lighting within the derrick of the drilling rig.

24. The Proposed Development will be lit for approximately 8 weeks (best case scenario) – 14 weeks (worst case scenario).

25. Lighting models produced for the Proposed Development indicate that light spill directly to the rear of the lighting will be 1.5-2lux, although this quickly depreciates beyond this to approximately 0.01lux at 10m behind the unit. Beyond 10m the light contribution from the luminaire would be 0 lux. Lighting levels are therefore expected to depreciate to background levels approximately 10m away from the Proposed Development.

26. Mitigation measures will be conditioned as part of the planning application to further reduce both light and noise pollution emanating from the Proposed Development. This will include the following:

- Areas of the site that are not operational will not be lit;
- The power of the lights will be the minimum necessary for purpose;
- Topsoil bunds, of approximately 2.5-3m will be created between the site boundary and the woodland edge – further reducing light spill into adjacent habitats;
- Noise attenuation and dust control procedures will operate on site including effective silencers; and,
- A Construction Environmental Management Plan (CEMP) will be compiled prior to works commencing on site to ensure best environmental working practice during construction.

Identification of Potential Impact Pathways

Barbastelle and Bechstein's Bat

Disturbance to foraging and commuting bats

27. There is potential for increased light and noise levels generated by the Proposed Development to disturb barbastelle and Bechstein's bat, if present within the vicinity of the Proposed Development.

28. Increased illumination may reduce the ability of both species to forage within a given area as it can:

1. Cause bats to avoid an illuminated area (both barbastelle and Bechstein's bats are known to be particularly sensitive to illumination and tend to avoid lit areas[2]); and,
2. Reduce the availability of prey species (insects) within an area. Insects are often attracted to light and may therefore move from a less lit area to a more illuminated one. This can reduce the availability of prey species for light sensitive bats (such as barbastelle and Bechstein's bat).

29. The illumination of an area can also disturb commuting bats. This is particularly harmful along favoured commuting routes, such as rivers, woodland edges, and hedgerows. Severance to commuting corridors can also potentially reduce the ability of bats to feed if the commuting route leads to a favoured foraging area.

30. There has been limited research conducted on the effect of noise on bats. A recent study concerning the greater mouse-eared bat *Myotis myotis* showed that various types of noise did affect the foraging behaviour of the species (and in some cases reduced the ability of the bat to forage)[3]. However, the effect of noise on the bat was complex and was not directly related to the amplitude of the sound (volume), but rather to nature (frequency and time structure) of the sound and how this interacted with the bat's echolocation. For example, the Schaub study showed that 'vegetation noise', which was at a lower volume when compared to the traffic noise, had a more disruptive effect on the bat's foraging behaviour due to its similarity in sound character to the bat's prey species.

31. The potential for foraging and commuting bats to be affected by increased light and noise levels as a result of the Proposed Development will therefore be considered further.

Disturbance to roosting bats

32. Illumination of a bat roost, even a transient summer roost, has the potential to disturb bats and cause them to desert the roost. In the case of the Proposed Development, however, there is no reasonable likelihood of potential

[2] Bat Conservation Trust. 2008; Bats and Lighting in the UK.

[3] Schaub A, Ostwald J, Siemers BM. 2009. Foraging bats avoid noise. Journal of Experimental Biology.

barbastelle or Bechstein's bat roosts being illuminated. Light levels will depreciate to background levels after 10m and no trees with the potential to support roosting bats are located with this buffer.

Habitats

Direct loss and degradation to habitats

33. Direct loss of habitats for which both European Sites are designated will not occur due to the intervening distance between the Proposed Development and the European sites (both sites are located >500m from the Proposed Development).

34. Furthermore, degradation to habitats due to air quality impacts are not anticipated. The requirement for an Air Quality chapter has been scoped out of the Environmental Impact Assessment (EIA) following consultation with WSCC as air quality impacts are not anticipated. Potential adverse effects on the habitats for which both European sites are designated are therefore not anticipated and are not considered further in this assessment.

Likely Significant Effects Assessment

35. In order to assess whether barbastelle and Bechstein's bat are likely to be affected by the Proposed Development, a review of available literature and the collection of bespoke data (collected to inform the Environmental Impact Assessment (EIA)) has been undertaken. The results of this review are presented below.

Literature Review

36. A significant amount of data on the foraging and commuting behaviour of barbastelle bats supported by The Mens SAC and Ebernoe Common SAC exists due to studies which have been undertaken by Frank Greenaway over the past 10 years. This includes information contained within:

1. Greenaway, F. (2004) Advice for the management of flightlines and foraging habitats of the barbastelle bat *Barbastellus barbastellus*. English Nature Research Report, Number 657.
2. Greenaway, F. (2008) Barbastelle bats in the Sussex West Weald 1997 - 2008

37. The above studies identified that the barbastelle of The Mens SAC forage to the east of the site, principally on the floodplain of the river Arun from close to Horsham in the north to Parham in the south. The studies also revealed that barbastelle cross to the Adur floodplain, with bats in some cases travelling up to 7km to visit foraging areas.

38. Greenaway demonstrated that the barbastelle supported by Ebernoe Common SAC had flightlines that followed watercourses, particularly the river Kird, and woodland cover for distances of typically 5km. Flightlines outside the SAC were largely concentrated to the south of the SAC (the Petworth and Tillington area) but also to the west, north and east.

39. The key commuting and foraging areas for barbastelle, as identified by the Frank Greenaway studies, are presented on Figure 1 below.

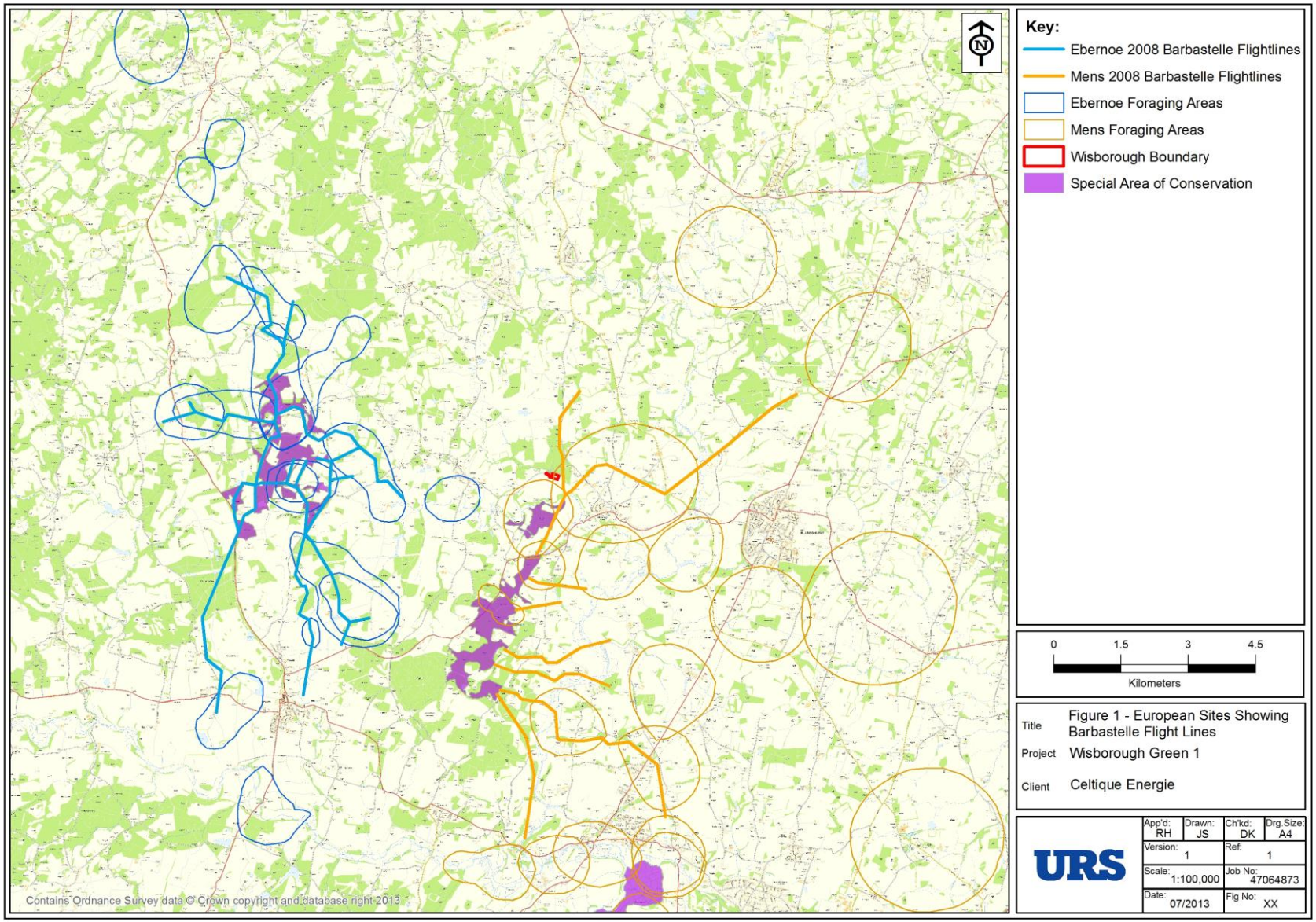
40. With regards Bechstein's bat, less study of their populations has been undertaken when compared to barbastelle. However, those radio-tracking projects which have been implemented for the species have established that the tracked individuals generally remained within approximately 1.5 km of their roosts[4]. These distances fit with those identified from radio-tracking of Bechstein's that was undertaken at Ebernoe Common SAC from 2001, which identified that the maximum distance travelled by a tagged Bechstein's bat to its foraging area was 1,407m, with the average being 735.7m[5].

41. As the maximum routine commuting distance for Bechstein's bat is approximately 1.5km, and the Proposed Development is located approximately 5km away from Ebernoe Common (Bechstein's bat are only listed as a qualifying

[4] Cited in: Schofield H & Morris C. 2000. 'Ranging Behaviour and Habitat Preferences of Female Bechstein's Bats in Summer'. Vincent Wildlife Trust

[5] Fitzsimmons P, Hill D, Greenaway F. 2002. Patterns of habitat use by female Bechstein's bats (Myotis bechsteinii) from a maternity colony in a British woodland

feature for Ebernoe Common and **not** the Mens SAC), it is unlikely that the Proposed Development will significant affect populations of Bechstein's bat. The potential for significant effects on Bechstein's bat are therefore not considered further in this assessment.


Key:
Ebernoe 2008 Barbastelle Flightlines
Mens 2008 Barbastelle Flightlines
Ebernoe Foraging Areas
Mens Foraging Areas
Wisborough Boundary
Special Area of Conservation
0
1.5
3
4.5
Kilometers
Contains Ordnance Survey data © Crown copyright and database right 2013
Title
Figure 1 - European Sites Showing Barbastelle Flight Lines
Project
Wisborough Green 1
Client
Celtique Energie
URS
App'd: RH
Drawn: JS
Ch'kd: DK
Drg.Size: A4
Version: 1
Ref: 1
Scale: 1:100,000
Job No: 47064873
Date: 07/2013
Fig No: XX

2013 URS Field Survey Data

42. Bat activity surveys were undertaken by URS at the Proposed Development site during spring and summer 2013. These surveys are to be completed in September 2013. These surveys included:

    1. Walked transect surveys – undertaken during May (dusk survey), June (dusk and dawn survey), and July (dusk survey); and,
    2. Automated static surveys – undertaken from May – July with recorders left at various locations across the Proposed Development site to record bat activity.

43. All surveys were undertaken in accordance with guidance for bat survey issued by the Bat Conservation Trust (BCT) in 2012[6]. A summary of the findings of these surveys is provided below although for full details with regards the methods and results of this survey please refer to Appendix 7.2.

Walked transect surveys

44. During the walked transect surveys, barbastelle were recorded during the May survey only, with two barbastelle seen flying westwards along the woodland edge located to the north of the Proposed Development. No barbastelle were recorded during the June and July surveys.

45. The behaviour of barbastelle within the vicinity of the Proposed Development are generally likely to accord to that of the other bat species recorded (more frequently) during the transect surveys. Bats were noted commuting and foraging adjacent to and within the woodland to the north, east and west of the site. No bats were recorded within the arable field within which the Proposed Development is to be sited (please refer to Figure 1 for survey locations and results).

[6] Bat Conservation Trust (2012). *Bat Surveys; Good Practice Guidelines.* Bat Conservation Trust, London

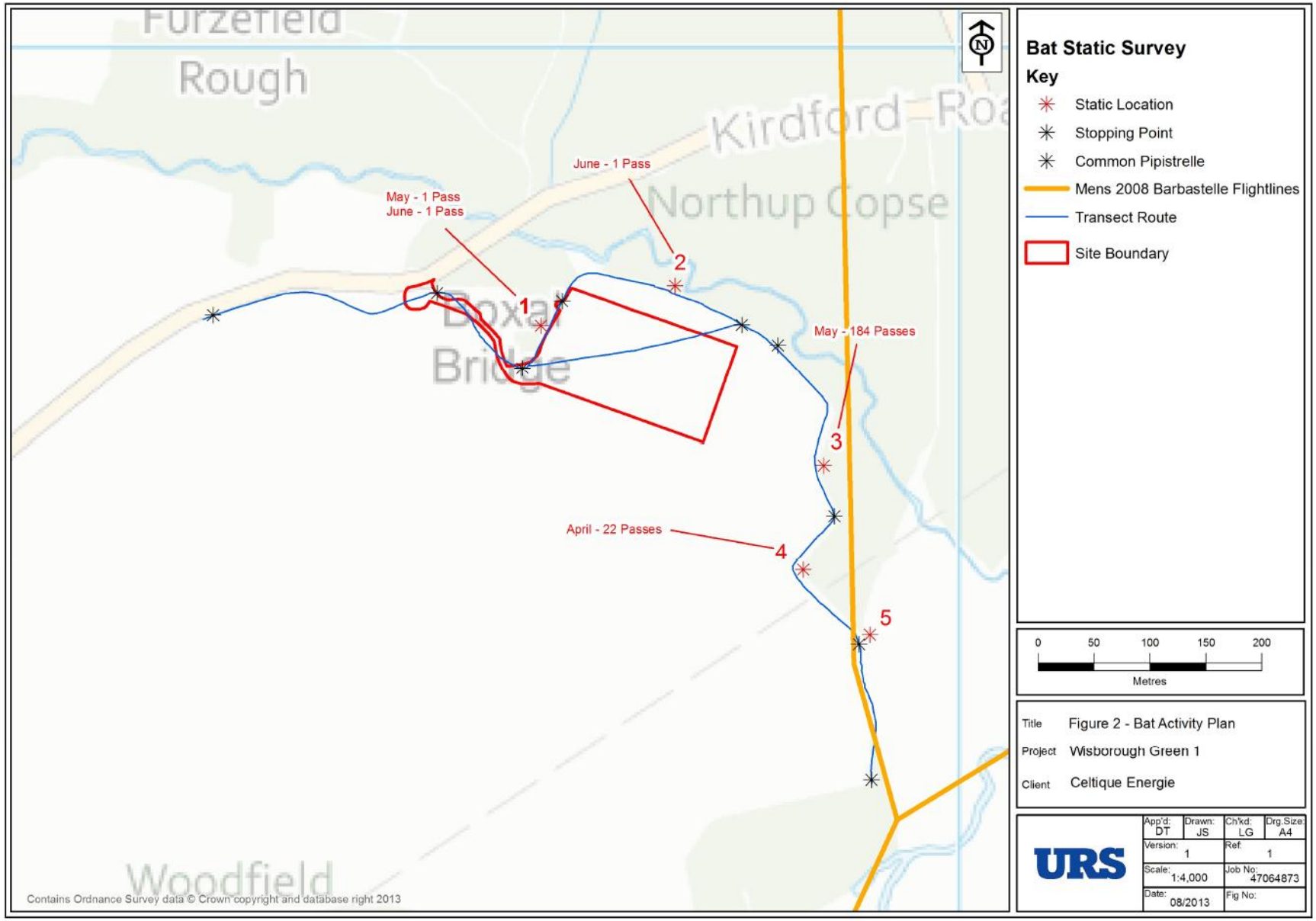
Automated static surveys

46. The number of barbastelle passes at each automated static bat detector location is presented in Table 1.2 below. The location of the statics is presented on Figure 2.

Table 1.2 Number of Bat Passes Recorded at Each Static Location

Static Location and Month of Operation	Barbastelle Passes
April Static Location 4	22
May Static Location 1	1
May Static Location 3	184
June Static Location 1	3
June Static Location 2	1

47. The highest number of barbastelle passes (passes can provide an indication of bat activity on site, was recorded by statics 3 and 4, located to the east of the Proposed Development site (see Figure 2). The location of the relatively high levels of barbastelle activity (recorded at statics 3 and 4) correlates with the location of a key commuting route as observed by Frank Greenaway in his 2008 study (see Figure 1 for further detail). This commuting route is located approximately 100m east of the Proposed Development, with barbastelle likely to be commuting in a northerly and southerly direction when moving between The Mens SAC and favoured foraging habitat in the north


Furzefield
Rough
Kirdford Road
Northup Copse
Boxall
Bridge
Woodfield
May - 1 Pass
June - 1 Pass
June - 1 Pass
May - 184 Passes
April - 22 Passes
1
2
3
4
5
Contains Ordnance Survey data © Crown copyright and database right 2013
Bat Static Survey
Key
Static Location
Stopping Point
Common Pipistrelle
Mens 2008 Barbastelle Flightlines
Transect Route
Site Boundary
0
50
100
150
200
Metres
Title Figure 2 - Bat Activity Plan
Project Wisborough Green 1
Client Celtique Energie
URS
App'd: DT
Drawn: JS
Ch'kd: LG
Drg.Size: A4
Version: 1
Ref: 1
Scale: 1:4,000
Job No: 47064873
Date: 08/2013
Fig No:

Discussion

48. The literature and field surveys identified an important barbastelle commuting route located in the vicinity of the woodland approximately 100m to the east of the Proposed Development (see Figure 1 and static location 3 and 4). The literature review and results of the URS bat activity surveys also indicated that low numbers of barbastelle are present commuting and potentially foraging adjacent to the woodland (see static locations 1 and 2) to the west and north of the site. Barbastelle were not recorded during transect surveys within the arable field during the transect surveys where the Proposed Development is to be sited.

49. The Proposed Development has been sensitively designed and sited to avoid affecting bats. There will be no light spill on to surrounding sensitive habitats (including the woodland) which support commuting and foraging barbastelle. This has been demonstrated through lighting models which indicate that light levels will depreciate to 'background' levels at distances greater than 10m from the Proposed Development. The woodland habitats are located no closer than 15m to the Proposed Development at any one point.

50. There will be elevated levels of noise during the construction and drilling phases of the Proposed Development (an approximately 20 week period under a worst case scenario). However, construction will not be undertaken at night and the period when noise could potentially affect foraging barbastelle is limited to a 10 week drilling phase (worst case scenario).

51. Furthermore, as the literature review and field surveys demonstrated, the area within the immediate vicinity of the Proposed Development, while potentially supporting small numbers of barbastelle, is not considered to be a significantly important foraging resource for the species. The studies by Frank Greenaway have identified a range of other (and indeed favoured) foraging areas within the wider area, outside of the vicinity of the Proposed Development (see Figure 1).

52. Based on the considerations above, it is unlikely that the Proposed Development would affect the foraging or commuting behaviour of a significant number of barbastelle supported by The Mens SAC and / or Ebernoe Common SAC.

53. **Significant effects on these European Sites are therefore not considered likely**.

In-combination assessment

54. Table 1.3 presents three schemes which have been identified in the EIA as having the potential to interact with the Proposed Development. These schemes are considered for their potential to have in-combination effects with the Proposed Development.

Table 1.3 Number of Bat Passes Recorded at Each Static Location

Planning Application Number	Description of Scheme	Distance from Proposed Development
08/02511/FUL	The siting of 3 portable containers associated with the harvesting of methane gas	3.7km
13/00593/EIA	Screening for 31ha solar farm – was screened in previous year for a 20ha solar farm.	3.5km
13/01190/EIA	EIA Screening for 30 houses on land south of Petworth Road opposite Meadowbank, Wisborough Green	1.4km

55. Considering the nature and location of the in-combination schemes is relation to the Proposed Development, no obvious interactions or impact pathways have been identified. **It is therefore unlikely that the Proposed Development will have significant effects on any European Site in-combination with another plan or project.**