Unique No. 20031091 13 March 2023

Submission Deadline 8 re Badlingham Lane U6006

EN010106-005275-8.96 Applicant's response to Other Parties Deadline 6 Submissions.pdf (planninginspectorate.gov.uk)

The Applicant's assertion (p.30) that the *'northern crossing point is no longer required'* would be welcome if it were true but it is not, the northern crossing is still planned, albeit by Horizontal Directional Drilling (HDD) or similar method.

In a recent examination, the Applicant's counsel Mr Turney explained that HDD involves not one underground channel but four, so the two crossings of U6006 will involve eight drillings, giving ample scope for error and release of polluting lubrication fluid, which happened during construction of HS2 [see The Guardian, 12 September 2021 HS2 loses large amount of potentially highly polluting bentonite | HS2 | The Guardian]. The Applicant acknowledges the risk of pollution in the latest iteration of the LEMP [EN010106-005237-6.2_Appendix_10I] :

5.12.23 *During construction, there is potential for pollutant spills and dust deposition onto Badlingham Lane CWS, which have the potential to adversely affect habitats associated with the CWS and, consequently, species associated with them.*

This is concerning as construction works should not need to be anywhere near the CWS. There is a 400m gap between the houses and the start of the CWS, allowing sufficient width as HDD construction should take place either side of U6006 and some distance from the Lane itself.

There doesn't seem to be any logic in having a northern crossing at all, as the cable will need to recross south of the Lane at some point to link into the BESS. This could be avoided if the cable connected to the BESS from E24 via E13 (the Quarry extension doesn't appear to extend as far as the U6006 boundary, so would allow this route, see p.56, Ecological Assessment PDF, Appendix A attached). This would avoid any damage to the CWS in Badlingham Lane and obviate the necessity of cable trenching inside E12 with potential to damage the trees along U6006 if sited too close to their roots. This route could be used if E12 were removed from the scheme entirely.

EN010106-005237-6.2_Appendix_10I_Landscape and Ecology Management Plan_[REDACTED, TRACKED].pdf (planninginspectorate.gov.uk)

While it is gratifying that the Applicant has acknowledged that Badlingham Lane is *Part of the historic Icknield Way and a valuable local amenity . . .* [5.12.17] I am less happy with their proposed 'Management' plans. That it is not currently managed [5.12.18] is clearly to its advantage, given its abundant flora and fauna. The CWS exists perfectly well without interference. Existing trees and hedges must not be 'managed' if that involves felling,

lopping, clearance of dead wood, or Ivy, due to their importance for foraging and roosting bats, see bat survey attached [Appendix B].

The Applicant has produced significant late stage changes and additions to this document making it difficult if not impossible for lay interested parties to process. Its presentation is unhelpful, lacking clarity and with imprecise and confusing language: for example, Headers are only provided on the first page of Table B1, so the reader has to constantly refer back. Language is imprecise, e.g.

5.2.4. (i) *Parcel EC03 will establish a substantial offset from Freckenham Road, to reduce the perception of the solar panels and proximity to residents.*

Freckenham Road is known as Mildenhall Road in Freckenham but is actually the B1102. It would be preferable if the Applicant used road numbers where they exist as well as local names, to avoid confusion. U6006 is variously referred to as Badlingham Road and Badlingham Lane.

5.2.4. (i) continues: *The U6006 County Wildlife Site will be retained and is proposed for native chalk grassland as an improvement to the land cover compared to the agricultural fields.*

5.12.21. Badlingham Lane will be retained as part of the Scheme design and will remain undeveloped as secured through the limits of deviation shown on the Works Plan.

5.13.11. Badlingham Road (U6006) . . . passes through the centre of Sunnica East Site B and is enclosed by dense trees and scrub on both sides through the section where solar panels are proposed (E12 and E13)

These clauses imply U6006 and the CWS within it are in the Applicant's gift '*to be retained*' – or not. This is not the case, U6006 is a road and must remain under the control of SCC as would any other highway. Strictly U6006 does not pass through East Site B, on the contrary the Scheme surrounds U6006, an historic road of considerable antiquity, which the applicant acknowledges [5.12.17].

These criticisms might appear trivial but I would argue that perceptions matter; the applicant has made no secret of their intention to sell the scheme on should the DCO be granted, so it is important that there is no ambiguity as to the status and importance of U6006 or Badlingham Lane CWS for future owners.

The applicant's plans for proposed improvement appear laudable but are possibly unnecessary and impracticable. There is only a short section of verges along U6006, already a suitable habitat for the plants they support. The suggestion that it should be improved or grazed by sheep [5.12.26] I can only assume to be a 'cut and paste' error, introducing sheep onto a public highway popular with dog-walkers and motor cyclists would be dangerous to both users and livestock.

There seems to be some overlap in the text as to whether Applicant means the CWS running **along** U6006 (Badlingham Lane CWS) or the CWS **beside** U6006 in ECO3 (Worlington Heath CWS).

The inclusion of Badlingham Lane CWS in detailed management plans at this very late stage is confusing. The Applicant appears to have been unaware of its existence or ignored it on previous plans having overlain the site with their thick red Order Limit line, see EN010106-001880-SEF_ES_6.3_Figure 2-2_Sunnica East Constraints.pdf (planninginspectorate.gov.uk), only recently acknowledging it on EN010106-004867-8.47 Environmental Masterplan (Zoomed Out).pdf [p.5 of 7] although not very prominently, the label could be indicating the tiny triangular extension area off it. The extent of Badlingham Lane CWS only becomes clear on the Worlington Ecological Assessment plan, p. 19 (and text description on p.21) attached as Appendix 1.

I do not believe the applicant should have any control over U6006 post construction. They should not need to have access to any part of the lane apart from their one maintenance crossing.

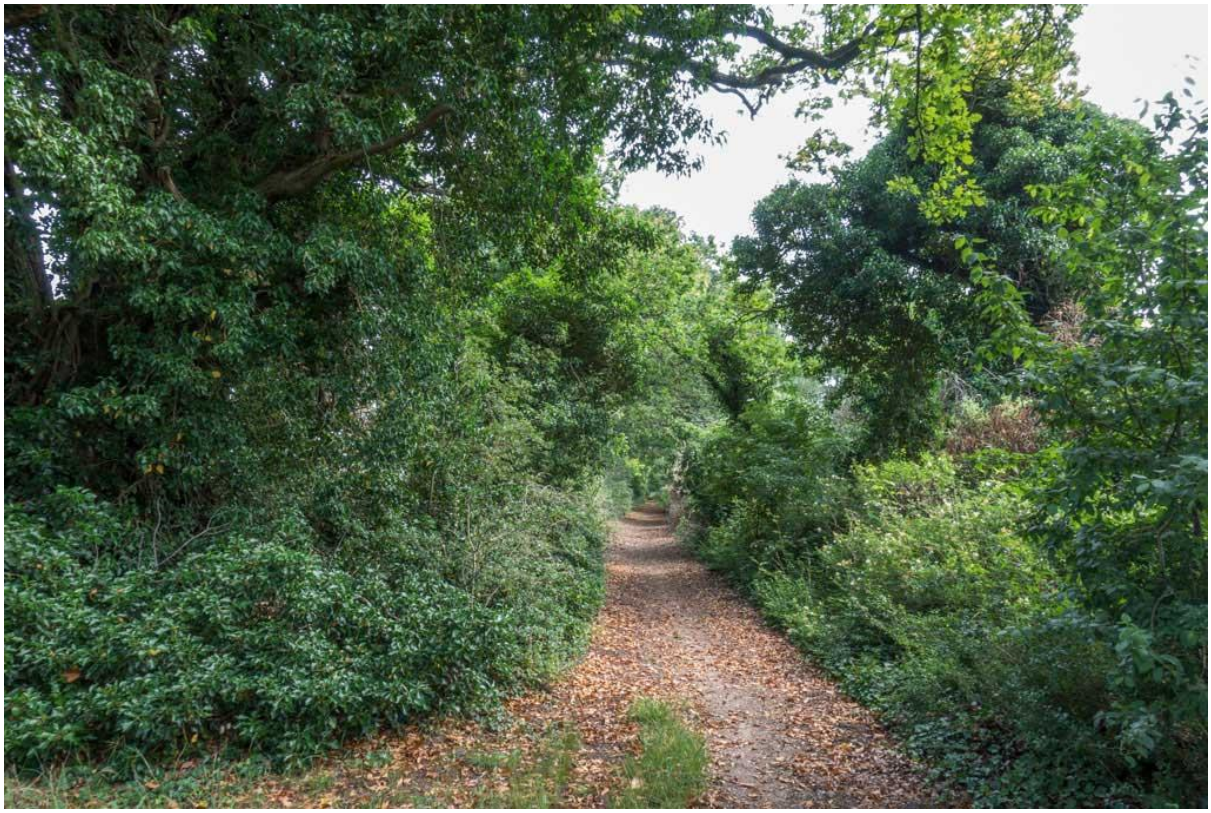
Very concerning is the section relating to post-construction management of Worlington Heath CWS:

5.12.12. The post-construction management for Worlington Heath CWS focuses on the key habitats of lowland dry grassland and heathland for which it is designated a CWS. This will initially be targeted at assessing the status of scrub across the CWS and, ***despite its classification as a Priority Habitat, it is likely that some or all of this may need to be removed****. [my emphasis]*

This statement demonstrates that 'management' can do more harm than good. What is the point of managing a priority habitat if it results in its destruction? 'Key habitats' which have formed naturally over time, without human intervention or interference, should be left to their own devices. As a resident very much affected, I resent the potential for yet more interference and change from this development.

APPENDIX 3:

Badlingham Lane
Bat Activity Survey
11th August 2021



1. Survey Methodology

The survey was carried out at various fixed points along the lane [see map]. The points were chosen because they were judged to offer good sheltered feeding areas for bats so as to maximize the amount of feeding activity detected.
Batbox Duet bat detectors were used in conjunction with digital recorders to record bat echolocation. Recording times were synchronized and ran for 90 minutes from sunset. Analysis was done on computer using Batscan and Batsound analysis programmes.

Survey Points, 11th August 2021

Badlingham Lane[Green Lane]
Bat Survey 11th August 2021.
Survey Points.

2. Summary of Results

Recording points 11th August 2021.

Point 1. TL69377312
Three species were recorded. Common Pipistrelle *Pipistrellus pipistrellus,* Soprano Pipistrelle *Pipistrellus pygmaeus* and Barbastelle *Barbastella barbastellus.*

Point 2. TL69337305
Three species were recorded. Common Pipistrelle, Soprano Pipistrelle and a Myotis species [probably Natterer's bat *Myotis nattereri*].

Point 3. TL69187286
Four species were recorded. Common Pipistrelle, Soprano Pipistrelle, Serotine *Eptesicus serotinus* and a Myotis species [probably Natterer's bat].

Point 4. **TL69057267**
Four species were recorded. Common Pipistrelle, Soprano Pipistrelle, Serotine and a Myotis species [probably Natterer's bat].

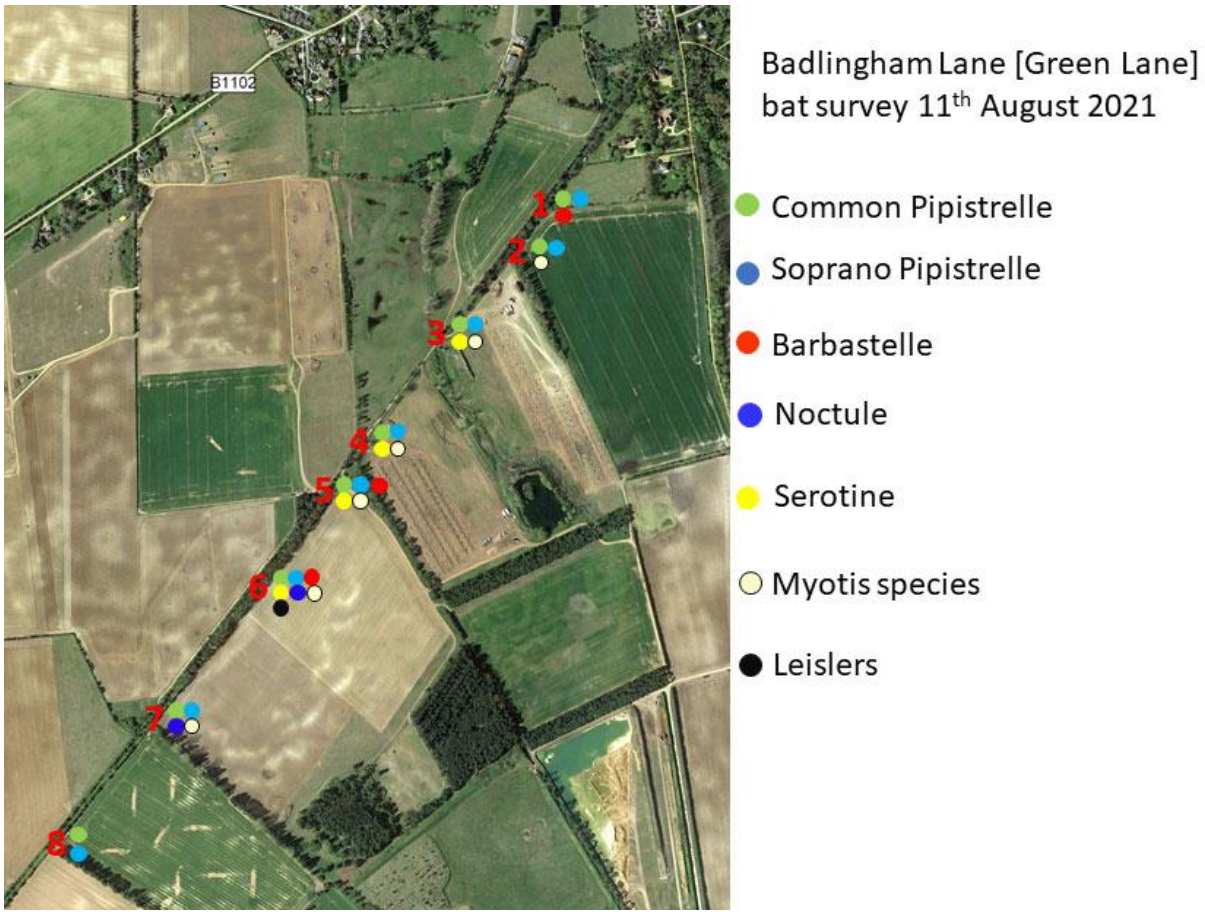
Point 5. TL69007257
Five species were recorded. Common Pipistrelle, Soprano Pipistrelle, Barbastelle, Serotine and a Myotis species [probably Natterer's bat].

Point 6. TL68867238
Seven species were recorded. Common Pipistrelle, Soprano Pipistrelle, Barbastelle, Serotine, Noctule *Nyctalus nocula,* Leisler's bat *Nyctalus leisleri* and a Myotis species [probably Natterer's bat].

Point 7. TL68717215
Four species were recorded. Common Pipistrelle, Soprano Pipistrelle, Noctule and a Myotis species [probably Natterer's bat].

Point 8. **TL68527190**
Two species were recorded. Common Pipistrelle and Soprano Pipistrelle.

Species distribution 11th August 2021.



3. Conclusions

Both Common and Soprano Pipistrelle bats were widespread along Badlingham Lane, being recorded at all points. These bats will be roosting in a number of different trees or buildings depending on the time of year and weather conditions. In both species there will have been main maternity roost sites during June and July with other sites being used at other times.

Barbastelle bats were recorded at three different points. The Barbastelle is a nationally rare bat with a stronghold in East Anglia, even here it is still rare with colony sizes being small and very mobile. Barbastelle bats roost mainly in trees but will also use buildings. As this species is very mobile with colonies regularly changing roost sites all of the old trees are very important. Roost sites will be in holes and splits in both the trunk and branches and behind loose lifting bark on dead or lightning struck trees. Ivy is also very important for this species as it is known to roost in crevices between thick stems and the tree trunk.

Serotine bats were recorded at four of the points. The Serotine is one of our largest bats and is not very common. This species is only known to roost in buildings, usually large houses and barns, there is a known roost in Worlington church. Serotines feed around woodland edges, along tall hedges and very low down over unimproved grassland which supports large insects, including beetles and moths. The pastures behind Manor Farm and the stables on the south side of Worlington village north of points three and four will be very important for foraging and Serotines will fly along tree belts and hedgerows to get to these areas.

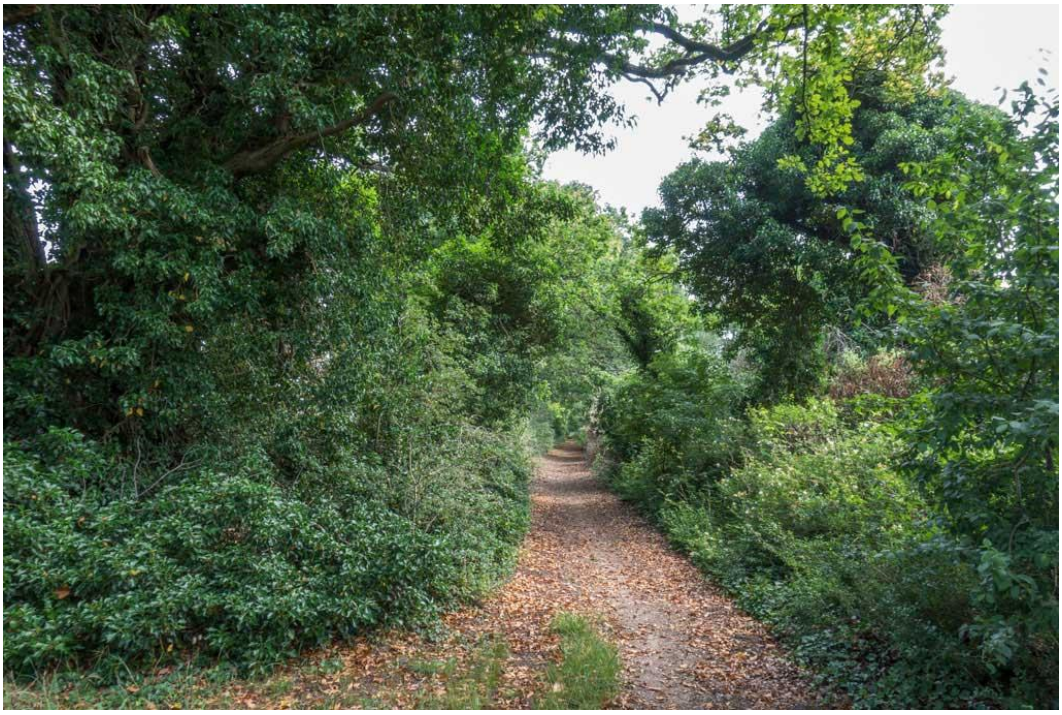
Noctule bats were recorded at two of the survey points but as they fly high and travel long distances to feed the records could have been the same bat. The Noctule bat is still decreasing in numbers due to loss of roosting sites and good feeding areas. This is another of our largest bats, almost always found roosting in tree holes, they have a particular liking for the old Breckland pine trees, often roosting in old woodpecker holes. They will fly up to twenty miles at night from roost sites to good feeding areas and can be seen flying over as the Swifts go to roost.

The Leisler's bat recorded at point six is a smaller and rarer relative of the Noctule and will roost in buildings as well as trees. Leisler's bats mainly roost in tree holes and could possibly be roosting in one of the old pine trees in the area.

The Myotis bats recorded at six of the points could be any one of the four species we have in Suffolk, these are Daubenton's bat, Natterer's bat, Whiskered bat *Myotis mystacinus* and Brandt's bat *Myotis brandtii.* The last two are very rare in Suffolk and the most likely species will be the Natterer's bat which is a species that mainly feeds around trees and roosts in both tree holes and buildings.

There is one other species that we do not pick up on the bat detectors but is widespread in Suffolk and will be present along Badlingham Lane, that is the Brown Long-eared bat *Plecotus auratus.* This bat has very quiet echo-location and such sensitive hearing that it can pick insects, particularly moths, off foliage while flying in amongst the tree branches. Brown Long-eared bats roost in both tree holes and the roof spaces of buildings, including modern houses, churches and barns.

Badlingham Lane, good for foraging, commuting and roosting.



Suitable roosting site along Badlingham Lane for Barbastelle bats.

Example of lifting bark suitable for Barbastelle bats to roost behind.

Old pine trees along Badlingham Lane offer good roosting potential.

Old pine trees for roosting and unimproved pasture for foraging.

Old pine tree with holes suitable for bats

Flower rich pasture at Manor Farm, good for foraging.

4. Hibernation

It is likely that many of the older trees in the area will be used for hibernation for at least part of the winter, particularly by Noctule and Barbastelle bats. Barbastelles are known to roost behind loose tree bark as well as in cavities and will only move to alternative sites during very cold weather.

5. Recommendations.

Leave dead standing trees as roosting sites.
Leave all trees with splits in the trunk and loose peeling bark as these are important roosting sites for Barbastelle bats.
Do not remove any wind damaged or dead branches from the old trees as the splits and holes in these also provide important roosting sites, often some distance from the main trunk.
Before carrying out work on any trees which may have cavities in them it is important that a thorough search is done to make sure no bats are present [contact the Bat Conservation Trust for advice].
Do not remove or kill mature Ivy on the large trees as it provides roosting sites for Barbastelle bats.
Retain and improve any hedgerows and tree belts that link roosting and foraging areas as these provide good commuting routes for bats.
Maintain any areas of open unimproved flower rich grassland which provides insects for foraging bats.
Maintain ponds etc. in an open condition as they provide good feeding sites for bats.
It is important that no large gaps are created between the trees along Badlingham lane as this would interrupt commuting routes used by bats. Some species of bat will not fly across wide gaps in tree lines.

Acknowledgements.
Many thanks to Sandie Geddes and her group of volunteers for their time spent on this survey.

Arthur Rivett
27th October 2021

Contacts.

Suffolk Bat Group. [redacted]

Bat Conservation Trust. [redacted]

WARD ASSOCIATES
CONSULTANT ECOLOGISTS

ECOLOGICAL ASSESSMENT OF LAND AT BAY FARM,WORLINGTON, SUFFOLK

A Report to Frimstone

April 2017

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48 Great Lane,
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CONTENTS

ECOLOGICAL ASSESSMENT OF LAND AT BAY FARM, WORLINGTON, SUFFOLK

1. INTRODUCTION

1.1.1 Frimstone are preparing an application for the extension of their current quarry at Bay Farm, Worlington. This is a small triangular area of arable land and plantation woodland centred on TL698711. The extent of the survey area is outlined in red on Figure 1.

1.1.2 This report has been commissioned by Frimstone to assess the possible effects on biodiversity by undertaking an initial ecological assessment, evaluating the importance of the site by reference to recognised criteria, determining any potential for off-site effects and identifying mitigation and enhancements to avoid or reduce any potential adverse impacts and enhance biodiversity.

1.1.3 It follows the direction by the Secretary of State (dated 10th January 2017) that the development is not EIA. This asked for consideration of possible effects on stone curlew.

1.1.4 Following initial site assessment by Diana Ward MSc CBiol MRSB MCIEEM, the following surveys were undertaken: bat survey; badger survey and Phase 1 survey. There was insufficient suitable habitat and continuity of habitat to allow a reptile population to be present, the presence of plastic on the field precluded use by bird survey and there are no waterbodies in the vicinity to hold great crested newts.

1.1.5 A data search was undertaken and this is given in Appendix 1. The findings are referred to in the text as appropriate. Reference is also made in the text to previous surveys in the immediate vicinity undertaken on behalf of Frimstone which were also used to determine survey requirements.

1.1.6 Final report production is by Diana Ward.

2. PHASE 1 SURVEY

2.1 Method

2.1.1 An extended Phase 1 survey was carried by Sarah Lambert on 2nd April 2017 using the methodology given in the JNCC Phase 1 Survey Handbook.

The survey, which was undertaken in fine weather, took approximately three hours. The whole of the survey area was walked over and plant species lists were made for the main habitats. The main purpose of the survey was to assess the likelihood that rare arable plants were present.

2.1.2 The survey area comprises part of a much larger area of farmland and mineral extraction, and in previous surveys rare arable plant species, including fine-leaved fumitory *Fumaria parviflora*, have been recorded from other parts of Bay Farm. The majority of the survey area supports arable land, with plantation woodland, both mature and recent, forming the south-western and north-western boundaries.

2.1.3 While a survey in April allows identification of the habitats present and a reasonable assessment of their ecological value, it is not an appropriate time to survey for many of the rarer arable species. Therefore, it is not possible to make a definitive statement about their presence. An additional survey would be required in summer to provide this information.

2.2 Habitat descriptions

Arable land

2.2.1 The majority of the survey area is occupied by arable land with free-draining sandy soil. At the time of survey a carrot crop was being cultivated under plastic sheeting. Areas of bare soil between the polythene supported a number of plant seedlings and young plants including frequent small nettle *Urtica urens*, scentless mayweed *Tripleurospermum inodorum*, groundsel *Senecio vulgaris*, flixweed *Descurainia sophia* and fumitory *Fumaria* sp. Towards the edges of the field, seedlings of sycamore *Acer pseudoplatanus* were locally frequent to abundant, together with some perennial weeds such as mugwort *Artemisia vulgaris*.

Track and field margins

2.2.2 The uncultivated south-western margin of the arable field, which is about 4m in width, is shaded by a plantation of Scots pine *Pinus sylvestris* and sycamore, and supports a mix of eutrophic ruderal vegetation and secondary woodland species. Much of it is dominated by common nettle *Urtica dioica* and cleavers *Galium aparine*, with frequent mugwort, common chickweed *Stellaria media* and abundant bur-chervil *Anthiscus caucalis*. Shade-loving species present along this margin include locally

frequent springbeauty *Claytonia perfoliata*, black horehound *Ballota nigra*, ground-ivy *Glechoma hederacea* and garlic mustard *Alliaria petiolata*.

2.2.3 To the north-west of the arable field there is a vehicle access track, composed of compacted sand with fragmentary vegetation of annual meadow-grass *Poa annua* and lesser chickweed *Stellaria pallida*. The transition zone between the vehicle track and the adjacent plantation to the north-west has a south-easterly aspect and supports a moderately diverse flora. Many of the species present along the track-edge are widespread across the site, such as mugwort, springbeauty, small nettle and hound's-tongue *Cynoglossum officinale*, but species which are particularly associated with this band of open-structured vegetation include alkanet *Anchusa arvensis*, weld *Reseda luteola*, wild mignonette *Reseda lutea*, common fiddleneck *Amsinckia micrantha*, grey field-speedwell *Veronica polita*, thyme-leaved sandwort *Arenaria serpyllifolia* and common cudweed *Filago vulgaris*.

Ruderal vegetation

2.2.4 A bank approximately 1.4m in height has recently been created along the northern boundary of the site, where it abuts the active quarry. This bank is composed of a mix of sandy and chalky substrates, and supports open-structured tall ruderal vegetation dominated in spring by bur-chervil with locally frequent mugwort, cock's-foot *Dactylis glomerata*, great lettuce *Lactuca virosa*, hemlock *Conium maculatum* and Guernsey fleabane *Conyza sumatrensis* over low-growing species such as groundsel, scentless mayweed, dove's-foot crane's-bill *Geranium molle*, common field-speedwell *Veronica persica* and willowherb *Epilobium* sp.

Rank grassland

2.2.5 There is rank grassland associated with both perimeter plantations, but this habitat is best developed towards the south-west end of the northern plantation where part of the mature tree belt has been felled and re-planted at wide spacing. Between the young trees there is a rough sward, 30-40 cm in height, dominated by false oat-grass *Arrhenatherum elatius*, Yorkshire-fog *Holcus lanatus* and cock's-foot. The sward is relatively open-structured, with patches of bare ground that support species of disturbed ground such as bur-chervil, hound's-tongue and springbeauty. There are also a number of perennial weedy species present, including locally frequent common nettle, mugwort and common ragwort *Senecio jacobaea*.

Scrub

2.2.6 Scrub is rare on site, but within the recent plantation there are single shrubs of gorse *Ulex europaeus* and broom *Cytisus scoparius*, as well as a small stand of snowberry *Symphoricarpos albus*.

Plantation woodland

2.2.7 There are three discrete types of plantation woodland within the survey area. Along the south-western boundary there is a strip of dense mixed woodland dominated by Scots pine and sycamore, with a heavily shaded ground flora dominated by a mix of grasses, common nettle, cleavers and characteristic shade-loving species such as springbeauty, black horehound, ground-ivy and garlic mustard.

2.2.8 Along the north-western boundary there is an older and somewhat more open-structured area of mixed plantation, some 30m wide, dominated by Corsican pine with sycamore. This more open structured woodland has a patchy shrub layer of elder *Sambucus nigra* and a dense stand of snowberry. The ground flora has a mix of grassland, secondary woodland and ruderal species, including locally frequent annual mercury *Mercurialis annua*. There is a small sand of cotton thistle *Onopordum acanthium* near the boundary with the vehicle access track.

2.2.9 At the western end a section of woodland has been recently felled and replanted with a mix of broadleaved species including pedunculate oak *Quercus robur*, hornbeam *Carpinus betulus*, rowan *Sorbus aucuparia* and sweet chestnut *Castanea sativa*. The trees are still in protective tubes and the majority of this area is currently occupied by rank grassland.

2.3 Assessment of ecological value

Habitats

2.3.1 The majority of the survey area is occupied by arable land, with significant areas of plantation woodland and rank grassland around the periphery of the site. The latter habitats are of relatively low ecological value, as they support rather species-poor vegetation which is unlikely to contain any rare species and is relatively easily re-created. Although no quadrats were recorded, the rank grassland appears to be most similar to MG1b *Arrhenatherum elatius* grassland, *Urtica dioica* sub-community, a

very common vegetation type characteristic of unmanaged grasslands throughout lowland Britain.

2.3.2 It was too early in the year to identify all the species present in the arable land and within the open-structured vegetation on the south-east facing edge of the vehicle access track. No quadrats were recorded, but the species present suggest that the arable flora has strong similarities with OV17 *Reseda lutea – Polygonum aviculare* community, which is characterised by the presence of species such as flixweed, alkanet, common field-speedwell, groundsel, chickweed, white campion, scentless mayweed and grey field-speedwell, all of which were recorded during the survey. This community, which is characteristic of disturbed, dry, sandy soils in East Anglia, is not particularly noted for the presence of rare arable weeds such as fine-leaved fumitory, which tend to prefer more chalky substrates.

2.3.3 However, a number of fumitory and poppy seedlings were present, and it is quite possible that the survey area might also have affinities with OV16 *Papaver rhoeas – Silene noctiflora* community, which is known to support a range of rare and declining arable weeds.

Higher Plants

2.3.4 All flowering plant species have been assessed against the IUCN 2001 guidelines to produce a Red List of species considered to be Critically Endangered, Endangered, Vulnerable or Lower Risk (Near Threatened) in both the United Kingdom and England. Species may also be considered nationally rare or scarce based on their national distribution, and some are Species of Principal Importance (SPI) as given by S41 of the Natural Environment and Rural Communities Act 2006.

2.3.5 No species is a SPI and none is protected under the Wildlife and Countryside Act 1981. One species, common cudweed, listed as Near Threatened in the United Kingdom was recorded from the north-eastern boundary track, and one species, hound's-tongue, considered to be Near Threatened in England was recorded more widely in rough grassland. Neither is of particular conservation significance.

2.3.6 Common Cudweed is an autumn- or spring-germinating annual of dry, open, acidic to neutral and occasionally calcareous habitats including open grassland, quarries and rocky ledges, sand-pits and dunes, sandy heaths and tracks, and arable and other cultivated land. Although still widespread and frequent, particularly in eastern England, it has shown a

progressive decline as a result of changing agricultural practices and the cultivation of marginal land. Consequently it is listed as Near Threatened in the IUCN Red List for the UK. Only a very small population of Common Cudweed was apparent in April 2017.

2.3.7 Hound's-tongue is a biennial herb of disturbed ground, growing mostly on dry, often base-rich soils. Habitats include coastal dunes, shingle, open grassland, woodland margins and clearings, field edges, cleared land and gravelly waste. It is unpalatable to grazing animals and is often frequent on disturbed ground by rabbit warrens. Although it remains locally common in eastern England, the population has declined sharply since the 1950s, loss of habitat and herbicide spraying doubtless being major factors.

Summary

2.3.8 On the available data it is not possible to assess properly the likely significance of the flora of the arable and disturbed land in Area 19 of Bay Farm, Worlington. The species present confirm that this area supports light, sandy soils which are at least locally calcareous. The site is located within Breckland, which is a nationally important area for flowering plants, including a significant number of rare species associated with disturbed sandy soils. A further visit in June or July would allow a more accurate assessment of the flora, and to enable the locations of any rare plants to be identified.

2.3.9 Irrespective of any such findings, mitigation is proposed which would cover all eventualities.

3. BATS

3.1 Personnel

3.1.1 Bat survey to assess use of the tree belt to be severed and to assess the potential of trees to hold a roost site was undertaken by Maurice Webber (Class licence WML-CL19 and 20 (levels 3 & 4)).

3.2 Tree survey

Method

3.2.1 Tree survey was initially undertaken on 3rd March 2017 and repeated during the setting out of detectors to assess the use of the tree belt on 21st April 2017.

3.2.2 The entire shelterbelt was surveyed including the north side of the gas pipe line, outside the proposed works looking for potential roost sites. Trees given further attention are shown on Figure 4.

Results

3.2.3 Initial assessment identified that no cavities were present in any of the deciduous trees on the south side of the pipeline to be affected by the development. On the north side, outside the development area, several trees had scars near the base (possibly former deer or rabbit damage) and in the top of the scar is a cavity going upwards. The majority of these cavities contained hibernating snails. Some of the cavities had recently been gnawed by grey squirrel.

3.2.4 Two pines were considered to have the potential to hold a bat roost within the development area (Figure 4). Inspection indicated that T1 had a low potential.

3.2.5 T2 was a tall dead pine that was too rotten to climb or rest a ladder against. An emergence survey was therefore undertaken on 11th May 2017 starting at 20.50 and ending at 22.30. Two infrared cameras were used; these were placed on the east and north sides. An Anabat SD1 was also used to record emerging bats (SD1A).

3.2.6 No bats emerged from the tree but noctule; brown long-eared, common and soprano pipistrelle bats were recorded on the bat detector. Data are given in Appendix 4. None of the bats recorded were observed. It is concluded that this tree is not being used by roosting bats at this time of the year.

3.2.7 On the north side of the pipeline outside the development area two pines were identified as having potential for roosting bats. These had either a fork in the trunk or where two trunks had fused together and were

surveyed with binoculars for gaps/cracks at these fusions. No such features were present.

3.3 Detector surveys

Method

3.3.1 Two Anabat Express bat detectors were fixed to trees 3·6 m above ground level, one, AEA, at the south-west end (N52.31309 E0.48766) and the other, AEB, at the north-east end outside the development site north of the pipeline (N52.31463 E0.49007) (Figure 5). Each was 30 m from the end of the woodland belt.

3.3.2 A Tiny Tag temperature probe was fixed to another tree between the two detectors. The detectors remained in place for twelve nights during which there was some unseasonably cold weather. Temperature data are given in Appendix 5.

3.3.3 Five nights of the twelve nights were chosen for analysis; the nights selected were the first and last night 21/04/2017 and 02/05/2017; warmest 23/04/2017, coldest 26/04/2017, and 29/04/2017. On the 26th, the coldest night, no bats were recorded.

3.3.4 The raw data are provided in Appendix 5.

Results

3.3.5 A summary of the findings is given in Table 1.

3.3.6 The south-west detector AEA was in a more open area than AEB. On all days AEA recorded a higher number of bats, believed to be the result of sheltered feeding conditions due to wind direction.

3.3.7 The dominant bat species were common pipistrelle and then soprano pipistrelle which accounted for 92% of passes recorded by AEA and 78% of passes recorded by AEB. The unidentified recordings not included in the above figures are likely to be social calls of pipistrelles.

3.3.8 The night of the 26th April the temperature dropped to 0·25°C @ 3 m above ground level and no bats were recorded.

3.3.9 Low numbers of barbastelle were recorded. A barbastelle roost at Red Lodge (E A R Enion's house) was recorded in the 1980's; whether it is still

present is unknown, but the bats are likely to remain in the area. On the 23rd April barbastelle passes were recorded at both ends of the tree belt 4 at the south-west end and 2 at the north-east end

3.3.10 Noctule bats were recorded at the south-west end early on the nights surveyed and therefore are likely to be roosting close to the site.

3.3.11 Individual calls of serotine, *Myotis* sp. and brown long-eared bats were recorded. Serotine bats are known to have roosts around the Newmarket area.

3.3.12 The last night recording 2nd May fewer bats, were feeding in the woodland belt possibly due to a change in wind direction resulting in more sheltered feeding conditions elsewhere. One recording of serotine bat was made on this night.

3.3.13 It is concluded that this woodland belt is used by feeding pipistrelle, the occasional barbastelle, brown long-eared, serotine, Natterer's and commuting noctule bats.

Summary

3.1.14 All species of bats and their places of refuge are strictly protected both under *The Wildlife and Countryside Act 1981* and under The *Conservation of Habitats and Species Regulations 2010*. It is an offence to intentionally or recklessly damage, destroy or obstruct access to the structures or places used for shelter or protection or to disturb the animal while it is occupying such a place. Of the species recorded, brown long-eared, soprano pipistrelle, barbastelle and noctule are SPI under the NERC Act 2006.

Table 3: Status of bats recorded in the area

Species	Distribution	Status	Population +
Common pipistrelle	Widespread	Common	2, 430,000 (UK) increasing
Soprano pipistrelle	Widespread	Common, Priority Species	1 300 000 (UK) increasing
Brown long-eared bat	Widespread	Common, Priority species	155 000 (England) stable
Noctule	Widespread	Uncommon, Priority species	50000 (UK) stable
Serotine	Southern England	Uncommon	560, 000 (UK) possible increase
Barbastelle	Southern	Rare. Priority species	Not available

Data from National Bat Monitoring Programme 2016

[redacted]

4.1.3 Considering the species and the numbers recorded it is considered that the tree belt is of Local importance for bats.

Table 1: Summary bat results

	Serotine	Barbastelle	Myotis sp.	Noctule	Brown-long-eared	Pipistrelle sp.	Common pipistrelle	Soprano pipistrelle	Unidentif-ied	Total
AEA										
21/4/17		3		11	1		72	81	29	197
23/4/17		4		5	2	8	82	27	1	129
26/4/17										0
29/4/17				1		2	341	8		353
2/5/17	1			1		17	65	10	1	95
AEB										
21/4/17				1		3	11	2	6	23
23/4/17		2		6			66	5	1	83
26/4/17										0
29/4/17			1	4		1	24		7	37
2/5/17				1		2		7	1	11

4. BADGERS

Method

4.1.1 Survey and report was undertaken by Diana Ward on 17th January 2017. Weather conditions were sun, dry with light breeze and a temperature of 4 degrees.

4.1.2 Phases 3, 6, 7 and the application site 19 were surveyed for badgers.

4.1.3 The site was searched for field signs including footprints, dung pits, snuffle holes and runways. Adjacent field margins and woodland belts were searched for signs of setts and were surveyed both from the side of phase and by walking through the centre of the belt.

Results

4.1.4 Many rabbit holes were present, particularly within and adjacent to the earth bunds and within the woodland belt south-east of Phase 7. Signs of rabbits were abundant across the area.

4.1.5 No holes attributable to badger were found. There were no footprints found, there was no sign of recent badger digging in the area. No dung pits were found.

4.1.6 No currently active setts are present within or immediately adjacent to any of Phases. It is never possible to be conclusive that no badger activity is taking place. However none was recorded and it is concluded that, if present, the level of current activity by badgers is minimal.

5. IMPACT ASSESSMENT AND MITIGATION PROPOSED

5.1 Botany

5.1.1 No habitat on the extension area is other than site importance and any loss will be of low significance.

5.1.2 While it is not possible to definitively assess the status of the flora of the site, it can be taken that the most interesting section will be in the field margins along the edge of the tree belts. Mitigation is therefore proposed to ensure the retention of any arable weed flora that may be present. The presence of individual arable weeds is likely to relate to the cultivation

routine being practiced from year to year but even if not present in any one year the seeds are likely to be in the soil.

5.1.3 The edge where the field abuts tree belt along the access road will have a standoff to protect the tree belt and it will be possible to cultivate this edge so as to mimic arable cultivation.

5.1.4 In the area abutting the northern tree belt, it is proposed to carefully strip the soils and use this to spread on land being restored so as to ensure that the seed bank can develop. This approach to protect arable weeds has been accepted by Inspector at the nearby Hatchfield Farm Inquiry.

5.1.5 Following infilling, the site will be returned to agriculture and the tree belt replanted. No residual adverse impact is therefore predicted.

5.2 Bats

5.2.1 There is the loss of two trees with the potential to hold a bat roost. Neither was considered to do so at the time of survey. Nevertheless, given the potential a re-survey should be undertaken prior to felling and a bat ecologist should be present when the tree is felled. If there is any risk of a roost being present it will be necessary to lower the tree to the ground. If a roost is shown to be present then a European Protected Species licence will be required.

5.2.2 It is proposed to remove the trees on the south side of the pipe line to allow the quarry to progress from area 7 into 19. It is not considered that this will have any significant effect on bat activity in the surrounding area or to adversely affect commuting noctule and other foraging species. There will only be a short break between the trees on both sides of the existing access road and those retained north of the pipeline which then connect to Swales Wood to the north.

5.2.3 Following the restoration, the tree belt will be replanted and thus the minor negative effect will be reversible, leading to a neutral effect on completion.

5.2.4 Three small boxes (2 Schwegler 2F and 1 CCL apex box) are recommended for the northern retained section of the woodland belt.

5.3 Birds

Stone Curlews

5.3.1 In his letter of the 10th January 2017, the Secretary of State asked for the potential impact of the development on stone curlews to be considered. Stone curlews are an interest feature of the Breckland Special Protection Area. (SPA). Under the Habitats Regulations, consideration must be given to the possibility of a likely significant effect which, if present would trigger an Appropriate Assessment.

5.3.2 Stone curlew breeding is partly determined by cropping patterns and the covering of the field by plastic as part of the carrot crop would preclude breeding. There will therefore be no direct effect and indirect effects must be considered.

5.3.3 The site is small and is sandwiched between the existing consented development which extends to the south as far as Elms Road and north-west for a distance of over 1 km. To the immediate south is the busy access road with significant lorry movements and to the east is the A11, a main trunk road, which is at its closest point to the extension area is some 160 metres and 375 metres at the furthest point. Land to the north-east bordered by the Red Lodge -Worlington Road. This is illustrated in Figure 1.

5.3.4 Stone curlew research has indicated that there is a clear avoidance of buildings and major roads by nesting stone curlews with an effect detectable at least 1000 m and up to 2000 km from a road. Analysis of 443 nests between 1988 and 2006 (Clarke et al., 2013) indicated a maximum distance of 1500 metres with a lower nest density and that within 500 metres the average nest density per km^2 was 0.061. Beyond that distance, up to 1000 metres the average nest density per km2 was 0.159 and at 1000 - 1500 metres 0.274. Thus the suitability of the site and land around is for breeding stone curlew is negligible and land 1000 metres beyond this is compromised by the A11.

5.3.5 During surveys as part of the initial application in 2002, a stone curlew as recorded within 600 metres of the extension area in an area which has already been worked for mineral and currently holds the plant site. Thus there will be no additional impact as a result of this extension. Land beyond this for up to 350 metres has existing consent for quarrying.

5.3.6 Data from the Suffolk Biological Records Centre (Appendix 1) identified two records, both from 2011 in Worlington and Herringswell. The Worlington record was the closest at 1.8 km distant.

5.3.6 In July 2016, a report was produced for Forest Heath District Council (Liley, 2016) to support its Core Strategy SIR and Site Allocations which reviewed the buffers so as to ensure that up to date data are used to reflect the areas of the SPA and the areas outside the SPA which were important. This was similar to that used by Breckland District Council in the preparation of its core strategy. It can be seen that the proposed extension site again falls outside all buffer zones (Figure 6).

5.3.7 In conclusion, given the constrained nature of the site, the surrounding land use and the proximity of the A11 there will be no likely significant effect on the integrity of Breckland SPA as a result of working this small extension.

5.4 Other birds

5.4.1 There will be the loss of the length of woodland as a result of the development. This has features which will support the range of common breeding woodland birds.

5.4.2 There is much suitable habitat in the vicinity and its loss is not considered to be more than a minor negative effect. The siting of some bird boxes in the retained woodland to the north will mitigate the loss.

5.4.3 Felling should take place outside the bird breeding season unless a prior survey by a competent ecologist confirms no breeding birds are present.

5.5. Mammals

5.5.1 No badgers were found and the only mammals recorded were rabbits and deer. No adverse effect is predicted.

6. CONCLUSIONS

6.1.1 The effects of development of the extension area on wildlife are considered to be minor where they occur and reversible with mitigation.

6.1.2 There will be no likely significant effect on stone curlew, and thus on the Breckland SPA.

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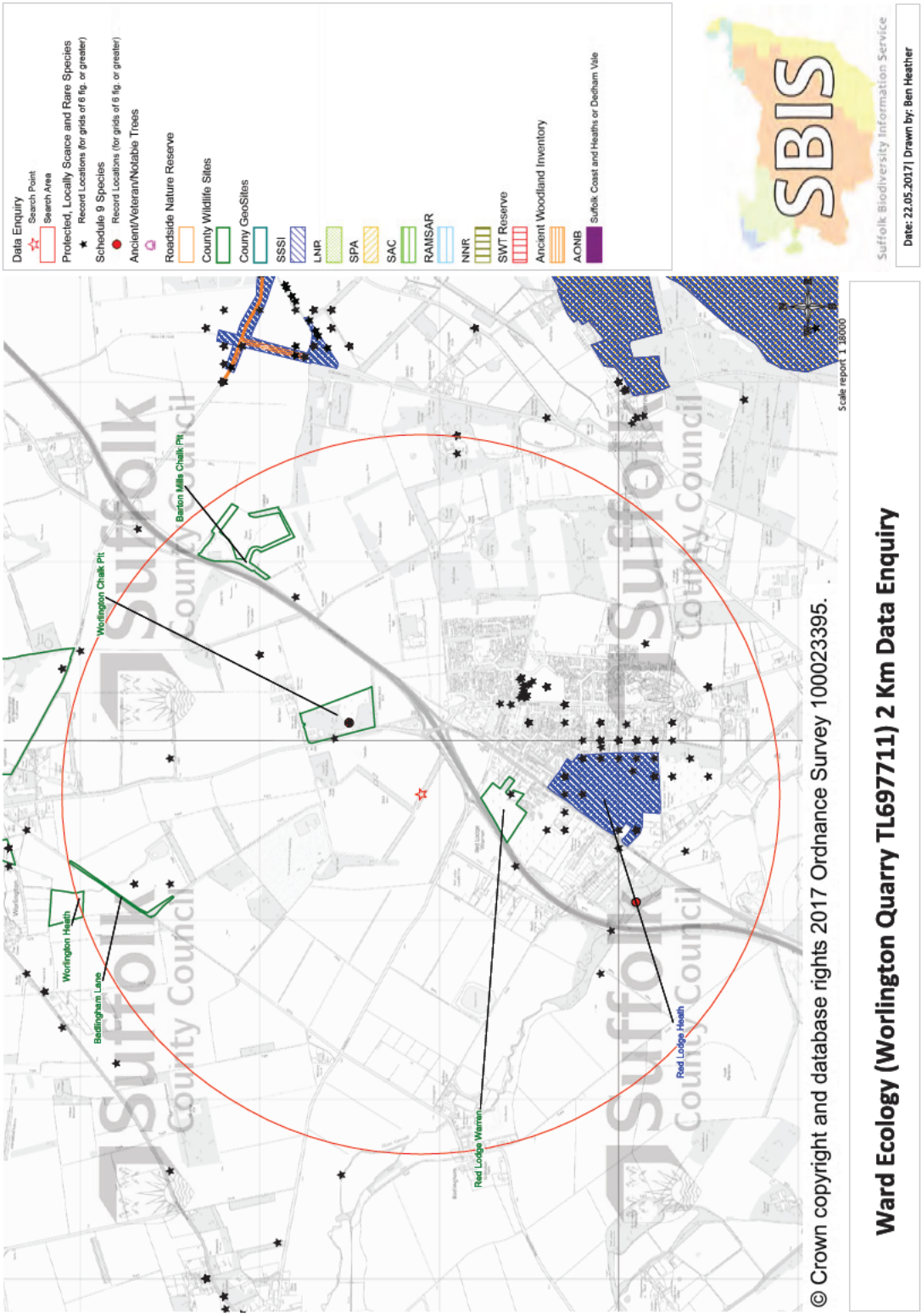
APPENDIX 1: DATA
Suffolk



Suffolk County Wildlife Site Citations

CWS Number	Forest Heath 1
Site Name	BARTON MILLS CHALK PIT
Parish	BARTON MILLS
District	Forest Heath
NGR	TL709720
Description	Once arable land, this now active chalk quarry and landfill site is situated adjacent to the A11. The botanical importance of the site lies in its chalk flora, which occurs on rabbit-grazed verges and on the pit face. Wild thyme, kidney-vetch, carline thistle and centaury can be found along the verges and the pit face supports a rich assemblage of hanging thyme, kidney-vetch and harebell. Additionally, records of basil thyme (biodiversity priority species) have also been recorded here. Calcareous grassland is a scarce and decreasing (biodiversity priority) habitat in Suffolk and it is considered that this site, although small, is of considerable importance for wildlife conservation. Following the cessation of mineral extraction, both the verges and pit face will act as a valuable seed bank resource and encourage future natural regeneration. The sites boundaries are surrounded by arable land to the north, east and south and separated from further arable land to the west by the A11. The site contains small sections of hedgerow, a pond and a strip of coniferous trees linking the site to a small mixed tree plantation south of the site.
RNR Number	0
Area	4.81
CWS Number	Forest Heath 43
Site Name	WORLINGTON HEATH
Parish	WORLINGTON
District	Forest Heath
NGR	TL690730
Description	Worlington Heath was once part of a more extensive area. This lowland heathland (Priority habitat) with damp hollows is grazed by horses.

The dry grassland supports lady's bedstraw, vipers bugloss, white campion and patches of gorse and scrub.

Thyme and harebell have previously been recorded along with
historical records of marsh stitchwort (Priority species and included within Suffolk's Rare Plant Register).
Wet hollows, formed as a result of previous gravel extraction have been known to support flora such as lesser spearwort, marsh pennywort and meadow-rue. Bog pimpernel and marsh
speedwell (considered locally scarce and included within the Suffolk Rare Plant Register) have also been recorded growing in low-lying areas of the Heath.

A small pocket of scrub occurs along its western boundary and a mature hedge (Priority habitat) occurs on its east. The site is surrounded by cultivated farmland to the north, east and south and free ranging pigs can be found adjacent to the heath to its west.

RNR Number 0
Area 3.03

CWS Number Forest Heath 44

Site Name BADLINGHAM LANE

Parish WORLINGTON

District Forest Heath

NGR TL691727

Description

The verges along this section of Badlingham Lane support a species-rich flora characteristic of a breckland habitat including sainfoin, listed as near threatened within Suffolk's Rare Plant Register, kidney vetch, wild thyme, crow garlic and salad burnet. Close to the lane on the edge of a grassy track into an arable field a small population of sand catchfly has previously been recorded, a plant which is listed in the Red Data Book (less than 15 x 10 km squares in Great Britain) and listed as nationally scarce within Suffolk's Rare Plant Register.
The site is connected to the wider landscape via hedgerow habitat (biodiversity priority habitat), surrounded by arable farmland and adjacent to lowland heathland (biodiversity priority habitat).

RNR Number 0
Area 0.92

CWS Number Forest Heath 46

Site Name WORLINGTON CHALK PIT

Parish WORLINGTON

District Forest Heath

NGR TL701715

Description

Worlington Chalk Pit has a diverse flora typical of a herb-rich chalk grassland including kidney vetch, dwarf thistle, cat-mint, tall melilot, wild basil and ploughman's-spikenard. Many of the species recorded here are rare in Suffolk such as cat mint, night-flowering catchfly and basil thyme all of which are included within Suffolk's Rare Plant Register and the latter is also a biodiversity priority species. Broad-leaved cudweed also recorded here is a biodiversity priority species, included with the Suffolk's Rare Plant Register and considered endangered and only found in this location. Sandy areas with cudweed, fern grass and blue fleabane occur and an interesting marshy area covered by goat willow, grey willow, white poplar and marsh yellow-cress is situated in the wet, low-lying area.

Invertebrate interest is high with over 200 species recorded including 80 beetles, 14 butterflies and 7 bees. Of particular note are the scarce-four-dot pin-palp beetle and cinnabar moth, both of which are biodiversity priority species

The whole area is surrounded by a fringe of pines, beeches, poplars, sycamores and young birch. Hawthorn scrub is developing at the southern end. The site is also adajacent to lowland heathland (biodiversity priority habitat) which can be found on its western edge.

RNR Number 0

Area 7.83

County Wildlife Site Citations

CWS Number Forest Heath 59

Site Name RED LODGE WARREN

Parish RED LODGE

District Forest Heath

NGR TL696706

Description

Red Lodge Warren County Wildlife Site is located in the north western corner of the parish of Red Lodge. It is separated from the adjacent Red Lodge County Wildlife Site by the A11 Barton Mills to Newmarket road. Red Lodge Warren consists of a number of small fields most of which are heavily grazed by rabbits. Although some parts of the site are colonised by bracken the remaining areas support a valuable Breckland grassland community. Bird's-foot trefoil, harebell, heath bedstraw and early flowering forget-me-not are amongst the typical acid indicator species which were recorded when the site was surveyed in 1995. Purple fescue, a nationally scarce plant (recorded in l5-l00 km squares in the UK) occurs in one area on the western boundary of the site. In 2010 the boundary was slightly reduced to match land lost to development.

RNR Number 0
Area 4.56

Suffolk Species Records

Common_Name	*Latin_Name*	Location
Whooper Swan	*Cygnus cygnus*	Barton Mills
Greylag Goose	*Anser anser*	Worlington
Shelduck	*Tadorna tadorna*	Herringswell
Shelduck	*Tadorna tadorna*	Worlington
Shelduck	*Tadorna tadorna*	Freckenham
Shelduck	*Tadorna tadorna*	Herringswell
Shelduck	*Tadorna tadorna*	Red Lodge CWS
Shelduck	*Tadorna tadorna*	Herringswell
Common Scoter	*Melanitta nigra*	Worlington
Little Egret	*Egretta garzetta*	Freckenham
Little Egret	*Egretta garzetta*	Herringswell
Little Egret	*Egretta garzetta*	Herringswell
Little Egret	*Egretta garzetta*	Barton Mills
Quail	*Coturnix coturnix*	Freckenham
Honey-buzzard	*Pernis apivorus*	Barton Mills
Red Kite	*Milvus milvus*	Barton Mills
Red Kite	*Milvus milvus*	Red Lodge CWS
Red Kite	*Milvus milvus*	Herringswell
Red Kite	*Milvus milvus*	Herringswell
Red Kite	*Milvus milvus*	Worlington
Red Kite	*Milvus milvus*	Worlington
Marsh Harrier	*Circus aeruginosus*	Freckenham
Osprey	*Pandion haliaetus*	Red Lodge CWS
Osprey	*Pandion haliaetus*	Red Lodge CWS
Kestrel	*Falco tinnunculus*	Barton Mills
Kestrel	*Falco tinnunculus*	Freckenham
Kestrel	*Falco tinnunculus*	Herringswell
Kestrel	*Falco tinnunculus*	Freckenham
Kestrel	*Falco tinnunculus*	Mildenhall
Kestrel	*Falco tinnunculus*	Herringswell
Hobby	*Falco subbuteo*	Herringswell
Hobby	*Falco subbuteo*	Herringswell
Peregrine	*Falco peregrinus*	Herringswell
Peregrine	*Falco peregrinus*	Red Lodge CWS
Peregrine	*Falco peregrinus*	Barton Mills
Lapwing	*Vanellus vanellus*	Red Lodge CWS
Lapwing	*Vanellus vanellus*	Freckenham
Lapwing	*Vanellus vanellus*	Herringswell
Lapwing	*Vanellus vanellus*	Herringswell
Lapwing	*Vanellus vanellus*	Worlington
Lapwing	*Vanellus vanellus*	Mildenhall
Lapwing	*Vanellus vanellus*	Herringswell
Stone-curlew	*Burhinus oedicnemus*	Worlington
Stone-curlew	*Burhinus oedicnemus*	Herringswell
Herring Gull	*Larus argentatus*	Herringswell
Herring Gull	*Larus argentatus*	Freckenham

Herring Gull	*Larus argentatus*	Worlington
Turtle Dove	*Streptopelia turtur*	Red Lodge
Turtle Dove	*Streptopelia turtur*	Freckenham
Turtle Dove	*Streptopelia turtur*	Worlington
Turtle Dove	*Streptopelia turtur*	Worlington
Turtle Dove	*Streptopelia turtur*	Herringswell
Cuckoo	*Cuculus canorus*	Barton Mills
Cuckoo	*Cuculus canorus*	Herringswell
Cuckoo	*Cuculus canorus*	Worlington
Barn Owl	*Tyto alba*	Barton Mills
Little Owl	*Athene noctua*	Herringswell
Little Owl	*Athene noctua*	Red Lodge CWS
Little Owl	*Athene noctua*	Freckenham
Tawny Owl	*Strix aluco*	Worlington
Tawny Owl	*Strix aluco*	Herringswell
Tawny Owl	*Strix aluco*	Herringswell
Tawny Owl	*Strix aluco*	Barton Mills
Swift	*Apus apus*	Red Lodge
Swift	*Apus apus*	Worlington
Swift	*Apus apus*	Worlington
Swift	*Apus apus*	Freckenham
Swift	*Apus apus*	Herringswell
Swift	*Apus apus*	Herringswell
Swift	*Apus apus*	Mildenhall
Swift	*Apus apus*	Herringswell
Kingfisher	*Alcedo atthis*	Barton Mills
Green Woodpecker	*Picus viridis*	Barton Mills
Green Woodpecker	*Picus viridis*	Red Lodge CWS
Green Woodpecker	*Picus viridis*	Herringswell
Green Woodpecker	*Picus viridis*	Herringswell
Green Woodpecker	*Picus viridis*	Worlington
Green Woodpecker	*Picus viridis*	Freckenham
Green Woodpecker	*Picus viridis*	Mildenhall
Green Woodpecker	*Picus viridis*	Herringswell
Great Spotted Woodpecker	*Dendrocopos major*	Worlington
Great Spotted Woodpecker	*Dendrocopos major*	Herringswell
Great Spotted Woodpecker	*Dendrocopos major*	Herringswell
Great Spotted Woodpecker	*Dendrocopos major*	Red Lodge CWS
Great Spotted Woodpecker	*Dendrocopos major*	Freckenham
Great Spotted Woodpecker	*Dendrocopos major*	Herringswell
Grasshopper Warbler	*Locustella naevia*	Barton Mills
Skylark	*Alauda arvensis*	Red Lodge
Skylark	*Alauda arvensis*	Red Lodge
Skylark	*Alauda arvensis*	Freckenham
Skylark	*Alauda arvensis*	Freckenham
Skylark	*Alauda arvensis*	Worlington
Skylark	*Alauda arvensis*	Red Lodge CWS
Skylark	*Alauda arvensis*	Herringswell
Skylark	*Alauda arvensis*	Herringswell

Skylark	*Alauda arvensis*	Barton Mills
Skylark	*Alauda arvensis*	Herringswell
Sand Martin	*Riparia riparia*	Freckenham
Sand Martin	*Riparia riparia*	Red Lodge CWS
Swallow	*Hirundo rustica*	Worlington
Swallow	*Hirundo rustica*	Red Lodge CWS
Swallow	*Hirundo rustica*	Herringswell
Swallow	*Hirundo rustica*	Freckenham
Swallow	*Hirundo rustica*	Barton Mills
Swallow	*Hirundo rustica*	Red Lodge CWS
Swallow	*Hirundo rustica*	Mildenhall
Swallow	*Hirundo rustica*	Herringswell
House Martin	*Delichon urbicum*	Barton Mills
House Martin	*Delichon urbicum*	Freckenham
House Martin	*Delichon urbicum*	Herringswell
House Martin	*Delichon urbicum*	Worlington
House Martin	*Delichon urbicum*	Red Lodge CWS
House Martin	*Delichon urbicum*	Herringswell
Meadow Pipit	*Anthus pratensis*	Freckenham
Meadow Pipit	*Anthus pratensis*	Freckenham
Meadow Pipit	*Anthus pratensis*	Worlington
Meadow Pipit	*Anthus pratensis*	Herringswell
Yellow Wagtail	*Motacilla flava*	Freckenham
Yellow Wagtail	*Motacilla flava subsp. flavissima*	Freckenham
Grey Wagtail	*Motacilla cinerea*	Barton Mills
Pied Wagtail	*Motacilla alba*	Freckenham
Pied Wagtail	*Motacilla alba*	Herringswell
Pied Wagtail	*Motacilla alba*	Freckenham
Pied Wagtail	*Motacilla alba*	Worlington
Pied Wagtail	*Motacilla alba*	Red Lodge
Pied Wagtail	*Motacilla alba*	Red Lodge
Pied Wagtail	*Motacilla alba*	Herringswell
Pied Wagtail	*Motacilla alba subsp. yarrellii*	Herringswell
Pied Wagtail	*Motacilla alba subsp. yarrellii*	Herringswell
Pied Wagtail	*Motacilla alba subsp. yarrellii*	Red Lodge CWS
Pied Wagtail	*Motacilla alba subsp. yarrellii*	Mildenhall
Pied Wagtail	*Motacilla alba subsp. yarrellii*	Freckenham
Wren	*Troglodytes troglodytes*	Barton Mills
Wren	*Troglodytes troglodytes*	Worlington
Wren	*Troglodytes troglodytes*	Herringswell
Wren	*Troglodytes troglodytes*	Red Lodge CWS
Wren	*Troglodytes troglodytes*	Freckenham
Wren	*Troglodytes troglodytes*	Red Lodge CWS
Wren	*Troglodytes troglodytes*	Herringswell
Wren	*Troglodytes troglodytes*	Herringswell
Dunnock	*Prunella modularis*	Herringswell
Dunnock	*Prunella modularis*	Barton Mills
Dunnock	*Prunella modularis*	Freckenham
Dunnock	*Prunella modularis*	Red Lodge CWS

Dunnock	*Prunella modularis*	Worlington
Dunnock	*Prunella modularis*	Red Lodge CWS
Dunnock	*Prunella modularis*	Herringswell
Dunnock	*Prunella modularis*	Herringswell
Dunnock	*Prunella modularis*	Red Lodge
Dunnock	*Prunella modularis*	Herringswell
Dunnock	*Prunella modularis*	Red Lodge
Dunnock	*Prunella modularis*	Red Lodge
Dunnock	*Prunella modularis*	Red Lodge
Dunnock	*Prunella modularis*	Red Lodge
Dunnock	*Prunella modularis*	Red Lodge
Robin	*Erithacus rubecula*	Red Lodge CWS
Robin	*Erithacus rubecula*	Freckenham
Robin	*Erithacus rubecula*	Herringswell
Robin	*Erithacus rubecula*	Herringswell
Robin	*Erithacus rubecula*	Worlington
Robin	*Erithacus rubecula*	Red Lodge CWS
Robin	*Erithacus rubecula*	Barton Mills
Robin	*Erithacus rubecula*	Red Lodge
Robin	*Erithacus rubecula*	Herringswell
Robin	*Erithacus rubecula*	Red Lodge
Robin	*Erithacus rubecula*	Red Lodge
Robin	*Erithacus rubecula*	Herringswell
Robin	*Erithacus rubecula*	Red Lodge
Robin	*Erithacus rubecula*	Red Lodge
Robin	*Erithacus rubecula*	Red Lodge
Nightingale	*Luscinia megarhynchos*	Red Lodge
Nightingale	*Luscinia megarhynchos*	Barton Mills
Nightingale	*Luscinia megarhynchos*	Freckenham
Nightingale	*Luscinia megarhynchos*	Herringswell
Fieldfare	*Turdus pilaris*	Herringswell
Fieldfare	*Turdus pilaris*	Red Lodge CWS
Fieldfare	*Turdus pilaris*	Freckenham
Fieldfare	*Turdus pilaris*	Freckenham
Fieldfare	*Turdus pilaris*	Herringswell
Fieldfare	*Turdus pilaris*	Worlington
Fieldfare	*Turdus pilaris*	Herringswell
Fieldfare	*Turdus pilaris*	Herringswell
Song Thrush	*Turdus philomelos*	Red Lodge CWS
Song Thrush	*Turdus philomelos*	Worlington
Song Thrush	*Turdus philomelos*	Herringswell
Song Thrush	*Turdus philomelos*	Red Lodge CWS
Song Thrush	*Turdus philomelos*	Barton Mills
Song Thrush	*Turdus philomelos*	Freckenham
Song Thrush	*Turdus philomelos*	Herringswell
Redwing	*Turdus iliacus*	Barton Mills
Redwing	*Turdus iliacus*	Herringswell
Redwing	*Turdus iliacus*	Herringswell
Redwing	*Turdus iliacus*	Herringswell

Redwing	*Turdus iliacus*	Freckenham
Redwing	*Turdus iliacus*	Freckenham
Redwing	*Turdus iliacus*	Worlington
Spotted Flycatcher	*Muscicapa striata*	Barton Mills
Spotted Flycatcher	*Muscicapa striata*	Worlington
Goldcrest	*Regulus regulus*	Herringswell
Goldcrest	*Regulus regulus*	Worlington
Goldcrest	*Regulus regulus*	Herringswell
Goldcrest	*Regulus regulus*	Freckenham
Goldcrest	*Regulus regulus*	Red Lodge CWS
Goldcrest	*Regulus regulus*	Herringswell
Firecrest	*Regulus ignicapilla*	Kentford Heath
Blue Tit	*Cyanistes caeruleus*	Herringswell
Blue Tit	*Cyanistes caeruleus*	Freckenham
Blue Tit	*Cyanistes caeruleus*	Worlington
Blue Tit	*Cyanistes caeruleus*	Herringswell
Blue Tit	*Cyanistes caeruleus*	Red Lodge CWS
Blue Tit	*Cyanistes caeruleus*	Red Lodge CWS
Blue Tit	*Cyanistes caeruleus*	Barton Mills
Blue Tit	*Cyanistes caeruleus*	Red Lodge
Blue Tit	*Cyanistes caeruleus*	Red Lodge
Blue Tit	*Cyanistes caeruleus*	Red Lodge
Blue Tit	*Cyanistes caeruleus*	Red Lodge
Blue Tit	*Cyanistes caeruleus*	Red Lodge
Blue Tit	*Cyanistes caeruleus*	Red Lodge
Blue Tit	*Cyanistes caeruleus*	Herringswell
Blue Tit	*Cyanistes caeruleus*	Herringswell
Great Tit	*Parus major*	Freckenham
Great Tit	*Parus major*	Red Lodge CWS
Great Tit	*Parus major*	Barton Mills
Great Tit	*Parus major*	Red Lodge CWS
Great Tit	*Parus major*	Worlington
Great Tit	*Parus major*	Herringswell
Great Tit	*Parus major*	Herringswell
Great Tit	*Parus major*	Herringswell
Great Tit	*Parus major*	Red Lodge
Great Tit	*Parus major*	Red Lodge
Great Tit	*Parus major*	Red Lodge
Great Tit	*Parus major*	Red Lodge
Great Tit	*Parus major*	Herringswell
Great Tit	*Parus major*	Red Lodge
Coal Tit	*Periparus ater*	Herringswell
Coal Tit	*Periparus ater*	Herringswell
Coal Tit	*Periparus ater*	Worlington
Coal Tit	*Periparus ater*	Barton Mills
Coal Tit	*Periparus ater*	Red Lodge CWS
Coal Tit	*Periparus ater*	Red Lodge
Coal Tit	*Periparus ater*	Red Lodge
Coal Tit	*Periparus ater*	Herringswell

Coal Tit	*Periparus ater*	Red Lodge
Coal Tit	*Periparus ater*	Red Lodge
Coal Tit	*Periparus ater*	Herringswell
Coal Tit	*Periparus ater*	Red Lodge
Coal Tit	*Periparus ater*	Freckenham
Marsh Tit	*Poecile palustris*	Barton Mills
Nuthatch	*Sitta europaea*	Barton Mills
Nuthatch	*Sitta europaea*	Herringswell
Nuthatch	*Sitta europaea*	Herringswell
Nuthatch	*Sitta europaea*	Herringswell
Treecreeper	*Certhia familiaris*	Barton Mills
Treecreeper	*Certhia familiaris*	Worlington
Treecreeper	*Certhia familiaris*	Herringswell
Treecreeper	*Certhia familiaris*	Herringswell
Treecreeper	*Certhia familiaris*	Freckenham
Starling	*Sturnus vulgaris*	Barton Mills
Starling	*Sturnus vulgaris*	Freckenham
Starling	*Sturnus vulgaris*	Herringswell
Starling	*Sturnus vulgaris*	Worlington
Starling	*Sturnus vulgaris*	Herringswell
Starling	*Sturnus vulgaris*	Red Lodge CWS
Starling	*Sturnus vulgaris*	Red Lodge CWS
Starling	*Sturnus vulgaris*	Red Lodge
Starling	*Sturnus vulgaris*	Red Lodge
Starling	*Sturnus vulgaris*	Red Lodge
Starling	*Sturnus vulgaris*	Red Lodge
Starling	*Sturnus vulgaris*	Red Lodge
Starling	*Sturnus vulgaris*	Red Lodge
Starling	*Sturnus vulgaris*	Herringswell
Starling	*Sturnus vulgaris*	Herringswell
Starling	*Sturnus vulgaris*	Herringswell
Starling	*Sturnus vulgaris*	Red Lodge
Starling	*Sturnus vulgaris*	Red Lodge
Starling	*Sturnus vulgaris*	Red Lodge
House Sparrow	*Passer domesticus*	Red Lodge
House Sparrow	*Passer domesticus*	Herringswell
House Sparrow	*Passer domesticus*	Barton Mills
House Sparrow	*Passer domesticus*	Herringswell
House Sparrow	*Passer domesticus*	Freckenham
House Sparrow	*Passer domesticus*	Worlington
House Sparrow	*Passer domesticus*	Red Lodge CWS
House Sparrow	*Passer domesticus*	Mildenhall
House Sparrow	*Passer domesticus*	Red Lodge
House Sparrow	*Passer domesticus*	Red Lodge
House Sparrow	*Passer domesticus*	Red Lodge
House Sparrow	*Passer domesticus*	Red Lodge
House Sparrow	*Passer domesticus*	Red Lodge
House Sparrow	*Passer domesticus*	Herringswell
Lesser Redpoll	*Acanthis cabaret*	Red Lodge CWS

Greenfinch	*Chloris chloris*	Freckenham
Greenfinch	*Chloris chloris*	Herringswell
Greenfinch	*Chloris chloris*	Red Lodge CWS
Greenfinch	*Chloris chloris*	Worlington
Greenfinch	*Chloris chloris*	Barton Mills
Greenfinch	*Chloris chloris*	Red Lodge CWS
Greenfinch	*Chloris chloris*	Herringswell
Greenfinch	*Chloris chloris*	Herringswell
Greenfinch	*Chloris chloris*	Red Lodge
Greenfinch	*Chloris chloris*	Red Lodge
Greenfinch	*Chloris chloris*	Red Lodge
Greenfinch	*Chloris chloris*	Red Lodge
Linnet	*Linaria cannabina*	Freckenham
Linnet	*Linaria cannabina*	Freckenham
Linnet	*Linaria cannabina*	Worlington
Linnet	*Linaria cannabina*	Herringswell
Linnet	*Linaria cannabina*	Barton Mills
Linnet	*Linaria cannabina*	Red Lodge CWS
Linnet	*Linaria cannabina*	Herringswell
Linnet	*Linaria cannabina*	Herringswell
Brambling	*Fringilla montifringilla*	Herringswell
Goldfinch	*Carduelis carduelis*	Worlington
Goldfinch	*Carduelis carduelis*	Herringswell
Goldfinch	*Carduelis carduelis*	Freckenham
Goldfinch	*Carduelis carduelis*	Herringswell
Goldfinch	*Carduelis carduelis*	Red Lodge CWS
Goldfinch	*Carduelis carduelis*	Barton Mills
Goldfinch	*Carduelis carduelis*	Freckenham
Goldfinch	*Carduelis carduelis*	Herringswell
Goldfinch	*Carduelis carduelis*	Red Lodge
Goldfinch	*Carduelis carduelis*	Red Lodge
Goldfinch	*Carduelis carduelis*	Red Lodge
Goldfinch	*Carduelis carduelis*	Red Lodge
Goldfinch	*Carduelis carduelis*	Herringswell
Common Crossbill	*Loxia curvirostra*	Worlington
Bullfinch	*Pyrrhula pyrrhula*	Herringswell
Yellowhammer	*Emberiza citrinella*	Freckenham
Yellowhammer	*Emberiza citrinella*	Red Lodge CWS
Yellowhammer	*Emberiza citrinella*	Freckenham
Yellowhammer	*Emberiza citrinella*	Herringswell
Yellowhammer	*Emberiza citrinella*	Barton Mills
Yellowhammer	*Emberiza citrinella*	Herringswell
Yellowhammer	*Emberiza citrinella*	Herringswell
Reed Bunting	*Emberiza schoeniclus*	Red Lodge CWS
Reed Bunting	*Emberiza schoeniclus*	Herringswell
Reed Bunting	*Emberiza schoeniclus*	Freckenham
Corn Bunting	*Emberiza calandra*	Freckenham
Corn Bunting	*Emberiza calandra*	Mildenhall
Bluebell	*Hyacinthoides non-scripta*	Freckenham

Purple Fescue	*Vulpia ciliata subsp. ambigua*	Herringswell
Purple Fescue	*Vulpia ciliata subsp. ambigua*	Red Lodge CWS
Loose Silky-bent	*Apera spica-venti*	Herringswell
Fine-leaved Fumitory	*Fumaria parviflora*	Worlington Chalk Pit
Barberry	*Berberis vulgaris*	Red Lodge CWS
Hoary Cinquefoil	*Potentilla argentea*	Herringswell
Hoary Cinquefoil	*Potentilla argentea*	Red Lodge CWS
Dropwort	*Filipendula vulgaris*	Herringswell
Hoary Plantain	*Plantago media*	Freckenham
Hoary Plantain	*Plantago media*	Red Lodge CWS
Hoary Plantain	*Plantago media*	Herringswell
Cat-mint	*Nepeta cataria*	Worlington Chalk Pit
Cat-mint	*Nepeta cataria*	Red Lodge CWS
Basil Thyme	*Clinopodium acinos*	Worlington Chalk Pit
Lesser Calamint	*Clinopodium calamintha*	Freckenham
Lesser Calamint	*Clinopodium calamintha*	Freckenham
Breckland Thyme	*Thymus serpyllum*	Red Lodge Warren
Breckland Thyme	*Thymus serpyllum*	Red Lodge Warren
Breckland Thyme	*Thymus serpyllum*	Worlington Chalk Pit
Sainfoin	*Onobrychis viciifolia*	Worlington
Bur Medick	*Medicago minima*	Red Lodge CWS
Bur Medick	*Medicago minima*	Worlington
Bur Medick	*Medicago minima*	Red Lodge CWS
Bur Medick	*Medicago minima*	Red Lodge CWS
Lucerne	*Medicago sativa subsp. sativa*	Red Lodge
Lucerne	*Medicago sativa subsp. sativa*	Freckenham
Lucerne	*Medicago sativa subsp. sativa*	Freckenham
Lucerne	*Medicago sativa subsp. sativa*	Red Lodge CWS
Field Mouse-ear	*Cerastium arvense*	Red Lodge CWS
Smooth Rupturewort	*Herniaria glabra*	Red Lodge Warren
Corn Spurrey	*Spergula arvensis*	Herringswell
Sand Catchfly	*Silene conica*	Worlington
Night-flowering Catchfly	*Silene noctiflora*	Worlington Chalk Pit
Night-flowering Catchfly	*Silene noctiflora*	Freckenham
Night-flowering Catchfly	*Silene noctiflora*	Herringswell
Lombardy-Poplar	*Populus nigra 'Italica'*	Freckenham
Lombardy-Poplar	*Populus nigra 'Italica'*	Red Lodge CWS
Imperforate St. John's-Wort	*Hypericum maculatum subsp. obtusiusculum*	Red Lodge
Common Rock-rose	*Helianthemum nummularium*	Red Lodge CWS
Common Rock-rose	*Helianthemum nummularium*	Red Lodge CWS
Hairy Rock-cress	*Arabis hirsuta*	Red Lodge CWS
Broad-leaved Cudweed	*Filago pyramidata*	Worlington Chalk Pit

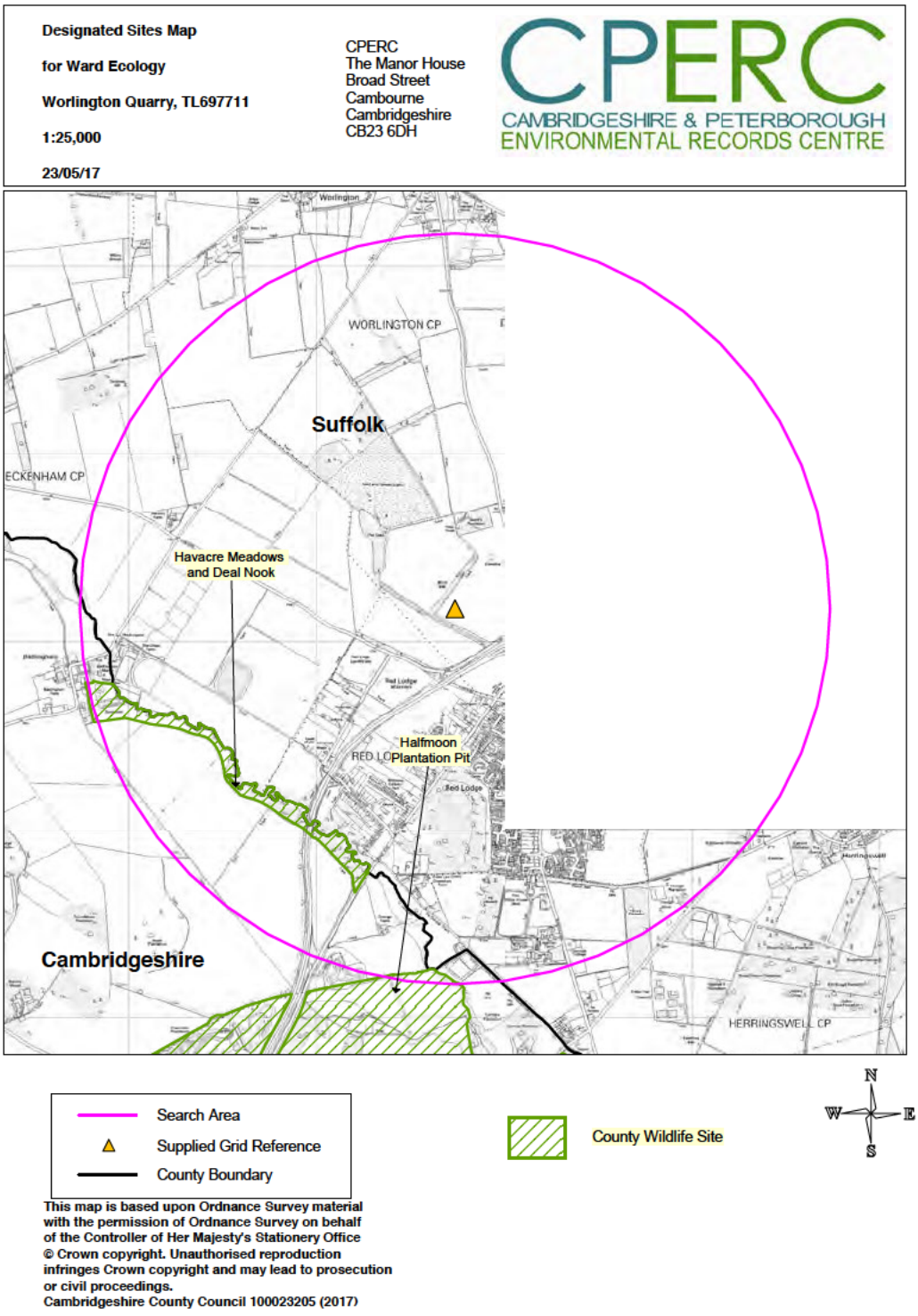
Common Cudweed	*Filago vulgaris*	Red Lodge CWS
Common Cudweed	*Filago vulgaris*	Herringswell
Corn Chamomile	*Anthemis arvensis*	Red Lodge CWS
Corn Chamomile	*Anthemis arvensis*	Worlington
Stinking Chamomile	*Anthemis cotula*	Red Lodge CWS
Field Scabious	*Knautia arvensis*	Freckenham
Field Scabious	*Knautia arvensis*	Herringswell
Field Scabious	*Knautia arvensis*	Freckenham
Field Scabious	*Knautia arvensis*	Worlington
Small Scabious	*Scabiosa columbaria*	Freckenham
Small Scabious	*Scabiosa columbaria*	Red Lodge CWS
Small Scabious	*Scabiosa columbaria*	Red Lodge CWS
Hound's-tongue	*Cynoglossum officinale*	Red Lodge CWS
Hound's-tongue	*Cynoglossum officinale*	Worlington Chalk Pit
Hound's-tongue	*Cynoglossum officinale*	Freckenham
Hound's-tongue	*Cynoglossum officinale*	Red Lodge
Hound's-tongue	*Cynoglossum officinale*	Herringswell
Hound's-tongue	*Cynoglossum officinale*	Freckenham
Hound's-tongue	*Cynoglossum officinale*	Red Lodge CWS
Acalyptus carpini	*Acalyptus carpini*	Worlington Chalk Pit
Cionus nigritarsis	*Cionus nigritarsis*	Worlington Chalk Pit
Cleopomiarus graminis	*Cleopomiarus graminis*	Red Lodge
Gymnetron rostellum	*Gymnetron rostellum*	Worlington Chalk Pit
Ceutorhynchus pulvinatus	*Ceutorhynchus pulvinatus*	Red Lodge
Glocianus punctiger	*Glocianus punctiger*	Red Lodge CWS
Mogulones geographicus	*Mogulones geographicus*	Red Lodge
Mogulones geographicus	*Mogulones geographicus*	Red Lodge Warren
Scarce Four-dot Pin-palp	*Bembidion (Bembidion) quadripustulatum*	Worlington Chalk Pit
Platyderus depressus	*Platyderus depressus*	Red Lodge
Platyderus depressus	*Platyderus depressus*	Red Lodge Warren
Calathus (Calathus) ambiguus	*Calathus (Calathus) ambiguus*	Red Lodge CWS
Harpalus (Harpalus) pumilus	*Harpalus (Harpalus) pumilus*	Red Lodge CWS
Ophonus (Metophonus) schaubergerianus	*Ophonus (Metophonus) schaubergerianus*	Red Lodge CWS
Cercyon (Cercyon) bifenestratus	*Cercyon (Cercyon) bifenestratus*	Red Lodge Warren
Omaloplia ruricola	*Omaloplia ruricola*	Worlington Chalk Pit
Cardiophorus asellus	*Cardiophorus asellus*	Red Lodge Warren
Olibrus flavicornis	*Olibrus flavicornis*	Red Lodge CWS
Olibrus millefolii	*Olibrus millefolii*	Red Lodge
Olibrus pygmaeus	*Olibrus pygmaeus*	Red Lodge
Platynaspis luteorubra	*Platynaspis luteorubra*	Worlington Chalk Pit
Adonis' Ladybird	*Hippodamia (Adonia) variegata*	Red Lodge

Adonis' Ladybird	*Hippodamia (Adonia) variegata*	Worlington Chalk Pit
Mordellistena (Mordellistena) parvula	*Mordellistena (Mordellistena) parvula*	Red Lodge Warren
Anaspis (Anaspis) thoracica	*Anaspis (Anaspis) thoracica*	Red Lodge CWS
Anaspis (Anaspis) thoracica	*Anaspis (Anaspis) thoracica*	Red Lodge CWS
Anaspis (Anaspis) thoracica	*Anaspis (Anaspis) thoracica*	Red Lodge CWS
Longitarsus dorsalis	*Longitarsus dorsalis*	Red Lodge
Longitarsus quadriguttatus	*Longitarsus quadriguttatus*	Red Lodge
Mallow Flea Beetle	*Podagrica fuscicornis*	Red Lodge CWS
Apion rubiginosum	*Apion rubiginosum*	Red Lodge Warren
Protapion filirostre	*Protapion filirostre*	Worlington Chalk Pit
Small Heath	*Coenonympha pamphilus*	Red Lodge Warren
Small Heath	*Coenonympha pamphilus*	Red Lodge
Small Heath	*Coenonympha pamphilus*	Red Lodge CWS
Small Heath	*Coenonympha pamphilus*	Worlington
Small Heath	*Coenonympha pamphilus*	Red Lodge CWS
Small Heath	*Coenonympha pamphilus*	Red Lodge Warren
Small Heath	*Coenonympha pamphilus*	Red Lodge CWS
Small Heath	*Coenonympha pamphilus*	Red Lodge CWS
Small Heath	*Coenonympha pamphilus*	West Suffolk
White-letter Hairstreak	*Satyrium w-album*	Red Lodge CWS
Black-headed Mining Bee	*Andrena (Cnemidandrena) nigriceps*	Red Lodge
Grey-gastered Mining Bee	*Andrena (Plastandrena) tibialis*	Herringswell
Grey-gastered Mining Bee	*Andrena (Plastandrena) tibialis*	Red Lodge
Large Scabious Mining Bee	*Andrena (Charitandrena) hattorfiana*	Red Lodge CWS
Small Scabious Mining Bee	*Andrena (Margandrena) marginata*	Red Lodge
Small Scabious Mining Bee	*Andrena (Margandrena) marginata*	Red Lodge
Small Scabious Mining Bee	*Andrena (Margandrena) marginata*	Red Lodge
Small Scabious Mining Bee	*Andrena (Margandrena) marginata*	Herringswell
Plain Mini-miner	*Andrena (Micrandrena) minutuloides*	Red Lodge
Margined Colletes	*Colletes (Colletes) marginatus*	Red Lodge
Margined Colletes	*Colletes (Colletes) marginatus*	Herringswell
Large Yellow-face Bee	*Hylaeus (Prosopis) signatus*	Red Lodge
Large Yellow-face Bee	*Hylaeus (Prosopis) signatus*	Red Lodge
Large Yellow-face Bee	*Hylaeus (Prosopis) signatus*	Herringswell
Large Yellow-face Bee	*Hylaeus (Prosopis) signatus*	Worlington Chalk Pit
Spined Hylaeus	*Hylaeus (Abrupta) cornutus*	Red Lodge
Spined Hylaeus	*Hylaeus (Abrupta) cornutus*	Red Lodge
Spined Hylaeus	*Hylaeus (Abrupta) cornutus*	Worlington Chalk Pit
Spined Hylaeus	*Hylaeus (Abrupta) cornutus*	Herringswell
Four-spotted Furrow Bee	*Lasioglossum (Lasioglossum) quadrinotatum*	Red Lodge
Four-spotted Furrow Bee	*Lasioglossum (Lasioglossum) quadrinotatum*	Herringswell
Sharp-collared Furrow Bee	*Lasioglossum (Evylaeus) malachurum*	Herringswell

White-footed Furrow Bee	*Lasioglossum (Dialictus) leucopus*	Red Lodge CWS
White-footed Furrow Bee	*Lasioglossum (Dialictus) leucopus*	Red Lodge
White-footed Furrow Bee	*Lasioglossum (Dialictus) leucopus*	Red Lodge
White-footed Furrow Bee	*Lasioglossum (Dialictus) leucopus*	Herringswell
Swollen-thighed Blood Bee	*Sphecodes crassus*	Herringswell
Little Sickle-jawed Blood Bee	*Sphecodes longulus*	Red Lodge
Reticulate Blood Bee	*Sphecodes reticulatus*	Herringswell
Reticulate Blood Bee	*Sphecodes reticulatus*	Red Lodge CWS
Pantaloon Bee	*Dasypoda hirtipes*	Red Lodge
Pantaloon Bee	*Dasypoda hirtipes*	Herringswell
Hedychrum niemelai	*Hedychrum niemelai*	Red Lodge
Hedychrum niemelai	*Hedychrum niemelai*	Red Lodge
Hedychrum niemelai	*Hedychrum niemelai*	Herringswell
Hedychrum niemelai	*Hedychrum niemelai*	Red Lodge
Chrysis illigeri	*Chrysis illigeri*	Red Lodge
Chrysis illigeri	*Chrysis illigeri*	Herringswell
Small Velvet Ant	*Smicromyrme rufipes*	Worlington Chalk Pit
Dolichovespula (Dolichovespula) media	*Dolichovespula (Dolichovespula) media*	Herringswell
Dolichovespula (Dolichovespula) media	*Dolichovespula (Dolichovespula) media*	Red Lodge
Mud Wasp	*Podalonia affinis*	Red Lodge CWS
Ectemnius (Clytochrysus) ruficornis	*Ectemnius (Clytochrysus) ruficornis*	Red Lodge
Ectemnius (Clytochrysus) ruficornis	*Ectemnius (Clytochrysus) ruficornis*	Herringswell
Silver Spiny Digger Wasp	*Oxybelus argentatus*	Red Lodge
Little Black Wasp	*Pemphredon (Cemonus) lethifera*	Red Lodge
Nysson trimaculatus	*Nysson trimaculatus*	Red Lodge
Five-banded Weevil-wasp	*Cerceris quinquefasciata*	Red Lodge
Five-banded Weevil-wasp	*Cerceris quinquefasciata*	Red Lodge
Five-banded Weevil-wasp	*Cerceris quinquefasciata*	Red Lodge
Five-banded Weevil-wasp	*Cerceris quinquefasciata*	Herringswell
Five-banded Weevil-wasp	*Cerceris quinquefasciata*	Red Lodge
Bee Wolf	*Philanthus triangulum*	Herringswell
Bee Wolf	*Philanthus triangulum*	Red Lodge
Bee Wolf	*Philanthus triangulum*	Red Lodge
Silver-sided Nomad Bee	*Nomada argentata*	Red Lodge CWS
Blunthorn Nomad Bee	*Nomada flavopicta*	Herringswell
Orange-horned Nomad Bee	*Nomada fulvicornis*	Red Lodge CWS
Grey Carpet	*Lithostege griseata*	Red Lodge CWS
Cinnabar	*Tyria jacobaeae*	Red Lodge CWS
Cinnabar	*Tyria jacobaeae*	Worlington Chalk Pit
Halticus saltator	*Halticus saltator*	Red Lodge
Stictopleurus abutilon	*Stictopleurus abutilon*	Red Lodge CWS
Stictopleurus abutilon	*Stictopleurus abutilon*	Red Lodge CWS
Stictopleurus punctatonervosus	*Stictopleurus punctatonervosus*	Red Lodge CWS
Stictopleurus punctatonervosus	*Stictopleurus punctatonervosus*	Red Lodge CWS
Stictopleurus punctatonervosus	*Stictopleurus punctatonervosus*	Red Lodge CWS
Stictopleurus punctatonervosus	*Stictopleurus punctatonervosus*	Red Lodge CWS

Stictopleurus punctatonervosus	*Stictopleurus punctatonervosus*	Red Lodge CWS
Drab Wood-soldierfly	*Solva marginata*	Worlington Chalk Pit
Freraea gagatea	*Freraea gagatea*	Red Lodge CWS
Bacidia adastra	*Bacidia adastra*	Red Lodge
West European Hedgehog	*Erinaceus europaeus*	Worlington
West European Hedgehog	*Erinaceus europaeus*	Red Lodge
West European Hedgehog	*Erinaceus europaeus*	Red Lodge CWS
West European Hedgehog	*Erinaceus europaeus*	Red Lodge CWS
West European Hedgehog	*Erinaceus europaeus*	Red Lodge CWS
West European Hedgehog	*Erinaceus europaeus*	Red Lodge CWS
West European Hedgehog	*Erinaceus europaeus*	Red Lodge CWS
West European Hedgehog	*Erinaceus europaeus*	Red Lodge CWS
Serotine	*Eptesicus serotinus*	Red Lodge CWS
Noctule Bat	*Nyctalus noctula*	Red Lodge CWS
Pipistrelle	*Pipistrellus pipistrellus*	Red Lodge CWS
Nathusius's Pipistrelle	*Pipistrellus nathusii*	Red Lodge CWS
Soprano Pipistrelle	*Pipistrellus pygmaeus*	Red Lodge CWS
Brown Long-eared Bat	*Plecotus auritus*	Red Lodge CWS
European Otter	*Lutra lutra*	Red Lodge
European Otter	*Lutra lutra*	Red Lodge
Eurasian Badger	*Meles meles*	Red Lodge
Polecat	*Mustela putorius*	Red Lodge CWS
Brown Hare	*Lepus europaeus*	Red Lodge

Cambridgeshire



County Wildlife Sites

Site Name	Grid Ref	Area (ha)	Reasons for designation
Halfmoon Plantation Pit	TL6 968	87.14	Supports populations of Nationally Rare (*Herniaria glabra*) and Nationally Scarce vascular plant species (*Clinopodium calamintha, Vulpia ciliata ssp. ambigua, Medicago minima*); and species which are rare in the county.
Havacre Meadows and Deal Nook	TL6 870	14.24	Site is over 10ha in size and contains semi-improved grassland, woodland, scrub and open water in close association. The willow carr of the NVC Alder - Stinging Nettle woodland community (W6), qualifies as a CWS in its own right.

Cambridgeshire Species Records

Common Name	Scientific Name	Location
Fieldfare	*Turdus pilaris*	Red Lodge
Kingfisher	*Alcedo atthis*	Havacre Meadows and Deal Nook CWS
Red Kite	*Milvus milvus*	A11, Chippenham
Red Kite	*Milvus milvus*	A11, Red Lodge
Skylark	*Alauda arvensis*	Red Lodge
Tree Sparrow	*Passer montanus*	Badlingham Manor, Chippenham
Black Poplar	*Populus nigra subsp. betulifolia*	Red Lodge
Black Poplar	*Populus nigra subsp. betulifolia*	River Kennett, Chippenham
Cat-mint	*Nepeta cataria*	Chippenham
Dwarf Spurge	*Euphorbia exigua*	Chippenham
White-letter Hairstreak	*Satyrium w-album*	Red Lodge
Odontoscelis (Odontoscelis) lineola	*Odontoscelis (Odontoscelis) lineola*	Halfmoon Plantation Pit CWS

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APPENDIX 2 PLANT SPECIES DATA APRIL 2017

Taxon	English name	Arable land	Track edge /field margin	Rank grassland	Boundary bank	Plantation woodland
Acer pseudoplatanus	Sycamore	lf	lf-a			f
Alliaria petiolata	Garlic Mustard		lf		r	lf
Amsinckia micranthum	Common Fiddleneck		r			
Anchusa arvensis	Alkanet		r			
Anthriscus caucalis	Bur Chervil	r-o	a	f	a	a
Arenaria serpyllifolia	Thyme-leaved Sandwort		r			
Arrhenatherum elatius	False Oat-grass		o	a		
Artemisia absinthium	Wormwood		r			
Artemisia vulgaris	Mugwort	lf	f	lf	lf	
Ballota nigra	Black Horehound		r	o		lf
Buddleja davidii	Butterfly-bush					r
Carpinus betulus	Hornbeam					f
Castanea sativa	Sweet Chestnut					f
Cerastium fontanum	Common Mouse-ear				r	
Cerastium glomeratum	Sticky Mouse-ear				r	
Cirsium arvense	Creeping Thistle	r	r		r	
Cirsium vulgare	Spear Thistle			r		
Claytonia perfoliata	Springbeauty		la	f		lf
Conium maculatum	Hemlock				lf	lf
Conyza sumatrensis	Guernsey Fleabane				lf	
Cynoglossum officinale	Hound's-tongue		f	o		o
Cytisus scoparius	Broom					r
Dactylis glomerata	Cock's-foot			a	f	
Descurainia sophia	Flixweed	f	r			

Taxon	English name	Arable land	Track edge /field margin	Rank grassland	Boundary bank	Plantation woodland
Epilobium sp.	Willowherb				r-o	
Filago vulgaris	Common Cudweed		r			
Fumaria sp.	Fumitory	o-f				
Galium aparine	Cleavers		o			f
Geranium dissectum	Cut-leaved Crane's-bill	r	r			
Geranium molle	Dove's-foot Crane's-bill		o		o-f	
Glechoma hederacea	Ground Ivy		r			lf
Holcus lanatus	Yorkshire-fog			a	r-o	
Hordeum murinum	Wall Barley					la
Lactuca virosa	Great Lettuce		r		o	
Lamium album	White Deadnettle		o			o
Lolium perenne	Perennial Rye-grass		r			
Malva sylvestris	Common Mallow					r
Mercurialis annua	Annual Mercury					o-lf
Onopordum acanthium	Cotton Thistle		o			
Papaver sp.	Poppy	r				
Pinus nigra	Corsican Pine					ld
Pinus sylvestris	Scots Pine					ld
Plantago lanceolata	Ribwort Plantain		r	r		
Poa annua	Annual Meadow-grass				o	
Quercus robur	Pedunculate Oak					f
Reseda lutea	Wild Mignonette		r			
Reseda luteola	Weld		r			
Ribes uva-crispa	Gooseberry					r
Rumex crispus	Curled Dock					
Rumex obtusifolius	Broad-leaved Dock			r		

Taxon	English name	Arable land	Track edge /field margin	Rank grassland	Boundary bank	Plantation woodland
Sambucus nigra	Elder					lf
Senecio jacobaea	Common Ragwort		o	o-lf		
Senecio vulgaris	Groundsel	f-a			f	lf
Silene latifolia	Whie Campion		r-o	o		
Sonchus asper	Prickly Sow-thistle				r	
Sonchus oleraceus	Smooth Sow-thistle				r	
Sorbus aucuparia	Rowan					f
Stellaria media	Chickweed		o-f		r	f
Stellaria pallida	Lesser Chickweed		lf			
Symphoricarpos albus	Snowberry					lf
Taraxacum agg.	Dandelion				r	
Tripleurospermum inodorum	Scentless Mayweed	f			o	
Ulex europaeus	Gorse					r
Urtica dioica	Common Nettle		la	lf	o	f-la
Urtica urens	Small Nettle	f			r-o	
Veronica persica	Common Field-speedwell	o	o		r	
Veronica polita	Grey Field-speedwell		r			
Vulpia sp.			lf			

APPENDIX 3: PHOTOGRAPHS

Location of photographs

1 View north across the survey area, mostly occupied by arable land supporting a crop of carrots being grown under polythene.

2 View north-west across the survey area, showing arable land with strip of ruderal vegetation forming boundary to mature pine plantation.

3 An area of cleared plantation in the western corner of the survey area, now supporting rank grassland and young broad-leaved trees.

4 A soil bank forming the boundary between the survey area and extraction area 7, supporting a profuse stand of bur-chervil *Anthriscus caucalis*.

5 A view south-west along the access track located between the arable and recent plantation woodland forming the north-west boundary of the survey area.

6 A view north-east along the access track located between the arable and mature plantation woodland forming the north-west boundary of the survey area.

7 A view north-east along the access track located between the arable and plantation woodland forming the north-west boundary of the survey area, showing both recent and mature stands of trees.

8 One of the fumitory seedlings present in the arable area.

9 Seedlings of flixweed and small nettle in the arable area.

APPENDIX 4: RAW BAT DATA

NB AEA bat detector Is GMT
AEB bat detector is GMT +1hr

Detector AEA

Day	Time	Label	Number
21/04/17	19:15	Ppyg	2
21/04/17	19:20	Ppyg	2
21/04/17	19:25	Nn	1
21/04/17	19:25	Pp	7
21/04/17	19:25	Ppyg	16
21/04/17	19:30	Nn	7
21/04/17	19:30	Pp	15
21/04/17	19:30	Ppyg	16
21/04/17	19:35	Nn	2
21/04/17	19:35	Pp	14
21/04/17	19:35	Ppyg	3
21/04/17	19:35	Unident	1
21/04/17	19:40	Pp	2
21/04/17	19:40	Ppyg	1
21/04/17	19:50	Pp	1
21/04/17	19:50	Unident	1
21/04/17	19:55	Pp	1
21/04/17	19:55	Unident	1
21/04/17	20:00	Pp	1
21/04/17	20:05	Pp	1
21/04/17	20:20	Pp	1
21/04/17	20:35	Bb	1
21/04/17	20:35	Unident	1
21/04/17	20:40	Bb	1
21/04/17	20:45	Ppyg	1
21/04/17	20:50	Pp	1
21/04/17	21:25	Pp	1
21/04/17	21:25	Ppyg	1
21/04/17	21:25	Unident	1
21/04/17	21:30	Pp	2
21/04/17	21:30	Unident	1
21/04/17	21:50	Unident	1
21/04/17	21:55	Unident	1
21/04/17	22:00	Ppyg	1
21/04/17	22:05	Pp	2
21/04/17	22:05	Ppyg	1
21/04/17	22:05	Unident	1
21/04/17	22:15	Unident	1
21/04/17	22:20	Pp	2
21/04/17	22:20	Unident	6
21/04/17	22:25	Nn	1
21/04/17	22:25	Pp	3

21/04/17	22:25	Unident	2
21/04/17	22:30	Bb	1
21/04/17	22:30	Unident	3
21/04/17	22:35	Unident	2
21/04/17	22:40	Pp	1
21/04/17	22:40	Unident	1
21/04/17	22:50	Ppyg	2
21/04/17	22:50	Unident	1
21/04/17	23:00	Pp	4
21/04/17	23:10	Pp	1
21/04/17	23:20	Pp	1
22/04/17	00:25	Pp	1
22/04/17	00:25	Unident	3
22/04/17	00:35	Paur	1
22/04/17	00:55	Unident	1
22/04/17	01:05	Pp	1
22/04/17	01:15	Pp	2
22/04/17	01:50	Pp	1
22/04/17	02:05	Pp	1
22/04/17	02:35	Pp	2
22/04/17	03:20	Pp	1
22/04/17	04:10	Pp	2
22/04/17	04:15	Ppyg	7
22/04/17	04:20	Ppyg	26
22/04/17	04:25	Ppyg	2

Day	Time	Label	Number
23/04/17	19:35	Nn	1
23/04/17	19:35	Pp	10
23/04/17	19:35	Ppyg	11
23/04/17	19:40	Nn	4
23/04/17	19:40	Pp	15
23/04/17	19:40	Ppyg	8
23/04/17	19:45	Pip	2
23/04/17	19:45	Pp	14
23/04/17	19:45	Ppyg	3
23/04/17	19:50	Pip	5
23/04/17	19:50	Pp	15
23/04/17	19:50	Ppyg	4
23/04/17	19:55	Pp	12
23/04/17	20:00	Pp	7
23/04/17	20:05	Pip	1
23/04/17	20:05	Pp	1
23/04/17	20:10	Pp	1
23/04/17	20:20	Pp	1
23/04/17	20:30	Pp	1
23/04/17	20:45	Pp	1
23/04/17	20:50	Pp	1
23/04/17	20:55	Bb	1
23/04/17	20:55	Pp	1

23/04/17	20:55	Ppyg	1
23/04/17	21:50	Bb	2
23/04/17	22:30	Bb	1
24/04/17	00:35	Unident	1
24/04/17	02:40	Paur	1
24/04/17	02:45	Paur	1
24/04/17	03:40	Pp	2

26/04/17 No bats

Day	Time	Label	Number
29/04/17	19:45	Nn	1
29/04/17	19:45	Pp	2
29/04/17	19:50	Pp	4
29/04/17	19:50	Ppyg	1
29/04/17	19:55	Pp	5
29/04/17	19:55	Ppyg	1
29/04/17	20:00	Ppyg	2
29/04/17	20:05	Ppyg	2
29/04/17	20:10	Pip	1
29/04/17	20:10	Pp	8
29/04/17	20:15	Pp	7
29/04/17	20:20	Pp	13
29/04/17	20:25	Pp	20
29/04/17	20:30	Pp	21
29/04/17	20:35	Pp	23
29/04/17	20:40	Pp	24
29/04/17	20:45	Pp	21
29/04/17	20:50	Pp	26
29/04/17	20:55	Pp	16
29/04/17	21:00	Pp	10
29/04/17	21:05	Pp	16
29/04/17	21:10	Pp	21
29/04/17	21:15	Pp	14
29/04/17	21:20	Pp	22
29/04/17	21:25	Pp	9
29/04/17	21:30	Pip	1
29/04/17	21:30	Pp	2
29/04/17	21:35	Pp	2
29/04/17	21:50	Pp	4
29/04/17	21:55	Pp	2
29/04/17	22:00	Pp	2
29/04/17	22:10	Pp	2
29/04/17	22:15	Pp	3
29/04/17	22:40	Pp	1
29/04/17	22:45	Pp	1
29/04/17	23:05	Pp	9
29/04/17	23:25	Pp	10

29/04/17	23:35	Myotis	1
29/04/17	23:35	Pp	3
29/04/17	23:40	Pp	4
30/04/17	00:00	Pp	2
30/04/17	00:20	Pp	1
30/04/17	01:35	Pp	5
30/04/17	01:40	Pp	3
30/04/17	02:35	Pp	1
30/04/17	03:05	Pp	1
30/04/17	03:55	Pp	1
30/04/17	03:55	Ppyg	2

Day	Time	Label	Number
02/05/17	19:50	Pp	1
02/05/17	19:55	Pip	5
02/05/17	19:55	Pp	15
02/05/17	19:55	Ppyg	1
02/05/17	20:00	Pip	6
02/05/17	20:00	Pp	12
02/05/17	20:00	Ppyg	2
02/05/17	20:05	Pip	6
02/05/17	20:05	Pp	16
02/05/17	20:05	Ppyg	4
02/05/17	20:10	Pp	7
02/05/17	20:15	Pp	2
02/05/17	20:20	Pp	9
02/05/17	20:30	Ppyg	1
02/05/17	20:45	Ppyg	1
02/05/17	20:50	Ppyg	1
02/05/17	21:05	Unident	1
02/05/17	21:25	Pp	2
02/05/17	21:30	Es	1
02/05/17	21:50	Pp	1
03/05/17	03:40	Nn	1

Detector AEB

Day	Time	Label	Number
21/04/17	20:30	Pp	2
21/04/17	20:30	Ppyg	1
21/04/17	20:35	Pp	2
21/04/17	20:55	Ppyg	1
21/04/17	21:00	Unident	1
21/04/17	21:25	Unident	1
21/04/17	21:40	Unident	2
21/04/17	21:45	Unident	1
21/04/17	23:25	Nn	1
21/04/17	00:15	Pip	1
22/04/17	01:50	Pp	1

22/04/17	02:40	Pip	1
22/04/17	02:50	Pp	1
22/04/17	03:05	Pp	1
22/04/17	04:30	Pp	1
22/04/17	04:30	Unident	1
22/04/17	04:35	Pip	1
22/04/17	04:35	Pp	1
22/04/17	04:40	Pp	2

Day	Time	Label	Number
23/04/17	20:35	Unident	1
23/04/17	20:45	Pp	18
23/04/17	20:45	Ppyg	3
23/04/17	20:50	Pp	18
23/04/17	20:50	Ppyg	1
23/04/17	20:55	Pp	18
23/04/17	21:00	Pp	2
23/04/17	21:05	Pp	6
23/04/17	21:10	Pp	1
23/04/17	21:15	Nn	1
23/04/17	21:15	Pp	1
23/04/17	21:25	Pp	1
23/04/17	21:30	Nn	3
23/04/17	21:30	Pp	1
23/04/17	21:30	Ppyg	1
23/04/17	21:35	Nn	1
23/04/17	21:45	Pp	1
23/04/17	21:50	Nn	1
23/04/17	22:45	Bb	1
23/04/17	23:00	Bb	1
24/04/17	01:10	Pp	1
24/04/17	01:40	Pp	1

26/04/17		No bats

Day	Time	Label	Number
29/04/17	20:45	Nn	2
29/04/17	20:50	Pp	3
29/04/17	20:55	Pp	2
29/04/17	20:55	Unident	1
29/04/17	21:00	Pp	1
29/04/17	21:00	Unident	2
29/04/17	21:05	Unident	1
29/04/17	21:20	Myotis	1
29/04/17	21:30	Nn	2
29/04/17	21:55	Pp	1
29/04/17	22:00	Pip	1
29/04/17	22:00	Pp	1

29/04/17	22:05	Pp	2
29/04/17	22:05	Unident	1
29/04/17	22:10	Pp	1
29/04/17	22:15	Pp	2
29/04/17	22:20	Pp	2
29/04/17	22:20	Unident	1
29/04/17	22:25	Pp	1
29/04/17	22:30	Pp	1
29/04/17	22:30	Unident	1
29/04/17	22:35	Pp	1
29/04/17	22:40	Pp	2
29/04/17	22:45	Pp	1
29/04/17	22:55	Pp	1
30/04/17	00:45	Pp	1
30/04/17	03:45	Pp	1

Day	Time	Label	Number
02/05/17	21:00	Pip	2
02/05/17	21:00	Ppyg	3
02/05/17	21:40	Ppyg	1
02/05/17	21:45	Ppyg	1
02/05/17	21:50	Ppyg	1
02/05/17	22:05	Nn	1
02/05/17	22:25	Ppyg	1
02/05/17	22:30	Unident	1

SD1A - tree emergence survey

Day	Time	Label	Number
11/05/17	21:15	Pp	4
11/05/17	21:20	Nn	1
11/05/17	21:20	Ppyg	1
11/05/17	21:25	Pp	1
11/05/17	21:40	Nn	1
11/05/17	21:45	Paur	1
11/05/17	21:50	Nn	1

Temperature data

AEA	Temperature °C			
Date \ Time	12:00	07:00	00:00	05:00
21 April 2017	16.75	13.50	12.50	8.75
22 April 2017	16.25	11.25	8.25	7.50
23 April 2017	15.25	14.75	8.75	7.75
24 April 2017	12.50	10.00	4.00	0.75
25 April 2017	13.00	6.00	2.75	3.00
26 April 2017	6.50	7.50	2.50	0.25
27 April 2017	8.75	8.50	7.75	5.50
28 April 2017	13.75	12.50	9.25	8.75
29 April 2017	16.75	13.25	9.50	8.25
30 April 2017	16.75	16.25	12.25	9.75
1 May 2017	12.75	13.00	7.75	6.50
2 May 2017	16.50	12.25	7.50	7.25

Highlighted are the analysed nights

FIGURES

FIGURE 1: LOCATION PLAN

Legend

- Application boundary
- Extraction limit
- Existing contours
- Base of mineral deposit contours
- Transco pipeline
- Existing woodland retained
- Proposed advanced planting as labelled
- Existing trees to be removed
- Proposed soil storage
- 8m wide quarry access track
- Permitted phasing
- Proposed phasing and direction of working
- Access to Phase 4
- Existing site boundary

FRIMSTONE LTD

Ashcraft Farm, Main Road, Crimplesham, Norfolk PE33 9EB
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BAY FARM, WORLINGTON

Site 19 Extension Working Plan

SCALE : NTS	DATE : Oct 2016	DRAWING NUMBER
DRAWN : PJL		WORL/2016/03

Ashcraft Farm, Main Road, Crimplesham, Norfolk PE33 9EB
Tel: 01366 388900 Fax: 01366 388901

[redacted]

For illustrative purposes only

FIGURE 2: PHASE 1 HABITAT MAP

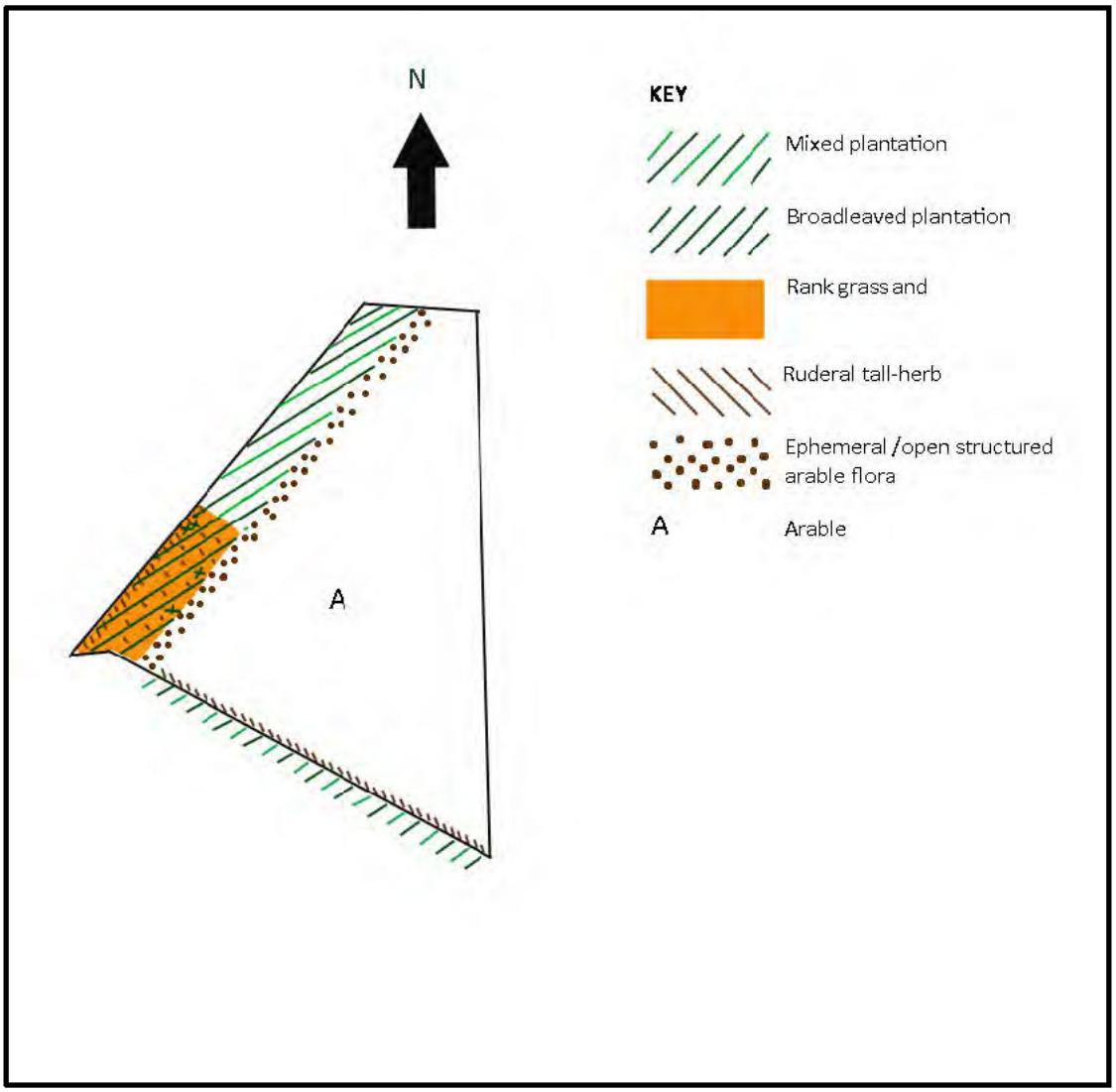


FIGURE 3: LOCATION OF TREES WITH BAT ROOST POTENTIAL

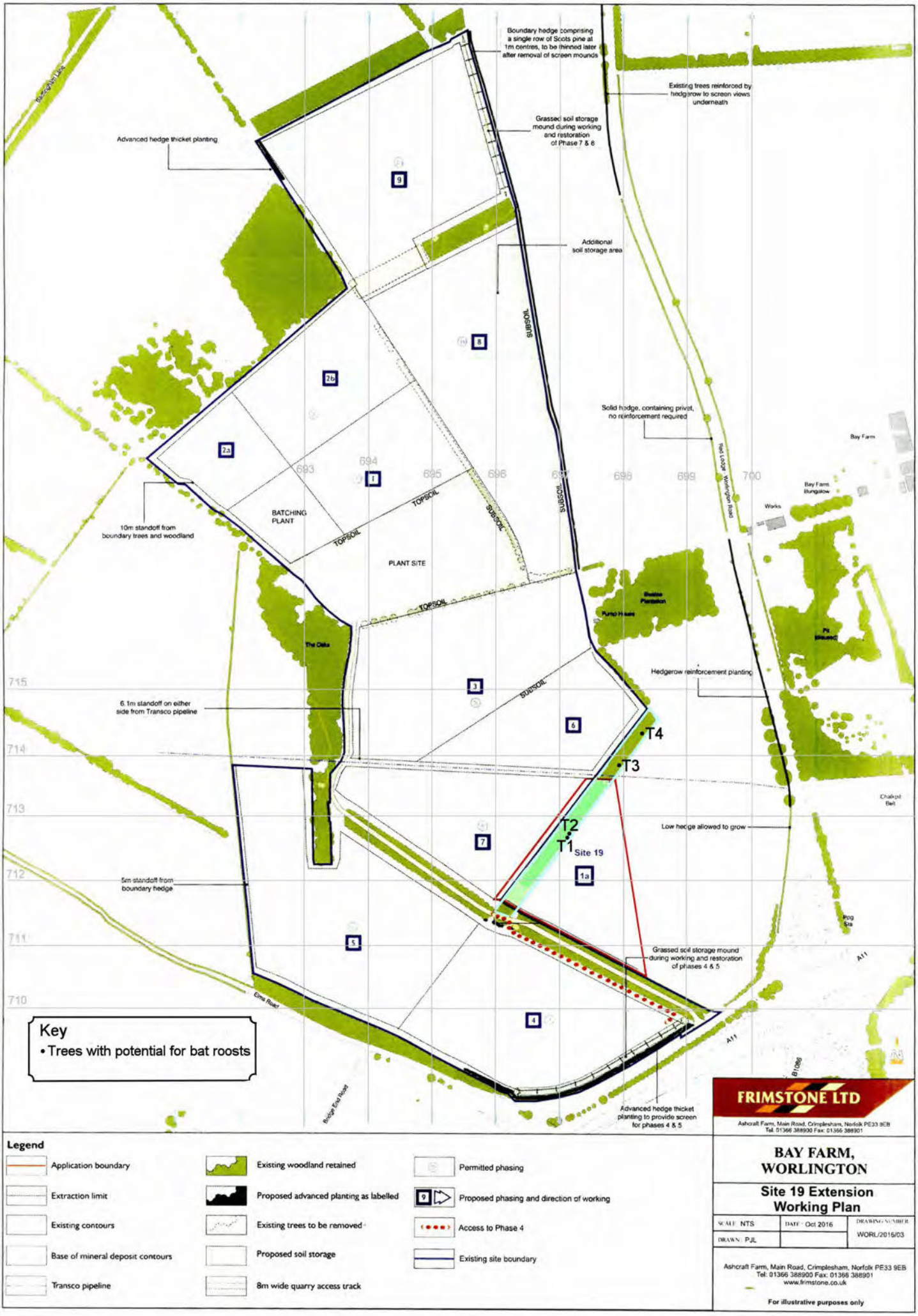


FIGURE 4: LOCATION OF BAT DETECTORS

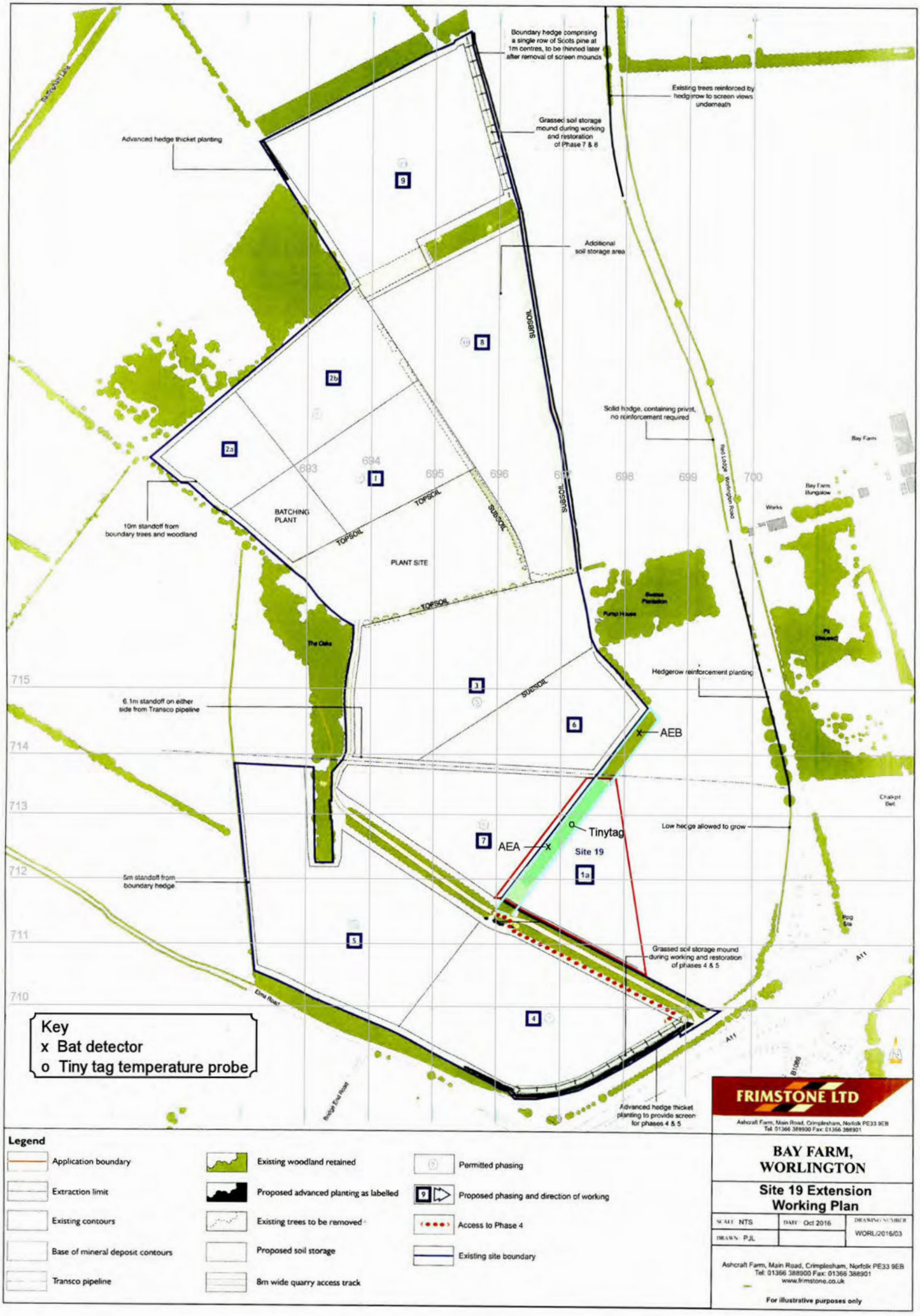
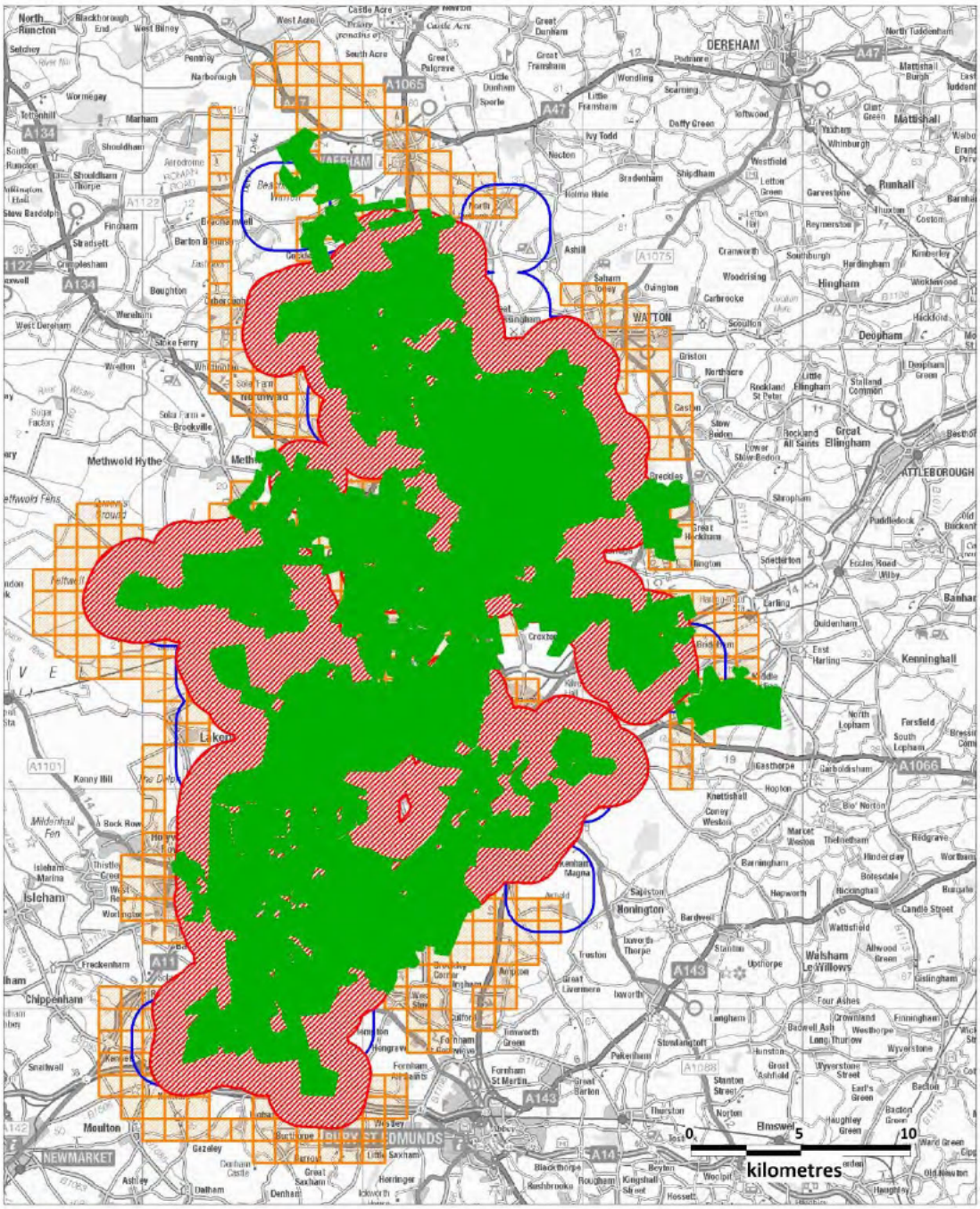


FIGURE 5: LOCATION OF EXTENSION AREA IN RELATION TO STONE CURLEW BUFFER ZONES (Buffer zones taken from Liley, 2016)

Map 1: Stone Curlew buffers



Breckland SPA

1500m buffer, SPA (with stone curlews)

1500m buffer for 1km cells outside SPA

1km grid cells where less than half area

Extension Area