

Land at Lea Castle Farm

Proposed sand and gravel quarry with progressive restoration using site derived and imported inert material to agricultural parkland, public access and nature enhancement - Application Ref: 19/000053/CM

Reg 25 Response Appendix B

Information in Respect of Biodiversity: Arboriculture (Ancient Woodland, and Ancient and Veteran Trees) and Protected Species

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Biodiversity: Arboriculture (Ancient Woodland, and Ancient and Veteran Trees) and Protected Species

1 Introduction

1.1 Reg 25 Request

1.1.1 This statement seeks to address the arboricultural and protected species comments raised in Worcestershire County Council's (MPA) request for clarification and additional information requested on the 5th June 2020 to help determine the above application as result of consultation.

1.2 Arboriculture

1.2.1 The following key points in terms of ancient woodland, and ancient and veteran trees are set out in the Reg 25 request:

- Tree T22 has been given limited consideration within the application submission with further information sought regarding the 'wholly exceptional reasons' for the loss of a veteran tree. Furthermore, the Mineral Planning Authority request that a suitable compensation strategy is submitted.
 - Development resulting in loss or deterioration of veteran trees (T5, T22 and T25 as per Arboriculture Appendix, based on combined assessment between the applicant's Ecologists and Arboriculturists) should not be permitted unless there are 'wholly exceptional reasons' and an suitable compensation strategy.
- Mismatch in Tree ID between the various submitted documents, specifically between the Ecological Impact Assessment and Arboriculture appendices.
- Woodland bordering the northern and western edges of the site have been included in the county Ancient Woodland Catalogue (WNCT, JJ Day, 1983) as "Wolverley Lodge" (reference 87023). In view of this, the Mineral Planning Authority seeks further information regarding the proposed mitigation strategies in relation to this ancient woodland, and their suitability for protection of ancient woodland habitats.

1.3 Protected Species

1.3.1 The following key points in terms of ancient woodland, and ancient and veteran trees are set out in the Reg 25 request:

- The Mineral Planning Authority requests that further information regarding the

submission of a dark corridor map that demonstrates that bat commuting routes can be maintained throughout the duration of the operations.

- Further information / clarification of the potential effects on and protection measures for veteran oak tree Target Note 3 / Tree T25. (Kedd note – Target Note 3 is T5).
- Further information / clarification as to why it is considered a 10 - metre buffer zone is acceptable to not cause disturbance to potentially active bat roosts; or further surveys of the boundary features for bats should be undertaken.
- Further clarification / consideration is given to mitigation for the loss of habitat for Skylark.
- Further consideration of specifications for proportional compensation and sustainable long-term enhancement measures for Otters.
- Recommendation that bat and bird boxes should be in the form of woodcreats or other more durable materials, due to the length of time these mitigation features would be required to be in place.

1.3.2 Details of the approach together with suggested revisions and amendments are set out below to address the points above.

2 Arboriculture

2.1 Tree 22

- 2.1.1 Tree 22 has been resurveyed and the findings confirm that the veteran tree is of poor structural and physiological condition. Defects present included apical dieback, presence of stags horns, and damaged bark at its base. It is noted that consultation comments from the County's ecologist, the Forestry Commission, the Woodland Trust and Natural England failed to give the poor structural and physiological condition any consideration in their responses. Despite the findings of the further survey, it is now proposed to retain Tree 22 with the implementation of a buffer zone in line with Natural England's standing advice on veteran trees.
- 2.1.2 An update bat roost assessment was conducted on the tree as part of the 2020 update bat surveys (Attached at **Appendix A**). It was assessed that this tree was considered to provide negligible roosting potential for bats. The damaged bark was considered an unsuitable feature for roosting bats, in addition there was no evidence of bats recorded during this roost assessment. It should be noted that this tree is also to be retained during the extent of the works.

2.2 Tree 5

- 2.2.1 Ecological and arboricultural addendum reports will be prepared and provide consistency between tree references. It should be noted that T5 will not be impacted by the proposed development, with a significant stand off between mineral workings (95-150m) and T5 on the western boundary of the site.
- 2.2.2 In terms of bat surveys, T5 was not initially surveyed as part of the Bat Roost Surveys because this tree was due to be retained and it was not considered that the roosting bats within this tree would be impacted as part of the proposed works. It is proposed to survey this tree as part of the Reg 25 response.
- 2.2.3 This tree has been surveyed as part of the update surveys (see **Appendix A**). A total of three surveys were conducted. There were no bats recorded emerging or re-entering this tree during any of the three roost surveys undertaken.

2.3 Tree 25

- 2.3.1 As with T5, ecological and arboricultural addendum reports will be prepared and provide consistency between tree references. Furthermore and again as with T5, T25 will not be impacted by the proposed development, with a stand off between mineral workings and T25

on the eastern boundary of the site.

- 2.3.2 This tree was assessed to provide a high roosting potential for bats and was subsequently surveyed in 2018. No bats were recorded emerging or re-entering this tree during the surveys.
- 2.3.3 A total of three roost surveys were undertaken on this tree during the 2020 surveys (see **Appendix A**). There was no evidence of any bats found to be emerging or re – entering this tree during the surveys.

2.4 Ancient Woodland

- 2.4.1 The woodland surrounding the boundaries of the site has been designated as broad-leaved woodland within the Ecological Impact Assessment as no areas of Ancient Woodland were shown within the desk study using the MAGIC software. The Council’s ecological response (24 March 2020) states that use of Worcestershire Habitat Inventory should be applied in order to assess whether these woodlands should be categorised as Ancient Woodlands.
- 2.4.2 A Preliminary search using the Worcestershire Habitat Inventory indicates that there may be areas of Ancient Woodland surrounding the site boundary, however this mapping software does not have definitive boundaries providing certainty on the exact location of Ancient Woodlands. For example, near the southern site boundary, the inventory shows an area of Ancient Woodland, however from the PEA Drawing we can see that within this area is an arable farmland. For this reason, it is difficult to understand exactly what areas have been assessed Ancient Woodland.
- 2.4.3 The guidance states that for areas of Ancient Woodland, the required stand-off for Ancient Woodland should be at least 15m, however the buffer from the site boundary for the proposals largely vary. There are two sections, one along the western boundary and one along the northern boundary where the stand-off falls to 10m. In the case that the council is considering all of the boundary woodlands as Ancient Woodland, as part of the Reg 25 response, the applicant is now proposing a varied stand-off varied across the areas of woodland with the minimum stand-off of 10m.

3 Protected Species

3.1 Mitigation

- 3.1.1 The Reg 25 request mentions that further clarification is needed on mitigation enhancement for other protected species such as birds and bats. In terms of bats, the updated surveys (see **Appendix A**) contains mitigation recommendations to feed into the restoration proposal.
- 3.1.2 In terms of farmlands birds, the 2018 breeding bird surveys identified farmland bird species

such as skylark (detailed comments below), yellowhammer, linnet and stock dove. It is considered that the works may have a minor disturbance for these farmland bird species, however it is considered that the proposed phasing strategy ensures that favourable habitat will be present within the site during the extent of the works.

3.1.3 For stock dove, this species was recorded during the survey using the arable fields for opportunistic foraging purposes. Ample areas of this habitat will remain in place through the phasing strategy, with many other suitable foraging areas present within wider surrounding area. In addition, the proposed restoration includes large areas of the site being returned to arable farmland within the proposed restoration strategy. It is considered that the proposed works will therefore have limited impact on this species.

3.1.4 For yellowhammer and linnet, these species were recorded in low numbers during the surveys. It is considered that they may be a small population of these species breeding within the site boundary. The phasing strategy will ensure that large areas of suitable habitat for these species are retained as part of the proposed works, will suitable areas of hedgerow creation and arable fields margins to be included within the proposed restoration strategy. The proposed works impacts approximately 0.25km of hedgerow, with the remaining 0.6km of to be enhanced. In addition, a further area of 0.5km of hedgerow is to be created as part of the restoration works. With the additional creation of arable field margins adjacent to these areas of hedgerow, it is assessed that following the implementation of the proposed restoration, there will be an increase in the suitable nesting and foraging habitat for both these species.

3.2 Repeat Bat Surveys

3.2.1 It states within the Ecological Impact Assessment "Should more than two years pass between the last survey (September 2018) and the removal of this tree, an update bat roost survey will be required to identify any changes to the status of the bat roost". Bat roost and activity surveys have both been updated. - see attached report at **Appendix A**.

3.3 Dark Corridor Map

3.3.1 As the bat activity surveys were conducted in 2018 and are now two years old, updated bat activity surveys have been conducted across the site (see **Appendix A**). Two dark corridor drawings have been completed and can be found within the Update bat roost and activity report. During the proposed works, the main dark corridors located within the site which are used by bats are the woodlands surrounding the western boundary of the site. These woodlands are to be retained during the extent of the works. In addition, there will be a bund located along the western boundary of the proposed plant site to ensure these corridors are

protected from light pollution during the extent of the works.

- 3.3.2 Bats were also recorded foraging along corridors within the eastern boundary of the site, however, these hedgerows suffer from light pollution from the existing B4189 Road. Following the implementation of the restoration scheme, further areas of woodland planting and hedgerow creation will ensure further dark corridors are provided post restoration.

3.4 Skylark

- 3.4.1 As part of the proposed restoration works, the majority of the site will be restored arable land largely similar to what is currently present within the site. In addition, there will be a large area of lowland acid grassland created as part of the restoration works. It is considered that the creation of the acid grassland will create greater nesting opportunities for skylark as this is a constant managed habitat that will be available every year. Whereas with the arable land that is currently in place, the chosen crop can vary from year to year, or some years can be left in situ. This means that the quality of nesting habitat available for skylarks can vary depending on the planted crop. Therefore, it is considered that the overall restoration strategy will have a positive impact on the suitable habitats available for skylarks within the local area.
- 3.4.2 Further benefits of the proposals include the phasing of the works. The grassland creation is to be created within Phase 1, so this will ensure that this grassland creation is in place for a large extent of the works. In addition, the phasing plan ensures that by the time the works extend into the eastern boundary of the site, large areas of restoration will be created in the west. This will ensure large areas of skylark nesting and foraging habitat are available during the extent of the works.
- 3.4.3 The creation of additional public rights of way are to largely be created surrounding the site boundary. Skylarks are largely found in the centre of fields and therefore additional disturbance should have minimal impact on nesting skylarks. Additional recommendations should include the creation of skylark plots as part of the proposed restoration works. These skylark plots should be encouraged to be created in areas of restored arable land.

3.5 Otters

- 3.5.1 An additional otter survey has been carried out and the full report is attached at **Appendix B**. The report concludes that no otters were recorded within the site, or within the adjacent mixed plantation woodland during the surveys. Typically, otter holts and resting sites are usually within 50m of a watercourse and therefore due to the absence during the survey and the distance from the waterbodies. There is a public right of way located between the canal and the River Stour, this is a very busy public footpath which is considered may cause

disturbance prevent otters from creating holts in this location. The proposed works will also provide a minimum stand-off of 10m from all areas of boundary woodland.

3.5.2 It is considered unlikely that the mixed plantation woodlands and the full extent of the site boundary are being used by otters for breeding and resting purposes.

3.5.3 Although no otters were recorded during the time of survey, otters occupy a large home range and therefore the new otter holts could be created between the time of survey and the extraction of Phase 1. It is therefore recommended that an update walkover survey to check for otter holts or signs of otters is conducted prior to the commencement of works.

3.6 Bat and Bird Boxes

3.6.1 It is recommended that bat and bird boxes are to be erected within the boundary woodlands surrounding the western site boundary. As updated within this bat report, it is recommended that a total of 5 bat boxes are erected within these woodlands. Woodcrete boxes such as the Schwegler bat boxes such as the 1FD, 1FF and 1FS should be installed within the site. It is also recommended that an additional 15 bird boxes should be installed within the western boundary woodlands. Woodcrete bird boxes such as the Schwegler 1B and 2M should be installed.

3.7 Additional Comments - Barn Owls

3.7.1 No evidence of nesting or foraging barn owl was observed during the 2018 bird and bat surveys. No evidence of nesting barn owl were recorded in the three trees that were considered to provide potential habitat. These were occupied by nesting jackdaw during the surveys. During a bat survey in August 2018, a barn owl was heard calling to the west of the Site. This recognises the potential of the Site as an area that could support barn owl breeding and/or foraging. It is considered that during the survey periods the Site did not fall within the home range of any nesting barn owl.

3.7.2 As a result, it states within the ECIA "Due to the lack of barn owl observations during the surveys, the Site is considered to be of Negligible importance for barn owl and they are not considered further".

3.7.3 During the surveys conducted in 2020, barn owl have been recorded on multiple occasions roosting in T9 of the arboricultural report. This tree has subsequently been checked and no evidence of nesting barn owls has been observed within the tree and therefore it is assessed that this species is using the site for roosting and foraging purposes only. As a result mitigation for this species will be required to be provided for this species and the impact within the ECIA will be required to be upgraded.

- 3.7.4 As T9 is to be removed as part of the proposed works it is recommended that update barn owl surveys are conducted prior to any tree removal. This will involve climbing the tree to search for owl pellets and watching the tree for any signs of barn owl activity. As barn owls have been recorded within this tree, it is essential that this tree is removed outside the nesting bird season (Late February – End of August). Mitigation for barn owls should include the erection of a barn owl box within the southern boundary woodland. It is essential that this barn owl nest box is sited as close to T9 as possible.
- 3.7.5 Further enhancements for barn owls include the creation of 7.5 hectares of acid grassland as part of the proposed restoration works. Further benefits of the proposals include the phasing of the works. The grassland creation is to be created within Phase 1, so this will ensure that this grassland creation is in place for a large extent of the works. This will create a large area of optimal foraging habitat for barn owls within the site boundary.

3.8 Dormice - Response to additional email clarification by Steve Aldridge and Cody Levine, from Worcestershire County Council.

- 3.8.1 The information below has been provided in response to Steve Aldridge's email dated 7th October 2020, specifically in relation to the County Ecologist comments on Dormice. Other on-Site and off-Site effects on ecology being discussed within this appendix and the overall covering response to the Regulation 25 request.

Response

- 3.8.2 The site offers small areas of sub-optimal habitat for dormouse (*Muscardinus avellanarius*) in the form of hedgerows and woodland surrounding the boundary of the site. The hedgerows present on the site are mostly limited in length, condition and species diversity and not well connected to other areas of more suitable habitat. The woodland that surrounds the site provides sub-optimal habitat for this species, due to the lack of a varied structure. The woodland is generally without an understorey that dormice can use to forage, nest, and commute between. This woodland will be retained and unaffected by the proposals.
- 3.8.3 During the ecological surveys, regular nut searches were undertaken within the woodlands and hedgerows located within the site boundary. During these nut searches, no dormouse nests or characteristically chewed hazel nuts were recorded on the site throughout the surveys, based upon comments received further dormouse / nut searches were carried out in 2020. Again, no dormouse nests or chewed hazel nuts were found. During these surveys, all hedgerows within the site boundary were surveyed and the full extent of the woodland

surrounding the site was also surveyed as part of the nut searches. This included a small area of hazel located approximately 200m to the north of the site boundary.

- 3.8.4 Within the Preliminary Ecological Appraisal (PEA) assessment conducted as part of the baseline ecology WBRC returned no records of dormice within 2km of the site boundary.
- 3.8.5 To provide further indication of the records for dormice within 2km of the site boundary, an updated NBN search has been undertaken. This search returned 1 record for dormice within 2km of the site boundary. This record was dated from 2014. This record was located approximately 1.75km from the boundary woodland to the east of the site boundary. It should be noted that there is no connectivity between the site boundary woodlands and the woodland in which the record for dormice was returned. In addition, located between the site and this record is large areas of open fields, housing and the A449 road network, which are therefore assessed as a barrier for this species between the site and this record for this species.
- 3.8.6 When consulting with the Multi-Agency Geographic Information for the Countryside (MAGIC) database, an updated search has been undertaken to identify whether there are any active or pre-existing records for European Protected Species Mitigation Licences relating to dormice within 10km of the site boundary. Following the completion of the search, no active or pre-existing dormouse licences were found within 10km of the site boundary. This suggests that all development works within 10km of the surrounding area have been conducted without the requirement for a dormouse Mitigation Licence from Natural England, suggesting there are no known populations for this species within 10km of these proposals.
- 3.8.7 As part of the proposed works, there is to be a minimum stand-off of 10m from the boundary woodlands of the site. However, in some areas of the site this stand-off will be as high as 95-100m in certain areas of the site proposals. This would ensure that in the unlikely case that any dormice are present within the site boundary woodlands, that no dormice would be disturbed during the extent of the works.
- 3.8.8 As shown within the Biodiversity Net Gain (BNG) Assessment Report, areas of hedgerow are to be created within the overall site boundary as part of the proposed restoration strategy. This will increase the overall connectivity within the site boundary providing optimal dormice habitat within the medium to long-term. The proposals include the creation of 0.5km of hedgerows with an additional 0.6km of existing hedgerows being enhanced as part of these proposals. This creation and enhancement of hedgerows along with planting of native woodland blocks to include hazel and other fruiting, nut and seeding species during the advanced planting and progressive restoration will help ensure areas of optimal habitat for dormice are created, should dormice migrate to or are introduced to the area over time.

Appendix A – Updated Bat Report



LEA Castle Update Survey Report

in respect of

Land at LEA Castle Farm, Wolverley, Kidderminster
for

NRS Aggregates LTD

Prepared By

Heaton's

September 2020

Heaton's

9 The Square, Keyworth, Nottingham NG12 5JT

tel: 0115 937 5552 email: consultants@heatonplanning.co.uk web: www.heatonplanning.co.uk

Heaton's is the trading name for Heaton Planning Ltd.

Registered office – 12 Bridgford Road, West Bridgford, Nottingham, NG2 6AB. Registered No. 4786259

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1.0 INTRODUCTION

1.1 Heatons have been commissioned by NRS to undertake update the bat roost and activity surveys at LEA Castle Farm, hereafter referred to as 'the site'.

1.2 Bat activity and bat roost surveys were undertaken on the site in 2018, as this information is now two years old update surveys were undertaken in 2020

Site Location and Description

1.3 The site is located on land to the north of Wolverley Road, Wolverley, Kidderminster. The site is located approximately 2.3km to the north-east of the centre of Kidderminster, Worcestershire. The site is centred at grid reference SO 840790.

1.4 The site comprises approximately 45ha of arable farmland with semi-improved and improved grass headlands. A hardstanding track separates the site from south to north that is delineated by standards of beech (*Fagus sylvatica*) and lime (*Tilia sp.*). The field boundaries of the site include post and wire fencing, hedgerows containing native species, woodland edge and estate boundary brick wall. Occasional standard trees were present in the fields, including pedunculate oak (*Quercus robur*), sweet chestnut (*Castanea sativa*) and conifer.

1.5 The surrounding area includes the River Stour approximately 100m to the north-west of the site, as well as extensive arable land to the north, east and west and blocks of broadleaved woodland to the north, west and south. The surrounding area provides high quality habitat for bats in the form of woodland, watercourses and hedgerows.

Scope of Works

1.6 The key objective of the bat activity surveys was to determine the abundance, composition and spatial distribution of foraging/commuting bats onsite. This information enables an assessment of the importance of the site for bats and the effects of the proposals on bat populations to be made. It will also help determine the need for and scope of any mitigation measures.

1.7 The aims and objectives of the surveys were therefore to:

- Make an assessment of the approximate abundance of bats on the site;
- Determine which species are present;

- Determine how bats are using the site (foraging, commuting etc);
- Make an assessment as to the spatial distribution of bats within the site;
- Provide sufficient data to enable a robust assessment of the effects of the proposed development on local bat populations to be made;
- Provide recommendations for any necessary mitigation measures; and
- Provide recommendations for enhancement measures above and beyond the need to mitigate adverse effects that might be included within the proposals.

2.0 LEGISLATION

2.1 Bats are a European Protected Species under the EC Habitats Directive. In England and Wales all bat species are fully protected under The Conservation of Habitats and Species Regulations 2017 and the Wildlife and Countryside Act 1981 (as amended).

2.2 Under this legislation, it is illegal to:

- intentionally or deliberately* kill, injure or capture (or take) bats;
- deliberately disturb bats (whether in a roost or not);
- recklessly disturb roosting bats or obstruct access to their roosts;
- damage or destroy bat roosts;
- possess or transport a bat or any part of a bat, unless acquired legally; and
- sell or exchange bats, or parts of bats.

* In a court, 'deliberately' will probably be interpreted as someone who, although not intending to capture/injure or kill a bat, performed the relevant action, being sufficiently informed and aware of the consequence which his/her action will most likely have.

2.3 Some bat species are also included on the S41 list of UK Biodiversity Action Plan species. Under the Natural Environment and Rural Communities (NERC) Act 2006, local authorities must consider the conservation of these species in planning decisions.

2.4 In many cases, it should be possible to avoid harming the bats or damaging/blocking access to their habitat. If this cannot be avoided, a mitigation licence will need to be granted from Natural England (NE) prior to works commencing. Planning Permission will need to be granted prior to this application.

3.0 ASSESSMENT METHODOLOGY

Desktop Study

- 3.1 In order to compile background information on the site and its immediate surroundings, information on statutory and non-statutory designated sites and ancient woodland sites within 3km of the central point of the site was obtained from the MultiAgency Geographic Information for the Countryside (MAGIC) website.
- 3.2 Worcestershire Biological Records Centre (WBRC) was also commissioned to undertake a data search for all protected and notable species and all sites of conservation importance within a 3km radius of SO834789.
- 3.3 Reference was also made to Ordnance Survey maps and aerial photography, which were used to determine the presence of open water and ponds in the area and provide information on land use and habitat connectivity throughout the area.

Roosting Habitat Assessment

- 3.4 The initial habitat assessment was undertaken as part of the ecological walkover of the site in January 2016, which was conducted by Nick Staples of Pleydell Smithyman Limited. An update assessment was completed in May 2018 by Steven Pagett of Pleydell Smithyman Limited, with a further assessment of trees 4 and 5 completed by Kelly Hopkins of Pleydell Smithyman Limited on 27th June 2018.
- 3.5 The assessment involved considering the suitability of the habitats and features present on the site for their potential to provide roosting, foraging and commuting habitat for bats. With respect to foraging and commuting habitat this included an assessment as to the extent, quality and diversity of habitats present and their potential importance in providing linkages in the landscape for bats.
- 3.6 The methodology for the roost assessment involved assessing the trees on the site that were considered to be impacted by the development for potential features that may be used by bats for roosting (e.g. splits, cracks, rot holes or lifted bark) along with any direct evidence of bats (e.g. droppings and urine staining). The potential for the trees to support bat roosts was ranked in accordance with the criteria set out in the Bat Conservation Trust's 'Bat Surveys for Professional Ecologists Good Practice Guidelines' (Collins, 2016):

- High roost suitability – A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.
- Moderate roost suitability – A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments are made irrespective of species conservation status, which is established after presence is confirmed).
- Low roost suitability – A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain PRF's (Potential Roosting Features) but with none seen from the ground or features seen with only very limited roosting potential

Foraging Habitat Assessment

- 3.1 The methodology for the bat activity surveys followed that described in the Bat Conservation Trust Good Practice Guidelines (3rd Ed 2016) for transect surveys. As the habitat present within the Site was assessed to provide a moderate foraging habitat quality for bats, one transect survey per month during 2019 was conducted (May – August 2020).
- 3.2 This methodology involves identifying a suitable transect route which covers the habitats and features that have been identified from the assessment as potentially providing suitable foraging and commuting habitat for bats. For this site, one transect route was identified to cover the site. The transect route was approximately 3km long and covered the whole Site during each of the survey visits to reach the BCT Guidance of 2 hours per survey.
- 3.3 Walked transect surveys were completed once per month throughout the optimal bat survey season. Surveys commenced in May and concluded in August. The location and extent of the transects are shown in Appendix B.

- 3.4 Surveyors were equipped with EchoMeter Touch and Android devices with recording capability and also Duet Batbox detectors.

Surveyors

- 3.5 The update bat surveys were led by S. Pagett (NE licence number 2018 – 34022-CLS-CLS).

Accurate Lifespan of Ecological Data

- 3.6 The majority of ecological data remains valid for only short periods due to the inherently transient nature of the subject. The survey results contained in this report are considered accurate for approximately 2 years, notwithstanding any considerable changes to the Site conditions.

- 3.7 It should also be noted that bats are highly mobile species and will move throughout the landscape using multiple available habitats/roost spaces. Therefore, bats may be found in suitable roosting spaces during any part of the year.

Ecological Survey Constraints and Limitations

- 3.8 There were no limitations or constraints during survey efforts throughout the surveys.

4.0 RESULTS

Species Records

- 4.1 Worcestershire Biological Records Centre (WBRC) returned records of Pipistrelle bat species (*Pipistrellus sp.*), common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), Nathusius' pipistrelle (*Pipistrellus nathusii*), noctule bat (*Nyctalus noctule*), Leisler's bat (*Nyctalus leisleri*), brown long-eared bat (*Plecotus auratus*), Daubenton's bat (*Myotis daubentoniid*), Brandt's bat (*Myotis brandtii*) and unidentified bat (*Myotis sp.*) from the data search. None of these records were specific to the site, and all were at least 380m from the site. It is possible that all of these bats could roost on the site in the trees present that offer bat roosting potential.
- 4.2 The MAGIC search shows that the closest European Protected Species (EPS) licence in relation to bats is approximately 1.5km to the south-east of the site. This licence relates to Natterer's bats and was valid between February 2012 and September 2013. The licence allowed the destruction of a resting place.
- 4.3 During bat roost surveys completed on three trees on the site in 2016, common pipistrelle, soprano pipistrelle, brown long-eared bat, *Myotis* species (*Myotis sp.*), Natterer's bat (*Myotis nattereri*), noctule bat and Leisler's bats were recorded. No confirmed roosts were recorded; however a possible brown long-eared bat roost was recorded on Tree 1.
- 4.4 During the bat roost surveys in 2018, one common pipistrelle was seen emerging from a split in a limb of Tree 8 during the second survey. No other emergence or re-entry activity was observed from this tree during any of the other two surveys. It is therefore considered that this tree is used as an occasional roost by a single bat. One possible brown long-eared bat emergence was recorded from Tree 9 during the second survey. No other emergence or re-entry activity was observed from this tree during any of the other two surveys. During the surveys conducted in 2016, one possible brown long-eared bat re-entry was observed from Tree 10 during the second survey. No other emergence or re-entry activity was observed from this tree during the other two surveys in 2016 or from the three surveys completed in 2018. The other two surveyed trees (Trees 25 and 26) were found to have no bats roosting within them at the time of the surveys in 2018.
- 4.5 During the bat activity surveys conducted in 2016, a total of eight species of bat common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, noctule bat,

Leisler's bat, serotine (*Eptesicus serotinus*) bat, brown long-eared bat and Myotis sp.) were confirmed as foraging and commuting on or very close to the site during the course of the surveys. A further two species of Myotis bat may possibly occur on the site. Of the recorded bat species, common pipistrelle was the most frequently encountered.

Bat Roost Habitat Assessment

4.6 Within the previous bat roost survey report, the tree number references are taken from the Preliminary Ecological Appraisal tree numbers, for consistency the arboricultural tree numbers have been used, these are shown in within the LEA Castle Bat Trees Drawing located in Appendix A. Table 1 below also provides details of what each tree refers to within the different reports.

Table 1 – Tree reference numbers for from the Preliminary Ecological Appraisal and Arboricultural Assessment

Trees (PEA)	Trees Arbourcultural Report
Tree 1	Tree 10
Tree 2	Tree 9
Tree 3	Tree 8
Tree 4	Tree 25
Tree 5	Tree 26

4.7 During the surveys conducted in 2016 and 2018, there were a total of five trees surveyed which were considered to provide roosting potential for bats. Of these trees, four were considered to offer moderate roosting potential for bats, with one considered to offer a high roosting potential for bats.

4.8 Following submission of the 2018 report, a request for further information for information was required regarding the requirement for bat surveys for T5, T22 and T23. Following this a further bat roost assessment was conducted on these three trees. Both T22 and T23 were considered to provide negligible suitability

for roosting bats, however T5 was assessed to provide a high suitability for roosting bats. For T22, the trunk of the tree was in good condition, with no cracks or crevice's, split limbs or woodpecker holes. In details within the arboricultural assessment that the tree has a split limb at the base, however this split limb was checked as it considered unsuitable for roosting bats. For T23, the trunk of the tree was in good condition, split limbs or woodpecker holes. Table 2 below table details the roosting features of these trees.

Table 2. Bat Roosting features associated with the trees on the site

Tree Number	Species	Bat Roost Suitability	Details
Tree 10	Oak	Moderate	Split Limbs at approximately 3m high on southern aspect.
Tree 9	Oak	Moderate	Woodpecker holes at approx. 2.5m height on southern aspect.
Tree 8	Oak	Moderate	Dead tree with crack in its limb at approx. 1.8m height on eastern aspect.
Tree 25	Oak	High	Dead tree with cracks in limbs at approx. 4m height and woodpecker holes on main trunk on eastern aspect. Elder is growing around the base of this tree.

Tree 26	Oak	Moderate	Split lower limb and broken branch stubs at approx. 2m height on northern aspect.
Tree 5	Oak	High	Split limb at approx. 4m from ground. Major dead wood in the centre of the tree providing a large hollow centre.

Bat Foraging Habitat Assessment

- 4.9 The majority of the site is comprised of arable farmland, and as a result the majority of the site offers limited foraging opportunities for bats. However, there are a number of areas which offer more suitable foraging habitat for bats in the form of hedgerows, woodland and a tree lined driveway. There are also a number of scattered mature trees present in the arable fields. In addition, broad-leaved woodland borders the western site boundary as well as part of the southern and northern boundaries. Many of these features provide foraging habitat for bats as well as commuting routes through the site to the local area and additional areas of foraging habitat such as the areas of woodland to the north-west and the River Stour to the west. The site is assessed to offer low habitat quality due to the largely arable composition, with additional suitable areas of foraging habitat located in the wider area.

Bat Roost/Activity Survey Information

- 4.10 A total of four bat activity surveys were undertaken on the site during the 2020 survey season. In addition, a total of three bat roost surveys were undertaken on the six trees which were considered to provide suitable features for roosting bats. Table 3 below provides the survey dates and weather conditions for all of the bat roost and activity surveys conducted during the 2020 season.

Table 3: Weather conditions for the bat activity and roost surveys conducted within the site.

Date	Weather Conditions	Survey Type
29/06/2020	Temperature between 13-12 degrees during the survey. Light breeze with cloud cover of 90%. No rain during the survey.	Bat Activity Survey 1 (June)
27/07/2020	Temperature between 16-14 during the survey. Light air – light breeze during the survey. No rain recorded throughout the survey. 5% cloud cover.	Bat Activity Survey 2 (July)
24/08/2020	Temperature between 19-17 degrees. Light air- light breeze by the end of the survey. Cloud cover varying between 90%-70%. No rain during the survey.	Bat Activity Survey 3 (August)
24/09/2020	Temperature hovering around 10 degrees. A light breeze reaching 3 on the Beaufort scale, cloud cover remaining at 60%.	Bat Activity Survey 4 (September)
02/07/2020	Temperature between 18-15 degrees. Very low wind throughout the survey, with cloud cover remaining around 85% throughout.	Roost Tree 10
28/07/2020	Temperature varying from 15-13 degrees. No wind throughout with 35% cloud cover and no rain.	Roost Tree 10
18/09/2020	Dawn survey with temperatures between 9-7 degrees. Very light	Roost Tree 10

	wind with 10% cloud cover and no rain.	
02/07/2020	Temperature between 17.5 – 15 degrees, no rain throughout and 100% cloud cover.	Roost Tree 9
28/07/2020	Temperature varying from 15-13 degrees. No wind throughout with 35% cloud cover and no rain.	Roost Tree 9
18/09/2020	Dawn survey with temperatures between 9-7 degrees. Very light wind with 10% cloud cover and no rain.	Roost Tree 9
09/07/2020	Temperature between 12-11 degrees, with 80% cloud cover with a very light wind.	Roost Tree 8
04/08/2020	Temperature between 7-8 degrees, with 50-60% cloud cover and a light wind throughout, no rain.	Roost Tree 8
22/09/2020	Temperature between 15-16 degrees, with a light wind (3 on Beaufort scale) with no rain, cloud cover 80%.	Roost Tree 8
09/07/2020	Temperature between 12-11 degrees, with 80% cloud cover with a very light wind.	Roost Tree 5
04/08/2020	Temperature between 7-8 degrees, with 50-60% cloud cover and a light wind throughout, no rain.	Roost Tree 5
22/09/2020	Temperature between 15-16 degrees, with a light wind (3 on	Roost Tree 5

	Beaufort scale) with no rain, cloud cover 80%.	
10/07/2020	Temperature between 9-11 degrees, with 15% cloud cover and a light wind, with no rain.	Roost Tree 25
30/07/2020	Temperature between 17-20 degrees, with 5-10% cloud cover, with no rain.	Roost Tree 25
17/09/2020	Temperature between 15-16 degrees, with 0% cloud cover and no wind and rain.	Roost Tree 25
10/07/2020	Temperature between 9-11 degrees, with 15% cloud cover and a light wind, with no rain.	Roost Tree 26
30/07/2020	Temperature between 17-20 degrees, with 5-10% cloud cover, with no rain.	Roost Tree 26
17/09/2020	Temperature between 15-16 degrees, with 0% cloud cover and no wind and rain.	Roost Tree 26

Static Bat Detector Survey Information

- 4.11 The static detectors were put out onsite during the following timeframes: 3rd July 2020 – 23rd July 2020; 3rd of July 2020 – 28th July 2020; 24th August 2020 – 18th September 2020; 18th September 2020 – 23rd September 2020. Due to the timing of commission, the early spring season was missed, however extra survey dates were summer and spring in order to mitigate for this missed time period. As there is static bat detector information dating back to 2018, it is not anticipated that this missed season will have any impact on the results of the static data for the purpose of this report. For the specific locations of the static detectors, please see Appendix B.
- 4.12 The static detectors were set up so that they recorded in night mode. This ensured that daytime activity such as bird song would not be picked up which

could waste the SD card space or battery power. This does mean that any bats that may have been flying in the day (although unlikely) would not be recorded by these static detectors.

Activity Survey Results

- 4.13 During the first bat activity survey a total of three bat species were recorded within the site during the survey. The species recorded include noctule, common pipistrelle and soprano pipistrelle. During this survey, common pipistrelle and noctule were recorded in the eastern boundary of the site foraging over open arable fields. In addition, a number of common and soprano pipistrelle bats were also recorded foraging along the south-western boundary woodland edge.
- 4.14 During the second bat activity survey, a total of three species were recorded within the survey, these include common pipistrelle, soprano pipistrelle and a myotis bat species with the characteristics of Brandt's bat. These bats were observed foraging within the central site hedgerows and along edges of the woodland surrounding the site boundaries.
- 4.15 During the third bat activity survey a total of five bat species were recorded during the survey. These include common pipistrelle, soprano pipistrelle, noctule, brown long-eared and Daubenton's. This survey produced high levels of foraging activity for these species along the hedgerow boundaries and along the boundaries of the surrounding woodlands.
- 4.16 The final bat activity survey was conducted in September. There was only two common pipistrelles recorded during the survey. These bats were foraging along the hedgerows in the eastern section of the site.

Static Detector Results

- 4.17 Table 4 below provides the results of that static detector positions, the species recorded and the number of passes for each species at each position. A total of nine species were recorded within the static detector surveys, these were common pipistrelle, soprano pipistrelle, noctule, brown long-eared, Daubenton's, serotine, Leisler's and myotis bat species with the characteristics of Brandt's.

Table 4 – Anabat Positions, bat species recorded and the number of passes for each species

Anabat Position	Bats and Number of passes
Position 1	<p>Common Pipistrelle – 153 passes</p> <p>Soprano Pipistrelle – 44 passes</p> <p>Noctule – 15 passes</p> <p>Brown long-eared – 2 passes</p> <p>Daubentons – 5 passes</p> <p>Myotis with characteristics of brandts – 1 pass</p>
Position 2	<p>Common Pipistrelle – 62 passes</p> <p>Soprano Pipistrelle – 17 passes</p> <p>Noctule - 7 passes</p>
Position 3	<p>Common Pipistrelle – 463 passes</p> <p>Soprano Pipistrelle – 84 passes</p> <p>Noctule – 21 passes</p> <p>Brown long-eared – 3 passes</p> <p>Daubentons – 18 passes</p> <p>Myotis with characteristics of brandts – 1 pass</p> <p>Myotis with the characteristics of natterers – 5 passes</p> <p>Serotine – 4 passes</p> <p>Leisler's – 2 passes</p>

Position 4	Common Pipistrelle – 112 passes Soprano Pipistrelle – 62 passes Noctule – 12 passes Brown long-eared – 3 passes Daubentons – 1 pass
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Bat Roost Survey Results

- 4.18 During the roost surveys conducted on the six trees within the site, there was no evidence of any emerging or re-entering bats recorded during the surveys. In addition, upon inspecting the trees, there was no evidence of bat droppings or bat urine stains on any of the trees.

Table 5 – Bat Activity Survey (June)

Table 5 – Bat Activity Survey (June)					
Project/Location		Lea Castle	Date		29/6/2020
Surveyors		SP + HH			
Sunset		21:37	Sunrise		N/A
Survey Start		21:37	Survey End		23:37
Start Temperature		13 Degrees Celsius	End Temperature		12 Degrees Celsius
Other Weather Conditions (Beaufort Scale 1-14)		90% Cloud Cover - (2)			
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Details (e.g. Direction of travel)
21:52 – 21:55	1 (Stop)	N/A	N/A	N/A	N/A
22:15 – 22:18	2 (Stop)	Noctule	Rare	Foraging	Foraging over open field.
22:20	2 – 3	Common Pipistrelle	Rare	Foraging	Foraging over open field
22:28 – 22:31	3 (Stop)	N/A	N/A	N/A	N/A
22:40 – 22:43	4 (Stop)	N/A	N/A	N/A	N/A
22:47 – 22:50	5 (Stop)	N/A	N/A	N/A	N/A
22:58	5 - 6	Common Pipistrelle	Occasional	Foraging	Foraging over crop field
23:06 – 23:10	6 (Stop)	N/A	N/A	N/A	N/A
23:15 – 23:18	7 (Stop)	N/A	N/A	N/A	N/A
23:23 – 23:24	7 – 8	Soprano Pipistrelle	Constant	Foraging	Foraging over field corner
23:24	7 – 8	Common Pipistrelle	Occasional	Foraging	Foraging over field corner
23:24 – 23:27	8 (Stop)	Common Pipistrelle (23:24)	Constant	Foraging	Foraging over field corner
23:28	8 – 9	Common Pipistrelle	Occasional	Foraging	Foraging over field corner

Heatons

9 The Square, Keyworth, Nottingham NG12 5JT

tel: 0115 937 5552 email: consultants@heatonplanning.co.uk web: www.heatonplanning.co.uk

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23:30	8 – 9	Soprano Pipistrelle	Occasional	Foraging	Foraging over woodland edge
23:32	8 – 9	Common Pipistrelle	Occasional	Foraging	Foraging over woodland edge

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 6 – Bat Activity Survey (July)					
Project/Location	Lea Castle	Date	27/7/20		
Surveyors	HH				
Sunset	21:07	Sunrise	N/A		
Survey Start	21:07	Survey End	23:07		
Start Temperature	16 Degrees Celsius	End Temperature	14 Degrees Celsius		
Other Weather Conditions (Beaufort Scale 1-14)	Cloud cover – 5% (1 – Start/End – 2)				
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Details (eg. Direction of travel)
21:07 - 21:10	1 (Stop)	N/A	N/A	N/A	N/A
21:17 – 21:20	2 (Stop)	N/A	N/A	N/A	N/A
21:31 – 21:34	3 (Stop)	N/A	N/A	N/A	N/A
21:46 – 21:49	4 (Stop)	Common Pipistrelle	Rare	Foraging	Foraging along woodland belt
21:50	4 – 5	Common Pipistrelle	Rare	Foraging	Foraging along woodland belt
22:01	4 – 5	Soprano Pipistrelle	Constant	Foraging	Foraging in hedgerow field boundary
22:03	4 – 5	Common Pipistrelle	Constant	Foraging	Foraging in hedgerow field boundary
22:10 – 22:13	5 (Stop)	Common Pipistrelle (22:10 – 22:13)	Constant	Foraging	Foraging over open wheat
22:14 – 22:15	5 - 6	Common Pipistrelle	Constant	Foraging	Foraging over open wheat
22:21	5 – 6	Common Pipistrelle	Frequent	Foraging	Foraging over open wheat



22:27	5 – 6	Myotis with characteristics of Brandts Bat	Rare	Foraging	Foraging near woodland
22:32	5 – 6	Soprano Pipistrelle	Rare	Foraging	Foraging near woodland bike track
22:33 – 22:36	6 (Stop)	Soprano Pipistrelle	Rare	Foraging	Foraging along woodland belt
22:43 – 22:47	7 (Stop)	N/A	N/A	N/A	N/A
22:54	7 – 8	Common Pipistrelle	Occasional	Foraging	Foraging over track/trees
23:06 – 23:09	8 (Stop)	N/A	N/A	N/A	N/A
23:13 – 23:14	8 – 9	Common Pipistrelle	Constant	Foraging	Foraging over track

*

Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 7 – Bat Activity Survey (August)					
Project/Location	Lea Castle	Date	24/08/2020		
Surveyors	HH + JC				
Sunset	20:15	Sunrise	N/A		
Survey Start	20:15	Survey End	22:15		
Start Temperature	19 Degrees Celsius	End Temperature	17.5 Degrees Celsius		
Other Weather Conditions (Beaufort Scale 1-14)	90% Cloud Cover – (1)				
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Details (e.g. Direction of travel)
20:15 – 20:18	1 (Stop)	Noctule (20:18)	Rare	Foraging HNS	Foraging overhead
20:20	1 – 2	Noctule	Rare	Foraging HNS	Foraging overhead
20:26 – 20:29	2 (Stop)	Noctule (20:27) Soprano Pipistrelle (20:29) Noctule (20:29)	Rare Occasional Occasional	Foraging HNS	Foraging overhead
20:37	2 – 3	Common Pipistrelle	Rare	Foraging HNS	Foraging over crop field
20:38 – 20:40	2 – 3	Common Pipistrelle	Constant	Foraging HNS	Foraging over crop field
20:40	2 – 3	Noctule	Occasional	Foraging	Foraging overhead
20:42 – 20:45	3 (Stop)	Soprano Pipistrelle (20:45) Noctule (20:45)	Occasional Rare	Foraging HNS Foraging HNS	Foraging overhead Foraging overhead
20:49 – 20:50	3 – 4	Common Pipistrelle	Constant	Foraging	Foraging overhead
20:52 – 20:56	3 – 4	Soprano Pipistrelle	Constant	Foraging	Foraging along hedgerow down to road.
20:57 – 21:00	4 (Stop)	Noctule (20:59 – 21:00) Soprano Pipistrelle (21:00)	Constant Rare	Foraging Foraging	Foraging overhead Foraging overhead

21:05	4 – 5	Soprano Pipistrelle	Rare	Foraging	Foraging overhead
21:06	4 – 5	Noctule	Rare	Foraging	Foraging overhead
21:08	4 – 5	Daubentons'	Rare	Foraging	Foraging along roadside
21:08	4 – 5	Soprano Pipistrelle	Constant	Foraging	Foraging over field
21:10 – 21:12	4 – 5	Common Pipistrelle	Constant	Foraging	Foraging over crops
21:14 – 21:17	5 (Stop)	N/A	N/A	N/A	N/A
21:21 – 21:22	5 – 6	Common Pipistrelle	Constant	Foraging	Foraging over middle of field
21:23	5 – 6	Common Pipistrelle	Constant	Foraging	Foraging along middle hedgerow
21:25	5 – 6	Common Pipistrelle	Rare	Foraging	Foraging along hedgerow field boundary
21:27 – 21:30	6 (Stop)	Common Pipistrelle (21:27) Soprano Pipistrelle (21:28)	Occasional Rare	Foraging (both)	Foraging over crop field (both)
21:34	6 – 7	Soprano Pipistrelle	Rare	Foraging	Foraging over field
21:44 – 21:47	7 (Stop)	N/A	N/A	N/A	N/A
21:57 – 22:00	8 (Stop)	Common Pipistrelle (21:58)	Rare	Foraging	Foraging near woodland belt
22:02	8 – 9	Brown Long Eared Bat	Rare	Foraging	Foraging near woodland belt
22:14 – 22:17	9 (Stop)	Soprano Pipistrelle (22:14) Noctule (22:15) Daubentons' (22:16)	Rare Rare Rare	Foraging (all)	Foraging near woodland belt (all)
22:22	9 – 10	Soprano Pipistrelle	Rare	Foraging	Foraging near track next to woodland belt

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 8 – Bat Activity Survey (September)							
Project/Location		Lea Castle		Date		24/09/2020	
Surveyors		SP					
Sunset		04:57		Sunrise		06:57	
Survey Start		04:57		Survey End		06:57	
Start Temperature		10 Degrees Celsius		End Temperature		10 Degrees Celsius	
Other Weather Conditions (Beaufort Scale 1-14)		60% Cloud Cover – (3) No rain.					
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Details (e.g, Direction of travel).		
06:05	5 (Stop)	Common Pipistrelle	Occasional	Foraging	Foraging		

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 9 – Tree 10 (Roost Activity Survey 1)					
Project/Location		Lea Castle		Date 2/7/2020	
Surveyors		HH			
Sunset		21:34		Sunrise N/A	
Survey Start		21:34		Survey End 23:04	
Start Temperature		17.5 Degrees Celsius		End Temperature 15.8 Degrees Celsius	
Other Weather Conditions (Beaufort Scale 1-14)		85% Cloud Cover – (1)			
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Emerging/Re-entering/ Not emerging/ Not Re-entering
22:17	Tree 10	Common Pipistrelle	Occasional	Foraging	No
22:18	Tree 10	Common Pipistrelle	Rare	Foraging	No
22:51	Tree 10	Soprano Pipistrelle	Rare	Foraging	No
22:59	Tree 10	Common Pipistrelle	Occasional	Foraging	No

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 10 – Tree 10 (Roost Activity Survey 2)					
Project/Location	Lea Castle	Date	28/07/2020		
Surveyors	HH				
Sunset	21:06	Sunrise	N/A		
Survey Start	21:06	Survey End	22:36		
Start Temperature	14.9 Degrees Celsius	End Temperature	13.3 Degrees Celsius		
Other Weather Conditions (Beaufort Scale 1-14)	35% Cloud Cover – (1)				
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Emerging/Re-entering/ Not emerging/ Not Re-entering
21:28	Tree 10	Noctule	Rare	Foraging over wheat field	No
22:23	Tree 10	Common Pipistrelle	Occasional	Foraging over wheat field	No
22:32	Tree 10	Common Pipistrelle	Occasional	Foraging over wheat field	No
22:32	Tree 10	Soprano Pipistrelle	Rare	Foraging over wheat field	No

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 11 – Tree 10 (Roost Activity Survey 3)					
Project/Location		Lea Castle		Date 18/09/2020	
Surveyors		HH			
Sunset		N/A		Sunrise 06:48	
Survey Start		05:18		Survey End 06:48	
Start Temperature		7.5 Degrees Celsius		End Temperature 8.6 Degrees Celsius	
Other Weather Conditions (Beaufort Scale 1-14)		10% Cloud Cover – (1)			
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Emerging/Re-entering/ Not emerging/ Not Re-entering
05:25	Tree 10	Common Pipistrelle	Occasional	Foraging over crop field	No
05:31	Tree 10	Daubentons'	Rare	Foraging over crop field	No
05:32	Tree 10	Soprano Pipistrelle	Rare	Foraging over crop field	No
06:48	Tree 10	Common Pipistrelle	Rare	Foraging over crop field	No

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 12 – Tree 9 (Roost Activity Survey 1)							
Project/Location		Lea Castle		Date		02/07/2020	
Surveyors		SP					
Sunset		21:34		Sunrise		N/A	
Survey Start		21:34		Survey End		23:04	
Start Temperature		17.5 Degrees		End Temperature		15.8 Degrees Celcius	
Other Weather Conditions (Beaufort Scale 1-14)		100% Cloud Cover – (2)					
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Emerging/Re-entering/ Not emerging/ Not Re-entering		
21:57	Tree 9	Noctule	Rare	Foraging high above	No		
22:11	Tree 9	Common Pipistrelle	Rare	Foraging above	No		
22:22	Tree 9	Noctule	Rare	Foraging above	No		
22:29	Tree 9	Common Pipistrelle	Rare	Foraging above	No		

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 13 – Tree 9 (Roost Activity Survey 2)					
Project/Location		Lea Castle	Date		28/07/2020
Surveyors		SP			
Sunset		21:07	Sunrise		N/A
Survey Start		21:07	Survey End		22:27
Start Temperature		14.9 Degrees Celsius	End Temperature		13.3 Degrees Celsius
Other Weather Conditions (Beaufort Scale 1-14)		30% Cloud Cover – (2)			
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Emerging/Re-entering/ Not emerging/ Not Re-entering
21:44	Tree 9	Noctule	Rare	Foraging over tree	No
22:07	Tree 9	Nathusius' Pipistrelle	Occasional	Foraging HNS	No
22:08	Tree 9	Brown Long Eared Bat	Rare	Foraging HNS	No
22:23	Tree 9	Common Pipistrelle	Rare	Foraging HNS	No

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 14 – Tree 9 (Roost Activity Survey 3)							
Project/Location		Lea Castle		Date		18/09/2020	
Surveyors		SP					
Sunset		N/A		Sunrise		06:48	
Survey Start		05:18		Survey End		06:48	
Start Temperature		8.2 Degrees Celsius		End Temperature		8.6 Degrees Celsius	
Other Weather Conditions (Beaufort Scale 1-14)		20% Cloud Cover – (3)					
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Emerging/Re-entering/ Not emerging/ Not Re-entering		
05:33	Tree 9	Soprano Pipistrelle	Rare	Foraging	No		

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).



Table 15 – Tree 8 (Roost Activity Survey 1)

Table 15 – Tree 8 (Roost Activity Survey 1)					
Project/Location	Lea Castle		Date	09/07/2020	
Surveyors	SP				
Sunset	21:29		Sunrise	N/A	
Survey Start	21:29		Survey End	22:59	
Start Temperature	12.5 Degrees Celsius		End Temperature	11.4 Degrees Celsius	
Other Weather Conditions (Beaufort Scale 1-14)	110% Cloud Cover and light rain at start of survey – (2)				
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Emerging/Re-entering/ Not emerging/ Not Re-entering
NO BATS RECORDED					

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 16 – Tree 8 (Roost Activity Survey 2)					
Project/Location	Lea Castle		Date	04/08/2020	
Surveyors	SP				
Sunset	N/A		Sunrise	05:33	
Survey Start	4:03		Survey End	05:33	
Start Temperature	7.7 Degrees Celsius		End Temperature	8.2 Degrees Celsius	
Other Weather Conditions (Beaufort Scale 1-14)	60% Cloud Cover – (2)				
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Emerging/Re-entering/ Not emerging/ Not Re-entering
04:54	Tree 8	Common Pipistrelle	Rare	Foraging above	No

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).



Table 17 – Tree 8 (Roost Activity Survey 3)

Table 17 – Tree 8 (Roost Activity Survey 3)					
Project/Location	Lea Castle		Date	22/09/2020	
Surveyors	SP				
Sunset	19:06		Sunrise	N/A	
Survey Start	19:06		Survey End	20:36	
Start Temperature	16.5 Degrees Celsius		End Temperature	15.2 Degrees Celsius	
Other Weather Conditions (Beaufort Scale 1-14)	80% Cloud Cover – (3)				
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Emerging/Re-entering/ Not emerging/ Not Re-entering
NO BATS RECORDED					

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 18 – Tree 25 (Roost Activity Survey 1)							
Project/Location		Lea Castle		Date		10/07/2020	
Surveyors							
Sunset		N/A		Sunrise		05:00	
Survey Start		03:30		Survey End		05:00	
Start Temperature		11 Degrees		End Temperature		9.8 Degrees Celsius	
Other Weather Conditions (Beaufort Scale 1-14)		15% Cloud Cover (3)					
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Emerging/Re-entering/ Not emerging/ Not Re-entering		
03:33 – 03:36	Tree 25	Soprano Pipistrelle	Constant	Foraging	No		
03:38	Tree 25	Common Pipistrelle	Occasional	Foraging HNS	No		
03:38 – 03:40	Tree 25	Soprano Pipistrelle	Constant	Foraging HNS	No		
03:40 – 03:45	Tree 25	Soprano Pipistrelle	Constant	Constant Activity/ Distant Calls	No		
03:45	Tree 25	Daubentons'	Rare	Foraging HNS	No		
03:45 – 03:47	Tree 25	Soprano Pipistrelle	Constant	Foraging HNS/ Constant calls	No		
03:51 – 03:52	Tree 25	Soprano Pipistrelle	Constant	Foraging HNS	No		
03:56 – 03:58	Tree 25	Soprano Pipistrelle	Constant	Constant Activity/ Distant Calls	No		
03:58 – 03:59	Tree 25	Soprano Pipistrelle	Constant	Constant Activity/ Distant Calls	No		
04:01 – 04:04	Tree 25	Soprano Pipistrelle	Constant	Constant Activity/ Distant Calls	No		



04:04 – 04:07	Tree 25	Soprano Pipistrelle	Constant	Constant Activity/ Distant Calls	No
04:07 – 04:09	Tree 25	Soprano Pipistrelle	Constant	Constant Activity/ Distant Calls	No

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 19 – Tree 25 (Roost Activity Survey 2)					
Project/Location	Lea Castle		Date	30/7/2020	
Surveyors	HH				
Sunset	21:03		Sunrise	N/A	
Survey Start	21:03		Survey End	22:33	
Start Temperature	20.9 Degrees Celsius		End Temperature	17.1 Degrees Celsius	
Other Weather Conditions (Beaufort Scale 1-14)	5% Cloud Cover (1)				
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Emerging/Re-entering/ Not emerging/ Not Re-entering
21:07	Tree 25	Common Pipistrelle	Rare	Foraging	No
21:47	Tree 25	Common Pipistrelle	Rare	Foraging	No
21:53 – 21:54	Tree 25	Noctule	Constant	Foraging over field	No
21:54	Tree 25	Soprano Pipistrelle	Rare	Foraging around tree	No
21:57	Tree 25	Noctule	Rare	Foraging high above crop field	No
22:01 – 22:04	Tree 25	Common Pipistrelle	Constant	Constant	No
22:02 – 22:05	Tree 25	Soprano Pipistrelle	Constant	Foraging around tree/ open field	No
22:05 – 22:06	Tree 25	Noctule	Occasional	Foraging around crop field	No
22:09	Tree 25	Noctule	Rare	Foraging around crop field	No
22:10	Tree 25	Soprano Pipistrelle	Rare	Foraging around crop field	No
22:15	Tree 25	Soprano Pipistrelle	Rare	Foraging around crop field	No
22:17 – 22:19	Tree 25	Common Pipistrelle	Occasional	Foraging around crop field	No
22:20	Tree 25	Soprano Pipistrelle	Rare	Foraging around crop field	No



22:21 – 22:22	Tree 25	Common Pipistrelle	Occasional	Foraging around crop field	No
22:24 – 22:25	Tree 25	Soprano Pipistrelle	Occasional	Foraging around crop field	No
22:24	Tree 25	Common Pipistrelle	Occasional	Foraging around crop field	No
22:27 – 22:28	Tree 25	Soprano Pipistrelle	Rare	Foraging around crop field	No
22:27 – 22:30	Tree 25	Common Pipistrelle	Occasional	Foraging around crop field	No
22:31 – 22:33	Tree 25	Common Pipistrelle	Occasional	Foraging around crop field	No

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 20– Tree 25 (Roost Activity Survey 3)					
Project/Location	Lea Castle	Date	17/09/2020		
Surveyors	HH				
Sunset	19:20	Sunrise	N/A		
Survey Start	19:20	Survey End	22:50		
Start Temperature	16.5 Degrees Celsius	End Temperature	15.7 Degrees Celsius		
Other Weather Conditions (Beaufort Scale 1-14)	0% Cloud Cover – (1)				
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Emerging/Re-entering/ Not emerging/ Not Re-entering
19:55	Tree 25	Noctule	Rare	Foraging over crop field	No
20:13	Tree 25	Common Pipistrelle	Occasional	Foraging over crop field	No
20:16	Tree 25	Common Pipistrelle	Rare	Foraging over crop field	No
20:17	Tree 25	Common Pipistrelle	Rare	Foraging over crop field	No
20:28	Tree 25	Common Pipistrelle	Rare	Foraging over crop field	No

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 21 – Tree 26 (Roost Activity Survey 1)							
Project/Location		Lea Castle		Date		10/07/2020	
Surveyors		SP					
Sunset		N/A		Sunrise		03:30	
Survey Start		03:30		Survey End		05:00	
Start Temperature		11.8 Degrees Celsius		End Temperature		9.8 Degrees Celsius	
Other Weather Conditions (Beaufort Scale 1-14)		30% Cloud Cover – (4)					
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Emerging/Re-entering/ Not emerging/ Not Re-entering		
03:35 – 03:50	Tree 26	Common Pipistrelle	Constant	Foraging	No		

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 22 – Tree 26 (Roost Activity Survey 2)					
Project/Location	Lea Castle		Date	30/07/2020	
Surveyors	SP				
Sunset	21:03		Sunrise	N/A	
Survey Start	21:03		Survey End	22:33	
Start Temperature	20.9 Degrees Celsius		End Temperature	17.7 Degrees Celsius	
Other Weather Conditions (Beaufort Scale 1-14)	5-10% Cloud Cover – (1)				
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Emerging/Re-entering/ Not emerging/ Not Re-entering
21:50	Tree 26	Soprano Pipistrelle	Occasional	Foraging along hedge	No
21:51	Tree 26	Common Pipistrelle	Rare	Foraging along hedge	No
21:52	Tree 26	Soprano Pipistrelle	Rare	Foraging along hedge	No
21:53	Tree 26	Soprano Pipistrelle	Rare	Foraging along hedge	No
21:54	Tree 26	Noctule	Constant	Foraging over fields	No
22:12	Tree 26	Common Pipistrelle	Frequent	Foraging along hedge	No

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 23 – Tree 26 (Roost Activity Survey 3)					
Project/Location		Lea Castle		Date 17/09/2020	
Surveyors		SP			
Sunset		19:18		Sunrise N/A	
Survey Start		19:18		Survey End 20:48	
Start Temperature		16.5 Degrees Celsius		End Temperature 15.5 Degrees Celsius	
Other Weather Conditions (Beaufort Scale 1-14)		0% Cloud Cover – (3)			
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Emerging/Re-entering/ Not emerging/ Not Re-entering
19:48	Tree 26	Common Pipistrelle	Frequent	Foraging around tree	No
19:49	Tree 26	Common Pipistrelle	Constant	Foraging along hedge	No
19:58	Tree 26	Soprano Pipistrelle	Occasional	Distant foraging	No
20:04	Tree 26	Common Pipistrelle	Rare	Distant foraging	No
20:11	Tree 26	Common Pipistrelle	Constant	Foraging along hedge/ constant in field	No

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 24 – Tree 5 (Roost Activity Survey 1)					
Project/Location		Lea Castle	Date		09/07/2020
Surveyors		HH			
Sunset		21:29	Sunrise		N/A
Survey Start		21:29	Survey End		22:59
Start Temperature		13 Degrees Celsius	End Temperature		11.4 Degrees Celsius
Other Weather Conditions (Beaufort Scale 1-14)		80% Cloud Cover - (1)			
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Emerging/Re-entering/ Not emerging/ Not Re-entering
21:57	Tree 6	Common Pipistrelle	Rare	Foraging	No
22:00	Tree 6	Soprano Pipistrelle	Rare	Foraging	No
22:02	Tree 6	Soprano Pipistrelle	Rare	Foraging near woodland	No
22:25	Tree 6	Common Pipistrelle	Rare	Foraging near woodland	No
22:28	Tree 6	Soprano Pipistrelle	Rare	Foraging near woodland	No
22:36	Tree 6	Noctule	Rare	Foraging near woodland	No

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Table 25 – Tree 5 (Roost Activity Survey 2)					
Project/Location	Lea Castle	Date	04/08/2020		
Surveyors	HH				
Sunset	N/A	Sunrise	5:34		
Survey Start	4:04	Survey End	5:34		
Start Temperature	7.7 Degrees Celsius	End Temperature	8.2 Degrees Celsius		
Other Weather Conditions (Beaufort Scale 1-14)	50% Cloud Cover – (1)				
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Emerging/Re-entering/ Not emerging/ Not Re-entering
04:27	Tree 5	Common Pipistrelle	Occasional	Foraging	No
05:05	Tree 5	Common Pipistrelle	Rare	Foraging near woodland	No
05:13	Tree 5	Soprano Pipistrelle	Rare	Foraging near woodland	No
05:13	Tree 5	Noctule	Rare	Foraging near woodland	No
05:14	Tree 5	Soprano Pipistrelle	Rare	Foraging near woodland	No
05:28	Tree 5	Noctule	Occasional	Foraging near woodland	No

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).



Table 26 – Tree 5 (Roost Activity Survey 3)

Table 26 – Tree 5 (Roost Activity Survey 3)					
Project/Location	Lea Castle		Date	22/09/2020	
Surveyors	HH				
Sunset	19:06		Sunrise	N/A	
Survey Start	19:06		Survey End	20:36	
Start Temperature	16.5 Degrees Celsius		End Temperature	15.2 Degrees Celcius	
Other Weather Conditions (Beaufort Scale 1-14)	80% Cloud Cover – (3)				
Time	Ref No	Species	Level of Activity* (Rare, Occasional, Frequent, Constant)	Behaviour (eg foraging, commuting)	Emerging/Re-entering/ Not emerging/ Not Re-entering
NO BATS RECORDED					

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

5.0 IMPACTS

Bat Foraging Habitat

- 5.1 A total of nine species were recorded within the site during surveys, these were common pipistrelle, soprano pipistrelle, noctule, brown long-eared, Daubenton's, serotine, Leisler's and myotis bat species with the characteristics of Brandt's and natterer's. The value of the site for foraging and commuting bats is considered to be at the district, local or parish scale according to the guidance produced by Wray, 2010.
- 5.2 The overall abundance of bats detected during the course of the surveys is assessed to be moderate with single bats encountered the majority of the time and the overall levels of activity of these bats being most often considered rare or occasional (1-3 passes). 4.3 The vast majority of bat activity (both in terms of the number of bats and the highest levels of foraging from those bats) were recorded along the external boundaries of the site. Hotspots of activity occurred along the western and southern boundaries of the sites adjacent to the woodland and also along the tree lined driveway through the centre of the site. In addition, bats were also frequently recorded foraging along the hedgerows in the eastern section of the site.

Dark Corridor

- 5.3 The majority of bats were recorded commuting and foraging along the woodland boundaries in the western section of the site. These form suitable dark corridors for bats as there is no light pollution in these areas. As shown in Appendix D, these areas are to be retained during the extent of the works, and will also be protected from light pollution with the creation of a large bund on the western boundary of the proposed plant site.
- 5.4 The hedgerows in the eastern section of the site, although form suitable foraging habitat for bats, there is areas of existing light pollution from the B4189 Road and therefore these hedgerows were not considered to provide optimal foraging corridors as shown along the western boundary. As shown in Appendix D, these corridors will be lost during the proposed works but will subsequently be replaced and where existing hedgerows are to be retained, these hedgerows will be enhanced. This will ensure that following the

Heatons

9 The Square, Keyworth, Nottingham NG12 5JT

tel: 0115 937 5552 email: consultants@heatonplanning.co.uk web: www.heatonplanning.co.uk

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Registered office – 12 Bridgford Road, West Bridgford, Nottingham, NG2 6AB. Registered No. 4786259

implementation of the restoration works the overall habitats for foraging and commuting bats will be a positive in the long term. Appendix E shows the available dark corridors following the implementation of the restoration proposals.

Bat Roosting Habitat

- 5.5 During the roost surveys conducted on the six trees within the site, there was no evidence of any emerging or re-entering bats recorded during the surveys. In addition, upon inspecting the trees, there was no evidence of bat droppings or bat urine stains on any of the trees.
- 5.6 Although no bats were recorded during the 2020 surveys, bats were previously recorded during the bat roost surveys in 2018. One common pipistrelle was seen emerging from a split in a limb of Tree 8 during the second survey. No other emergence or re-entry activity was observed from this tree during any of the other two surveys. It is therefore considered that this tree is used as an occasional roost by a single bat. One possible brown long-eared bat emergence was recorded from Tree 9 during the second survey. No other emergence or re-entry activity was observed from this tree during any of the other two surveys.
- 5.7 It is our understanding that trees 8, 9, 10 and 26 are to be removed as part of the proposed works.

6.0 RECOMMENDATIONS

- 6.1 The retention of the external boundary features will ensure that connectivity to the locality is maintained as well as foraging and commuting habitats. A suitable stand-off from these boundaries will be required to minimise disturbance levels. It is recommended that a minimum of a 10 metre stand-off is observed from all boundary woodland and hedgerows.
- 6.2 It is recommended that a hedgerow is planted along the eastern boundary of the site to provide additional foraging and commuting features for bats. In order to ensure that bats continue to use the commuting and foraging features that are to be retained, it is strongly recommended that any lighting used on the site is kept to an absolute minimum and is carefully designed in order to prevent light spilling onto important foraging and commuting features (please see below for recommendations).

Lighting Mitigation

- 6.3 To ensure that bats continue to use the commuting and foraging features that are to be retained, it is strongly recommended that any lighting used within the scheme is kept to a minimum and is carefully designed in order to prevent light spilling onto important foraging and commuting features (in particular over the River Foss).
- 6.4 Artificial lighting has been found to affect the feeding behaviour of bats in two ways; one is the attraction that light from certain types of lamps has to a range of insects; the other is the presence of lit conditions (BCT, 2009). With regard to insects, the increase in insects around certain types of lighting can favour bats which are more tolerant to light (pipistrelle species, noctule, Leisler's Bat and serotine) but is thought to cause adjacent habitats to support fewer insects, potentially resulting in less food for species which are adverse to lighting (myotis, long-eared, barbastelle and horseshoe bats) (BCT, 2009). The presence of lighting in areas where these species forage and commute has also been shown to significantly affect their typical foraging and commuting routes with lighting acting as a barrier for some species which they will not cross (BCT, 2009).
- 6.5 As one species of myotis bat have been recorded during the surveys, lighting around the external boundaries must be restricted and only used where it is an essential requirement. This includes construction lighting as well as permanent lighting as part of the new scheme.

6.6 The following considerations should be made within the final scheme -

- **Type of lamp (light source)** - The impact on bats can be minimised by the use of low-pressure sodium lamps or high-pressure sodium instead of mercury or metal halide lamps where glass glazing is preferred due to its UV filtration characteristics.
- **Luminaire and light spill accessories** - Lighting should be directed to where it is needed, and light spillage avoided. This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvres and shields to direct the light to the intended area only. Planting can also be used as a barrier, or manmade features that are required as part of the works can be positioned so as to form a barrier.
- **Lighting column** - The height of lighting columns in general should be as short as is possible as light at a low level typically reduces the ecological impact. However, there are cases where a taller column will enable light to be directed downwards at a more acute angle and thereby reduce horizontal spill. For pedestrian lighting this can take the form of low-level lighting that is as directional as possible and below 3 lux at ground level. The acceptable level of lighting may vary dependent upon the surroundings and on the species of bat affected.
- **Predicting where the light cone and light spill will occur** - There are lighting design computer programs that are widely in use which produce an image of the site in question, showing how the area will be affected by light spill when all the factors of the lighting components listed above are taken into consideration. This should be a useful tool to inform the mitigation process.
- **Light levels** - The light should be as low as guidelines permit. If lighting is not needed, then it shouldn't be used.
- **Timing of lighting** - The times during which the lighting is on should be limited to provide some dark periods, particularly during the peak in bat activity (20.00-23.00hrs between April and September).

Roosting Bats

- 6.7 Although no bats were recorded during the 2020 surveys, bats were previously during the bat roost surveys in 2018. One common pipistrelle was seen emerging from a split in a limb of Tree 8 during the second survey. No other emergence or re-entry activity was observed from this tree during any of the other two surveys. It is therefore considered that this tree is used as an occasional roost by a single bat. One possible brown long-eared bat emergence was recorded from Tree 9 during the second survey. No other emergence or re-entry activity was observed from this tree during any of the other two surveys.
- 6.8 It is our understanding that trees 8, 9 10 and 26 are to be removed as part of the proposed works. As a result it is recommended Should more than two years pass between the last survey (September 2020) and the removal of this tree, an update bat roost survey will be required to identify any changes to the status of the bat roost. Immediately prior to the removal of this tree, it will be necessary for an arboriculturalist and a suitably qualified ecologist to inspect this tree for any signs of bats (e.g. droppings, individual bats or urine staining). All potential roosting features must be inspected carefully with torches or endoscopes. Should no signs of bats be present this tree can be removed without the need for a licence, using soft felling techniques by the arboriculturalist. However, should any bats or signs of bats be discovered, then no works can be undertaken on this tree without a licence for the destruction of a roost first being granted. The licence procedure would follow the same method as stated above, with mitigation measures being required and no works would be able to be undertaken on this tree until all mitigation measures as described in the EPS licence have been completed.
- 6.9 As a number of trees with potential roosting features are to be removed, it is recommended that bat boxes are erected on trees that are to be retained along the boundaries of the site to provide additional roosting features for bats to enhance the site. Where suitable trees are identified, it is recommended that 3 bat boxes are placed on each tree at a height of at least 3m above ground level. The bat boxes should be placed facing different directions to provide differing micro-habitats for bats. It is recommended that 15 bat boxes are erected on the site ideally within the boundary woodlands. It is recommended that the boxes implemented within the site are of made of woodcrete for long term use, such as the Schwegler 2F, 2FN, 1FF and 1FD.

Enhancement


- 6.10 The restoration proposals are to include the creation of additional areas of broad – leaved woodland. This should include the planting of native species to form a linear network for commuting bird species.
- 6.11 The majority of hedgerows are to be retained during the extent of the works, with only hedgerows located in the centre of the field to be removed. The restoration proposals include the enhancement of 0.6km of existing hedgerows within the site boundary. Hedgerows within the site should be ‘beaten up’ to encourage a denser hedgerow with a wider range of native species present. Native plants will be sourced locally wherever possible to be included within the planting regime. Species such as hawthorn (*Crataegus monogyna*), field maple (*Acer campestre*), blackthorn (*Prunus spinosa*), native rose species and honeysuckle (*Lonicera periclymenum*) could be included.
- 6.12 Existing hedgerows should be managed to create thick hedgerows of differing heights up to 2m tall, as particularly required for yellowhammer. The hedgerows should be enhanced by additional planting to fill gaps. New sections of species-rich hedgerow should be planted to maintain and enhance connectivity around the site and the surrounding area. These enhancements should be undertaken prior to the commencement of works. This habitat should be managed for birds by trimming on a rotation of every 2-3 years in late winter and by hedge-laying and/or coppicing to restore a dense structure at the base of the hedge.

7.0 CONCLUSIONS

- 7.1 Heatons were instructed to undertake update Bat activity and roost surveys on the site to update the 2018 surveys. In addition, these surveys were required to provide further information upon request from Worcestershire County Council.
- 7.2 The site is located on land to the north of Wolverley Road, Wolverley, Kidderminster. The site is located approximately 2.3km to the north-east of the centre of Kidderminster, Worcestershire. The site is centred at grid reference SO 840790.
- 7.3 A total of four bat activity surveys were undertaken on the site, in June July August and September 2020. In addition, a total of four static detectors locations were completed.
- 7.4 During the roost surveys conducted on the six trees within the site, there was no evidence of any emerging or re-entering bats recorded during the surveys. In addition, upon inspecting the trees, there was no evidence of bat droppings or bat urine stains on any of the trees.
- 7.5 A total of nine species were recorded within the site during surveys, these were common pipistrelle, soprano pipistrelle, noctule, brown long-eared, Daubenton's, serotine, Leisler's and myotis bat species with the characteristics of Brandt's and natterer's. The value of the site for foraging and commuting bats is considered to be at the district, local or parish scale according to the guidance produced by Wray, 2010.
- 7.6 Small areas of suitable habitat for foraging and roosting bats are to be removed during the proposed works. However, the majority of suitable habitat features are to be retained. Following the implementation of the proposed restoration, it is considered that the overall habitat diversity for foraging bats will have a positive impact over the long term.

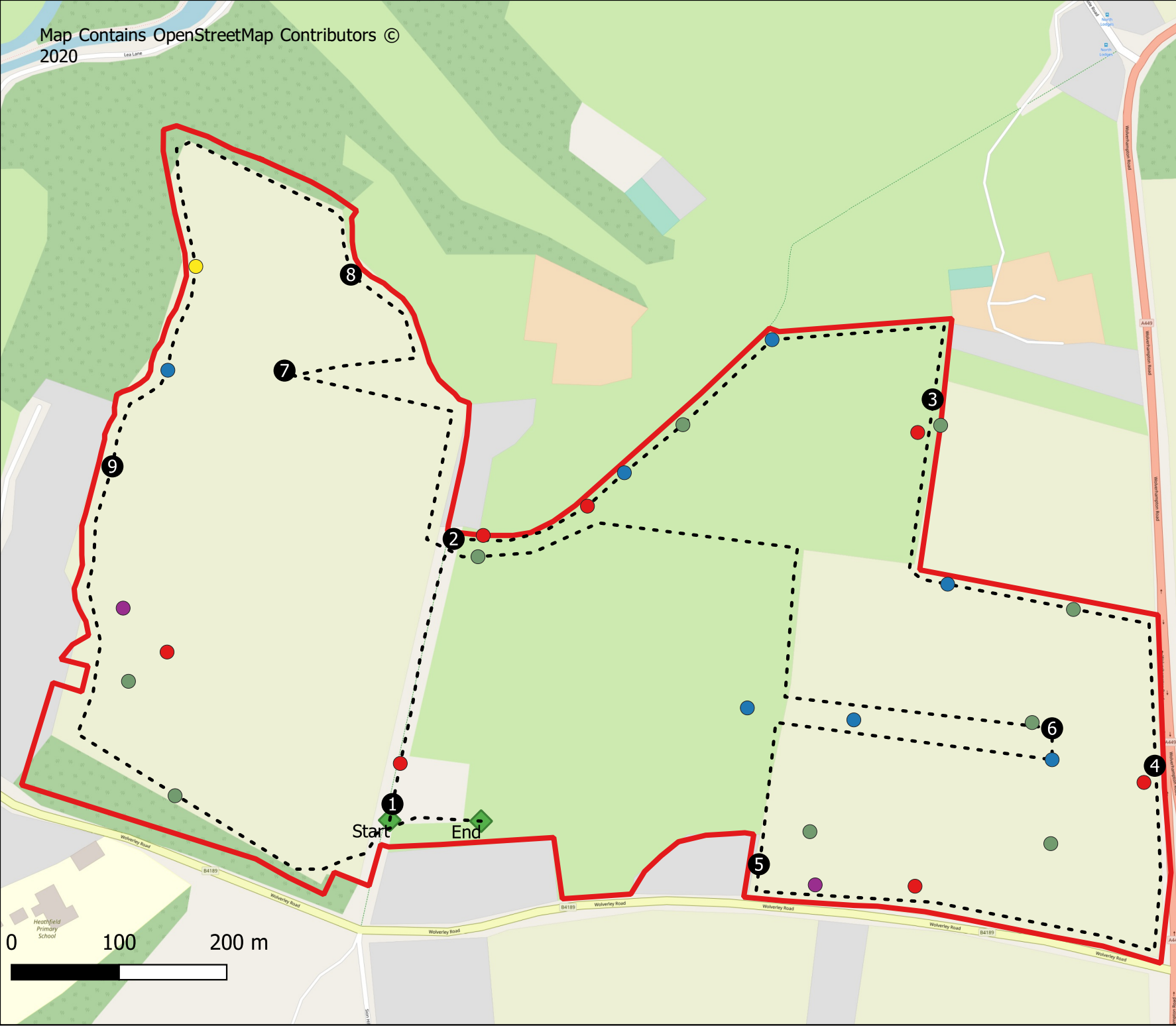
8.0 REFERENCES

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Appendix A

Bat Activity Survey Drawings



LEGEND

- Daubentons' Bat
 - Noctule
 - Brown Long Eared Bat
 - Soprano Pipistrelle
 - Common Pipistrelle
 - Bat Listening Points
 - - - Bat Transect Route
 - ◆ Start - End Points
 - Site Boundary
- OpenStreetMap

Heatons
Planning Environment Design

PROJECT
Lea Castle Farm

DRAWING TITLE
Bat Activity Survey - 24/8/2020

DATE REFERENCE
Oct 2020 KEDL-004-M (ED.004)

SCALE
See Map

STATUS
FINAL



LEGEND

- Common Pipistrelle
- ◆ Start-End Points
- Bat Listening Points
- - - Bat Transect Route
- Site Boundary

OpenStreetMap

Heaton's
Planning Environment Design

PROJECT
Lea Castle Farm

DRAWING TITLE
Bat Activity Survey 24/9/2020








DATE
Oct 2020

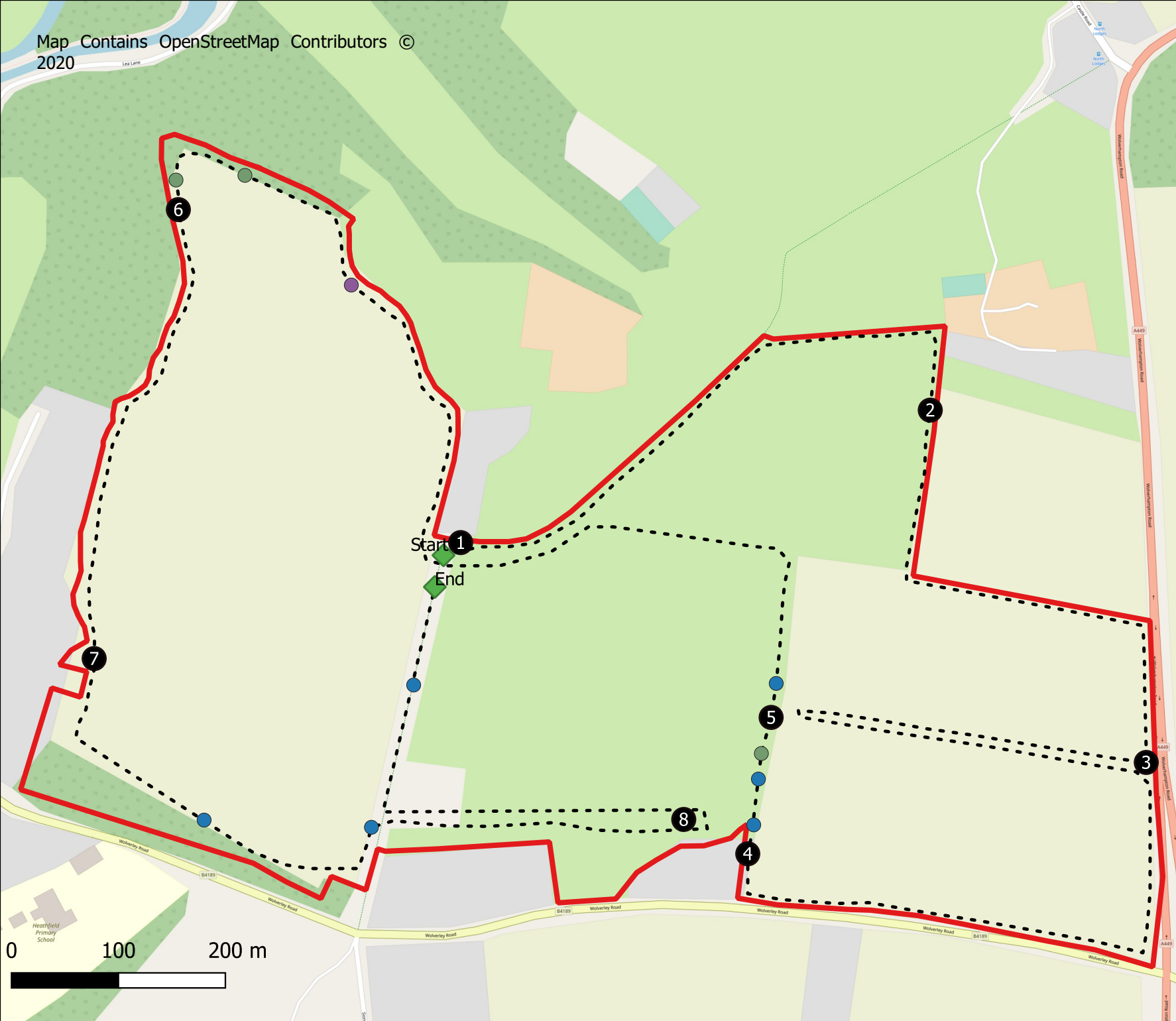
REFERENCE
KEDL-004-M (ED.005)

SCALE
See Map

STATUS
FINAL

LEGEND

-  Whiskered Bat
 -  Soprano Pipistrelle
 -  Common Pipistrelle
 -  Start-End Point
 -  Bat Transect Route
 -  Bat Listening Points
 -  Site Boundary
- OpenStreetMap



PROJECT
Lea Castle Farm

DRAWING TITLE
Bat Activity Map - 27/7/20

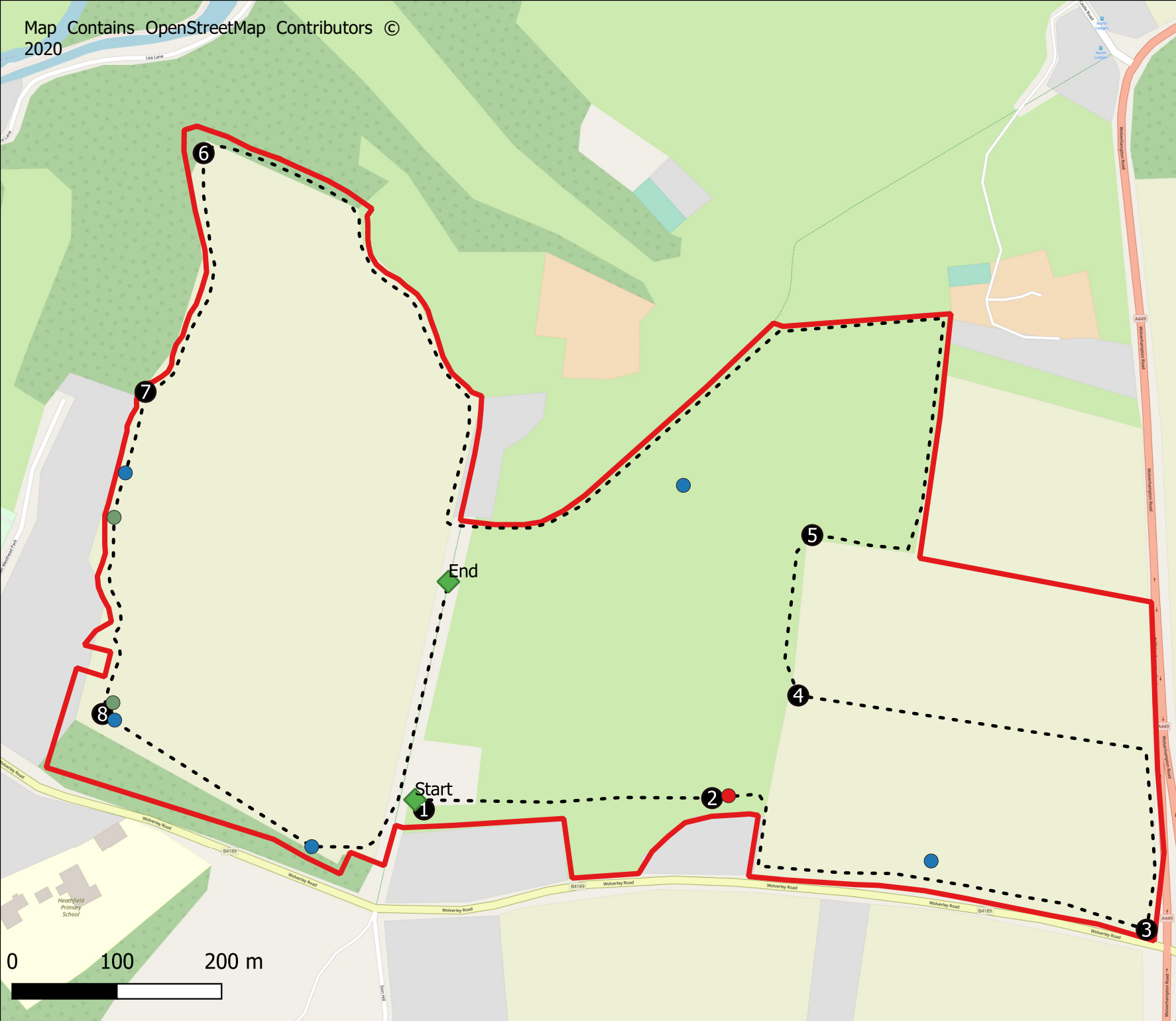
DATE REFERENCE
Sep 2020 KEDL-004-M (ED.003)

SCALE
See Map

STATUS
FINAL

LEGEND

- Common Pipistrelle
 - Soprano Pipistrelle
 - Noctule
 - ◆ Start-End Points
 - Bat Listening Points
 - - - Bat Transect Route
 - Site Boundary
- OpenStreetMap



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Planning Environment Design

PROJECT
Lea Castle Farm
 DRAWING TITLE
Bat Activity Survey - 29/6/2020
 DATE REFERENCE
Sep 2020 KEDL-004-M (ED.)

SCALE
N **See Map**
 STATUS
FINAL







Appendix B

Tree Location and Numbers



LEGEND

Bat Potential

-  High
-  Moderate
-  Trees Surveyed
-  Site Boundary

OpenStreetMap



PROJECT
Lea Caslte Farm

DRAWING TITLE
Tree Location and Numbers

DATE
Sep 2020

REFERENCE
KEDL-004-M (ED. 001)

SCALE
See Map

STATUS
FINAL










Appendix C

Static Detector Locations

LEGEND

-  Anabat Locations
- Bat Potential**
-  High
-  Moderate
-  Site Boundary
-  Trees Surveyed
- OpenStreetMap

Anabat Location 1 -
3rd July - 12th July

Anabat Location 2 -
23rd July - 28th July

Anabat Location 3 -
24th August - 31st
August

Anabat Location 4 -
18th September -
23rd September

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Planning Environment Design

PROJECT

Lea Castle Farm

DRAWING TITLE

Static Bat Detector Locations

DATE

Oct 2020

REFERENCE

KEDL-004 (ED.006)


SCALE

See Map

STATUS

FINAL





Appendix D


Dark Corridors to be Retained During the Extent of the Works

LEGEND

 Corridors Retained during Works

Bat Potential

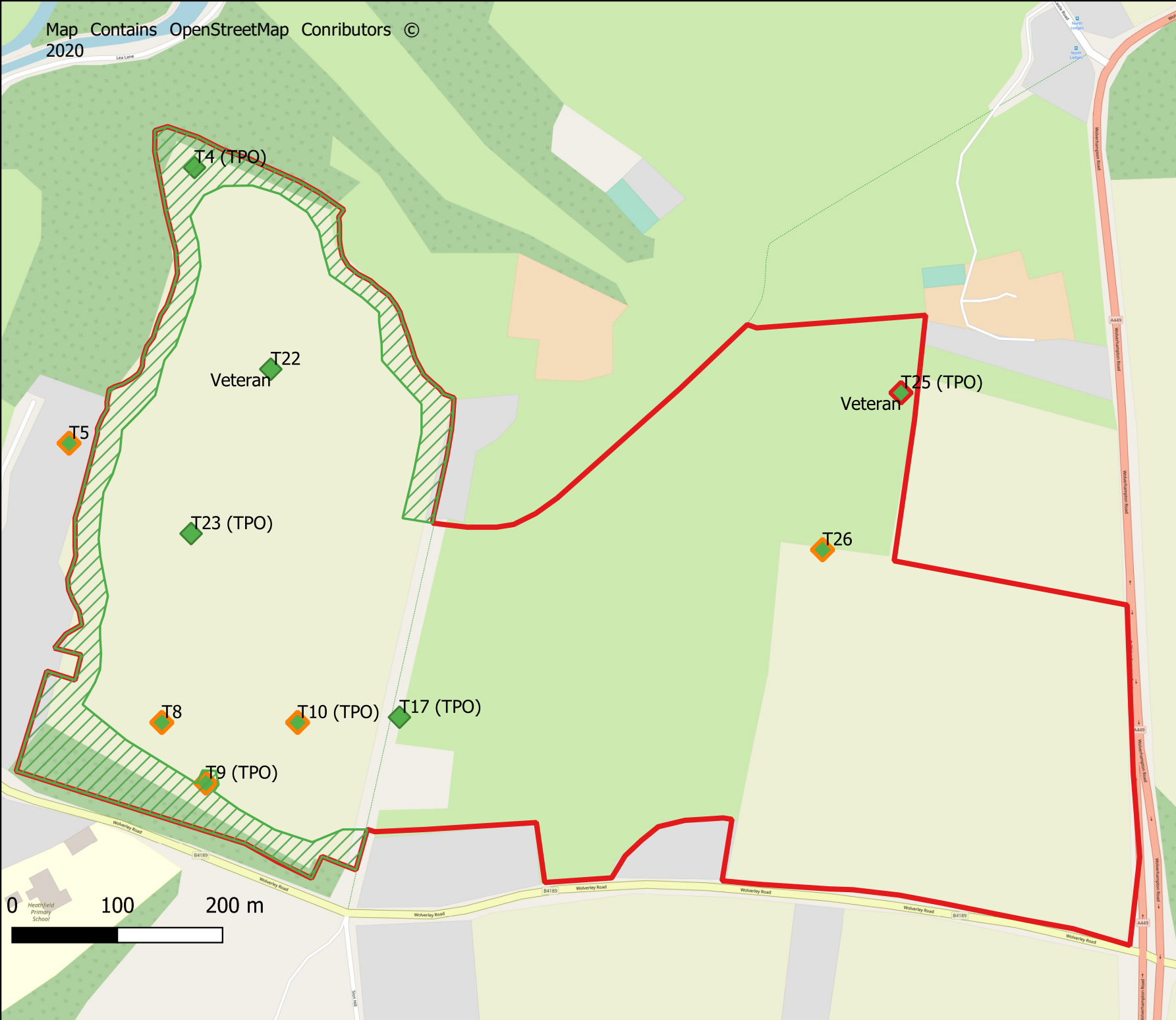
 High

 Moderate

 Trees Surveyed

 Site Boundary

OpenStreetMap



PROJECT
Lea Castle Farm

DRAWING TITLE
Dark Corridors to be Retained During the Extent of the Works

DATE
Oct 2020

REFERENCE
KEDL-004-M (ED.007)

SCALE
See Map

STATUS
FINAL



Appendix E

Darks Corridors Post Restoration



LEGEND

- New Corridors Post Restoration
- Corridors Retained during Works
- Site Boundary

Bat Potential

- High
- Moderate
- Trees Surveyed
- Proposed Woodland Plantation

OpenStreetMap

Heaton's
Planning Environment Design

PROJECT
Lea Castle Farm

DRAWING TITLE
Dark Corridors Post Restoration

DATE	REFERENCE
Oct 2020	KEDL-004 (ED.008)

SCALE
See Map

STATUS
FINAL

Appendix B – Otter Survey Report



Otter Survey Report

in respect of

Land at LEA Castle Farm, Wolverley, Kidderminster

for

NRS Aggregates LTD

Prepared By

Heaton's

September 2020

Heaton's

9 The Square, Keyworth, Nottingham NG12 5JT

tel: 0115 937 5552 email: consultants@heatonplanning.co.uk web: www.heatonplanning.co.uk

Heaton's is the trading name for Heaton Planning Ltd.

Registered office – 12 Bridgford Road, West Bridgford, Nottingham, NG2 6AB. Registered No. 4786259

CONTENTS

1. Introduction
2. Legislation
3. Assessment Methodology
4. Results
5. Likely Impacts and Recommendations
6. Conclusions
7. Recommendations

1.0 INTRODUCTION

1.1 Heaton's have been commissioned by NRS Aggregates Ltd to undertake otter (*Lutra lutra*) surveys at LEA Castle Farm (hereafter referred to as the site).

1.2 These surveys were required to inform the preparation and submission of a planning application for the phased extraction of mineral and subsequent restoration of the site.

Survey Scope

1.3 The scope of these surveys is to identify the presence or likely absence of otters within the site boundary, adjacent woodland and within the River Stour (located approximately 100m to the north-west of the site boundary). Otter are protected under both European and UK laws, while the water vole is protected under UK laws.

1.4 Sufficient ecological information is required to fully inform the site design and the proposed works. Reports will enable the project to satisfy all current UK and European legal wildlife requirements, as well as national and local planning regulations. All public bodies have statutory obligations under the Natural Environment and Rural Communities Act 2006 to conserve and enhance biodiversity.

Site Location and Description

1.5 The site is located on land to the north of Wolverley Road, Wolverley, Kidderminster. The site is located approximately 2.3km to the north-east of the centre of Kidderminster, Worcestershire. The site is centred at grid reference SO840790.

1.6 The site comprises approximately 45ha of arable farmland with semi-improved and improved grass headlands. A hardstanding track separates the site from south to north that is delineated by standards of beech (*Fagus sylvatica*) and lime (*Tilia* sp.). The field boundaries of the site include post and wire fencing, hedgerows containing native species, woodland edge and estate boundary brick wall. Occasional standard trees were present within the fields, including pedunculate oak (*Quercus robur*), sweet chestnut (*Castanea sativa*) and non-native conifers.

1.7 The surrounding area includes the River Stour approximately 100m to the north-west of the site, as well as extensive arable land to the north, east and west and

blocks of broadleaved woodland to the north, west and south. Wolverley lies 1km to the west of the site and Cookley lies 800m to the north.

2.0 LEGISLATION

2.1 The European otter is a European Protected Species and is safeguarded under the Habitats Directive. The European Otter is also fully protected under Schedule 5 of the Wildlife and Countryside Act 1981.

2.2 It is an offence to:

- Capture, kill, disturb or injure otters (on purpose or by not taking enough care);
- Damage or destroy a breeding or resting place (deliberately or by not taking enough care);
- Obstruct access to their resting or sheltering places (deliberately or by not taking enough care); and
- Possess, sell, control or transport live or dead otters, or parts of otters.

2.3 In most cases, it should be possible to avoid harming otters or damaging/blocking access to their habitats. If this cannot be avoided, then a mitigation licence may be available from Natural England. An application can only be made once planning permission for the scheme has been approved. To obtain a protected species licence, the client must demonstrate that the work cannot be avoided and that there are no alternatives.

3.0 ASSESSMENT METHODOLOGY

Desktop Study

3.1 To accurately assess the potential ecological impacts of the scheme, a desktop study has been undertaken to identify the presence of sensitive ecological receptors at the site and within the surrounding area. Data has been obtained from a range of information sources including:

- Multi-Agency Geographic Information for the Countryside (MAGIC).
- National Biodiversity Network (NBN); and
- Worcestershire Biological Records Centre (WBRC).

Habitat Assessment

3.2 Located approximately 110m to the north-west of the site at its closest point, is a canal which runs adjacent to the River Stour. The River Stour is located approximately 150m to the north-west of the site boundary at its closest point. Located between the site and the two adjacent waterbodies is a large area of mixed plantation woodland which may provide suitable foraging habitat for otters and suitable habitat for otter holt creation.

3.3 There are no waterbodies located within the site that are considered to provide suitable habitat for otters. In addition, none of the habitat present within the site is considered suitable for the creation of otter holts.

Field Survey

3.4 Surveys for otter were conducted on the 27/05/2020 and on the 10/09/2020 by suitably qualified ecologists from Heatons following standard methodology as set out by Natural England.

3.5 The full extent of the western mixed plantation woodland and a 200m stretch of the adjacent canal and the River Stour were closely surveyed for the following:

- Dung (spraints) – black or dark greenish, tar like when fresh and with a musky odour. Spraints will often be found on heaps constructed of earth or sand scraped together);
- Tracks (footprints) – 42-80mm wide and asymmetrical showing all 5 toes. The webbing is often shown in the mud;

- Feeding remains – usually the shells of crustaceans, bony parts of fish or parts of amphibians;
- Otter slides (into the water) – areas where otters pass in and out of the water along the water's edge;
- Holts - covered structures, usually a hole or burrow along the river bank among the vegetation and root system of river side trees. They may also be found behind boulders set into the bank and will usually have other associated otter signs such as footprints or an accumulation of spraints. Holts may also be connected to lying up areas and have several entrances; and
- Couches (lying up areas) – 'temporary' areas used for resting, grooming or feeding. They are usually partially hidden bankside shelves among the vegetation or may appear nest like among reeds or grasses.

4.0 RESULTS

Desk study

- 4.1 The MAGIC search returned no statutory designated sites on the site. Seven statutory designated sites were returned within 3km of the centre of the site.
- 4.2 Hurcott and Podmore Pools Site of Special Scientific Interest (SSSI) is located approximately 670m to the south of the site. It is approximately 21.65 hectares in size and is notified due to its pools with rich riparian vegetation zones and woodland. The site is an important wetland complex, containing the largest area of wet valley alder carr in the county.
- 4.3 Hurcott Pasture SSSI is situated approximately 680m to the south of the site. It is approximately 4.69 hectares and is comprised of semi-natural acidic and neutral grassland. It is of a type that is nationally scarce with a number of locally uncommon or rare species including field mouse-ear (*Cerastium arvense*), little mouse-ear (*C. semidecandrum*), spring vetch (*Vicia lethyroides*) and sand spurrey (*Spergularia rubra*).
- 4.4 Stourvale Marsh SSSI is situated 800m to the south-west of the site and is 9.28 hectares in size. The site is notified due to its wetland habitats including damp grassland, tall fen, tall rank vegetation and carr woodland. A number of less common plants are found on the site including narrow-leaved water parsnip (*Berula erecta*), southern marsh orchid (*Dactylorhiza praetermissa*) hemp agrimony (*Eupatorium cannabinum*) and great water dock (*Rumex hydrolapathum*). Reed bunting (*Emberiza schoeniclus*) and sedge warbler (*Acrocephalus schoenobaenus*) breed on the site. The site is also important for insects including the dragonfly, brown aeshna (*Aeshna grandis*), which is an uncommon species in the county.
- 4.5 Puxton Marshes SSSI is located approximately 920m to the south-west of the site and is 13 hectares in size. The site is notified due to its large area of unimproved marshy grassland with associated damp woodland and open water. It is one of the largest and most important areas of marshland remaining in the county and is a remnant of more extensive marshland once present in the Stour Valley. The marsh is noted for its variety of plants, of which 110 species have been recorded. The site attracts many birds and is particularly important for breeding snipe (*Gallinago gallinago*). Other species which breed on the site include willow tit (*Poecile montanus*) and reed bunting.

- 4.6 Hurcott Wood Local Nature Reserve (LNR) is located approximately 620m to the southeast of the site and is 37.2 hectares in size. The site includes two pools with adjoining woodland of wet valley alder carr which is the largest in Worcestershire. The open water and woodland is good habitat for birds with 30 species breeding on site including great crested grebe (*Podiceps cristatus*), little grebe (*Tachybaptus ruficollis*), kingfisher (*Alcedo atthis*) and reed warbler (*Acrocephalus scirpaceus*). Plants include yellow water-lily, (*Nuphar lutea*) in the pool.
- 4.7 King Forest Park LNR is located approximately 1.9km to the north-west of the site and is 80.76 hectares in size. The site supports habitats including heathland, sandy tracks, pine forests and broad-leaved woodland.
- 4.8 Blake Marsh LNR is located approximately 2.3km to the south-west of the site and is 4.36 hectares in size. The site supports marshland with a rare flora that includes the southern marsh orchid. The site is surrounded by areas of woodland at different stages of development and is used as an important site for environmental education for 5 local schools.
- 4.9 The site is covered by a SSSI impact risk zone that is put in place to highlight nearby SSSI that may be impacted by the proposals. The SSSI Impact Risk Zones are in place to protect Stourvale Marsh SSSI, Hurcott and Podmore Pools SSSI and Hurcott Pasture SSSI. These impact risk zones state that where planning applications for quarries are to be submitted, the Local Planning Authority (LPA) should consult Natural England on the likely risks.

Ecological Non-Statutory Designations

- 4.10 WBRC returned fourteen Local Wildlife Sites (LWS) within a 3km radius of the data search central grid reference. These were:
- Staffordshire and Worcestershire Canal – approximately 160m to the northwest at its closest point;
 - River Stour – approximately 190m to the north-west at its closest point;
 - Gloucester Coppice – approximately 320m to the north-west of the site;
 - Wolverley Court Lock Carr – approximately 550m to the south-west of the site;
 - Wolverley Marsh – approximately 590m to the west of the site;

- Hurcott and Podmore Pools (Pastures) – approximately 640m to the south of the site;
- Puxton Marsh – approximately 760m to the south-west of the site;
- The Island Pool – approximately 1.4km to the north-east of the site;
- Caunsall Marsh – approximately 1.8km to the north-east of the site;
- Kingsford Heath – approximately 2 km to the west of the site;
- Honeytop Farm Pastures – approximately 2.3km to the west of the site;
- Easthams Coppice – approximately 2.4km to the west of the site;
- Cornhill Coppice – approximately 2.7km to the west of the site; and
- Parkatt Wood and Honeybottom – approximately 2.9km to the west of the site.

- 4.11 Staffordshire and Worcestershire Canal LWS covers a total of 14.7km and consists of open standing water with marshland and woodland. Otters, kingfisher and bats are known to use the canal.
- 4.12 The River Stour LWS covers a total of 18.75km and consists of the national BAP habitat rivers and streams as well as marshland and grassland. Otter and kingfisher are known to use the river and there are historical records for water vole (*Arvicola amphibius*) and club-tailed dragonfly (*Gomphus vulgatissimus*).
- 4.13 Gloucester Coppice LWS covers 12.53 hectares and comprises grassland and broadleaved woodland. This site includes three notable Worcestershire vascular plant species: common calamint (*Clinopodium ascendens*), fiddle dock (*Rumex pulcher*) and wild clary (*Salvia verbenacea*). Other important plants were recorded and are detailed in full in the citations in Appendix 1.
- 4.14 Wolverley Court Lock Carr LWS covers approximately 5.24 hectares and comprises wet woodland, broadleaved woodland, marsh and swamp. At least 50 species of vascular plant have been recorded in the recent past from the wetland parts of the site including notable Worcestershire vascular plant species. Faunal records include wintering snipe, breeding sedge warbler and reed bunting. There are also historical records of water vole for the site.
- 4.15 Wolverley Marsh LWS covers a total of 1.84 hectares and includes marsh/mire and swamp. There is also a core area of swamp on deep silt, fragments of carr-

woodland – willow and alder and scrub. There is also an associated area of marshy pastureland. Approximately 70 species of vascular plant have been recorded in the recent past from the wetland parts of the site, including notable Worcestershire vascular plants. 12 records include wintering snipe and breeding sedge warbler and reed bunting. There are past records for three nationally scarce coleopterans – *Mantura rustica*, a flea beetle, *Bagous lutulentus* and *Magdalis cerasi*.

- 4.16 Hurcott and Podmore Pools LWS covers a total area of 6.87 hectares and comprises grassland and broadleaved/wet woodland including a number of recent records of Worcestershire notable plants. Faunal records include small skipper (*Thymelicus sylvestris*), large skipper (*Ochlodes sylvanus*), small copper (*Lycaena phlaeas*), ringlet (*Aphantopus hyperantus*), speckled wood (*Pararge aegeria*), marbled white (*Melanargia galathea*), meadow brown (*Maniola jurtina*), drinker moth (*Euthris potatoria*), common toad (*Bufo bufo*), grass snake (*Natrix helvetica*) and hornet robber-fly, (*Asilus crabroniformis*).
- 4.17 Puxton Marsh LWS covers a total area of 8.89 hectares and consists of marsh, swamp, wet woodland, wet grassland and unimproved acid grassland. At least 90 species of vascular plant have been recorded including notable Worcestershire vascular plants. Faunal records include hornet robber-fly, wintering snipe, breeding sedge warbler and reed bunting.
- 4.18 The Island Pool LWS, 3.54 hectares; broad-leaved and wet woodland with open water and swamp/marsh with the main feature of botanical interest, a seral stage swamp of lesser pond sedge (*Carex acutiformis*) and, a small area of greater tussock-sedge (*c. paniculata*) swamp. Notable Worcestershire plants include greater tussock-sedge and wood club-rush, (*Scirpus sylvaticus*).
- 4.19 Caunsall Marsh LWS, 6.63 hectares of wet woodland comprising a network of drains ditches and springs that cross pasture-land, and there are fragments of alder and willow woodland. A number of Worcestershire notable plants are present.
- 4.20 Kingsford Heath LWS, 28.79 hectares of remnant heathland Calluna and NVC U2 wavyhair grass (*Deschampsia flexuosa*) amongst birch coppice and a remnant of H9 open heath. The crown of Drakelow Hill supports oak/birch woodland with bracken, and wavy hair grass ground layer. Knotted clover (*Trifolium striatum*) and prickly sedge (*Carex spicata*) comprise some of the rarer heathland plants and the site is also home to the scrub/woodland notable species; navelwort (*Hieracium umbellatum*) and white mullein (*Verbascum*

lychnitis). A number of bat species use the Drakelow tunnels as a hibernation site and grass snake and slow-worm (*Anguis fragilis*), are present with local reports of adder (*Vipera berus*) as well.

- 4.21 Honeytop Farm Pastures LWS, 2.98 hectares unimproved acid grassland with calcareous elements. Two rare species are present: cypress spurge (*Euphorbia cyperissias*) and subterranean clover (*Trifolium subterraneum*) as well as some locally notable species. This is known to be a breeding site for the Hornet Robber Fly, a nationally scarce BAP species. A number of solitary sand wasp and bee species also occur.
- 4.22 Easthams Coppice LWS, a 21.45 hectares partly semi-natural ancient woodland of at least three NVC classifications and a neutral/acid grassland site supporting notable grassland plants including common fleabane (*Pulicaria dysenterica*), dyer's greenweed (*Genista tinctoria*), lousewort (*Pedicularis sylvatica*), and wild thyme (*Thymus polytrichus*). The hornet robber-fly breeds on horse grazed pasture and is a national BAP species.
- 4.23 Cornhill Coppice LWS, 30.55 hectares of ancient semi-natural secondary woodland and plantations of various non-native species. The underlying geology is of sandstones and pebble beds. The wood is dominated by oak, ash (*Fraxinus excelsior*) and birch with some small plantations of exotics. Some of the secondary woodland is more open with glades with broom (*Cytisus scoparius*) and gorse (*Ulex europaeus*) scrub.
- 4.24 Parkatt Wood and Honeybottom LWS, 47.38 hectares of woodland and grassland along the Honey Brook valley north-west of Kidderminster. Some of the woodland is Ancient Semi-Natural Woodland (ASNW). Varied geology has influenced the woodland communities that have developed on the site which is predominantly woodland, both ASNW and secondary woodland. Canopy species include pedunculate oak, ash, silver birch, (*Betula pendula*) and sweet chestnut. The richest areas of ground-flora occur where good levels of light are able to penetrate the canopy and include species such as dog's mercury, (*Mercurialis perennis*), bluebell, (*Hyacinthoides non-scripta*), and male fern, (*Dryopteris filix-mas*). Bordering the woodland to the west and south-east are areas of scrub and acid grassland.
- 4.25 One Worcestershire Wildlife Trust Reserve was returned from the data search. This was Bishops Field that is situated approximately 615m to the west of the site. This comprises wetland habitat with peaty soils and a host of wetland flora including southern marsh orchid and greater tussock sedge.

4.26 WBRC also returned a number of areas listed on Worcestershire Grassland Inventory. None of these were specific to the site, with the closest approximately 195m to the north-west of the site on the far side of the River Stour.

4.27 Thirty-one records of ancient trees were returned from the data search. These included ash, beech, black poplar (*Populus nigra*), pedunculate oak and silver birch. None of these records were specific to the site. The closest of these ancient trees was approximately 690m to the south-west of the site.

Ancient Woodland and Habitats of Principal Importance

There were six areas of ancient woodland within 3km of the central point of the site, none of which were on or adjacent to the site. These were:

- Gloucester Coppice, ancient and semi-natural woodland, approximately 8.01 hectares in size, located 280m to the north-west;
- Axborough Wood ancient replanted woodland, approximately 3.65 hectares in size, located 990m to the east;
- Cookley Wood ancient and semi-natural woodland, approximately 1.64 hectares in size, located 1.1km to the north;
- An unnamed ancient and semi-natural woodland, approximately 4.94 hectares in size, located 1.3km to the north-west;
- An unnamed ancient replanted woodland, approximately 3.77 hectares in size, located 1.4km to the north-west; and
- Hollies Wood ancient and semi-natural woodland, approximately 2.03 hectares in size, located 2.4km to the south-west.

4.28 A large amount of priority habitats was returned from the data search. This included coastal and floodplain grazing marsh, good quality semi-improved grassland, lowland dry acid grassland, lowland meadows, lowland heathland, lowland fens, deciduous woodland, coniferous woodland, traditional orchard and wood-pasture and parkland. The closest of this habitat is the deciduous woodland which borders the northern, western and part of the southern boundary. Extensive blocks of this habitat are present in the wider landscape.

Species Records

- 4.29 GLNP returned records WBRC returned 32 records for otter from the data search. These were dated between 2002 and 2005, with no records returned for the site. Otter have been reported using the River Stour LWS and Staffordshire and Worcestershire Canal LWS.
- 4.30 The NBN search returned no records for otter within 2km of the site boundary.

Survey Results

- 4.31 Table 1 presents the dates and prevailing weather conditions of the surveys undertaken in 2020.

Table 1: Survey visit times and weather conditions.

Date	General Weather Conditions (Beaufort Scale 1-1-14)	Air Temperature (°C)
27/5/2020	Sunny and Dry, 30% cloud cover with very low wind (1).	19°C
10/09/2020	High cloud cover and warm, Cloud cover 20% (1).	22°C

- 4.32 The adjacent mixed plantation woodland contained no evidence of otters or any otter holts during the surveys. Typically, otter holts and resting sites are usually within 50m of a watercourse and therefore due to the absence during the survey and the distance from the waterbodies, it is considered unlikely that the mixed plantation woodlands are being used by otters for breeding and resting purposes.
- 4.33 In addition, no otter holts or signs of otters were recorded along the adjacent canal or River Stour during the surveys. The banks of the canal were generally concrete with areas of vegetation located within sections of the bank. It is assessed that the canal structure is unsuitable for the creation of otter holts. The River Stour banks were generally well vegetated during the surveys, however there were no signs of excavated otter holts and there was no evidence of fresh tracks within areas of the vegetation.

5.0 LIKELY IMPACTS AND RECOMMENDATIONS

Impacts

- 5.1 No otters were recorded within the site, or within the adjacent mixed plantation woodland during the surveys. Typically, otter holts and resting sites are usually within 50m of a watercourse and therefore due to the absence during the survey and the distance from the waterbodies. There is a public right of way located between the canal and the River Stour, this is a very busy public footpath which is considered may cause disturbance prevent otters from creating holts in this location. The proposed works will also provide a minimum stand-off of 10m from all areas of boundary woodland.
- 5.2 For the reasons provided in 5.1 above, it is considered unlikely that the mixed plantation woodlands and the full extent of the site boundary are being used by otters for breeding and resting purposes.

Recommendations

- 5.3 Although no otters were recorded during the time of survey, otters occupy a large home range and therefore the new otter holts could be created between the time of survey and the extraction of Phase 1. It is therefore recommended that an update walkover survey to check for otter holts or signs of otters is conducted prior to the commencement of works.

6.0 CONCLUSION

- 6.1 Otter surveys were undertaken on the site following the request for further information from Worcestershire County Council. Survey were carried out in May and September 2020. The surveys comprised surveying the western mixed plantation woodland and a 200m stretch of the adjacent canal and the River Stour. The survey involved searching for dung, tracks, feeding remains, otter slides, holts and couches.
- 6.2 GLNP returned records WBRC returned 32 records for otter from the data search. These were dated between 2002 and 2005, with no records returned for the site. Otter have been reported using the River Stour LWS and Staffordshire and Worcestershire Canal LWS. The NBN search returned no records for otter within 2km of the site boundary.
- 6.3 No otters were recorded within the site, or within the adjacent mixed plantation woodland during the surveys. In addition, no otter holts or signs of otters were recorded along the adjacent canal or River Stour during the surveys.
- 6.4 Although no otters were recorded during the time of survey, otters occupy a large home range and therefore the new otter holts could be created between the time of survey and the extraction of Phase 1. It is therefore recommended that an update walkover survey to check for otter holts or signs of otters is conducted prior to the commencement of works.

7.0 REFERENCES

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Heatons

9 The Square, Keyworth, Nottingham NG12 5JT

tel: 0115 937 5552 email: consultants@heatonplanning.co.uk web: www.heatonplanning.co.uk

Heatons is the trading name for Heaton Planning Ltd.

Registered office – 12 Bridgford Road, West Bridgford, Nottingham, NG2 6AB. Registered No. 4786259