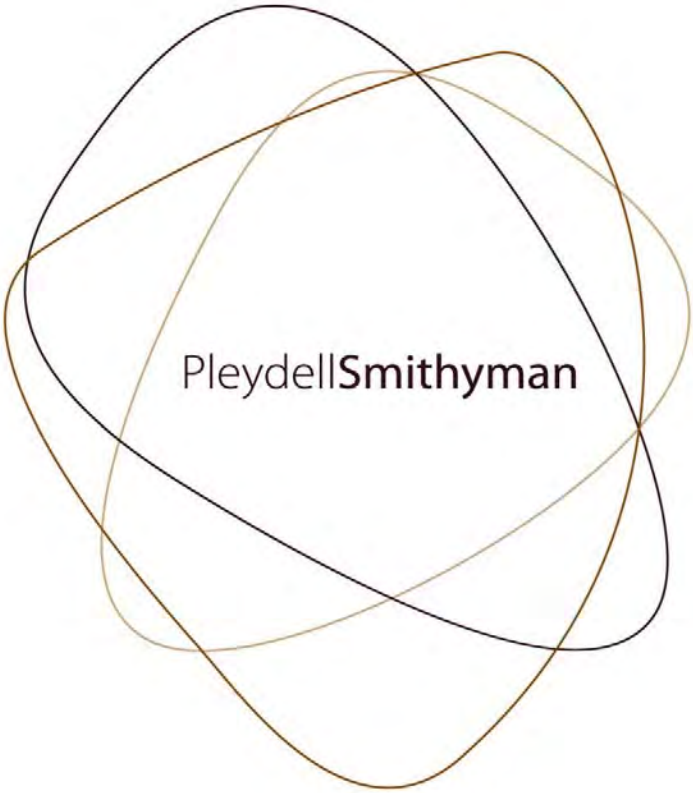
ES VOLUME 2
Technical Appendices

B - Nature Conservation and Ecology

KEDD Limited



ECOLOGICAL IMPACT ASSESSMENT

RELATING TO LAND AT LEA CASTLE FARM, WOLVERLEY

APPLICATION FOR PLANNING PERMISSION

For NRS Aggregates Ltd

April 2019

PSL Report Reference Number: M16.176(a).R.006

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ECOLOGICAL IMPACT ASSESSMENT
RELATING TO LAND AT LEA CASTLE FARM, WOLVERLEY

Report Prepared For:
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ECOLOGICAL IMPACT ASSESSMENT ON
LEA CASTLE FARM,
WOLVERLEY ROAD,
WOLVERLEY,
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Drawing Number	Drawing Title
M16.176(a).D.006	Preliminary Ecological Appraisal
M16.176(a).D.022	Site Boundary Plan

Appendix Number	Appendix Title
9/1	Preliminary Ecological Appraisal Report
9/2	Breeding Bird Survey Report
9/3	Bat Roost Survey Report
9/4	Bat Activity Survey Report
9/5	Reptile Survey Report
9/6	EcIA Methodology
9/7	Biodiversity Impact Assessment Calculations
9/8	Confidential Annex – **MUST NOT BE RELEASED INTO THE PUBLIC DOMAIN**

Non-Technical Summary

Pleydell Smithyman Limited were instructed by Kedd Development Ltd on behalf of NRS Aggregates Ltd to complete a suite of ecological surveys to inform an Ecological Impact Assessment (EcIA). This EcIA has been produced to provide the ecological chapter for the environmental statement that supports a planning application for the extraction of mineral from the site at Lea Castle Farm. Following the completion of mineral extraction, the restoration of the site will include agricultural land, species-rich acid grassland, ephemerally wet grassland/pools, broad-leaved woodland, scattered trees and hedgerows.

The surveys completed included a Preliminary Ecological Appraisal (PEA), breeding bird surveys, bat activity surveys, bat roost surveys, badger surveys, harvest mouse surveys and reptile surveys. The surveys were completed between 2016 and 2019.

The PEA survey recorded the presence of a range of habitats including semi-improved neutral grassland, improved grassland, tall ruderal habitat, arable, hedgerows, scattered trees, hardstanding and surrounding broad-leaved and mixed woodland.

The protected species surveys recorded the presence of 32 species of breeding birds, 27 species of wintering birds, a minimum of 9 species of foraging and commuting bats, one confirmed common pipistrelle bat roost, badgers and thirteen butterfly species. This included a range of species that are protected by legislation and/or of conservation concern. None of these protected species were deemed to be of higher than district, local or parish level.

An assessment of the significance of the possible ecological impacts that would result from the proposed development has been undertaken and it is not considered that the extraction of mineral and associated works proposed at the Site would have a significant negative effect on any statutory or non-statutory nature conservation sites.

The habitats of highest ecological importance (boundary deciduous woodland) will not be removed by the proposals. No significant negative effects are anticipated on the habitats present within the Site providing the restoration plan is delivered as specified. A net biodiversity gain is anticipated. A landscape and ecological management plan will be produced to ensure the long-term benefits of the habitats to be created.

A number of mitigation measures have been detailed to ensure that all legally protected species recorded within the Site are adequately protected throughout the duration of the works. No significant negative impacts are anticipated on any known protected species present.

1 Introduction

Baseline information

1.1 This Ecological Impact Assessment (EcIA) will form the ecological chapter of the Environmental Statement (ES) and has been prepared by Pleydell Smithyman Limited to present the results of a number of surveys relating to land at Lea Castle Farm, Wolverley (hereafter referred to as the Site). This study relates to mineral extraction, quarrying works and restoration of the Site. The proposed works will include the following:

- Extraction of mineral from the Site; and
- Restoration of the Site to agricultural use with scattered trees, hedgerows, woodland, species rich acid grassland and ephemerally wet grassland and pools to enhance local ecology.

1.2 For the purpose of this chapter the Site, corresponds to the site boundary presented in Drawing 7/1, Preliminary Ecological Appraisal – M16.176(a).D.006.

1.3 The scope of this assessment has been determined through a consideration of ecological features that may be affected by the possible direct and indirect impacts associated with the proposed quarry development at the Site.

1.4 The scope of this EcIA, collection of baseline data, evaluation of ecological resources, description and assessment of the significance of impacts follows guidelines set out by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) and references therein, as well as BS42020: 2013 Biodiversity. Code of Practice for Planning and Development.

1.5 This EcIA cross refers to a number of technical appendices that individually report the range of habitat and species specific surveys that have been undertaken as part of the assessment. The drawings referred to in this chapter are contained in the relevant appendix for the habitat or species to which it refers.

1.6 In accordance with standard protected species reporting, the information relating to badgers is reported in Technical Appendix 9/8 and is classed as confidential in nature due to the risk of persecution of species. This confidential annex forms part of the ES and is to be taken into account by Worcestershire County Council in determination of the mineral extraction application.

Site Description

1.7 The Site is approximately 45.7ha in size and comprises arable farmland with semi-improved and improved grassland headlands. A hardstanding track separates the Site from south to north that is delineated by standards of beech (*Fagus sylvativa*) 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 oak (*Quercus robur*), sweet chestnut (*Castanea sativa*) and non-native conifers.

1.8 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.

Background Data and Biological Records

1.9 Information relating to sites and species occurring within proximity of the Site has been acquired through consultation with the internet published resource Multi-Agency Geographical Information for the Countryside (MAGIC) website. In addition, the Worcestershire Biological Records Centre (WBRC) was commissioned to undertake a data search for all protected and notable species within 3km of central grid reference SO834789.

1.10 Any pre-existing data available for the Site was also reviewed, including the results of previous surveys. This includes the breeding bird survey report (Pleydell Smithyman Limited, 2016), Reptile Survey report (Pleydell Smithyman Limited, 2016) and Bat Roost Survey Report (Pleydell Smithyman Limited, 2016).

1.11 Reference was made to Ordnance Survey maps and aerial photography, which were used to determine the presence of open water and ponds in the area and to provide information on land use and habitat connectivity throughout the area.

1.12 A copy of all external data received for the purposes of this study is included in the PEA report (M16.176(a).R.005) which is enclosed as Technical Appendix 9/1.

2 Competence of Persons Undertaking Assessment

2.1 The ecological surveys were undertaken by a team of experienced and qualified ecologists from PSL and comprised Nick Staples, Kelly Hopkins and Steven Pagett. The team was guided by Principal Ecologist Nick Staples, B.Sc., (Hons.) Zoology, M.Sc., and Diploma of Imperial College in, Advanced Methods in Biodiversity and Taxonomy and, a Chartered Biologist of 15 years and a full member of the Royal Society of Biology. A field ecologist experienced in conducting zoological and botanical surveys of 19 years standing, he has considerable experience of working on and supervising projects including mitigating and compensating for European Protected Species. These have been on large scale residential, industrial, infrastructure and mineral extraction projects in the UK and abroad with extensive experience in writing technical reports and EcIAs and, with experience as an expert witness. Kelly Hopkins B.Sc., (Hons.) Zoology, ACIEEM also has extensive field and technical experience in zoological and botanical surveys and exceptional organisational skills with six years experience of writing, contributing to and compiling reports and EcIAs. Steven Pagett, B.Sc., (Hons.) Geography, GradCIEEM is a highly experienced and qualified ornithologist, with five years' experience of field and technical skills in zoological and botanical surveys and the associated detailed reports and EcIA submissions. The team is particularly experienced in assessing the ecological values of mineral extraction projects and associated restoration. This EcIA was written by Kelly Hopkins and proofed by an external independent consultant.

3 Limitations

3.1 Surveys of the Site were conducted over an extended period. This period of three years enabled all relevant surveys to be conducted during optimum periods of weather and within recommended guidelines. It is not anticipated that the results of any surveys were compromised through inappropriate timing, weather or other issues. It should be noted that the Site boundary changed mid-way through the surveys (June 2018) and therefore one area of the Site was not covered by all surveys. Please refer to Drawing M16.176(a).D.022 for a plan for the boundaries of the site. The reduced survey effort within this area is not considered to significantly affect the results and assessments of the surveys.

4 Planning Policy and Legislation

4.1 The Habitat Regulations 2017 are the principal means by which Council Directive 92/43/EEC on the Conservation of Natural Habitats of Wild Fauna and Flora (the "Habitats Directive") is transposed in England and Wales and the adjacent territorial seas. They also transpose elements of the EU Wild Birds Directive in England and Wales.

4.2 The 'UK Post-2010 Biodiversity Framework' (JNCC & DEFRA, 2012) sets out a framework of priorities for UK-level work for the Convention on Biological Diversity. This framework replaces the original UK Biodiversity Action Plan (UK BAP, 2004). England, Scotland, Northern Ireland and Wales have individual plans to protect and reverse the declines of more widespread species and habitats that (in England) are covered by Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 which states: "Every public authority must, in exercising its functions, have regard, so far is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity". Local Biodiversity Action Plans (LBAPs) are still in place under this framework to manage and conserve species and habitats of priority at a local level.

4.3 The details relating to the legislation for all protected species can be found in the Preliminary Ecological Appraisal Report in Technical Appendix 9/1. Certain species in the UK are protected under the Habitats and Species Regulations 2017, The Wildlife and Countryside Act 1981 (as amended) and the Protection of Badgers Act 1992. This legislation affords certain species

protection against killing or injury of the individual animals as well as protection of habitats that provide breeding or resting places for certain species.

4.4 This assessment is guided by the National Planning Policy Framework (NPPF), revised in 2019, where the policies in paragraphs 15 to 217, taken as a whole, constitute the Government's view of what sustainable development in England means in practice for the planning system.

4.5 The Adopted County of Hereford and Worcester Minerals Local Plan 1997 was reviewed to support this assessment, however it should be noted that an emerging minerals local plan for Worcestershire is currently underway. The intention for this new document is to set out how the council plan for mineral extraction in Worcestershire, guiding where minerals should be extracted, how sites should be worked and "restored" when working has finished and how minerals development should protect and enhance Worcestershire's people and places.

4.6 The planning policies that are relevant to this assessment are detailed in full in the scoping opinion received from Worcestershire County Council and within the Environmental Statement.

5 Survey Methodology

Desk Study

5.1 In order to obtain information on sites of nature conservation interest in the area, the Multi-Agency Geographical Information for the Countryside (MAGIC) website was searched for ecological statutory and non-statutory designated sites and ancient woodland and habitats of principal importance within a 3km radius around the central point of the site.

5.2 In addition, Worcestershire Biological Records Centre (WBRC) was commissioned to undertake a data search for all protected and notable species and all sites of conservation importance within 3km of central grid reference SO834789.

5.3 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 to provide information on land use and habitat connectivity throughout the area. Pre-existing information for the site was also reviewed to inform the assessment.

Habitat Survey

5.4 The methods used for ecological survey are in accordance with those established and generally accepted methodologies for field survey, as published by the Chartered Institute of Ecology and Environmental Management (CIEEM), Natural England, Biodiversity: Code of practice for planning and development (BS 42020: 2013) or relevant advisory group e.g. (Bat Conservation Trust). These methodologies have been drawn up based on professional experience of highly qualified experts in their respective fields and, designed to reflect and conform with current local, national and international legislation and, are therefore compatible with current planning legislation.

5.5 In line with current best practice, a (PEA comprises an assessment of the habitat structure of the Site as a whole and aims to identify and provide further information. Phase I habitat survey is a standardised method of recording habitat types and characteristic vegetation, as set out in the Handbook for Phase I Habitat Survey – a technique for Environmental Audit (JNCC, 2010). This survey method is extended through the additional recording of specific features

indicating the presence, or likely presence, of protected species or other species of nature conservation significance.

5.6 Further details of the PEA methodology are provided in Technical Appendix 9/1.

Protected and Notable Fauna Surveys

5.7 All ecological survey work in respect of species took place during 2016, 2018 and 2019. A summary of the specific protected species surveys carried out on the Site are detailed in Table 9/1 below.

5.8 Full methodologies for the individual surveys can be found in the appropriate Technical Appendices. It should be noted that this chapter details the results of most recent surveys only unless the prior information provides important additional information with regard to the baseline.

Table9/1: Ecological Surveys undertaken

Survey Type	Dates Completed	Coverage of Presented Data	Technical Appendix
Preliminary Ecological Appraisal	January 2016, October 2016, June 2018 and February 2019	Application Boundary	Technical Appendix 9/1
Breeding Bird	April – June 2016 and May – June 2018	Survey Area	Technical Appendix 9/2
Barn Owl	April and July 2016	Survey Area	Technical Appendix 9/2
Wintering Bird Transect	February 2019	Application Boundary	Technical Appendix 9/1
Bat Roost	May, August and September 2016 and June, July, August and September 2018	Application Boundary	Technical Appendix 9/3
Bat Activity	May, July and	Survey Area for May	Technical Appendix 9/4

Survey Type	Dates Completed	Coverage of Presented Data	Technical Appendix
	September 2018	2018, Application Boundary for July and September 2018	
Badger	January 2016 – February 2019	Application Boundary	Technical Appendix 9/8 (Confidential)
Reptiles	April – September 2016	Survey Area	Technical Appendix 9/5
Harvest Mouse	August – September 2018	Application Boundary	Technical Appendix 9/1

Impact Assessment Methodology

5.9 Following the EIA screening, desk study and field surveys, the following criteria are applied to assess the nature conservation importance of the 'important ecological features' (IEFs), i.e. the sites, habitats, ecosystems, species, populations, communities or assemblages (both on and off-site) that could be impacted by the proposed development. As there is rarely comprehensive quantitative data on the wider habitat or species population resource, particularly below the international and national level, the nature conservation evaluation of features necessarily also involves a qualitative component. This requires a suitably trained and experienced ecologist to make a professional judgement based upon a combination of published sources, consultation responses and knowledge of both the proposed development and the wider area. Descriptions of geographical areas can become loosely defined at the smaller areas. An assessment of impacts on IEFs are required at specified geographical levels i.e. international and European; national; regional; metropolitan, county, vice-county or other local authority-wide area; river basin district; estuarine system/coastal cell and local. Full details of the Ecological Impact Assessment Methodology can be found in Appendix 9/6.

5.10 A scoping exercise was completed with Worcestershire County Council in April 2018. Comments relating to ecology and biodiversity were received from Wolverley and Cookley Parish Council, Worcestershire County ecologist, Natural England, the Environment Agency, Worcestershire Wildlife Trust and Wyre Forest District Council's Countryside Manager. Their

comments have been reviewed and taken into consideration within this Ecological Impact Assessment.

5.11 In addition, local ecological and biodiversity enhancement and target schemes have been reviewed and used to inform the restoration scheme for the Site. This includes (but is not limited to): Wyre Forest Biodiversity Delivery Area, Worcestershire Biodiversity Partnership and Worcestershire Biodiversity Action Plan.

Biodiversity Net Gain

5.12 A biodiversity impact assessment calculation has been completed to quantify the overall balance between gains and losses of biodiversity for the Site. The calculator that was used was the Warwickshire, Coventry and Solihull Habitat Impact Assessment Calculator which is an approved method of biodiversity net gain calculations across the UK. Simply put, this calculation involves inputting the areas of habitats currently present on the site and their proposed losses and enhancement areas. An assessment is completed as to the habitat condition (e.g. poor, moderate, good) of each of the habitats present. A separate calculation is then completed for the habitats to be created, adding each habitat and the total size proposed, along with the target habitat condition. The area of each existing habitat and proposed habitat have been calculated from the preliminary ecological appraisal drawing and from the concept restoration drawing. These areas are as accurate as possible from the habitats shown on each drawing, however in reality there may be some slight differences in area of each habitat.

6 Baseline Conditions and Evaluation of Important Ecological Features

Ecologically Designated Sites

Statutory Nature Conservation Sites

6.1 No internationally designated statutory nature conservation sites (such as Special Areas of Conservation (SAC) or Special Protection Areas) are present within a 3km radius of the Site. There is one internationally designated site within 15km of the site. This is Fen Pools SAC which is located approximately 11.5km to the north-east of the site. This SAC is designated due to the presence of great crested newts. It is considered that this SAC is sufficiently distant from the site to be impacted by the development proposals.

6.2 There are no statutory designated sites present on the Site; however there are seven statutory designated sites within 3km of the centre of the Site.

6.3 These are:

- Hurcott and Podmore Pools Site of Special Scientific Interest (SSSI), located 670m to the south of the Site, designated due to its pools with rich riparian vegetation zones and woodland which is an important wetland complex containing the largest area of wet valley alder carr in the county;
- Hurcott Pasture SSSI, located 680m to the south of the Site, designated for its semi-natural acidic and neutral grassland and locally uncommon or rare plant species
- Stourvale Marsh SSSI, located 800m to the south-west of the Site, designated due to its wetland habitats including damp grassland, tall fen, tall rank vegetation and carr woodland as well as being important for insects;
- Puxton Marshes SSSI, located 920m to the south-west of the Site, designated due to its large area of unimproved marshy grassland with associated damp woodland and open water and being one of the largest and most important areas of marshland remaining in the county;

- Hurcott Wood Local Nature Reserve (LNR), located 620m to the south-east of the Site, designated for habitat including pools, woodland and wet valley alder carr which is the largest in Worcestershire;
- Kingsford Forest Park LNR, located 1.9km to the north-west of the Site, designated for habitats including heathland, sandy tracks, pine forests and broad-leaved woodland; and
- Blake Marsh LNR, located 2.3km to the south-west of the Site, designated for its marshland habitat with rare flora including southern marsh orchid (*Dactylorhiza praetermissa*). The LNR 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.

6.4 The Site is covered by a SSSI impact risk zone that is put in place to highlight nearby SSSIs 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.

6.5 All of these statutory designated sites are sufficiently distant from the site to be likely to be impacted by the proposals and are therefore not considered further in this assessment.

Non-Statutory Nature Conservation Sites

6.6 There are fifteen non-statutory designations which were returned from WBRC within 3km of the Site.

6.7 These are:

- Staffordshire and Worcestershire Canal Local Wildlife Site (LWS), located 0.16km to the north-west of the Site, consisting of open standing water with marshland and woodland;
- River Stour LWS, located 190m to the north-west of the Site, consisting of habitats of principal importance including rivers and streams as well as marshland and grassland;
- Gloucester Coppice LWS, located 320m to the north-west of the Site, comprising grassland and broadleaved woodland and including three notable Worcestershire

vascular plant species: common calamint, (*Clinopodium ascendens*), fiddle dock, (*Rumex pulcher*), and wild clary, (*Salvia verbenacea*) as well as other important plant species;

- Wolverley Court Lock Carr LWS, located 550m to the south-west of the Site, comprising wet woodland, broadleaved woodland, marsh and swamp and notable Worcestershire vascular plant species;
- Wolverley Marsh LWS, located 590m to the west of the Site, comprising marsh/mire and swamp with a core area of swamp on deep silt, fragments of carr-woodland – willow (*Salix* sp.) and alder (*Alnus glutinosa*) and scrub;
- Bishops Field Wildlife Trust Reserve, located 610m to the west of the Site, comprising wetland habitat with peaty soils and a host of wetland flora;
- Hurcott and Podmore Pools (Pastures) LWS, located 640m to the south of the Site, comprising grassland and broadleaved/wet woodland and notable plant records;
- Puxton Marsh LWS, located 760m to the south-west of the Site, comprising marsh, swamp, wet woodland, wet grassland and unimproved acid grassland and notable vascular plants;
- The Island Pool LWS, located 1.4km to the north-east of the Site, comprising broad-leaved and wet woodland with open water and swamp/marsh with notable vascular plants;
- Caunsall Marsh LWS, located 1.8km to the north-east of the Site, comprising wet woodland and a network of drains, ditches and springs with fragments of alder and willow woodland and notable plant species;
- Kingsford Heath LWS, located 2km to the west of the Site, comprising remnant heathland, birch coppice and remnant open heath with a number of rare plant species present;
- Honeytop Farm Pastures LWS, located 2.3km to the west of the Site, comprising unimproved acid grassland with calcareous elements and rare and notable plant species as well as a breeding site for the hornet robber-fly (*Asilus crabroniformis*);

- Easthams Coppice LWS, located 2.4km to the west of the Site, comprising semi-natural ancient woodland and neutral/acid grassland supporting notable grassland plants;
- Cornhill Coppice LWS, located 2.7km to the west of the Site, comprising ancient semi-natural secondary woodland and plantations; and
- Parkatt Wood and Honeybottom LWS, located 2.9km to the west of the Site, comprising woodland and grassland with varied geology.

Ancient Woodland

6.8 There were six areas of ancient woodland within 3km of the central point of the Site, which comprised both ancient and semi-natural woodland and ancient re-planted woodland. These were:

- Gloucester Coppice, located 280m to the north-west of the Site and comprising ancient and semi-natural woodland;
- Axborough Wood, located 990m to the north of the Site and comprising ancient replanted woodland;
- Cookley Wood, located 1.1km to the north of the Site and comprising ancient and semi-natural woodland;
- An un-named ancient and semi-natural woodland, located 1.3km to the north-west of the Site;
- An un-named ancient replanted woodland, located 1.4km to the north-west of the Site; and
- The Hollies Wood, located 2.4km to the south-west of the Site and comprising ancient and semi-natural woodland.

6.9 Thirty one records of ancient trees were returned from the data search with the closest being 690m to the south-west of the Site.

Habitats of Principal Importance (HPI)

6.10 A large amount of HPI 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 these habitats is the deciduous woodland which borders the northern, western and part of the southern boundary. Extensive blocks of this habitat are also present in the wider landscape.

6.11 The only HPI taken forward in this assessment is the deciduous woodland present adjacent to the site boundary. All other HPI returned from the data search are located a sufficient distance from the site to be likely to be impacted by the proposals.

6.12 Table 9/2 below provides a summary of statutory and non-statutory site designations within a 3km radius of the central point of the site.

Table 9/2: Summary of Statutory and Non-Statutory Site Designations within a 3km radius of the central point of the Site

Level of Importance	SITE	AREA (ha)	REASON FOR DESIGNATION	PROXIMITY TO THE SITE
National	Deciduous Woodland Habitat of Principal Importance (HPI)	8.41	Botanical	Adjacent to the site boundary
National	Gloucester Coppice Ancient and Semi-Natural Woodland (ASNW)	8.07	Ancient Woodland	280m to the north-west
National	Hurcott Wood Local Nature Reserve (LNR)	37.20	Botanical	620m to the south-east
National	Hurcott and Podmore Pools Site of Special Scientific	21.65	Botanical	670m to the south

	Interest (SSSI)			
National	Hurcott Pasture SSSI	4.69	Botanical	680m to the south
National	Stourvale Marsh SSSI	9.28	Botanical	800m to the south-west
National	Puxton Marshes SSSI	12.81	Botanical	920m to the south-west
National	Axborough Wood Ancient Replanted Woodland (ARW)	3.65	Ancient Woodland	990m to the north
National	Cookley Wood ASNW	1.64	Ancient Woodland	1.1km to the north
National	Un-named ASNW	4.94	Ancient Woodland	1.3km to the north-west
National	Un-named ARW	3.77	Ancient Woodland	1.4km to the north-west
National	Kingsford Forest Park LNR	80.76	Botanical	1.9km to the north-west
National	Blake Marsh LNR	4.36	Botanical	2.3km to the south-west
National	The Hollies Wood	2.03	Ancient Woodland	2.4km to the south-west
County	Staffordshire and Worcestershire Canal Local Wildlife Site (LWS)	14.7km (linear)	Botanical	160m to the north-west
County	River Stour LWS	18.75km (linear)	Botanical	190m to the north-west
County	Gloucester Coppice LWS	12.53	Botanical	320m to the north-west
County	Wolverley Court Lock Carr LWS	5.24	Botanical	550m to the south-west
County	Wolverley Marsh LWS	1.84	Botanical	590m to the west
County	Bishops Field Wildlife Trust Reserve	1.50	Botanical	610m to the west
County	Hurcott and Podmore Pools	6.87	Botanical	640m to the south

	(Pastures) LWS			
County	Puxton Marsh LWS	8.89	Botanical	760m to the south-west
County	The Island Pool LWS	3.54	Botanical	1.4km to the north-east
County	Caunsall Marsh LWS	6.63	Botanical	1.8km to the north-east
County	Kingsford Heath LWS	28.79	Botanical	2km to the west
County	Honeytop Farm Pastres LWS	2.98	Botanical and Invertebrate Interest	2.3km to the west
County	Easthams Coppice LWS	21.45	Botanical	2.4km to the west
County	Cornhill Coppice LWS	30.55	Botanical and Ancient Woodland	2.7km to the west
County	Parkatt Wood and Honeybottom LWS	47.38	Botanical	2.9km to the west

Habitats

6.13 Details of habitats occurring across the Site including a habitat plan are included in Technical Appendix 9/1.

Semi-improved neutral grassland

6.14 Semi-improved neutral grassland was recorded along the edges of the arable field on the western part of the Site. The sward length was between 20-40cm and dense in places. No active grazing is present and the habitat is dominated by cock's foot and Yorkshire fog. Scattered patches of bramble scrub are also present along the edges of these areas of grassland.

6.15 In the north-western corner of the Site was an area that is used as a motorcycling track that has raised areas of soil bunds. Where the ground was not bare, the habitat comprised semi-improved neutral grassland.

6.16 The semi-improved neutral grassland has been assessed as of **site** importance in context of the proposed development due to the presence of this habitat in the wider area.

Improved Grassland

6.17 One improved grassland field was present on the eastern part of the Site that was intensively grazed by horses. This field was fenced off with electric fencing and is grazed for most of the year.

6.18 The improved grassland has been assessed as important at the **site** level only.

Tall ruderal

6.19 One area of tall ruderal vegetation is present to the east of the track that runs through the centre of the site. This area was dominated by nettle and bramble with a moderate diversity including frequent hogweed and cock's-foot and occasional creeping thistle and spear thistle. x This area included patches of bare ground and is frequently in use by the farmer for storing materials, machinery and stock piling soil. Tall ruderal habitat is also present along the edges of the track through the centre of the site, with similar diversity to that described above.

6.20 The tall ruderal habitat has been assessed as important at the **site** level only.

Arable

6.21 A number of arable fields were recorded on the Site. These were predominantly arable crop fields with limited areas set aside as grazing for horses. The fields were planted with cereals, potatoes or brassicas. Occasional Green alkanet, bramble, (*Rubus frutocisus agg.*), and common poppy, (*Papaver rhoeas*) were also recorded in these fields at the time of the survey. The arable fields had limited arable margins with crop sewn close to the edges of the fields.

6.22 The arable habitat has been assessed as important at the **site** level only.

Defunct hedgerow

6.23 A defunct hedgerow was located in the eastern half of the Site running west to east between two arable fields. This hedgerow was unmanaged and gappy and comprised hawthorn (*Crataegus monogyna*) and elm (*Ulmus procera*).

6.24 A second defunct hedgerow was present running west to east, with a similar composition to the hedgerow listed above, with the addition of elder, (*Sambucus nigra*) and honeysuckle, (*Lonicera periclymenum*).

6.25 A third hedgerow is present along the north-eastern boundary of the site. This hedgerow contains hawthorn, elder and elm and is intact.

6.26 The hedgerow habitat has been assessed as **site** importance in context of the proposed development due to their gappy nature and relatively poor species diversity. Hedgerows are listed as a habitat of importance and a Worcestershire BAP; however the defunct hedgerows present on the site do not support enough hedgerow species to be classified by these levels of importance.

Standard trees

6.27 There were a number of scattered standard trees recorded across the Site. These included oak, beech, sweet chestnut, lime, redwood (*Sequoia sp.*) and conifer. The beech and lime trees line a hardstanding track that runs north to south through the Site. It is assumed that the other scattered trees were planted as, or with existing parkland trees.

6.28 The scattered trees within the Site have been assessed as of site importance in the context of the proposed development due to the presence of large amounts of woodland in the wider area.

Hardstanding

6.29 There is a hardstanding track present towards the centre of the Site that separates the eastern and western sides of the Site. The track comes from the main road to the south (Wolverely Road) and bears north-eastwards towards the farm further north. The edges of the hardstanding have tall ruderal habitat present.

6.30 The hardstanding habitat within the Site has been assessed as important at the site level only.

Boundary woodland

6.31 The north, west and south of the Site is bordered by a combination of mixed plantation woodland and broad-leaved semi-natural woodland. The northern and north-western

boundary of the Site is comprised of mixed plantation woodland. It is not known whether the box in this area of the woodland is planted or native; although it is considered likely that it was planted as cover for gamebirds. Should it be native, this is a very rare species in the county. One record of box was returned from the data search.

6.32 These areas of woodland have been assessed as Local importance in context of the proposed development. The habitat is categorised as habitat of principal importance, however this habitat is common and widespread in the local area and is therefore considered to be of local importance in the context of the site.

Fauna

Badger

6.33 Please refer to the confidential appendix (Technical Appendix 9/8) for the detailed report. The site offers suitable habitat for sett building in the form of areas of scrub and trees and hedgerows and offers suitable habitat for foraging and commuting badgers in the form of arable land, semi-improved grassland and hedgerows. The site is considered to be of local importance for badger (*Meles meles*).

Bats

Roosting

6.34 There were five trees present on the Site that were considered to offer roosting potential for bats. Initially four trees (Trees 1, 2, 3 and 4) were considered to offer moderate potential for bat roosts and one tree (Tree 5) was considered to offer high potential for bat roosts. Bat roost surveys were conducted on all 5 trees and a confirmed bat roost was recorded in Tree 3. This was a single common pipistrelle in 2018. In addition, one possible brown long-eared bat roost was recorded from Tree 2 during 2018. During a survey completed in 2016, one possible brown long-eared bat roost was recorded from Tree 1. No other bat roosting activity was recorded from this tree during any of the other surveys in 2016 or 2018. The other two trees (Tree 4 and Tree 5) did not have any bat roosts recorded during the surveys. There are no buildings on the Site.

6.35 Due to the presence of individual bats of common species only (common pipistrelle and possible brown long-eared), the value of the site for roosting bats is considered to be of **district, local or parish** value only according to Wray, 2010. This assessment categorises the three levels of district, local and parish together, as it has been found to be extremely difficult to provide a framework that can meaningfully distinguish between these, given that receptors falling into these categories are generally small numbers of common or individual rarer bats.

Foraging and commuting

6.36 Three bat activity surveys were conducted across the Site in 2018. In addition, static bat detectors were placed on the Site during 2018. During these surveys and including the results from the static bat detectors and the bat roost surveys, a minimum of nine species of bat were recorded on the Site. This included common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, (*Pipistrellus nathusii*), noctule, Leisler's, serotine, (*Eptesicus serotinus*), brown long-eared bat, lesser horseshoe bat, (*Rhinolophus hipposideros*) and *Myotis sp.* The Myotis bats that were recorded were considered to have the characteristics of four different Myotis species – Daubenton's bat, Natterer's bat, (*Myotis nattereri*), Brandt's bat, (*Myotis brandtii*) and whiskered bat, (*Myotis mystacinus*). Should all four of these species be present on the Site, then the bat surveys would have recorded twelve species of bat. The activity levels across the Site were considered moderate with single bats encountered the majority of the time and the overall levels of activity being most often considered rare or occasional (1-3 passes). The vast majority of the activity was recorded along the external boundaries of the Site with hotspots of activity along the western and southern boundaries of the Site, adjacent to the woodland and also along the tree lined driveway through the centre of the Site.

6.37 Of the bat species recorded, brown long-eared bat, common pipistrelle and soprano pipistrelle are considered to be widespread and common within the county, Daubenton's bat and noctule are considered to be widespread within the county, Leisler's bat, Whiskered bat, Natterer's bat and lesser horseshoe bat are considered to be uncommon within the county; Nathusius' pipistrelle and serotine are considered to be rare within the county; and Brandt's bat is considered to be very rare within the county.

6.38 WBRC returned 126 bat records from the search area with no species returned that weren't recorded during the surveys. None of the records were specific to the Site, with the closest record being common pipistrelle and Daubenton's bats approximately 645m to the west of the Site at Kidderminster canal in 2002.

6.39 The ecological value for foraging and commuting bats is assessed to be of **district, local or parish** importance in context of the proposed development in accordance with the guidelines from Wray, 2010. This assessment categorises the three levels of district, local and parish together, as it has been found to be extremely difficult to provide a framework that can meaningfully distinguish between these, given that receptors falling into these categories are generally small numbers of common or individual rarer bats.

Water vole

6.40 There were no waterbodies recorded on the Site and therefore no areas that provide suitable habitat for water vole (*Arvicola amphibius*). The River Stour is the closest suitable waterbody for this species and is situated approximately 110m to the north-west of the Site. WBRC returned no records of water vole from the data search.

6.41 Due to the lack of suitable habitat present on the Site, and the lack of local records water vole, the site is considered to be of **negligible** importance for this species. Water vole is not, therefore, considered further.

Otter

6.42 There were no waterbodies recorded on the Site and therefore no areas that provide suitable habitat for otter (*Lutra lutra*). The River Stour is the closest suitable waterbody for this species and is situated approximately 110m to the north-west of the Site.

6.43 WBRC returned thirty two historical records of otter from the data search, dated between 2002 and 2005. These records are considered to be historical as they are older than 10 years old. None of the records were specific to the Site with reports of otters using the River Stour LWS and the Staffordshire and Worcestershire Canal LWS.

6.44 Due to the lack of suitable habitat present on the Site, the Site is considered to be of **negligible** importance for this species and is not considered further.

Dormouse

6.45 The site offers small areas of sub-optimal habitat for dormouse (*Muscardinus avellanarius*) in the form of hedgerows and woodland. The hedgerows present on the site are mostly defunct and poorly 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 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.

6.46 No dormouse nest or characteristically chewed hazel nuts were recorded on the Site throughout the surveys, however only one of the surveys was completed during the optimum time for nut searches (between mid-August and December).

6.47 WBRC returned no records of dormouse from the data search. Due to the lack of suitable habitat on the site that will be impacted by the proposals, and the lack of connectivity to any habitat that will be impacted by the proposals, the site is assessed as being of **Negligible** importance for this species and is not considered further.

Other Mammals

6.48 Evidence of roe deer (*Capreolus capreolus*), red fox (*Vulpes vulpes*), wood mouse (*Apodemus sylvaticus*), field vole (*Microtus agrestis*) and mole (*Talpa europaea*) were observed on the Site during the surveys.

6.49 The non-native pest species, rabbit (*Oryctolagus cuniculus*), muntjac deer (*Muntiacus reevesii*) and grey squirrel (*Sciurus carolinensis*) were observed on the Site.

6.50 No signs of any other protected, rare or notable mammal species were recorded.

6.51 Suitable habitat for harvest mouse (*Micromys minutus*) was recorded on the site in the form of semi-improved grassland, arable field edges and hedgerows and therefore a survey was carried out in 2018 to inspect for signs of harvest mouse. 20 harvest mouse artificial nest sites

were placed on the Site and checked on several occasions throughout 2018 with no evidence of harvest mouse was recorded during the surveys.

6.52 The Site is considered to be of importance at the **site** level only for a range of mammal species.

Great crested newts

6.53 No ponds were recorded on the Site during the surveys completed in 2016 and 2018 and no ponds were identified within 500m of the Site boundaries. The closest waterbody to the Site is the River Stour which is situated approximately 110m to the north-west. The River Stour is considered unsuitable for great crested newt (*Triturus cristatus*) due to its fast-flowing nature.

6.54 It should be noted that during the latest update survey at the Site (February 2019), some habitat removal had been completed immediately outside of the Site boundary. The removal of this dense scrub and woodland (presumed to have been removed due to the damage to the external wall) revealed the presence of a very small pond. At the time of this update survey, the pond was full of leaf litter and plastic rubbish. The pond was lined and had a very limited amount of water present. It was of poor quality and is considered highly unlikely to support great crested newt as it had been previously heavily choked with vegetation and is likely to dry out during the spring and summer months. This pond was assessed using a HSI method and the pond scored 0.37 giving it 'poor' habitat suitability for great crested newts.

6.55 The Site offers small areas of suitable terrestrial habitat for great crested newt in the form of hedgerows and semi-improved grassland, however there are no suitable waterbodies for breeding great crested newts present within 500m of the Site.

6.56 WBRC returned no records of great crested newt from the data search.

6.57 Due to the lack of suitable waterbodies in close proximity to the Site, the Site is considered to be of **Negligible** importance for great crested newt and this species is not considered further.

Other amphibians

6.58 The Site offers small areas of suitable habitat for amphibians in the form of hedgerows and semi-improved grassland. There are no ponds present on the Site and only one known to

occur within 250m of the Site boundaries. This is a small pond that was discovered during the February 2019 survey. This pond is considered to dry frequently and is not likely to be used regularly by amphibians.

6.59 A number of reptile surveys were conducted during 2016 where reptile refugia were placed around the Site. One common toad, (*Bufo bufo*) was recorded under the mats during one survey. Common toad is a species or principal importance under Section 41 of the NERC Act, 2006.

6.60 WBRC returned records of common toad, smooth newt (*Lissotriton vulgaris*) and common frog (*Rana temporaria*). These records were dated between 1996 and 2007. Three records of juvenile common toad were recorded on the Site in 2009. It is possible that these species could occur on the site along the base of the hedgerows.

6.61 The Site is considered to be of importance for amphibian species (excluding great crested newts) at the **site** level only.

Reptiles

6.62 The Site offers small areas of suitable habitat for reptiles in the form of the hedgerows, semi-improved grassland and woodland edge habitat that could be used to forage, bask and commute. The Site has good connectivity to further areas of suitable habitat to the north and west in the form of woodland, rivers and marshy habitat and wetland.

6.63 Reptile surveys were conducted across the Site in 2016 under suitable weather conditions. No reptiles were recorded during these surveys. Subsequent surveys were not considered necessary to be completed in 2018 due to the lack of habitat change on the Site or in close proximity to the Site. Anecdotal information of inspections of reptile refugia throughout 2018 did not reveal any reptile recordings.

6.64 The surrounding brick estate boundary to the south and east of the Site provides a significant boundary to immigration or emigration and the likelihood of historic populations of ground feeding game birds, and more recently, domestic cats from the adjacent properties, suggests that any previous reptile populations may have been lost over time.

6.65 The western part of the Site has open connectivity to the woodland and the wider area that connects to the River Stour.

6.66 WBRC returned twelve records of reptiles from the data search. These were all records of grass snake (*Natrix helvetica*), dated between 1996 and 2015. The closest of these was approximately 435m to the west of the Site at Wolverley Lock in 2011. It is considered unlikely that grass snake would occur on the site due to the lack of suitable habitat.

6.67 Due to the lack of reptile records following surveys, the Site is considered to be of **Negligible** importance for reptiles and this group is not considered further.

Birds

6.68 The Site supports diverse habitats for nesting and breeding birds in the form of grassland, woodland, defunct hedgerows and arable fields and offers potential as a good farmland bird site.

6.69 WBRC returned a large number of bird records from the data search including a number of birds that are listed as Schedule 1 or listed on the Red or Amber Birds of Conservation Concern (BoCC) list. None of the records were specific to the Site, with the closest being a skylark (*Alauda arvensis*), from approximately 500m to the north in 2009.

Breeding birds

6.70 The initial breeding bird surveys were undertaken between April and June 2016, with additional surveys carried between April and June 2018. A total of 40 bird species were recorded using the Site during the breeding bird surveys in 2018. Of the recorded species, 32 were listed as confirmed, probable or possible breeding species. These breeding bird species included many common and widespread opportunistic breeding species as well as red and amber listed species. The habitats used on the site by breeding birds were considered to be common and widespread in the wider area.

6.71 Despite the number of species recorded during the breeding bird surveys, which would categorise the site has of district value, the site is considered to be of **local** importance to breeding birds due to the presence of common and widespread habitats and species.

Wintering birds

6.72 A transect survey was completed in February 2019 to record the birds present on the site during February. A total of 27 species were observed during the survey, however many of these were observed on adjacent pasture and boundary hedges and woodland and not on the arable fields. The species recorded were not seen as atypical for the Site or the local area.

6.73 Due to the presence of frequently occurring species recorded during the survey, the Site is evaluated as being of **Local** importance for over-wintering birds.

Barn Owl

6.74 Numerous trees on the Site showed features suitable for barn owl (*Tyto alba*) roosting and breeding (including extensive splits and hollow limbs/trunks with elevated access areas).

6.75 No evidence of nesting or foraging barn owl was observed during the 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 (*Corvus monedula*) 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.

6.76 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.

Invertebrates

6.77 The Site does not support any locally rare habitats, but does support semi-improved grassland and hedgerows which offer suitable habitat for a range of invertebrates. The arable land and other habitats across the site are considered unlikely to support any notable invertebrate species. It is therefore anticipated that a number of invertebrates are likely to occur on the Site, as well as in the wider area. A number of butterflies were recorded on the site during the surveys completed and necklace ground beetle, (*Carabus monilis*) were recorded on the site from the data search in 2007 and 2008.

6.78 Given the presence of a large number of butterflies, none of which are listed as UK BAP priority species or Worcestershire BAP species, the ecological value for Invertebrates has been assessed as of **Local** importance in context of the proposed development. It should be noted that the farmland BAP for Worcestershire includes a focus on invertebrates.

Ecological Processes and Trends

6.79 The majority of the Site is comprised of agricultural land. It is considered that over time if the Site was left under current management regimes that, the agricultural land would continue to be farmed, with varying crops present during different seasons and years. The hedgerows and grassland strips would continue to be managed by the farmer, ensuring that succession of habitats does not occur. The woodland that surrounds the Site would continue to develop, with trees maturing and shading out smaller trees and plants and ground flora. The hardstanding track through the centre of the Site would continue to be used frequently and would degrade in quality further and may potentially be subject to new hardstanding covering at some point in the future.

Summary of Important Ecological Features

6.80 The following designated sites, habitats and features of ecological significance have been identified in Table 9/3 through baseline studies as having the potential to be affected by the development proposals or requiring further evaluation and/or comment.

Table 9/3: Summary of important ecological features in the context of the Site

Feature	Conservation Importance	Status at the Site	Important Ecological Feature importance
Statutory Designated Sites			
Deciduous Woodland Habitat of Principal Importance (HPI)	National	Adjacent to the site boundary	National
Gloucester Coppice Ancient and Semi-Natural Woodland	National	Present 280m to the north-west.	No impacts - not considered further in this assessment
Hurcott Wood LNR	National	Present 620m to the south-east.	No impacts - not considered further in

Feature	Conservation Importance	Status at the Site	Important Ecological Feature importance
			this assessment
Hurcott and Podmore Pools SSSI	National	Present 670m to the south.	No impacts - not considered further in this assessment
Hurcott Pasture SSSI	National	Present 680m to the south.	No impacts - not considered further in this assessment
Stourvale Marsh SSSI	National	Present 800m to the south-west.	No impacts - not considered further in this assessment
Puxton Marshes SSSI	National	Present 900m to the south-west.	No impacts - not considered further in this assessment
Axborough Wood Ancient Replanted Woodland (ARW)	National	Present 990m to the south-west.	No impacts - not considered further in this assessment
Cookley Wood ASNW	National	Present 1.1km to the north.	No impacts - not considered further in this assessment
Un-named ASNW	National	Present 1.3km to the north-west.	No impacts - not considered further in this assessment
Un-named ARW	National	Present 1.4km to the north-west.	No impacts - not considered further in this assessment
Kingsford Forest Park LNR	National	Present 1.39km to the north-west.	No impacts - not considered further in this assessment
Blake Marsh LNR	National	Present 2.4km to the south-west.	No impacts - not considered further in this assessment
The Hollies Wood ASNW	National	Present 2.4km to the south-west.	No impacts - not considered further in this assessment

Feature	Conservation Importance	Status at the Site	Important Ecological Feature importance
Non Statutory Designated Sites			
Staffordshire and Worcestershire Canal LWS	County	Present 160m to the north-west.	County
River Stour LWS	County	Present approximately 190m to the north-west.	County
Gloucester Coppice LWS	County	Present approximately 320m to the north-west.	No impacts - not considered further in this assessment
Wolverley Court Lock Carr LWS	County	Present approximately 550m to the south-west.	No impacts - not considered further in this assessment
Wolverley Marsh LWS	County	Present approximately 590m to the west.	No impacts - not considered further in this assessment
Bishops Field Wildlife Trust Reserve	County	Present approximately 610m to the west.	No impacts - not considered further in this assessment
Hurcott and Podmore Pools (Pastures) LWS	County	Present approximately 640m to the south.	No impacts - not considered further in this assessment
Puxton Marsh LWS	County	Present approximately 760m to the south-west.	No impacts - not considered further in this assessment
The Island Pool LWS	County	Present approximately 1.4km to the north-east.	No impacts - not considered further in this assessment
Caunsall Marsh LWS	County	Present approximately 1.8km to the north-east.	No impacts - not considered further in this assessment
Kingsford Heath LWS	County	Present approximately 2km to the west.	No impacts - not considered further in this assessment

Feature	Conservation Importance	Status at the Site	Important Ecological Feature importance
Habitats and Flora			
Semi-improved neutral grassland	County	Along edges of arable fields. County BAP habitat.	Site
Improved grassland	Site	One field that is grazed by horses.	Site
Tall ruderal	Site	One area to the east of the central track.	Site
Arable	Site	Present over the majority of the Site.	Site
Defunct hedgerow	National	Two hedgerows present on the Site and a number bordering the boundaries of the Site. Local and national BAP habitat.	Site
Standard Trees	Local	A number scattered across the Site and lining the driveway.	Site
Hardstanding	Site	One track present through the centre of the Site.	Site
Woodland	County	All habitat present bordering the boundaries of the Site. Local and national BAP habitats.	Local
Fauna			
Badger	National	Confidential information.	Local
Roosting Bats	International	One confirmed bat roost and two possible bat roosts present in trees on the Site.	District, Local or Parish
Foraging Bats	International	A minimum of 9	District, Local or Parish

Feature	Conservation Importance	Status at the Site	Important Ecological Feature importance
		species of foraging and commuting bats using the Site.	
Water vole	National	Species not recorded.	Negligible - not considered further in this assessment
Otter	International	Species not recorded.	Negligible - not considered further in this assessment
Dormice	International	Species not recorded.	Negligible - not considered further in this assessment
Other Mammals	National	Presence of small numbers of common and widespread mammals. Local records of species of principal importance.	Site
Great crested newts	International	No suitable ponds on or close to the Site. No records of great crested newts from the data search.	Negligible – not considered further in this assessment.
Other Amphibians	National	Small numbers of common toad recorded on the Site. Records of other amphibians in the local area.	Site
Reptiles	National	No reptiles recorded during reptile surveys.	Negligible - not considered further in this assessment
Breeding Birds	National	32 species recorded as confirmed, probable or possible breeding species including	Local

Feature	Conservation Importance	Status at the Site	Important Ecological Feature importance
		species listed on the Red and Amber list and species of principal importance.	
Wintering Birds	National	27 species recorded during the surveys, with many of these recorded in adjacent habitat and not on the site. Species recorded included species listed on the Red and Amber list and species of principal importance.	Local
Barn Owl	National	No evidence of roosting or foraging barn owl.	Negligible – not considered further in this assessment.
Invertebrates	Local	13 butterfly species recorded on the Site. None listed as species of principal importance or local BAP lists.	Local

7 Potential Effects (Impact Assessment)

7.1 This chapter describes the potential effects of the Site proposals on the Important Ecological Features (IEFs) recorded on the Site and, are characterised in terms of their direction, permanence, certainty and reversibility in line with CIEEM 2018. An assessment is made of the likely significance of the impact prior to any mitigation or compensation measures.

7.2 The development will involve the removal of habitat to allow the extraction of mineral from the site. The access track that is to be created from Wolverley Road into the site has been located in an area dominated by improved grassland. The extraction limit has been designed to ensure a minimum of a 10m stand-off from all boundaries and has not included the arable fields to the east of the site and the majority of the hedgerow that is present between the two. The extraction boundary also excludes Tree 4 located in the north-eastern corner of the site, as well as the tree lined hardstanding track that runs through the centre of the site. Please refer to Drawing M16.176(a).D.006 for a plan of the site.

Potential Construction and Operational Impacts

7.3 The following development-related impacts have been identified and are discussed in the following sections:

- Habitat loss;
- Habitat fragmentation;
- Displacement of species;
- Noise, light and dust disturbance; and
- Hydrological changes.

Direct Habitat Loss, Fragmentation and Isolation through Land-Take

7.4 Habitat loss involves the removal or physical take-up of vegetation, or other structures of conservation interest, such as dead wood or bare ground. Habitat loss may also occur as a

result of a change in land or water management, for instance the drying-up of ponds or successional events leading to a change in habitat type. Destruction of ponds for example could mean the loss of breeding amphibian and invertebrate populations. Destruction of hedgerows would remove breeding habitat for birds, and removal of trees, roosting areas for bats, birds and invertebrates.

7.5 Habitat loss can result in the direct loss of individuals or populations of plant or animal species. It may also cause other populations to become demographically unstable or unsustainable, due to loss of prey species or habitat niches.

7.6 Fragmented and isolated habitats are likely to be more vulnerable to external factors that may have a negative effect upon them; e.g. disturbance, and may be less resilient to change, including climate and management change than connected habitats because colonising species may be unable to reach that habitat. Due to the complexities of ecological systems, it is not possible to quantify the potential effects that may occur to isolated habitats.

7.7 Initial phases of development are the main periods when consolidation work would need to occur. A section of the internal hedgerows would be lost to allow for the mineral extraction of the Site. The arable fields and semi-improved neutral grassland would also be removed as part of the proposed development. A number of standard mature trees will be removed as well. A section of the improved grassland will be lost to allow the access track into the Site.

Noise, Light and Dust Disturbance

7.8 The increased level of noise, lighting and dust created as part of the proposals may impact upon several species and species groups including birds, bats, badgers and invertebrates.

7.9 In the absence of mitigation, dust particles may travel into the wider landscape, which over time, could collate to cause problems, particularly along watercourses. The air quality of the environmental statement (Chapter 12) states that adverse dust impacts from sand and gravel are uncommon beyond 250m of the operation and have considered that all designated sites detailed above are likely to have a negligible effect from any dust arising from the proposed development.

7.10 The presence of lighting that will be used on the Site may cause disturbance to bats and may negatively impact on their ability to forage and commute across the Site.

7.11 The increased level of noise/vibration is likely to impact upon invertebrates, mammals and birds and may cause disturbance that could affect their ability to survive and breed. This may then cause certain species to move away from these sites and not return until noise levels have decreased.

Hydrological Changes

7.12 The extraction of mineral from the Site it is not anticipated to impact the hydrological levels in the wider area. This is due to the operations not intercepting the watertable contained within the SSG aquifer; thus there will be no sub-watertable working or dewatering. There will be no lowering of the watertable and no drawdown-related impact upon groundwater levels and flow. A flood risk assessment has determined that the proposed development is compliant with current regulatory requirements and SuDS principals designed to ensure that site operation will be safe and that its implementation will not increase extent flood risk elsewhere. Please refer to chapter 11 of the Environmental Statement for full details.

Impacts on Important Ecological Features

Impacts on Statutory Designated Sites within 3km of the proposed development

7.13 There are seven statutory designated sites within 3km of the central point of the Site. These are located between 0.62km and 2.4km from the Site. There are five sites within 1km of the Site which may be subject to impacts from changes to noise, dust and hydrology. None of these statutory designated sites would be subject to any direct habitat removal as a result of the development. With reference to the hydrology (Chapter 11) and air quality (Chapter 12) chapters of the Environmental Statement, there are considered to be **negligible** impacts on any of these designated sites due to the distance of the sites from the proposed development.

Impacts on Non-Statutory Designated Sites within 3km of the proposed development

7.14 There are fifteen non-statutory designated sites within 3km of the central point of the Site. Eight of these are present within 1km of the Site and therefore may be subject to impacts from

changes to noise, dust and hydrology. None of these non-statutory designated sites would be subject to any direct habitat removal as a result of the development. With reference to the hydrology (Chapter 11) and air quality (Chapter 12) chapters of the Environmental Statement, there are considered to be **negligible** impacts on any of these designated sites due to the distance of the sites from the proposed development.

Impacts on Ancient Woodland within 3km of the proposed development

7.15 There are six areas of ancient woodland within 3km of the central point of the Site. Two of these are present within 1km of the Site and therefore may be subject to impacts from changes to noise, dust and hydrology. With reference to the hydrology (Chapter 11) and air quality (Chapter 12) chapters of the Environmental Statement, there are considered to be **negligible** impacts on any of these areas of ancient woodland due to the distance of these woodlands from the proposed development.

Impacts on Habitats of Principal Importance within 3km of the proposed development

7.16 There is an area of deciduous woodland present adjacent to the site boundary that is a habitat of principal importance. Due to its proximity to the proposed development, it may be subject to impacts from changes to noise and dust. In the absence of mitigation, the development would have a **significant negative impact** that is considered to be **temporary, reversible and short-term.**

Impacts on Habitats

Semi-improved neutral grassland

7.17 There are a number of areas of semi-improved neutral grassland within the Site. This habitat has been assessed as of site importance in context of the proposed development. Neutral grassland is a national and local BAP priority habitat and offers habitat for invertebrates and mammals. Small areas of this habitat will be removed to allow for mineral extraction. Any remaining habitat that will be retained may suffer indirect impacts from changes to local hydrology or increases in dust levels. The development would have a **short-term negative impact** on this habitat **that is considered to be temporary, reversible and not-significant.**

Improved grassland

7.18 There is one field of improved grassland within the Site. This habitat has been assessed as of Site importance in context of the proposed development. Improved grassland is common and widespread in the local area and offers limited opportunities for wildlife. A small area of this habitat will be removed to allow the access track to be created into the Site. The remaining habitat that will be retained may suffer indirect impacts from changes to local hydrology or increases in dust levels. The development would have a **short-term negative impact** on this habitat **that is considered to be temporary, reversible and not-significant.**

Tall ruderal

7.19 There is one area of tall ruderal on the Site which has been assessed as of Site importance in context of the proposed development. Tall ruderal habitat has some ecological value as foraging and resting habitat for birds, mammals and invertebrates. This habitat will be removed to allow the mineral extraction to take place. The development would have a **short-term negative impact** on this habitat **that is considered to be temporary, reversible and not-significant.**

Arable

7.20 Arable fields cover the majority of the Site. The arable habitat has been assessed as of Site importance in context of the proposed development. Arable land has some ecological value as foraging and cover habitat for birds and mammals. The majority of the arable land on the Site will be removed to allow the extraction of mineral. Loss of this habitat would be a **short-term negative impact that is considered to be temporary, reversible and not-significant.**

Defunct hedgerow

7.21 There are two defunct hedgerows present within the Site, located between arable fields. There are also a number of hedgerows that border the external boundaries of the Site. These hedgerows are relatively uniform with a number of gaps present. Hedgerows are a habitat of principal importance and local BAP priority habitat which are used by foraging bats as well as breeding and wintering farmland birds included on the national and local BAP priority list. This

habitat has been assessed as of site importance in context of the proposed development. The proposals include the removal of a small section of the two hedgerows as these areas fall within the extraction area. The loss of this habitat would be a **long-term negative impact that is considered to be temporary, reversible and not-significant.**

Standard trees

7.22 There were a number of standard trees recorded across the Site; with a large number present along sides of the existing hardstanding track in the centre of the Site. A number are also present in the centre of the arable field on the western side of the Site. The trees have been assessed as of local importance in context of the proposed development. The trees provide suitable roosting habitat for bats and suitable potential for breeding birds. All trees along the hardstanding track will be retained; however they may be subject to impacts from changes to hydrology and increased disturbance and dust levels. The scattered trees in the centre of the arable field will be lost to allow the extraction to take place. One tree that is present along the section of hedgerow to be removed will also be lost. The development would have a **long-term negative impact** on scattered trees **that is considered to be temporary, reversible and not-significant.**

Hardstanding

7.23 One hardstanding track is present through the centre of the Site. The hardstanding has been assessed as of Site importance in the context of the proposed development. This habitat offers minimal ecological interest. None of this habitat will be removed by the proposals, and will continue to be used by vehicles and pedestrians. No additional impacts are anticipated by the proposals. The development is therefore anticipated to have **negligible** impacts on this habitat.

Woodland

7.24 The boundaries of the Site are bordered by mixed plantation and semi-natural broad-leaved woodland. This woodland has been assessed as of local importance in context of the proposed development. The woodlands provide high ecological value as foraging habitat and cover for birds and mammals. None of this habitat will be lost by the proposals; however it may suffer

indirect impacts from increased levels of noise, dust and disturbance. This habitat is the same as the habitats of principal importance deciduous woodland and it is therefore considered that the development would have a **significant negative impact** that is considered to be **temporary, reversible and short-term.**

Fauna

Badgers

7.25 The site is considered to be of importance at the local level for badger. The proposals involve the removal of possible resting habitat as well as the loss of agricultural land and grassland which would cause a reduction in foraging habitat for this species. It is considered that the development would have a **short-term negative impact** on badgers that is considered to be **temporary, reversible and significant.**

Bats - Roosting

7.26 Three trees would be removed by the proposals, one of which supports a confirmed bat roost, and the other two support possible bat roosts. The roosts recorded were not found to be of high conservation importance due to the low numbers of bats and the presence of common and widespread species. The site is evaluated as of district, local or parish level for roosting bats. It is considered that the development would have a **long-term negative impact** on roosting bats **that is considered to be temporary, reversible and significant.**

Bats – foraging/commuting

7.27 The site is considered to be of district, local or parish importance for foraging/commuting bats.

7.28 The removal of the hedgerow and trees on the Site would reduce the available habitat for foraging and commuting bats. Disturbance is likely to impact bats from increased noise, lighting and dust. Lighting can cause bats to be forced to commute and forage in different areas, this could mean that the bats expend more energy before getting to their foraging or roosting places. In the absence of mitigation, it is considered that the proposed development

would have a **short-term negative impact on foraging/commuting bats that is considered to be temporary, reversible and significant.**

Other Mammals

7.29 A number of common and widespread small mammals have been recorded on the Site. These species are assessed as of Site importance in context of the proposed development. The proposals will involve the removal of habitat that supports these species, including arable, hedgerow and grassland. The destruction of habitat could cause a decline in numbers of these animals. The development will also increase levels of disturbance for these groups of animals from the increased noise and dust levels. It is considered that the proposed development would have a **short-term negative impact for other mammal species that is considered to be temporary, reversible and significant.**

Amphibians

7.30 Small numbers of common toad have been recorded during the surveys. The ecological value of the Site for amphibians has been assessed as of Site importance in context of the proposed development. The proposals would involve the removal of suitable habitat for amphibians including hedgerow and grassland. The extraction of mineral could cause disturbance to amphibians in the locality due to the increased noise, vibrations and dust generated. It is considered that the development would have a **short-term negative impact for other amphibian species (not including great crested newts) that is considered to be temporary, reversible and significant.**

Breeding Birds

7.31 The breeding bird assemblage within the Site has been assessed of local importance due to the number of recorded confirmed, probable or possible breeding species (32), that are likely to be common and widespread in the local area. The proposed development has the potential to impact a number of red and amber listed species. The development will involve the removal of suitable habitat for breeding birds including arable, grassland, hedgerow and scattered trees. The loss of this habitat could result in birds being displaced into other areas in the vicinity which may already be at carrying capacity. This could result in reduced breeding

success and therefore a decline in breeding bird numbers. In addition, the extraction of mineral and increased vehicle and human presence within the Site may cause disturbance to birds in the form of noise and dust. This disturbance may cause birds to abandon their nests or to reduce their likelihood of breeding within areas of the Site that are not subject to mineral extraction.

7.32 It is considered that the proposed development would have a **long-term negative impact on breeding birds that is considered to be temporary, reversible and significant.**

Wintering Birds

7.33 The wintering bird assemblage within the Site has been assessed of local importance due to the number of recorded wintering species in the local area (27). The proposed works may impact on a number of red and amber listed bird species.

7.34 The removal of habitat will reduce the amount of available space for birds to forage and shelter during the wintering season, which in turn could reduce the success and fitness of the birds and therefore could cause a decline in bird numbers. It is considered that the proposed development would have **a short-term negative impact on wintering birds that is considered to be temporary, reversible and not-significant.**

Invertebrates

7.35 A total of thirteen butterfly species were recorded on the Site during the surveys. The ecological value of the Site for invertebrates has been assessed as of local importance in context of the proposed development. The removal of areas of grassland and hedgerow will reduce the amount of habitat available to invertebrates. The increased level of dust created by the proposals will cause disturbance to invertebrates and may reduce the amount of food plants available. It is considered that the development would have a **long-term negative impact on invertebrates that is considered to be temporary, reversible and significant.**

Summary of Likely Unmitigated Significant Effects

7.36 In the absence of mitigation the following significant impacts on important ecological features are predicted to occur, as shown in Table 9/4.

Table 9/4 Summary of likely unmitigated significant impacts

Important Ecological Feature	Impact in the absence of Mitigation
Deciduous Woodland Habitat of Principal Importance (Boundary Woodland)	Significant negative, temporary, reversible and short-term impact
Badgers	Short-term negative, temporary, reversible, significant impact
Roosting bats	Long-term negative, temporary, reversible, significant impact
Foraging/commuting bats	Short-term negative, temporary, reversible, significant impact
Other Mammals	Short-term negative, temporary, reversible, significant impact
Amphibians	Short-term negative, temporary, reversible, significant impact
Breeding Birds	Long-term negative, temporary, reversible, significant impact
Wintering Birds	Short-term negative, temporary, reversible, significant impact
Invertebrates	Long-term negative, temporary, reversible, significant impact

8 Mitigation

8.1 This section of the EcIA considers the range of mitigation measures which are deemed to be required in order to avoid, reduce or (as a last resort) compensate for identified impacts on important ecological features. Following this an assessment of residual ecological effects is made in respect of habitats and species and compensation measures provided. Finally, measures deemed to represent ecological enhancements are then considered.

8.2 The degree of confidence in the likely success of mitigation, based upon published studies and the experience of the assessor, is also made and any uncertainties are clearly expressed.

8.3 The relevant legislation in respect of protected species is included within the relevant survey reports enclosed as Technical Appendices to this EcIA.

8.4 This section outlines the mitigation measures that would be incorporated into the proposed scheme. Recommendations for mitigation are based upon what is practicable and 'reasonable' and would not affect the integrity of the proposed development.

General Mitigation Incorporated into Scheme

8.5 Mitigation on the Site is based on the underlying substrate, local features of ecological interest and local recommendations for restoration of habitats that are locally and nationally important.

8.6 The restoration design has been based on native ecology enhancement with retention of local arable interests. Restoration of the Site includes the creation of arable land, acid grassland, native woodland, scattered and parkland trees, ephemerally wet grassland/pools and enhanced and new hedgerows. The restoration of the Site to include acid grassland re-creates a historic environment that has declined within the local area. The creation of these habitats helps to meet national and local BAP priority habitat targets with the creation of three habitats of principal importance – namely lowland mixed deciduous woodland, lowland dry acid grassland and native hedgerow. Grassland, hedgerows, woodland and arable farmland also have habitat action plans on the Worcestershire BAP.

8.7 All external hedgerows within the Site will 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.

8.8 A minimum of a 10m stand-off from the woodland along the northern, western and southern boundaries would be observed. A fence would be erected along the edge of this buffer to ensure that there would not be any encroachment into this buffer area by vehicles or materials. The works would be undertaken in phases, and restored as phases are completed to ensure the minimum amount of damage to ecological systems and to allow for the quickest possible establishment of restored areas.

8.9 The retention of external boundary features will ensure connectivity to the wider landscape is maintained throughout the life of the development.

8.10 Measures will be put in place to prevent dust pollution of the surrounding areas including any restored phases. Please refer to the Air Quality Chapter in Chapter 12 of the Environmental Statement. Measures will be put in place to prevent light pollution.

8.11 Measures will be put in place to prevent pollution of the aquatic environment. For full details please refer to the Hydrological Chapter in Chapter 11 of the Environmental Statement.

8.12 A tool-box talk will be provided to Contractor staff as part of their site induction by a suitably qualified Ecologist regarding ecological sensitivities and to outline which protected species are present within the proposed construction area prior to the contractors starting work on the Site.

8.13 Good construction site management, regarding ecological issues will be implemented to avoid/minimise generation of litter, dust, noise and vibration. This will be controlled and monitored throughout the life of the development. These measures will be detailed in a Landscape and Ecological Management Plan (LEMP) in accordance with BS42020:2013.

8.14 The established mitigation hierarchy has been followed through all processes of this impact assessment. The need for the development site at this location has been identified in the third draft of the local minerals plan for Worcestershire. The mineral from the Site is required to

continue the reserves of sand and gravel in the county. The Site has been chosen due to its largely ecologically poor uniform nature. Where possible, habitats of higher ecological importance have been left in-situ to avoid any unnecessary impacts. The tree-lined driveway is to be retained, as well as Tree 4 to the north-east of the Site. The eastern most fields of the site and intersecting hedgerow will also be retained.

Protected Species

Badger

Mitigation

8.15 For full details of the mitigation required in relation to badgers, please refer to the confidential annex at Technical Appendix 9/8.

8.16 Regular (annual and prior to the commencement of each phase) monitoring will be required across the Site to identify any new evidence of badger activity. Where new setts are recorded, a 30m stand-off will be required at all times. Should this not be possible, it will be necessary to apply for a licence from Natural England for the destruction or disturbance of these badger setts.

8.17 The phased working and restoration of the Site will ensure that there will continue to be habitat present for foraging and commuting badgers. The restoration of agricultural land and open grassland within the Site will ensure that there are opportunities for foraging badgers in the long term.

8.18 Any trenches or holes created by the development will be covered overnight or have a ramp fitted to allow any mammals that may climb into these excavations to escape safely.

Roosting Bats

Mitigation

8.19 Possible bat emergences were observed from Tree 2 during 2018 and from Tree 1 during 2016. As these were not confirmed to be bat roosts, a European Protected Species Licence is not considered to be required. 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 on each tree must be inspected carefully with torches, mirrors and 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. This licence would need to include mitigation measures that would be required along with a detailed timetable of works.

8.20 All trees that are to be removed that haven't been found to support a bat roost, but do offer bat roosting potential should be removed using soft felling techniques by an arboriculturalist with a suitably qualified ecologist present to conduct detailed climbed bat surveys prior to observed felling. Should bats be found to be roosting in these trees then an EPS licence will be required as detailed above.

8.21 Should more than two years pass from the date of the last survey on the trees with bat roost potential (September 2018) to the date that the trees are removed, update bat roost surveys should be undertaken to identify any changes in the intervening period.

8.22 Should any trees require removal in the boundary woodland or along the tree lined driveway, they must first be assessed for their suitability for roosting bats. Where potential roosting features are observed, bat roost surveys must be conducted to enable a thorough assessment of their importance for roosting bats.

Foraging/Commuting Bats

8.23 Any trees that are retained (particularly Tree 4) should have a minimum of a 10m stand-off observed at all times. This will ensure that any bats using these trees for foraging purposes remain un-disturbed. All external boundaries will also have a minimum of a 10m stand-off observed at all times to minimise the disturbance levels in these important foraging and commuting features.

8.24 The restoration scheme will provide a variety of foraging and commuting habitats for bats in the form of enhanced hedgerows, new woodland blocks, standard trees and acid grassland. The planting of trees will provide future potential for roosting bats.

8.25 Timing and use of any lighting used on the Site must take account of the local bat population. Any lighting used must be directed away from the external boundaries and the tree-lined driveway to maintain the dark corridor that offers good quality habitat for foraging bats.

8.26 All lighting should follow the recommendations within the 'Bats and Artificial Lighting in the UK, Bats and the Built Environment series' document which was produced in 2018 by the Institution of Lighting Professionals:

- All luminaires should lack UV elements when manufactured. Metal halide, fluorescent sources should not be used.
- LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (ideally <2,700 Kelvin) should be adopted to reduce blue light component).
- Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Internal luminaires can be recessed where installed in proximity to windows to reduce glare and light spill.
- The use of specialist bollard or low-level downward directional luminaries to retain darkness above can be considered.
- Column height should be carefully considered to minimise light spill.
- Only luminaries with an upward light ratio of 0% and with good optical control should be used.
- Luminaires should always be mounted on the horizontal, i.e. no upward tilt.
- Any external security lighting should be set on motion-sensors and short (1 minute) timers.
- As a last resort, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed.

Compensation

8.27 As a bat roost has been confirmed as present within Tree 3, a European Protected Species (EPS) Licence will be required to allow the removal of this tree. A licence will need to be applied for to Natural England to ensure that any works undertaken to this tree are not done so illegally. The licence will need to include measures to compensate for the loss of this roost. This should include the placement of the current roosting site on a nearby tree. This roosting site should be placed in the same orientation as its current location, as close to the current roost as possible. Additional bat boxes should be installed on suitable trees around the boundary of the site to provide a location for bats to be moved to during the licensed works relating to the loss of Tree 3.

Other Mammals

Mitigation

8.28 The phased extraction and restoration of the Site will allow time for any small mammals present on the Site to move around to different habitats and will ensure that some habitat is always present on the Site.

Compensation

8.29 The restoration of the Site will provide greater areas of habitat on the Site for small mammals in the form of acid grassland and woodland.

Amphibians (excluding great crested newts)

Mitigation

8.30 The phased extraction and restoration of the Site will allow time for any amphibians present on the Site to move around to different habitats and will ensure that some habitat is always present on the Site. The removal of the sections of hedgerow in the site will be preceded by a hand search for any sheltering amphibians. Any amphibians that are found will be safely relocated to an area that will not be impacted by the proposals (i.e. external boundaries).

Compensation

8.31 The restoration of the Site will provide greater areas of habitat on the Site for amphibians in the form of acid grassland, ephemerally wet grassland/pools and woodland.

Breeding Birds

Mitigation

8.32 When required, the removal of any vegetation should occur outside of the nesting bird season which usually takes place from late February to late August. In the event that this is not possible then all vegetation removal works mustbe preceded by a survey conducted by a suitably qualified ecologist, in order to check for nesting birds and to advise accordingly on the most appropriate way to proceed. Furthermore, should any active nests (from when the nest is in the process of being built, until all the nestlings have fledged) be discovered during the works, then works to the area around the nest must stop immediately and a suitably qualified ecologist called in to check the nest and advise on the most appropriate way to proceed.

8.33 A screening bund will be created around the western and southern boundaries of the Site which will screen the boundary woodland from the mineral extraction works. These screening bunds will be seeded with native grass species from a local wildflower mixture.

8.34 The phased extraction and restoration of the Site will ensure that some habitat is always available on the Site for breeding birds.

Compensation

8.35 The restoration proposals include restoring the Site to agricultural land with acid grassland edges, woodland and scattered trees and hedgerows.

Wintering Birds

Mitigation

8.36 The phased extraction and restoration of the Site will ensure that some habitat is always available on the Site for wintering birds.

Compensation

8.37 The restoration proposals include restoring the Site to agricultural land with acid grassland edges, ephemerally wet grassland/pools, woodland and scattered trees and hedgerows. This restoration design will provide a variety of habitat for wintering birds with extensive foraging and resting opportunities.

Invertebrates

Mitigation

8.38 The phased extraction and restoration of the Site will ensure that some habitat is always available on the Site for invertebrates.

Compensation

8.39 The restoration of the Site will provide greater areas of habitat on the Site for invertebrates in the form of acid grassland, ephemerally wet grassland/pools and woodland.

Likely Success of Mitigation

8.40 The mitigation measures detailed are considered to be highly likely to succeed. All mitigation measures detailed have been used before in numerous different scenarios and proven to be successful. It may be necessary to secure these mitigation measures in appropriately worded conditions. Regular monitoring will be important to identify any new activity by protected species.

9 Residual Effects

9.1 Providing that all mitigation and compensation measures detailed above are undertaken, the residual impacts are anticipated to be that ecological habitats and species will benefit to a greater extent than currently. All habitats will be replaced as part of the restoration strategy to the same habitats or habitats of higher ecological importance. The habitats of the highest importance will be retained throughout the proposals (i.e. the external boundary woodland). All legally protected species recorded on the Site will be protected throughout the duration of the works and mitigation, compensation and enhancement measures will be undertaken wherever necessary.

9.2 Table 9/5 shows the Important Ecological Feature, the nature of impact upon it and the severity and, the appropriate planned mitigation and resultant impact significance.

Table 9/5: Impacts on IEFs before and after mitigation

IEF	Nature of Impact	Impact in the absence of mitigation	Nature of mitigation	Impact significance after mitigation
Statutory Designated Sites				
Deciduous Woodland Habitat of Principal Importance	Potential noise, dust and hydrology impacts	Significant negative, temporary, reversible, short-term impact	Control noise and dust levels and hydrological changes	Negligible impact **Not significant**
Fauna				
Badgers	Removal of resting habitat and foraging habitat.	Short-term negative, temporary, reversible, significant	Supervised sett removal. Licence to be obtained from Natural England where activity levels change. Regular monitoring to identify	Negligible impact. **Not significant**

IEF	Nature of Impact	Impact in the absence of mitigation	Nature of mitigation	Impact significance after mitigation
			new activity. Creation of suitable foraging habitat in restoration.	
Roosting Bats	Removal of confirmed roost for one common pipistrelle, removal of two potential brown-long eared roosts, removal of potential roosting features in trees,	Long-term negative, temporary, reversible, significant impact	Licence to be obtained from Natural England for the destruction of a bat roost. Supervised tree felling and inspections. Bat boxes to be erected.	Negligible impact. **Not significant**
Foraging/Commuting Bats	Removal of foraging habitat, disturbance from noise, lighting and dust.	Short-term negative, temporary, reversible, significant impact	10m stand-off from retained trees and boundary habitats. Phased restoration of habitats, increase and enhancement of foraging links to wider countryside. Management of noise and dust. Control of light levels, particularly along foraging and commuting corridors. Creation of additional hedgerows and management.	Negligible impact. **Not significant**
Other mammals	Removal of habitat and disturbance from noise and dust levels	Short-term negative, temporary, reversible, significant	Phased extraction and restoration of greater habitat.	Negligible impact. **Not significant**

IEF	Nature of Impact	Impact in the absence of mitigation	Nature of mitigation	Impact significance after mitigation
		impact		
Amphibians (excluding great crested newts)	Removal of terrestrial habitats and disturbance from increased noise, vibrations and dust generated.	Short-term negative, temporary, reversible, significant impact	Phased extraction and restoration of greater habitat.	Negligible impact. **Not significant**
Breeding Birds	Removal of breeding and foraging habitat, disturbance from increased noise and dust levels	Long-term negative, temporary, reversible, significant impact	Sensitive removal of habitat regarding timing. Phased restoration of improved habitats, increase of foraging links to wider countryside. Creation of screening bunds. Management of noise and dust. Management of enhanced and created habitats. Installation of bird boxes.	Long-term positive impact. **Not significant**
Wintering Birds	Removal of habitat used for foraging and shelter	Short-term negative, temporary, reversible, significant impact	Phased extraction of the Site and restoration to greater habitats. Management of enhanced and created habitats.	Long-term positive impact. **Not significant**
Invertebrates	Destruction of habitat. Disturbance from dust.	Long-term negative, temporary, reversible, significant impact	Phased extraction and restoration of greater habitat.	Negligible impact. **Not significant**

10 Cumulative Impacts

11.1 It is understood that there are no other temporary minerals development which could combine with the proposals to result in similar existing or proposed quarrying and restoration sites in the local area.

11.2 An outline planning permission for 600 new residential properties is present on land approximately 500metres to the east of the proposed quarry extraction limited known as the Former Lea Castle Hospital Site, together with employment uses and local shop and café. In addition, Wyre Forest District Council have also submitted proposals to the Government Planning Inspectorate for a further 800 properties on the former hospital site to be now known as Lea Castle Village along with a local centre and additional employment uses.

11.3 The implementation of this housing development will reduce the presence of arable land and hedgerows in the local area, however extensive additional arable land and hedgerows are present further to the north, east and west that are considered sufficient to support the species that may be displaced from the proposed development.

11.4 The Kidderminster Eastern extension is also proposed within the Wyre Forest Local Plan Review (2016-2036) which proposed 1400 houses and a new primary school. This is located approximately 3km to the south/east of the proposed quarry site. The distance of this proposed housing development from the site is considered sufficiently far from the proposed development to be able to have any negative impacts on the local ecology.

11.5 There is also a residential permission at Sion Hill which is approximately 800m to the south of the site. This is in an already residential area and therefore is considered unlikely to impact on the local ecology of the site.

11.6 No other development type or land use change has been identified that is considered likely to result in cumulative impacts.

11 Enhancements and Net Gain Calculations

Biodiversity Impact Assessment

11.1 A biodiversity impact assessment calculation has been completed for the site to quantify the balance between biodiversity losses and gains as a consequence of the proposed development. The below tables show the habitat areas currently on the site and the habitats to be enhanced and habitats to be created. The full results of the biodiversity impact assessment can be found in Technical Appendix 9/7.

Table 9/6 Habitats currently present on the site

Habitat	**Area (Hectares)**
Arable	39.5
Improved grassland	0.7
Tall ruderal	0.5
Hardstanding	0.4
Semi-improved neutral grassland	3.5
Boundary woodland	1.1
Total Area	**45.7**

Table 9/7 Habitats to be lost as a result of the development

Habitat	**Area (Hectares)**
Arable	29.9
Improved grassland	0.3
Tall ruderal	0.4
Hardstanding	0

Semi-improved neutral grassland	1.3
Boundary woodland	0
Total Area of Habitats to be Lost	**31.9**

Table 9/8 Habitats to be enhanced throughout and after the development

Habitat	**Area (Hectares)**
Arable	2.0
Improved grassland	0.4
Tall ruderal	0.1
Hardstanding	0
Semi-improved neutral grassland	2.2
Boundary woodland	0
Total Area of Habitats to be Enhanced	**4.7**

Table 9/9 Habitats to be included within the restoration scheme

Habitat	**Area (Hectares)**
Existing Arable	7.6
Newly created Arable	24.1
Semi-improved acid grassland	8.9
Standing water - Ephemerally wet grassland/pools	0.2
Existing Boundary Woodland	1.1

Broad-leaved plantation woodland	3.0
Hardstanding	0.4
Bare earth – pocket parks	0.4
Total Area of Restoration Habitats	**45.7**

Table 9/10 Hedgerow Impacts

Hedgerow element	**Distance (km)**
Existing Hedgerow	0.85
Hedgerow to be lost	0.25
Hedgerow to be enhanced	0.60
New hedgerow to be created	0.50
Total distance of hedgerow in restoration	1.1

11.2 As can be seen from the biodiversity impact calculator, the habitat losses are calculated at a habitat impact score of 72.60; the habitat gains are calculated at a habitat mitigation score of 202.11 and an overall habitat biodiversity impact score of 129.51 gain.

11.3 The hedgerow impact assessment has calculated a hedge impact score of 1.00 and a hedge mitigation score of 8.29. The overall hedge biodiversity impact score is 7.29 gain.

11.4 This assessment is calculated from area and distance of habitats to be lost and gained and also takes into consideration the quality of the habitats to be lost and gained.

11.5 The restoration of the site is therefore considered to provide an overall net biodiversity gain through the creation of enhanced habitats such as acid grassland, woodland and additional hedgerow.

Enhancements

11.6 A hedgerow will be planted along the eastern boundary of the Site to provide additional foraging and commuting features for bats which will compensate for the removal of the internal hedgerow.

11.7 Bat boxes shall be erected on trees that are to be retained on the Site. These will provide additional roosting features and provide compensation for the loss of trees with potential roosting features. Where suitable trees are identified, 3 bat boxes should be placed on each tree, facing in different directions to provide differing micro-habitats at a height of at least 3m above ground level. It is recommended that 15 bat boxes are erected on the Site. The bat boxes should be a combination of Schwegler 2F (double-fronted), Schwegler 1FF and Schwegler 2FN (or similar). These will provide a range of roosting features for different species of bats that have been recorded on the Site. The best location for these bat boxes is along the woodland to the south and west of the Site.

11.8 All hedgerows on the external boundaries of the Site and the internal hedgerow that is to be retained will be enhanced with additional plants to vary the species assemblage of the hedgerow and provide a denser feature for foraging and commuting bats that will be capable of supporting a wider range of invertebrates.

11.9 The hedgerows on the Site will be enhanced to increase in density and quality which will provide greater areas of cover and foraging opportunities for small mammals, amphibians and invertebrates.

11.10 The hedgerows being retained on the Site and the new hedgerows to be created or enhanced 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 hedgerow.

11.11 The creation of 6 metre wide grassland strips along the arable fields and hedgerow boundaries will be seeded with native grass and herb species from a local wildflower mixture.

11.12 These grassland areas should be cut or selectively grazed once every two years avoiding the bird breeding season to allow tussocks to develop and insect populations to increase. These areas should be cut in rotation to ensure plenty of uncut margins each year that provide a

source of seed as winter food for species such as linnet and provide a dense sward structure suitable as nesting habitat. Some of the grassland arisings from management works should be stacked nearby and left as a food source.

11.13 As nesting opportunities will be reduced by the removal of hedgerows and trees, bird boxes will be erected on to trees that are to be retained along the boundaries of the Site. Nest boxes for crepuscular species e.g. tawny owl will also be installed.

11.14 Any non-native plants present on the site should be removed and ongoing management of the removal of these species should be included within the LEMP.

11.15 Providing the above mitigation and enhancement measures are followed, the proposed development at the site is not considered to have any residual negative significant impacts on any of the habitats and protected species at the site and the proposals comply with all relevant planning policy and legislation.

12 References

1. BSI, (2013). *BS 42020:2013 Biodiversity – Code of practice for planning and development.* British Standards Institution, London.
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5. IEA. (1995). Guidelines for Baseline Ecological Assessment. Chapman and Hall.
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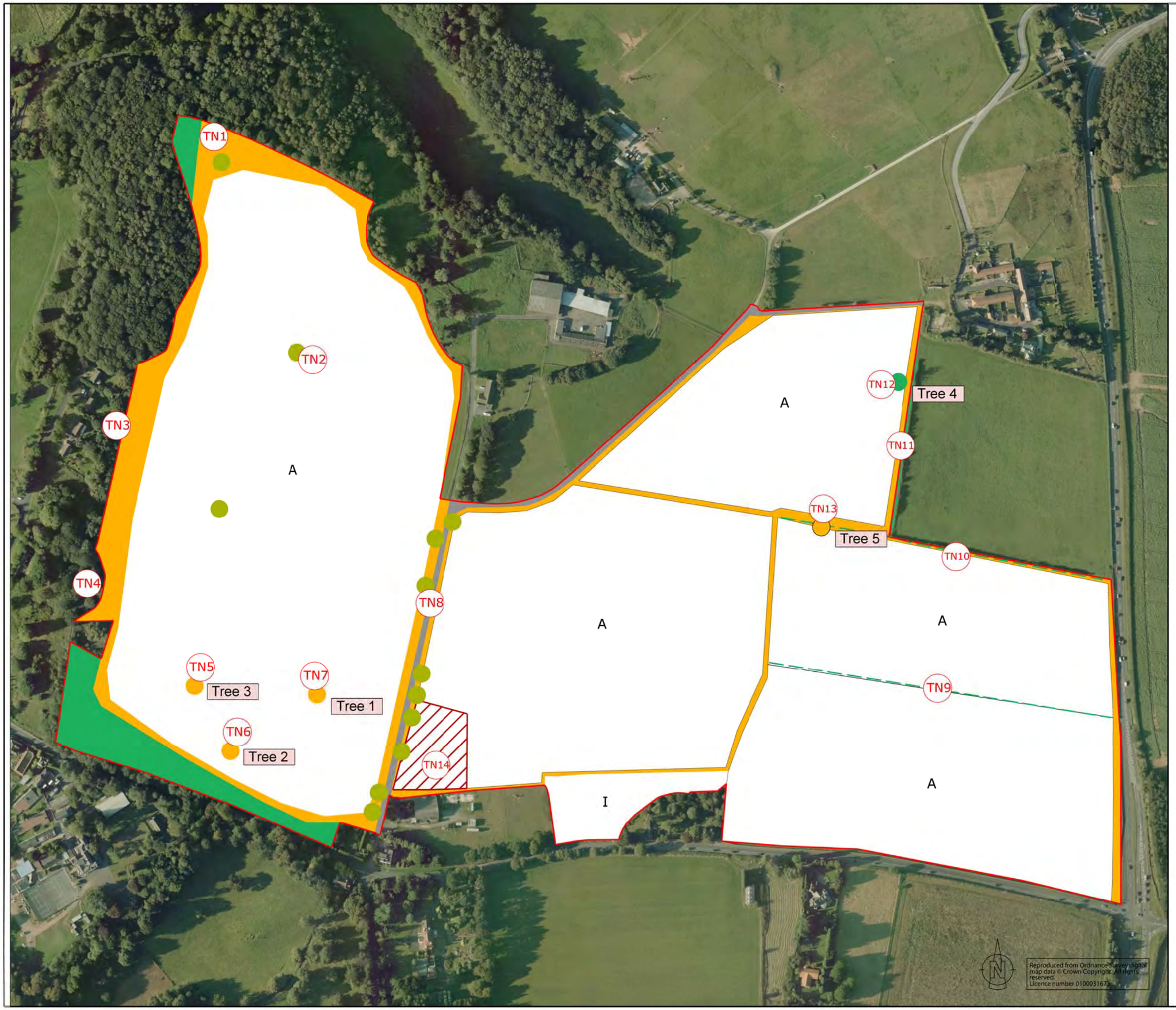
9. Worcestershire County Council (2018). *Worcestershire Habitat and Species Biodiversity Action Plans.* Accessed online on 15th February 2019. <http://www.worcestershire.gov.uk/info/20252/environmental_policy/1155/biodiversity_action_plan>

DRAWING M16.176(a).D.006

PRELIMINARY ECOLOGICAL APPRAISAL



Legend

- Site boundary
- Broad-leaved and mixed plantation woodland
- Semi-improved neutral grassland
- I — Improved grassland
- Tall ruderal
- A — Arable
- Native intact hedgerow
- Native defunct hedgerow
- Hardstanding
- Standard tree
- Tree with moderate bat roosting potential
- Tree with high bat roosting potential
- Tree 1 — Tree Number
- TN1 — Target Note Number

DRAWING STATUS	**FINAL**
PROJECT	**LEA CASTLE FARM**
CLIENT	**NRS Aggregates Ltd**
TITLE	**Preliminary Ecological Appraisal**
DATE: **March 2019**	SCALE: **1:3,500 @A3**
DRAWN: **KH**	CHECKED: **SC**
DRAW NO.: **M16.176(a).D.006**	REVISION

PleydellSmithyman

DRAWING M16.176(a).D.022

SITE BOUNDARY PLAN

Legend

Site boundary

Site boundary prior to June 2018

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DRAWING STATUS
FINAL

PROJECT
LEA CASTLE FARM

CLIENT
NRS Aggregates Ltd

TITLE
Site Boundary Plan

DATE	SCALE
April 2019	**1:3,500 @A3**
DRAWN **KH**	CHECKED **SC**
DRAW NO. **M16.176(a).D.022**	REVISION

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TECHNICAL APPENDIX 9/1

PRELIMINARY ECOLOGICAL APPRAISAL REPORT

PRELIMINARY ECOLOGICAL APPRAISAL

RELATING TO LAND AT LEA CASTLE FARM, WOLVERLEY, KIDDERMINSTER

APPLICATION FOR PLANNING PERMISSION

FOR NRS AGGREGATES LTD.

APRIL 2019

PSL Report Reference Number: M16.176(a)R.005

PREPARED BY PLEYDELL SMITHYMAN LIMITED

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PRELIMINARY ECOLOGICAL APPRAISAL ON LAND AT LEA CASTLE FARM, WOLVERLEY ROAD, WOLVERLEY, KIDDERMINSTER, DY10 3QD

By:
Pleydell Smithyman Limited
April 2019

Main Contributors
Nick Staples, Kelly Hopkins

Issued By

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……..

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1.0 INTRODUCTION

Background and Proposals

1.1 Pleydell Smithyman Limited (PSL) was instructed by NRS Aggregates Ltd via Robin Smithyman of Kedd Limited to undertake a Preliminary Ecological Appraisal of land at Lea Castle Farm, Wolverley, Kidderminster (hereafter referred to as the site). Please see Drawing Number: M16.176(a).D.006: Preliminary Ecological Appraisal, for a plan of the site.

1.2 The survey was required to inform the preparation and submission of a planning application for the phased extraction of mineral and subsequent restoration of the site to include agricultural land, woodland, acid grassland and parkland and avenue trees.

Site Location

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.

Site Description

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 within the fields, including pedunculate oak (*Quercus robur*), sweet chestnut (*Castanea sativa*) and non-native conifers.

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. Wolverley lies 1km to the west of the site and Cookley lies 800m to the north.

Aims and Objectives of the Survey

1.6 The key objective of the preliminary ecological appraisal was to classify the habitats present on the site according to the Phase 1 habitat survey methodology and establish the potential of the site to support protected and notable species, of which account must be taken prior to and during the planned works in accordance with the wildlife and Countryside Act 1981 (as amended), the Conservation of Habitats and Species

Regulations 2017 and the Protection of Badgers Act 1992 (details of wildlife legislation are provided in Appendix 4).

1.7 Where necessary, further (phase 2) detailed surveys are recommended to safeguard any existing ecological interests within the site and opportunities for mitigation or enhancement are proposed with reference to current legislation and guidance.

1.8 The preliminary ecological appraisal also aims to identify key constraints of the project and make recommendations for design options where appropriate.

1.9 The site visit also focussed on assessing the potential of the site to support populations of priority species, whose protection and recovery is promoted under British or International legislation as stated below.

Biodiversity Legislation

1.10 Details of National and International Biodiversity Legislation are found in Appendix 5.

1.11 The Habitat Regulations 2017 are the principal means by which Council Directive 92/43/EEC on the Conservation of Natural Habitats of Wild Fauna and Flora (the "Habitats Directive") is transposed in England and Wales and the adjacent territorial seas. They also transpose elements of the EU Wild Birds Directive in England and Wales.

1.12 The 'UK Post-2010 Biodiversity Framework' (JNCC & DEFRA, 2012) sets out a framework of priorities for UK-level work for the Convention on Biological Diversity. This framework replaces the original UK Biodiversity Action Plan (UK BAP, 2004). England, Scotland, Northern Ireland and Wales have individual plans to protect and reverse the declines of more widespread species and habitats that (in England) are covered by Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 which states: "Every public authority must, in exercising its functions, have regard, so far is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity". Local Biodiversity Action Plans (LBAPs) are still in place under this framework to manage and conserve species and habitats of priority at a local level.

1.13 Furthermore, the survey assessment recommendations are guided by the National Planning Policy Framework (NPPF) produced in July 2018, where the policies in paragraphs 15 to 217, taken as a whole, constitute the government's view of what sustainable development in England means in practice for the planning system.

2.0 SURVEY METHODOLOGY

2.1 Site surveys were made over an extended period due to modifications of design plans and boundary extensions. The initial extended Phase 1 habitat survey was undertaken on the 28 January 2016 by Nick Staples and on the 17 October 2016 by Nick Staples and Steven Pagett then on the 27 June 2018 by Kelly Hopkins BSc (Hons) ACIEEM and Nick Staples B.Sc., (Hons) M.Sc., DIC, CBiol, MRSB of Pleydell Smithyman Limited. A further update survey was completed on the 5 February 2019 by Nick Staples to conduct a transect survey to record birds and to re-inspect for evidence of badger (*Meles meles*). Site boundary modifications have increased the survey area from 40 to 47.9ha. This survey report details the results of the survey completed in June 2018 and is supplemented by additional site visits as detailed above.

2.2 The preliminary ecological appraisal was completed following the guidance produced by CIEEM entitled 'Guidelines for Preliminary Ecological Appraisals' (CIEEM, 2017) and by BS42020:2013 Biodiversity: Code of Practice for Planning and Development. The survey methodology used can be split into three main areas: a desk study, Phase 1 habitat survey and a protected species assessment. These are discussed in more detail below.

Desk Study

2.3 In order to obtain information on sites of nature conservation interest in the area, the Multi-Agency Geographical Information for the Countryside (MAGIC) website was searched for ecological statutory and non-statutory designated sites and ancient woodland within a 3km radius around the central point of the site. A 3km search radius was conducted from the central point of the site to ensure that a 2km radius from the boundaries of the site was covered.

2.4 In addition, Worcestershire Biological Records Centre (WBRC) was commissioned to undertake a data search for all protected and notable species and all sites of conservation importance within 3km of central grid reference SO834789. For relevant information please see Appendix 1.

2.5 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 to provide information on land use and habitat connectivity throughout the area.

Phase 1 Habitat Survey

2.6 The Phase 1 habitat survey of the site was carried out in order to assess the current ecological importance of the land contained within the boundaries of the site. This involved identifying the main habitats and associated botanical species present at the time of the survey.

2.7 The site was surveyed using the Phase 1 Habitat Survey methodology outlined in 'The Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit' (JNCC, 2010). This involves identifying the species present within each habitat and classifying the habitat types accordingly, following the Phase 1 habitat survey methodology. This technique provides an inventory of the broad habitat types present and enables areas of greater botanical interest which may require further, more detailed, surveys to be identified.

2.8 Habitats are mapped (Drawing Number: M16.176(a).D.006: Preliminary Ecological Appraisal) and 'target notes' are made, where relevant, to describe characteristic habitats, features of ecological interest, or any other features which may present a potential constraint to the proposed development (see Appendix 2).

2.9 Whilst not a comprehensive protected species or botanical survey, the extended Phase 1 method enables a suitably experienced ecologist to undertake a baseline ecological appraisal of the site that:

- provides a preliminary evaluation of the nature conservation importance of the site and survey area and assess the potential for impacts on habitats/species likely to represent a material consideration in planning terms; and,
- determines the scope of further specialised surveys that may be required.

2.10 Higher plant species nomenclature follows that provided in Stace (2010) for vascular plants and Atherton, Bosanquet and Lawley (2010) for bryophytes.

Protected Species Assessment

2.11 General faunal activity, such as birds or mammals observed or noted by call or, evidence of a species' activity such as prints, droppings, burrows or similar, was also recorded with specific attention paid to the potential presence of any protected, rare and notable species, including species listed on local or national BAP lists. This involved assessing the suitability of the habitats present on the site for these species as well as the connectivity of the site to other areas of potentially suitable habitat nearby.

In addition, specific survey work was undertaken for badger, bats, harvest mouse (*Micromys minutus*) and great crested newt (*Triturus cristatus*) and is outlined below.

Badger

2.12 The badger survey comprises two main elements. Firstly, the site and approximately 50m from the boundaries (where access is allowed) is searched thoroughly for evidence of badger setts. For any setts that may be encountered, each sett entrance would be noted and plotted even if the entrance appears disused.

2.13 Secondly, evidence of badger activity, such as well-worn runs and push throughs, snagged guard hair, footprints, latrines, dung pits, loose droppings and foraging signs, would be recorded so as to build up a picture of the use of the site by badgers.

Bats

2.14 All trees within the site that were anticipated to be impacted by the development were assessed from the ground 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 Ecologist: Good Survey Guidelines' (Collins, 2016):

- Negligible Suitability – Negligible habitat features on site likely to be used by roosting bats.
- Low 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.
- Moderate 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).

- High Suitability – A structure or tree with one or more potential roost sites that are obviously suitable for use by a large number of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

Great crested newt

2.15 A Habitat Suitability Index (HSI) assessment is usually undertaken on all waterbodies on the site and within 500m of the boundary of a proposed development site (on the near side of major dispersal barriers and where access permission is granted). This assessment is undertaken in order to establish the likelihood of great crested newt either breeding on the site or dispersing to the site during their terrestrial phase.

2.16 The HSI is a standard assessment method developed specifically to evaluate the habitat suitability for this species. A series of factors must be considered. Each factor is assessed along suitability guidelines and allocated a value of between 0.01 (highly unsuitable) to 1.0 (highly suitable). The geometric mean of these values provides an overall suitability score for each waterbody. Although this is no substitute for a dedicated survey, it does give an indication of whether such a survey is required.

Additional Surveys

2.17 To provide additional information on potential species recorded on the site, a number of additional surveys were completed and are reported within this PEA report. It should be noted that these additional surveys detailed below are outside the normal scope of a PEA report and have been reported within this report due to the time between commissioning and submission of the planning application.

Harvest mouse

2.18 To inspect for evidence of harvest mice on the site, 20 artificial nest sites were placed around the site in suitable locations along hedgerows. These artificial nest sites comprised a tennis ball with a small entrance hole drilled into it attached to a bamboo cane. The cane was then inserted into the ground. These artificial nest sites have been proven to be used by harvest mice and are an effective survey tool. The artificial nest sites were placed on site on the 25 July 2018, and were checked three times throughout August and September 2018. Whilst on site completing other surveys, checks were frequently made of the suitable habitat on site for any evidence of natural harvest mice nests. Please see Drawing M16.176(a).D.020 Harvest Mouse Refugia Locations for a plan of the location of the artificial nest sites.

Wintering birds

2.19 During February 2019, a survey of the site was completed to record the bird activity at this time of the year. A simple transect was followed around the site, and the surveyor recorded all birds heard and seen whilst following this transect. Records were also made of any bird species observed on land adjacent to the survey area or flying over the site. Birds in this category would not be included in the assessment, unless it was obvious that they were moving between different parts of the survey area.

Evaluation

2.20 The site's ecological importance has been evaluated broadly following guidance issued by CIEEM in 2018, which ranks the nature conservation importance of a site according to a geographic scale of reference: international; national; regional, metropolitan, county, vice county or other local authority-wide area; local (district, borough or parish); and of importance at the zone of influence of the site only. In evaluating the nature conservation importance of the site, the following factors were considered: nature conservation designations; species/habitat rarity; naturalness; fragility and connectivity to other habitats. Ecological impacts are also assessed in line with CIEEM (2018) only where clear evidence is available to substantiate and justify the findings. In the absence of such evidence, the ecological feature is merely identified as a potential constraint to development.

2.21 Where ecological constraints to development are identified, further survey requirements and/or avoidance, mitigation, compensation measures that are proportionate to the predicted degree of risk to biodiversity and to the nature and scale of the proposed development are described.

Survey Constraints and Limitations

2.22 Species that may be present on the site would not necessarily be detectable during the survey assessment, since different species are apparent during different seasons and detailed species-specific survey work is often required to identify the presence or likely absence of particular species or species groups. However, the extended Phase 1 habitat survey is considered to provide a robust assessment of the likelihood of various protected species to be present and to subsequently identify the need for further, more detailed, surveys to be undertaken at the correct time of year.

2.23 Extended Phase 1 habitat surveys can be undertaken at any time of the year; with the optimum time of year for these surveys to be undertaken being between April and mid

July (inclusive) to enable the majority of botanical species to be detected. Four surveys were conducted including one within this period, spanning autumn, winter and summer with, additional notes taken during breeding bird, reptile, badger and bat roost and activity surveys. It is therefore considered that the survey events encompassed the majority of likely species and habitats present and that there were no constraints to the survey.

3.0 RESULTS

Desk Study

Ecological Statutory Designations

3.1 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.

3.2 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.

3.3 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*).

3.4 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.

3.5 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.

3.6 Hurcott Wood Local Nature Reserve (LNR) is located approximately 620m to the south-east 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.

3.7 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.

3.8 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.

3.9 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

3.10 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 north-west 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.

3.11 A summary of these non-statutory sites is provided below, however please refer to Appendix 1 for the full details.

3.12 Staffordshire and Worcestershire Canal LWS covers a total of 14.7km and consists of open standing water with marshland and woodland. Otters (*Lutra lutra*), kingfisher and bats are known to use the canal.

3.13 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*).

3.14 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.

3.15 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.

3.16 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. Faunal

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*.

3.17 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* (*natrix*) *helveticus*) and hornet robber-fly, (*Asilus crabroniformis*).

3.18 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.

3.19 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*).

3.20 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.

3.21 Kingsford Heath LWS, 28.79 hectares of remnant heathland Calluna and NVC U2 wavy-hair 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.

3.22 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.

3.23 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.

3.24 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.

3.25 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.

3.26 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.

3.27 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.

3.28 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

3.29 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.

3.30 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.

Phase 1 Habitat Survey

3.31 The following habitats/ecological features were identified within the site and classified according to the system prescribed in the JNCC 'Handbook for Phase 1 Habitat Survey' (2010):

- Semi-improved neutral grassland;
- Improved grassland;
- Tall ruderal;
- Arable;
- Defunct hedgerow;
- Standard trees; and
- Hardstanding.

3.32 The location of these habitat types and features are represented on Drawing Number: M16.176(a).D.006: Preliminary Ecological Appraisal and described in detail below. Please see Appendix 3 for photographs of the site.

3.33 WBRC returned a large number of floral records from the data search. One of these was specific to the site, this was a hornbeam, (*Carpinus betulus*), recorded on the roadside verge on the eastern boundary of the site in 1992. All records were dated between 1990 and 2007.

Semi-improved neutral grassland;

3.34 Semi-improved neutral grassland was recorded along the edges of the arable field on the western part of the site. The sward length was between 20-40cm and dense in places as there is no active grazing taking place. Grass species recorded included perennial rye-grass, (*Lolium perenne*), cock's-foot (*Dactylis glomerata*), Yorkshire fog (*Holcus lanatus*) and red fescue (*Festuca rubra*).

3.35 Herb species recorded included common mouse-ear (*Cerastium fontanum*), white clover (*Trifolium repens*), red clover (*T. pratense*), herb Robert (*Geranium robertianum*), dove's-foot crane's-bill (*Geranium molle*), cut-leaved crane's-bill (*G. dissectum*), hedgerow crane's-bill (*G. pyrenaicum*), small-flowered crane's-bill (*G. pusillum*), creeping buttercup (*Ranunculus repens*), dock (*Rumex* sp.), common sorrel (*R. acetosa*), ribwort plantain (*Plantago lanceolata*), greater plantain (*Plantago major*), ground ivy (*Glechoma hederacea*), cleavers (*Galium aparine*), common dandelion (*Taraxacum officinale*), pineappleweed (*Matricaria discoidea*), mayweed (*Matricaria* sp.), common vetch (*Vicia sativa*), hairy tare (*V. hirsuta*), dame's violet (*Hesperis matronalis*), field pansy (*Viola arvensis*), common field-speedwell (*Veronica persica*), selfheal (*Prunella vulgaris*), perforate St. John's-wort (*Hypericum perforatum*), redshank (*Persicaria maculosa*), black nightshade (*Solanum nigrum*), common toadflax (*Linaria vulgaris*), white campion (*Silene latifolia*), red campion (*Silene dioica*), creeping thistle (*Cirsium arvense*), spear

thistle (*C. vulgare*), hogweed (*Heracleum sphondylium*), upright hedge parsley (*Torilis japonica*), hemp-agrimony(*Eupatorium cannabinum*), charlock (*Sinapis arvensis*), green alkanet (*Pentaglottis sempervirens*), mugwort (*Artemisia vulgaris*), groundsel (*Senecio vulgaris*), ragwort (*Jacobaea vulgaris*), great mullein (*Verbascum thapsus*), evening primrose (*Oenothera* agg.), willowherb (*Epilobium* sp.), white dead-nettle (*Lamium album*) and common nettle (*Urtica dioica*). Scattered patches of bramble scrub are also present along the edges of these areas of grassland.

3.36 In the north-western corner of the site there is an area that is used as a motorcycling track that has raised areas of soil bunds (TN1). Where the ground is not bare, the habitat comprises semi-improved neutral grassland.

Improved grassland

3.37 One improved grassland field was present on the eastern part of the site that was intensively grazed by horses. This field was fenced off with electric fencing and is grazed for most of the year. The grassland was dominated by perennial rye-grass and sward length was approximately 7cm.

Tall ruderal

3.38 One area of tall ruderal is present to the east of the track that runs through the centre of the site (TN14). This area has nettle, bramble, hogweed, creeping thistle, spear thistle, cock's-foot and Yorkshire fog. This area has patches of bare ground and is frequently in use by the farmer for storing materials, machinery and stock piling soil.

3.39 The edges of the hardstanding track have tall ruderal habitat present with species occurring including bramble, hogweed, yarrow, (*Achillea millefolium*), red clover, cock's-foot, perennial rye grass, Yorkshire fog, pineapple weed, nettle, ribwort plantain, greater plantain, broad-leaved dock, (*Rumex obtusifolius*), cat's-ear, (*Hypochaeris radicata*), mugwort, ragwort, common poppy, musk mallow, (Malva moschata), creeping thistle, hedge bindweed, (*Calystegia sepium*), hedgerow crane's-bill, dandelion, and common nettle. Sycamore, (*Acer pseudoplatanus*), and pedunculate oak saplings were recorded along this track.

Arable

3.40 The majority of the site comprised arable fields. At the time of the survey crops present included beet, maize and oats. Green alkanet, bramble (*Rubus fruticosus* agg.) and

common poppy (*Papaver rhoeas*), were also recorded in these fields at the time of the survey.

Defunct hedgerow

3.41 A defunct hedgerow (TN9) was located in the eastern half of the site running west to east between two arable fields. This hedgerow was unmanaged and gappy and comprised hawthorn (*Crataegus monogyna*) and elm (*Ulmus procera*).

3.42 A second defunct hedgerow (TN10) was present running west to east parallel to TN9, with a similar composition to above, with the addition of elder, (*Sambucus nigra*) and honeysuckle, (*Lonicera periclymenum*).

3.43 A third hedgerow (TN11) is present along the north-eastern boundary of the site. This hedgerow is intact and contains hawthorn, elder and elm.

Standard trees

3.44 A number of scattered standard mature trees were recorded across the site. These included oak, beech, sweet chestnut, lime, redwood, (*Sequoia* sp.) and conifer. Beech and lime trees lined a hardstanding track present on the site (TN8). It should be noted that during the latest survey completed in February 2019, one of the oak trees present on the site (Tree 1) had been subject to storm damage and one of its limbs had been lost.

Hardstanding

3.45 The hardstanding track present towards the centre of the site separated the eastern and western sides of the site. This track comes from the main road to the south (Wolverley Road) and bears north-eastwards towards the farm further north. The edges of the hardstanding have tall ruderal habitat present as described above.

Boundary woodland

3.46 The north, west and south of the site is bordered by a combination of mixed plantation woodland and broad-leaved semi-natural woodland. The northern and north-western boundary of the site is comprised of mixed plantation woodland. Species recorded include elder, yew, (*Taxus baccata*), box, (*Buxus sempervirens*), field maple, (*Acer campestre*), rowan, (*Sorbus aucuparia*), oak, hawthorn, sycamore, silver birch, (*Betula pendula*), beech, sweet chestnut, ivy, (*Hedera helix*), holly, (*Ilex aquifolium*), cherry (*Prunus* sp.), nettle, ground ivy, wood avens, (*Geum urbanum*), bramble and

rhododendron, (*Rhododendron ponticum*). It is not known whether the box in this area of the woodland is planted or native. Should it be native, this is a very rare species in the county. One record of box was returned from the data search. This was recorded in Gloucester Coppice in 2007 approximately 655m to the north-west of the site. Due to the uniform size of the dominant sycamore trees it is suspected that the woodland here has been clear-felled and replanted at some point in the past. This may be because of a requirement for timber or as a result of disease.

3.47 The north-eastern boundary of the western part of the site is bordered by broad-leaved semi-natural woodland, with species recorded including wych elm, (*Ulmus glabra*), small-leaved lime, (*Tilia cordata*), oak, sycamore, hawthorn, ash and broom.

3.48 The south-western boundary of the site is bordered by broad-leaved semi-natural woodland, with species recorded including small-leaved lime, sycamore, oak, box, beech, willow, (*Salix* sp.), and elm. Ground flora in this area included herb Robert, ground ivy, common vetch, white dead-nettle, bramble and nettle.

3.49 The woodland that borders the southern boundary of the site was dominated by common lime (*Tilia x europaea*) and also included silver birch, sycamore, horse chestnut (*Aesculus hippocastanum*), fig (*Ficus carica*), elm, yew, holly, ivy, cherry laurel (*Prunus laurocerasus*), bramble, common nettle, herb Robert and foxglove (*Digitalis purpurea*).

Faunal Survey

Badger

3.50 The site provides suitable habitat for badger sett creation and provides suitable foraging habitat for badger in the form of semi-improved grassland and arable fields. Please refer to the confidential annex in Appendix 6 for the details of the badger survey.

3.51 WBRC returned 21 records of badger from the data search. None of these records were specific to the site. The closest record was a road casualty from 2008 from Wolverley Road immediately to the south of the site. The records dated between 2001 and 2014. The vast majority of the records were road casualties or live sightings.

Bats

Roosting habitat

3.52 There are four trees present on the site which offer moderate roosting potential for bats and one tree which is considered to offer high roosting potential for bats. The table below provides further details in relation to these trees. Please see Appendix 3 for photographs of these trees. The location of the trees can be seen on Drawing M16.176(a).D.006.

Table 1. Trees recorded on the site with bat roosting potential.

Tree Number	**Species**	**Bat Roost Suitability**	**Details**
Tree1	Oak	Moderate	Split limbs at approx. 3m height on southern aspect.
Tree 2	Oak	Moderate	Woodpecker holes at approx. 2.5m height on southern aspect.
Tree 3	Sweet chestnut	Moderate	Dead tree with crack in its limb at approx. 1.8m height on eastern aspect.
Tree 4	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 5	Oak	Moderate	Split lower limb and broken branch stubs at approx. 2m height on northern aspect.

3.53 There are no buildings present within the site.

3.54 There are also a number of mature trees along the external boundaries of the site that offer roosting potential for bats. These were not assessed fully as they are not anticipated to be directly or indirectly impacted by the proposals.

Foraging and commuting habitat

3.55 The majority of the site comprises large arable fields that offer limited suitability for foraging, commuting and roosting bats. There are however, headlands of semi-improved grassland and scattered trees throughout the site that provide more suitable habitat. The external boundaries of the site offer higher quality foraging and commuting habitat in the form of hedgerows and woodland. The surrounding area offers areas of higher quality habitat in the form of woodland, river and canal. The site is connected to these more suitable areas of habitat. As a result, overall the site is assessed to offer low habitat quality with higher areas of foraging habitat located in the wider area.

3.56 WBRC returned 126 bat records from the search area. These records included Daubenton's bat, (*Myotis daubentonii*), noctule, (*Nyctalus noctula*), common pipistrelle, (*Pipistrellus pipistrellus*), soprano pipistrelle, (*P. pygmaeus*) and Pipistrelle sp. None of these records were specific to the site; the closest were common pipistrelle and Daubenton's bat approximately 645m to the west at Kidderminster canal in 2002. More recent records were returned from Hurcott Pools, Kidderminster and Cookley. A number of roost records were returned from the data search. None of the roost records were on the site or within close proximity to the site.

Water vole

3.57 There were no waterbodies recorded on the site and therefore no areas that provide suitable habitat for water vole. The River Stour is the closest suitable waterbody for water voles and this is situated approximately 110m to the north-west of the site.

3.58 WBRC returned no records of water vole from the data search. It is considered that historically water vole occurred on the River Stour.

Otter

3.59 There were no waterbodies recorded on the site and therefore no areas that provides suitable habitat for otter. The River Stour is the closest suitable waterbody for this species and this is situated approximately 110m to the north-west of the site.

3.60 WBRC returned thirty two records of 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.

Dormouse

3.61 The site offers small areas of sub-optimal habitat for dormouse (*Muscardinus avellanarius*) in the form of hedgerows and woodland. The hedgerows present on the site are mostly defunct 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.

3.62 No dormouse nests or characteristically chewed hazel nuts were recorded on the site throughout the surveys, however only one of the surveys was completed during the optimum time for nut searches (between mid August and December).

3.63 WBRC returned no records of dormouse from the data search.

Other mammals

3.64 Evidence of roe deer (*Capreolus capreolus*), red fox (*Vulpes vulpes*), wood mouse (*Apodemus sylvaticus*), field vole (*Microtus agrestis*) and mole (*Talpa europaea*) were observed on the site during the surveys.

3.65 The non-native pest species rabbit (*Oryctolagus cuniculus*), grey squirrel (*Sciurus carolinensis*) and muntjac deer (*Muntiacus reevesi*) were observed on the site.

3.66 Suitable habitat for harvest mouse was recorded on the site in the form of semi-improved grassland, arable field edges and hedgerows and therefore a survey was carried out in 2018 to inspect for signs of harvest mice. 20 harvest mouse artificial nesting sites (20) were placed around the site and checked on several occasions throughout 2018. No evidence of harvest mice were recorded in these artificial nesting sites during the surveys.

3.67 No signs of any other protected, rare or notable mammal species were recorded.

3.68 WBRC returned records of hedgehog (*Erinaceus europaeus*), brown hare *(Lepus europaeus*), harvest mouse and polecat (*Mustela putorius*) from within 3km of the site. None of these records were specific to the site. Suitable habitat for hedgehog and brown hare do occur on the site in the form of the hedgerows and arable fields. No other mammal records were returned from the data search that has not already been commented upon.

Great crested newt

3.69 No ponds were recorded on the site during the surveys completed in 2016 and 2018 and no ponds were identified within 500m of the site boundary. The closest waterbody to the site is the River Stour which is situated approximately 110m to the north-west. The River Stour is considered unsuitable for great crested newt due to its fast-flowing nature.

3.70 It should be noted that during the latest survey at the site (February 2019), some habitat removal had been completed immediately outside of the site boundary. The removal of this dense scrub and woodland (presumed to have been removed due to damage to the external wall) revealed the presence of a very small pond. At the time of this update survey, the pond was full of leaf litter and plastic rubbish. The pond was lined with a very limited amount of water present. It was of poor quality and is considered highly unlikely to support great crested newt as it had been previously heavily choked with vegetation and is likely to dry out during the spring and summer months.

3.71 A HSI Assessment was completed on this pond and the results are shown in the table below.

Table 2. HSI Assessment results for the pond present to the south of the site observed in February 2019.

HSI Factor	Value	HSI Rating for Index
Geographic Location	1.00	Excellent
Pond Area	0.01	Poor
Drying Out Frequency	0.10	Poor
Water Quality	0.33	Poos
Shade	1.00	Excellent
Fowl	1.00	Excellent
Fish	1.00	Excellent
Pond Count	0.65	Average
Terrestrial Habitat	0.67	Average
Macrophytes	0.30	Poor
Overall HSI Value	**0.37**	**Poor**

3.72 The site offers small areas of suitable terrestrial habitat for great crested newt in the form of hedgerows and semi-improved grassland. As no suitable waterbodies are present in close proximity to the site, it is considered highly unlikely that great crested newt would occur on the site.

3.73 In addition, WBRC returned no records of great crested newt from the data search. Other amphibians returned from the data search included common toad (*Bufo bufo*), smooth newt (*Lissotriton vulgaris*) and common frog (*Rana tamporaria*). These records were dated between 1996 and 2007 and are therefore considered historic. Three records of juvenile common toad were recorded on the site in 2009.

Reptiles

3.74 The site offers small areas of suitable habitat for reptiles in the form of the hedgerows, semi-improved grassland and woodland edge habitat that could be used to forage, bask and commute.

3.75 The site has good connectivity to further areas of suitable habitat to the north and west in the form of woodland, rivers and marshy habitat and wetland.

3.76 The surrounding brick estate boundary to the south and east of the site provides a significant boundary to immigration or emigration and the likelihood of historic

populations of ground feeding game birds, and more recently, domestic cats from the adjacent properties, suggest that reptile populations may have been lost over time.

3.77 The western part of the site has open connectivity to the woodland and the wider area that connects to the River Stour.

3.78 Reptile surveys were completed on the site in 2016 and no reptiles were recorded, despite the surveys being completed under suitable weather conditions. Anecdotal information of inspections of reptile refugia throughout 2018 did not reveal any reptile recordings. Due to the lack of reptiles recorded during the 2016 surveys and the lack of change of habitat since this time, it is considered highly unlikely that reptiles would occur on the site.

3.79 WBRC returned twelve records of reptiles within 3km of the site. These were all records of grass snakes, dated between 1996 and 2015. The closest of these was approximately 435m to the west of the site at Wolverley Lock in 2011.

Birds

Breeding Birds

3.80 The site was assessed as holding potential as a good farmland bird site. Many farmland birds are listed on the local BAP. The site supports suitable habitat for breeding birds in the form of arable fields, hedgerows, scattered trees and woodland edge.

3.81 Numerous trees on the site showed features suitable for barn owl roosting and breeding (including extensive splits, and hollow limbs/trunks with elevated access areas). The site has suitable habitat for foraging barn owls in the form of the semi-improved grassland.

Wintering Birds

3.82 The site supports some suitable habitat for wintering birds in the form of arable and hedgerows. This habitat is extensive in the wider area.

3.83 During the initial PEA survey completed in January 2016 numerous flocks of birds were seen on the arable fields including a mixed flock of 50+ finches including chaffinch (*Fringilla coelebs*) and goldfinch (*Carduelis carduelis*), a flock of 40 redwing (*Turdus iliacus*) and a mixed flock of 8 skylark (*Alauda arvensis*) and 20 meadow pipit (*Anthus pratensis*). In addition, a female goshawk (*Accipiter gentilis*) was observed flying from south-west to north-east across the site.

3.84 During a survey completed across the site in October 2016, species recorded included fieldfare (*Turdus pilaris*), robin (*Erithacus rubecula*), meadow pipit, jay (*Garrulus glandarius*), blue tit (*Cyanistes caeruleus*), wren (*Troglodytes troglodytes*) and great spotted woodpecker (*Dendrocopos major*). Raven (*Corvus corax*) and black-headed gull (*Chroicocephalus ridibundus*) were also seen flying over the site.

3.85 During the survey completed in February 2019, species recorded included flocks of 40+ redwing, mixed flocks of redwing, fieldfare and starling (*Sturnus vulgaris*), mixed flocks of chaffinch, goldfinch and yellowhammer (*Emberiza citronella*), mixed flocks of long-tailed tit (*Aegithalos caudatus*), blue tit and great tit (*Parus major*) and large flocks of chaffinch (40+), jackdaw (*Corvus monedula*) (20+) and wood pigeon (*Columba palumbus*) (up to 50). Skylark and meadow pipit were observed in small mixed flocks and wren, robin, coal tit (*Periparus ater*), buzzard (*Buteo buteo*), sparrowhawk (*Accipiter nisus*), cormorant (*Phalacrocorax carbo*), song thrush (*Turdus philomelos*) and jay seen singly. Blackbird (*Turdus merula*), carrion crow (*Corvus corone*), magpie (*Pica pica*), jay, pied wagtail (*Motacilla alba subsp. yarrellii*), herring gull (*Larus argentatus*) and common gull, (*Larus canus*) were seen in pairs or small groups.

3.86 Many of these species were observed on adjacent pasture and boundary hedges and woodland and not on the arable fields. The species recorded were not seen as atypical for the site or for the local area.

3.87 WBRC returned a number of bird records from the data search. This included lesser redpoll (*Acanthis cabaret*), skylark, kingfisher, linnet (*Carduelis cannabina*), lesser spotted woodpecker, (*Dendrocopos minor*), yellowhammer, reed bunting, brambling, (*Fringilla montifringilla*), herring gull, house sparrow, (*Passer domesticus*), starling, redwing, song thrush, fieldfare and lapwing, (*Vanellus vanellus*). None of the records were specific to the site. The closest was a skylark returned from approximately 500m to the north of the site in 2009. The site provides suitable habitat for species returned from the desk study such as skylark, lapwing, linnet, yellowhammer, starling, redwing, song thrush and fieldfare.

Invertebrates

3.88 The site does not support any locally rare habitats, but does support semi-improved grassland which offers suitable habitat for a range of invertebrates. The hedgerows also provide habitat for a range of invertebrates. The arable land and other habitats across the site are considered unlikely to support any notable invertebrate species. It is

therefore anticipated that a number of invertebrates are likely to occur on the site, as well as in the wider area. During the surveys conducted between 2016-2018, incidental observation of red admiral (*Vanessa atalanta*), small tortoiseshell (*Aglais urtica*), peacock (*Aglaisis io*), large white (*Pieris brassicae*), small white (*P. rapae*), brimstone (*Gonepteryx rhamni*), orange tip (*Anthocharis cardamines*), common blue (*Polyommatus icarus*), small copper (*Lycaena phlaeas*) small skipper (*Thymellus sylvestris*), meadow brown (*Maniola jurtina*), speckled wood (*Pararge aegeria*) and gatekeeper (*Pyronia tithonus*) butterflies were seen on the site.

3.89 WBRC returned a large number of invertebrate records from within 3km of the site. These records included beetles, butterflies, moths and flies. The records are dated between 1999 and 2014. Three of these records were specific to the site, these included necklace ground beetle (*Carabus monilis*), in 2007 and 2008 and garden tiger (*Arctia caja*), in 2007.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Ecological Designations

4.1 There were no statutory designations present on the site, however, seven were returned within 3km of the central point of the site. The closest of these was approximately 620m from the boundary and is therefore considered unlikely to be impacted by the proposals. No other statutory designations are anticipated to be impacted by the proposals.

4.2 Fourteen LWS were returned from WBRC within the 3km search radius. The closest of these is Staffordshire and Worcestershire Canal LWS, located approximately 160m to the north-west at its closest point. In addition, the River Stour LWS is located approximately 190m from the site boundary. It is beyond the scope of this report to comment on whether this LWS might be impacted by potential hydrological changes.

4.3 All other non-statutory designated sites are further than 300m from the site boundary and are therefore not anticipated to be impacted by the proposals.

4.4 All areas of ancient woodland are situated at least 250m from the site boundary and are not anticipated to be impacted by the proposals.

4.5 To fully assess potential hydrological impacts from the proposals for the site it is recommended that a detailed hydrological assessment is conducted.

Habitats

4.6 The majority of the habitats present within the site are considered to be of relatively low ecological importance due to their species-poor and widespread nature. It is therefore considered that the habitats present on the site will not be of any greater than local value.

4.7 It is recommended that as part of the proposed development plan, a minimum of a 10m stand-off is observed from the boundary features of woodland and hedgerows to maintain their quality. It will also be necessary to maintain the root protection zones from all trees to be retained in line with BS5837:2012 – Trees in relation to design, demolition and construction. Where possible, mature standard trees present on the site should be retained. The restoration plan should include habitats of equal or greater quality than the current situation in line with the emerging best practice guidelines on biodiversity net gain. The restoration of the site should also seek to provide functional connections to the existing retained habitats in the wider area.

4.8 Habitats of principal importance are present in close proximity to the site, mainly in the form of broad-leaved woodland adjacent to the western boundary of the site. This habitat should be retained and measures should be put in place to avoid and minimise any indirect impacts on this woodland.

Protected Species

Badgers

4.9 The results of the badger findings are reported separately in the confidential annex in Appendix 6. It is recommended that regular badger update surveys are completed on the site as this species can be quite unpredictable regarding sett creation. Surveys should be completed 6 months prior to the commencement of the works, and 6 months prior to the commencement of each subsequent phase of works.

Bats

4.10 Bats are protected under the Conservation of Habitats and Species Regulations 2017 and the Wildlife and Countryside Act 1981 (as amended). This legislation affords them protection against killing, injury and disturbance, as well as the damage, destruction or obstruction of access to their resting places, in addition to other actions (please see Appendix 4 for details of wildlife legislation).

4.11 Following initial site surveys four trees on the site were assessed as having moderate potential for bat roosts (T1, T2, T3 and T5), a fifth, T4 was assessed as having high potential. Bat roost presence/absence surveys are therefore recommended on these trees to establish the likely presence or absence of roosting bats. These surveys require at least two surveys for trees that offer moderate roosting potential and at least three surveys for trees that offer high bat roosting potential. The surveys must be a combination of dusk and dawn surveys and must be completed by suitably licensed ecologists.

4.12 The site is considered to offer suitable foraging and commuting habitat for bats in the form of hedgerows and woodland edge. The majority of the site offers limited opportunities for foraging and commuting bats due to the large areas of open arable land. For this reason, the site is considered to provide low suitability foraging and commuting habitat for bats. The wider area offers extensive high quality habitat in the form of broad-leaved woodland and waterbodies.

4.13 Bat activity surveys are therefore recommended to establish the bat assemblage across the site. For sites supporting low quality habitat such as this site, one visit per transect each season (spring, summer and autumn) is required in order to follow current guidelines. In addition, one static detector location is required per season (spring, summer and autumn) with data to be collected on five consecutive nights each season.

4.14 It is our understanding that the boundary trees of the site will be retained and un-affected throughout the duration of the works. Where this is not possible, these trees will require bat roost inspection surveys to identify any potential for roosting bats. This may involve further detailed presence/absence or roost characterisation bat roost surveys and associated mitigation and/or compensation strategies that might require European Protected Species (EPS) licensing.

Reptiles

4.15 A number of areas on the site were identified as suitable habitat for reptiles. Local records returned from the data search included grass snakes.

4.16 All British reptiles are protected under the Wildlife and Countryside Act 1981 (as amended) against killing and injury amongst other actions (please see Appendix 4 for details of wildlife legislation).

4.17 Presence/absence surveys for reptiles were undertaken in 2016 to establish whether reptiles occur in areas anticipated to be affected by the proposed works. These surveys help ensure legal compliance and assist in fully informing the ecological impacts of the proposals as well as the design of any mitigation measures (if necessary).

4.18 The reptile surveys involved at least seven visits. No reptiles were recorded during the survey period (please see PSL Report Reference Number: PSC1biii435.R.004 and therefore it is considered highly unlikely that reptiles would occur on the site.

Breeding Birds

4.19 The site supports good habitat for farmland species of birds. All wild birds, their nests and eggs are protected under the Wildlife & Countryside Act 1981 (as amended) from the time that the nest is being built until the nest is no longer in use (the nesting season is typically between late February and late August).

4.20 Breeding bird surveys were completed in 2016 and these survey results are now considered out of data and therefore update surveys are recommended. Update surveys should involve at least two survey visits between April and June to record the bird assemblage across the site. All surveys should be conducted by a suitably experienced ecologist.

Wintering Birds

4.21 Birds observed during the winter months were considered typical of the site habitats and the local area being consistent with WBRC records. It is not considered necessary to complete additional surveys in relation to wintering birds.

Other protected and notable species

4.22 Apart from the species listed above, there are no obvious and immediate issues regarding other protected and notable species on the site.

5.0 REFERENCES

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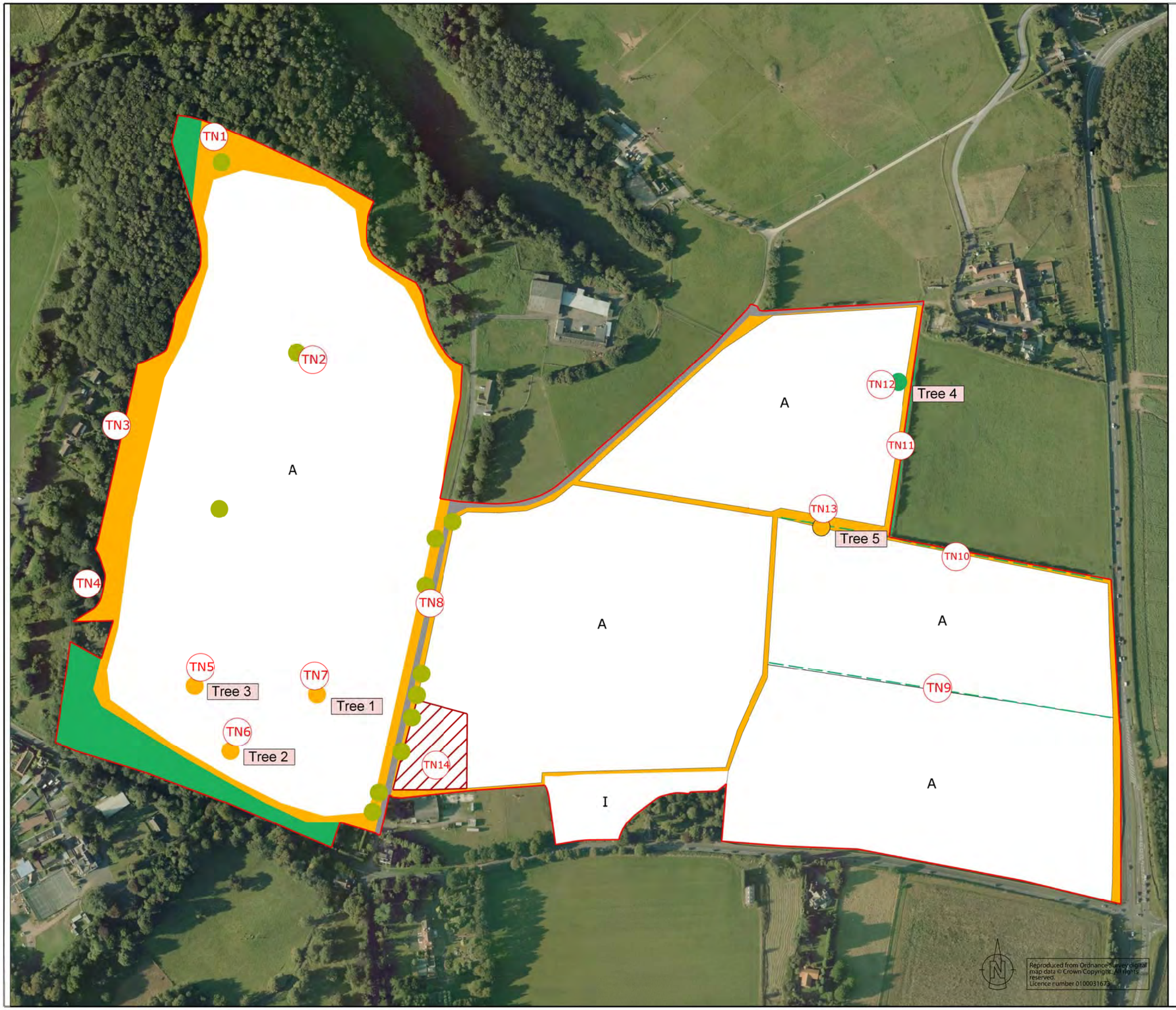
DRAWING M16.176(a).D.006

PRELIMINARY ECOLOGICAL APPRAISAL



Legend

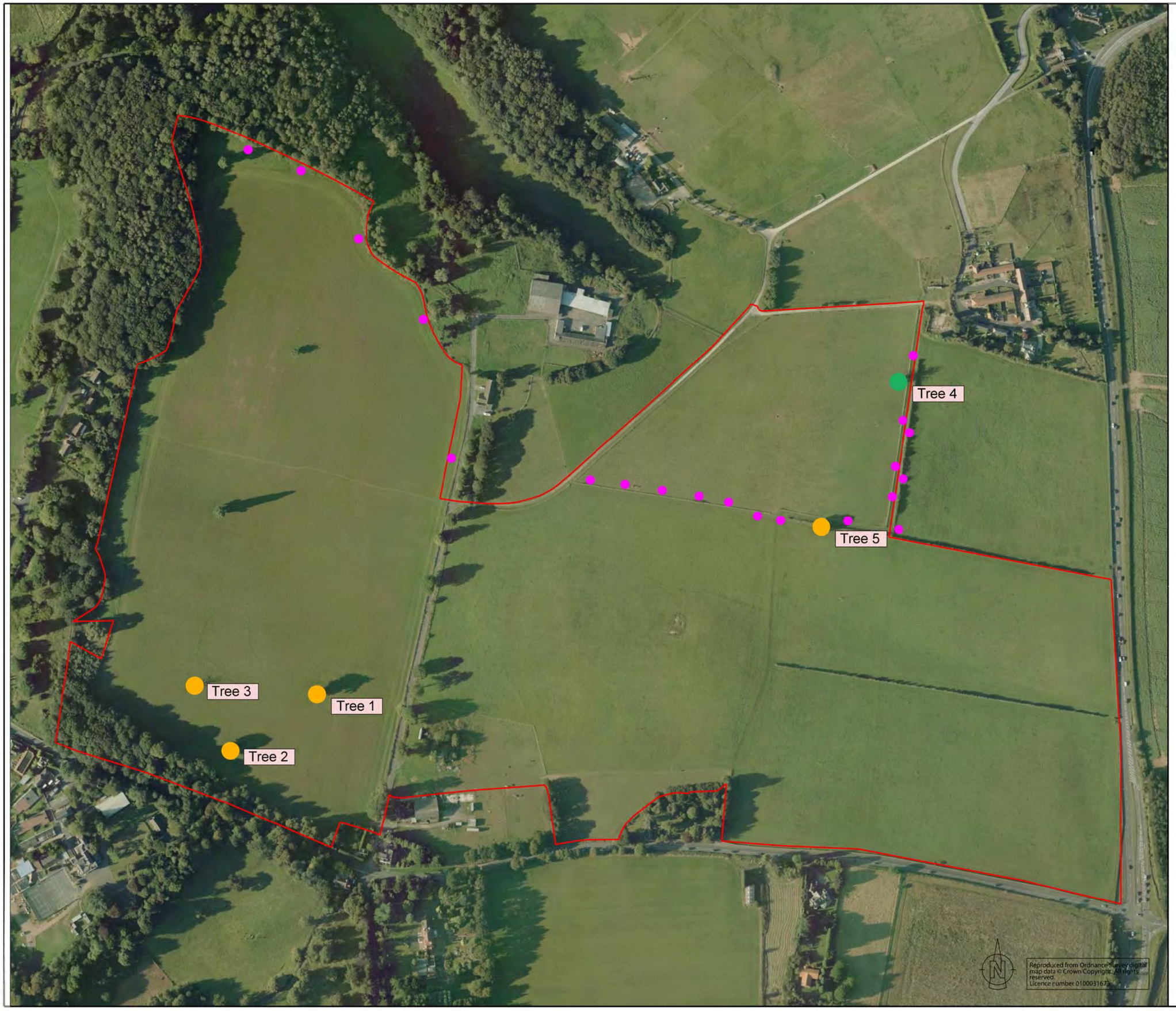
- Site boundary
- Broad-leaved and mixed plantation woodland
- Semi-improved neutral grassland
- I — Improved grassland
- Tall ruderal
- A — Arable
- Native intact hedgerow
- Native defunct hedgerow
- Hardstanding
- Standard tree
- Tree with moderate bat roosting potential
- Tree with high bat roosting potential
- Tree 1 — Tree Number
- TN1 — Target Note Number

DRAWING STATUS	**FINAL**
PROJECT	**LEA CASTLE FARM**
CLIENT	**NRS Aggregates Ltd**
TITLE	**Preliminary Ecological Appraisal**
DATE: **March 2019**	SCALE: **1:3,500 @A3**
DRAWN: **KH**	CHECKED: **SC**
DRAW NO.: **M16.176(a).D.006**	REVISION

PleydellSmithyman

DRAWING M16.176(a).D.020

HARVEST MOUSE REFUGIA LOCATIONS



Legend

- Site boundary
- Tree with moderate roosting potential
- Tree with high roosting potential
- Tree 1 — Tree Number
- Harvest Mouse Refugia Location

DRAWING STATUS	**FINAL**
PROJECT	**LEA CASTLE FARM**
CLIENT	**NRS Aggregates Ltd**
TITLE	**Harvest Mouse Refugia Locations**
DATE: **March 2019**	SCALE: **1:3,500 @A3**
DRAWN: **KH**	CHECKED: **SC**
DRAW NO.: **M16.176(a).D.020**	REVISION:

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APPENDIX 1

Information obtained from Worcestershire Biological Records Centre

Worcestershire Biological Records Centre

Protected/notable species and designated sites information

Protected/notable species and designated sites information held by WBRC as at 04/05/18 for 3km radius around Central Grid Ref SO834789 Wolverley.

Protected/notable species - objects, which are wholly or partially within 3km of site.

No	Scientific Name	Common Name	Grid Ref	Location Name	Date	Comments	Status
839	*Bufo bufo*	Common Toad	SO84567796	Podmore Pool	1996		WCA NERC s.41 UKBAP
706	*Bufo bufo*	Common Toad	SO834774	Springfield Park	2003		WCA NERC s.41 UKBAP
850	*Bufo bufo*	Common Toad	SO845777	Podmore Pool	05/07/96	30 Adults	WCA NERC s.41 UKBAP
853	*Bufo bufo*	Common Toad	SO845780	Podmore Pool	06/05/02	15 Adult	WCA NERC s.41 UKBAP
707	*Bufo bufo*	Common Toad	SO834778	Stack Pools	06/07/02	2 Adult	WCA NERC s.41 UKBAP
958	*Bufo bufo*	Common Toad	SO853779	Hurcott Pool	05/09/02	2 present	WCA NERC s.41 UKBAP
707	*Bufo bufo*	Common Toad	SO834778	Stack Pools	06/09/02		WCA NERC s.41 UKBAP
178	*Bufo bufo*	Common Toad	SO856800	Island Pool	20/07/03	Pool & dry valley; toadlets	WCA NERC s.41 UKBAP
605	*Bufo bufo*	Common Toad	SO829794	Bishop's Field	13/07/04		WCA NERC s.41 UKBAP
1054	*Bufo bufo*	Common Toad	SO862781	Wannerton Farm	23/02/07		WCA NERC s.41 UKBAP
997	*Bufo bufo*	Common Toad	SO857779	Hurcott	23/02/07		WCA NERC s.41 UKBAP
724	*Bufo bufo*	Common Toad	SO835781	Springfield Park	20/03/07		WCA NERC s.41 UKBAP
712	*Bufo bufo*	Common Toad	SO834796	Wolverley/Lea Castle Fm	02/07/09	3 Juvenile	WCA NERC s.41 UKBAP
382	*Bufo bufo*	Common Toad	SO820776	Franche	16/07/2016		WCA NERC s.41 UKBAP
722	*Bufo bufo*	Common Toad	SO835778	Springfield Park	23/01/2017		WCA NERC s.41 UKBAP
706	*Bufo bufo*	Common Toad	SO834774	Springfield Park	Aug-05	15 Adult	WCA NERC s.41 UKBAP
9	*Lissotriton vulgaris*	Smooth Newt	SO8377	Old Sand Quarry, nr Kidderminster	Apr-98		WCA
724	*Lissotriton vulgaris*	Smooth Newt	SO835781	Springfield Park	17/04/07		WCA
313	*Lissotriton vulgaris*	Smooth Newt	SO816767	Baxter College, Kidderminster	11/06/2009	Within both ponds on site	WCA
706	*Rana temporaria*	Common Frog	SO834774	Springfield Park	2003		WCA
605	*Rana temporaria*	Common Frog	SO829794	Bishop's Field	14/06/99		WCA
853	*Rana temporaria*	Common Frog	SO845780	Podmore Pool	06/05/02	7 Adults	WCA

No	Scientific Name	Common Name	Grid Ref	Location Name	Date	Comments	Status
175	*Rana temporaria*	Common Frog	SO855803	Island Pool	17/07/02		WCA
176	*Rana temporaria*	Common Frog	SO855805	Island Pool	17/07/02		WCA
958	*Rana temporaria*	Common Frog	SO853779	Hurcott Pool	05/09/02	3 present	WCA
851	*Rana temporaria*	Common Frog	SO845778	Kidderminster	02/03/03	spawn in garden	WCA
605	*Rana temporaria*	Common Frog	SO829794	Bishop's Field	13/07/04		WCA
605	*Rana temporaria*	Common Frog	SO829794	Bishop's Field	22/09/05		WCA
659	*Rana temporaria*	Common Frog	SO831793	Bishops Field	07/06/06		WCA
724	*Rana temporaria*	Common Frog	SO835781	Springfield Park	20/03/07		WCA
270	*Rana temporaria*	Common Frog	SO813772	Briars Hotel site, Habberley Rd	31/05/08		WCA
703	*Rana temporaria*	Common Frog	SO834768	Kidderminster	05/06/2016	All stages	WCA
706	*Rana temporaria*	Common Frog	SO834774	Springfield Park	Aug-05	20+ Adult	WCA
605	*Acanthis cabaret*	Lesser Redpoll	SO829794	Bishop's Field	2009		NERC s.41 UKBAP Bird:Red
605	*Alauda arvensis*	Skylark	SO829794	Bishop's Field	2009	overhead	NERC s.41 Bird:Red
83	*Alauda arvensis*	Skylark	SO823815	Round Hill	24/04/06	1 singing, rough grassland	NERC s.41 Bird:Red
92	*Alauda arvensis*	Skylark	SO825817	Round Hill	27/04/06	1 singing, rough grassland	NERC s.41 Bird:Red
83	*Alauda arvensis*	Skylark	SO823815	Round Hill	27/04/06	1 singing, rough grassland	NERC s.41 Bird:Red
148	*Alauda arvensis*	Skylark	SO846811	Cookley	10/04/07	2 songs heard	NERC s.41 Bird:Red
855	*Alauda arvensis*	Skylark	SO845796	Wolverley	16/04/07	2 songs heard; arable	NERC s.41 Bird:Red
149	*Alauda arvensis*	Skylark	SO846812	Caunsall	25/04/07	Song heard; arable	NERC s.41 Bird:Red
151	*Alauda arvensis*	Skylark	SO847810	Cookley	07/05/08	Song. Arable	NERC s.41 Bird:Red
605	*Alcedo atthis*	Kingfisher	SO829794	Bishop's Field	2008	young male caught & ringed between rows of willows/pools	WCA
605	*Alcedo atthis*	Kingfisher	SO829794	Bishop's Field	2009		WCA
853	*Alcedo atthis*	Kingfisher	SO845780	Podmore Pool	18/07/02	1 Adult	WCA
958	*Alcedo atthis*	Kingfisher	SO853779	Hurcott Pool	05/09/02	1 Adult	WCA
557	*Alcedo atthis*	Kingfisher	SO828777	Puxton Marsh	05/01/05		WCA
722	*Anser anser*	Greylag Goose	SO835778	Kidderminster	31/03/2016		WCA
901	*Cettia cetti*	Cetti's Warbler	SO848778	Hurcott Meadow	17/06/05		WCA
849	*Cuculus canorus*	Cuckoo	SO845769	Hardy Av, Kidderminster	30/08/2016	Juvenile fed by blackbirds over breeding season in garden.	NERC s.41 UKBAP Bird:Red
557	*Dendrocopos minor*	Lesser Spotted Woodpecker	SO828777	Puxton Marsh	05/01/05		Bird:Red
605	*Emberiza citrinella*	Yellowhammer	SO829794	Bishop's Field	2009		NERC s.41 UKBAP Bird:Red
960	*Emberiza citrinella*	Yellowhammer	SO853798	Axborough Lane	16/04/07		NERC s.41 UKBAP Bird:Red
146	*Emberiza citrinella*	Yellowhammer	SO845809	Cookley	18/04/07		NERC s.41 UKBAP Bird:Red

No	Scientific Name	Common Name	Grid Ref	Location Name	Date	Comments	Status
87	*Emberiza citrinella*	Yellowhammer	SO824811	Iverley	02/07/08	Song & sighitng. Hedgerow	NERC s.41 UKBAP Bird:Red
192	*Emberiza citrinella*	Yellowhammer	SO858806	Caunsall	04/07/08	Song & sighitng. Hedgerow	NERC s.41 UKBAP Bird:Red
114	*Emberiza citrinella*	Yellowhammer	SO833812	Iverley Way Farm	May-06	Individuals above 3 different nests. On telegraph wires above hedgerow/arable.	NERC s.41 UKBAP Bird:Red
605	*Emberiza schoeniclus*	Reed Bunting	SO829794	Bishop's Field	2009	ringed	NERC s.41 UKBAP
605	*Emberiza schoeniclus*	Reed Bunting	SO829794	Bishop's Field	14/06/99		NERC s.41 UKBAP
853	*Emberiza schoeniclus*	Reed Bunting	SO845780	Podmore Pool	18/07/02	1 Adult	NERC s.41 UKBAP
557	*Emberiza schoeniclus*	Reed Bunting	SO828777	Puxton Marsh	05/01/05		NERC s.41 UKBAP
599	*Falco peregrinus*	Peregrine	SO829765	Kidderminster, Weavers Wharf	28/02/11	Photographed male perching on chimney stack	WCA
605	*Fringilla montifringilla*	Brambling	SO829794	Bishop's Field	2009	in very low numbers.	WCA
605	*Larus argentatus*	Herring Gull	SO829794	Bishop's Field	2009	overhead	Bird:Red
853	*Larus argentatus*	Herring Gull	SO845780	Podmore Pool	18/07/02	1 Adult	Bird:Red
605	*Linaria cannabina*	Linnet	SO829794	Bishop's Field	2009		Bird:Red
605	*Passer domesticus*	House Sparrow	SO829794	Bishop's Field	2009		NERC s.41 UKBAP Bird:Red
557	*Passer domesticus*	House Sparrow	SO828777	Puxton Marsh	05/01/05		NERC s.41 UKBAP Bird:Red
140	*Passer domesticus*	House Sparrow	SO84378007		02/06/2013		NERC s.41 UKBAP Bird:Red
414	*Passer domesticus*	House Sparrow	SO822769		09/05/2014		NERC s.41 UKBAP Bird:Red
773	*Passer domesticus*	House Sparrow	SO84017617	Kidderminster	29/03/2016		NERC s.41 UKBAP Bird:Red
990	*Passer domesticus*	House Sparrow	SO8568377403	Blakedown	14/01/2017		NERC s.41 UKBAP Bird:Red
773	*Passer domesticus*	House Sparrow	SO84027617	Kidderminster	24/02/2017		NERC s.41 UKBAP Bird:Red
145	*Perdix perdix*	Grey Partridge	SO844811	Caunsall	27/04/07	Orange tail feathers seen clearly in flight. Lack of eyestripe. Both rule out red-legged	NERC s.41 UKBAP Bird:Red
605	*Sturnus vulgaris*	Starling	SO829794	Bishop's Field	2009		Bird:Red
605	*Turdus iliacus*	Redwing	SO829794	Bishop's Field	2009		WCA Bird:Red
557	*Turdus iliacus*	Redwing	SO828777	Puxton Marsh	05/01/05		WCA Bird:Red
605	*Turdus philomelos*	Song Thrush	SO829794	Bishop's Field	2009		Bird:Red
605	*Turdus philomelos*	Song Thrush	SO829794	Bishop's Field	06/07/04		Bird:Red
557	*Turdus philomelos*	Song Thrush	SO828777	Puxton Marsh	05/01/05		Bird:Red
815	*Turdus philomelos*	Song Thrush	SO843773	Greenhill	13/05/06	1 singing, garden	Bird:Red

No	Scientific Name	Common Name	Grid Ref	Location Name	Date	Comments	Status
139	*Turdus philomelos*	Song Thrush	SO842808	Cookley	29/04/08	Song & sighting. Woodland	Bird:Red
605	*Turdus pilaris*	Fieldfare	SO829794	Bishop's Field	2009		WCA Bird:Red
1044	*Turdus pilaris*	Fieldfare	SO861787	Blakedown	02/01/2017		WCA Bird:Red
605	*Vanellus vanellus*	Lapwing	SO829794	Bishop's Field	2009	overhead	NERC s.41 UKBAP Bird:Red
165	*Vanellus vanellus*	Lapwing	SO853800	Axborough Lane	01/04/06	3 perched; arable	NERC s.41 UKBAP Bird:Red
969	*Pinus sylvestris*	Scots Pine	SO854779	Hurcott Pool	17/09/04		Nationally Scarce
71	*Pinus sylvestris*	Scots Pine	SO820808	Kingsford Heath	12/06/07	Widespread	Nationally Scarce
504	*Pinus sylvestris*	Scots Pine	SO826762	Sutton Park Road Cemetery	15/08/07	DAFOR; LF	Nationally Scarce
758	*Pinus sylvestris*	Scots Pine	SO838762	Kidderminster train station	30/05/13		Nationally Scarce
47	*Pinus sylvestris*	Scots Pine	SO810801	Horseley Hills	07/10/13		Nationally Scarce
626	*Achillea ptarmica*	Sneezewort	SO830785	Wolverley Court Lock Mdw	1998		Locally Nb
532	*Achillea ptarmica*	Sneezewort	SO827774	Puxton Marsh	26/08/98	WWT Wetlands Survey	Locally Nb
982	*Aira caryophyllea*	Silver Hair-grass	SO855791	nr Lea Castle Hospital	27/06/93	Scattered plants in set-aside arable	Locally Nb
720	*Aira caryophyllea*	Silver Hair-grass	SO835765	Kidderminster ring road	19/05/94	Locally Common; roadside bank	Locally Nb
808	*Aira caryophyllea*	Silver Hair-grass	SO842768	Chester Rd, Kidderminster	09/06/94	Several plants; railway bank	Locally Nb
947	*Aira caryophyllea*	Silver Hair-grass	SO852793	Lea Castle	05/07/97	Locally Common; bare waste ground	Locally Nb
898	*Aira caryophyllea*	Silver Hair-grass	SO848772	A456, Offmore	16/07/97	Sizeable patch on sandy grass verge	Locally Nb
133	*Aira caryophyllea*	Silver Hair-grass	SO841801	Cookley	22/06/98	Locally abundant on disused tennis courts	Locally Nb
15	*Aira praecox*	Early Hair-grass	SO8579	SO87 tetrad P	1992		Locally Nb
14	*Aira praecox*	Early Hair-grass	SO8577	SO87 tetrad N	1994		Locally Nb
9	*Aira praecox*	Early Hair-grass	SO8377	SO87 tetrad I	1994		Locally Nb
315	*Althaea officinalis*	Marsh-Mallow	SO816773	Blake Marsh	18/08/98	WWT Wetlands Survey - 1 specimen only, garden escape?	Nationally Scarce
315	*Althaea officinalis*	Marsh-Mallow	SO816773	Blake Marsh	24/07/02	Large plant on edge of marsh. Perhaps most likely persistent garden throw-out than planted	Nationally Scarce
141	*Anthemis arvensis*	Corn Chamomile	SO843804	Cookley	May-92	5/6 plants in horse pasture by canal	Locally Nb
117	*Anthemis arvensis*	Corn Chamomile	SO834813	Blakeshall	06/06/93	3 large plants in sandy set-aside	Locally Nb
1006	*Anthriscus caucalis*	Bur Parsley	SO858791	Lea Castle	25/05/92	Large patch in arable set-aside	Locally Nb
105	*Anthriscus caucalis*	Bur Parsley	SO830811	Blakeshall	15/03/98	2 plants on gravel driveway	Locally Nb

No	Scientific Name	Common Name	Grid Ref	Location Name	Date	Comments	Status
91	*Anthriscus caucalis*	Bur Parsley	SO825808	Solcum Farm	29/03/98	A few plants in a hedgerow	Locally Nb
797	*Berula erecta*	Lesser Water-parsnip	SO841780	Broadwaters	10/06/94	A few plants by stream	Locally Nb
785	*Berula erecta*	Lesser Water-parsnip	SO840779	Broadwaters, Kidderminster	10/06/94	1 or 2 plants by stream	Locally Nb
770	*Berula erecta*	Lesser Water-parsnip	SO839779	Broadwaters, Kidderminster	12/08/95	A few plants on edge of stream	Locally Nb
32	*Berula erecta*	Lesser Water-parsnip	SO8577	Hurcott Carr	09/06/98	WWT Wetlands Survey	Locally Nb
871	*Berula erecta*	Lesser Water-parsnip	SO846779	Podmore Pool & Carr	03/07/98	Pool swamp	Locally Nb
557	*Berula erecta*	Lesser Water-parsnip	SO828777	Puxton Marsh	17/08/98	Cmpt A - Alder / willow copse	Locally Nb
330	*Berula erecta*	Lesser Water-parsnip	SO817773	Blake Marsh	18/08/98	WWT Wetlands Survey	Locally Nb
853	*Berula erecta*	Lesser Water-parsnip	SO845780	Podmore Pool & Carr	03/09/04	Carr wood tributary valley	Locally Nb
871	*Berula erecta*	Lesser Water-parsnip	SO846779	Podmore Pool & Carr	03/09/04	Swamp	Locally Nb
943	*Berula erecta*	Lesser Water-parsnip	SO852778	Hurcott Pool	17/09/04	Backmarsh S shore	Locally Nb
5	*Berula erecta*	Lesser Water-parsnip	SO8580	Island Pool	28/01/05		Locally Nb
557	*Bidens cernua*	Nodding Bur-marigold	SO828777	Puxton Marsh	17/08/98	Cmpt A - Core swampy area	Locally Nb
871	*Bidens cernua*	Nodding Bur-marigold	SO846779	Podmore Pool & Carr	03/09/04	Swamp	Locally Nb
871	*Bidens tripartita*	Trifid Bur-marigold	SO846779	Podmore Pool & Carr	03/09/04	Swamp	Locally Nb
146	*Blechnum spicant*	Hard Fern	SO806797	Parkatt Wood Cliff	19/04/03		Locally Nb
120	*Buxus sempervirens*	Box	SO835801	Gloucester Coppice	12/06/07		Nationally Rare
79	*Calluna vulgaris*	Heather	SO821815	Kingsford Farm	26/08/93	Patch on grassy verge of footpath	Locally Nb
183	*Calluna vulgaris*	Heather	SO808798	Cornhill Coppice	22/04/94	Fair sized patch in acid woodland	Locally Nb
656	*Calluna vulgaris*	Heather	SO831775	Larkhill, Kidderminster	14/05/94	Sizeable patch on acid heathy waste ground	Locally Nb
66	*Calluna vulgaris*	Heather	SO818803	Drakelow Lane, Wolverley	12/03/03	Sandstone outcrop E side	Locally Nb

No	Scientific Name	Common Name	Grid Ref	Location Name	Date	Comments	Status
739	*Campanula latifolia*	Giant Bellflower	SO836796	Wolverley	11/05/92	Alder wood between canal and Stour - small patch in wood & large clump on river bank	Locally Nb
122	*Campanula patula*	Spreading Bellflower	SO835813	Blakeshall	Jul-93	12 plants in sandy set-aside	NERC s.41 UKBAP Locally Nb Nationally Scarce
113	*Campanula patula*	Spreading Bellflower	SO833809	Snake Lane, Blakeshall	06/08/93	1 plant in arable	NERC s.41 UKBAP Locally Nb Nationally Scarce
121	*Campanula patula*	Spreading Bellflower	SO835805	Debdale	23/07/02	4 or 5 plants in bracken on south slope of dry sandstone valley	NERC s.41 UKBAP Locally Nb Nationally Scarce
479	*Cardamine amara*	Large Bitter-cress	SO825795	Drakelow Marsh, Wolverley	12/05/92	Scattered - shaded streamside	Locally Nb
884	*Cardamine amara*	Large Bitter-cress	SO847778	Between Hurcott & Podmore Pools	11/05/93	Frequent in alder carr	Locally Nb
690	*Cardamine amara*	Large Bitter-cress	SO833778	NE of Limekiln Bridge, Kidderminster	14/05/94	Good colony on shaded canal bank	Locally Nb
853	*Cardamine amara*	Large Bitter-cress	SO845780	Podmore Pool	14/07/94	Scarce on pool margins	Locally Nb
416	*Cardamine amara*	Large Bitter-cress	SO822799	nr Bayhorse Farm, Wolverley	08/05/95	Single colony; damp woodland by stream	Locally Nb
748	*Cardamine amara*	Large Bitter-cress	SO837797	Lea Lane, Wolverey	08/05/95	Damp woodland between canal and Stour	Locally Nb
37	*Cardamine amara*	Large Bitter-cress	SO8678	Hurcott Carr	09/06/98	*Alnus* carr community 1b	Locally Nb
32	*Cardamine amara*	Large Bitter-cress	SO8577	Hurcott Carr	09/06/98	WWT Wetlands Survey	Locally Nb
901	*Cardamine amara*	Large Bitter-cress	SO848778	Podmore Pool & Carr	03/07/98	Carr	Locally Nb
557	*Cardamine amara*	Large Bitter-cress	SO828777	Puxton Marsh	17/08/98	Cmpt A - Alder / willow copse	Locally Nb
748	*Cardamine amara*	Large Bitter-cress	SO837797	Wolverley Carr	12/10/98	WWT Wetlands Survey	Locally Nb
870	*Cardamine amara*	Large Bitter-cress	SO846778	Podmore Pool & Carr	03/09/04	Carr / swamp transition	Locally Nb
968	*Carex acuta*	Slender Tufted-sedge	SO854778	Hurcott Pool	2001	A few plants in tall-sedge carr community (recorded here in 1978)	Locally Nb
658	*Carex disticha*	Brown Sedge	SO831784	Stourvale Marsh	25/06/95	Dried out marsh E of canal - frequent	Locally Nb
658	*Carex disticha*	Brown Sedge	SO831784	Wolverley Court Lock Carr	27/08/98	Marsh / swamp	Locally Nb
658	*Carex disticha*	Brown Sedge	SO831784	Wolverley Court Lock Carr	11/06/02	Locally common; marsh	Locally Nb

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871	*Carex muricata ssp. lamprocarpa*	Prickly Sedge	SO846779	Podmore	1996	Sandy grassland	Locally Nb
562	*Carex muricata ssp. lamprocarpa*	Prickly Sedge	SO828793	Wolverley Church	11/05/92	Rare in mown acid grassland	Locally Nb
1046	*Carex muricata ssp. lamprocarpa*	Prickly Sedge	SO861798	nr Whitehouse Farm, Ismere	03/05/93	2 or 3 plants in sandy hedgebank	Locally Nb
904	*Carex muricata ssp. lamprocarpa*	Prickly Sedge	SO848794	Lea Castle	29/06/93	1 plant on pathside	Locally Nb
135	*Carex muricata ssp. lamprocarpa*	Prickly Sedge	SO841804	Cookley	26/08/93	Single plant by path at back of steelworks	Locally Nb
833	*Carex muricata ssp. lamprocarpa*	Prickly Sedge	SO844761	Hillgrove Crescent, Kidderminster	09/06/94	3 plants in pavement	Locally Nb
942	*Carex muricata ssp. lamprocarpa*	Prickly Sedge	SO852776	Hurcott	09/06/94	A few plants in hedgebank	Locally Nb
276	*Carex muricata ssp. lamprocarpa*	Prickly Sedge	SO813794	Honeytop Farm	11/05/95	Locally frequent in sandy pasture	Locally Nb
561	*Carex muricata ssp. lamprocarpa*	Prickly Sedge	SO828792	B4189 / B4190 junction at Wolverly	25/06/95	Several plants; sandstone face	Locally Nb
1019	*Carex muricata ssp. lamprocarpa*	Prickly Sedge	SO859799	The Gorse	22/06/98	1 clump in sandy scrub	Locally Nb
873	*Carex muricata ssp. lamprocarpa*	Prickly Sedge	SO846781	Kendlewood Rd, Broadwater	22/06/98	2 clumps on house driveway	Locally Nb
925	*Carex muricata ssp. lamprocarpa*	Prickly Sedge	SO850779	Hurcott Pasture E	28/01/05		Locally Nb
902	*Carex muricata ssp. lamprocarpa*	Prickly Sedge	SO848779	Hurcott Pasture W	28/01/05		Locally Nb
49	*Carex muricata ssp. lamprocarpa*	Prickly Sedge	SO811803	Horsleyhills Farm	09/02/06	Sandstone bank N side of lane	Locally Nb
508	*Carex nigra*	Common Sedge	SO826794	Drakelow Marsh, Wolverley	11/05/92		Locally Nb
628	*Carex nigra*	Common Sedge	SO830794	Wolverley Marsh	25/06/95	Frequent	Locally Nb
534	*Carex nigra*	Common Sedge	SO827778	Puxton Marsh	26/06/95	Large stands	Locally Nb
557	*Carex nigra*	Common Sedge	SO828777	Puxton Marsh	17/08/98	Cmpt A - Core swampy area	Locally Nb
555	*Carex nigra*	Common Sedge	SO828772	Puxton Marsh	26/08/98	Community 1 - tall-herb fen	Locally Nb
180	*Carex paniculata*	Greater Tussock-sedge	SO856802	Island Pool	2002	Carr & marsh - still present	Locally Nb
853	*Carex paniculata*	Greater Tussock-sedge	SO845780	Podmore Pool & Carr	2000		Locally Nb

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884	*Carex paniculata*	Greater Tussock-sedge	SO847778	Between Hurcott & Podmore Pools	11/05/93	Local in alder carr	Locally Nb
660	*Carex paniculata*	Greater Tussock-sedge	SO831795	Edge of Gloucester Coppice	08/05/95	Single tussock by stagnant pool	Locally Nb
37	*Carex paniculata*	Greater Tussock-sedge	SO8678	Hurcott Carr	09/06/98	WWT Wetlands Survey	Locally Nb
32	*Carex paniculata*	Greater Tussock-sedge	SO8577	Hurcott Carr	09/06/98	WWT Wetlands Survey	Locally Nb
871	*Carex paniculata*	Greater Tussock-sedge	SO846779	Podmore Pool & Carr	03/07/98	Pool swamp	Locally Nb
901	*Carex paniculata*	Greater Tussock-sedge	SO848778	Podmore Pool & Carr	03/07/98	Carr	Locally Nb
557	*Carex paniculata*	Greater Tussock-sedge	SO828777	Puxton Marsh	17/08/98	Cmpt A - Alder / willow copse	Locally Nb
532	*Carex paniculata*	Greater Tussock-sedge	SO827774	Puxton Marsh	26/08/98	WWT Wetlands Survey	Locally Nb
671	*Carex paniculata*	Greater Tussock-sedge	SO832779	Stourvale Marsh	Aug - Sept 1998	Carex acutiformis stand	Locally Nb
628	*Carex paniculata*	Greater Tussock-sedge	SO830794	Wolverley Mdws	08/09/98	WWT Wetlands Survey	Locally Nb
944	*Carex paniculata*	Greater Tussock-sedge	SO852779	Hurcott Pool	17/09/04	Frequent along N shore	Locally Nb
167	*Carex paniculata*	Greater Tussock-sedge	SO85458037	Island Pool	28/01/05	4 tussocks; NW bay	Locally Nb
872	*Carex pseudocyperus*	Cyperus Sedge	SO846780	By Podmore Pool	14/07/94	A few plants	Locally Nb
37	*Carex pseudocyperus*	Cyperus Sedge	SO8678	Hurcott Carr	09/06/98	WWT Wetlands Survey	Locally Nb
32	*Carex pseudocyperus*	Cyperus Sedge	SO8577	Hurcott Pool	09/06/98	WWT Wetlands Survey	Locally Nb
902	*Carex pseudocyperus*	Cyperus Sedge	SO848779	Hurcott Carr	09/06/98	Recent coppice *alnus*	Locally Nb
901	*Carex pseudocyperus*	Cyperus Sedge	SO848778	Podmore Pool & Carr	03/07/98	Carr	Locally Nb
871	*Carex pseudocyperus*	Cyperus Sedge	SO846779	Podmore Pool & Carr	03/07/98	Pool swamp	Locally Nb
557	*Carex pseudocyperus*	Cyperus Sedge	SO828777	Puxton Marsh	17/08/98	Cmpt A - Alder / willow copse	Locally Nb
532	*Carex pseudocyperus*	Cyperus Sedge	SO827774	Puxton Marsh	26/08/98	WWT Wetlands Survey	Locally Nb
672	*Carex pseudocyperus*	Cyperus Sedge	SO832780	Stourvale Marsh	Aug - Sept 1998	Small area in *Arrhenatherum elatius* fen	Locally Nb
853	*Carex pseudocyperus*	Cyperus Sedge	SO845780	Podmore Pool & Carr	03/09/04	Carr wood tributary valley	Locally Nb

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871	*Carex pseudocyperus*	Cyperus Sedge	SO846779	Podmore Pool & Carr	03/09/04	Swamp	Locally Nb
944	*Carex pseudocyperus*	Cyperus Sedge	SO852779	Hurcott Pool	17/09/04	Frequemt along N shore	Locally Nb
173	*Carex pseudocyperus*	Cyperus Sedge	SO85568026	Island Pool	28/01/05		Locally Nb
838	*Carex vesicaria*	Bladder-sedge	SO84567791	Podmore Pool & Carr	03/09/04	Stand over 5-10m; S shore	Locally Nb
1018	*Carlina vulgaris*	Carline Thistle	SO859798	The Gorse, Ismere	25/06/92	Acid unimproved pasture - scarce (<100 plants)	Locally Nb
694	*Carpinus betulus*	Hornbeam	SO833796	Gloucester Coppice, Wolverley	11/05/92	Sycamore / yew plantation - naturalised, scattered	Locally Nb
874	*Carpinus betulus*	Hornbeam	SO846790	Cookley	25/05/92	Several trees on roadside verge	Locally Nb
350	*Carpinus betulus*	Hornbeam	SO818794	Lowe Lane, Fairfield	04/06/02	Hedge - established from plantings (E)	Locally Nb
562	*Cerastium arvense*	Field Mouse-Ear	SO828793	Wolverley Parish Church	11/05/92	Locally frequent in mown grass	Locally Nb
932	*Cerastium arvense*	Field Mouse-Ear	SO851779	Hurcott	11/05/93	Large colony scattered over sandy pasture	Locally Nb
363	*Cerastium arvense*	Field Mouse-Ear	SO819797	B4189, Lowe Lane, Fairfield	22/04/94	Small patch on grass verge nr junction	Locally Nb
275	*Cerastium arvense*	Field Mouse-Ear	SO813786	Honeytop Farm	11/05/95	Locally frequent in sandy pasture	Locally Nb
888	*Cerastium diffusum*	Dark-Green Mouse-Ear	SO847786	A449, Lea Castle	30/04/92	Central reservation - locally frequent	Locally Nb
507	*Cerastium diffusum*	Dark-Green Mouse-Ear	SO826793	By B4189, Wolverley	08/05/93	Sandy roadside verge - locally frequent	Locally Nb
719	*Cerastium diffusum*	Dark-Green Mouse-Ear	SO835760	Kidderminster ring road	19/05/94	Bare patches of verge - occasional (to SO834767)	Locally Nb
1017	*Cerastium semidecandrum*	Little Mouse-ear	SO859793	Axborough	30/04/92	Occasional; sandy hedgebank	Locally Nb
888	*Cerastium semidecandrum*	Little Mouse-ear	SO847786	A449, Lea Castle	30/04/92	Frequent in central reservation	Locally Nb
627	*Cerastium semidecandrum*	Little Mouse-ear	SO830792	Lock Inn, Wolverley	11/05/92	Mown grassland on sandy soil - frequent	Locally Nb
1029	*Cerastium semidecandrum*	Little Mouse-ear	SO860798	Ismere	03/05/93	Frequent in sandy unimproved pasture	Locally Nb
562	*Cerastium semidecandrum*	Little Mouse-ear	SO828793	Wolverley Church	08/05/93	Mown grass on sandy soil - locally frequent	Locally Nb
930	*Cerastium semidecandrum*	Little Mouse-ear	SO851773	A456, Offmore	11/05/93	4 or 5 in cracks in tarmac	Locally Nb

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902	*Cerastium semidecandrum*	Little Mouse-ear	SO848779	Hurcott	11/05/93	Frequent, sandy pasture	Locally Nb
276	*Cerastium semidecandrum*	Little Mouse-ear	SO813794	Honeytop Farm	11/05/95	Sandy pasture - locally frequent	Locally Nb
933	*Cerastium semidecandrum*	Little Mouse-ear	SO851780	Hurcott	04/06/97	Edge of sandy pasture - locally common	Locally Nb
562	*Ceratocapnos claviculata*	Climbing Corydalis	SO828793	Wolverley	11/05/92	Frequent in oakwood below church & sandstone cliffs above public house car park	Locally Nb
202	*Ceratocapnos claviculata*	Climbing Corydalis	SO809786	Hollies Farm	22/04/94	Small patch; sandstone rocks	Locally Nb
562	*Ceratocapnos claviculata*	Climbing Corydalis	SO828793	SO87 tetrad J	11/06/02	Still frequent here	Locally Nb
175	*Chara globularis*	Fragile Stonewort	SO855803	Island Pool	20/07/03		Locally Nb
346	*Chrysanthemum segetum*	Corn Marigold	SO818764	Pineridge Drive, Kidderminster	24/07/02	1 plant on disturbed ground	Locally Nb
884	*Chrysosplenium alternifolium*	Alternate-leaved Golden-saxifrage	SO847778	Between Hurcott & Podmore Pools	11/05/93	Locally frequent in alder carr	Locally Nb
37	*Chrysosplenium alternifolium*	Alternate-leaved Golden-saxifrage	SO8678	Hurcott Carr	09/06/98	*Alnus* carr community 1b	Locally Nb
748	*Chrysosplenium alternifolium*	Alternate-leaved Golden-saxifrage	SO837797	Wolverley Carr	12/10/98	WWT Wetlands Survey	Locally Nb
853	*Cicuta virosa*	Cowbane	SO845780	By Podmoor Pool	14/07/94	2 or 3 plants in reed-swamp	Locally Nb Nationally Scarce
892	*Cicuta virosa*	Cowbane	SO84797788	Podmore Pool	03/07/98	DAFOR; O	Locally Nb Nationally Scarce
871	*Cicuta virosa*	Cowbane	SO846779	Podmore Pool & Carr	03/07/98	WWT Wetlands Survey. DAFOR; O - pool swamp	Locally Nb Nationally Scarce
969	*Cicuta virosa*	Cowbane	SO854779	Podmore Pool	18/07/02		Locally Nb Nationally Scarce
853	*Cicuta virosa*	Cowbane	SO845780	Podmore Pool	18/07/02	DAFOR; O - Aquatic Habitat	Locally Nb Nationally Scarce
969	*Cicuta virosa*	Cowbane	SO854779	Hurcott & Podmore Pools	03/09/04		Locally Nb Nationally Scarce
853	*Cicuta virosa*	Cowbane	SO845780	Podmore Pool & Carr	03/09/04	DAFOR; O. Margin & reedswamp N shore	Locally Nb Nationally Scarce
852	*Cicuta virosa*	Cowbane	SO845779	Podmore Pool & Carr	03/09/04	DAFOR; LA. S shore & swamp	Locally Nb Nationally Scarce
870	*Cicuta virosa*	Cowbane	SO846778	Podmore Pool & Carr	03/09/04	DAFOR; LD, marginal swamp	Locally Nb Nationally Scarce

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872	*Cicuta virosa*	Cowbane	SO846780	Podmore Pool & Carr	03/09/04	DAFOR; LF. N shore edge, willow carr	Locally Nb Nationally Scarce
871	*Cicuta virosa*	Cowbane	SO846779	Podmore Pool & Carr	03/09/04	DAFOR; LD, marginal swamp	Locally Nb Nationally Scarce
816	*Cicuta virosa*	Cowbane	SO843779	Podmore Pool & Carr	03/09/04	Dam wall / spillway; 1	Locally Nb Nationally Scarce
835	*Cicuta virosa*	Cowbane	SO844780	Podmore Pool & Carr	03/09/04	DAFOR; O. Reedswamp N shore	Locally Nb Nationally Scarce
834	*Cicuta virosa*	Cowbane	SO844779	Podmore Pool & Carr	03/09/04	DAFOR; LF. S shore & swamp	Locally Nb Nationally Scarce
818	*Cicuta virosa*	Cowbane	SO843780	Podmore Pool & Carr	03/09/04	DAFOR; R - dam wall	Locally Nb Nationally Scarce
820	*Cicuta virosa*	Cowbane	SO84387798	Podmore Pool & Carr	03/09/04	Walls of overflow by mill race; 1	Locally Nb Nationally Scarce
314	*Cirsium dissectum*	Meadow Thistle	SO816772	Blakemarsh	16/08/07	DAFOR; O	Locally Nb
204	*Clinopodium ascendens*	Common Calamint	SO809795	A442 / B4189 junc. NW of Honeytop	22/04/94	Locally frequent in sandy hedgebank - long known here	Locally Nb
182	*Clinopodium ascendens*	Common Calamint	SO808796	By A442 NW of Honeytop	22/04/94	Scattered plants on sandstone rock	Locally Nb
535	*Convallaria majalis*	Lily of The Valley	SO827793	Wolverley Church	11/06/01	Small patch in churchyard	Locally Nb
71	*Convallaria majalis*	Lily of The Valley	SO820808	Kingsford Heath	12/06/07	DAFOR; R	Locally Nb
1066	*Cruciata laevipes*	Crosswort	SO863783	Wannerton	03/05/93	W bank of lane next to Hurcott Wood - 3 patches	Locally Nb
292	*Cynoglossum officinale*	Hound's-tongue	SO814791	Honeytop Farm	11/05/95	Frequent in sandy pasture to SO813794	Locally Nb
166	*Cyperus longus*	Galingale	SO853806	Caunsall Marsh	06/12/07		Nationally Scarce
626	*Dactylorhiza praetermissa*	Southern Marsh-orchid	SO830785	Wolverley Court Lock Mdw	1998		Locally Nb
347	*Dactylorhiza praetermissa*	Southern Marsh-orchid	SO818773	Blake Marsh	2001		Locally Nb
658	*Dactylorhiza praetermissa*	Southern Marsh-orchid	SO831784	Wolverley Court Lock Mdw	11/05/92	c.50 plants	Locally Nb
505	*Dactylorhiza praetermissa*	Southern Marsh-orchid	SO826785	Stourvale Marsh	25/06/95	500+ plants; W of canal & river	Locally Nb
708	*Dactylorhiza praetermissa*	Southern Marsh-orchid	SO834783	Below Sion Hill	25/06/95	c.20 plants in small marsh on edge of carr	Locally Nb
534	*Dactylorhiza praetermissa*	Southern Marsh-orchid	SO827778	Puxton Marsh	26/06/95	400-500 plants	Locally Nb

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557	*Dactylorhiza praetermissa*	Southern Marsh-orchid	SO828777	Puxton Marsh	17/08/98	Cmpt A - various	Locally Nb
555	*Dactylorhiza praetermissa*	Southern Marsh-orchid	SO828772	Puxton Marsh	26/08/98	Community 1 - tall-herb fen	Locally Nb
556	*Dactylorhiza praetermissa*	Southern Marsh-orchid	SO828773	Puxton Marsh	26/08/98	Community 2 - *Filipendula* / *Angelica*	Locally Nb
505	*Dactylorhiza praetermissa*	Southern Marsh-orchid	SO826785	Stourvale Marsh	11/06/02	Still frequent (to SO827785)	Locally Nb
658	*Dactylorhiza praetermissa*	Southern Marsh-orchid	SO831784	Wolverley Court Lock Mdw	11/06/02	Still scattered plants to SO831785	Locally Nb
27	*Dactylorhiza praetermissa*	Southern Marsh-orchid	SO8477	Kidderminster	19/06/2010		Locally Nb
1018	*Danthonia decumbens*	Heath-grass	SO859798	The Gorse, Ismere	25/06/92	Acid unimproved pasture - scarce	Locally Nb
1019	*Danthonia decumbens*	Heath-grass	SO859799	Whitehouse Bank, The Gorse	05/07/96	Bank in unimproved pasture	Locally Nb
131	*Deschampsia flexuosa*	Wavy Hair-grass	SO840802	Debdale Lock	1993	sandstone bank above canal	Locally Nb
15	*Deschampsia flexuosa*	Wavy Hair-grass	SO8579	SO87 tetrad P	1992		Locally Nb
10	*Deschampsia flexuosa*	Wavy Hair-grass	SO8379	SO87 tetrad J	1993		Locally Nb
66	*Deschampsia flexuosa*	Wavy Hair-grass	SO818803	Drakelow Lane, Wolverley	12/03/03	Sandstone outcrop E side	Locally Nb
83	*Deschampsia flexuosa*	Wavy Hair-grass	SO823815	Kingsford Country Park	12/03/03	by road	Locally Nb
130	*Deschampsia flexuosa*	Wavy Hair-grass	SO840801	Staffs & Worcs Canal	28/01/05	Cliff adj Debdale Lock	Locally Nb
126	*Deschampsia flexuosa*	Wavy Hair-grass	SO839801	Cookley Banks POS	28/01/05	Cliff	Locally Nb
981	*Dianthus deltoides*	Maiden Pink	SO855788	Lea Castle	27/06/93	Set-aside arable - 1 plant also in 1994 (field ploughed 1996)	Locally Nb Nationally Scarce
63	*Dipsacus pilosus*	Small Teasel	SO817810	lane to Little Kingsford Farm	30/08/93	2 plants on shaded streamside	Locally Nb
72	*Dipsacus pilosus*	Small Teasel	SO820810	Kingsford Lane	22/10/95	Lane verge nr caravan park	Locally Nb
277	*Dryopteris affinis ssp. affinis*	a buckler-fern	SO813798	N of B4189	22/04/94	Wooded bank of sandstone scarp - very locally frequent	Locally Nb
73	*Dryopteris carthusiana*	Narrow Buckler-fern	SO820813	Kingsford	1993	Wooded streamside	Locally Nb
182	*Dryopteris carthusiana*	Narrow Buckler-fern	SO856809	A449 nr Caunsall	1993	LF in strip of damp woodland	Locally Nb
28	*Dryopteris carthusiana*	Narrow Buckler-fern	SO8478	Podmore Pool & Carr	2000		Locally Nb

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748	*Dryopteris carthusiana*	Narrow Buckler-fern	SO837797	N of Wolverley Lodge	11/05/92	Local in alder carr	Locally Nb
692	*Dryopteris carthusiana*	Narrow Buckler-fern	SO833783	Broadwaters, Kidderminster	14/05/94	Scattered plants in carr	Locally Nb
306	*Dryopteris carthusiana*	Narrow Buckler-fern	SO815773	Blakebrook	11/06/95	Several plants, damp woodland	Locally Nb
37	*Dryopteris carthusiana*	Narrow Buckler-fern	SO8678	Hurcott Carr	09/06/98	*Alnus* carr community 1b	Locally Nb
902	*Dryopteris carthusiana*	Narrow Buckler-fern	SO848779	Hurcott Carr	09/06/98	Recent coppice *alnus*	Locally Nb
557	*Dryopteris carthusiana*	Narrow Buckler-fern	SO828777	Puxton Marsh	17/08/98	Cmpt A - Alder / willow copse	Locally Nb
692	*Dryopteris carthusiana*	Narrow Buckler-fern	SO833783	Wolverley Court Lock Carr	27/08/98	Willow woodland	Locally Nb
870	*Dryopteris carthusiana*	Narrow Buckler-fern	SO846778	Podmore Pool & Carr	03/09/04	Carr / swamp transition	Locally Nb
505	*Epilobium palustre*	Marsh Willowherb	SO826785	Stourvale Marsh	25/06/95	Frequent	Locally Nb
534	*Epilobium palustre*	Marsh Willowherb	SO827778	Puxton Marsh	26/06/95	Occasional	Locally Nb
557	*Epilobium palustre*	Marsh Willowherb	SO828777	Puxton Marsh	17/08/98	Cmpt A - Core swampy area	Locally Nb
555	*Epilobium palustre*	Marsh Willowherb	SO828772	Puxton Marsh	26/08/98	Community 1 - tall-herb fen	Locally Nb
556	*Epilobium palustre*	Marsh Willowherb	SO828773	Puxton Marsh	26/08/98	Community 2 - *Filipendula* / *Angelica*	Locally Nb
658	*Epilobium palustre*	Marsh Willowherb	SO831784	Wolverley Court Lock Carr	27/08/98	Marsh / swamp	Locally Nb
15	*Equisetum fluviatile*	Water Horsetail	SO8579	SO87 tetrad P	1992		Locally Nb
901	*Equisetum fluviatile*	Water Horsetail	SO848778	Podmore Pool & Carr	03/07/98	Carr	Locally Nb
557	*Equisetum fluviatile*	Water Horsetail	SO828777	Puxton Marsh	17/08/98	Cmpt A - Alder / willow copse	Locally Nb
555	*Equisetum fluviatile*	Water Horsetail	SO828772	Puxton Marsh	26/08/98	Community 1 - tall-herb fen	Locally Nb
556	*Equisetum fluviatile*	Water Horsetail	SO828773	Puxton Marsh	26/08/98	Community 2 - *Filipendula* / *Angelica*	Locally Nb
671	*Equisetum fluviatile*	Water Horsetail	SO832779	Stourvale Marsh	Aug - Sept 1998	*Carex acutiformis* stand	Locally Nb
628	*Equisetum fluviatile*	Water Horsetail	SO830794	Wolverley Mdws	08/09/98	WWT Wetlands Survey	Locally Nb
83	*Erica cinerea*	Bell Heather	SO823815	Kingsford Country Park	12/03/03	by road	Locally Nb
117	*Erigeron acer*	Blue Fleabane	SO834813	Blakeshall	06/08/93	Single plant; sandy set-aside	Locally Nb
224	*Erophila majuscula*	Hairy Whitlowgrass	SO810795	B4189, N of Honeybrook	14/05/04	Small patch; road verge	Locally Nb

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982	*Filago minima*	Small Cudweed	SO855791	Lea Castle	29/06/92	Scattered / local in set-aside arable	Locally Nb
117	*Filago minima*	Small Cudweed	SO834813	Blakeshall	06/06/93	Single large plant in sandy set-aside	Locally Nb
982	*Filago vulgaris*	Common Cudweed	SO855791	Lea Castle	29/06/92	Set-aside arable - 3 or 4	Locally Nb
117	*Filago vulgaris*	Common Cudweed	SO834813	Blakeshall	06/08/93	1 large plant in set-aside	Locally Nb
274	*Filago vulgaris*	Common Cudweed	SO813785	Honeytop Farm	11/05/95	Sandy pasture - scattered plants	Locally Nb
187	*Filago vulgaris*	Common Cudweed	SO857807	Sleepy Mill, Caunsall	Sep-97	1 large plant in set-aside	Locally Nb
934	*Filago vulgaris*	Common Cudweed	SO851781	Hurcott	Jul-98	Several plants in sandy set-aside	Locally Nb
274	*Filago vulgaris*	Common Cudweed	SO813785	Honeytop Farm Pastures	04/09/02		Locally Nb
12	*Filago vulgaris*	Common Cudweed	SO8178	Honey Brook Bank	04/09/02	1 present	Locally Nb
124	*Galium saxatile*	Heath Bedstraw	SO836806	Debdale Farm	1992	Sandy grassland	Locally Nb
15	*Galium saxatile*	Heath Bedstraw	SO8579	SO87 tetrad P	1992		Locally Nb
14	*Galium saxatile*	Heath Bedstraw	SO8577	SO87 tetrad N	1996		Locally Nb
10	*Galium saxatile*	Heath Bedstraw	SO8379	SO87 tetrad J	1993		Locally Nb
330	*Galium uliginosum*	Fen Bedstraw	SO817773	Blake Marsh	18/08/98	WWT Wetlands Survey	Locally Nb
555	*Galium uliginosum*	Fen Bedstraw	SO828772	Puxton Marsh	26/08/98	Community 1 - tall-herb fen	Locally Nb
628	*Galium uliginosum*	Fen Bedstraw	SO830794	Wolverley Mdws	08/09/98	WWT Wetlands Survey	Locally Nb
140	*Gladiolus illyricus*	Wild Gladiolus	SO84378007		02/06/2013		WCA
117	*Gnaphalium sylvaticum*	Heath Cudweed	SO834813	Blakeshall	06/08/93	Plant with 8 flowering stems in sandy set-aside	Locally Nb
98	*Gnaphalium sylvaticum*	Heath Cudweed	SO827818	Kingsford section of Kinver Edge	Aug-97	50+ plants on underground reservoir (here in early 1970s)	Locally Nb
110	*Helleborus foetidus*	Stinking Hellebore	SO832815	Kinver	15/02/2015		Locally Nb Nationally Scarce
999	*Hyacinthoides non-scripta*	Bluebell	SO857782	Hurcott Wood	18/05/95	DAFOR	WCA
175	*Hyacinthoides non-scripta*	Bluebell	SO855803	Island Pool	17/07/02	DAFOR; LA, woodland	WCA
176	*Hyacinthoides non-scripta*	Bluebell	SO855805	Island Pool	17/07/02	DAFOR; LA	WCA
202	*Hyacinthoides non-scripta*	Bluebell	SO809786	Easthams Coppice	16/08/06	Wooded rockface	WCA
1001	*Hyacinthoides non-scripta*	Bluebell	SO857799	IslandPool	23/05/07		WCA
71	*Hyacinthoides non-scripta*	Bluebell	SO820808	Kingsford Heath	12/06/07	Common	WCA
673	*Hyacinthoides non-scripta*	Bluebell	SO832781	Springfield	27/07/07	DAFOR; O-LF	WCA

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504	*Hyacinthoides non-scripta*	Bluebell	SO826762	Sutton Park Road Cemetery	15/08/07	DAFOR; VLA	WCA
314	*Hyacinthoides non-scripta*	Bluebell	SO816772	Blakemarsh	16/08/07	DAFOR; VLF	WCA
692	*Hyacinthoides non-scripta*	Bluebell	SO833783	Wolverley Court Lock Carr	08/11/07		WCA
162	*Hyacinthoides non-scripta*	Bluebell	SO807795	Parkatt Wood & Honeybottom	20/03/08	DAFOR; OLA	WCA
557	*Hyacinthoides non-scripta*	Bluebell	SO828777	Puxton Marsh	Sep-05		WCA
982	*Hypochaeris glabra*	Smooth Cat's-Ear	SO855791	Lea Castle	27/06/93	Set-aside arable - locally frequent, 100s (field ploughed 1996)	Locally Nb
625	*Isolepis setacea*	Bristle Club-rush	SO830782	Stourvale Marsh	Aug - Sept 1998	Ditch	Locally Nb
169	*Isolepis setacea*	Bristle Club-rush	SO854807	Caunsall	24/06/02	Small patch; marshy pasture	Locally Nb
968	*Juncus compressus*	Round-fruited Rush	SO854778	Hurcott Pool	16/07/97	Several patches; S edge	Locally Nb
943	*Juncus compressus*	Round-fruited Rush	SO852778	Hurcott Pool	17/09/04	Backmarsh S shore; stand c.1sq.m	Locally Nb
117	*Lamium hybridum*	Cut-leaved Dead-nettle	SO834813	Blakeshall	06/06/93	Single plant; sandy set-aside	Locally Nb
125	*Lamium hybridum*	Cut-leaved Dead-nettle	SO836811	Blakeshall	08/03/98	Single plant; hedgebank at corner of arable field	Locally Nb
101	*Lathraea squamaria*	Toothwort	SO804787	nr Easthams Farm	22/04/94	Shaded stream bank - c.60 flowering spikes on hazel	Locally Nb
126	*Lathraea squamaria*	Toothwort	SO805787	Honey Brook	14/05/04	100+ plants by brook	Locally Nb
127	*Lemna gibba*	Fat Duckweed	SO839802	Debdale	26/08/93	Very locally frequent behind shuttering in canal	Locally Nb
723	*Lemna gibba*	Fat Duckweed	SO835779	Springfield Park, Kidderminster	08/09/02	Stream nr pool - a few scattered plants with *L. minor*	Locally Nb
758	*Lepidium heterophyllum*	Smith's Pepperwort	SO838762	Kidderminster SVR station	29/06/95	Small patch; railway bank	Locally Nb
146	*Luzula sylvatica*	Great Wood-rush	SO806797	Parkatt Wood Cliff	19/04/03		Locally Nb
398	*Montia fontana*	Blinks	SO821795	N of Fairfield	19/03/98	Very locally common; steep sandy pasture	Locally Nb
276	*Myosotis ramosissima*	Early Forget-me-not	SO813794	Honeytop Farm	11/05/95	Sandy pasture - small colony	Locally Nb
1007	*Myosotis ramosissima*	Early Forget-me-not	SO858799	The Gorse	22/06/98	Frequent on scrubby sandy bank	Locally Nb
256	*Myosotis ramosissima*	Early Forget-me-not	SO812784	Honey Brook	14/05/04	Small patch; trackside bank	Locally Nb

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15	*Nuphar lutea*	Yellow Water-lily	SO8579	SO87 tetrad P	1992	East	Locally Nb
9	*Nuphar lutea*	Yellow Water-lily	SO8377	SO87 tetrad I	1994	East	Locally Nb
32	*Nuphar lutea*	Yellow Water-lily	SO8577	Hurcott Pool	09/06/98	WWT Wetlands Survey	Locally Nb
852	*Nuphar lutea*	Yellow Water-lily	SO845779	Podmore Pool & Carr	03/09/04	Dominating most of open water zone	Locally Nb
853	*Nuphar lutea*	Yellow Water-lily	SO845780	Podmore Pool & Carr	03/09/04		Locally Nb
944	*Nuphar lutea*	Yellow Water-lily	SO852779	Hurcott Pool	17/09/04		Locally Nb
67	*Oreopteris limbosperma*	Lemon-scented Fern	SO818809	Kingsford Lane	30/08/93	10/12 plants; verge at foot of sandstone rock	Locally Nb
10	*Ornithopus perpusillus*	Bird's-foot	SO8379	SO87 tetrad J	1993		Locally Nb
9	*Ornithopus perpusillus*	Bird's-foot	SO8377	SO87 tetrad I	1994		Locally Nb
5	*Ornithopus perpusillus*	Bird's-foot	SO8179	SO87 tetrad E	1995		Locally Nb
601	*Ornithopus perpusillus*	Bird's-foot	SO829775	Staffs & Worcs Canal	21/07/01	Limekiln Bridge SO828772 to SO829775	Locally Nb
126	*Ornithopus perpusillus*	Bird's-foot	SO839801	Cookley Banks POS	28/01/05	Cliff	Locally Nb
902	*Ornithopus perpusillus*	Bird's-foot	SO848779	Hurcott Pasture W	28/01/05		Locally Nb
702	*Papaver argemone*	Prickly Poppy	SO834764	Oxford St, Kidderminster	19/05/94	Flower bed - 2 plants	Locally Nb
109	*Papaver argemone*	Prickly Poppy	SO832813	Blakeshall	May-95	1 plant in sandy field	Locally Nb
625	*Persicaria bistorta*	Common Bistort	SO830782	Stourvale Marsh	Aug - Sept 1998	Ditch	Locally Nb
33	*Polygala vulgaris*	Common Milkwort	SO8579	The Gorse	1998	Scattered plants on grassy bank	Locally Nb
707	*Populus nigra*	Black-poplar	SO834778	Stack Pools	06/09/02	DAFOR; R - banks	WorcBAP
673	*Populus nigra*	Black-poplar	SO832781	Springfield	27/07/07	DAFOR; O	WorcBAP
314	*Populus nigra*	Black-poplar	SO816772	Blakemarsh	16/08/07	DAFOR; VLF	WorcBAP
870	*Potentilla anglica*	Trailing Tormentil	SO846778	Podmore Mdws	03/09/04		Locally Nb
885	*Potentilla argentea*	Hoary Cinquefoil	SO847779	Hurcott Meadow	10/08/92	Rare	Locally Nb
276	*Potentilla argentea*	Hoary Cinquefoil	SO813794	Honeytop Farm	11/05/95	Sandy pasture - locally frequent	Locally Nb
289	*Potentilla argentea*	Hoary Cinquefoil	SO814784	Honeytop Farm	11/05/95	Sandy pasture - locally frequent	Locally Nb
533	*Potentilla palustris*	Marsh Cinquefoil	SO827775	Puxton Marsh	1999		Locally Nb
693	*Potentilla palustris*	Marsh Cinquefoil	SO833784	Puxton Marsh	11/05/92	Frequent in alder / willow carr	Locally Nb
692	*Potentilla palustris*	Marsh Cinquefoil	SO833783	Wolverley Court Lock Carr	27/08/98	WWT Wetlands Survey. DAFOR; LF, willow woodland	Locally Nb
557	*Potentilla palustris*	Marsh Cinquefoil	SO828777	Puxton Marsh	Sep-05	M27 & MG10a communities	Locally Nb
170	*Ranunculus fluitans*	River Water-crowfoot	SO854809	River Stour, Caunsall	24/06/02	Small patch; the river	Locally Nb

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128	*Ranunculus fluitans*	River Water-crowfoot	SO839804	River Stour, Debdale	14/05/03	Patches in river	Locally Nb
604	*Ranunculus fluitans*	River Water-crowfoot	SO829792	River Stour, Wolverley	26/05/03	Small patch	Locally Nb
809	*Ranunculus lingua*	Greater Spearwort	SO842780	Broadwaters, Kidderminster	14/07/94	A few plants in *Typha* reed-swamp (E)	Locally Nb
287	*Ranunculus lingua*	Greater Spearwort	SO814773	Blakebrook	11/06/95	Small stagnant pool - a few plants established (E)	Locally Nb
817	*Ranunculus parviflorus*	Small-flowered Buttercup	SO84377993		01/06/2013		Locally Nb
175	*Rorippa microphylla*	Narrow-fruited Water-cress	SO855803	Island Pool	24/06/02	Muddy margin	Locally Nb
624	*Rumex aquaticus*	Scottish Dock	SO830780	Stourvale Marsh	23/08/94		UKBAP Nationally Rare
532	*Rumex hydrolapathum*	Water Dock	SO827774	Puxton Marsh	1998	Survey for proposed Stour Valley C.P.	Locally Nb
556	*Rumex hydrolapathum*	Water Dock	SO828773	Limekiln Bridge, Kidderminster	15/07/93	Canal bank - 1 large clump	Locally Nb
555	*Rumex hydrolapathum*	Water Dock	SO828772	Limekiln Bridge, Kidderminster	14/05/94	Canal bank - single plant	Locally Nb
657	*Rumex hydrolapathum*	Water Dock	SO831776	NE of Limekiln Bridge, Kidderminster	14/05/94	Canal bank - 2 plants	Locally Nb
957	*Rumex hydrolapathum*	Water Dock	SO853778	Hurcott Pool	16/07/97	Single plant; S edge	Locally Nb
556	*Rumex hydrolapathum*	Water Dock	SO828773	Puxton Marsh	26/08/98	Community 2 - *Filipendula* / *Angelica*	Locally Nb
671	*Rumex hydrolapathum*	Water Dock	SO832779	Stourvale Marsh	Aug - Sept 1998	*Carex acutiformis* stand	Locally Nb
628	*Rumex hydrolapathum*	Water Dock	SO830794	Wolverley Mdws	08/09/98	WWT Wetlands Survey	Locally Nb
181	*Salix triandra*	Almond Willow	SO856808	By A449 nr Caunsall	26/08/96	Single bush in Alder carr	Locally Nb
557	*Salix triandra*	Almond Willow	SO828777	Puxton Marsh	17/08/98	Cmpt A - Alder / willow copse	Locally Nb
532	*Salix triandra*	Almond Willow	SO827774	Puxton Marsh	26/08/98	WWT Wetlands Survey	Locally Nb
123	*Salvia verbenaca*	Wild Clary	SO836805	Debdale Farm Pastures	17/02/05	DAFOR; LF. S facing slope	Locally Nb
123	*Salvia verbenaca*	Wild Clary	SO836805	Gloucester Coppice	23/05/07		Locally Nb
721	*Sanguisorba officinalis*	Great Burnet	SO835767	Kidderminster ring road	15/07/93	Road verge / car park - 1 small patch	Locally Nb
535	*Saxifraga granulata*	Meadow Saxifrage	SO827793	Wolverley Parish Church	08/05/93	Widespread & locally frequent in grassy churchyard (to SO829793)	Locally Nb

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561	*Saxifraga granulata*	Meadow Saxifrage	SO828792	By B4189 roundabout, Wolverley	08/05/93	Small patch on roadside bank on sandstone	Locally Nb
163	*Saxifraga granulata*	Meadow Saxifrage	SO807797	Cornhill Coppice	Jul-94	A few plants on sandstone rock in woodland	Locally Nb
504	*Saxifraga granulata*	Meadow Saxifrage	SO826762	Kidderminster Cemetery	19/03/95	Small patch (c.1sq.m) on grassy verge	Locally Nb
257	*Saxifraga granulata*	Meadow Saxifrage	SO812787	A442, Honeybrook	11/05/95	Locally frequent on newly cantoured section of bank	Locally Nb
257	*Saxifraga granulata*	Meadow Saxifrage	SO812787	A442 Bridgnorth Road	14/05/04	Patch of 10sq.m. on bank	Locally Nb
138	*Saxifraga granulata*	Meadow Saxifrage	SO842802	St Peters Church, Cookley	28/01/05	Frequent	Locally Nb
884	*Scirpus sylvaticus*	Wood Club-rush	SO847778	By Podmoor Pool	11/05/93	Locally common in alder carr	Locally Nb
505	*Scirpus sylvaticus*	Wood Club-rush	SO826785	Stourvale Marsh	25/06/95	Locally frequent	Locally Nb
32	*Scirpus sylvaticus*	Wood Club-rush	SO8577	Hurcott Carr	09/06/98	WWT Wetlands Survey	Locally Nb
901	*Scirpus sylvaticus*	Wood Club-rush	SO848778	Podmore Pool & Carr	03/07/98	Carr	Locally Nb
532	*Scirpus sylvaticus*	Wood Club-rush	SO827774	Puxton Marsh	26/08/98	WWT Wetlands Survey	Locally Nb
180	*Scirpus sylvaticus*	Wood Club-rush	SO856802	Island Pool	24/06/02	Still flourishing	Locally Nb
870	*Scirpus sylvaticus*	Wood Club-rush	SO846778	Podmore Pool & Carr	03/09/04	Swamp fringe	Locally Nb
174	*Scirpus sylvaticus*	Wood Club-rush	SO855802	Island Pool	28/01/05		Locally Nb
888	*Scleranthus annuus subsp. annuus*	Annual Knawel	SO847786	A449, Lea Castle	30/04/92	Locally frequent on central reservation	NERC s.41 UKBAP Locally Nb
1029	*Scleranthus annuus subsp. annuus*	Annual Knawel	SO860798	Ismere	03/05/93	Scarce in unimproved sandy pasture	NERC s.41 UKBAP Locally Nb
885	*Scleranthus annuus subsp. annuus*	Annual Knawel	SO847779	N of Podmore Pool	10/06/94	Locally frequent in sandy pastures	NERC s.41 UKBAP Locally Nb
293	*Scleranthus annuus subsp. annuus*	Annual Knawel	SO814792	Honeytop Farm	11/05/95	Locally frequent in sandy pasture	NERC s.41 UKBAP Locally Nb
455	*Senecio sylvaticus*	Heath Groundsel	SO824794	By B4189 at Wolverley	08/05/93	Locally frequent on sandy bank	Locally Nb
1067	*Senecio sylvaticus*	Heath Groundsel	SO863784	Wannerton	11/06/94	A few plants - laneside bank	Locally Nb
274	*Senecio sylvaticus*	Heath Groundsel	SO813785	Honeytop Farm	11/05/95	3 plants in sandy pasture	Locally Nb
935	*Senecio sylvaticus*	Heath Groundsel	SO851785	A451 nr Lea Castle	05/07/97	Locally frequent - hedgebank	Locally Nb
182	*Solidago virgaurea*	Goldenrod	SO808796	By A442 nr junction with B4189	22/04/94	sandstone rocks - small group of plants	Locally Nb

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78	*Solidago virgaurea*	Goldenrod	SO821811	Kingsford	11/08/04	1; sandy laneside bank	Locally Nb
1000	*Spergularia rubra*	Sand Spurrey	SO857793	Lea Castle	25/05/92	Frequent on edge of sandy set-aside	Locally Nb
885	*Spergularia rubra*	Sand Spurrey	SO847779	Hurcott	10/08/92	Occasional; sandy pasture	Locally Nb
1029	*Spergularia rubra*	Sand Spurrey	SO860798	Ismere	03/05/93	Scarce in sandy unimproved pasture	Locally Nb
293	*Spergularia rubra*	Sand Spurrey	SO814792	Honeytop Farm	11/05/95	Occasional on bare patches in sandy pasture	Locally Nb
179	*Spergularia rubra*	Sand Spurrey	SO856801	Island Pool	24/06/02	1 plant on disturbed sandy slope above pool	Locally Nb
117	*Stachys arvensis*	Field Woundwort	SO834813	Blakeshall	06/08/93	2 plants in sandy set-aside	Locally Nb
989	*Stachys arvensis*	Field Woundwort	SO856797	Axborough	05/08/98	Locally frequent in set-aside	Locally Nb
15	*Thymus polytrichus*	Wild Thyme	SO8579	SO87 tetrad P	1996		Locally Nb
5	*Thymus polytrichus*	Wild Thyme	SO8179	SO87 tetrad E	1992		Locally Nb
535	*Tilia platyphyllos*	Large-Leaved Lime	SO827793	Wolverley	11/05/92	Oak/hazel wood on steep slope - single large coppice tree (status not clear)	Locally Nb Nationally Scarce
147	*Tilia platyphyllos*	Large-Leaved Lime	SO806799	Cornhill Coppice	May-94	Top of wooded sandstone scarp - several trees (native here)	Locally Nb Nationally Scarce
162	*Tilia platyphyllos*	Large-Leaved Lime	SO807795	Parkatt Wood	06/07/95	Woodland - several trees (native here)	Locally Nb Nationally Scarce
15	*Trifolium arvense*	Hare's-foot Clover	SO8579	SO87 tetrad P	1992		Locally Nb
14	*Trifolium arvense*	Hare's-foot Clover	SO8577	SO87 tetrad N	1997		Locally Nb
10	*Trifolium arvense*	Hare's-foot Clover	SO8379	SO87 tetrad J	1993		Locally Nb
5	*Trifolium arvense*	Hare's-foot Clover	SO8179	SO87 tetrad E	1995		Locally Nb
600	*Trifolium arvense*	Hare's-foot Clover	SO829773	Georgian Carpets Site, Kidderminster	21/07/01		Locally Nb
889	*Trifolium striatum*	Knotted Clover	SO847787	A449, Lea Castle	30/04/92	Central reservation	Locally Nb
1029	*Trifolium striatum*	Knotted Clover	SO860798	Ismere	03/05/93	Sandy unimproved pasture - frequent	Locally Nb
932	*Trifolium striatum*	Knotted Clover	SO851779	Hurcott	11/05/93	Sandy pasture - frequent	Locally Nb
902	*Trifolium striatum*	Knotted Clover	SO848779	Hurcott	11/05/93	Sandy pasture - frequent	Locally Nb
886	*Trifolium striatum*	Knotted Clover	SO847780	N of Podmore Pool	04/07/94	Quite common in sandy pasture	Locally Nb
276	*Trifolium striatum*	Knotted Clover	SO813794	Honeytop Farm	11/05/95	Sandy pastures - locally frequent	Locally Nb
274	*Trifolium striatum*	Knotted Clover	SO813785	Honeytop Farm	11/05/95	Sandy pastures - locally frequent	Locally Nb
900	*Trifolium striatum*	Knotted Clover	SO848777	nr Hurcott	04/06/97	2 plants on sandy laneside bank	Locally Nb
887	*Trifolium striatum*	Knotted Clover	SO847782	Kendlewood Rd, Broadwater	22/06/98	Small patch; grass verge	Locally Nb
115	*Trifolium striatum*	Knotted Clover	SO833815	Blakeshall	Sep-98	Linseed field	Locally Nb
435	*Trifolium striatum*	Knotted Clover	SO823791	Sebright Road, Fairfield	11/06/02	Small patches; grass verge	Locally Nb

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560	*Trifolium striatum*	Knotted Clover	SO828781	Brooklands Drive, Franche	11/06/02	Small patch; lawn	Locally Nb
179	*Trifolium striatum*	Knotted Clover	SO856801	Island Pool	24/06/02	A few plants on disturbed sandy slope above pool	Locally Nb
872	*Typha angustifolia*	Lesser Bulrush	SO846780	Podmore Pool	29/06/92	Common	Locally Nb
810	*Typha angustifolia*	Lesser Bulrush	SO842781	Broadwaters	10/06/94	Local in small reed-swamp with *T. latifolia* and *T.* x *glauca*	Locally Nb
969	*Typha angustifolia*	Lesser Bulrush	SO854779	Hurcott Pool	16/07/97	Abundant & locally dominant in reed-swamp	Locally Nb
32	*Typha angustifolia*	Lesser Bulrush	SO8577	Hurcott Pool	09/06/98	WWT Wetlands Survey	Locally Nb
871	*Typha angustifolia*	Lesser Bulrush	SO846779	Podmore Pool & Carr	03/07/98	Pool swamp	Locally Nb
853	*Typha angustifolia*	Lesser Bulrush	SO845780	Podmore Pool & Carr	03/09/04		Locally Nb
852	*Typha angustifolia*	Lesser Bulrush	SO845779	Podmore Pool & Carr	03/09/04	Swamp	Locally Nb
943	*Typha angustifolia*	Lesser Bulrush	SO852778	Hurcott Pool	17/09/04		Locally Nb
73	*Ulex gallii*	Western Gorse	SO820813	Kingsford	1993		Locally Nb
15	*Ulex gallii*	Western Gorse	SO8579	SO87 tetrad P	1992		Locally Nb
5	*Ulex gallii*	Western Gorse	SO8179	SO87 tetrad E	1994		Locally Nb
870	*Ulex gallii*	Western Gorse	SO846778	Podmore Mdws	03/09/04		Locally Nb
925	*Ulex gallii*	Western Gorse	SO850779	Hurcott Pasture E	28/01/05		Locally Nb
125	*Umbilicus rupestris*	Navelwort	SO805785	Low Habberley	2001		Locally Nb
318	*Umbilicus rupestris*	Navelwort	SO816799	Sladd Lane	22/04/94	sandstone rocks - common	Locally Nb
203	*Umbilicus rupestris*	Navelwort	SO809787	nr Hollies Farm	22/04/94	Locally Common; sandstone rocks	Locally Nb
240	*Umbilicus rupestris*	Navelwort	SO811785	nr Hollies Farm	22/04/94	Locally Common; sandstone rocks	Locally Nb
307	*Umbilicus rupestris*	Navelwort	SO815787	nr Honeytop Farm	22/04/94	Common; sandstone trackside banks	Locally Nb
201	*Umbilicus rupestris*	Navelwort	SO809785	Hollies Lane	06/07/95	Hedgebanks - scattered colonies	Locally Nb
127	*Umbilicus rupestris*	Navelwort	SO805791	Hollies Lane	06/07/95	Hedgebanks - scattered colonies	Locally Nb
81	*Umbilicus rupestris*	Navelwort	SO822808	Drakelow	24/06/97	Small colony; sandstone outcrop, old cave houses	Locally Nb
318	*Umbilicus rupestris*	Navelwort	SO816799	Rock New House, Drakelow	12/03/03		Locally Nb
66	*Umbilicus rupestris*	Navelwort	SO818803	Drakelow Lane, Wolverley	12/03/03	Sandstone outcrop E side	Locally Nb
71	*Verbascum lychnitis*	White Mullein	SO820808	Kingsford Heath	12/06/07	DAFOR; VR	Nationally Scarce
1018	*Viola canina*	Heath Dog-violet	SO859798	The Gorse, nr Axborough	25/06/92	Acid unimproved pasture - scattered	Locally Nb

No	Scientific Name	Common Name	Grid Ref	Location Name	Date	Comments	Status
1018	*Viola canina*	Heath Dog-violet	SO859798	The Gorse	13/08/98	Still present	Locally Nb
1029	*Viola canina*	Heath Dog-violet	SO860798	The Gorse	13/08/98	A few plants just in tetrad	Locally Nb
932	*Acalles ptinoides*	Acalles ptinoides	SO851779	Hurcott Wood	07/05/12	6 on decayed mature tree stump in damp woodland	Notable B
725	*Anaglyptus mysticus*	Anaglyptus mysticus	SO835782	Springfield Park	19/05/11	on Oak trunk on woodland verge of meadow	Notable B
899	*Anaglyptus mysticus*	Anaglyptus mysticus	SO848776	Hurcott & Podmore Pools	26/05/2014	Pastures	Notable B
736	*Anthracus consputus*	Anthracus consputus	SO836781	Springfield Park	14/10/10	At night, under leaf litter in shaded dried-up, willow carr bog	Notable B
932	*Anthribus fasciatus*	Anthribus fasciatus	SO851779	nr Hurcott Wood	08/03/12	under decaying bark, 1 on lime, 2 on cherry	Notable A
932	*Aphodius (Chilothorax) distinctus*	Aphodius (Chilothorax) distinctus	SO851779	Hurcott Wood	07/05/12	on ground in woodland	Notable B
932	*Aphodius (Limarus) zenkeri*	Aphodius (Limarus) zenkeri	SO851779	Hurcott Wood	21/07/11	in damp woodland, active at night	Notable B
736	*Badister (Badister) unipustulatus*	Badister (Badister) unipustulatus	SO836781	Springfield Park	10/03/09	Beside pond under leaf litter. L:7mm	Notable B
736	*Bembidion (Diplocampa) clarkii*	Bembidion (Diplocampa) clarkii	SO836781	Springfield Park	14/10/10	At night, under leaf litter in shaded dried-up, willow carr bog	Notable B
736	*Blemus discus*	Blemus discus	SO836781	Springfield Park	25/07/09	On damp silty ground near waterline on marshland. 5mm	Notable B
932	*Caenopsis fissirostris*	Caenopsis fissirostris	SO851779	Hurcott Wood	07/05/12	2; on Beech trunk in damp woodland	Notable B
854	*Carabus monilis*	Necklace Ground Beetle	SO845789	Podmore	28/05/07		NERC s.41 UKBAP Notable B
854	*Carabus monilis*	Necklace Ground Beetle	SO845789	Kidderminster, on farm	02/08/08	1 Male	NERC s.41 UKBAP Notable B
736	*Chlaenius nigricornis*	Chlaenius nigricornis	SO836781	Springfield Park	10/04/09	On marshy ground. 10.5mm	Notable B
736	*Chrysolina oricalcia*	Chrysolina oricalcia	SO836781	Springfield Park	28/02/09	7 on umbellifer shoots at night. L: 8mm	Notable B
737	*Cis festivus*	Cis festivus	SO836782	Springfield Park	31/03/2016		Notable B
725	*Ctesias serra*	Cobweb Beetle	SO835782	Springfield Park	04/06/11	in niche in Beech, in damp woodland	Notable B
725	*Curculio betulae*	Curculio betulae	SO835782	Springfield Park	06/08/12	active at night on cones on mature Grey Alder	Notable B

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869	*Curculio betulae*	Curculio betulae	SO846775	Hurcott	28/07/2016	Beaten of *Alnus* tree	Notable B
737	*Diplapion stolidum*	Diplapion stolidum	SO836782	Springfield Park	31/03/2016		Notable B
932	*Diplocoelus fagi*	Diplocoelus fagi	SO851779	Hurcott Wood	29/04/11	6 on decaying Birch bough with sooty bark disease	Notable B
736	*Dorytomus tremulae*	Dorytomus tremulae	SO836781	Springfield Park	22/04/14	Found on mature Aspen trunk	Notable B
736	*Elaphropus parvulus*	Elaphropus parvulus	SO836781	Puxton Marsh, Springfield Park	23/08/10	Under gravel shale on damp sandy soil, close to marsh margin	Notable B
932	*Eledona agricola*	Eledona agricola	SO851779	Hurcott Wood	28/06/11	2 on decaying sycamore logs in woodland	Notable B
932	*Enicmus brevicornis*	Enicmus brevicornis	SO851779	Hurcott Wood	28/06/11	on decaying sycamore logs in woodland	Notable
736	*Gonioctena decemnotata*	Gonioctena decemnotata	SO836781	Springfield Park	16/06/10		Notable B
932	*Hadrobregmus denticollis*	Hadrobregmus denticollis	SO851779	nr Hurcott Wood	08/03/12	behind bark on decaying section of Cherry	Notable B
32	*Hallomenus binotatus*	Hallomenus binotatus	SO8577	Hurcott Wood	14/05/11	on damp decaying Birch log, in shady woodland, at night	Notable B
932	*Hedobia (Ptinomorphus) imperialis*	Hedobia (Ptinomorphus) imperialis	SO851779	Hurcott Wood	10/05/11		Notable B
932	*Hedobia (Ptinomorphus) imperialis*	Hedobia (Ptinomorphus) imperialis	SO851779	Hurcott Wood	12/05/11		Notable B
709	*Helophorus (Helophorus) dorsalis*	Helophorus (Helophorus) dorsalis	SO834784	Springfield Park	04/02/11		Nationally Scarce Notable B
178	*Hippodamia (Adonia) variegata*	Adonis' Ladybird	SO856800	Cookley, Island Pool	20/07/03		Notable B
533	*Hydaticus seminiger*	Hydaticus seminiger	SO827775	Puxton Marsh	23/01/11		Nationally Scarce
998	*Lebia (Lamprias) chlorocephala*	Lebia (Lamprias) chlorocephala	SO857780	Hurcott & Podmore Pools	12/06/2014		Notable B
932	*Lissodema denticolle*	Lissodema denticolle	SO851779	Hurcott Wood	12/07/11	at night in shady woodland on decaying chestnut bough	Notable B
605	*Magdalis cerasi*	Magdalis cerasi	SO829794	Bishop's Field	04/06/99		Notable B
725	*Megatoma undata*	Megatoma undata	SO835782	Springfield Park	23/05/12	inactive at night in niche Ash in open parkland	Notable B

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725	*Melandrya caraboides*	Melandrya caraboides	SO835782	Springfield Park	30/05/12	inactive at night in crevice on Willow in open parkland	Notable B
932	*Melasis buprestoides*	Melasis buprestoides	SO851779	Hurcott Wood	04/06/13	1 present	Notable B
737	*Meligethes rotundicollis*	Meligethes rotundicollis	SO836782	Springfield Park	31/03/2016	Female	Notable
725	*Notaris scirpi*	Notaris scirpi	SO835782	Puxton Marsh	25/11/11		Notable B
725	*Omalium allardi*	Omalium allardi	SO835782	Puxton Marsh	25/11/11		Notable
736	*Ophonus (Metophonus) schaubergerianus*	Ophonus rufibarbis	SO836781	Springfield Park	26/03/09	At night, active on sandy soil, open field. L: 8mm	Notable B
932	*Opilo mollis*	Opilo mollis	SO851779	Hurcott Wood	10/07/11	on beetle gallery on decaying ash stump, at night	Notable B
725	*Phloiophilus edwardsii*	Phloiophilus edwardsii	SO835782	Springfield Park	08/02/12	on decaying oak branches in woodland	Notable B
736	*Platyderus depressus*	Platyderus depressus	SO836781	Springfield Park	22/04/09	On sandy field margin on woodland verge. 7mm	Notable B
725	*Platyrhinus resinosus*	Cramp-Ball Fungus Weevil	SO835782	Springfield Park	02/06/11	on Beech trunk in damp woodland	Notable B
932	*Plegaderus dissectus*	Plegaderus dissectus	SO851779	Hurcott Wood	22/04/11		Notable B
736	*Poecilus lepidus*	Poecilus lepidus	SO836781	Springfield Park	02/07/09	Heath section of sandy soil, active at night. L: 12.5mm	Notable B
736	*Pomatinus substriatus*	Pomatinus substriatus	SO836781	Springfield Park	22/04/14	Large species at night feeding on algae on wall of canal	Notable
725	*Ptinus sexpunctatus*	Ptinus sexpunctatus	SO835782	Springfield Park	24/04/12	on mature lime trunk at night	Notable B
885	*Pyrochroa coccinea*	Black-Headed Cardinal Beetle	SO847779	Podmore, Hurcott Pasture	21/04/2014		Notable B
706	*Pyrochroa coccinea*	Black-Headed Cardinal Beetle	SO834774	Springfield Park	Jul-05	2 Adult	Notable B
725	*Quedius (Microsaurus) nigrocaeruleus*	Quedius (Microsaurus) nigrocaeruleus	SO835782	Kidderminster Golf Course	04/11/12	active at night on old, hollowed-out Oak trunk	Notable B
932	*Quedius (Microsaurus) scitus*	Quedius (Microsaurus) scitus	SO851779	Hurcott Wood	09/05/12		Notable B
725	*Rabocerus gabrieli*	Rabocerus gabrieli	SO835782	Springfield Park	09/01/12	10 on dying Birch, in deciduous woodland with *Xyloterus domesticus* colony	Notable B

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932	*Rhizophagus (Rhizophagus) nitidulus*	Rhizophagus (Rhizophagus) nitidulus	SO851779	Hurcott Wood	21/01/12	on dead standing Birch in woods	Notable B
932	*Rhizophagus (Rhizophagus) picipes*	Rhizophagus (Rhizophagus) picipes	SO851779	Hurcott Wood	10/05/11		Notable A
932	*Scaphidema metallicum*	Scaphidema metallicum	SO851779	Hurcott Wood	07/05/12	on decayed stump of Birch with some fungus in woodland	Notable B
853	*Silis ruficollis*	Silis ruficollis	SO845780	Podmore Pool	18/07/02		Notable B
725	*Symbiotes latus*	Symbiotes latus	SO835782	Springfield Park	22/05/12	in debris in base of hollow Oak tree	Notable B
725	*Tetratoma desmarestii*	Tetratoma desmarestii	SO835782	Kidderminster Golf Course	04/11/12	active at night on decaying oak branch with crust fungi	Notable A
32	*Tillus elongatus*	Tillus elongatus	SO8577	Hurcott Wood	18/05/11	active at night, nr weevil infestation on dead standing Birch, in woodland	Notable B
725	*Uleiota planata*	Uleiota planata	SO835782	Springfield Park	29/07/11	at night under beech bark on beech logs on woodland edge	Notable A
932	*Variimorda villosa*	Variimorda villosa	SO851779	Hurcott Wood	09/07/12	inactive at night on decaying sycamore bough with soot mould	Notable B
725	*Xyleborus dispar*	Ambrosia Beetle	SO835782	Springfield Park	06/08/12		Notable B
875	*Coenonympha pamphilus*	Small Heath	SO84767775	Hurcott Meadow	08/08/04		NERC s.41 UKBAP
1005	*Limenitis camilla*	White Admiral	SO858781	Hurcott Wood	27/07/15	Flying over tree tops	NERC s.41 UKBAP
511	*Satyrium w-album*	White Letter Hairstreak	SO82707886	Wyre Mill Lane, Wolverley	24/07/12	5 Adults	WCA NERC s.41 UKBAP
478	*Satyrium w-album*	White Letter Hairstreak	SO825780	Marlpool Estate	27/07/13	3 Adults	WCA NERC s.41 UKBAP
869	*Andrena (Andrena) apicata*	Large Sallow Mining Bee	SO846775	Hurcott	05/04/2015	Garden	Notable B
869	*Andrena (Plastandrena) bimaculata*	Large Gorse Mining Bee	SO846775	Hurcott	02/04/2016	Garden; 1 male	Notable B
916	*Bombus (Megabombus) ruderatus*	Large Garden Bumble Bee	SO849776	Hurcott Fields	16/04/2014		NERC s.41 UKBAP Notable B
1029	*Bombus (Psithyrus) rupestris*	Hill Cuckoo Bee	SO860798	Whitehouse Farm, Ismere	17/04/10	Queen on Ground Ivy	Notable B
1001	*Bombus (Psithyrus) rupestris*	Hill Cuckoo Bee	SO857799	Whitehouse Farm, Axborough	20/05/12	Queen	Notable B
197	*Bombus (Psithyrus) rupestris*	Hill Cuckoo Bee	SO859805	Common Barn, Caunsall	28/04/13	2-3 queens on white deadnettle	Notable B

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5	*Bombus (Psithyrus) rupestris*	Hill Cuckoo Bee	SO8580	Island pool, Caunsall	03/05/15	Queen	Notable B
869	*Dolichovespula (Dolichovespula) media*	Dolichovespula (Dolichovespula) media	SO846775	Hurcott	02/09/2015	Several	Notable A
738	*Lasioglossum (Evylaeus) pauxillum*	Lobe-spurred Furrow Bee	SO836786	Summerfield Works Roxel,	22/05/07		Notable A
869	*Lasius brunneus*	Brown Ant	SO846775	Hurcott	14/04/2014		Notable A
885	*Lasius brunneus*	Brown Ant	SO847779	Podmore, Hurcott Pasture	21/04/2014		Notable A
706	*Acronicta psi*	Grey Dagger	SO834774	Springfield Park	2005	2 adults; June. Larvae on willow; July	NERC s.41 UKBAP
869	*Acronicta psi*	Grey Dagger	SO846775	Hurcott	12/09/11	Larvae garden	NERC s.41 UKBAP
773	*Acronicta psi*	Grey Dagger	SO84017617	Kidderminster	03/07/2016		NERC s.41 UKBAP
706	*Acronicta rumicis*	Knot Grass	SO834774	Springfield Park	Aug-05	2 Adult	NERC s.41 UKBAP
706	*Allophyes oxyacanthae*	Green-Brindled Crescent	SO834774	Springfield Park	2005	2 adults; Sept. Larvae on hawthorn; Apr	NERC s.41 UKBAP
854	*Arctia caja*	Garden Tiger	SO845789	Podmore	21/04/07		NERC s.41 UKBAP
563	*Arctia caja*	Garden Tiger	SO828796	Fairfield	17/08/11	caterpillar	NERC s.41 UKBAP
512	*Atethmia centrago*	Centre-Barred Sallow	SO82767955		11/09/2015		NERC s.41 UKBAP
512	*Diarsia rubi*	Small Square-Spot	SO82767955		11/09/2015		NERC s.41 UKBAP
512	*Ecliptopera silaceata*	Small Phoenix	SO82767955		11/09/2015		NERC s.41 UKBAP
706	*Ecliptopera silaceata*	Small Phoenix	SO834774	Springfield Park	Jun-05	2 Adult	NERC s.41 UKBAP
512	*Ennomos erosaria*	September Thorn	SO82767955		11/09/2015		NERC s.41 UKBAP
512	*Ennomos fuscantaria*	Dusky Thorn	SO82767955		11/09/2015		NERC s.41 UKBAP
706	*Eugnorisma glareosa form edda*	Autumnal Rustic	SO834774	Springfield Park	Sep-05	2 Adult	NERC s.41 UKBAP
706	*Hemistola chrysoprasaria*	Small Emerald	SO834774	Springfield Park	2005	June, July; 4 adults	NERC s.41 UKBAP
869	*Hepialus humuli*	Ghost Moth	SO846775	Hurcott	24/07/2016	1, garden MV trap	NERC s.41 UKBAP
512	*Hydraecia micacea*	Rosy Rustic	SO82767955		11/09/2015		NERC s.41 UKBAP
706	*Lycia hirtaria*	Brindled Beauty	SO834774	Springfield Park	Apr-05	1 Adult	NERC s.41 UKBAP
706	*Malacosoma neustria*	Lackey	SO834774	Springfield Park	Apr-03		NERC s.41 UKBAP
869	*Melanchra persicariae*	Dot Moth	SO846775	Hurcott	16/07/2015	1	NERC s.41 UKBAP
706	*Melanchra persicariae*	Dot Moth	SO834774	Springfield Park	Sep-05	2 larva	NERC s.41 UKBAP
726	*Semiothisa clathrata subsp. clathrata*	Latticed Heath	SO835784	Sion Hill House	10/06/09		NERC s.41 UKBAP
869	*Spilosoma luteum*	Buff Ermine	SO846775	Hurcott	16/07/2015	1	NERC s.41 UKBAP

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899	*Stathmopoda pedella*	Alder Signal	SO848776	Hurcott & Podmore Pools	14/07/2014		Notable B
869	*Stathmopoda pedella*	Alder Signal	SO846775	Hurcott	28/07/2016	1; off *Alnus* tree	Notable B
512	*Tholera decimalis*	Feathered Gothic	SO82767955		11/09/2015		NERC s.41 UKBAP
706	*Tholera decimalis*	Feathered Gothic	SO834774	Springfield Park	Sep-05	4 Adult	NERC s.41 UKBAP
901	*Tyria jacobaeae*	Cinnabar	SO848778	Hurcott Meadow	26/07/02		NERC s.41 UKBAP
178	*Tyria jacobaeae*	Cinnabar	SO856800	Island Pool	20/07/03	Pool & dry valley; larvae abundant on cinnabar	NERC s.41 UKBAP
711	*Tyria jacobaeae*	Cinnabar	SO834795	Wolverley	03/07/07	caterpillars	NERC s.41 UKBAP
556	*Tyria jacobaeae*	Cinnabar	SO828773	Franche	31/07/07		NERC s.41 UKBAP
710	*Tyria jacobaeae*	Cinnabar	SO834789	Wolverley Court	09/08/07	caterpillars	NERC s.41 UKBAP
150	*Tyria jacobaeae*	Cinnabar	SO846816	Caunsall	17/08/07	caterpillars	NERC s.41 UKBAP
918	*Tyria jacobaeae*	Cinnabar	SO849781	Broadwaters, Kidderminster	01/07/08	caterpillars	NERC s.41 UKBAP
509	*Tyria jacobaeae*	Cinnabar	SO826797	Fairfield	20/07/09	caterpillar	NERC s.41 UKBAP
241	*Tyria jacobaeae*	Cinnabar	SO811787	Franche	23/07/09	caterpillar	NERC s.41 UKBAP
899	*Tyria jacobaeae*	Cinnabar	SO848776	Greenhill	03/08/11	caterpillars	NERC s.41 UKBAP
1068	*Tyria jacobaeae*	Cinnabar	SO863795	Ismere Ho	30/08/12	caterpillar	NERC s.41 UKBAP
703	*Tyria jacobaeae*	Cinnabar	SO834768	Kidderminster	05/06/2016		NERC s.41 UKBAP
706	*Tyria jacobaeae*	Cinnabar	SO834774	Springfield Park	Jul-03		NERC s.41 UKBAP
32	*Asilus crabroniformis*	Hornet Robberfly	SO8577	Hurcott	Aug-99	1 present	NERC s.41 UKBAP WorcBAP
915	*Asilus crabroniformis*	Hornet Robberfly	SO849775	Hurcott Meadow	28/08/99	7/8 Adults 2 in cop	NERC s.41 UKBAP WorcBAP
901	*Asilus crabroniformis*	Hornet Robberfly	SO848778	Hurcott Meadow	28/08/99	2 Adults	NERC s.41 UKBAP WorcBAP
4	*Asilus crabroniformis*	Hornet Robberfly	SO8480	Cookley	Sep-99	1 present	NERC s.41 UKBAP WorcBAP
134	*Asilus crabroniformis*	Hornet Robberfly	SO841802	Cookley	01/09/99	Meadow by Cookley Castings	NERC s.41 UKBAP WorcBAP
15	*Asilus crabroniformis*	Hornet Robberfly	SO8579	Cookley	Sep-99	1 present	NERC s.41 UKBAP WorcBAP
971	*Asilus crabroniformis*	Hornet Robberfly	SO854798	Axborough Lane	04/09/99	Meadow	NERC s.41 UKBAP WorcBAP
945	*Asilus crabroniformis*	Hornet Robberfly	SO852785	Hurcott	04/09/99	Meadow	NERC s.41 UKBAP WorcBAP
915	*Asilus crabroniformis*	Hornet Robberfly	SO849775	Hurcott Meadow	04/09/99	10 adults , 1 ovipositing in horse dung	NERC s.41 UKBAP WorcBAP
14	*Asilus crabroniformis*	Hornet Robberfly	SO8577	Hawthorns Stud Farm	12/09/99	1 male on fresh horse dung in very closely grazed paddocks	NERC s.41 UKBAP WorcBAP

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903	*Asilus crabroniformis*	Hornet Robberfly	SO848780	Hurcott Pasture	12/09/99	live sighting	NERC s.41 UKBAP WorcBAP
915	*Asilus crabroniformis*	Hornet Robberfly	SO849775	Hurcott Meadow	14/09/99	3 in meadow by park Gate PH	NERC s.41 UKBAP WorcBAP
915	*Asilus crabroniformis*	Hornet Robberfly	SO849775	Hurcott Meadow	10/08/01	15+	NERC s.41 UKBAP WorcBAP
914	*Asilus crabroniformis*	Hornet Robberfly	SO849773	Hurcott Meadow	27/08/02		NERC s.41 UKBAP WorcBAP
901	*Asilus crabroniformis*	Hornet Robberfly	SO848778	Hurcott Meadow	27/08/02		NERC s.41 UKBAP WorcBAP
917	*Asilus crabroniformis*	Hornet Robberfly	SO849777	Hurcott Meadow	27/08/02		NERC s.41 UKBAP WorcBAP
851	*Asilus crabroniformis*	Hornet Robberfly	SO845778	Kidderminster	27/08/02	Garden	NERC s.41 UKBAP WorcBAP
902	*Asilus crabroniformis*	Hornet Robberfly	SO848779	Hurcott Meadow	30/08/03	3	NERC s.41 UKBAP WorcBAP
923	*Asilus crabroniformis*	Hornet Robberfly	SO850774	Hurcott Meadow	30/08/03	5-10 present	NERC s.41 UKBAP WorcBAP
924	*Asilus crabroniformis*	Hornet Robberfly	SO850777	Hurcott Meadow	30/08/03		NERC s.41 UKBAP WorcBAP
914	*Asilus crabroniformis*	Hornet Robberfly	SO849773	Hurcott Meadow	30/08/03	5-10 present	NERC s.41 UKBAP WorcBAP
917	*Asilus crabroniformis*	Hornet Robberfly	SO849777	Hurcott Meadow	30/08/03	3	NERC s.41 UKBAP WorcBAP
941	*Asilus crabroniformis*	Hornet Robberfly	SO852775	Hurcott Meadow	08/08/04		NERC s.41 UKBAP WorcBAP
891	*Asilus crabroniformis*	Hornet Robberfly	SO84797771	Hurcott Meadow	08/08/04	few individuals	NERC s.41 UKBAP WorcBAP
902	*Asilus crabroniformis*	Hornet Robberfly	SO848779	Hurcott Meadow	08/08/04	1 eating a grasshopper whilst sat on Rabbit dung	NERC s.41 UKBAP WorcBAP
875	*Asilus crabroniformis*	Hornet Robberfly	SO84767775	Hurcott Meadow	08/08/04	16, including 3 pairs in cop	NERC s.41 UKBAP WorcBAP
915	*Asilus crabroniformis*	Hornet Robberfly	SO849775	Hurcott Meadow	08/08/04		NERC s.41 UKBAP WorcBAP
160	*Asilus crabroniformis*	Hornet Robberfly	SO84988022	Caunsall mdw	14/08/04	1 in 10 muck piles had a robber fly	NERC s.41 UKBAP WorcBAP
163	*Asilus crabroniformis*	Hornet Robberfly	SO85278007	Axborough Lane mdw	14/08/04	Male	NERC s.41 UKBAP WorcBAP
162	*Asilus crabroniformis*	Hornet Robberfly	SO85248005	Axborough Lane mdw	14/08/04	female eating beetle	NERC s.41 UKBAP WorcBAP
925	*Asilus crabroniformis*	Hornet Robberfly	SO850779	Hurcott Meadow	28/08/05	1 on cattle dung	NERC s.41 UKBAP WorcBAP

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924	*Asilus crabroniformis*	Hornet Robberfly	SO850777	Hurcott Meadow	28/08/05	A few	NERC s.41 UKBAP WorcBAP
901	*Asilus crabroniformis*	Hornet Robberfly	SO848778	Hurcott Meadow	28/08/05	A few	NERC s.41 UKBAP WorcBAP
957	*Asilus crabroniformis*	Hornet Robberfly	SO853778	Hurcott Pool	05/08/06	1 dead male	NERC s.41 UKBAP WorcBAP
914	*Asilus crabroniformis*	Hornet Robberfly	SO849773	Hurcott Meadow	05/08/06	Several adults	NERC s.41 UKBAP WorcBAP
145	*Asilus crabroniformis*	Hornet Robberfly	SO806788	Low Habberley	16/08/06		NERC s.41 UKBAP WorcBAP
1019	*Didea fasciata*	Didea fasciata	SO859799	Island Pool, Ismere	08/08/09	Male	Notable
869	*Neoempheria lineola*	Neoempheria lineola	SO846775	Hurcott & Podmore Pools	25/07/2014		NERC s.41 UKBAP
869	*Stratiomys potamida*	Banded General	SO846775	Hurcot	19/08/12		Notable
997	*Stratiomys potamida*	Banded General	SO857779	Hurcott Wood	14/06/2015	1. Near carr wood	Notable
869	*Volucella inanis*	Volucella inanis	SO846775	Hurcott	16/08/12		Notable
839	*Natrix natrix*	Grass Snake	SO84567796	Podmore Pool	1996		WCA NERC s.41 UKBAP
706	*Natrix natrix*	Grass Snake	SO834774	Springfield Park	2003		WCA NERC s.41 UKBAP
735	*Natrix natrix*	Grass Snake	SO836778	Broadwaters	12/06/01		WCA NERC s.41 UKBAP
958	*Natrix natrix*	Grass Snake	SO853779	Hurcott Pool	05/09/02	Adult seen am	WCA NERC s.41 UKBAP
969	*Natrix natrix*	Grass Snake	SO854779	Podmore pool	03/09/04		WCA NERC s.41 UKBAP
724	*Natrix natrix*	Grass Snake	SO835781	Springfield Park	20/07/07		WCA NERC s.41 UKBAP
602	*Natrix natrix*	Grass Snake	SO829777	Stourvale	20/08/07		WCA NERC s.41 UKBAP
931	*Natrix natrix*	Grass Snake	SO851778	Hurcott	30/08/07	Corpse	WCA NERC s.41 UKBAP
192	*Natrix natrix*	Grass Snake	SO858806	Caunsall	04/07/08	live sighting	WCA NERC s.41 UKBAP
980	*Natrix natrix*	Grass Snake	SO855777	Hurcott Hall Farm	07/06/10	regularly sunbathing in garden, lives under paving slab	WCA NERC s.41 UKBAP
674	*Natrix natrix*	Grass Snake	SO832793	Wolverley Lock	06/04/11		WCA NERC s.41 UKBAP
706	*Natrix natrix*	Grass Snake	SO834774	Springfield Park	Aug-05	6 found.	WCA NERC s.41 UKBAP
760	*Chiroptera*	Bats	SO838776	Brecknell Rise, Kidderminster	16/07/03	Roost; droppings on windowsill	WCA NERC s.41 UKBAP ECH4 WorcBAP
269	*Erinaceus europaeus*	Hedgehog	SO813769	Kidderminster	01/05/01	1 present	NERC s.41 UKBAP
269	*Erinaceus europaeus*	Hedgehog	SO813769	Kidderminster	07/06/01	1 present	NERC s.41 UKBAP
271	*Erinaceus europaeus*	Hedgehog	SO813773	Kidderminster	12/06/01	dead on road	NERC s.41 UKBAP
255	*Erinaceus europaeus*	Hedgehog	SO812773	Devil's Spittleful & Rifle Range	08/08/01	1 present	NERC s.41 UKBAP
836	*Erinaceus europaeus*	Hedgehog	SO84507783	Kidderminster	25/05/03	casualty (not road)	NERC s.41 UKBAP
272	*Erinaceus europaeus*	Hedgehog	SO813774	Kidderminster	07/10/04	dead on road	NERC s.41 UKBAP
316	*Erinaceus europaeus*	Hedgehog	SO816778	Kidderminster	30/10/04	dead on road	NERC s.41 UKBAP

No	Scientific Name	Common Name	Grid Ref	Location Name	Date	Comments	Status
705	*Erinaceus europaeus*	Hedgehog	SO834772	Horse Fair, Kidderminster	08/07/05	1 dead in road	NERC s.41 UKBAP
434	*Erinaceus europaeus*	Hedgehog	SO823784	Wolverley	22/09/05		NERC s.41 UKBAP
288	*Erinaceus europaeus*	Hedgehog	SO814775	Habberley	13/05/06	Corpse	NERC s.41 UKBAP
477	*Erinaceus europaeus*	Hedgehog	SO825767	Abberley, Kidderminster	24/06/06	dead on road	NERC s.41 UKBAP
361	*Erinaceus europaeus*	Hedgehog	SO819776	Franche school, forest	04/06/07	Corpse	NERC s.41 UKBAP
273	*Erinaceus europaeus*	Hedgehog	SO813775	Franche	16/10/07	dead on road	NERC s.41 UKBAP
689	*Erinaceus europaeus*	Hedgehog	SO833777	Kidderminster	16/07/11	dead on road	NERC s.41 UKBAP
395	*Erinaceus europaeus*	Hedgehog	SO821772	Woodland Av., Kidderminster	10/08/12	on grass verge at 12.30am	NERC s.41 UKBAP
786	*Erinaceus europaeus*	Hedgehog	SO840782	Sion Av., Kidderminster	25/05/2013	Lives in back garden. There were 2 last yr but have only seen 1 this yr	NERC s.41 UKBAP
771	*Erinaceus europaeus*	Hedgehog	SO839782	Sion Hill jct Sion Ave	28/03/2016	In centre of road	NERC s.41 UKBAP
313	*Lepus europaeus*	Brown Hare	SO816767	Habberley Valley	10/01/98	1 dead on road	NERC s.41 UKBAP
107	*Lepus europaeus*	Brown Hare	SO831805	Blakeshall Farm	20/06/07	live sighting; 4	NERC s.41 UKBAP
124	*Lepus europaeus*	Brown Hare	SO836806	Cookley	23/01/10		NERC s.41 UKBAP
22	*Lutra lutra*	Otter	SO8377		23/07/02	1 present	WCA NERC s.41 UKBAP ECH4 WorcBAP
558	*Lutra lutra*	Otter	SO828778	Puxton Marsh, River Stour	10/04/05		WCA NERC s.41 UKBAP ECH4 WorcBAP
23	*Lutra lutra*	Otter	SO8379	Wolverley	23/05/05	1 Dead	WCA NERC s.41 UKBAP ECH4 WorcBAP
697	*Lutra lutra*	Otter	SO83437606	River Stour, Kidderminster	20/03/09	far end of Morrisons car park, taken from opp. bank to tracks photos	WCA NERC s.41 UKBAP ECH4 WorcBAP
696	*Lutra lutra*	Otter	SO83417614	River Stour, Kidderminster	20/03/09	from in car park, many tracks & spraints on sandy mounds	WCA NERC s.41 UKBAP ECH4 WorcBAP
695	*Lutra lutra*	Otter	SO83397619	River Stour, Kidderminster	20/03/09	old tracks below bridge Photo	WCA NERC s.41 UKBAP ECH4 WorcBAP
688	*Lutra lutra*	Otter	SO83377624	River Stour, Kidderminster	20/03/09	tracks below in sand, Morrisons	WCA NERC s.41 UKBAP ECH4 WorcBAP
677	*Lutra lutra*	Otter	SO83367630	River Stour, Kidderminster	20/03/09	tracks in sand, Morrisons	WCA NERC s.41 UKBAP ECH4 WorcBAP
629	*Lutra lutra*	Otter	SO83097617	River Stour, Kidderminster	20/03/09	outside fire station, tracks in sand below wall, photo	WCA NERC s.41 UKBAP ECH4 WorcBAP
638	*Lutra lutra*	Otter	SO83147642	River Stour, Kidderminster	20/03/09	dead on track	WCA NERC s.41 UKBAP ECH4 WorcBAP

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633	*Lutra lutra*	Otter	SO83107667	River Stour, Kidderminster	20/03/09	tracks opposite bank in narrow sand behind TJ Hughes, photo	WCA NERC s.41 UKBAP ECH4 WorcBAP
630	*Lutra lutra*	Otter	SO83097651	River Stour, Kidderminster	20/03/09	Where tributary joins, spraint on sandy pile, photo	WCA NERC s.41 UKBAP ECH4 WorcBAP
609	*Lutra lutra*	Otter	SO83037606	Kidderminster, Carter's bridge	11/08/09	sandy beach under bridge	WCA NERC s.41 UKBAP ECH4 WorcBAP
654	*Lutra lutra*	Otter	SO831762	Kidderminster	11/08/09	concrete under bridge, fire station	WCA NERC s.41 UKBAP ECH4 WorcBAP
631	*Lutra lutra*	Otter	SO83097665	Kidderminster by TJHughes	11/08/09		WCA NERC s.41 UKBAP ECH4 WorcBAP
627	*Lutra lutra*	Otter	SO830792	R Stour, Wolverley	23/03/2011	Old spraint under bridge nr farm shop on old sand bag	WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Lutra lutra*	Otter	SO830765		21/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
655	*Lutra lutra*	Otter	SO831763	R Stour, Kidderminster	22/07/2015	4 on river next to Tesco	WCA NERC s.41 UKBAP ECH4 WorcBAP
21	*Lutra lutra*	Otter	SO8376	Kidderminster	20/08/2015	Juvenile reported in centre of town	WCA NERC s.41 UKBAP ECH4 WorcBAP
21	*Lutra lutra*	Otter	SO8376	Kidderminster	20/08/15	Reported to be in centre of Kidderminster	WCA NERC s.41 UKBAP ECH4 WorcBAP
1426	*Lutra lutra*	Otter	SO830764	R Stour, Husum Bridge	20/08/2015	Juvenile (c.1 yr old) swimming in centre of town	WCA NERC s.41 UKBAP ECH4 WorcBAP
622	*Lutra lutra*	Otter	SO830764	River Stour, Husum Bridge	20/08/15	Young otter (c.1yr old) swimming in centre of town	WCA NERC s.41 UKBAP ECH4 WorcBAP
687	*Lutra lutra*	Otter	SO833761	River Stour, Dixon St.	12/11/15		WCA NERC s.41 UKBAP ECH4 WorcBAP
168	*Lutra lutra*	Otter	SO8547780663	A449, Caunsall	23/12/15	dead on road	WCA NERC s.41 UKBAP ECH4 WorcBAP
1008	*Lutra lutra*	Otter	SO85887796	Hurcott Wood, Blakedown Brook	04/08/2016	Spraint on water level control weir	WCA NERC s.41 UKBAP ECH4 WorcBAP
559	*Lutra lutra*	Otter	SO82877938	Wolverley, Drakelow Brook	10/08/2016	Spraint & prints along brook	WCA NERC s.41 UKBAP ECH4 WorcBAP
603	*Lutra lutra*	Otter	SO82977924	Wolverley, R. Stour	10/08/2016	Spraint by river, scraped mound in silt	WCA NERC s.41 UKBAP ECH4 WorcBAP
691	*Lutra lutra*	Otter	SO83377951	Wolverley, Forge Cottage	10/08/2016	Spraint on Mill weir	WCA NERC s.41 UKBAP ECH4 WorcBAP
480	*Lutra lutra*	Otter	SO82607720	Kidderminster, R Stour	10/08/2016	Tracks	WCA NERC s.41 UKBAP ECH4 WorcBAP
635	*Lutra lutra*	Otter	SO83117654	Kidderminster, R Stour	10/08/2016	Tracks in flood relief channel under Brintons old factory	WCA NERC s.41 UKBAP ECH4 WorcBAP

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537	*Lutra lutra*	Otter	SO82857879	Beachcote, R. Stour	10/08/2016	Spraint under new flood defence access bridge	WCA NERC s.41 UKBAP ECH4 WorcBAP
632	*Lutra lutra*	Otter	SO83097786	Puxton, Blakedown Brook	10/08/2016	Spraint on low cattle access bridge over Brook	WCA NERC s.41 UKBAP ECH4 WorcBAP
901	*Meles meles*	Badger	SO848778	Hurcott Meadow	08/05/01	2	PBA
204	*Meles meles*	Badger	SO809795	Kidderminster	22/08/01	casualty (not road)	PBA
112	*Meles meles*	Badger	SO833800	Cookley	01/09/01	Dung or other signs	PBA
50	*Meles meles*	Badger	SO811807	Drakelow	17/03/02	tracks/trail	PBA
72	*Meles meles*	Badger	SO820810	Blakeshall	24/04/02	dead on road	PBA
851	*Meles meles*	Badger	SO845778	Kidderminster	14/07/02		PBA
475	*Meles meles*	Badger	SO825761	Kidderminster	01/09/02		PBA
836	*Meles meles*	Badger	SO84507783	Kidderminster	24/09/02	live sighting	PBA
946	*Meles meles*	Badger	SO852786	Kidderminster	03/11/02	casualty (not road)	PBA
116	*Meles meles*	Badger	SO834808	Cookley	06/02/03	dung/droppings, etc.	PBA
836	*Meles meles*	Badger	SO84507783	Kidderminster	14/03/03	live sighting	PBA
996	*Meles meles*	Badger	SO857774	Kidderminster	23/03/03	dead on road	PBA
836	*Meles meles*	Badger	SO84507783	Kidderminster	25/05/03	live sighting	PBA
694	*Meles meles*	Badger	SO833796	Cookley	21/06/03	dung/droppings, etc.	PBA
118	*Meles meles*	Badger	SO834815	Blakeshall	13/12/03	Dung pits & tracks	PBA
291	*Meles meles*	Badger	SO814790	Fairfield	13/01/04	dung/droppings, etc.	PBA
103	*Meles meles*	Badger	SO829812	Blakeshall Common	21/02/04		PBA
415	*Meles meles*	Badger	SO822798	Wolverley	06/03/04	dung/droppings, etc.	PBA
967	*Meles meles*	Badger	SO854774	Kidderminster	12/04/04	dead on road	PBA
205	*Meles meles*	Badger	SO809798	Cornhill Coppice	04/08/04	Sett & tracks	PBA
96	*Meles meles*	Badger	SO826806	Drakelow	12/02/05	dung/droppings, etc.	PBA
290	*Meles meles*	Badger	SO814786	Franche	12/02/05	Occupied sett	PBA
397	*Meles meles*	Badger	SO821794	Fairfield	11/02/06	casualty (not road)	PBA
959	*Meles meles*	Badger	SO853789	Lea Castle Hospital	14/04/06		PBA
196	*Meles meles*	Badger	SO859805	Caunsall	22/01/07	tracks/trail	PBA
453	*Meles meles*	Badger	SO824785	Franche	22/04/07	Corpse	PBA
107	*Meles meles*	Badger	SO831805	Blakeshall Farm	20/06/07	Live sighting between 21:15-22:30	PBA
759	*Meles meles*	Badger	SO838772	Shrubbery St., Kidderminster	01/04/08	Sett	PBA
454	*Meles meles*	Badger	SO824786	Wolverley	14/06/08	dead on road	PBA
807	*Meles meles*	Badger	SO842767	Kidderminster	29/01/09	Active sett on railway cuttings, with another c.200m on	PBA
137	*Meles meles*	Badger	SO841815	Blakeshall/Caunsall	28/03/09	casualty (not road)	PBA
970	*Meles meles*	Badger	SO854786	Lea Castle	22/02/10	1 Dead	PBA

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819	*Meles meles*	Badger	SO843787	Wolverley	22/02/10	1 Dead	PBA
348	*Meles meles*	Badger	SO818781	Wolverley	17/08/13	Corpse	PBA
454	*Meles meles*	Badger	SO824786	Kidderminster	29/01/14	dead on road	PBA
13	*Meles meles*	Badger	SO8179	Kidderminster	29/01/2014		PBA
161	*Meles meles*	Badger	SO851800	A449	18/07/2016	Road kill	PBA
506	*Micromys minutus*	Harvest Mouse	SO826790	Mill Lane, Wolverley	28/11/13	Nest in long grass	NERC s.41 UKBAP
182	*Mustela putorius*	Polecat	SO856809	Cookley	17/07/92	1 present	NERC s.41 UKBAP
944	*Mustela putorius*	Polecat	SO852779	Kidderminster	12/11/93	1 present	NERC s.41 UKBAP
890	*Mustela putorius*	Polecat	SO847795	Lea Castle	11/07/95	1 present	NERC s.41 UKBAP
798	*Mustela putorius*	Polecat	SO841785		20/04/02	dead on road	NERC s.41 UKBAP
535	*Mustela putorius*	Polecat	SO827793	Kidderminster	29/06/02	dead on road	NERC s.41 UKBAP
181	*Mustela putorius*	Polecat	SO856808	Caunsall	01/09/02	dead on road	NERC s.41 UKBAP
198	*Mustela putorius*	Polecat	SO860800	Five Ways	01/08/03	dead on road	NERC s.41 UKBAP
453	*Mustela putorius*	Polecat	SO824785	Wolverley	25/02/04	dead on road	NERC s.41 UKBAP
535	*Mustela putorius*	Polecat	SO827793	Wolverley	09/03/05	dead male on road	NERC s.41 UKBAP
317	*Mustela putorius*	Polecat	SO816782	Devil's Spittleful & Rifle Range	02/07/05	Female orphan collected & held at RSPCA Stapeley Grange	NERC s.41 UKBAP
4	*Mustela putorius*	Polecat	SO8480	Cookley	06/09/05	Recovered as juveniles, then released.	NERC s.41 UKBAP
476	*Mustela putorius*	Polecat	SO825765	Kidderminster	17/07/06	Mother & 2 young living under decking in garden. All trapped & taken into veterinary care	NERC s.41 UKBAP
396	*Mustela putorius*	Polecat	SO821774		01/10/07	dead on road	NERC s.41 UKBAP
144	*Mustela putorius*	Polecat	SO844807		16/05/08	Looked to be Male from it's size	NERC s.41 UKBAP
144	*Mustela putorius*	Polecat	SO844807	nr River Stour	16/06/08	Running along fenceline towards river. Looked male from size.	NERC s.41 UKBAP
242	*Mustela putorius*	Polecat	SO811798	Wolverley	01/01/14	Seen on camera trap	NERC s.41 UKBAP
242	*Mustela putorius*	Polecat	SO811798	Old Coppice	31/01/2014	Caught on Trail Cam	NERC s.41 UKBAP
1045	*Mustela putorius*	Polecat	SO861791	Wolverley	29/06/2015		NERC s.41 UKBAP
313	*Myotis*	Unidentified Bat	SO816767	Baxter College, Kidderminster	12/05/2009	Foraging & flying in locality	WCA NERC s.41 UKBAP ECH4 WorcBAP
1056	*Myotis*	Unidentified Bat	SO8629678170	Hurcott	14/06/10	Whiskered/Brandt's - adult male	WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Myotis*	Unidentified Bat	SO830765		06/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
1056	*Myotis brandtii*	Brandt's Bat	SO8629678170	Hurcott	14/06/10	Pregnant female	WCA ECH4 WorcBAP
136	*Myotis daubentonii*	Daubenton's Bat	SO841805	Steel Stampings, Cookley	10/09/92	singleton, oiled	WCA ECH4 WorcBAP

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142	*Myotis daubentonii*	Daubenton's Bat	SO843805	Caunsall	07/06/02		WCA ECH4 WorcBAP
627	*Myotis daubentonii*	Daubenton's Bat	SO830792	Cookley	07/06/02		WCA ECH4 WorcBAP
177	*Myotis daubentonii*	Daubenton's Bat	SO855809	Caunsall	07/06/02		WCA ECH4 WorcBAP
958	*Myotis daubentonii*	Daubenton's Bat	SO853779	Hurcott Pool	05/09/02	aural bat detector; 1	WCA ECH4 WorcBAP
707	*Myotis daubentonii*	Daubenton's Bat	SO834778	Stack Pools	06/09/02		WCA ECH4 WorcBAP
944	*Myotis daubentonii*	Daubenton's Bat	SO852779	Hurcott Pool	18/05/11	Foraging over pool	WCA ECH4 WorcBAP
676	*Myotis daubentonii*	Daubenton's Bat	SO8336277845	Springfield Park, Kidderminster	13/09/11		WCA ECH4 WorcBAP
623	*Myotis daubentonii*	Daubenton's Bat	SO830765		22/07/2015		WCA ECH4 WorcBAP
270	*Myotis nattereri*	Natterer's Bat	SO813772	Briars Hotel site, Habberley Rd	23/06/08		WCA ECH4 WorcBAP
186	*Nyctalus*	Nyctalus sp.	SO857804	Common Farm Barn, Caunsall	05/08/2008	Flying in locality	WCA NERC s.41 UKBAP ECH4 WorcBAP
270	*Nyctalus leisleri*	Lesser Noctule	SO813772	Briars Hotel site, Habberley Rd	31/05/08	Recorded calls sent to expert for ID confirmation	WCA ECH4 WorcBAP
936	*Nyctalus leisleri*	Lesser Noctule	SO8520977913	Hurcott Pool	20/05/11	Foraging over water	WCA ECH4 WorcBAP
623	*Nyctalus leisleri*	Lesser Noctule	SO830765		14/07/2015		WCA ECH4 WorcBAP
77	*Nyctalus noctula*	Noctule	SO821801	Drakelow Lane, Wolverley	07/08/92	juvenile female singleton	WCA NERC s.41 UKBAP ECH4 WorcBAP
958	*Nyctalus noctula*	Noctule	SO853779	Hurcott Pool	05/09/02	aural bat detector; 1	WCA NERC s.41 UKBAP ECH4 WorcBAP
836	*Nyctalus noctula*	Noctule	SO84507783	Kidderminster	29/05/03	aural bat detector	WCA NERC s.41 UKBAP ECH4 WorcBAP
956	*Nyctalus noctula*	Noctule	SO853773	Hodge Hill Farm	26/07/06	Emergence survey; passed over site & foraged over fields to N	WCA NERC s.41 UKBAP ECH4 WorcBAP
270	*Nyctalus noctula*	Noctule	SO813772	Briars Hotel site, Habberley Rd	31/05/08		WCA NERC s.41 UKBAP ECH4 WorcBAP
270	*Nyctalus noctula*	Noctule	SO813772	Briars Hotel site, Habberley Rd	19/06/08		WCA NERC s.41 UKBAP ECH4 WorcBAP
270	*Nyctalus noctula*	Noctule	SO813772	Briars Hotel site, Habberley Rd	23/06/08		WCA NERC s.41 UKBAP ECH4 WorcBAP
143	*Nyctalus noctula*	Noctule	SO843808	Cookley	25/06/08	3 large bats flying above trees along river. Flew lower over car park & heard to 'chirp' in flight.	WCA NERC s.41 UKBAP ECH4 WorcBAP
313	*Nyctalus noctula*	Noctule	SO816767	Baxter College, Kidderminster	12/05/2009	Foraging & flying in locality	WCA NERC s.41 UKBAP ECH4 WorcBAP
360	*Nyctalus noctula*	Noctule	SO819769	The Elms, Habberley Rd	03/06/09	1 in flight	WCA NERC s.41 UKBAP ECH4 WorcBAP
772	*Nyctalus noctula*	Noctule	SO839784	Sion Hill Middle School	26/08/2009		WCA NERC s.41 UKBAP ECH4 WorcBAP

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944	*Nyctalus noctula*	Noctule	SO852779	Hurcott Pool	18/05/11	Foraging over pool	WCA NERC s.41 UKBAP ECH4 WorcBAP
936	*Nyctalus noctula*	Noctule	SO8520977913	Hurcott Pool	20/05/11	Foraging over water	WCA NERC s.41 UKBAP ECH4 WorcBAP
414	*Nyctalus noctula*	Noctule	SO822769		01/07/2014		WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Nyctalus noctula*	Noctule	SO830765		06/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Nyctalus noctula*	Noctule	SO830765		14/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Nyctalus noctula*	Noctule	SO830765		22/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
707	*Pipistrellus*	Pipistrelle sp.	SO834778	Stack Pools	06/09/02		WCA NERC s.41 UKBAP ECH4 WorcBAP
172	*Pipistrellus*	Pipistrelle sp.	SO8556780947	Wolverley and Cookley	03/07/13	auditory record	WCA NERC s.41 UKBAP ECH4 WorcBAP
698	*Pipistrellus*	Pipistrelle sp.	SO83457771	Kidderminster	05/08/13	Corpse	WCA NERC s.41 UKBAP ECH4 WorcBAP
70	*Pipistrellus*	Pipistrelle sp.	SO82048022	Kidderminster	17/08/13		WCA NERC s.41 UKBAP ECH4 WorcBAP
944	*Pipistrellus nathusii*	Nathusius's Pipistrelle	SO852779	Hurcott Pool	18/05/11	Foraging over pool	WCA ECH4 WorcBAP
139	*Pipistrellus pipistrellus*	Common Pipistrelle	SO842808	Caunsall Rd, Cookley	30/06/92	Roost site: 2 dead babies	WCA ECH4 WorcBAP
159	*Pipistrellus pipistrellus*	Common Pipistrelle	SO849809	Caunsall Rd, Cookley	02/07/92	Roost site: 24 in garage	WCA ECH4 WorcBAP
913	*Pipistrellus pipistrellus*	Common Pipistrelle	SO849768	Osborne Close, Kidderminster	24/08/92	singleton, injured	WCA ECH4 WorcBAP
477	*Pipistrellus pipistrellus*	Common Pipistrelle	SO825767	Hume St, Kidderminster	17/08/94	juvenile female singleton, on floor of garage, broken left forearm	WCA ECH4 WorcBAP
477	*Pipistrellus pipistrellus*	Common Pipistrelle	SO825767	Kidderminster, Hume St	17/08/94	1 present	WCA ECH4 WorcBAP
477	*Pipistrellus pipistrellus*	Common Pipistrelle	SO825767	Stourport Swimming Baths	06/10/94	singleton, flying over indoor pool into false ceiling space	WCA ECH4 WorcBAP
181	*Pipistrellus pipistrellus*	Common Pipistrelle	SO808789	Kidderminster, Hollies Lane	16/10/94	1 present	WCA ECH4 WorcBAP
181	*Pipistrellus pipistrellus*	Common Pipistrelle	SO808789	Holly Bank Farm	16/10/94	singleton, mauled by cat left wing broken, possible roost in loft	WCA ECH4 WorcBAP
931	*Pipistrellus pipistrellus*	Common Pipistrelle	SO851778	Penstock Court, Kidderminster	16/07/95	Roost site: 71 visual ID, exit point 50ft up in converted mill building	WCA ECH4 WorcBAP

No	Scientific Name	Common Name	Grid Ref	Location Name	Date	Comments	Status
931	*Pipistrellus pipistrellus*	Common Pipistrelle	SO851778	Kidderminster, Hurcott Lane	16/07/95	1 present	WCA ECH4 WorcBAP
331	*Pipistrellus pipistrellus*	Common Pipistrelle	SO817778	Wilton Avenue, Kidderminster	18/07/95	singleton broken wing, put down by vet	WCA ECH4 WorcBAP
331	*Pipistrellus pipistrellus*	Common Pipistrelle	SO817778	Kidderminster, Wilton Av.	19/07/95	1 present	WCA ECH4 WorcBAP
134	*Pipistrellus pipistrellus*	Common Pipistrelle	SO841802	Cookley, canal	21/02/01	Flying in daylight	WCA ECH4 WorcBAP
605	*Pipistrellus pipistrellus*	Common Pipistrelle	SO829794	Bishop's Field	09/05/01	1 present	WCA ECH4 WorcBAP
76	*Pipistrellus pipistrellus*	Common Pipistrelle	SO821800	Blakeshall	02/06/02		WCA ECH4 WorcBAP
362	*Pipistrellus pipistrellus*	Common Pipistrelle	SO819793	Low Habberley	02/06/02		WCA ECH4 WorcBAP
455	*Pipistrellus pipistrellus*	Common Pipistrelle	SO824794	Kidderminster	02/06/02		WCA ECH4 WorcBAP
627	*Pipistrellus pipistrellus*	Common Pipistrelle	SO830792	Kidderminster Canal	02/06/02		WCA ECH4 WorcBAP
349	*Pipistrellus pipistrellus*	Common Pipistrelle	SO818784	Low Habberley	02/06/02		WCA ECH4 WorcBAP
287	*Pipistrellus pipistrellus*	Common Pipistrelle	SO814773	Habberley Valley	02/06/02		WCA ECH4 WorcBAP
958	*Pipistrellus pipistrellus*	Common Pipistrelle	SO853779	Hurcott Pool	05/09/02	aural bat detector; 2	WCA ECH4 WorcBAP
836	*Pipistrellus pipistrellus*	Common Pipistrelle	SO84507783	Kidderminster	29/05/03	aural bat detector	WCA ECH4 WorcBAP
32	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8577	Hurcott Lane, Hurcott	16/09/03	ID by sight & sound. Fresh droppings on windowsills. Possibly roosting under slates.	WCA ECH4 WorcBAP
875	*Pipistrellus pipistrellus*	Common Pipistrelle	SO84767775	Hurcott Meadow	09/10/03	45Khz echo-location	WCA ECH4 WorcBAP
531	*Pipistrellus pipistrellus*	Common Pipistrelle	SO827760	Park Lane, Kidderminster	18/08/04	Roost; possibly Pipistrelles from droppings & house owners description	WCA ECH4 WorcBAP
868	*Pipistrellus pipistrellus*	Common Pipistrelle	SO846774	Landoak Drive, Green Hill, Kidderminster	24/05/05	Roost; access via gable apex, droppings	WCA ECH4 WorcBAP
956	*Pipistrellus pipistrellus*	Common Pipistrelle	SO853773	Hodge Hill Farm	26/07/06	Emergence survey; 1+ roosting in farm building. Fresh droppings & feeding remains	WCA ECH4 WorcBAP
270	*Pipistrellus pipistrellus*	Common Pipistrelle	SO813772	Briars Hotel site, Habberley Rd	31/05/08		WCA ECH4 WorcBAP
270	*Pipistrellus pipistrellus*	Common Pipistrelle	SO813772	Briars Hotel site, Habberley Rd	19/06/08		WCA ECH4 WorcBAP
270	*Pipistrellus pipistrellus*	Common Pipistrelle	SO813772	Briars Hotel site, Habberley Rd	23/06/08		WCA ECH4 WorcBAP
360	*Pipistrellus pipistrellus*	Common Pipistrelle	SO819769	The Elms, Habberley Rd	23/07/08	Roost & sighting	WCA ECH4 WorcBAP

No	Scientific Name	Common Name	Grid Ref	Location Name	Date	Comments	Status
186	*Pipistrellus pipistrellus*	Common Pipistrelle	SO857804	Common Farm Barn, Caunsall	05/08/2008	Roost	WCA ECH4 WorcBAP
313	*Pipistrellus pipistrellus*	Common Pipistrelle	SO816767	Baxter College, Kidderminster	12/05/2009	Foraging & flying in locality	WCA ECH4 WorcBAP
360	*Pipistrellus pipistrellus*	Common Pipistrelle	SO819769	The Elms, Habberley Rd	03/06/09	Roost & sighting	WCA ECH4 WorcBAP
772	*Pipistrellus pipistrellus*	Common Pipistrelle	SO839784	Sion Hill Middle School	26/08/2009	Foraging & flying in locality	WCA ECH4 WorcBAP
130	*Pipistrellus pipistrellus*	Common Pipistrelle	SO840801	Cookley	27/04/10	6 heard & heading from house bordering Lea lane, due NW to canal	WCA ECH4 WorcBAP
944	*Pipistrellus pipistrellus*	Common Pipistrelle	SO852779	Hurcott Pool	18/05/11	Foraging over pool	WCA ECH4 WorcBAP
360	*Pipistrellus pipistrellus*	Common Pipistrelle	SO819769	The Elms Hotel, Habberley Rd	15/06/11	Flying & foraging on site	WCA ECH4 WorcBAP
676	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8336277845	Springfield Park, Kidderminster	13/09/11		WCA ECH4 WorcBAP
360	*Pipistrellus pipistrellus*	Common Pipistrelle	SO819769	The Elms Hotel	21/09/11	2 present	WCA ECH4 WorcBAP
102	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8295180205	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
69	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8202980137	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
565	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8289379624	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
147	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8459280814	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
566	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8291579609	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
106	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8317681131	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
155	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8478280898	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
334	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8183079795	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
332	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8179079848	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
65	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8182880388	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
64	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8180080547	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP

No	Scientific Name	Common Name	Grid Ref	Location Name	Date	Comments	Status
414	*Pipistrellus pipistrellus*	Common Pipistrelle	SO822769		01/07/2014		WCA ECH4 WorcBAP
414	*Pipistrellus pipistrellus*	Common Pipistrelle	SO822769		08/07/2014		WCA ECH4 WorcBAP
164	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8081977515	Kidderminster Foreign	17/09/14	auditory record	WCA ECH4 WorcBAP
623	*Pipistrellus pipistrellus*	Common Pipistrelle	SO830765		06/07/2015		WCA ECH4 WorcBAP
623	*Pipistrellus pipistrellus*	Common Pipistrelle	SO830765		14/07/2015		WCA ECH4 WorcBAP
623	*Pipistrellus pipistrellus*	Common Pipistrelle	SO830765		22/07/2015		WCA ECH4 WorcBAP
349	*Pipistrellus pipistrellus*	Common Pipistrelle	SO818784	Franche	Jun-03		WCA ECH4 WorcBAP
286	*Pipistrellus pipistrellus*	Common Pipistrelle	SO814772	Blake marsh	Jul-01	1 present	WCA ECH4 WorcBAP
270	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO813772	Briars Hotel site, Habberley Rd	31/05/08		WCA NERC s.41 UKBAP ECH4 WorcBAP
270	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO813772	Briars Hotel site, Habberley Rd	23/06/08		WCA NERC s.41 UKBAP ECH4 WorcBAP
605	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO829794	Bishop's Field	12/09/08	aural bat detector; 4	WCA NERC s.41 UKBAP ECH4 WorcBAP
313	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO816767	Baxter College, Kidderminster	12/05/2009	Foraging & flying in locality	WCA NERC s.41 UKBAP ECH4 WorcBAP
360	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO819769	The Elms, Habberley Rd	03/06/09	1 in flight	WCA NERC s.41 UKBAP ECH4 WorcBAP
772	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO839784	Sion Hill Middle School	26/08/2009		WCA NERC s.41 UKBAP ECH4 WorcBAP
130	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO840801	Cookley	27/04/10	5; heard & heading from house bordering Lea lane, due NW to canal	WCA NERC s.41 UKBAP ECH4 WorcBAP
1056	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO8629678170	Hurcott	14/06/10	Adult male	WCA NERC s.41 UKBAP ECH4 WorcBAP
944	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO852779	Hurcott Pool	18/05/11	Foraging over pool	WCA NERC s.41 UKBAP ECH4 WorcBAP
360	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO819769	The Elms Hotel, Habberley Rd	15/06/11	Flying & foraging on site	WCA NERC s.41 UKBAP ECH4 WorcBAP
676	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO8336277845	Springfield Park, Kidderminster	13/09/11		WCA NERC s.41 UKBAP ECH4 WorcBAP
156	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO8481480905	Wolverley and Cookley	03/07/13	auditory record	WCA NERC s.41 UKBAP ECH4 WorcBAP
58	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO8135180451	Wolverley and Cookley	03/07/13	auditory record	WCA NERC s.41 UKBAP ECH4 WorcBAP
607	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO8300579823	Wolverley and Cookley	03/07/13	auditory record	WCA NERC s.41 UKBAP ECH4 WorcBAP
414	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO822769		01/07/2014		WCA NERC s.41 UKBAP ECH4 WorcBAP

No	Scientific Name	Common Name	Grid Ref	Location Name	Date	Comments	Status
414	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO822769		08/07/2014		WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO830765		06/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO830765		14/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO830765		22/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
104	*Plecotus auritus*	Brown Long-Eared Bat	SO829813	Blakeshall Hall	22/05/06	Accumulations of droppings indicate moderate maternity roost used over number of yrs	WCA NERC s.41 UKBAP ECH4 WorcBAP
956	*Plecotus auritus*	Brown Long-Eared Bat	SO853773	Hodge Hill Farm	26/07/06	Emergence survey; 1 roosting in farm building, 4 other possible roosting bats. 30 fresh droppings.	WCA NERC s.41 UKBAP ECH4 WorcBAP
186	*Plecotus auritus*	Brown Long-Eared Bat	SO857804	Common Farm Barn, Caunsall	05/08/2008	Roost	WCA NERC s.41 UKBAP ECH4 WorcBAP
955	*Plecotus auritus*	Brown Long-Eared Bat	SO853766	Offmore Farmhouse Care Home	19/11/08	Small cluster of relatively fresh droppings in roof void, modern wing of house. Indicated roosting b	WCA NERC s.41 UKBAP ECH4 WorcBAP
313	*Plecotus auritus*	Brown Long-Eared Bat	SO816767	Baxter College, Kidderminster	12/05/2009	Foraging & flying in locality	WCA NERC s.41 UKBAP ECH4 WorcBAP
1056	*Plecotus auritus*	Brown Long-Eared Bat	SO8629678170	Hurcott	14/06/10	1 Female	WCA NERC s.41 UKBAP ECH4 WorcBAP
414	*Plecotus auritus*	Brown Long-Eared Bat	SO822769		01/07/2014		WCA NERC s.41 UKBAP ECH4 WorcBAP
414	*Plecotus auritus*	Brown Long-Eared Bat	SO822769		08/07/2014		WCA NERC s.41 UKBAP ECH4 WorcBAP

Special Areas of Conservation - objects, which are wholly or partially within 3km of site.
No records found.

SSSI - objects, which are wholly or partially within 3km of site.

SSSI Name	SSSI Easting	SSSI Northing
Hurcott & Podmore Pools	385614.45	277962.75
Hurcott Pasture	384891.39	277997.56
Stourvale Marsh	383057.14	278247.53
Puxton Marshes	382754.5	277762.75

Local Wildlife Sites - objects, which are wholly or partially within 3km of site.

Site Ref	Site Name	Grid Ref
SO 87/03	Easthams Coppice	SO803787
SO 87/18	Wolverley Court Lock Carr	SO833783
SO 87/17	Wolverley Marsh	SO830794
SO 88/02	Kingsford Heath	SO820808
SO 87/14	Staffordshire and Worcestershire Canal	SO828766
SO 87/12	River Stour	SO831761
SO 87/06	Cornhill Coppice	SO809797
SO 87/01	Parkatt Wood and Honeybottom	SO807795
SO 87/08	Honeytop Farm Pastures	SO813785
SO 87/15	Puxton Marsh	SO826784
SO 88/04	Gloucester Coppice	SO835800
SO 87/22	The Island Pool	SO855802
SO 88/05	Caunsall Marsh	SO854808
SO 87/21	Hurcott & Podmore Pools (Pastures)	SO846778

Worcs Grassland Inventory - objects, which are wholly or partially within 3km of site.

Site No	Site Name	Grid Ref	Area (ha)	NVC Type	Management
18 41	Puxton Marshes	SO827784	0	U/'MG10	
11 14	Honeytop Bank	SO813785	3	U4	past
12 15	Hollies Meadows	SO811788	0	MG5	
3 5	Kingsford Meadow	SO813812	2	(U4/U20)	
2 4	Hobro Meadows	SO816807	1	MG5A/MG1	neg
6 9	Caunsell Marshes	SO853806	5	U4/MG8	
33 53	Whitehouse Bank	SO860798	6	U1/U4	hay
36 56	Park Hall Meadow	SO863777	4	MG1/MG5	hay
28 38	Ismere Meadows	SO863795	0	(U20)	

Site No	Site Name	Grid Ref	Area (ha)	NVC Type	Management
7 12	The Gorse	SO857800	0	(U4)	
6 11	Caunsell Marshes	SO855811	3	MG8	past
2 3	Hobro Meadows	SO813807	2	U20	past
11 17	Gloucester Coppice Meadows	SO834805	2	(MG6)	
30 42	Wolverley Meadows	SO833795	9		
11 16	Gloucester Coppice Meadows	SO836805	0	MG5A	hor
11 16	Gloucester Coppice Meadows	SO836805	3	MG5A	hor
5 7	Debdale Meadows	SO836801	4		
5 8	Debdale Meadows	SO839801	5	U4/U20	neg
32 52	Honeytop Meadows	SO813793	5		
32 51	Honeytop Meadows	SO812794	4		
19 26	Hillfields Meadow	SO820795	4	(U4)	
6 10	Caunsell Marshes	SO852807	2	(MG8)	

Local Nature Reserves - objects, which are wholly or partially within 3km of site.

Site Name	LNR Easting	LNR Northing
Kingsford Forest Park	382715.44	281696.59
Hurcott Wood	385796.27	278125.69
Blakemarsh	381612.38	277229.69
Kingsford Forest Park	382715.44	281696.59

Worcestershire Wildlife Trust Reserves - objects, which are wholly or partially within 3km of site.

Site No.	Site Name	Grid Ref
65	Bishops Field	SO830793

Ancient Trees - objects, which are wholly or partially within 3km of site.

Species	Grid Ref	Site Name	Date	Girth m	Comments
Sweet chestnut	SO86277815	HURCOTT WOODS	07/05/2005	4.9	Located at East end to left of uphill path but within group of same species on high ground.
Pedunculate oak	SO84907768	HURCOTT ROAD	15/03/2003	6	
Pedunculate oak	SO84867772	HURCOTT ROAD	15/03/2003	5.6	
Silver birch	SO85247807	HURCOTT WOODS	07/06/2006	2.06	Individual specimen within old hazel coppice and conifer re-afforestation.
Sweet chestnut	SO85447800	HURCOTT WOODS	22/06/2005	5.05	Between path and pool.
Horse chestnut	SO85387801	HURCOTT WOODS	22/06/2005	3.1	Situated on left of path from end of the pool past the old boathouse. Height estimated as top unseen
Beech	SO86307824	HURCOTT WOODS	07/06/2006	3.3	Specimen tree within the wood with extensive canopy.
Pedunculate oak	SO83948016	COOKLEY PLAYING FIELD	27/03/2007	2.5	On sandstone bank overhanging canal.

Species	Grid Ref	Site Name	Date	Girth m	Comments
Sweet chestnut	SO86257826	HURCOTT WOODS	07/06/2005	4.5	Growing on LH side of uphill path from Eastern entrance to Reserve Managed by Wyre Forest DC. Bi-ann
Pedunculate oak	SO83908010	COOKLEY PLAYING FIELD	27/03/2007	6.2	One side of the tree is dead. Girth includes this. Remaining trunk has been fired high up.
Pedunculate oak	SO83858006	COOKLEY PLAYING FIELD	27/03/2007	4	Fire in hollow some time ago.
Sweet chestnut	SO85437801	HURCOTT WOODS	22/06/2005	3.8	Situated on left of path from end of the pool.
Sweet chestnut	SO85407803	HURCOTT WOODS	22/06/2005	4.6	Situated on steep slope between path and waters edge to east of old boathouse. Several dead/barkless
Sweet chestnut	SO86257811	HURCOTT WOODS	22/06/2005	4.2	Located on side of path. Fallen decaying branch.
Pedunculate oak	SO86197813	HURCOTT WOODS	22/06/2005	3.3	Located on upper side of path.
Pedunculate oak	SO83708011	COOKLEY PLAYING FIELD	27/03/2007	4.3	Several low branches removed from waterside.
Pedunculate oak	SO81998121	KINGSFORD_2	23/02/2004	5.8	Just inside private woodland.
Pedunculate oak	SO81988104	KINGSFORD_2	23/02/2004	4	Just inside private wood.
Pedunculate oak	SO81818075	KINGSFORD_2	23/02/2004	3	Evidence of structure in tree could be a TPO to protect from further damage - girth estimated.
Black poplar	SO82957888	RIVER STOUR	29/09/2008	3.5	Bank of river stour. Minor cavities at base of trunk. Some root damage.
Pedunculate oak	SO83738007	COOKLEY PLAYING FIELD	27/03/2007	5.2	Looks as if coppiced, or maybe 2 trunks. Carrying a lot of weight saved by sheltered location.
Beech	SO85277804	HURCOTT WOODS	22/06/2006	3.7	The larger of a pair growing within 20m of each other and surrounded by coniferous plantation. On a
Pedunculate oak	SO83718010	COOKLEY PLAYING FIELD	27/03/2007	4.6	Uphill side of tree missing canal bank has eroded exposing root system. Hollow trunk.
Pedunculate oak	SO80997988	CORNHILL COPPICE	04/08/2004	4	Edge of wood by footpath. Adjacent conifer plantation. Previously heathland. Many burrs on trunk. On
Ash	SO83718025	COOKLEY PLAYING FIELD	27/03/2007	3	4m from canal.
Pedunculate oak	SO83838017	COOKLEY PLAYING FIELD	27/03/2007	3.7	Good condition.
Pedunculate oak	SO83898016	COOKLEY PLAYING FIELD	27/03/2007	3.1	Possible woodpecker hole in scar of branch.
Pedunculate oak	SO83868015	COOKLEY PLAYING FIELD	27/03/2007	2.8	Hollowness caursed by falling limb. Badger sett in base.
Pedunculate oak	SO83908015	COOKLEY PLAYING FIELD	27/03/2007	3	Silver birch growing out of trunk.
Pedunculate oak	SO83938016	COOKLEY PLAYING FIELD	27/03/2007	3.4	Heartwood exposed and rotting.
Pedunculate oak	SO83718008	COOKLEY PLAYING FIELD	27/03/2007	4.5	Needs pollarding - tree alive but crown nearly dead. Some roots exposed.

APPENDIX 2

Target Notes

Target Notes

Target Note	Grid reference	Notes
1	SO 83757 79491	Motorcycle scramble jumps, bramble scrub to the north. Bare ground present that is regularly disturbed.
2	SO 83840 79280	Dying sweet chestnut. Negligible bat potential.
3	SO 83659 79208	Oak – dieback. Veteran tree poor condition on footpath.
4	SO 83639 79005	Large-leaved lime. Low bat potential.
5	SO 83736 78946	T3 Dead sweet chestnut. Moderate bat potential.
6	SO 83777 78885	T2 Oak tree with woodpecker holes. Moderate bat potential. Potential for barn owls.
7	SO 83863 78940	T1 Oak tree with moderate potential for bats and barn owl
8	SO 83969 79042	Beech and lime trees along the remains of an avenue.
9	SO 84475 78943	Unmanaged, gappy field hedgerow comprising hawthorn and elm.
10	SO 84503 79080	Unmanaged, gappy field hedgerow comprising hawthorn, elm, elder and honeysuckle
11	SO 84448 79183	Intact field hedgerow comprising hawthorn, elm and elder.
12	SO 84438 79251	T4 Oak tree. High bat roost potential. Potential kestrel nest site
13	SO 84363 79104	T5 Oak tree. Moderate bat roost potential
14	SO83974 78892	Tall ruderal area with patches of bramble scrub, and stored machinery, vehicles and stock piles. Areas of bare ground also present.

APPENDIX 3

Photographs

Plate 1. Arable field with boundary woodland.

Plate 2. Motorcycle scramble area at Target Note 1

Plate 3. Standard trees in field.

Plate 4. Tree lined driveway

Plate 5. Improved grassland to the left of the photos with track running alongside.

Plate 6. Hedgerow at Target Note 9.

Plate 7. Arable field to the west of the site.

Plate 8. Semi-improved grassland margins.

APPENDIX 4

Wildlife Legislation

Wildlife Legislation

Badgers (*Meles meles*)

In the UK the relevant legislation pertaining to Badgers is the Protection of Badgers Act 1992 and the Wildlife and Countryside Act, 1981 (as amended). Under the Protection of Badgers Act it is an offence to:

- Wilfully kill, injure, take possess or cruelly ill-treat[*] a Badger, or attempt to do so;
- To intentionally or recklessly interfere with a sett[#] (this includes disturbing Badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it).

[*] the intentional elimination of sufficient foraging area to support a known social group of badgers may, in certain circumstances, be construed as an offence by constituting 'cruel ill treatment' of a Badger.

[#] a sett is defined as 'any structure or place which displays signs indicating current use by a Badger', with 'current use' defined by Natural England under interim guidance as over the preceding few months prior to a likely interference/disturbance event.

Licences can be obtained from the SNCO for development activities that would otherwise be unlawful under the legislation.

Bats

All British bats are European protected species and therefore receive protection under the Conservation of Habitats and Species Regulations (2017), making it an offence to:

- Deliberately kill, injure or capture a bat;
- Deliberately disturb bats, including in particular any disturbance which is likely to:
    - impair their ability to survive, reproduce or to rear or nurture their young;
    - impair their ability to hibernate or migrate; or
    - significantly affect their local distribution or abundance.
- Damage or destroy a breeding site or resting place of a bat;
- Possess or control any live or dead specimen or anything derived from a bat;
- Sell, offer for sale, possess or transport a bat (live or dead, part or derivative) for the purpose of sale or advertise for buying or selling.

In addition, all British bats are listed under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended), which contains further provisions making it an offence to intentionally or recklessly:

- Damage, destroy or obstruct access to any structure or place which any bat uses for shelter or protection; or
- Disturb any bat while occupying a structure or place which it uses for that purpose.

Licences can be obtained from the Statutory Nature Conservation Organisation (SNCO) for development activities that would otherwise be unlawful under the legislation.

Water Vole (*Arvicola amphibius*)

Water Voles are protected under the Wildlife and Countryside Act 1981 (as amended), making it illegal to:

- Intentionally kill, injure or take a Water Vole;
- Possess or control a live or dead Water Vole, or any part of a Water Vole;
- Intentionally or recklessly disturb, destroy or obstruct access to any place that Water Voles use for shelter or protection;
- Sell, offer for sale or advertise any live or dead Water Voles.

Otter (*Lutra lutra*)

Otters are a European protected species and therefore receive protection under the Conservation of Habitats and Species Regulations (2017), making it an offence to:

- Deliberately kill, injure or capture an Otter;
- Deliberately disturb Otters, including in particular any disturbance which is likely to:
    - impair their ability to survive, reproduce or to rear or nurture their young;
    - impair their ability to hibernate or migrate; or
    - significantly affect their local distribution or abundance.
- Damage or destroy a breeding site or resting place of an Otter;
- Possess or control any live or dead specimen or anything derived from an Otter;
- Sell, offer for sale, possess or transport an Otter (live or dead, part or derivative) for the purpose of sale or advertise for buying or selling.

In addition, Otters are listed under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended), which contains further provisions making it an offence to intentionally or recklessly:

- Damage, destroy or obstruct access to any structure or place which an Otter uses for shelter or protection; or
- Disturb an Otter while occupying a structure or place which it uses for that purpose.

Dormice(*Muscardinus avellanarius*)

Dormice are a European protected species and therefore receive protection under the Conservation of Habitats and Species Regulations (2017), making it an offence to:

- Deliberately kill, injure or capture a Dormouse;
- Deliberately disturb Dormice, including in particular any disturbance which is likely to:
    - impair their ability to survive, reproduce or to rear or nurture their young;
    - impair their ability to hibernate or migrate; or
    - significantly affect their local distribution or abundance.
- Damage or destroy a breeding site or resting place of a Dormouse;
- Possess or control any live or dead specimen or anything derived from a Dormouse;
- Sell, offer for sale, possess or transport a Dormouse (live or dead, part or derivative) for the purpose of sale or advertise for buying or selling.

In addition, Dormice are listed under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended), which contains further provisions making it an offence to intentionally or recklessly:

- Damage, destroy or obstruct access to any structure or place which a Dormouse uses for shelter or protection; or
- Disturb a Dormouse while occupying a structure or place which it uses for that purpose.

Amphibians

All British amphibian species receive a degree of protection under the Wildlife & Countryside Act 1981 (as amended). The level of protection varies from protection from sale or trade only, as is the case with species such as Common Toad (*Bufo bufo*) and

Smooth Newt (*Lissotriton vulgaris*), to full protection afforded to species such as Great Crested Newt (*Triturus cristatus*).

Great Crested Newt is a European protected species and as such receives full protection under the Conservation of Habitats and Species Regulations 2010, making it an offence to:

- Deliberately capture, injure or kill a Great Crested Newt;
- Deliberately disturb Great Crested Newts, including in particular any disturbance which is likely to:
    - impair their ability to survive, reproduce or to rear or nurture their young;
    - impair their ability to hibernate or migrate; or
    - significantly affect their local distribution or abundance.
- Deliberately take or destroy eggs of Great Crested Newts;
- Damage or destroy a breeding site or resting place of Great Crested Newts;
- Possess or control any live or dead specimen or anything derived from a Great Crested Newt;
- Sell, offer for sale, possess or transport a Great Crested Newt (live or dead, part or derivative) for the purpose of sale or advertise for buying or selling.

<u>Reptiles</u>

All reptile species receive protection under the Wildlife & Countryside Act 1981 (as amended), making it illegal to;

- Intentionally kill or injure reptiles;
- Sell, offer for sale, possess or transport reptiles (live or dead, part or derivative) for the purpose of sale or advertise for buying or selling.

In addition, due to their status as scarce species both Smooth Snake (*Coronella austriaca*) and Sand Lizard (*Lacerta agilis*) are European protected species, protected under the Conservation of Habitats and Species Regulations, 2017. This affords them additional protection, making it illegal to:

- Deliberately capture Smooth Snakes or Sand Lizards;
- Deliberately disturb Smooth Snakes or Sand Lizards, including in particular any disturbance which is likely to:
    - impair their ability to survive, reproduce or to rear or nurture their young;
    - impair their ability to hibernate or migrate; or
    - significantly affect their local distribution or abundance.

- Damage or destroy a breeding site or resting place of Smooth Snakes and Sand Lizards.
- Possess or control any live or dead specimen or anything derived from a Smooth Snake or Sand Lizard.

Birds

All wild birds, their nests and eggs are protected throughout the breeding season (typically late February to late August inclusive) under the Wildlife and Countryside Act, 1981 (as amended). This legislation makes it an offence to (with certain limited exceptions and in the absence of a licence) intentionally:

- Kill or injure any wild bird;
- Take, damage or destroy the nest of any wild bird whilst it is in use or being built;
- Take or destroy the egg of any wild bird;
- It is also an offence to possess any live or dead wild bird or egg, or anything derived from a bird or egg
- Restrictions on trade and advertising also apply.

Schedule 1 of the Wildlife & Countryside Act 1981 is a list of the nationally rare and uncommon breeding birds for which all offences carry special (i.e. greater) penalties. These species also benefit from additional protection whilst breeding, as it is an offence to disturb adults or their dependent young when at a nest.

The RSPB categorise British bird species in terms of conservation importance based on a number of criteria including the level of threat to a species population status. Species are listed as Green, Amber or Red. Red Listed species are considered to be of the highest conservation concern, being either globally threatened and / or experiencing a high level of population decline (e.g. a reduction in breeding population size greater than or equal to 50% over the past 25 years or since 1969, when the first species assessment was made).

Crayfish

White-clawed Crayfish (*Austropotamobius pallipes*) are protected under the Wildlife and Countryside Act, 1981 (as amended), making it an offence to:

- Take White-clawed Crayfish from the wild;
- Sell, offer for sale, possess or transport White-clawed Crayfish (live or dead, part or derivative) for the purpose of sale or advertise for buying or selling.

In addition, under the Wildlife and Countryside Act, 1981 (as amended) it is an offence to:

- Release or allow to escape into the wild any animal which is included in Part I of Schedule 9

Signal Crayfish (*Pacifastacus leniusculus*) are included in Part 1 of Schedule 9 of the Wildlife and Countryside Act, 1981 (as amended).

APPENDIX 5

Biodiversity Legislation

Biodiversity Legislation

The Habitat Regulations 2017 are the principal means by which Council Directive 92/43/EEC on the conservation of natural habitats of wild fauna and flora (the "Habitats Directive") is transposed in England and Wales and the adjacent territorial seas. They also transpose elements of the EU Wild Birds Directive in England and Wales.

There is an expectation, based on long standing Parliamentary convention, that the UK will consolidate legislation on the fourth substantive amendment. The Habitats Regulations 2017 themselves a consolidation of the Conservation (Natural Habitats &c.) Regulations 1994, have now been amended ten times since enactment. They are likely to remain in place for some time after the UK exits the EU, and the power to consolidate them will no longer be available once the UK exits the EU. In the light of this, the government have consolidated the Regulations, aiding usability and clarity.

A statutory instrument is also being made to consolidate the Offshore Marine (Conservation Natural Habitats &c.) Regulations 2007, which transpose the Wild Birds and Habitats Directives in the UK beyond 12 nautical miles. The 2007 Regulations have been amended twelve times since being introduced. A separate Explanatory Memorandum has been prepared for that instrument known as the Conservation of Offshore Marine Habitats and Species Regulations 2017.

The 'UK' Post-2010 Biodiversity Framework' (JNCC & DEFRA, 2012), published in July 2012, also sets out a framework of priorities for UK-level work for the Convention on Biological Diversity, to which the UK is a signatory. Covering the period 2011-2020, this framework replaces the original UK Biodiversity Action Plan (UK BAP, 2004) system and now the work is focussed on the separate countries (England, Scotland, Northern Ireland and Wales). The overall aim remains to protect a number of rare species and habitats, and reverse the declines of more widespread but declining species and habitats, and so currently many of the species and habitats in the UK BAP still form the basis of the biodiversity work carried out in the separate countries as required under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 (England).

Furthermore, Local Biodiversity Action Plans (LBAPs) are still in place under this framework to manage and conserve species and habitats of priority at a local level. Where necessary, further species specific surveys and mitigation measures are recommended so as to safeguard any significant existing ecological interest within the site and where appropriate, opportunities for ecological enhancements are proposed with reference to national and local Biodiversity Action Plans (BAPs).

Furthermore, recommendations are guided by the National Planning Policy Framework (NPPF) produced in July 2018, where the policies in paragraphs 15 to 217, taken as a whole, constitute the government's view of what sustainable development in England means in practice for the planning system. The following paragraphs of the NPPF are of particular relevance:

- With regard to paragraph 170, planning policies and decisions should contribute to and enhance the natural and local environment by:
  - Protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
  - Recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;
  - Maintaining the character of the undeveloped coast, while improving public access to it where appropriate;
  - Minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;
  - Preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and
  - Remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.
- With regard to paragraph 174, to protect and enhance biodiversity and geodiversity, plans should:
  - Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and
  - Promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and

identify and pursue opportunities for securing measurable net gains for biodiversity.

With reference to paragraph 175, when determining planning applications, local planning authorities should apply the following principles:

- if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, the planning permission should be refused;
- development on land within or outside a Site of Special Scientific Interest (SSSI), and which is likely to have an adverse effect on it (either individually or in combination with other developments) should not normally be permitted. The only exception is where the benefits of the development in the location clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of SSSIs;
- development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and
- development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged; especially where this can secure measurable net gains for biodiversity.

Paragraph 176 states that the following should be given the same protection as habitats sites:

- potential Special Protection Areas (SPA) and possible Special Areas of Conservation (SAC);
- listed or proposed Ramsar sites; and
- sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential SPA, possible SAC, and listed or proposed Ramsar sites.

Section 14 discusses the need for meeting the challenge of climate change, flooding and coastal change. Paragraph 148 is of particular relevance and states that:

- The planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse

gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure.

The recommendations are also guided by the relevant legislation:

- The Natural Environmental and Rural Communities (NERC) Act, 2006 states: "Every public authority must, in exercising its functions, have regard, so far is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity".

APPENDIX 6

Confidential Annex

The information contained within this appendix is Confidential and must not be released into the public domain in the interests of wildlife conservation

M16.176(a).R.007 - Confidential Annex

The information contained within this report is confidential and therefore in the interests of wildlife conservation it must not be released into the public domain.

Badger

Results

One outlier badger sett (Sett 1) was recorded at the base of an oak tree during the initial survey completed in January 2016. . At the time of this survey, the sett was recorded as active, with no debris present.

During the survey undertaken in October 2016, a total of five badger outlier setts were recorded on or surrounding the site. Sett 1 was active with a recent dung pit nearby. Sett 2 was an active hole in the base of a sweet chestnut tree with a recent dung pit nearby. Sett 3 was a partially used hole with debris present. Sett 4 was an old hole with recent digging evidence. Sett 5 was a partially used hole with debris present in the entrance.

The following surveys completed throughout 2018 and 2019 recorded these setts as partially active with debris present at the entrance on each occasion and no signs of current badger use i.e. hairs or recent dung pits.

A badger sett (Sett 6) is known to be present approximately 300m to the north of the site within the woodland. This sett was recorded during surveys completed by Pleydell Smithyman Limited in June 2018 as part of a wider site survey. This sett is not considered to be a main sett, and the main sett is considered likely further north or west within the woodland.

One badger dung pit was recorded at the entrance to the woodland during the initial survey. A further two badger dung pits were recorded during the October 2016 survey, with one in the woodland to the west and one in the woodland to the north.

A large badger latrine was recorded to the western end of the field hedgerow TN9 during the initial survey. It is assumed that this latrine is a territory boundary marker as there were no

active sett entrances recorded in the area. These latrines showed evidence of partially digested sweet chestnuts.

During a breeding bird survey conducted in June 2016, badger footprints were recorded along the southern boundary of the western half of the site.

During the initial survey, a badger path was recorded along the north-western boundary of the site. A well-used badger track was also recorded in the woodland to the north heading into the grassland towards an area of woodland further north.

During a bat roost survey completed in July 2018, a badger was seen in the north-eastern corner of the site crossing the track and entering the arable field.

For a plan showing the location of the badger activity, please see Drawing M16.176(a).D.021. Please note that this drawing is confidential and should not be released into the public domain.

WBRC returned 21 records of badger from the data search. None of these records were specific to the site. The closest record was a road casualty from 2008 from Wolverley Road immediately to the south of the site. The records dated between 2001 and 2014. The vast majority of the records were road casualties or live sightings.

Assessment

The site is considered to be of local importance to badgers due to the presence of foraging and commuting habitat and the presence of a small number of outlier setts. Badgers in the local area are likely to pass through the site to forage or commute, however the site is unlikely to be of importance to badgers at any higher than a local level.

Impacts

The proposals will involve the removal of two partially used outlier badger setts as well as the loss of agricultural land and grassland which would cause a reduction in foraging habitat for badgers.

Mitigation

The two outlier setts present on the Site must be removed. As these setts are not currently active, it is considered that this removal can be completed under the supervision of a suitably

experienced ecologist providing that a minimum of three months monitoring prior to the sett removal is conducted with no evidence of badger activity. This sett must be removed using a digger and toothed excavator bucket. Excavation of the sett must continue until all tunnels and chambers have reached their end.

Prior to any habitat destruction on the Site, an update survey must be conducted to identify any changes to the badger activity levels at the Site. Should there be evidence of recent badger activity, a licence for disturbance/destruction will be required from Natural England. A disturbance licence will detail that construction works and vehicle movements within 30m of any badger sett will only be permitted between 1st July and 30th November inclusive. A destruction licence will need to have a detailed method statement that outlines the works required to destroy the sett. This may need to include the creation of an artificial sett to compensate for the loss of a badger sett. A timetable of works will also be required to be submitted as part of the licence application.

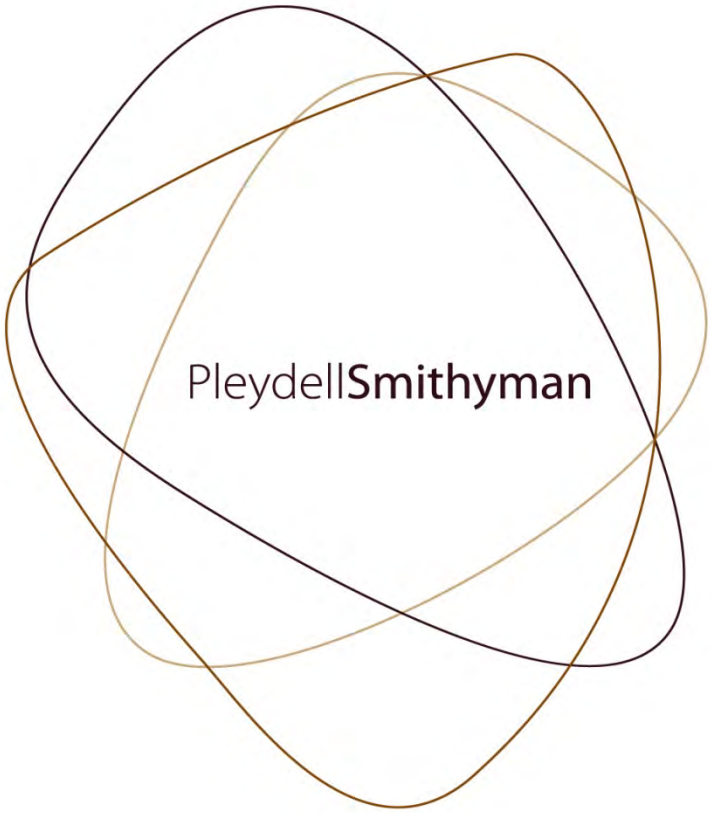
Regular (annual and prior to the commencement of each phase) monitoring will be required across the Site to identify any new evidence of badger activity. Where new setts are recorded, a 30m stand-off will be required at all times. Should this not be possible, it will be necessary to apply for a licence from Natural England for the destruction or disturbance of these badger setts.

The phased working and restoration of the Site will ensure that there will continue to be habitat present for foraging and commuting badgers. The restoration of agricultural land and open grassland within the Site will ensure that there are opportunities for foraging badgers in the long term.

Any trenches or holes created by the development will be covered overnight or have a ramp fitted to allow any mammals that may climb into these excavations to escape safely.

TECHNICAL APPENDIX 9/2

BREEDING BIRD SURVEY REPORT



BREEDING BIRD SURVEY REPORT

RELATING TO LAND AT LEA CASTLE FARM, WOLVERLEY, KIDDERMINSTER

APPLICATION FOR PLANNING PERMISSION

FOR NRS AGGREGATES LTD.

APRIL 2019

PSL Report Reference Number: M16.176(a).R.002

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BREEDING BIRD SURVEY ON LAND AT LEA CASTLE FARM, WOLVERLEY ROAD, WOLVERLEY, KIDDERMINSTER, DY10 3QD

By:
Pleydell Smithyman Limited
April 2019

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1.0 INTRODUCTION

Background and Proposals

1.1 Pleydell Smithyman Limited was instructed by NRS Aggregates Ltd via Robin Smithyman of Kedd Ltd to undertake breeding bird on the land at Lea Castle Farm, Wolverley, Kidderminster (hereafter referred to as the site). Please see Drawing Number M16.176(a).D.006 Preliminary Ecological Appraisal, for a plan showing the area surveyed.

1.2 The surveys were recommended following an ecological walkover survey that was undertaken in January 2016 by Nick Staples of Pleydell Smithyman Limited that identified suitable habitat for breeding birds.

1.3 The initial surveys were conducted in 2016 and then subsequently updated in 2018. The surveys were required to inform the preparation and submission of a planning application for the extraction of mineral from the site. The surveys were also required to help ensure compliance with national and European legislation.

Site Location

1.4 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. The surrounding area includes arable fields, woodland and residential areas. The River Stour is approximately 100m to the north-west of the site at its nearest point.

Site Description

1.5 The site comprises approximately 45ha of arable farmland with semi-improved and improved grass headlands. A hard-standing 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 tree standards were present within the fields, including oak (*Quercus robur*), sweet chestnut (*Castanea sativa*) and non-native conifers. Suitable habitat for breeding birds included the arable fields, hedgerows, standard trees and surrounding woodland.

Legislation

1.6 The Wildlife and Countryside Act 1981 (as amended) is the principal legislation affording protection to UK wild birds. Under this legislation all birds, their nests and eggs are protected by law and it is an offence, with certain exceptions, to recklessly or intentionally:

- Kill, injure or take any wild bird;
- Take, damage or destroy the nest of any wild bird while in use or being built; and
- Take or destroy the egg of any wild bird.

1.7 Species listed on Schedule 1 of the Wildlife and Countryside Act, 1981 (as amended) are specially protected to avoid disturbance of an active nest.

1.8 In addition to statutory protection, some bird species are classified according to their conservation status, such as their inclusion on the Red and Amber lists of Birds of Conservation Concern 4 (BoCC[4]) in the UK (Eaton *et al* 2015):

- Red list (high conservation concern) species are those that are Globally Threatened according to IUCN (International Union for Conservation of Nature) criteria; those whose population has declined rapidly (50% or more) in recent years; and those that have declined historically and not shown a substantial recent recovery.
- Amber list (medium conservation concern) species are those with an unfavourable conservation status in Europe; whose population or range has declined moderately (between 25% and 49%) in recent years; whose population has declined historically but made a substantial recent recovery; rare breeders; and those with internationally important or localised populations.
- Green list (low conservation concern) species fulfil none of the above criteria.

1.9 Certain species have also been identified as species of principal importance listed in Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

1.10 The 'UK Post-2010 Biodiversity Framework' (JNCC & DEFRA, 2012), published in July 2012, also sets out a framework of priorities for UK-level work for the Convention on Biological Diversity, to which the UK is a signatory. Covering the period 2011-2020, this

framework replaces the original UK Biodiversity Action Plan (UK BAP, 2004) system and now the work is focussed on the separate countries (England, Scotland, Northern Ireland and Wales). The overall aim remains to protect a number of rare species and habitats, and reverse the declines of more widespread but declining species and habitats, and so currently many of the species and habitats in the UK BAP still form the basis of the biodiversity work carried out in the devolved countries. Furthermore the Local Biodiversity Action Plan (LBAP) are still in place under this framework. The LBAP which covers this area is the Worcestershire Biodiversity Action Plan, which lists the species of conservation concern in Worcestershire.

Aims and Objectives of the Study

1.11 The aims and objectives of the surveys at Lea Castle Farm were therefore to:

- Record and categorise calling birds, singing birds, perched or stationary birds and birds in flight;
- Update the surveys completed in 2016;
- Record species using distance bands - dividing the site into 10 sections and record 0-100metres either side of the transect line; and
- Provide sufficient data to enable a robust assessment of the effects of the proposals to be made within this report.

1.12 This information was used to identify the following (where appropriate):

- The need for further survey work required to fully assess the impacts associated with development proposals;
- The need for mitigation and/or compensation measures which should be incorporated into the design of the proposed development; and
- Recommendations for enhancement measures above and beyond the need to mitigate adverse effects in order to encourage breeding birds onto the site post-development.

2.0 METHODOLOGY

Desk Study

2.1 To support the initial ecological survey conducted in January 2016, background information on the site and its immediate surroundings was compiled to provide information on statutory and non-statutory designated sites and ancient woodland sites within a 3km radius of the central point of the site. This was obtained from the Multi-Agency Geographic Information for the Countryside (MAGIC) website and the information supplied is detailed in the Preliminary Ecological Appraisal, (Pleydell Smithyman Limited, 2019).

2.2 In addition, Worcestershire Biological Records Centre (WBRC) was commissioned to undertake a data search for all protected and notable species and all sites of conservation importance within a 3km radius of the grid reference SO834789. Please see Appendix 1 for more information.

2.3 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.

Field Survey

Breeding bird survey

2.4 The survey methodology deployed was based on the Breeding Bird Survey (BBS, joint funded by BTO and JNCC) which uses a set transect which is walked on the survey visits. Birds are recorded along the line and at 25m and 100m distances to either side of the transect route. Standard two-letter species codes and symbols for bird activities are used to identify birds and denote activity.

2.5 Birds that were considered to be not using the site for breeding were categorised as 'non-breeders' (e.g. flying over the site, migrant or habitat not suitable).

2.6 Observations of bird species (by sight or sound) within the site were noted on the survey (field) map using standard species and activity recording codes (see Drawing Numbers M16.176(a).D.010 and M16.176(a).D.011). Records were also made of any bird species observed on land adjacent to the survey area or flying over the site. Birds in

this category would not be included in the assessment, unless it was obvious that they were moving between different parts of the survey area.

2.7 A transect route was established during earlier site visits in preparation for the breeding bird surveys. The update surveys were conducted on the 4th April 2018 and the 5th June 2018. This concurs with the BBS method of at least two survey visits, made approximately four weeks apart, ensuring that any late arriving migrants are recorded. Surveys were carried out to avoid the peak activity around dawn with a start no later than 9am. Bird surveys were not undertaken in unfavourable conditions such as heavy rain or strong wind, conditions which may have negatively affected the results. The surveys were carried out by Steven Pagett who has extensive experience of carrying out bird surveys using BBS methodology.

2.8 The dates and weather conditions during the BBS survey visits are detailed in Table 1 below.

Table 1. Breeding bird survey dates and weather conditions.

Date	Cloud Cover	Rain	Wind	Visibility
Breeding Bird Surveys				
04/05/2018	80%	No	Moderate breeze	Good
05/06/2018	90%	No	Gentle breeze	Good

2.9 The ecological importance of the breeding bird assemblage has been assessed using two separate approaches: nature conservation importance and conservation status. The Chartered Institute of Ecology and Environmental Management (CIEEM) guidance on Ecological Impact Assessment assesses nature conservation value within a geographical context (CIEEM, 2018). To attain each level of importance, an ornithological resource or one of the features (species population or assemblage of species) should meet the criteria set out in Table 2 below. In some cases, professional judgement may be required to increase or decrease the allocation of specific value, based upon local knowledge.

Table 2. Definition of Terms Relating to Nature Conservation Importance.

Nature Conservation Importance	Examples of Selection Criteria
International	A species which is part of the cited interest of an SPA and

Nature Conservation Importance	Examples of Selection Criteria
	which regularly occurs in internationally or nationally important numbers. A species present in internationally important numbers (>1% of international population).
National	A species which is part of the cited interest of a SSSI and which regularly occurs in nationally important numbers. A nationally important assemblage of breeding or over-wintering species. A species present in nationally important numbers (>1% UK population). A rare breeding species (<300 breeding pairs in the UK).
Regional	Species listed as species of principal importance (SPI) on Section 41 of the NERC Act, 2006, which are not covered above, and which regularly occurs in regionally important numbers. Sustainable populations of species that are rare or scarce within a region. Species on the Birds of Conservation Concern (BoCC[4]) Red List and which regularly occurs in regionally important numbers.
County	Species listed as an SPI, which are not covered above, and which regularly occurs in county important numbers. Species present in county important numbers (>0.5% of national population). Sustainable populations of species that are rare or scarce within a county, or listed in a county BAP. A site designated for its county important assemblage of birds Species on the BoCC[4] Red List and which regularly occur in county important numbers.
District	Species listed as an SPI which are not covered above, and are rare in the locality or in the relevant Natural Area profile. Species present in numbers just short of county importance. Sustainable populations of species which are rare or scarce within the locality. A site whose designation falls just short for inclusion for its county important assemblage of birds Other species on the BoCC[4] Red List and which are considered to regularly occur in district important numbers.
Local	Other species of conservation interest (e.g. all other species on the BoCC[4] Red and Amber List and SPI which are not covered above) regularly occurring in locally sustainable populations.
Site	All other BoCC[4] Green-listed common and widespread

Nature Conservation Importance	Examples of Selection Criteria
	species.

Survey Constraints and Limitations

2.10 The surveys covered an extensive survey area and consequently it was possible that species may have been double counted, especially birds which have a large feeding range i.e. goldfinch and linnet which will feed on seeds over a large distance before returning to their nest or roost. Therefore when recording the more nomadic species these were only noted where they were most frequently observed and in areas where they were considered likely to be nesting, this technique minimised the risk of repeat recording of the same individuals.

2.11 It should be noted that the site boundary changed after the completion of the surveys. This included an additional arable field to the north-east of the site. It is therefore possible that additional species may have been breeding within this area, however the overall assessment of the sites breeding bird population status is considered unlikely to change.

3.0 RESULTS

Desk Study

Species Records

3.1 During the initial walkover survey during January 2016, numerous flocks of birds were seen on the arable fields including a mixed flock of 50+ finches including chaffinch and goldfinch, a flock of 40 redwing and a mixed flock of 8 skylark and 20 meadow pipit. In addition, a female goshawk was observed flying from south-west to north-east across the site.

3.2 During the vegetation survey conducted in October 2016, species recorded included fieldfare, robin, meadow pipit, jay, linnet, blue tit, wren and great spotted woodpecker. A flock of 500 woodpigeon was observed gleaning oats in the western section of the site. Raven and black-headed gull were also seen flying over the site.

3.3 WBRC returned a number of bird records from the data search. This included lesser redpoll, skylark, kingfisher, linnet, lesser spotted woodpecker, yellowhammer, reed bunting, brambling, herring gull, house sparrow, starling, redwing, song thrush, fieldfare and lapwing. None of the records were specific to the site. The closest was a skylark returned from approximately 500m to the north of the site in 2009. It is considered unlikely that species including kingfisher, herring gull, house sparrow, redwing and fieldfare would be found to be breeding on the site.

3.4 During the surveys completed in 2016, a total of 27 bird species were observed within the surveyed site, of which 4 species were confirmed breeding, 4 were probable breeders, 11 were possible breeders and 8 species were not breeding. This included a number of birds listed on the Red and Amber BoCC list, as well as a number of Green listed birds. For full details, please refer to the report produced by Pleydell Smithyman Limited, 2016. No evidence of nesting or foraging barn owls were recorded during these surveys,

Field survey

3.5 The below table presents the species recorded on the site and includes the abundance of each species measured as the maximum number of individuals detected on any one survey visit. The number of 'notable' recorded species is also given, i.e. species either appearing on the BoCC[4] Red or Amber Lists; or listed as an SPI and/or Worcestershire

Local Biodiversity Action Plan (LBAP). For specific locations of bird species across the site, (see Drawing Numbers M16.176(a).D.010 and M16.176(a).D.011). For information on the standard two–letter species code used as part of the breeding bird survey methodology, and for scientific names for all birds referred to in this report, please see Appendix 2.

3.6 The breeding status of the birds recorded on the site is given in Table 2, these are classified into four different categories as detailed below:

- **Confirmed breeding -** occupied nest found with eggs or young chicks present or observations of recently fledged or downy young. Adults observed entering or leaving active nest site, conducting behaviour indicating occupied nest or adult observed sitting on active nest. In addition, if any adult bird is observed carrying food into suitable nesting habitat or carrying faecal sacs from suitable nesting habitat.
- **Probable breeding –** pairs observed within suitable nesting habitat during the nesting bird season. If permanent territory is observed through birdsong, bird calling or any form of territorial behaviour carried out within the same location during at least two different surveys. Also, if species is observed carrying out agitated behaviour or anxiety calls from adults, building nests or excavating potential nest holes.
- **Possible breeding** – species recorded during the breeding season within possible nesting habitat, this includes singing males or calling birds.
- **Not breeding** – species recorded using the site for foraging or commuting purposes, clearly observed within unsuitable breeding habitat.

<u>Species recorded during the 2018 surveys</u>

3.7 A total of 40 bird species were observed within the site, of which 5 species were confirmed breeding, 5 were probable breeders, 22 were possible breeders and 8 species were not breeding. Table 3 lists these species and includes the abundance measured as the maximum number of individuals detected on any one survey visit.

Table 3. Bird species, conservation and breeding status and abundance of birds recorded within the site.

Species	Conservation Status	Breeding Status on Site	Abundance
Blackbird *Turdus merula*	Green List	Probable	2
Blackcap *Sylvia atricapilla*	Green List	Probable	3
Blue Tit *Cyanistes caeruleus*	Green List	Possible	5
Bullfinch *Pyrrhula pyrrhula*	Red List	Possible	1
Buzzard *Buteo buteo*	Green List	Confirmed	1
Chaffinch *Fringilla coelebs*	Green List	Possible	2
Chiffchaff *Phylloscopus collybita*	Green List	Possible	2
Coal tit *Periparus ater*	Green List	Possible	2
Collared dove *Streptopelia decaocto*	Green List	Possible	1
Crow *Corvus corone*	Green List	Possible	126
Dunnock *Prunella modularis*	Amber List	Probable	4
Garden warbler *Sylvia borin*	Green List	Possible	1
Goldcrest *Regulus regulus*	Green List	Possible	1
Goldfinch *Carduelis carduelis*	Green List	Possible	2
Great spotted woodpecker *Dendrocopos major*	Green List	Not breeding	1
Great tit *Parus major*	Green List	Probable	3
Greenfinch *Carduelis chloris*	Green List	Possible	1
Green woodpecker *Picus viridis*	Green List	Not breeding	1
Jackdaw *Corvus monedula*	Green List	Possible	37
Kestrel *Falco tinnunculus*	Amber List	Possible	2
Linnet *Carduelis cannabina*	Red List	Possible	5
Long-tailed tit *Aegithalos caudatus*	Green List	Confirmed	2
Magpie *Pica pica*	Green List	Possible	3
Mistle thrush *Turdus viscivorus*	Red List	Not breeding	1
Nuthatch *Sitta europaea*	Green List	Not breeding	2
Pheasant *Phasianus colchicus*	Not Listed	Possible	1
Pied wagtail *Motacilla alba yarrellii*	Green List	Not breeding	2
Red-legged partridge *Alectoris rufa*	Not Listed	Possible	2
Robin *Erithacus rubecula*	Green List	Probable	3
Rook *Corvus frugilegus*	Green List	Not breeding	2

Species	Conservation Status	Breeding Status on Site	Abundance
Skylark *Alauda arvensis*	Red List	Confirmed	9
Song thrush *Turdus philomelos*	Red List	Not breeding	2
Stock dove *Columba oenas*	Amber List	Possible	8
Swallow *Hirundo rustica*	Green List	Not breeding	4
*Tawny owl *Strix aluco*	Amber list	Possible	2
Treecreeper *Certhia familiaris*	Green List	Possible	1
Whitethroat *Sylvia communis*	Green List	Confirmed	2
Woodpigeon *Columba palumbus*	Green List	Possible	48
Wren *Troglodytes troglodytes*	Green List	Confirmed	4
Yellowhammer *Emberiza citrinella*	Red List	Possible	2

*Tawny owl recorded during night-time bat surveys.

3.8 The majority of notable and common and opportunistic species were recorded using the boundary woodlands surrounding the site. However a number of species were also observed feeding and nesting within the hedgerows, arable fields, scattered trees and semi-improved grasslands.

3.9 A number of song thrushes were observed singing and calling within the boundary woodlands and therefore are assessed as not breeding within the site. A number of dunnocks were observed singing within the boundary woodland and in the grassland located near the southern boundary and eastern hedgerows.

3.10 Two yellowhammers were observed singing and calling along the hedgerow in the north-eastern corner of the site, these were both male birds. It is therefore assessed that yellowhammer is possibly breeding within the hedgerows present on the site.

3.11 A number of linnets were observed singing and foraging within the hedgerows present near the eastern boundary of the site. There is very little suitable breeding habitat for linnets present on the site, however it is assessed that a small population may possibly be breeding within the site.

3.12 There was one male bullfinch observed calling within the north-eastern site boundary. There are small areas of suitable breeding habitat for bullfinch present within the site. Therefore this species is assessed as possibly breeding within the site.

3.13 One mistle thrush was observed calling within the woodland along the boundary of the site. The trees within the site provide suitable nesting habitat for mistle thrushes and therefore this species is assessed as possibly breeding within the site.

3.14 Skylarks were observed singing and calling within the arable fields and grasslands across the site.

3.15 A maximum count of two kestrels was made during the surveys (5th June 2018). This species was observed foraging in areas of semi-improved grassland and perching on power lines and large trees on the site, this species is considered likely to be breeding in the local area. A Kestrel was observed settling to roost in a large oak tree during a bat survey (T4) on 24th July 2018.

3.16 A maximum count of 8 stock doves was made, observed perching in a tree before flying down to forage in the arable fields in the centre of the site. It is considered that stock dove may possibly be breeding within the site.

3.17 Of the recorded species, ten are 'notable' either appearing on; the BoCC[4] Red or Amber Lists; or listed as an SPI (see Table 4 below).

Table 4. Notable bird species within the site and their designations.

Species	Designations
Bullfinch	Red List, SPI
Dunnock	Amber List, SPI
Kestrel	Amber List
Linnet	Red List, SPI
Mistle thrush	Red List
Skylark	Red List, SPI
Song thrush	Red List, SPI
Stock dove	Amber List
Tawny owl	Amber List
Yellowhammer	Red List, SPI

Incidental bird species recorded

3.18 During the bat activity surveys completed throughout 2018, a number of additional incidental bird species were observed within the site, please see Table 5 below. This information is provided as additional information, however these additional observations weren't observed in the breeding bird survey season.

Table 5. Additional bird species and conservation status recorded during bat surveys in 2018.

Species	Designations
Barn owl *Tyto alba*	Green list, Schedule 1
Tawny owl *Strix aluco**	Amber list

*= possible breeding species

3.19 Tawny owls were heard around the site on 25th July, 8th August and 11th September, during 2018 bat surveys. It is likely that tawny owls hold nesting territories in woodland or trees adjacent to the site. It is possible that tawny owls could nest and forage on the site. Tawny owl has been included as a possible breeding species.

3.20 During a bat survey to the west of the site on 8th August 2018 a barn owl was heard calling. The call was from off-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.

Species Flying Over the Site

3.21 In order to exclude what is considered superfluous information, species solely flying over the site have been omitted from the map and main tables, but for completeness are included in Table 6 below. One additional bird species were observed solely flying over the site.

Table 6. Bird species and conservation status of birds recorded solely flying over the site.

Species	Designations
Cormorant *Phalacrocorax carbo*	Green List

3.22 One cormorant flew over the site during the survey conducted on the 04/05/2018. It is considered that this bird was commuting to an inland waterbody in the surrounding area.

4.0 PRELIMINARY IMPACT ASSESSMENT

4.1 To assess the overall breeding bird assemblage, Fuller (1980) describes a method for assessing ornithological interest of sites, whereby the importance is defined by the number of breeding species present as shown in the centre column of Table 7 below.

Table 7. Breeding bird assessment using the number of breeding bird species.

Level of Importance	Number of Breeding Species	
	Fuller (1980)	Adapted Criteria
Local	25 – 49	<25
District	-	25 – 49
County	50 – 69	50 – 69
Regional	70 – 84	70 – 84
National	85+	85+

4.2 For the purposes of this assessment, Fuller's geographical levels have been adapted so that Fuller's 'Local importance' is assumed to correspond to site importance as described in the CIEEM Guidelines (CIEEM, 2018). An assemblage comprising fewer than 25 species is therefore considered to be of local importance or less. Since the publication of the criteria in 1980, declines have occurred in many farmland bird populations, and for this reason it is therefore deemed appropriate to recalibrate the categories slightly downwards in this way.

4.3 The combined total of confirmed, probable and possible breeding species is used to assess the importance category which is taken from the breeding bird surveys. The combined total of confirmed, probable and possible species recorded within the site is 32. Therefore the site is indicated as having a 'district' level of importance. The district in this area is the Wyre Forest District. The breeding bird species recorded included many common and widespread opportunistic species and the habitats present on the site used by these species are generally common and widespread in the wider area. The value of the site for breeding birds is therefore considered to be of local importance.

Potential Operational Impacts- Disturbance, Displacement and Habitat Loss

4.4 The site contains suitable breeding habitat for a variety of breeding bird species. The habitats present within the site that provide suitable breeding habitat include: arable

fields, hedgerows, boundary mixed and broad-leaved woodland, semi-improved grassland and scattered trees. These provide habitat for a variety of common and opportunistic species and 10 'notable' species discussed below.

4.5 The boundary mixed and broad-leaved woodland provides suitable breeding and foraging habitat for 3 Red List species (bullfinch, mistle thrush and song thrush) and 4 Amber List species (dunnock, kestrel, stock dove and tawny owl). The woodland also provides suitable foraging and nesting habitat for many common and opportunistic species including blue tit and great tit.

4.6 The hedgerows within the site provide suitable nesting habitat for 3 Red List species (bullfinch, linnet and yellowhammer) and 1 Amber List species (dunnock). The hedgerows also provide suitable foraging habitat and commuting corridors for many common and opportunistic species including wren, robin and blackbird.

4.7 The arable fields within the site provide suitable nesting habitat for 1 Red List species (skylark). The arable fields provide suitable foraging habitat for 1 Red List species (linnet) and 1 Amber List species (stock dove). Linnets are considered to be breeding within the local area and will frequently travel large distances to feed during the breeding season.

4.8 The tussocky semi-improved grassland within the site provides suitable nesting habitat for 1 Red List species (skylark). The grasslands also provide suitable foraging habitat for 2 Amber List species (kestrel and tawny owl) and for many common and opportunistic species including wren, robin and blackbird.

4.9 The scattered trees provide suitable nesting habitat for 1 Red List species (mistle thrush) and 3 Amber List species (stock dove, kestrel and tawny owl). These habitats also provide suitable foraging and nesting habitat for many common and opportunistic species including blue tit and jackdaw.

4.10 For 4 Red List species (bullfinch, yellowhammer, song thrush and mistle thrush) and 2 Amber List species (dunnock and stock dove) the impacts are assessed as being low. This assessment was made as these species were observed in low breeding numbers or within boundary vegetation that is to be retained during the extent of the works. In addition, there is ample suitable surrounding replacement habitat that can be used by these species without having an overall negative effect on local numbers.

4.11 For 2 Red List species (skylark and linnet) and 2 Amber List species (kestrel and tawny owl), the proposed works would have an immediate impact and will have a medium effect on these species. This is considered as immediate as a large number of skylark territories would be removed as would areas of suitable foraging habitat for kestrel and tawny owl.

5.0 RECOMMENDATIONS AND MITIGATION MEASURES

5.1 The proposed development has the potential to impact on 6 Red List species (bullfinch, linnet, mistle thrush, skylark, song thrush and yellowhammer) and 4 Amber List species (dunnock, kestrel, stock dove and tawny owl). The following mitigation measures are recommended to provide breeding habitat, food sources and commuting opportunities for these species. These recommendations will also provide benefits for other species of conservation concern which are not currently present on site.

5.2 When required and unavoidable, the removal of any vegetation should occur outside of the nesting bird season which usually takes place from late February to late August. In the event that this is not possible then all vegetation removal works should be preceded by an inspection conducted by a suitably qualified ecologist, in order to check for nesting birds and to advise accordingly on the most appropriate way to proceed. This inspection should be completed no more than 48 hours before any vegetation removal. Furthermore, should any active nests (from when the nest is in the process of being built, until all the nestlings have fledged) be discovered during the works, then works to the area around the nest must stop immediately and a suitably qualified ecologist called in to check the nest and advise on the most appropriate way to proceed.

5.3 No further breeding bird surveys are recommended, with the exception of any nesting bird checks if habitat removal is required during the nesting bird season.

5.4 All the boundary vegetation which contains mixed plantation woodland and broad-leaved woodland is to be retained during the extent of the works. It is recommended that a large screening bund with a suitable buffer distance is created which extends across the southern, western and northern boundary. This will screen the areas of mixed plantation and broad leaved woodland from the active quarry workings. It is recommended that the screening bunds are seeded with native grass species from a local wildflower mixture.

5.5 The restoration proposals include restoring the site to agricultural land, with areas of species rich acid grassland, scatted trees, woodland and ephemeral wet grassland and pools. It is recommended that new sections of species-rich hedgerows should be

planted on field margins improving the nesting/foraging and commuting habitat for farmland birds. 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.

5.6 Areas of grassland are to be removed during the proposed works. Therefore it is recommended that the restoration proposals include the creation of 6 metre wide grassland strips seeded with native grass and herb species from a local wildflower mixture. These should be located on field margins adjacent to woodland and hedgerows.

5.7 The created grasslands should be cut or selectively grazed once every two years avoiding the bird breeding season to allow tussocks to develop and insect populations to increase. These areas should be cut in rotation to ensure plenty of uncut margins each year that provide a source of seed as winter food for species such as linnet and, provides a dense sward structure, suitable as nesting habitat. Some of the grassland arisings from management works should be stacked nearby and left as a food source.

5.8 A number of scattered trees are to be removed during the proposed works. Therefore it is recommended that a number of native scattered trees are planted within the restoration works.

5.9 As areas of scattered trees are to be removed during the works, nesting opportunities for breeding bird species will be reduced. Therefore in areas of boundary woodland it is recommended that bird boxes are erected. This will provide nesting opportunities for hole - nesting birds affected by the removal of habitat from the site. This should include a variety of nest boxes for a wide range of species including crepuscular species e.g. tawny owl. For information relating to nest box design, please see Appendix 3.

5.10 It is recommended that the proposed works should be phased to ensure that favourable habitat is created and available during a progressive restoration. This will ensure that breeding birds will always have some favourable habitat present during the proposed works.

6.0 CONCLUSIONS

6.1 A combined total of 40 species were recorded using the site during the 2018 surveys, of which 32 were recorded as confirmed, probable or possible breeding species. This indicates that the site has a 'district' level of importance. These breeding bird species include many common and widespread opportunistic species and the habitats present on the site used by these species are generally common and widespread in the wider area. The value of the site for breeding birds is therefore considered to be of local importance.

6.2 The proposed works on the site may have an impact on 6 species of **high** conservation concern (i.e. 'Red List' species) – bullfinch, linnet, mistle thrush, skylark, song thrush and yellowhammer. The works may also have an impact on 4 species of **medium** conservation concern (i.e. 'Amber List' species) – dunnock, kestrel, stock dove and tawny owl.

6.3 The desk study recorded a number of species of high conservation concern and medium conservation concern that were **not** observed on site. It is considered that these species may have been present within the habitats on the nearby land but do not occur on the site. Therefore, it is considered that these species are unlikely to be affected by the proposed works.

6.4 Two additional species were observed flying over the site, (mallard and cormorant). It is considered unlikely that mallard are present within the site. It is likely that cormorant were flying over between foraging sites.

6.5 It is considered that the site provides suitable habitat for a wide range of breeding bird species that will be impacted by the proposed works. However with the implementation of the above recommendations, it is considered that the long term avian biodiversity would be improved through the enhancements delivered on the site.

7.0 REFERENCES

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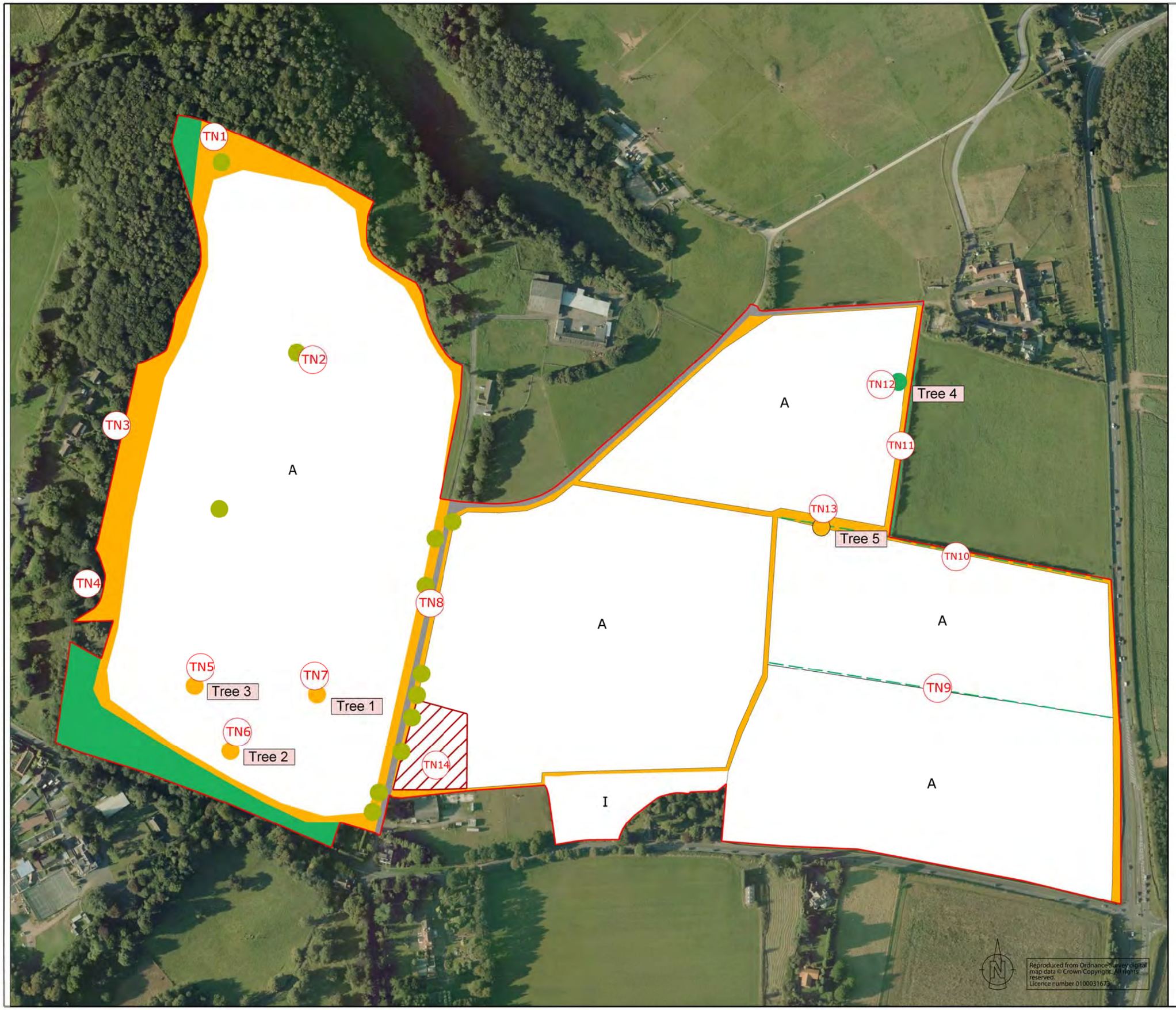
DRAWINGS

DRAWING M16.176(a).D.006

Preliminary Ecological Appraisal



Legend

- Site boundary
- Broad-leaved and mixed plantation woodland
- Semi-improved neutral grassland
- I — Improved grassland
- Tall ruderal
- A — Arable
- Native intact hedgerow
- Native defunct hedgerow
- Hardstanding
- Standard tree
- Tree with moderate bat roosting potential
- Tree with high bat roosting potential
- Tree 1 — Tree Number
- TN1 — Target Note Number

DRAWING STATUS	**FINAL**
PROJECT	**LEA CASTLE FARM**
CLIENT	**NRS Aggregates Ltd**
TITLE	**Preliminary Ecological Appraisal**
DATE: **March 2019**	SCALE: **1:3,500 @A3**
DRAWN: **KH**	CHECKED: **SC**
DRAW NO.: **M16.176(a).D.006**	REVISION

PleydellSmithyman

DRAWING M16.176(a).D.010

Breeding Bird Survey 14-05-2018

BIRD KEY

B. = Blackbird
BC = Blackcap
BT = Blue Tit
C. = Carrion Crow
CC = Chiffchaff
CD = Collared Dove
CH = Chaffinch
D. = Dunnock
GC = Goldcrest
GT = Great Tit
GW = Garden Warbler
JD = Jackdaw
LI = Linnet
LT = Long-Tailed Tit
MG = Magpie
PH = Pheasant
R. = Robin
RO = Rook
RL = Red-Legged Partridge
S. = Skylark
SD = Stock Dove
ST = Song Thrush
WH = Whitethroat
WP = Woodpigeon
WR = Wren

Legend

- Site boundary
- Survey Area
- (A.) Bird singing
- A. Bird calling
- A. Bird heard or seen
- Bird take-off point and flight direction
- Bird nest
- (FLOCK) Flock of birds

DRAWING STATUS	**FINAL**
PROJECT	**LEA CASTLE FARM**
CLIENT	**NRS Aggregates Ltd**
TITLE	**Breeding Bird Survey 04-05-2018**
DATE: **March 2019**	SCALE: **1:4,000 @A3**
DRAWN: **KH**	CHECKED: **SC**
DRAW NO.: **M16.176(a).D.010**	REVISION:

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DRAWING M16.176(a).D.011

Breeding Bird Survey 05-06-2018

BIRD KEY

B. = Blackbird
BC = Blackcap
BF = Bullfinch
BT = Blue Tit
BZ = Buzzard
C. = Carrion Crow
CC = Chiffchaff
CH = Chaffinch
CT = Coal Tit
D. = Dunnock
G. = Green Woodpecker
GC = Goldcrest
GR = Greenfinch
GS = Great Spotted Woodpecker
GT = Great Tit
GW = Garden Warbler
JD = Jackdaw
K. = Kestrel
KI = Kestrel
LI = Linnet
LT = Long-Tailed Tit
M. = Mistle Thrush
NH = Nuthatch
PW = Pied Wagtail
R. = Robin
RO = Rook
S. = Skylark
SD = Stock Dove
SL = Swallow
ST = Song Thrush
TC = Treecreeper
WH = Whitethroat
WP = Woodpigeon
WR = Wren
WW = Willow Warbler
Y. = Yellowhammer

Legend

- Site boundary
- Survey Area
- (A.) Bird singing
- A. Bird calling
- A. Bird heard or seen
- Bird take-off point and flight direction
- Bird nest
- (FLOCK) Flock of birds

DRAWING STATUS	**FINAL**
PROJECT	**LEA CASTLE FARM**
CLIENT	**NRS Aggregates Ltd**
TITLE	**Breeding Bird Survey 05-06-2018**
DATE	**March 2019**
SCALE	**1:4,000 @A3**
DRAWN	**KH**
CHECKED	**SC**
DRAW NO.	**M16.176(a).D.011**
REVISION	

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APPENDICES

APPENDIX 1

Information obtained from

Worcestershire Biological Records Centre (WBRC)

No	Scientific Name	Common Name	Grid Ref	Location Name	Date	Comments	Status
605	*Acanthis cabaret*	Lesser Redpoll	SO829794	Bishop's Field	2009		NERC s.41 UKBAP Bird:Red
605	*Alauda arvensis*	Skylark	SO829794	Bishop's Field	2009	overhead	NERC s.41 Bird:Red
83	*Alauda arvensis*	Skylark	SO823815	Round Hill	24/04/06	1 singing, rough grassland	NERC s.41 Bird:Red
92	*Alauda arvensis*	Skylark	SO825817	Round Hill	27/04/06	1 singing, rough grassland	NERC s.41 Bird:Red
83	*Alauda arvensis*	Skylark	SO823815	Round Hill	27/04/06	1 singing, rough grassland	NERC s.41 Bird:Red
148	*Alauda arvensis*	Skylark	SO846811	Cookley	10/04/07	2 songs heard	NERC s.41 Bird:Red
855	*Alauda arvensis*	Skylark	SO845796	Wolverley	16/04/07	2 songs heard; arable	NERC s.41 Bird:Red
149	*Alauda arvensis*	Skylark	SO846812	Caunsall	25/04/07	Song heard; arable	NERC s.41 Bird:Red
151	*Alauda arvensis*	Skylark	SO847810	Cookley	07/05/08	Song. Arable	NERC s.41 Bird:Red
605	*Alcedo atthis*	Kingfisher	SO829794	Bishop's Field	2008	young male caught & ringed between rows of willows/pools	WCA
605	*Alcedo atthis*	Kingfisher	SO829794	Bishop's Field	2009		WCA
853	*Alcedo atthis*	Kingfisher	SO845780	Podmore Pool	18/07/02	1 Adult	WCA
958	*Alcedo atthis*	Kingfisher	SO853779	Hurcott Pool	05/09/02	1 Adult	WCA
557	*Alcedo atthis*	Kingfisher	SO828777	Puxton Marsh	05/01/05		WCA
722	*Anser anser*	Greylag Goose	SO835778	Kidderminster	31/03/2016		WCA
901	*Cettia cetti*	Cetti's Warbler	SO848778	Hurcott Meadow	17/06/05		WCA
849	*Cuculus canorus*	Cuckoo	SO845769	Hardy Av, Kidderminster	30/08/2016	Juvenile fed by blackbirds over breeding season in garden.	NERC s.41 UKBAP Bird:Red
557	*Dendrocopos minor*	Lesser Spotted Woodpecker	SO828777	Puxton Marsh	05/01/05		Bird:Red
605	*Emberiza citrinella*	Yellowhammer	SO829794	Bishop's Field	2009		NERC s.41 UKBAP Bird:Red
960	*Emberiza citrinella*	Yellowhammer	SO853798	Axborough Lane	16/04/07		NERC s.41 UKBAP Bird:Red
146	*Emberiza citrinella*	Yellowhammer	SO845809	Cookley	18/04/07		NERC s.41 UKBAP Bird:Red
87	*Emberiza citrinella*	Yellowhammer	SO824811	Iverley	02/07/08	Song & sighitng. Hedgerow	NERC s.41 UKBAP Bird:Red
192	*Emberiza citrinella*	Yellowhammer	SO858806	Caunsall	04/07/08	Song & sighitng. Hedgerow	NERC s.41 UKBAP Bird:Red
114	*Emberiza citrinella*	Yellowhammer	SO833812	Iverley Way Farm	May-06	Individuals above 3 different nests. On telegraph wires above hedgerow/arable.	NERC s.41 UKBAP Bird:Red
605	*Emberiza schoeniclus*	Reed Bunting	SO829794	Bishop's Field	2009	ringed	NERC s.41 UKBAP
605	*Emberiza schoeniclus*	Reed Bunting	SO829794	Bishop's Field	14/06/99		NERC s.41 UKBAP
853	*Emberiza schoeniclus*	Reed Bunting	SO845780	Podmore Pool	18/07/02	1 Adult	NERC s.41 UKBAP

557	*Emberiza schoeniclus*	Reed Bunting	SO828777	Puxton Marsh	05/01/05		NERC s.41 UKBAP
599	*Falco peregrinus*	Peregrine	SO829765	Kidderminster, Weavers Wharf	28/02/11	Photographed male perching on chimney stack	WCA
605	*Fringilla montifringilla*	Brambling	SO829794	Bishop's Field	2009	in very low numbers.	WCA
605	*Larus argentatus*	Herring Gull	SO829794	Bishop's Field	2009	overhead	Bird:Red
853	*Larus argentatus*	Herring Gull	SO845780	Podmore Pool	18/07/02	1 Adult	Bird:Red
605	*Linaria cannabina*	Linnet	SO829794	Bishop's Field	2009		Bird:Red
605	*Passer domesticus*	House Sparrow	SO829794	Bishop's Field	2009		NERC s.41 UKBAP Bird:Red
557	*Passer domesticus*	House Sparrow	SO828777	Puxton Marsh	05/01/05		NERC s.41 UKBAP Bird:Red
140	*Passer domesticus*	House Sparrow	SO84378007		02/06/2013		NERC s.41 UKBAP Bird:Red
414	*Passer domesticus*	House Sparrow	SO822769		09/05/2014		NERC s.41 UKBAP Bird:Red
773	*Passer domesticus*	House Sparrow	SO84017617	Kidderminster	29/03/2016		NERC s.41 UKBAP Bird:Red
990	*Passer domesticus*	House Sparrow	SO8568377403	Blakedown	14/01/2017		NERC s.41 UKBAP Bird:Red
773	*Passer domesticus*	House Sparrow	SO84027617	Kidderminster	24/02/2017		NERC s.41 UKBAP Bird:Red
145	*Perdix perdix*	Grey Partridge	SO844811	Caunsall	27/04/07	Orange tail feathers seen clearly in flight. Lack of eyestripe. Both rule out red-legged	NERC s.41 UKBAP Bird:Red
605	*Sturnus vulgaris*	Starling	SO829794	Bishop's Field	2009		Bird:Red
605	*Turdus iliacus*	Redwing	SO829794	Bishop's Field	2009		WCA Bird:Red
557	*Turdus iliacus*	Redwing	SO828777	Puxton Marsh	05/01/05		WCA Bird:Red
605	*Turdus philomelos*	Song Thrush	SO829794	Bishop's Field	2009		Bird:Red
605	*Turdus philomelos*	Song Thrush	SO829794	Bishop's Field	06/07/04		Bird:Red
557	*Turdus philomelos*	Song Thrush	SO828777	Puxton Marsh	05/01/05		Bird:Red
815	*Turdus philomelos*	Song Thrush	SO843773	Greenhill	13/05/06	1 singing, garden	Bird:Red
139	*Turdus philomelos*	Song Thrush	SO842808	Cookley	29/04/08	Song & sighting. Woodland	Bird:Red
605	*Turdus pilaris*	Fieldfare	SO829794	Bishop's Field	2009		WCA Bird:Red
1044	*Turdus pilaris*	Fieldfare	SO861787	Blakedown	02/01/2017		WCA Bird:Red
605	*Vanellus vanellus*	Lapwing	SO829794	Bishop's Field	2009	overhead	NERC s.41 UKBAP Bird:Red
165	*Vanellus vanellus*	Lapwing	SO853800	Axborough Lane	01/04/06	3 perched; arable	NERC s.41 UKBAP Bird:Red

APPENDIX 2

Bird species codes

The standard two-letter bird species codes for all the species mapped in this report are shown in the following table.

Two-letter Species Code	Common Name	Scientific Name
B.	Blackbird	*Turdus merula*
BC	Blackcap	*Sylvia atricapilla*
BT	Blue Tit	*Cyanistes caeruleus*
BZ	Buzzard	*Buteo buteo*
CC	Chiffchaff	*Phylloscopus collybita*
CT	Coal tit	*Periparus ater*
D.	Dunnock	*Prunella modularis*
GW	Garden warbler	*Sylvia borin*
GO	Goldfinch	*Carduelis carduelis*
GT	Great tit	*Parus major*
GR	Greenfinch	*Carduelis chloris*
G.	Green woodpecker	*Picus viridis*
JD	Jackdaw	*Corvus monedula*
K.	Kestrel	*Falco tinnunculus*
MG	Magpie	*Pica pica*
M.	Mistle thrush	*Turdus viscivorus*
NH	Nuthatch	*Sitta europaea*
PH	Pheasant	*Phasianus colchicus*
PW	Pied wagtail	*Motacilla alba yarrellii*
R.	Robin	*Erithacus rubecula*
RO	Rook	*Corvus frugilegus*
S.	Skylark	*Alauda arvensis*
ST	Song thrush	*Turdus philomelos*
SD	Stock dove	*Columba oenas*
WW	Willow warbler	*Phylloscopus trochilus*
WP	Woodpigeon	*Columba palumbus*
WR	Wren	*Troglodytes troglodytes*

Scientific Names of birds listed within the report

Common Name	Scientific Name
Barn owl	*Tyto alba*
Black-headed gull	*Chroicocephalus ridibundus*
Blue tit	*Cyanistes caeruleus*
Brambling	*Fringilla montifringilla*
Chaffinch	*Fringilla coelebs*
Fieldfare	*Turdus pilaris*
Goldfinch	*Carduelis carduelis*
Goshawk	*Accipiter gentilis*
Great spotted woodpecker	*Dendrocopos major*
Herring gull	*Larus argentatus*
House sparrow	*Passer domesticus*
Jay	*Garrulus glandarius*
Kingfisher	*Alcedo atthis*
Lapwing	*Vanellus vanellus*
Lesser redpoll	*Acanthis cabaret*
Lesser spotted woodpecker	*Dendrocopos minor*
Linnet	*Carduelis cannabina*
Meadow pipit	*Ahtus pratensis*
Raven	*Corvus corax*
Redwing	*Turdus iliacus*
Reedbunting	*Emberiza schoeniclus*
Robin	*Erithacus rubecula*
Skylark	*Alauda arvensis*
Song thrush	*Turdus philomelos*
Starling	*Sturnus vulgaris*
Woodpigeon	*Columba palumbus*
Wren	*Troglodytes troglodytes*
Yellowhammer	*Emberiza citrinella*

APPENDIX 3

Information relating to bird box design

Choosing and siting your nest box

bioQUIP
biological equipment specialists

1 Smaller Nestboxes

In gardens, parks and gardens nest boxes should be hung at eye-level if they are not likely to be disturbed. This will allow for easy inspection and cleaning. Where necessary, boxes can be hung higher between 2.8 and 3.5m. It is not necessary to put anything inside the nest box as small birds such as blue and great tits, will build a new nest each year.

The entrance hole should usually face between north and east – this is out of the prevailing wind and direct sunlight. In a woodland situation the orientation of the nest box is less critical as the trees and canopy may shade or shelter the nest box.

The actual number of nest boxes erected depends on the particular habitat and it's surroundings. A small garden may only support a single pair of blue or great tits, food availability rather than nest sites is more often than not the determining size on the closeness of breeding tits to each other. In woodland up to 40 nest boxes can be hung per hectare (100m x 100m). A mix of nest boxes should be used to provide a greater variety of nest site options for the species present. We would recommend that 50% of the boxes have 32mm ∅ entrance hole (eg 1B32), 20% have a 26mm∅ entrance hole (1B26), 10% have an oval entrance hole (1Boval), 15% are open fronted (2H) and 5% are for treecreepers. A suitable mix for a 10-hectare woodland, with 10 boxes per hectare could be:

No	Nest box	Possible species
50	1B32	Suitable for blue and great tits, nuthatches and pied flycatchers
20	1B26	Suitable for blue and coal tits, tree sparrow
10	1Boval	Suitable for redstart, pied flycatcher, nuthatch, blue and great tit
15	2H	Suitable for pied wagtail (if sited low near water), spotted flycatcher and robin
5	2B	Suitable for treecreeper, may also be used by blue tit

.

We would expect that between 60 and 70% of the nest boxes would be used. If you get a higher success rate, then we suggest that the number of boxes is increased.

If predation by cats or weasels is a problem, or likely to be a problem, then the 1B nest boxes can be substituted for the 2GR or 1N nest boxes which are deeper.

Nest boxes for house sparrows and starlings are more likely to be occupied of they are sited on a building close to the eaves. As these birds nest in loose colonies, two or more boxes should be erected close together or select the House Sparrow terrace nest box (1SP)

2 Larger Boxes

Larger nest boxes such as the N4 and N5 boxes for owls and stock doves should be hung at heights between 4 and 6 metres. A layer of wood shavings or sawdust should be placed on the floor to encourage nesting. The larger boxes, especially if trying to encourage tawny owls, should be put up at about 2 per 50 hectares. If you are providing boxes for stock doves then put up 1 box per hectare.

3 Other Nest Boxes

We are able to supply nest boxes for a range of other species as well as woodland birds. Swallows, house martins, swifts, little owls and even kingfishers will all use nest boxes. In addition birds of prey and some owls will also use the woven baskets featured in our range of nesting aids.

4 Cleaning nest boxes

Nest boxes should be cleaned out in the autumn, from late September onwards. Remove the old nest and then replace the nest box. The use of any insecticidal sprays is NOT recommended, as they could be toxic to birds. If necessary clean the box with cold or warm water and a little detergent.

5 Other Occupants

Occasionally you may find bumblebees, wasps, wild bees or even bats using your nest box. If this is the case then leave the box undisturbed and consider adding a few of the other specialist insect and bat boxes from our range.

Schwegler Box / Species	1B 32	1B 26	1B Oval	2GR	2B	3S	2H	No4	No5
Great Tit	✓		✓	✓		✓			
Blue Tit	✓	✓	✓	✓					
Marsh Tit	✓			✓					
Coal Tit	✓	✓		✓					
Crested Tit	✓								
Redstart	✓		✓	✓		✓			
Nuthatch	✓		✓	✓		✓			
Pied Flycatcher	✓		✓	✓					
House Sparrow	✓		✓	✓					
Tree Sparrow	✓	✓	✓	✓					
Treecreeper					✓				
Starling						✓			
Spotted Flycatcher							✓		
Robin							✓		
Pied Wagtail							✓		
Grey Wagtail							✓		
Jackdaw								✓	✓
Stock Dove								✓	✓
Tawny Owl								✓	✓



1B32 nest box in brown (left)
Swift Chamber (centre)
2B Treecreeper nest box (right)

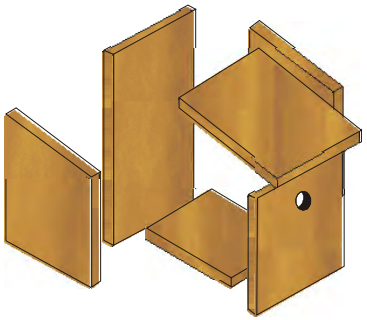
6 Make your own nestbox

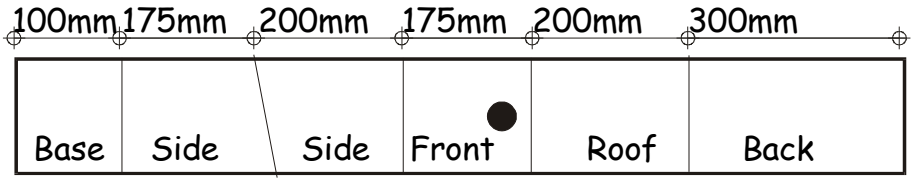
The nest box pictured below is suitable for Blue, Great, Coal and Marsh Tits, though House and Tree Sparrow are likely candidates too, especially if the entrance hole is made slightly larger. The type of wood used to make a nest box is not critical but remember that a box made from hardwood - e.g. oak or beech - will outlive one made from softwood - e.g. pine. Treating boxes with a wood preservative (on the outside only) is recommended. What is much more critical is the thickness of the wood and this should be at least 15mm. The box illustrated is 15mm thick. Nail your box together rather than use glue, as the latter will make the box too air tight which encourages condensation.

Make sure the roof of your box is waterproof. One of the best ways to ensure this, and to make your box top-opening, is to use a length of car inner tube or Butyl rubber cut to the width of the box and nailed along the back of the box and the roof which then acts as a waterproof hinge. Make sure you drill a couple of holes in the bottom of the box to ensure that any rain that does get in can drain out quickly.

If your goal is to get Coal or Marsh Tits nesting in your box then site your box lower to the ground, say between 25cm and 1.5m from the ground. Blue and Great Tits and sparrows prefer a higher elevation of 2-4m.

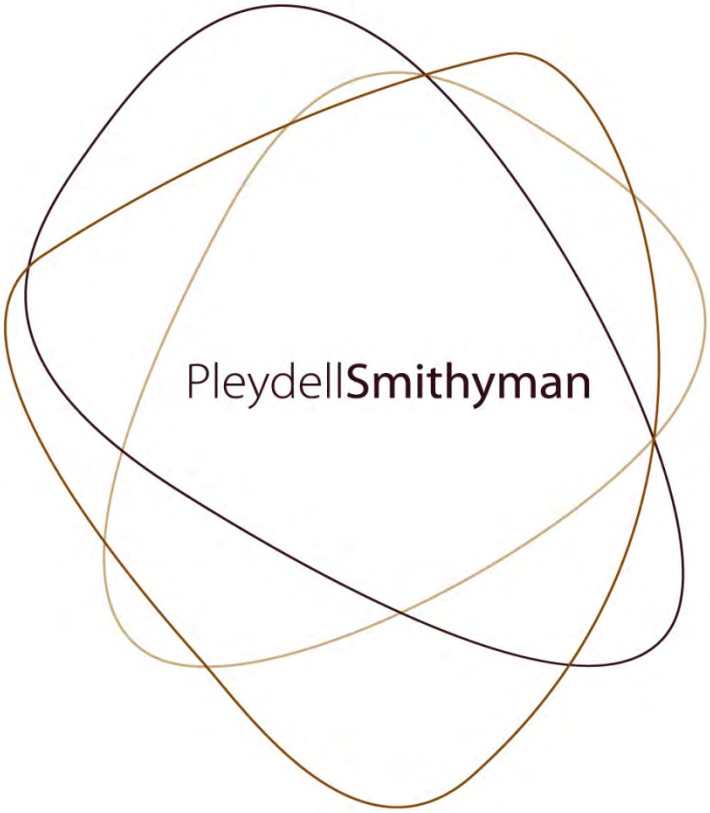
Follow the dimensions given in the illustration and you won't go far wrong. Good luck!





TECHNICAL APPENDIX 9/3

BAT ROOST SURVEY REPORT



BAT ROOST SURVEY

RELATING TO LAND AT LEA CASTLE FARM, WOLVERLEY

APPLICATION FOR PLANNING PERMISSION

For NRS Aggregates Limited

APRIL 2019

PSL Report Reference Number: M16.176(a).R.004

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BAT ROOST SURVEY
ON LAND AT
LEA CASTLE FARM,
WOLVERLEY ROAD,
WOLVERLEY,
KIDDERMINSTER,
DY10 3PX

By:
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April 2019

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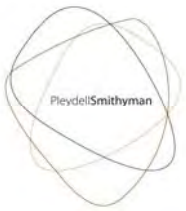

1.0 INTRODUCTION

Background and Proposals

1.1 Pleydell Smithyman Limited was instructed by NRS Aggregates Ltd via Robin Smithyman of Kedd Ltd. to undertake bat roost surveys on five trees on the land at Lea Castle Farm, Wolverley, Kidderminster (hereafter referred to as the site). Please see Drawing M16.176(a).D.001 Tree Locations for a plan of the location of the trees.

1.2 The surveys were recommended following a preliminary ecological appraisal, (Pleydell Smithyman Limited, 2019) that identified trees with suitable roosting features for bats. Previous bat roost surveys were conducted in 2016 on three of the five trees. These surveys are now considered to be out of date and therefore need to be repeated to provide up-to-date information on the roost status of these trees. The bat roost surveys were recommended to inform the preparation and submission of a planning application for the extraction of mineral from the site. The survey was also required to ensure compliance with national and European legislation and inform mitigation and enhancement proposals (where necessary and appropriate).

Site Location

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.

Site Description

1.4 The site comprises approximately 45ha of arable farmland with semi-improved and improved grass headlands. A hard-standing 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 tree standards were present in the fields, including oak (*Quercus robur*), sweet chestnut (*Castanea sativa*) and conifer. Please see Drawing Number M16.176(a).D.006 Preliminary Ecological Appraisal for a plan of the habitats on the site.

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.

For further details, please refer to the PEA survey report (Pleydell Smithyman Limited, 2019).

Legislation

1.6 The information contained in this section is a summary of the legislation relating to bats, and for full details the original texts should be referred to.

1.7 All British bats are European protected species and therefore receive protection under the Conservation of Habitats and Species Regulations (2017), making it an offence to:

- Deliberately kill, injure or capture a bat;
- Deliberately disturb bats, including in particular any disturbance which is likely to:
    - Impair their ability to survive, reproduce or to rear or nurture their young;
    - Impair their ability to hibernate or migrate; or
    - Significantly affect their local distribution or abundance.
- Damage or destroy a breeding site or resting place of a bat;
- Possess or control any live or dead specimen or anything derived from a bat;
- Sell, offer for sale, possess or transport a bat (live or dead, part or derivative) for the purpose of sale or advertise for buying or selling.

1.8 In addition, all British bats are listed under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended), which contains further provisions making it an offence to intentionally or recklessly:

- Damage, destroy or obstruct access to any structure or place which any bat uses for shelter or protection; or
- Disturb any bat while occupying a structure or place which it uses for that purpose.

1.9 A number of bat species are also on Worcestershire Biodiversity Action Plan. This includes all 16 bats that occur in Worcestershire as follows: barbastelle, (*Barbastella barbastellus*), Bechstein's bat, (*Myotis bechsteinii*), Brandt's bat, (*Myotis brandtii*), brown long-eared bat, (*Plecotus auritus*), Daubenton's bat, (*Myotis daubentonii*), Leisler's bat,

(*Nyctalus leisleri*), lesser horseshoe bat, (*Rhinolophus hipposideros*), greater horseshoe bat, (*Rhinolophus ferrumequinum*), Natterer's bat, (*Myotis nattereri*), noctule bat, (*Nyctalus noctula*), serotine, (*Eptesicus serotinus*), common pipistrelle, (*Pipistrellus pipistrellus*), soprano pipistrelle, (*Pipistrellus pygmaeus*), Nathusius' pipistrelle, (*Pipistrellus nathusii*), whiskered bat, (*Myotis mystacinus*) and Alcathoe bat, (*Myotis alcathoe*).

1.10 European Protected Species Licences (EPSLs) can be obtained from the relevant Statutory Nature Conservation Organisation (SNCO), in this case Natural England, for development activities that would otherwise be unlawful under the legislation.

Aims and Objectives of the Study

1.11 The key objective of the bat roost surveys was to establish if bats are roosting in the trees surveyed, and if so, the species, numbers and status of the roost(s) present.

1.12 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 an EPSL and the scope of any mitigation measures (where necessary).

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

- Determine the presence or absence of roosting bats in the surveyed trees;
- Establish the number, location and status (e.g. maternity, non-maternity or hibernation) of any bat roosts present, including the numbers and species of bats using any one particular roost;
- Establish the bat species commuting and/or foraging around the surveyed trees;
- Provide sufficient data to enable a robust assessment of the effects of the proposals on bats to be made in this report;
- 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 in the proposals.

2.0 SURVEY METHODOLOGY

Desk Study

2.1 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 Multi-Agency Geographic Information for the Countryside (MAGIC) website.

2.2 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. Relevant information is reproduced in Appendix 1.

2.3 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.

Habitat Assessment

2.4 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.

2.5 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.

2.6 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.

Bat Roost Survey

2.7 The methodology for the bat roost survey followed that described in Collins (2016).

2.8 These guidelines state that features with moderate roost suitability for bats require two separate survey visits and features with high roost suitability require three separate survey visits. Trees 1, 2, 3 and 5 that are present and are likely to be impacted by the proposals were assessed to offer moderate roosting potential for bats (please see section 3.0 for results), and therefore two roost surveys were undertaken on these trees. A possible re-entry of a brown long-eared bat was recorded on Tree 1 and therefore three roost surveys were completed on this tree to establish any bat roosts that may be present. During the second survey of Tree 2, potential emergence activity was observed and therefore a third survey was conducted on this tree to ensure that any roosting bats were observed. During the second survey of Tree 3, a common pipistrelle was seen emerging from the tree and therefore a third survey was conducted. Tree 4 was considered to offer high roosting potential and therefore three surveys were completed on this tree.

2.9 The survey dates of the bat roost surveys are shown below in Table 1.

Table 1. Survey dates and trees surveyed during the bat roost surveys.

Survey Date	**Trees surveyed**
5th June 2018 (dawn)	Tree 1, Tree 2, Tree 3
26th June 2018 (dusk)	Tree 1, Tree 2
24th July 2019 (dusk)	Tree 4, Tree 5
25th July 2018 (dawn)	Tree 1
8th August 2018 (dawn)	Tree 2, Tree 4, Tree 5
28th August 2018 (dusk)	Tree 3, Tree 4
11th September 2018 (dusk)	Tree 3

2.10 All surveys were undertaken under suitable weather conditions (please see section 3.0 for details).

2.11 The surveys were undertaken by a team of surveyors, which included Kelly Hopkins (Natural England Bat Licence Number: 2017-30172-CLS-CLS), Nick Staples (Natural England bat licence number 2018-33966-CLS-CLS) and Steven Pagett (Natural England bat licence number 2018-34022-CLS-CLS). A surveyor was stationed at each tree in a suitable position to ensure that all features that offered suitable roosting habitat for bats were adequately covered. Please see Drawings M16.176(a).D.013 – M16.176(a).D.019 for the surveyor locations during these surveys.

2.12 All bat activity was recorded throughout the survey with notes made on the number, species and behaviour (roosting, foraging or commuting and flight direction) of the bats present. Species were identified using a combination of field signs (e.g. flight patterns, size and behaviour) and ultrasonic bat detectors. The bat detectors used during the surveys included an EM3, Batbox duet and an Echometer touch. Recordings were made during each survey using the EM3, and Echometer touch and analysed to species level (where possible) using Analook software.

2.13 The dusk surveys commenced approximately 15 minutes before sunset and continued for approximately 1 hour and 30 minutes after sunset. The pre-dawn surveys

commenced approximately 1.5 hours before sunrise and continued until 15 minutes after sunrise.

Survey Constraints and Limitations

2.14 No constraints were identified during the surveys; the surveys were completed under suitable weather conditions with an adequate surveyor effort ensuring all possible features were surveyed sufficiently.

2.15 It should be noted this report cannot be considered to provide a comprehensive analysis of the bat interest of the site. However, it is considered to represent an accurate assessment of the findings at the time of the surveys and is fully appropriate to begin to inform a robust assessment of the effects of the proposals to be made. The survey data is also considered to be robust in informing the design of mitigation (where required) and enhancement measures in relation to the proposed works.

2.16 Please note that the surveys are a snapshot in time and as a result it is recommended that the surveys are updated if more than 24 months elapse between these surveys being undertaken (latest survey September 2018) and the proposed work being carried out.

3.0 RESULTS

Desk Study

Species Records

3.1 Worcestershire Biological Records Centre (WBRC) returned records of Pipistrelle bat species (*Pipistrellus sp.*), common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle noctule bat, Leisler's bat, Nyctalus sp., brown long-eared bat, Daubenton's bat, Brandt's bat 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.

3.2 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.

3.3 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, 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. The drawings from the 2016 bat roost surveys can be found at the end of this report in Drawing numbers PSC1b(iii).435.D.008, PSC1b(iii).435.D.009 and PSC1b(iii).435.D.010.

Habitat Assessment

Roosting features

3.4 There are five mature trees on the site that could be used by roosting bats. Four of these are considered to offer moderate roosting potential for bats, with one tree (Tree 4) offering high roosting potential. The below table details the roosting features offered by each tree. Please see Appendix 2 for photographs of these trees.

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

Tree Number	Species	Bat Roost Suitability	Details
Tree1	Oak	Moderate	Split limbs at approx. 3m height on southern aspect.
Tree 2	Oak	Moderate	Woodpecker holes at approx. 2.5m height on southern aspect.
Tree 3	Sweet chestnut	Moderate	Dead tree with crack in its limb at approx. 1.8m height on eastern aspect.
Tree 4	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 5	Oak	Moderate	Split lower limb and broken branch stubs at approx. 2m height on northern aspect.

3.5 There are also a number of mature trees along the external boundaries of the site and along the driveway through the centre of the site that offer roosting potential for bats. It is our understanding that these trees will not be removed or impacted by the proposals.

3.6 There are no buildings on the site that would be impacted by the proposals.

Foraging/commuting features

3.7 The majority of the site comprises large arable farmland fields that offer limited suitability for foraging, commuting and roosting bats. There is however headlands of semi-improved grassland, hedgerows and scattered trees throughout the site that provide more suitable habitat. The external boundaries of the site offer higher quality foraging and commuting habitat in the form of hedgerows and woodland. The surrounding area offers higher quality habitat in the form of woodland and rivers. The site is connected to these more suitable areas of habitat. As a result, overall the site is assessed to offer low habitat quality with higher areas of foraging habitat located in the wider area.

Bat Roost Survey

3.8 The results of the bat roost surveys are detailed below. Please see Drawings M16.176(a).D.013, M16.176(a).D.014, M16.176(a).D.015, M16.176(a).D.016, M16.176(a).D.017, M16.176(a).D.018 and M16.176(a).D.019 for maps of the bat activity during the roost surveys. Please see Appendix 2 for photographs and Appendix 3 for full details of the results.

3.9 The first survey recorded common pipistrelle, soprano pipistrelle and noctule foraging and commuting around Tree 1 and common pipistrelle, soprano pipistrelle, noctule, and brown long-eared bat foraging and commuting around Tree 2. No bat activity was recorded by Tree 3 during the survey. No bats were seen emerging from any of the surveyed trees during this survey. The survey ended at sunrise as no bats had been recorded for over 30 minutes and there was light rain present.

3.10 The second survey recorded Leisler's, common pipistrelle, soprano pipistrelle, brown long-eared bat and Myotis sp. with characteristics of Daubenton's foraging and commuting around Tree 1 and common pipistrelle foraging around Tree 2. During this

survey a brown long-eared bat was recorded as possibly emerging from Tree 2. No other bats were seen emerging from any of the surveyed trees during the survey.

3.11 The third survey recorded common pipistrelle, Leisler's, soprano pipistrelle and noctule foraging and commuting around Tree 4 and soprano pipistrelle, common pipistrelle, pipistrelle sp., and Myotis sp. with characteristics of Natterer's foraging and commuting around Tree 5. No bats were seen emerging from the two surveyed trees during this bat roost survey.

3.12 The fourth survey recorded common pipistrelle, soprano pipistrelle, noctule, brown long-eared, Myotis sp. with characteristics of Natterer's bat and Myotis sp. with characteristics of Daubenton's bat foraging and commuting around Tree 1. No bats were seen re-entering the surveyed tree during this bat roost survey.

3.13 The fifth survey recorded common pipistrelle and Myotis sp. with characteristics of Natterer's commuting and foraging around Tree 2 and noctule and lesser horseshoe commuting around Tree 4. No bats were recorded around Tree 5 during this survey. No bats were seen re-entering the three surveyed trees during this bat roost survey.

3.14 The sixth survey recorded a common pipistrelle foraging around Tree 3 and a single common pipistrelle emerge from the split in the limb of Tree 3 during this survey. Common pipistrelle, soprano pipistrelle and Myotis sp. with characteristics of Natterer's bat were recorded foraging around Tree 4. No bats were seen emerging from Tree 4 during this survey.

3.15 The seventh survey recorded common and soprano pipistrelle foraging and commuting around Tree 3. No bats were seen emerging from Tree 3 during this survey. The split in the limb that had previously had a bat emerging was inspected with torch light at the start of this survey. No evidence of bats was observed during this inspection.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 One common pipistrelle was seen emerging from a split in a limb of Tree 3 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 2 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 1 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 4 and 5) were found to have no bats roosting within them at the time of the surveys in 2018.

4.2 Due to the presence of individual bats of common species only (common pipistrelle and possible brown long-eared) the value of the bats roosts at the site are considered to be of district, local or parish value only according to Wray, 2010.

4.3 It is our understanding that Trees 1, 2, 3 and 5 are to be removed as part of the proposals.

4.4 As a bat roost has been confirmed as present within Tree 3, a European Protected Species (EPS) Licence will be required to allow the removal of this tree if loss cannot be avoided. A licence will need to be applied for to Natural England to ensure that any works undertaken to this tree are not done so illegally. Bats are protected by European law and it is illegal to deliberately kill, injure or capture a bat or damage or destroy a breeding site or resting place of a bat. The proposed works which involve the removal of this tree would be in breach of this legislation, should a licence for the destruction of this roost not be in place.

4.5 The licence will need to include mitigation measures to compensate for the loss of this roost. These mitigation measures could include the placement of the current roosting site on a nearby tree. This roosting site should be placed in the same orientation as its current location, as close to the current roost as possible. Additional mitigation measures could involve the erection of bat boxes on external boundary trees that are to be retained.

4.6 When applying for a licence to Natural England, planning permission should already be granted and a detailed timetable of proposed works will need to be submitted. Once the licence has been submitted, Natural England take 30 working days to return the licence and therefore the licence should be submitted in plenty of time to ensure that there are no delays to the proposed works. All mitigation measures need to be in place prior to any works being undertaken.

4.7 In addition, a possible bat emergence was recorded from Tree 2 during 2018 and from Tree 1 during 2016. As no further emergence or re-entry activity was recorded, this was not confirmed to be a roost, and therefore a European Protected Species (EPS) licence is not thought to be required. It is our understanding that these trees will require felling to allow for the extraction of mineral. 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. 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.

4.8 The other two surveyed trees do not require an EPS licence following the results of the surveys. However, should these trees not be removed for more than two years, then it will be necessary to complete update bat roost surveys to ensure that bats have not started roosting in these trees in the intervening period. It is recommended that these trees are removed using soft felling techniques by an arboriculturalist with a suitably qualified ecologist to conduct detailed climbed bat surveys prior to observed felling. Should bats be found to be roosting in these trees then an EPS licence will be required as detailed above.

4.9 It is not considered that the loss of these trees would have a significant negative impact on the local distribution of bats, providing that the necessary licences and mitigation measures are in place prior to the removal of the trees. None of the trees were found to support bat roosts of high conservation importance either in terms of rare species or important bat roosts such as a maternity roost. The surrounding habitat is of high quality for roosting bats due to the presence of a number of buildings and trees that are likely to offer roosting potential for bats.

4.10 Overall, the level of foraging and commuting bat activity recorded around the trees throughout the roost surveys was considered to be moderate. At least seven species of bats were detected foraging and commuting around the trees. These were soprano pipistrelle, common pipistrelle, noctule, Leisler's, brown long-eared bat, Myotis sp., and lesser horseshoe bat. The Myotis bats that were recorded were considered to have the characteristics of two different Myotis bat species – Daubenton's bat and Natterer's bat. Should both of these species be present on the site then the bat roost surveys would have recorded eight species of bat. Of these, common pipistrelle was recorded the most frequently. The majority of activity was single passes from individual bats.

4.11 Should any additional trees on the site require removal, they will first need to be assessed for their suitability for roosting bats. Where potential roosting features are identified, bat roost surveys must be conducted prior to any work on the trees to ensure that roosting bats are not present.

4.12 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. Please see Appendix 3 for guidance on bat boxes. 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.

4.13 The external boundaries of the site, particularly to the south and west offer suitable foraging and commuting features for bats as well as providing mature trees that may offer roosting potential for bats. It will be necessary to ensure that a minimum of a 10m stand-off is observed from these boundaries at all times. Any lighting used on the

site must be directed away from the boundaries to maintain the dark corridor that offers good quality habitat for bats. Further recommendations for foraging and commuting bats have been reported in the bat activity survey report (Pleydell Smithyman Limited, 2019). The restoration plan for the site should include habitats that provide opportunities for roosting bats.

5.0 REFERENCES

1. BCT, (2009). *Bats and Lighting in the UK, Bats and the Built Environment Series*. Bat Conservation Trust.
2. Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines*, *3rd edition*. The Bat Conservation Trust, London.
3. Institution of Lighting Professionals, (2018). *Bats and Artificial Lighting in the UK, Bats and the Built Environment Series. Guidance Note 08/18.* Institution of Lighting Professionals, Warwickshire.
4. Pleydell Smithyman Limited, (2019). *Bat Activity Survey relating to Land at Lea Castle Farm, Wolverley*. Pleydell Smithyman Limited, Ironbridge.
5. Pleydell Smithyman Limited, (2019). *Preliminary ecological appraisal relating to Land at Lea Castle Farm, Wolverley*. Pleydell Smithyman Limited, Ironbridge.
6. Russ J. (2012).*British bat calls: A Guide to Species Identification,* Pelagic Publishing, Exeter.
7. Wray S., Wells D., Long E., and Mitchell-Jones, T. (2010). *Valuing Bats in Ecological Impact Assessment*. CIEEM In Practice Journal.

DRAWINGS

DRAWING M16.176(a).D.001

Tree Locations

Legend

- Site boundary
- Tree with moderate roosting potential
- Tree with high roosting potential
- Tree 1 — Tree Number

DRAWING STATUS	**FINAL**
PROJECT	**LEA CASTLE FARM**
CLIENT	**NRS Aggregates Ltd**
TITLE	**Tree Locations**
DATE: **March 2019**	SCALE: **1:3,500 @A3**
DRAWN: **KH**	CHECKED: **SC**
DRAW NO.: **M16.176(a).D.001**	REVISION:

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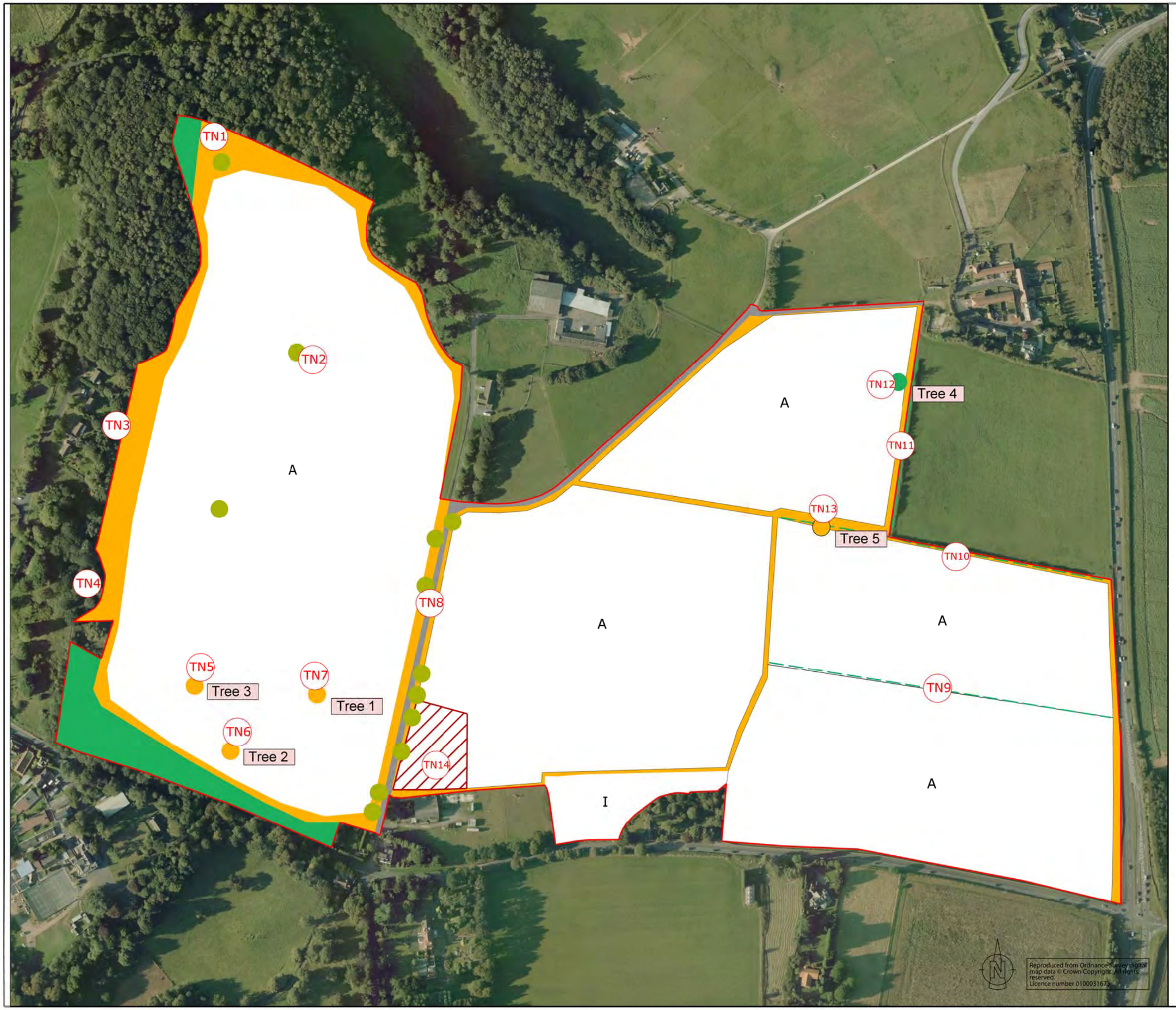
DRAWING M16.176(a).D.006

Preliminary Ecological Appraisal



Legend

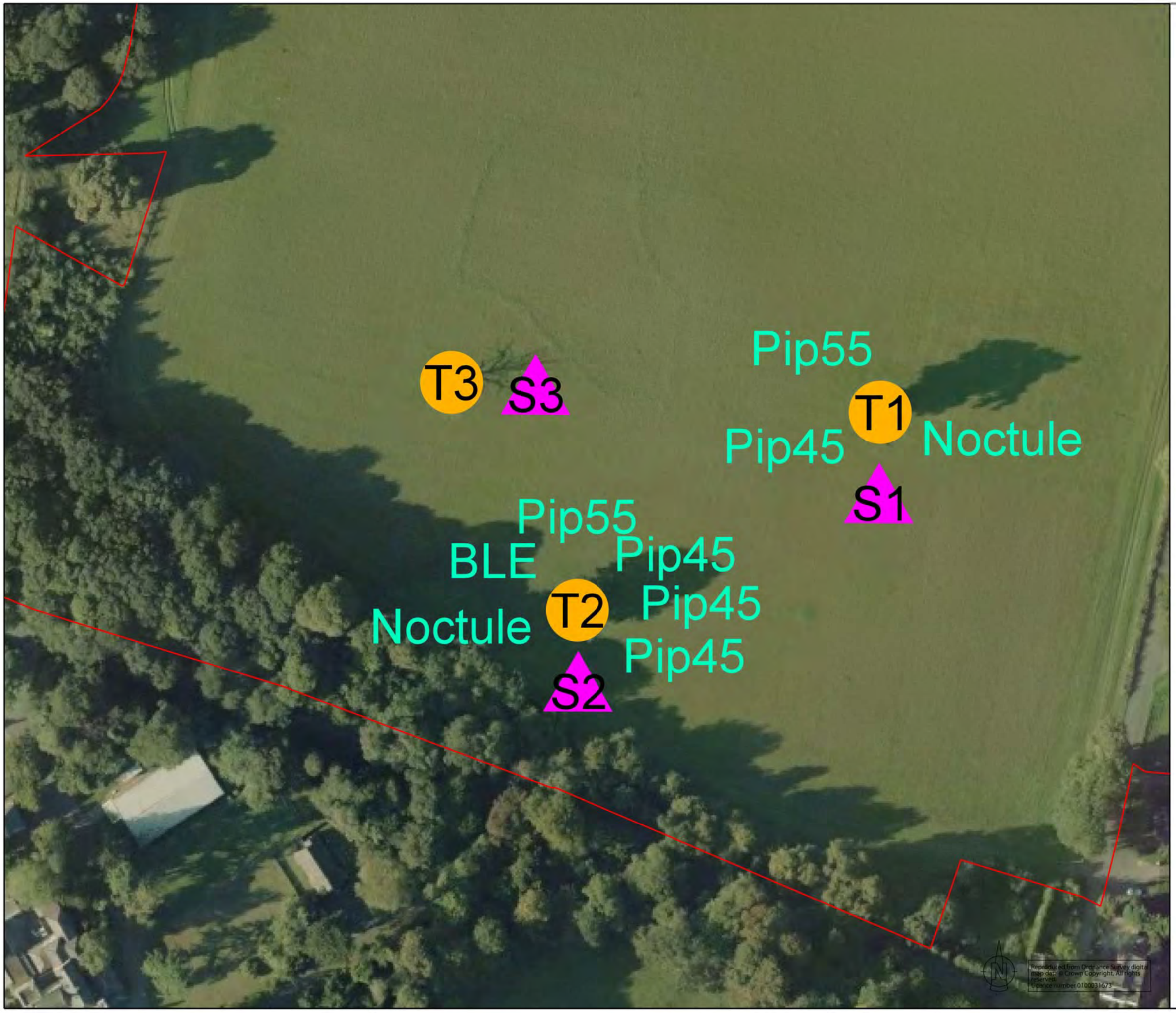
- Site boundary
- Broad-leaved and mixed plantation woodland
- Semi-improved neutral grassland
- I — Improved grassland
- Tall ruderal
- A — Arable
- Native intact hedgerow
- Native defunct hedgerow
- Hardstanding
- Standard tree
- Tree with moderate bat roosting potential
- Tree with high bat roosting potential
- Tree 1 — Tree Number
- TN1 — Target Note Number

DRAWING STATUS	**FINAL**
PROJECT	**LEA CASTLE FARM**
CLIENT	**NRS Aggregates Ltd**
TITLE	**Preliminary Ecological Appraisal**
DATE: **March 2019**	SCALE: **1:3,500 @A3**
DRAWN: **KH**	CHECKED: **SC**
DRAW NO.: **M16.176(a).D.006**	REVISION

PleydellSmithyman

DRAWING M16.176(a).D.013

Bat Roost Survey 5-6-2018



Legend

- Site boundary
- Tree with moderate roosting potential
- Tree with high roosting potential
- T1 — Tree Number
- S1 — Surveyor Location and Number
- BLE — Brown Long-eared Bat heard or seen
- Noctule — Noctule bat heard or seen
- Pip45 — Common pipistrelle bat heard or seen
- Pip55 — Soprano pipistrelle bat heard or seen

DRAWING STATUS	**FINAL**
PROJECT	**LEA CASTLE FARM**
CLIENT	**NRS Aggregates Ltd**
TITLE	**Bat Roost Survey 5-6-2018**
DATE	**March 2019**
SCALE	**1:1,000@A3**
DRAWN	**KH**
CHECKED	**SC**
DRAW NO.	**M16.176(a).D.013**
REVISION	

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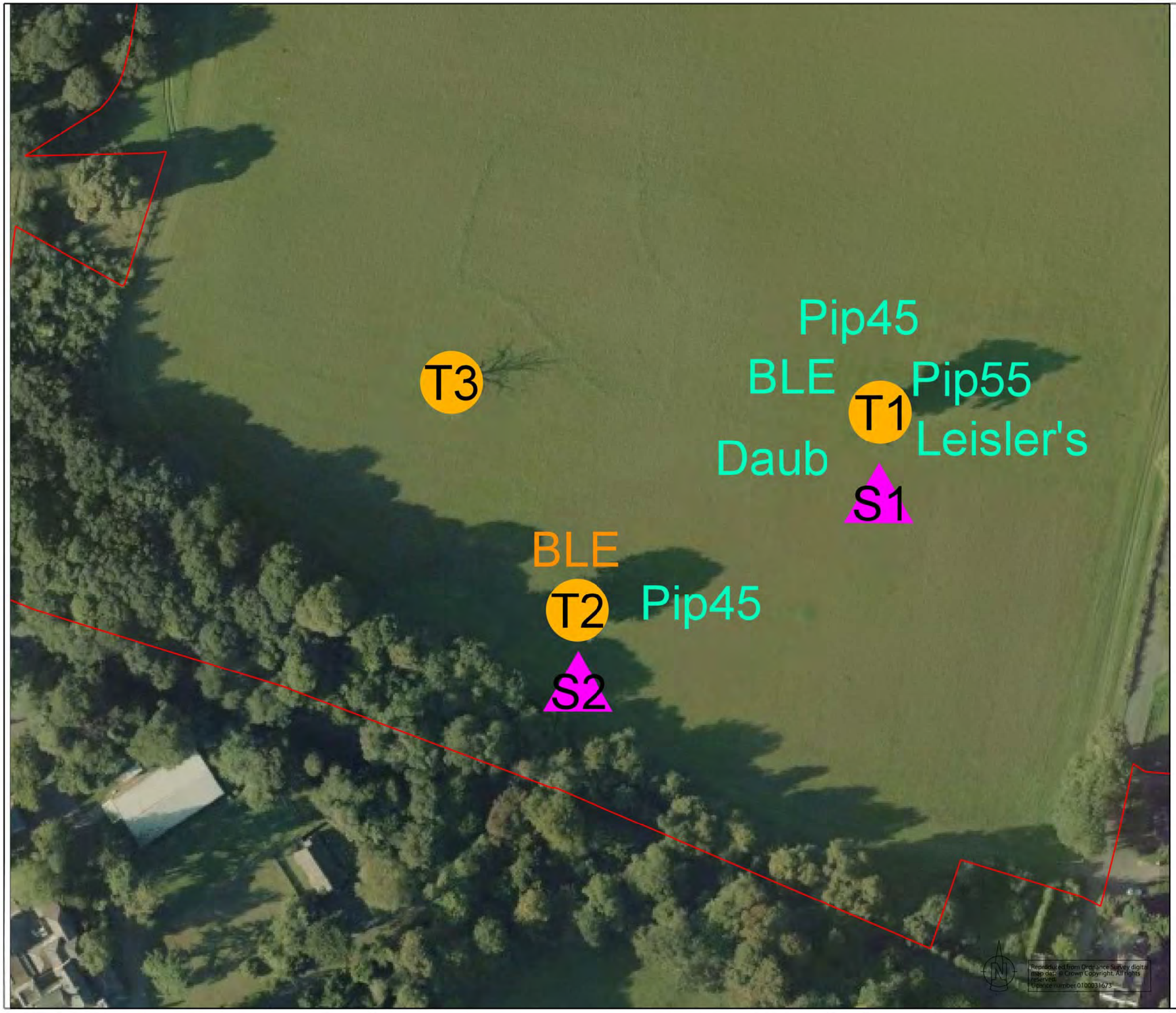
DRAWING M16.176(a).D.014

Bat Roost Survey 26-6-2018



Legend

- Site boundary
- Tree with moderate roosting potential
- Tree with high roosting potential
- T1 — Tree Number
- S1 — Surveyor Location and Number
- BLE — Brown Long-eared Bat heard or seen
- Daub — Myotis sp. with Daubenton's characteristics heard or seen
- Leisler's — Leisler's bat heard or seen
- Pip45 — Common pipistrelle bat heard or seen
- Pip55 — Soprano pipistrelle bat heard or seen
- BLE — Brown long-eared bat possible emergence from the tree

DRAWING STATUS	**FINAL**
PROJECT	**LEA CASTLE FARM**
CLIENT	**NRS Aggregates Ltd**
TITLE	**Bat Roost Survey 26-6-2018**
DATE: **March 2019**	SCALE: **1:1,000 @A3**
DRAWN: **KH**	CHECKED: **SC**
DRAW NO.: **M16.176(a).D.014**	REVISION

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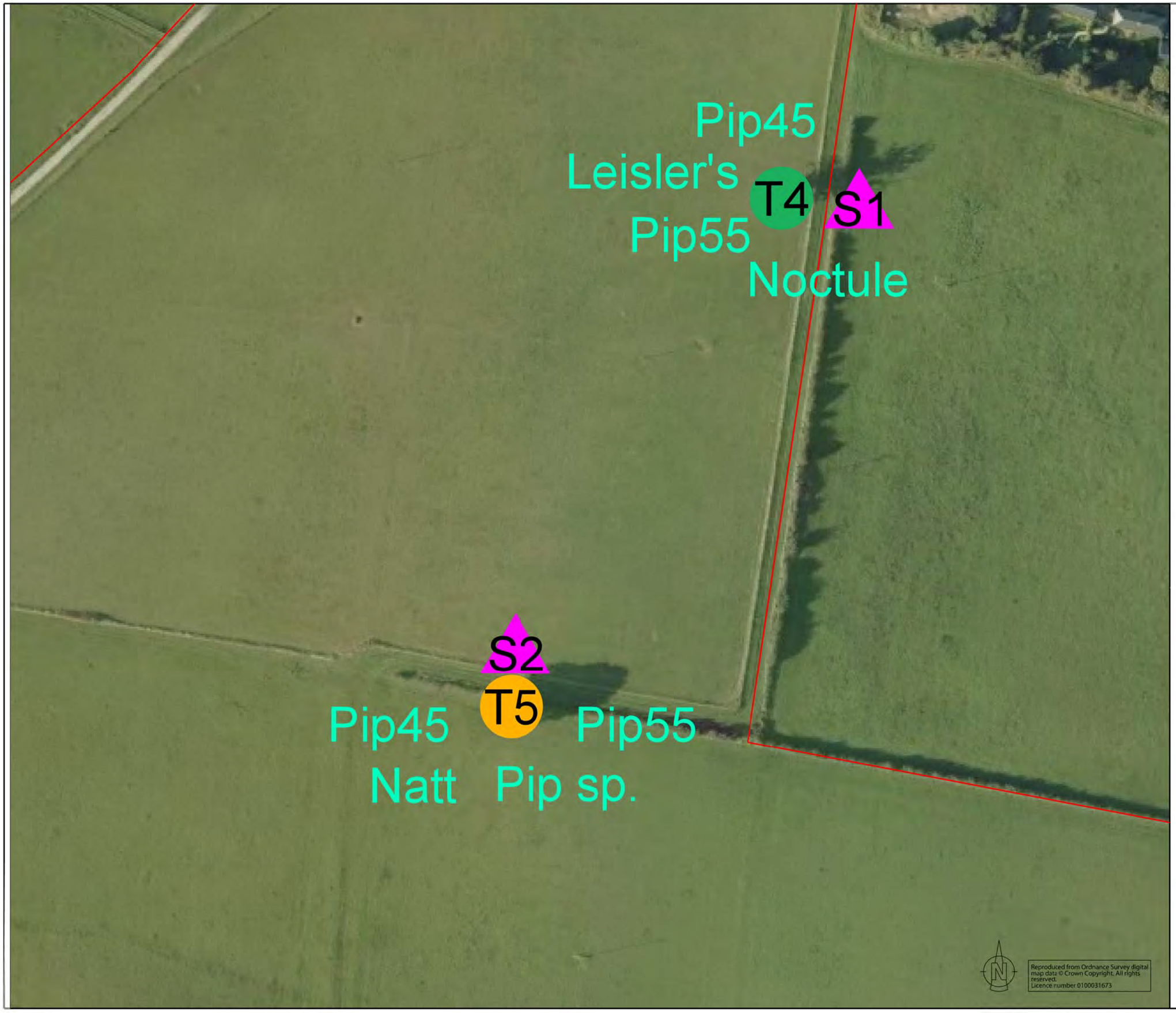
DRAWING M16.176(a).D.015

Bat Roost Survey 24-7-2018



Legend

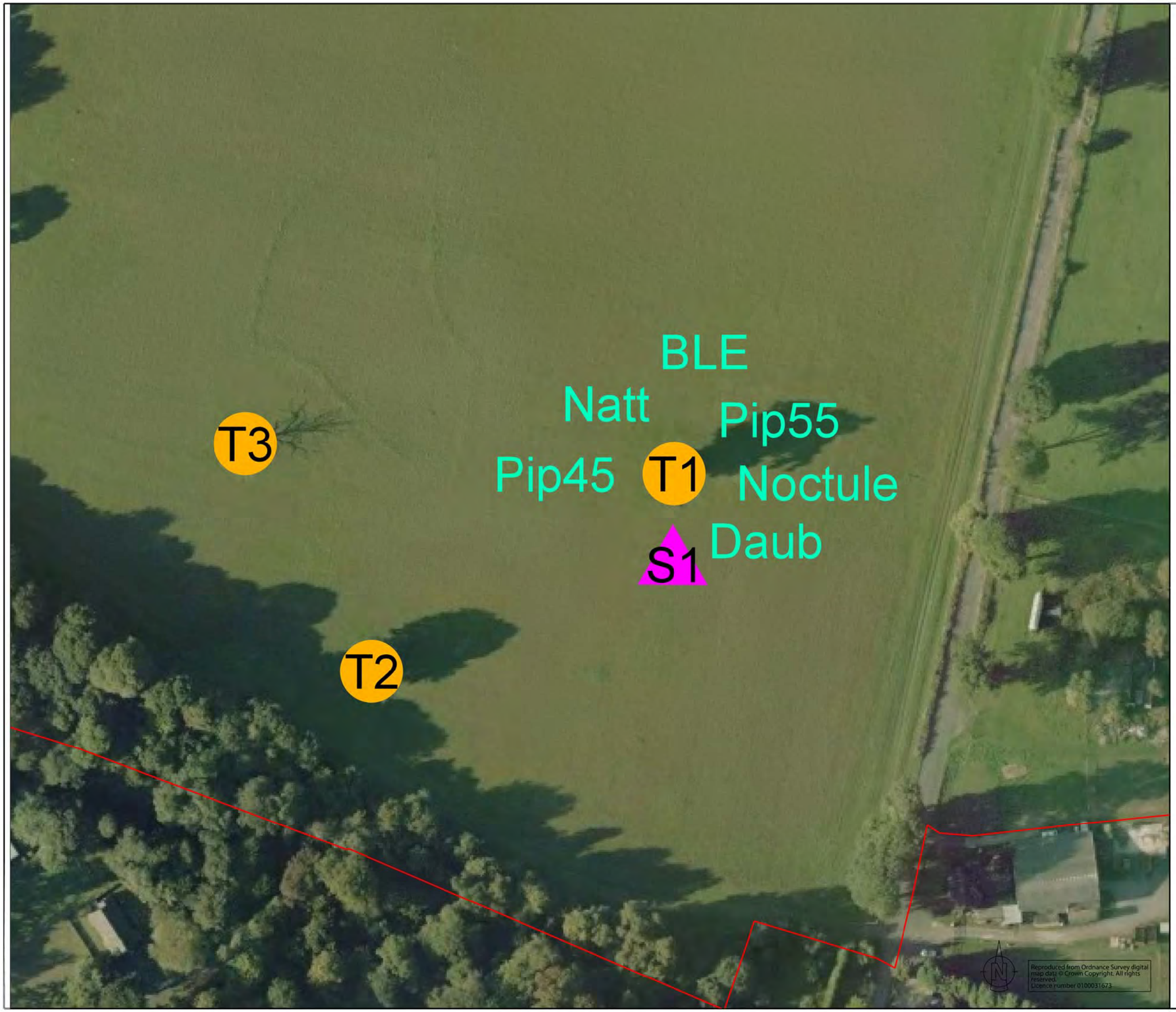
- Site boundary
- Tree with moderate roosting potential
- Tree with high roosting potential
- T4 — Tree Number
- S1 — Surveyor Location and Number
- Leisler's — Leisler's bat heard or seen
- Natt — Myotis sp. with characterists of Natterer's bat heard or seen
- Noctule — Noctule bat heard or seen
- Pip45 — Common pipistrelle bat heard or seen
- Pip55 — Soprano pipistrelle bat heard or seen
- Pip sp. — Pipistrelle sp. bat heard or seen

DRAWING STATUS	**FINAL**
PROJECT	**LEA CASTLE FARM**
CLIENT	**NRS Aggregates Ltd**
TITLE	**Bat Roost Survey 24-7-2018**
DATE	**March 2019**
SCALE	**1:1,000 @A3**
DRAWN	**KH**
CHECKED	**SC**
DRAW NO.	**M16.176(a).D.015**
REVISION	

PleydellSmithyman

DRAWING M16.176(a).D.016

Bat Roost Survey 25-7-2018



Legend

- Site boundary
- Tree with moderate roosting potential
- Tree with high roosting potential
- T1 — Tree Number
- S1 — Surveyor Location and Number
- BLE — Brown long-eared bat heard or seen
- Daub — Myotis sp. with characterists of Daubenton's bat heard or seen
- Natt — Myotis sp. with characterists of Natterer's bat heard or seen
- Noctule — Noctule bat heard or seen
- Pip45 — Common pipistrelle bat heard or seen
- Pip55 — Soprano pipistrelle bat heard or seen

DRAWING STATUS	**FINAL**
PROJECT	**LEA CASTLE FARM**
CLIENT	**NRS Aggregates Ltd**
TITLE	**Bat Roost Survey 25-7-2018**
DATE: **March 2019**	SCALE: **1:1,000 @A3**
DRAWN: **KH**	CHECKED: **SC**
DRAW NO.: **M16.176(a).D.016**	REVISION:

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DRAWING M16.176(a).D.017

Bat Roost Survey 8-8-2018

Legend

- Site boundary
- Tree with moderate roosting potential
- Tree with high roosting potential
- T1 — Tree Number
- S1 — Surveyor Location and Number
- LHS — Lesser horseshoe bat heard or seen
- Natt — Myotis sp. with characterists of Natterer's bat heard or seen
- Noctule — Noctule bat heard or seen
- Pip45 — Common pipistrelle bat heard or seen

DRAWING STATUS	**FINAL**
PROJECT	**LEA CASTLE FARM**
CLIENT	**NRS Aggregates Ltd**
TITLE	**Bat Roost Survey 8-8-2018**
DATE: **March 2019**	SCALE: **1:2,500 @A3**
DRAWN: **KH**	CHECKED: **SC**
DRAW NO.: **M16.176(a).D.017**	REVISION

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DRAWING M16.176(a).D.018

Bat Roost Survey 28-8-2018

Legend

- Site boundary
- Tree with moderate roosting potential
- Tree with high roosting potential
- T1 — Tree Number
- S1 — Surveyor Location and Number
- Natt — Myotis sp. with characterists of Natterer's bat heard or seen
- Pip45 — Common pipistrelle bat heard or seen
- Pip55 — Soprano pipistrelle bat heard or seen
- Pip45 — Common pipistrelle bat seen emerging from the tree

DRAWING STATUS	**FINAL**
PROJECT	**LEA CASTLE FARM**
CLIENT	**NRS Aggregates Ltd**
TITLE	**Bat Roost Survey 28-8-2018**
DATE: **March 2019**	SCALE: **1:2,500 @A3**
DRAWN: **KH**	CHECKED: **SC**
DRAW NO.: **M16.176(a).D.018**	REVISION

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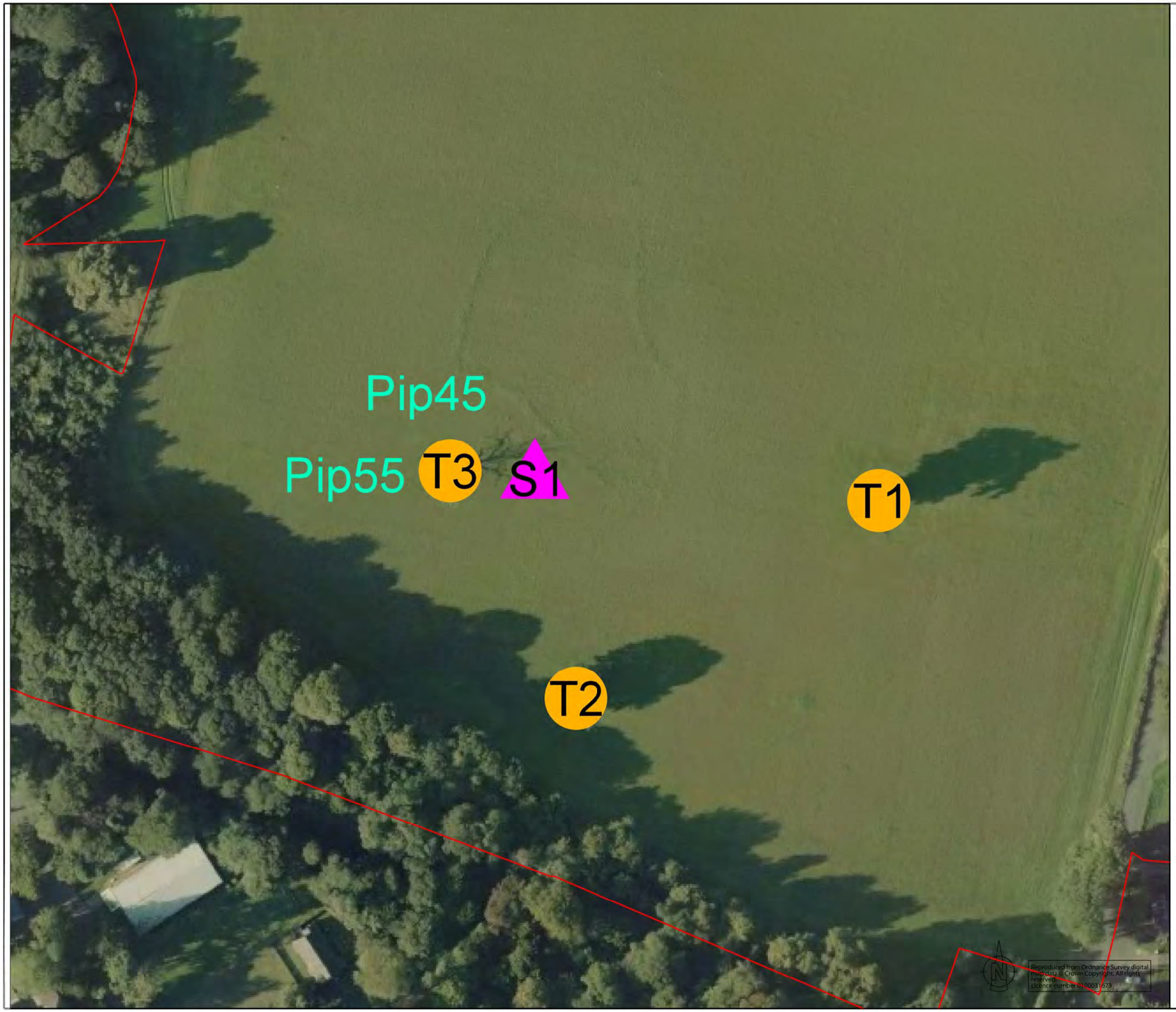
DRAWING M16.176(a).D.019

Bat Roost Survey 11-9-2018



Legend

- Site boundary
- Tree with moderate roosting potential
- Tree with high roosting potential
- T1 — Tree Number
- S1 — Surveyor Location and Number
- Pip45 — Common pipistrelle bat heard or seen
- Pip55 — Soprano pipistrelle bat heard or seen

DRAWING STATUS	**FINAL**
PROJECT	**LEA CASTLE FARM**
CLIENT	**NRS Aggregates Ltd**
TITLE	**Bat Roost Survey 11-9-2018**
DATE: **March 2019**	SCALE: **1:1,000 @A3**
DRAWN: **KH**	CHECKED: **SC**
DRAW NO.: **M16.176(a).D.019**	REVISION

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DRAWING PSC1biii435.D.008

Bat Roost Survey 24-5-2016

Legend

- Site boundary
- Tree with moderate roosting potential
- Tree 1 — Surveyed Tree Number
- S1 — Surveyor location and number
- BLE — Brown long-eared bat heard or seen
- Pip 45 — Common pipistrelle bat heard or seen

DRAWING STATUS
FINAL

PROJECT
LAND AT WOLVERLEY

CLIENT
Mr Louis Strong

TITLE
Bat Roost Survey 24-5-2016

DATE	SCALE
Dec 2016	**1:3,500 @A3**
DRAWN **KD**	CHECKED **NS**
DRAW NO. **Psc1b(iii).435.D.008**	REVISION

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DRAWING PSC1biii435.D.009

Bat Roost Survey 12-8-2016

Legend

- Site boundary
- Tree with moderate roosting potential
- Tree 1 — Surveyed Tree Number
- S1 — Surveyor location and number
- BLE — Brown long-eared bat heard or seen
- Myotis — Myotis species of bat heard or seen
- Natt — Natterer's bat heard or seen
- Noctule — Noctule bat heard or seen
- Pip 45 — Common pipistrelle bat heard or seen
- Pip 55 — Soprano pipistrelle bat heard or seen
- Flight direction of bat

DRAWING STATUS
FINAL

PROJECT
LAND AT WOLVERLEY

CLIENT
Mr Louis Strong

TITLE
Bat Roost Survey 12-8-2016

DATE	SCALE
Dec 2016	**1:3,500 @A3**
DRAWN **KD**	CHECKED **NS**
DRAW NO. **Psc1b(iii).435.D.009**	REVISION

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DRAWING PSC1biii435.D.010

Bat Roost Survey 27-9-2016

Legend

- Site boundary
- Tree with moderate roosting potential
- Tree 1 — Surveyed Tree Number
- S1 — Surveyor location and number
- Anabat static detector
- Leisler's — Leisler's bat heard or seen
- Pip 45 — Common pipistrelle bat heard or seen
- Pip 55 — Soprano pipistrelle bat heard or seen
- Bat flight direction

DRAWING STATUS
FINAL

PROJECT
LAND AT WOLVERLEY

CLIENT
Mr Louis Strong

TITLE
Bat Roost Survey 27-9-2016

DATE	SCALE
Dec 2016	**1:3,500 @A3**
DRAWN **KD**	CHECKED **NS**
DRAW NO. **Psc1b(iii).435.D.010**	REVISION

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APPENDICES

APPENDIX 1

Information obtained from the Worcestershire Biological Records Centre

No	Scientific Name	Common Name	Grid Ref	Location Name	Date	Comments	Status
313	*Myotis*	Unidentified Bat	SO816767	Baxter College, Kidderminster	12/05/2009	Foraging & flying in locality	WCA NERC s.41 UKBAP ECH4 WorcBAP
1056	*Myotis*	Unidentified Bat	SO8629678170	Hurcott	14/06/10	Whiskered/Brandt's - adult male	WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Myotis*	Unidentified Bat	SO830765		06/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
1056	*Myotis brandtii*	Brandt's Bat	SO8629678170	Hurcott	14/06/10	Pregnant female	WCA ECH4 WorcBAP
136	*Myotis daubentonii*	Daubenton's Bat	SO841805	Steel Stampings, Cookley	10/09/92	singleton, oiled	WCA ECH4 WorcBAP
142	*Myotis daubentonii*	Daubenton's Bat	SO843805	Caunsall	07/06/02		WCA ECH4 WorcBAP
627	*Myotis daubentonii*	Daubenton's Bat	SO830792	Cookley	07/06/02		WCA ECH4 WorcBAP
177	*Myotis daubentonii*	Daubenton's Bat	SO855809	Caunsall	07/06/02		WCA ECH4 WorcBAP
958	*Myotis daubentonii*	Daubenton's Bat	SO853779	Hurcott Pool	05/09/02	aural bat detector; 1	WCA ECH4 WorcBAP
707	*Myotis daubentonii*	Daubenton's Bat	SO834778	Stack Pools	06/09/02		WCA ECH4 WorcBAP
944	*Myotis daubentonii*	Daubenton's Bat	SO852779	Hurcott Pool	18/05/11	Foraging over pool	WCA ECH4 WorcBAP
676	*Myotis daubentonii*	Daubenton's Bat	SO8336277845	Springfield Park, Kidderminster	13/09/11		WCA ECH4 WorcBAP
623	*Myotis daubentonii*	Daubenton's Bat	SO830765		22/07/2015		WCA ECH4 WorcBAP
270	*Myotis nattereri*	Natterer's Bat	SO813772	Briars Hotel site, Habberley Rd	23/06/08		WCA ECH4 WorcBAP
186	*Nyctalus*	Nyctalus sp.	SO857804	Common Farm Barn, Caunsall	05/08/2008	Flying in locality	WCA NERC s.41 UKBAP ECH4 WorcBAP
270	*Nyctalus leisleri*	Lesser Noctule	SO813772	Briars Hotel site, Habberley Rd	31/05/08	Recorded calls sent to expert for ID confirmation	WCA ECH4 WorcBAP
936	*Nyctalus leisleri*	Lesser Noctule	SO8520977913	Hurcott Pool	20/05/11	Foraging over water	WCA ECH4 WorcBAP
623	*Nyctalus leisleri*	Lesser Noctule	SO830765		14/07/2015		WCA ECH4 WorcBAP
77	*Nyctalus noctula*	Noctule	SO821801	Drakelow Lane, Wolverley	07/08/92	juvenile female singleton	WCA NERC s.41 UKBAP ECH4 WorcBAP
958	*Nyctalus noctula*	Noctule	SO853779	Hurcott Pool	05/09/02	aural bat detector; 1	WCA NERC s.41 UKBAP ECH4 WorcBAP
836	*Nyctalus noctula*	Noctule	SO84507783	Kidderminster	29/05/03	aural bat detector	WCA NERC s.41 UKBAP ECH4 WorcBAP
956	*Nyctalus noctula*	Noctule	SO853773	Hodge Hill Farm	26/07/06	Emergence survey; passed over site & foraged over fields to N	WCA NERC s.41 UKBAP ECH4 WorcBAP
270	*Nyctalus noctula*	Noctule	SO813772	Briars Hotel site, Habberley Rd	31/05/08		WCA NERC s.41 UKBAP ECH4 WorcBAP
270	*Nyctalus noctula*	Noctule	SO813772	Briars Hotel site,	19/06/08		WCA NERC s.41 UKBAP ECH4 WorcBAP

				Habberley Rd			
270	*Nyctalus noctula*	Noctule	SO813772	Briars Hotel site, Habberley Rd	23/06/08		WCA NERC s.41 UKBAP ECH4 WorcBAP
143	*Nyctalus noctula*	Noctule	SO843808	Cookley	25/06/08	3 large bats flying above trees along river. Flew lower over car park & heard to 'chirp' in flight.	WCA NERC s.41 UKBAP ECH4 WorcBAP
313	*Nyctalus noctula*	Noctule	SO816767	Baxter College, Kidderminster	12/05/2009	Foraging & flying in locality	WCA NERC s.41 UKBAP ECH4 WorcBAP
360	*Nyctalus noctula*	Noctule	SO819769	The Elms, Habberley Rd	03/06/09	1 in flight	WCA NERC s.41 UKBAP ECH4 WorcBAP
772	*Nyctalus noctula*	Noctule	SO839784	Sion Hill Middle School	26/08/2009		WCA NERC s.41 UKBAP ECH4 WorcBAP
944	*Nyctalus noctula*	Noctule	SO852779	Hurcott Pool	18/05/11	Foraging over pool	WCA NERC s.41 UKBAP ECH4 WorcBAP
936	*Nyctalus noctula*	Noctule	SO8520977913	Hurcott Pool	20/05/11	Foraging over water	WCA NERC s.41 UKBAP ECH4 WorcBAP
414	*Nyctalus noctula*	Noctule	SO822769		01/07/2014		WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Nyctalus noctula*	Noctule	SO830765		06/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Nyctalus noctula*	Noctule	SO830765		14/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Nyctalus noctula*	Noctule	SO830765		22/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
707	*Pipistrellus*	Pipistrelle sp.	SO834778	Stack Pools	06/09/02		WCA NERC s.41 UKBAP ECH4 WorcBAP
172	*Pipistrellus*	Pipistrelle sp.	SO8556780947	Wolverley and Cookley	03/07/13	auditory record	WCA NERC s.41 UKBAP ECH4 WorcBAP
698	*Pipistrellus*	Pipistrelle sp.	SO83457771	Kidderminster	05/08/13	Corpse	WCA NERC s.41 UKBAP ECH4 WorcBAP
70	*Pipistrellus*	Pipistrelle sp.	SO82048022	Kidderminster	17/08/13		WCA NERC s.41 UKBAP ECH4 WorcBAP
944	*Pipistrellus nathusii*	Nathusius's Pipistrelle	SO852779	Hurcott Pool	18/05/11	Foraging over pool	WCA ECH4 WorcBAP
139	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	30/06/92	Roost site: 2 dead babies	WCA ECH4 WorcBAP
159	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	02/07/92	Roost site: 24 in garage	WCA ECH4 WorcBAP
913	*Pipistrellus pipistrellus*	Common Pipistrelle	SO849768	Osborne Close, Kidderminster	24/08/92	singleton, injured	WCA ECH4 WorcBAP

477	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	17/08/94	juvenile female singleton, on floor of garage, broken left forearm	WCA ECH4 WorcBAP
477	*Pipistrellus pipistrellus*	Common Pipistrelle	SO825767	Kidderminster, Hume St	17/08/94	1 present	WCA ECH4 WorcBAP
477	*Pipistrellus pipistrellus*	Common Pipistrelle	SO825767	Stourport Swimming Baths	06/10/94	singleton, flying over indoor pool into false ceiling space	WCA ECH4 WorcBAP
181	*Pipistrellus pipistrellus*	Common Pipistrelle	SO808789	Kidderminster, Hollies Lane	16/10/94	1 present	WCA ECH4 WorcBAP
181	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	16/10/94	singleton, mauled by cat left wing broken, possible roost in loft	WCA ECH4 WorcBAP
931	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	16/07/95	Roost site: 71 visual ID, exit point 50ft up in converted mill building	WCA ECH4 WorcBAP
931	*Pipistrellus pipistrellus*	Common Pipistrelle	SO851778	Kidderminster, Hurcott Lane	16/07/95	1 present	WCA ECH4 WorcBAP
331	*Pipistrellus pipistrellus*	Common Pipistrelle	SO817778	Wilton Avenue, Kidderminster	18/07/95	singleton broken wing, put down by vet	WCA ECH4 WorcBAP
331	*Pipistrellus pipistrellus*	Common Pipistrelle	SO817778	Kidderminster, Wilton Av.	19/07/95	1 present	WCA ECH4 WorcBAP
134	*Pipistrellus pipistrellus*	Common Pipistrelle	SO841802	Cookley, canal	21/02/01	Flying in daylight	WCA ECH4 WorcBAP
605	*Pipistrellus pipistrellus*	Common Pipistrelle	SO829794	Bishop's Field	09/05/01	1 present	WCA ECH4 WorcBAP
76	*Pipistrellus pipistrellus*	Common Pipistrelle	SO821800	Blakeshall	02/06/02		WCA ECH4 WorcBAP
362	*Pipistrellus pipistrellus*	Common Pipistrelle	SO819793	Low Habberley	02/06/02		WCA ECH4 WorcBAP
455	*Pipistrellus pipistrellus*	Common Pipistrelle	SO824794	Kidderminster	02/06/02		WCA ECH4 WorcBAP
627	*Pipistrellus pipistrellus*	Common Pipistrelle	SO830792	Kidderminster Canal	02/06/02		WCA ECH4 WorcBAP
349	*Pipistrellus pipistrellus*	Common Pipistrelle	SO818784	Low Habberley	02/06/02		WCA ECH4 WorcBAP
287	*Pipistrellus pipistrellus*	Common Pipistrelle	SO814773	Habberley Valley	02/06/02		WCA ECH4 WorcBAP
958	*Pipistrellus pipistrellus*	Common Pipistrelle	SO853779	Hurcott Pool	05/09/02	aural bat detector; 2	WCA ECH4 WorcBAP
836	*Pipistrellus pipistrellus*	Common Pipistrelle	SO84507783	Kidderminster	29/05/03	aural bat detector	WCA ECH4 WorcBAP
32	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	16/09/03	ID by sight & sound. Fresh droppings on windowsills. Possibly roosting under slates.	WCA ECH4 WorcBAP
875	*Pipistrellus pipistrellus*	Common Pipistrelle	SO84767775	Hurcott Meadow	09/10/03	45Khz echo-location	WCA ECH4 WorcBAP
531	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	18/08/04	Roost; possibly Pipistrelles from droppings & house owners description	WCA ECH4 WorcBAP
868	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	24/05/05	Roost; access via gable apex,	WCA ECH4 WorcBAP

				[redacted]		droppings	
956	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	26/07/06	Emergence survey; 1+ roosting in farm building. Fresh droppings & feeding remains	WCA ECH4 WorcBAP
270	*Pipistrellus pipistrellus*	Common Pipistrelle	SO813772	Briars Hotel site, Habberley Rd	31/05/08		WCA ECH4 WorcBAP
270	*Pipistrellus pipistrellus*	Common Pipistrelle	SO813772	Briars Hotel site, Habberley Rd	19/06/08		WCA ECH4 WorcBAP
270	*Pipistrellus pipistrellus*	Common Pipistrelle	SO813772	Briars Hotel site, Habberley Rd	23/06/08		WCA ECH4 WorcBAP
360	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	23/07/08	Roost & sighting	WCA ECH4 WorcBAP
186	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	05/08/2008	Roost	WCA ECH4 WorcBAP
313	*Pipistrellus pipistrellus*	Common Pipistrelle	SO816767	Baxter College, Kidderminster	12/05/2009	Foraging & flying in locality	WCA ECH4 WorcBAP
360	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	03/06/09	Roost & sighting	WCA ECH4 WorcBAP
772	*Pipistrellus pipistrellus*	Common Pipistrelle	SO839784	Sion Hill Middle School	26/08/2009	Foraging & flying in locality	WCA ECH4 WorcBAP
130	*Pipistrellus pipistrellus*	Common Pipistrelle	SO840801	Cookley	27/04/10	6 heard & heading from house bordering Lea lane, due NW to canal	WCA ECH4 WorcBAP
944	*Pipistrellus pipistrellus*	Common Pipistrelle	SO852779	Hurcott Pool	18/05/11	Foraging over pool	WCA ECH4 WorcBAP
360	*Pipistrellus pipistrellus*	Common Pipistrelle	SO819769	The Elms Hotel, Habberley Rd	15/06/11	Flying & foraging on site	WCA ECH4 WorcBAP
676	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8336277845	Springfield Park, Kidderminster	13/09/11		WCA ECH4 WorcBAP
360	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	21/09/11	2 present	WCA ECH4 WorcBAP
102	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8295180205	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
69	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8202980137	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
565	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8289379624	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
147	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8459280814	Wolverley and	03/07/13	auditory record	WCA ECH4 WorcBAP

				Cookley			
566	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8291579609	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
106	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8317681131	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
155	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8478280898	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
334	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8183079795	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
332	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8179079848	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
65	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8182880388	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
64	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8180080547	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
414	*Pipistrellus pipistrellus*	Common Pipistrelle	SO822769		01/07/2014		WCA ECH4 WorcBAP
414	*Pipistrellus pipistrellus*	Common Pipistrelle	SO822769		08/07/2014		WCA ECH4 WorcBAP
164	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8081977515	Kidderminster Foreign	17/09/14	auditory record	WCA ECH4 WorcBAP
623	*Pipistrellus pipistrellus*	Common Pipistrelle	SO830765		06/07/2015		WCA ECH4 WorcBAP
623	*Pipistrellus pipistrellus*	Common Pipistrelle	SO830765		14/07/2015		WCA ECH4 WorcBAP
623	*Pipistrellus pipistrellus*	Common Pipistrelle	SO830765		22/07/2015		WCA ECH4 WorcBAP
349	*Pipistrellus pipistrellus*	Common Pipistrelle	SO818784	Franche	Jun-03		WCA ECH4 WorcBAP
286	*Pipistrellus pipistrellus*	Common Pipistrelle	SO814772	Blake marsh	Jul-01	1 present	WCA ECH4 WorcBAP
270	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO813772	Briars Hotel site, Habberley Rd	31/05/08		WCA NERC s.41 UKBAP ECH4 WorcBAP
270	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO813772	Briars Hotel site, Habberley Rd	23/06/08		WCA NERC s.41 UKBAP ECH4 WorcBAP
605	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO829794	Bishop's Field	12/09/08	aural bat detector; 4	WCA NERC s.41 UKBAP ECH4 WorcBAP
313	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO816767	Baxter College, Kidderminster	12/05/2009	Foraging & flying in locality	WCA NERC s.41 UKBAP ECH4 WorcBAP
360	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO819769	The Elms, Habberley Rd	03/06/09	1 in flight	WCA NERC s.41 UKBAP ECH4 WorcBAP
772	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO839784	Sion Hill Middle School	26/08/2009		WCA NERC s.41 UKBAP ECH4 WorcBAP
130	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO840801	Cookley	27/04/10	5; heard & heading from house bordering Lea lane, due NW to	WCA NERC s.41 UKBAP ECH4 WorcBAP

						canal	
1056	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO8629678170	Hurcott	14/06/10	Adult male	WCA NERC s.41 UKBAP ECH4 WorcBAP
944	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO852779	Hurcott Pool	18/05/11	Foraging over pool	WCA NERC s.41 UKBAP ECH4 WorcBAP
360	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO819769	The Elms Hotel, Habberley Rd	15/06/11	Flying & foraging on site	WCA NERC s.41 UKBAP ECH4 WorcBAP
676	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO8336277845	Springfield Park, Kidderminster	13/09/11		WCA NERC s.41 UKBAP ECH4 WorcBAP
156	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO8481480905	Wolverley and Cookley	03/07/13	auditory record	WCA NERC s.41 UKBAP ECH4 WorcBAP
58	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO8135180451	Wolverley and Cookley	03/07/13	auditory record	WCA NERC s.41 UKBAP ECH4 WorcBAP
607	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO8300579823	Wolverley and Cookley	03/07/13	auditory record	WCA NERC s.41 UKBAP ECH4 WorcBAP
414	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO822769		01/07/2014		WCA NERC s.41 UKBAP ECH4 WorcBAP
414	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO822769		08/07/2014		WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO830765		06/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO830765		14/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO830765		22/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
104	*Plecotus auritus*	Brown Long-Eared Bat	[redacted]	[redacted]	22/05/06	Accumulations of droppings indicate moderate maternity roost used over number of yrs	WCA NERC s.41 UKBAP ECH4 WorcBAP
956	*Plecotus auritus*	Brown Long-Eared Bat	[redacted]	[redacted]	26/07/06	Emergence survey; 1 roosting in farm building, 4 other possible roosting bats. 30 fresh droppings.	WCA NERC s.41 UKBAP ECH4 WorcBAP
186	*Plecotus auritus*	Brown Long-Eared Bat	[redacted]	[redacted]	05/08/2008	Roost	WCA NERC s.41 UKBAP ECH4 WorcBAP
955	*Plecotus auritus*	Brown Long-Eared Bat	[redacted]	[redacted]	19/11/08	Small cluster of relatively fresh droppings in roof void, modern wing of house. Indicated roosting b	WCA NERC s.41 UKBAP ECH4 WorcBAP
313	*Plecotus auritus*	Brown Long-Eared Bat	SO816767	Baxter College, Kidderminster	12/05/2009	Foraging & flying in locality	WCA NERC s.41 UKBAP ECH4 WorcBAP
1056	*Plecotus auritus*	Brown Long-Eared	SO8629678170	Hurcott	14/06/10	1 Female	WCA NERC s.41 UKBAP

		Bat					ECH4 WorcBAP
414	*Plecotus auritus*	Brown Long-Eared Bat	SO822769		01/07/2014		WCA NERC s.41 UKBAP ECH4 WorcBAP
414	*Plecotus auritus*	Brown Long-Eared Bat	SO822769		08/07/2014		WCA NERC s.41 UKBAP ECH4 WorcBAP
760	*Chiroptera*	Bats	[redacted]	[redacted]	16/07/03	Roost; droppings on windowsill	WCA NERC s.41 UKBAP ECH4 WorcBAP

APPENDIX 2

Site Photographs

Plate 1. Tree 1

Plate 2. Tree2

Plate 3. Tree 3

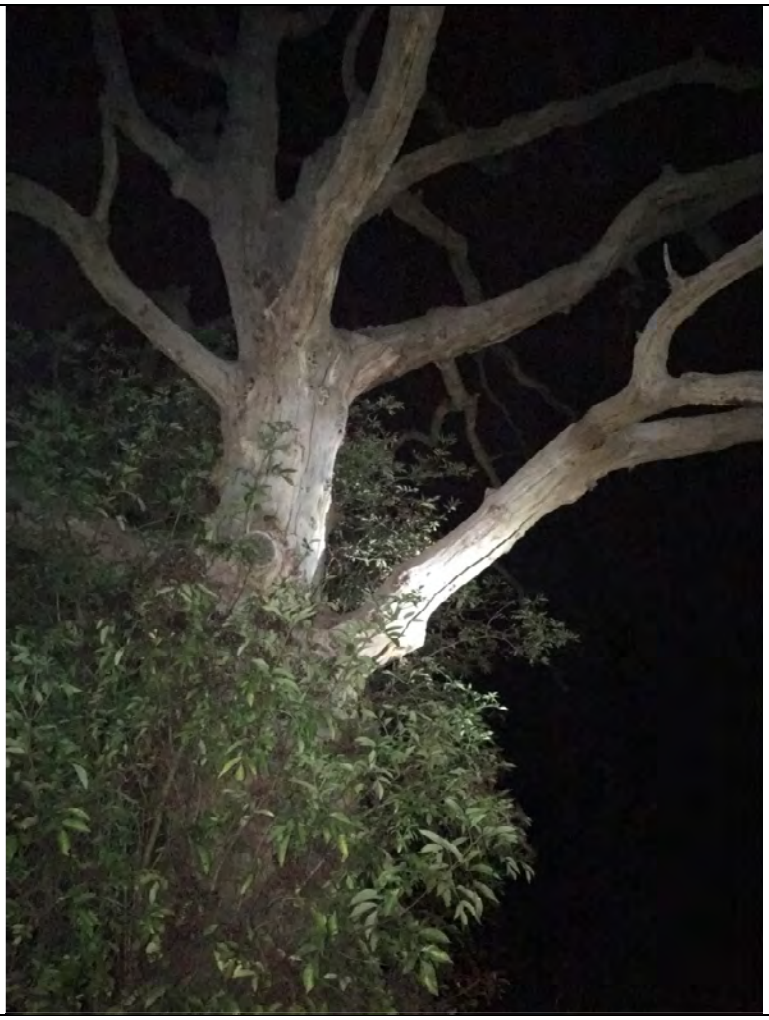


Plate 4. Tree 3 with crack in limb that a common pipistrelle emerged from.

Plate 5. Tree 5

APPENDIX 3

Full details of the bat roost surveys

Survey 1

Date:	5/6/2018				
Sunset/Sunrise:	04.50 (Sunrise)				
Survey start (time):	03.20		**Survey finish (time):**	04.51	
Weather conditions at start	Dry, Light breeze (Beaufort scale 2), air temp 13˚C.		**Weather conditions at finish**	Very light occasional rain, Light breeze (Beaufort scale 2), air temp 11.4˚C.	
Surveyor locations	Surveyor 1 was located to the south of Tree 1. Surveyor 2 was located to the south of Tree 2 and Surveyor 3 was located to the east of Tree 3. Please see Drawing M16.176(a).D.013 for a plan showing the locations of the surveyors and the bat activity throughout this roost survey.				
Time	**Activity Type**	**Species**	**No.**	**Surveyor**	**Location/Behaviour**
03.15-04.05	Foraging	Common pipistrelle	3	2	Constant foraging.
03.22 – 03.39	Foraging	Common pipistrelle	1	1	Constant foraging
03.35	Commuting	Noctule	1	2	Brief pass
03.42 – 03.53	Foraging	Common pipistrelle	1	1	Constant activity
03.42	Commuting	Brown long-eared	1	2	Brief pass

03.43	Foraging	Brown long-eared	1	2	Brief pass
03.47	Commuting	Noctule	1	1	Brief call
03.47	Commuting	Brown long-eared	1	2	Brief pass
04.00	Commuting	Common pipistrelle	1	1	Brief pass
04.07	Foraging	Soprano pipistrelle	1	1	Brief pass
04.07-04.09	Foraging	Common pipistrelle	3	2	Constant foraging
04.17	Foraging	Common pipistrelle	1	2	Seen briefly foraging and circling around the tree
04.18	Commuting	Soprano pipistrelle	1	2	Brief pass

Survey 2

Date:	26/6/2018		
Sunset/Sunrise:	21.36 (Sunset)		
Survey start (time):	21.22	**Survey finish (time):**	23.06
Weather conditions at start	15% Cloud Cover, No rain, Light air (Beaufort scale 1), air temp 23.3˚C.	**Weather conditions at finish**	10% Cloud Cover, No rain, Light air (Beaufort scale 1), air temp

					18.2˚C.
Surveyor locations		Surveyor 1 was located to the south of Tree 1. Surveyor 2 was located to the south of Tree 2. Please see Drawing M16.176(a).D.014 for a plan showing the locations of the surveyors and the bat activity throughout this roost survey.			
Time	**Activity Type**	**Species**	**No.**	**Surveyor**	**Location/Behaviour**
22.00	Commuting	Leisler's	1	1	Brief pass
22.25	Commuting	Soprano pipistrelle	1	1	Brief pass
22.31-22.34	Foraging	Common pipistrelle	1	2	Seen foraging above head
22.33	Foraging	Common pipistrelle	1	1	Brief pass
22.37	Foraging	Common pipistrelle	1	1	Brief pass
22.44	Commuting	Leisler's	1	1	Brief pass
22.44	Foraging	Common pipistrelle	1	1	Brief pass
22.45	**Possible emergence**	Brown long-eared	1	2	Bat seen flying to the south. Not heard.
22.51	Foraging	Brown long-eared	1	1	Brief pass
22.52-22.53	Foraging	Common pipistrelle	1	1	Frequent activity

22.52	Foraging	Common pipistrelle	1	2	Heard not seen
22.52	Foraging	Soprano pipistrelle	1	1	Heard not seen
22.57	Foraging	Myotis sp. – poss Daubenton's	1	1	Brief pass
22.58	Foraging	Soprano pipistrelle	1	1	Brief pass
23.01	Foraging	Common pipistrelle	1	1	Brief pass
23.03	Foraging	Common pipistrelle	1	1	Brief pass
23.05	Foraging	Myotis sp. – poss Daubenton's	1	1	Brief pass
23.05	Foraging	Common pipistrelle	1	1	Heard not seen

Survey 3

Date:	24/7/2018		
Sunset/Sunrise:	21.14		
Survey start (time):	21.00	**Survey finish (time):**	22.45
Weather conditions at start	75% Cloud Cover, Dry Gentle breeze (Beaufort scale 3), air	**Weather conditions at finish**	70% Cloud Cover, dry Light breeze (Beaufort scale 2), air temp

		temp 20.9˚C.			17.7˚C.
Surveyor locations		Surveyor 1 was located to the east of Tree 4. Surveyor 2 was located to the north of Tree 5. Please see Drawing M16.176(a).D.015 for a plan showing the locations of the surveyors and the bat activity throughout this roost survey.			
Time	**Activity Type**	**Species**	**No.**	**Surveyor**	**Location/Behaviour**
22.04	Foraging	Common pipistrelle	1	1	Heard not seen
22.10	Commuting	Soprano pipistrelle	1	2	Brief pass, heard not seen
22.11	Commuting	Common pipistrelle	1	1	Faint pass
22.12	Foraging	Common pipistrelle	1	1	From houses to the east
22.16	Foraging	Common pipistrelle	1	1	Two brief passes
22.16-22.17	Foraging	Common pipistrelle	1	2	Heard not seen
22.17	Foraging	Common pipistrelle	1	1	Two brief passes
22.18	Foraging	Common pipistrelle	1	1	Two brief passes
22.19	Foraging	Common pipistrelle	1	1	Heard not seen

22.20	Commuting	Common pipistrelle	1	2	Brief pass
22.24	Commuting	Common pipistrelle	1	2	Brief pass
22.25	Foraging	Common pipistrelle	1	1	Loud and close
22.25	Commuting	Common pipistrelle	1	2	Brief pass
22.26	Commuting	Common pipistrelle	1	1	Brief pass
22.27	Commuting	Common pipistrelle	1	2	Brief pass
22.28	Commuting	Common pipistrelle	1	2	Brief pass
22.30	Foraging	Common pipistrelle	1	1	Faint pass
22.30	Foraging	Leisler's	1	1	Faint pass
22.31-22.45	Foraging	Pipistrelle sp.	1	2	Bat seen circling around the southern side of Tree 5. The bat was not echolocating.
22.36	Foraging	Common pipistrelle	1	1	Very close activity
22.36	Foraging	Soprano pipistrelle	1	1	Brief pass
22.38	Foraging	Myotis sp. Natterer's	1	2	Heard not seen

		characeristics			
22.46	Commuting	Noctule	1	1	Brief pass
22.47	Commuting	Noctule	1	1	Brief pass
22.48	Foraging	Common pipistrelle	1	1	Faint pass

Survey 4

Date:	25/7/2018		
Sunset/Sunrise:	05.19		
Survey start (time):	03.15	**Survey finish (time):**	05.20
Weather conditions at start	100% Cloud Cover, Dry, Still (Beaufort scale 0), air temp 14˚C.	**Weather conditions at finish**	100% Cloud Cover, dry, still (Beaufort scale 0), air temp 13˚C.
Surveyor locations	Surveyor 1 was located to the south of Tree 1. Please see Drawing M16.176(a).D.016 for a plan showing the locations of the surveyors and the bat activity throughout this roost survey.		

Time	**Activity Type**	**Species**	**No.**	**Surveyor**	**Location/Behaviour**
03.39	Commuting	Myotis sp. Natterer's characteristics	1	1	Brief pass
03.42	Foraging	Common pipistrelle	1	1	Brief pass, heard not seen
03.45	Commuting	Myotis sp. Natterer's	1	1	Heard not seen

		characteristics			
03.45	Foraging	Common pipistrelle	1	1	Heard not seen
03.47	Commuting	Soprano pipistrelle	1	1	Heard not seen
03.47	Foraging	Myotis sp. Natterer's characteristics	1	1	Heard not seen
03.49	Commuting	Noctule	1	1	Faint pass
03.52	Foraging	Myotis sp. Natterer's characteristics	1	1	Brief pass
03.52	Foraging	Brown long-eared bat	1	1	Brief pass
03.53	Foraging	Soprano pipistrelle	1	1	Faint pass
03.53	Foraging	Myotis sp. Daubenton's characteristics	1	1	Brief pass
03.54	Foraging	Myotis sp. Daubenton's characteristics	1	1	Heard not seen
03.55-03.57	Foraging	Myotis sp. Natterer's characteristics	1	1	Regular activity, heard not seen
03.57	Foraging	Brown long-eared	1	1	Heard not seen

04.03	Foraging	Brown long-eared	1	1	Heard not seen
04.05-04.06	Foraging	Common pipistrelle	1	1	Heard not seen
04.05	Commuting	Myotis sp. Natterer's characteristics	1	1	Heard not seen
04.19	Foraging	Common pipistrelle	1	1	Brief pass

Survey 5

Date:	8/8/2018		
Sunset/Sunrise:	05.40		
Survey start (time):	04.06	**Survey finish (time):**	05.55
Weather conditions at start	10% Cloud Cover, Dry, Light air (Beaufort scale 1), air temp 11.8˚C.	**Weather conditions at finish**	10% Cloud Cover, dry, light air (Beaufort scale 1), air temp 13.5˚C.
Surveyor locations	Surveyor 1 was located to the south of Tree 2. Surveyor 2 was located to the east of Tree 4. Surveyor 3 was located to the north of Tree 5. Please see Drawing M16.176(a).D.017 for a plan showing the locations of the surveyors and the bat activity throughout this roost survey.		

Time	**Activity Type**	**Species**	**No.**	**Surveyor**	**Location/Behaviour**
04.09	Commuting	Noctule	1	2	Brief pass

04.18	Commuting	Myotis sp. Natterer's characteristics	1	1	Brief pass, heard not seen
04.21	Commuting	Lesser Horseshoe	1	2	Brief pass
04.30	Foraging	Common pipistrelle	1	1	Foraging around tree

Survey 6

Date:		28/8/2018			
Sunset/Sunrise:		20.07			
Survey start (time):		19.51		**Survey finish (time):**	21.37
Weather conditions at start		100% Cloud Cover, Dry, Light air (Beaufort scale 1), air temp 14.7˚C.		**Weather conditions at finish**	100% Cloud Cover, dry, light air (Beaufort scale 1), air temp 14.3˚C.
Surveyor locations		Surveyor 1 was located to the east of Tree 3. Surveyor 2 was located to the east of Tree 4. Please see Drawing M16.176(a).D.018 for a plan showing the locations of the surveyors and the bat activity throughout this roost survey.			
Time	**Activity Type**	**Species**	**No.**	**Surveyor**	**Location/Behaviour**
20.35-20.38	Foraging	Common pipistrelle	1	2	Seen flying along hedge and overhead
20.42	**Emergence**	Common pipistrelle	1	1	Seen emerging from split in limb
20.43	Foraging	Common	1	2	Heard not seen

		pipistrelle			
20.44-20.46	Foraging	Soprano pipistrelle	1	2	Seen flying along hedgerow
20.46-20.48	Foraging	Common pipistrelle	1	2	Seen flying along hedgerow
20.51	Foraging	Common pipistrelle	1	2	Seen flying along hedgerow
20.59	Foraging	Common pipistrelle	1	2	Seen flying along hedgerow
21.00	Foraging	Common pipistrelle	1	1	Seen flying around the tree
21.12	Foraging	Common pipistrelle	1	2	Flew overhead
21.24	Foraging	Myotis sp. Natterer's characteristics	1	2	Heard not seen

Survey 7

Date:	11/9/2018		
Sunset/Sunrise:	19.34		
Survey start (time):	19.22	**Survey finish (time):**	21.04
Weather conditions at start	100% Cloud Cover, Dry, Light breeze (Beaufort scale 2), air temp 16˚C.	**Weather conditions at finish**	100% Cloud Cover, dry, light air (Beaufort scale 1), air temp 15.1˚C.

Surveyor locations		Surveyor 1 was located to the east of Tree 3. Please see Drawing M16.176(a).D.019 for a plan showing the locations of the surveyor and the bat activity throughout this roost survey.			
Time	**Activity Type**	**Species**	**No.**	**Surveyor**	**Location/Behaviour**
20.04	Commuting	Soprano pipistrelle	1	1	Brief pass from east of tree round the tree and then flew to the north
20.17	Foraging	Common pipistrelle	1	1	Brief foraging around the tree
20.19	Foraging	Soprano pipistrelle	1	1	Heard not seen

APPENDIX 4

Information on bat boxes

Bat Box Information Pack

Bat boxes are artificial roosts designed to provide bats with alternative resting places. There are various designs of bat box, from wooden boxes that you can make yourself, to ready-assembled boxes and even integrated bat boxes that can be built into walls.


© Andrew Dumbleton

Providing bat boxes can increase opportunities for roosting bats, particularly when they are located where there are few existing roosting sites. However, where a number of suitable alternative roost sites exist it can take a long time for bat boxes to be used regularly and in some cases they may never be used. Even in these situations, bat boxes can have an important additional function in encouraging interest and educating members of the public about bat conservation. The correct design and placement of boxes will help increase the likelihood of their uptake by bats.

Bat roost preferences

Bat boxes are now available from many outlets, and in a range of shapes and sizes, so some knowledge of bats' preferences will help you choose the best possible box.

Microclimate within a new roost is a very important factor in terms of increasing the chance of successful uptake by bats. In general, they prefer warm spaces in the summer for rearing young and cooler spaces in the winter for hibernation. The box should be draught proof and made from a thermally stable material such as untreated wood, woodcrete, brick or stone. If possible, it is better to provide several internal chambers so that the bats can move around as their needs change.

Although, it can take bats a long time to make use of artificial roosts, bat box location seems to be the most important factor influencing successful uptake.


© Hugh Clark

Orientation and location

Lack of warmth is the most important known cause of bat box failure, and structures for summer roosting should be positioned where they are unshaded for most of the day. Summer maternity roosts (in the northern hemisphere) should have a southerly or westerly aspect. On average we estimate that the bat box should receive 6-10 hours of direct sunlight a day if possible. It is always best to provide a number of different options for bats so that they can choose the most appropriate temperature based on their needs. This can be achieved by grouping a number of bat boxes each with a different aspect, for example around the trunk of a tree (see 'putting up bat boxes' below).

Size of the bat box

It is important that the type of bat box should be appropriate to the species it is aimed at. The most frequently used bat boxes are small and only suitable for crevice-dwelling bat species. Some species such as horseshoe bats and grey long-eared bats do not use bat boxes.

Access

Crevice dwelling bats crawl into their roosts via small gaps in the range of 15-20mm high. Roughened surfaces or landing areas allow better access though landing perches should be avoided as these are not necessary, may even deter bats and encourage birds to nest within the bat box. It is important to locate access points where they are unobstructed but close to sizeable vegetation and flight lines. This allows bats to emerge earlier and forage longer.


© John Altringham

Other considerations

Bats are nocturnal and adapted to low light conditions. Artificial light sources should not be directed onto bat boxes or flight paths as most bat species find artificial lighting very disturbing.

Types of bat boxes

Bat boxes come in many forms depending on their materials, function and location. Simple bat boxes are available commercially or can be home-made. They can be divided into the following categories: woodcrete external bat boxes, wooden external bat boxes and integrated bat boxes. Advanced forms of artificial roost creation include bat houses, bat barns and internal bat lofts (if you are interested in these please refer to the websites and publications listed at the end of this document).

Woodcrete external bat box

Woodcrete (a mixture of wood and concrete) bat boxes have the advantage of being more durable so will not need to be replaced for many years. There are two basic types of woodcrete bat box:

- Cylindrical with an access hole in the front and designed to be hung on tree branches with a wire loop.
- Brick-shaped, usually with narrow roosting crevices inside and an entry slit at the bottom, designed to be fixed to trees or flat surfaces such as walls of buildings.


© Fiona Lockhurst

If possible, purchase boxes with an entrance slit along the bottom so that accumulated bat waste can drop out of the box or be pushed out as bats emerge. Bat boxes with entrance holes in the middle will need to be cleaned regularly by a licensed bat worker (see 'monitoring bat boxes' below).

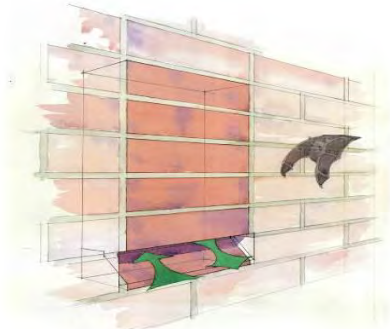
Wooden external bat boxes

External bat boxes are usually located on trees or outside walls of buildings. The most common types of bat boxes are made from wood. Wooden bat boxes are usually cubic or wedge-shaped, with a grooved 'bat ladder' and a narrow entrance slit at the bottom. These will last for approximately ten years and can either be bought ready-made, in kit form, or you can make your own from scratch (there are instructions for the 'The Kent Bat Box' and 'The CJM Bat Box' in the appendices of this document). They come in a variety of shapes but key requirements are:

- The wood should be rough sawn for grip and untreated on the inside.
- To protect against moisture, air leaks and wood deterioration, apply one coat of primer to all outer surfaces, including vent openings, landings and entry areas. Follow that with two coats of flat exterior, water-based paint or stain. Do not use oil-based products. Consult Natural England's guide for safe timber treatment products (TIN092).
- In cool climates bat boxes should be painted or stained black or a dark colour using non-toxic coatings.
- Bats do not like draughts. The entrance slit should be no more than 15-20mm wide, and there should be no gaps where the sides and top join. A box that cannot be opened from the top is best, as it will have fewer gaps for draughts, and will lessen the chances of the bats being disturbed. (Bats may unintentionally be injured if the box is opened, for example by damaging their feet and legs. A special licence is required in the UK to disturb bats and to handle them – see 'monitoring bat boxes' below)
- One of the most successful wooden bat boxes is the Kent bat box. These boxes are not available commercially but are very easy to make yourself (see instructions in the appendix).

Integrated bat boxes

Integral or integrated bat boxes can be built into the walls or masonry of houses and other buildings. The boxes can be embedded such that they do not impair the air-tightness of the building. Many designs are available including some that have bespoke coverings that can match the building façade. The same rules for size, location and access apply.



Habitat, enhancing home for bat boxes.
© Ecosurv

Putting up bat boxes

How many boxes?

Ideally, put up two or three boxes facing in different directions to provide a range of temperature conditions. For example, boxes facing from south-east to south-west allow the sun to fall on each box for part of the day. During very hot days a south-facing box may overheat, but the other boxes should have some shade.

Two or three boxes will always be preferable to one, although a single box has a chance of being used depending on the bat species that use the local area. Three boxes can be arranged around the trunk of larger trees.

To increase the chance of it being used, locate the box at a site where bats are known to feed, that is sheltered from strong winds and exposed to the sun for part of the day. Most maternity roosts are located within a short distance of permanent fresh water, preferably a stream, pond, river or lake. Bat boxes are more likely to succeed in areas where bats are frequently found in buildings and where there is a good mixture of habitat including trees and nearby water especially if there is good habitat for feeding bats but few roosting opportunities. (See below for more information on other things you can do to encourage bats.)

Bat boxes may be more successful if located close to a linear feature such as a line of trees or hedgerow. Some bat species use these features for navigation between their roosting sites and feeding grounds and to avoid flying in open and exposed areas. Ensure the bats approach to the box is not impeded, for example by branches – clear away underneath the box so the bats can land easily before crawling up into the box.


© Daniel Fellman

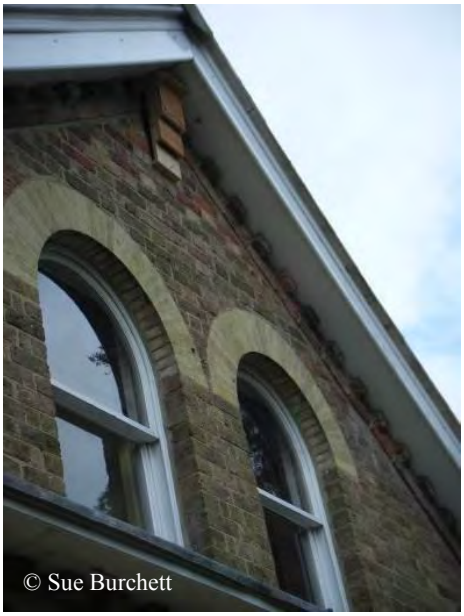
On trees

Most species will use higher positioned boxes (around 5m high), although brown long-eared bats may use a box 1.5m above the ground. If you are locating boxes in public areas, consider the risks of vandalism and of the box being accessible to cats. Place the box as high as it is safe to. Consideration should be given to tree growth and boxes may need rehanging over time. Use headless or domed nails not fully hammered home to allow the tree to push the box off without splitting, or strap the box to the tree. Iron nails can be used on trees with no commercial value. Copper nails can be used on conifers, but aluminium alloy nails are less likely to damage saws and chipping machinery.

On buildings

Placing the boxes high up by the eaves on a building will reduce the likelihood of the bats falling prey to cats or humans. As with trees, the aspect of the box should capture sun for part of the day.

Gazebos, garden walls and sheds have been suggested as sites for bat boxes. However, the main danger is that the boxes are not high enough above the ground and are too visible to predators.


© Sue Burchett

On poles

American style bat houses (larger, multi-chambered boxes) have been successfully used for bat conservation in North America and elsewhere. These are increasingly being used in the UK with some success. Some designs are suitable for the sides of buildings or they can be put up on poles. More information on the design of these bat houses can be found in 'The Bat House Builder's Handbook' produced by Bat Conservation International (referenced in the Publications section at the end of this document). Some commercial designs are also available.

Monitoring bat boxes

Making and putting up bat boxes is a great conservation action but what is even more useful is to know whether they are being used, when and by which species.

How long before bats will use the box?

Sometimes it may take several years for the bats to find the box. Be patient!

It is highly unlikely bats will shift their roost from a well-used site to a newly positioned box and there may be plenty of other suitable roosting sites in the area. However, at other times bats will use the box within a few months, and if you are extremely lucky, maybe even within a few weeks!

How will I know if the box has been successful?

To check if the box is being used, look out for droppings, urine staining, listen for 'chattering' and watch the box for an hour either side of sunset to observe any bats leaving to feed.

Licensing

You can undertake the checks above without needing a licence. However, if the box needs to be opened to check it then there must be a suitably licensed bat worker present. Anyone wishing to undertake bat box checks should obtain training in bat handling and identification before applying for a licence. You can find out more about licensing and bats on the Bat Conservation Trust website at: www.bats.org.uk/pages/licensing.html

All bats and their roosts are protected by law and it is an offence to deliberately disturb, handle or kill bats. The relevant legislation in England & Wales is the Wildlife and Countryside Act 1981 and Conservation of Habitats & Species Regulations 2010 (as amended). In Scotland it is the Conservation (Natural Habitats, etc.) Regulations 1994 and in Northern Ireland the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995.

A bed without breakfast?

Bats often use features such as hedgerows, tree lines and waterways as commuting pathways between roosts and foraging areas. This type of habitat also provides shelter, allowing insects to gather and therefore support foraging bats. The highest densities of bats occur where insects are most plentiful.

Make sure you maintain or create good foraging habitats for bats by planting a wide range of plants such as flowers that vary not only in colour and fragrance, but also in shape. The addition of water (for example a pond) and deadwood to a garden will also increase the variety of invertebrates that your garden can sustain, providing food for bats. See BCT's 'Encouraging Bats' leaflet for more information (available from www.bats.org.uk\publications).

Bat Box Supplier Websites

There is a wide variety of commercially available bat boxes in a wide range of shapes, sizes and materials. These are available through NHBS (www.nhbs.com), CJ Wildlife (www.birdfood.co.uk/pro), Amazon (www.amazon.co.uk), The Nestbox Company (www.nestbox.co.uk) and a range of alternative suppliers. Please be aware that BCT does not endorse any particular product or brand.

Habibat www.habibat.co.uk

Habibat is a partnership between the Bat Conservation Trust, Ecosurv and customers. Their aim is to provide bat boxes that work for bats and buildings. A portion of the profits from each Habibat sold is reinvested into the Habibat scheme to improve accommodation for bats through monitoring and research. They will be improving knowledge of integrated bat boxes, monitoring uptake, refining our bat box design and giving their customers guidance on installation.

Other Useful Websites

Bat Conservation Trust www.bats.org.uk

The Bat Conservation Trust (BCT) is working towards a world where bats and people thrive in harmony, to ensure they are around for future generations to enjoy. BCT is the only organisation solely devoted to bat conservation in the UK.

Roost roost.bats.org.uk

Roost is a resource developed by the Bat Conservation Trust (BCT) to aid in the gathering of information on bat roost mitigation, compensation and enhancement techniques. The aim for this site is to provide accessible information to support everyone involved in bat conservation and development. The site is useful for those involved in projects which require mitigation for loss of bat roosts, and for those who wish to provide additional resources for bats in buildings.

Bat Conservation International www.batcon.org

Bat Conservation International's mission is to conserve the world's bats and their ecosystems to ensure a healthy planet. Based in Austin, Texas, BCI is devoted to conservation, education and research initiatives involving bats and the ecosystems they serve.

Vincent Wildlife Trust www.vwt.org.uk

The Vincent Wildlife Trust (VWT) is an independent charitable body founded by Vincent Weir in 1975 and has been supporting wildlife conservation ever since. They conserve a range of endangered mammals through management their own reserves, undertake pioneering research and provide expert advice to others through practical demonstration.

Publications

Gunnell, K., Murphy, B. and Williams, C. (2013) Designing for biodiversity: a technical guide for new and existing buildings

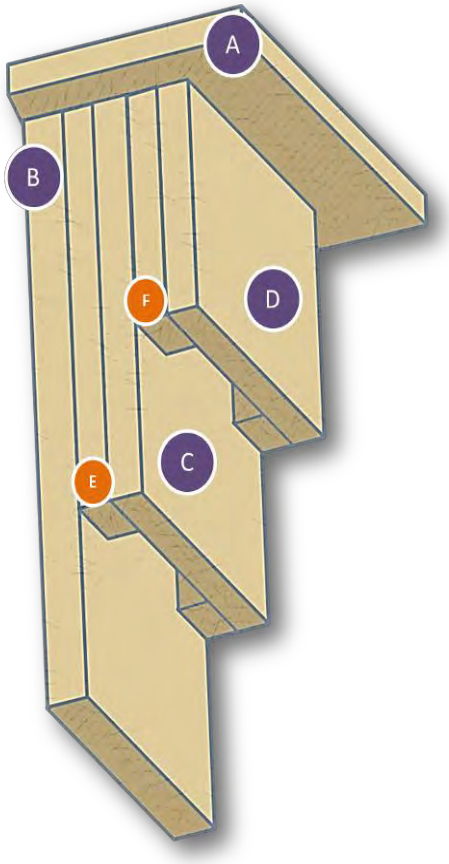
Gunnell, K., Grant, G. and Williams C. (2012) Landscape and urban design for bats and biodiversity

Photos and illustrations in this document by the Bat Conservation Trust unless otherwise stated.

Appendix A: The Kent Bat Box (D.I.Y. instructions)

Design and measurements

Simple to construct, self-cleaning and low maintenance, the Kent bat box (designed by the Kent Bat Group) is a great extra home for bats to hang out and rest on a hunting night out. These boxes won't be spacious enough to be used as maternity roosts but are a great way to encourage bats in your garden or your green space. The box should be rainproof and draught-free



The only critical measurement is the width of the crevices: between 15-20mm. Other measurements are approximate. Timber should be approximately 20mm thick.

Measurements for one Kent bat box kit would be as follows:

Part	Quantity	Size (mm)
Roof (A)	1	250 x 160 x 20
Back (B)	1	450 x 200 x 20
Centre (C)	1	330 x 200 x 20
Front (D)	1	210 x 200 x 20
Centre Rails (E)	2	330 x 20 x 20
Front Rails (F)	2	210 x 15 x 15
Stand-offs (optional)	2	200 x 20 x 20

Material and Tools

This kit requires approximately 1.6m of rough wood and 25 screws (8 x 1 ½ inches) to assemble. You can rough it up by scraping with a suitable tool – possibly a saw blade or even a screwdriver but make sure you use untreated wood as some preservative chemicals can kill bats.

Pre-drill the holes to prevent the wood splitting. The hanging screws may either be at the edges of the front panel or in the side centre block (not in the rails!). Fixing may be by use of brackets, durable nylon cord or wires. Alternatively you can assemble your bat box kit with nails although they tend to be less robust than boxes made with screws.

This design has been developed by Kent Bat Group

We'd like to know how successful it is. Please send any comments or records of bats seen using it to: records@kentbatgroup.org.uk

With thanks to Glen Sharman for help in prototype and Lloyd Bore for providing plans.

Kent Bat Group
www.kentbatgroup.org.uk
Reg Charity No. 1079767

Appendix B: The CJM Bat Box (D.I.Y. instructions)

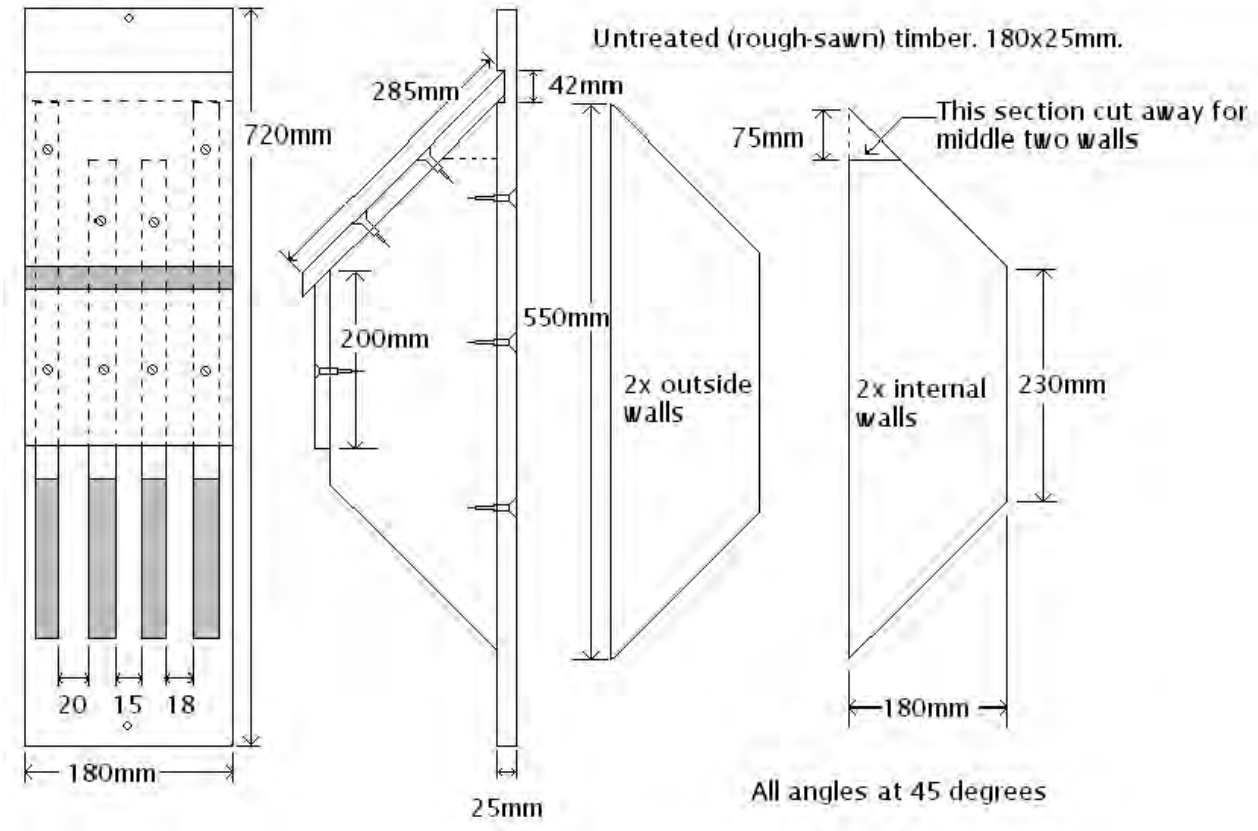
The CJM bat box was designed to imitate niches where crevice dwelling bats might roost; such as a split in a tree trunk or behind loose bark. This design was created for woodland habitats and has proven to be successful with several different species in woodland studies.

This design requires no maintenance as the open bottom allows droppings to fall from the box.

The three vertical 'slots' each of a different width, offers a choice that several species of bat, depending on their size, might use. The upper section of the two partition walls have been cut away to allow bats an area to cluster, conserve energy and breed.

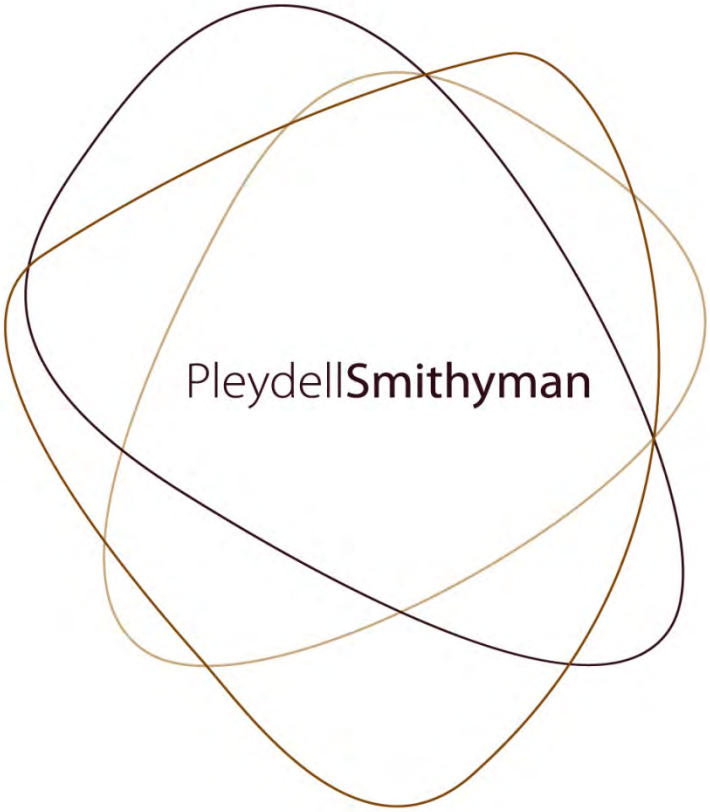
These simple drawings are all you need to build one yourself. Please contact Colin Morris at The Vincent Wildlife Trust if you require any more information: colinmorris@vwt.org.uk

All the timber used is untreated, rough-sawn 180mm x 25mm.



TECHNICAL APPENDIX 9/4

BAT ACTIVITY SURVEY REPORT



BAT ACTIVITY SURVEY

RELATING TO LAND AT LEA CASTLE FARM, WOLVERLEY

APPLICATION FOR PLANNING PERMISSION

For NRS Aggregates Ltd.

PREPARED BY PLEYDELL SMITHYMAN LIMITED

April 2019

PSL Report Reference M16.176(a).R.003

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BAT ACTIVITY SURVEY AT LEA CASTLE FARM, WOLVERLEY

Report Prepared for
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Warwickshire,
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Lea Castle Farm,
Wolverley Road,
Wolverley,
Kidderminster,
DY10 3PX

BAT ACTIVITY SURVEY
ON LAND AT
LEA CASTLE FARM,
WOLVERLEY ROAD,
WOLVERLEY,
KIDDERMINSTER,
DY10 3PX

By:
Pleydell Smithyman Limited

April 2019

Bat Activity Survey

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1.0 INTRODUCTION

Background and Proposals

1.1 Pleydell Smithyman Limited were instructed by NRS Aggregates Ltd via Robin Smithyman of Kedd Ltd. to carry out a bat activity survey on land at Lea Castle Farm, Wolverley, Kidderminster (hereafter referred to as the site). Please see Drawing Number M16.176(a).D.006: Preliminary Ecological Appraisal, for a plan showing the site boundary.

1.2 The surveys were recommended following a preliminary ecological appraisal survey undertaken in May 2018 that identified suitable foraging and commuting habitat for bats. The surveys were required in order to inform the preparation and submission of a planning application for the extraction of mineral from the site and to help ensure compliance with national and European legislation.

Site Location

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.

Site Description

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. For further details, please refer to the PEA survey report (Pleydell Smithyman Limited, 2019).

Legislation

1.6 The information contained in this section is a summary of the legislation relating to bats, and for full details the original texts should be referred to.

1.7 All British bats are European protected species and therefore receive protection under the Conservation of Habitats and Species Regulations (2017), making it an offence to:

- Deliberately kill, injure or capture a bat;
- Deliberately disturb bats, including in particular any disturbance which is likely to:
    - Impair their ability to survive, reproduce or to rear or nurture their young;
    - Impair their ability to hibernate or migrate; or
    - Significantly affect their local distribution or abundance.
- Damage or destroy a breeding site or resting place of a bat;
- Possess or control any live or dead specimen or anything derived from a bat;
- Sell, offer for sale, possess or transport a bat (live or dead, part or derivative) for the purpose of sale or advertise for buying or selling.

1.8 In addition, all British bats are listed under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended), which contains further provisions making it an offence to intentionally or recklessly:

- Damage, destroy or obstruct access to any structure or place which any bat uses for shelter or protection; or
- Disturb any bat while occupying a structure or place which it uses for that purpose.

1.9 A number of bat species are also on Worcestershire Biodiversity Action Plan. This includes all 16 bats that occur in Worcestershire as follows: barbastelle, (*Barbastella barbastellus*), Bechstein's bat, (*Myotis bechsteinii*), Brandt's bat, (*Myotis brandtii*), brown long-eared bat, (*Plecotus auritus*), Daubenton's bat, (*Myotis daubentonii*), Leisler's bat, (*Nyctalus leisleri*), lesser horseshoe bat, (*Rhinolophus hipposideros*), greater horseshoe bat, (*Rhinolophus ferrumequinum*), Natterer's bat, (*Myotis nattereri*), noctule bat, (*Nyctalus noctula*), serotine, (*Eptesicus serotinus*), common pipistrelle, (*Pipistrellus*

pipistrellus), soprano pipistrelle, (*Pipistrellus pygmaeus*), Nathusius' pipistrelle, (*Pipistrellus nathusii*), whiskered bat, (*Myotis mystacinus*) and Alcathoe bat, (*Myotis alcathoe*).

1.10 European Protected Species Licences (EPSLs) can be obtained from the relevant Statutory Nature Conservation Organisation (SNCO), in this case Natural England, for development activities that would otherwise be unlawful under the legislation.

Aims and Objectives of the Study

1.11 The key objective of the bat activity surveys was to determine the abundance, composition and spatial distribution of foraging/commuting bats at Lea Castle Farm. 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.

1.12 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 SURVEY METHODOLOGY

Desk Study

2.1 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 Multi-Agency Geographic Information for the Countryside (MAGIC) website. For further details, please refer to the PEA report produced by Pleydell Smithyman Limited in 2019.

2.2 Worcestershire Biological Records Centre 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. Relevant information is reproduced in Appendix 1.

2.3 Reference was also made to Ordnance Survey maps and aerial photography, which were used to provide information on land use and habitat connectivity throughout the area.

2.4 Any pre-existing ecological data available for the site was also reviewed.

Habitat Assessment

2.5 The initial habitat assessment was undertaken as part of the Preliminary Ecological Appraisal of the site on 4th May 2018, which was undertaken by Steven Pagett of Pleydell Smithyman Limited.

2.6 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 within the landscape for bats.

Activity Survey

2.7 The methodology for the bat activity survey followed that described in the Bat Surveys for Professional Ecologists Good Practice Guidelines, 3rd Edition, (Collins, 2016), for transect surveys.

2.8 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 was undertaken on each of the surveys.

2.9 The surveys undertaken were carried out by surveyors walking at a constant speed, recording bat activity for subsequent analysis. Regular listening stops were incorporated into the transect at comparable distances with bat activity recorded at each point for at least 3 minutes as well as in-between the points.

2.10 The surveyors used a combination of EM3+, Bat Box Duet and Echo Meter Touch detectors over the course of the surveys. Throughout the surveys sound recordings were made using the EM3+ bat detector and the Echo Meter Touch detector as well as general bat activity (species, location and behaviour) recorded using the field survey skills of the experienced surveyor.

2.11 The guidelines state that for sites with low suitability habitat for bats one survey visit per season (spring, summer and autumn) in suitable weather conditions should be conducted. These guidelines also state that automated/static bat detector surveys should be conducted at one location per transect, with data to be collected on five consecutive nights per season (spring, summer and autumn) in suitable weather conditions.

2.12 The surveys included two dawn surveys and one dusk survey. The transect route was varied slightly during the surveys and the direction of the transect route also varied in order that bats were recorded at different stages during the survey. It should be noted that following the May survey, the site boundary altered slightly to include one additional field to the north. This additional field was therefore not covered during the May survey but it was included in both the July and September surveys.

2.13 Dusk surveys commenced approximately 15 minutes before sunset and continued for approximately 2 hours after sunset. Pre-dawn surveys commenced approximately 2 hours before sunrise and finished at sunrise. Bat activity across the site was considered to be thoroughly covered within this timeframe.

2.14 The static bat detectors used were Anabat Express. One detector was placed at different locations around the site during each season. The detector was left on site for a period of at least five days during each season during suitable weather conditions.

Survey Constraints and Limitations

2.15 To ensure the security of the static detectors when out on site, they were slightly hidden to avoid theft. The detectors were placed on the ground and therefore some bat calls are very distant and undistinguishable. Where calls were not clear enough to be deciphered, these were not included in the results.

2.16 It should be noted this report cannot be considered to provide a comprehensive analysis of the bat interest of the site. However, it is considered to represent an accurate assessment of the findings at the time of the surveys and is fully appropriate to begin to inform a robust assessment of the effects of the proposals to be made. The survey data are also considered to be robust in informing the design of mitigation (where required) and enhancement measures in relation to the proposed works.

3.0 RESULTS

Desk Study

Statutory Designations

3.1 There are seven statutory designations of nature conservation interest that occur within 3km of the central point of the site. These are a combination of Local Nature Reserves (LNRs) and Sites of Special Scientific Interest (SSSI). They are designated for their range of habitats including pools, woodland, riparian vegetation, semi-natural acidic and neutral grassland, wetland habitats and marshy grassland. The sites are between 620m and 2.3km from the site at their closest point. None of these sites referred to bats in their citations, however it is highly likely that bats use these designated sites for foraging and commuting purposes. For further details, please refer to the PEA survey report.

Non-Statutory Designations

3.2 WBRC returned fifteen non-statutory sites of nature conservation interest within the 3km search radius. Fourteen of these are Local Wildlife Sites (LWSs) and one is a Worcestershire Wildlife Trust Reserve. These are designated for their range of habitats including open water, marshland, woodland, rivers, grassland and swamp. The sites are between 160m and 2.9km from the site at their closest point. It is highly likely that bats use these designated sites for foraging and commuting purposes.

Ancient Woodland and Priority Habitat

3.3 There are six areas of ancient woodland within 3km data search. None of these are on or adjacent to the site. WBRC returned a total of 31 ancient trees from the data search. None of these are on or adjacent to the site. It is highly likely that these trees and woodland offer roosting potential for bats as well as suitable foraging areas.

3.4 A large amount of priority habitats were 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.

Species Records

3.5 Worcestershire Biological Records Centre (WBRC) returned records of Pipistrelle bat species (*Pipistrellus sp.*), common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle,, noctule bat, Leisler's bat, Nyctalus sp., brown long-eared bat, Daubenton's bat, Brandt's bat, 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.

3.6 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.

3.7 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, noctule bat and Leisler's bats were recorded. No confirmed roosts were recorded; however a possible brown long-eared bat roost was recorded in Tree 1. Please see Drawing M16.176(a).D.001 for a plan showing the location of this tree.

Habitat Assessment

3.8 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, (please see Drawing M16.176(a).D.006 for a habitat map). 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.

Activity Survey

3.9 The bat activity surveys were undertaken by Kelly Hopkins (Natural England bat licence number: 2017-30172-CLS-CLS), Nick Staples (Natural England bat licence number 2018-33966-CLS-CLS) and Steven Pagett (Natural England bat licence number 2018-34022-CLS-CLS).

3.10 The surveys were undertaken on 22nd May 2018 (dawn), 25th July 2018 (dawn) and 11th September 2018 (dusk). Please see Drawings M16.176(a).D.003, M16.176(a).D.004 and M16.176(a).D.005 for maps of the bat activity on each survey.

3.11 The table below shows the weather conditions during the surveys undertaken.

Table 1. Survey dates and prevailing weather conditions

Date	Weather Conditions
22/5/2018	Dry, light breeze (Beaufort Scale 2), air temperature 12.5 – 10.1˚C
25/7/2018	Dry, light breeze (Beaufort Scale 2), air temperature 15.4-13.7˚C
11/9/2018	Dry, 100% cloud cover, light breeze (Beaufort Scale 2), air temperature 15.1 – 16.2˚C

Static Detector Surveys

3.12 The static bat detectors were put out on site over the following timeframes: 22nd May 2018 – 29th May 2018; 25th July 2018 – 7th August 2018; and 28th August 2018 – 11th September 2018. The detectors were left on site for slightly longer than the required 5 days to account for any poor weather conditions that may occur during the week. As the detectors were left on site during suitable weather conditions, a five day period during each season was analysed only. For the locations of the static bat detectors please see Drawing M16.176(a).D.002.

3.13 The static detectors were set up so that they recorded in night mode. This ensured that day time 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 Surveys

3.14 The first survey completed in May recorded common pipistrelle and soprano pipistrelle. All bats were heard not seen and all bats were recorded foraging. During the second survey completed in July, again only common pipistrelle and soprano pipistrelle were recorded. These were all brief passes and were all considered to be foraging. During the third survey completed in September, Leisler's, noctule, common pipistrelle, soprano pipistrelle and Myotis sp. were recorded. The last recorded bat was a Myotis bat with characteristics of a Brandt's bat. The majority of these bats were heard not seen, although a number of bats were seen foraging along the central track in the site and also along the edge of the arable field.

3.15 The majority of the bats were recorded along the southern boundary of the site and through the central track on the site as well as along the western boundary of the site. Additional bats were recorded along the northern boundary of the site. During the September survey the bat activity levels increased greatly from the first two surveys. Bats were recorded around most of the boundaries of the site during this survey, including along the hedgerow in the eastern part of the site. For full details of the survey results please refer to Appendix 2. Please refer to Drawings M16.176(a).D.003, M16.176(a).D.004 and M16.176(a).D.005 for a plan showing the bat activity across the site.

3.16 It should be noted that where possible, recordings were analysed following the surveys, however Myotis sp. calls are very difficult to determine to species level due to the high level of variability and therefore where Myotis sp. have been recorded these have not been listed to species level. Possible species have been stated where call characteristics are typical of that species in question.

3.17 During the bat activity surveys completed on the site, a total of five species were recorded.

Static Detector Surveys

3.18 The below tables detail the species recorded by the static detectors that were placed on the site in May, July and September 2018. The tables also summarise the level of activity in terms of the number of passes and the number of minutes of activity that

each bat at each pass activity level were recorded. The full results from the static detectors can be found in Appendix 3.

3.19 During May, common pipistrelle, soprano pipistrelle, brown long-eared bat, Leisler's noctule, Myotis with Daubenton's characteristics, Myotis with Brandt's characteristics and Nathusius' pipistrelle were recorded. The majority of activity was from common pipistrelle, followed then by soprano pipistrelle.

3.20 During July, common pipistrelle, soprano pipistrelle, Leisler's, noctule, Myotis with Daubenton's characteristics, Myotis with Brandt's characteristics and Myotis with whiskered characteristics were recorded. The vast majority of the activity was from common pipistrelle, then followed by soprano pipistrelle.

3.21 During September, common pipistrelle, soprano pipistrelle, brown long-eared, Leisler's, serotine, noctule, Myotis with Daubenton's characteristics and Myotis with Brandt's characteristics were recorded. Again, the vast majority of the activity was from common pipistrelle, then followed by soprano pipistrelle.

3.22 Whilst the static detector was placed on site during May, activity was recorded in a total of 58 minutes. On average, there was 11.6 minutes of activity per night (between sunset and sunrise) over the five days of recording. Whilst the static detector was placed on site during July, activity was recorded in a total of 526 minutes, with 10 of those minutes having more than one species recorded in it. On average, there was 105.2 minutes of activity per night (between sunset and sunrise) over the five days of recording. Whilst the static detector was placed on site during September, activity was recorded in a total of 665 minutes, with 40 of those minutes having more than one species recorded in it (with one minute having three species recorded in it). On average, there was 133 minutes of activity per night (between sunset and sunrise) over the five days of recording.

3.23 From the results of the static detector surveys, it is evident that the most activity was recorded during September. The static detector was placed along the edge of the woodland on the south-eastern boundary during May, along a hedgerow next to Tree 5 during July and along the edge of the woodland on the south-western boundary during September. All of these locations would be expected to record regular bat

activity and the location during September would be expected to record the most activity due to the density of the woodland in this area.

3.24 A total of eight confirmed species of bat were recorded via the static detectors. It is reportedly difficult to separate the species of Myotis bats via bat call alone, and therefore any Myotis calls that were recorded were written as a Myotis bat with characteristics of a certain species, but this cannot be definitely proven. A possible further two species of bats may be using the site, should those bat calls with characteristics of different species of Myotis bats be accurate to the species actually present on the site. Social calls were also detected on the static detectors in July and September from common and soprano pipistrelles.

Bat Roost Surveys

3.25 During the bat roost surveys, the level of foraging and commuting bat activity recorded around the trees throughout the roost surveys was considered to be moderate. At least seven species of bats were detected foraging and commuting around the trees. These were soprano pipistrelle, common pipistrelle, noctule, Leisler's, brown long-eared bat, Myotis sp., and lesser horseshoe bat. The Myotis bats that were recorded were considered to have the characteristics of two different Myotis bat species – Daubenton's bat and Natterer's bat. Should both of these species be present on the site, then the bat roost surveys would have recorded eight species of bat. Of these, common pipistrelle was recorded the most frequently. The majority of activity was single passes from individual bats.

3.26 The combined total of bats occurring on the site during the bat activity and the bat roost surveys is nine confirmed species plus a potential additional three species of Myotis bats, if all Myotis bat characteristics recorded were accurate to the species present. A total of 12 foraging and commuting bat species on a site is a high bat assemblage and therefore measures should be put in place to ensure that none of the species present are impacted by the proposals. It should be noted that with lesser horseshoe and serotine, only one single commuting pass was recorded from both species across all surveys.

Assessment

3.27 An assessment of the foraging and commuting importance has been completed following the guidelines in Wray, 2010 and the value of the site for commuting and foraging bats has been assessed as at District, local or parish value. This has been calculated for commuting routes by only individual bats of common (common pipistrelle, soprano pipistrelle and brown long-eared) or rarer (Leislers, noctule, serotine, lesser horseshoe and Myotis sp.) categorised species being recorded with an unknown number of roosts or potential roosts nearby and the complexity of the commuting features being classed as walls, gappy or flailed hedgerows, isolated well-grown hedgerows and moderate field sizes.

3.28 For foraging areas, the value has been calculated from the presence of common (soprano and common pipistrelle bats and brown long-eared bat) and rarer (Leisler's, noctule, Nathusius' pipistrelle and Myotis sp.) categorised species being recorded with an unknown number of roosts or potential roosts nearby and the foraging habitat characteristics categorised as larger or connected woodland blocks, mixed agriculture and small villages/hamlets.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 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.

4.2 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.

4.4 No potential bat roosts were discovered during the bat activity surveys, however dedicated bat roost surveys have been undertaken on five trees within the site by Pleydell Smithyman Limited. This has been reported on separately (Pleydell Smithyman Limited, 2019).

4.5 During the bat roost surveys, lesser horseshoe bat were also recorded commuting on the site and an additional Myotis sp. with characteristics of Natterer's bat was also recorded.

4.6 A combined total of nine confirmed species of foraging and commuting bat were recorded on the site with a potential additional three species of Myotis bat if all of the Myotis bats characteristics recorded were accurate to the species present. It should be noted that it is reported difficult to separate the Myotis species via call alone due to their frequent overlap in call characteristics.

4.7 With regards to assessing the potential impacts of the proposals on bats, it is our understanding that the proposals will involve the removal of large areas of arable fields, two small sections of internal hedgerow and a small number of scattered trees.

It is our understanding that the external boundaries and Tree 4 towards the north-eastern corner of the site are not to be affected by the proposals.

4.8 As a result, the proposals would involve the removal of some features that are used by foraging and commuting bats, including small sections of the hedgerows towards the eastern boundary of the site and Trees T1, T2, T3 and T5. The loss of this habitat is likely to have a negative impact upon local bat populations as this habitat provides suitable foraging and commuting habitat. 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. It will be necessary to provide mitigation measures for the loss of these features particularly along the western and southern boundaries of the site where the majority of the bat activity was recorded.

4.9 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.

4.10 It is recommended that a hedgerow is planted along the eastern boundary of the site to provide additional foraging and commuting features for bats.

4.11 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).

4.12 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 posing a barrier to movement (ILP, 2018). 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). However the slower-flying broad winged species such as Myotis, long-eared, barbastelle (*Barbastella barbastellus*) and horseshoe bats generally avoid street light and are then put at a competitive disadvantage and are less able to forage successfully and efficiently which can have a significant impact upon fitness and breeding success.

Lighting can also have negative impacts on drinking resources for bats, as well as commuting features and roosting sites (ILP, 2018).

4.13 As Myotis bats and long-eared bats have been recorded within the site, lighting around the external boundaries and along the tree lined driveway must be restricted and only used where it is an essential requirement.

4.14 It is recommended that the following approach towards lighting is adopted across the site. The recommendations have been taken from the Institution of Lighting Professionals 'Bats and Artificial Lighting in the UK, Bats and the Built Environment series' document which was produced in 2018:

- All luminaries should lack UV elements when manufactured. Metal halide, fluorescent sources should not be used.
- LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (ideally <2700 Kelvin) should be adopted to reduce blue light component).
- Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Internal luminaires can be recessed where installed in proximity to windows to reduce glare and light spill.
- The use of specialist bollard or low-level downward directional luminaries to retain darkness above can be considered.
- Column height should be carefully considered to minimise light spill.
- Only luminaires with an upward light ratio of 0% and with good optical control should be used.
- Luminaires should always be mounted on the horizontal, i.e no upward tilt.
- Any external security lighting should be set on motion-sensors and short (1 minute) timers.
- As a last resort, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed.

Enhancements

4.15 Upon completion of the extraction of the site, the restoration of the site will be to arable land with additional tree planting, woodland, hedgerows, species rich acid grassland and ephemerally wet grassland and pools. This additional tree planting will provide additional foraging and commuting features for bats. It is recommended that all trees and hedgerows that are planted are comprised of native locally sourced plant species. A management plan should be put in place to ensure the longevity of these features to provide the greatest benefits to bats and other wildlife.

4.16 The loss of potential bat roosting features in the form of the standard trees is discussed in the separate bat roost survey report (Pleydell Smithyman Limited, 2018).

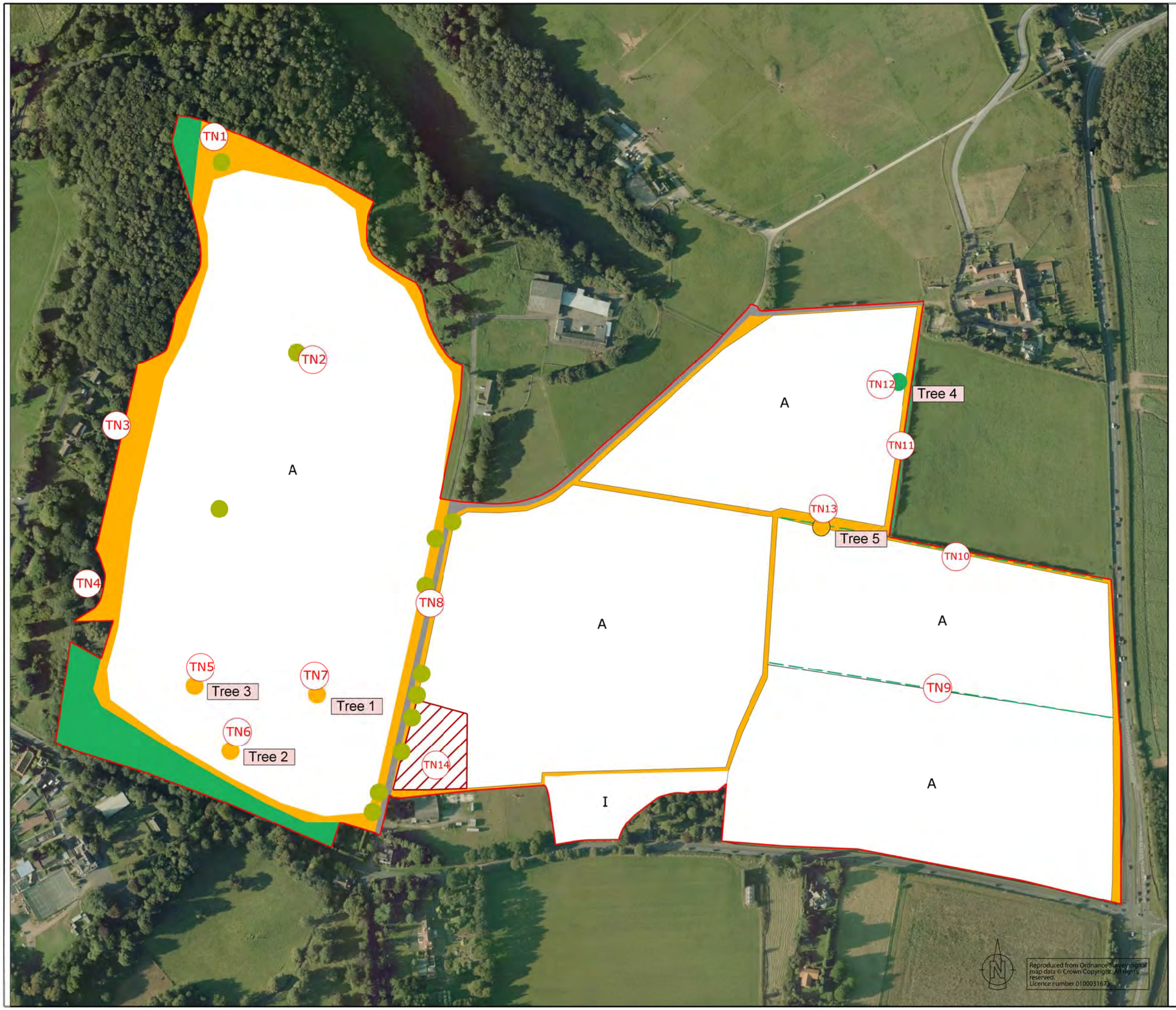
5.0 REFERENCES

1. BCT, (2009). *Bats and Lighting in the UK, Bats and the Built Environment Series*. Bat Conservation Trust.
2. Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines*, *3rd edition*. The Bat Conservation Trust, London.
3. Institution of Lighting Professionals, (2018). *Bats and Artificial Lighting in the UK, Bats and the Built Environment Series. Guidance Note 08/18.* Institution of Lighting Professionals, Warwickshire.
4. Pleydell Smithyman Limited, (2019). *Bat Roost Survey relating to Land at Lea Castle Farm, Wolverley*. Pleydell Smithyman Limited, Ironbridge.
5. Pleydell Smithyman Limited, (2019). *Preliminary ecological appraisal relating to Land at Lea Castle Farm, Wolverley*. Pleydell Smithyman Limited, Ironbridge.
6. Russ J. (2012).*British bat calls: A Guide to Species Identification,* Pelagic Publishing, Exeter.
7. Wray S., Wells D., Long E., and Mitchell-Jones, T. (2010). *Valuing Bats in Ecological Impact Assessment*. CIEEM In Practice Journal.

DRAWINGS

DRAWING M16.176(a).D.006

Preliminary Ecological Appraisal



Legend

- Site boundary
- Broad-leaved and mixed plantation woodland
- Semi-improved neutral grassland
- I — Improved grassland
- Tall ruderal
- A — Arable
- Native intact hedgerow
- Native defunct hedgerow
- Hardstanding
- Standard tree
- Tree with moderate bat roosting potential
- Tree with high bat roosting potential
- Tree 1 — Tree Number
- TN1 — Target Note Number

DRAWING STATUS	**FINAL**
PROJECT	**LEA CASTLE FARM**
CLIENT	**NRS Aggregates Ltd**
TITLE	**Preliminary Ecological Appraisal**
DATE: **March 2019**	SCALE: **1:3,500 @A3**
DRAWN: **KH**	CHECKED: **SC**
DRAW NO.: **M16.176(a).D.006**	REVISION

PleydellSmithyman

DRAWING M16.176(a).D.001

Tree Locations

Legend

- Site boundary
- Tree with moderate roosting potential
- Tree with high roosting potential
- Tree 1 — Tree Number

DRAWING STATUS	**FINAL**
PROJECT	**LEA CASTLE FARM**
CLIENT	**NRS Aggregates Ltd**
TITLE	**Tree Locations**
DATE: **March 2019**	SCALE: **1:3,500 @A3**
DRAWN: **KH**	CHECKED: **SC**
DRAW NO.: **M16.176(a).D.001**	REVISION:

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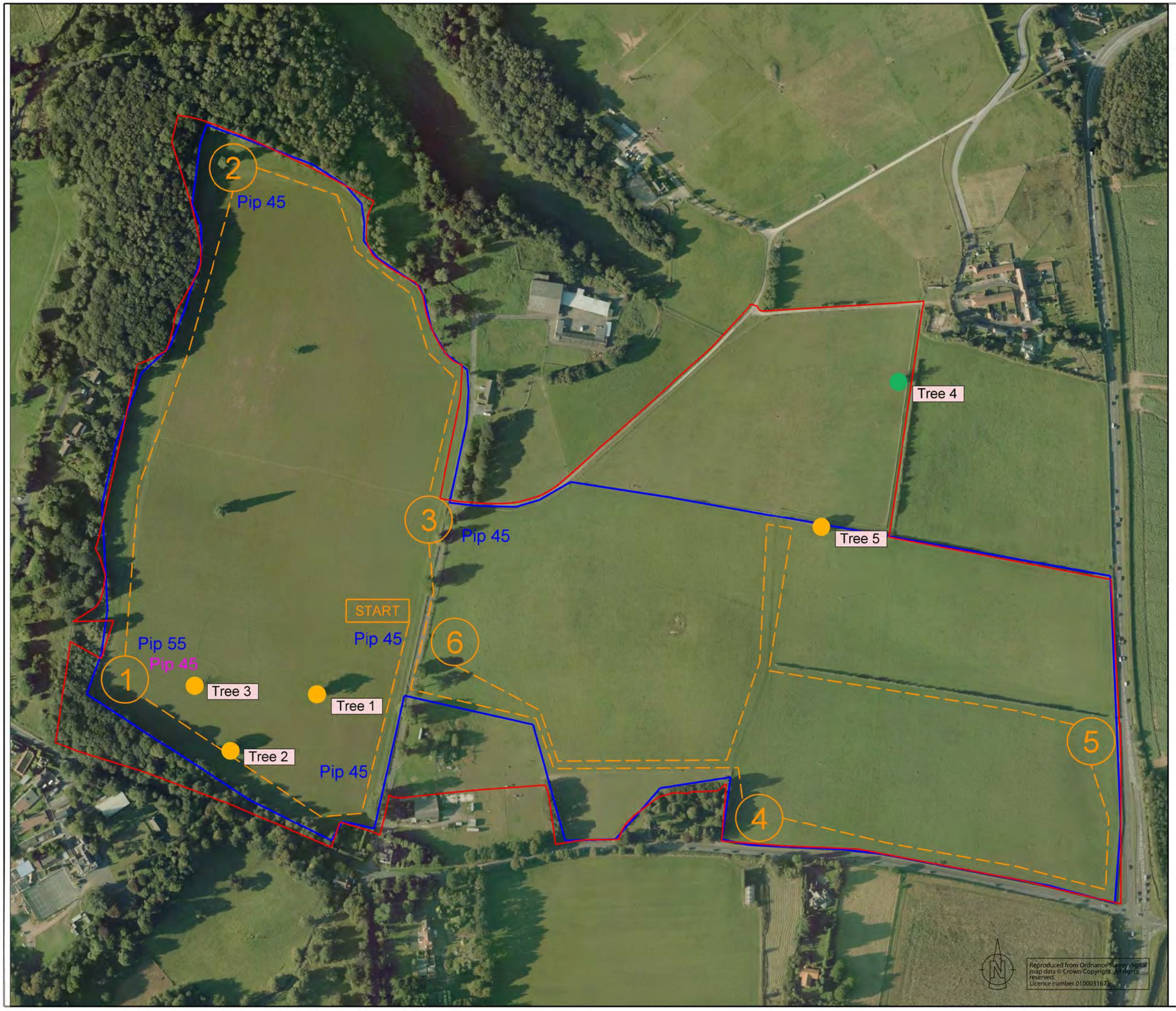
DRAWING M16.176(a).D.003

Bat Activity Survey 22-5-2018



Legend

- Site boundary
- Survey Area
- 1 — Transect Route and Stop Number
- Pip 45 — Common pipistrelle recorded with rare activity levels
- Pip 45 — Common pipistrelle recorded with frequent activity levels
- Pip 55 — Soprano pipistrelle recorded with rare activity levels
- Tree with moderate roosting potential
- Tree with high roosting potential
- Tree 1 — Tree Number

DRAWING STATUS	**FINAL**
PROJECT	**LEA CASTLE FARM**
CLIENT	**NRS Aggregates Ltd**
TITLE	**Bat Activity Survey 22-5-2018**
DATE: **March 2019**	SCALE: **1:3,500 @A3**
DRAWN: **KH**	CHECKED: **SC**
DRAW NO.: **M16.176(a).D.003**	REVISION

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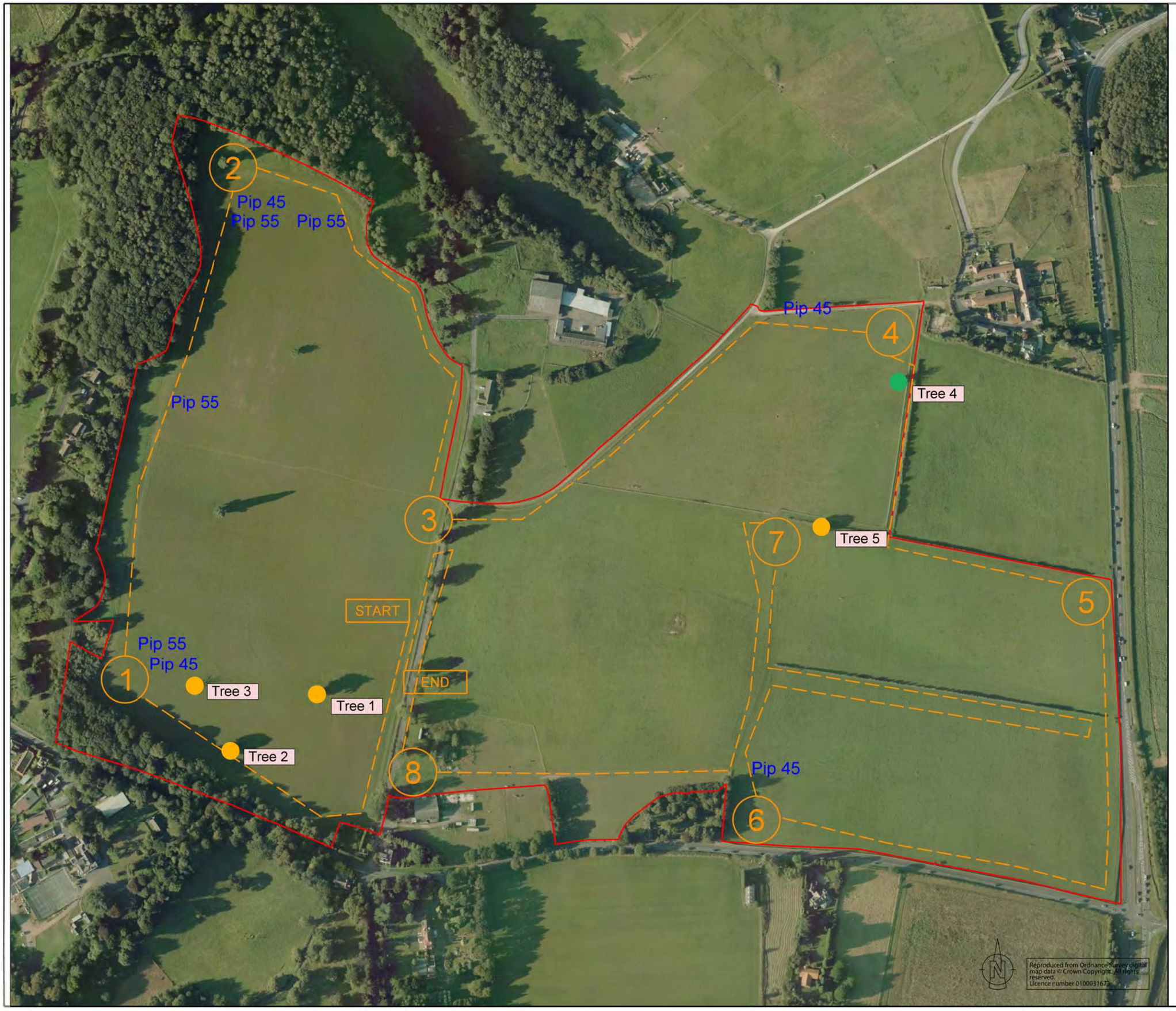
DRAWING M16.176(a).D.004

Bat Activity Survey 25-7-2018



Legend

- Site boundary
- 1 — Transect Route and Stop Number
- Pip 45 — Common pipistrelle recorded with rare activity levels
- Pip 55 — Soprano pipistrelle recorded with rare activity levels
- Tree with moderate roosting potential
- Tree with high roosting potential
- Tree 1 — Tree Number

DRAWING STATUS	**FINAL**
PROJECT	**LEA CASTLE FARM**
CLIENT	**NRS Aggregates Ltd**
TITLE	**Bat Activity Survey 25-7-2018**
DATE	**March 2019**
SCALE	**1:3,500 @A3**
DRAWN	**KH**
CHECKED	**SC**
DRAW NO.	**M16.176(a).D.004**
REVISION	

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DRAWING M16.176(a).D.005

Bat Activity Survey 11-9-2018

Legend

- Site boundary
- Transect Route and Stop Number
- Tree with moderate roosting potential
- Tree with high roosting potential
- Tree 1 — Tree Number
- Bat — Bat recorded with rare activity levels (1 pass)
- Bat — Bat recorded with occasional activity levels (2-3 passes)
- Bat — Bat recorded with frequent activity levels (4-5 passes)
- Leisler's — Leisler's bat recorded
- Myotis sp. — Myotis species of bat recorded
- Myotis sp. Brandt's — Myotis species of bat recorded with Brandt's characteristics
- Noctule — Noctule bat recorded
- Pip 45 — Common pipistrelle bat recorded
- Pip 55 — Soprano pipistrelle bat recorded

DRAWING STATUS	**FINAL**
PROJECT	**LEA CASTLE FARM**
CLIENT	**NRS Aggregates Ltd**
TITLE	**Bat Activity Survey 11-9-2018**
DATE: **March 2019**	SCALE: **1:3,500 @A3**
DRAWN: **KH**	CHECKED: **SC**
DRAW NO.: **M16.176(a).D.005**	REVISION:

PleydellSmithyman

DRAWING M16.176(a).D.002

Static Bat Detector Locations

Legend

- Site boundary
- Tree with moderate roosting potential
- Tree with high roosting potential
- Tree 1 — Tree Number
- Static Detector Location in May 2018
- Static Detector Location in July 2018
- Static Detector Location in September 2018

DRAWING STATUS	**FINAL**
PROJECT	**LEA CASTLE FARM**
CLIENT	**NRS Aggregates Ltd**
TITLE	**Static Bat Detector Locations**
DATE: **March 2019**	SCALE: **1:3,500 @A3**
DRAWN: **KH**	CHECKED: **SC**
DRAW NO.: **M16.176(a).D.002**	REVISION:

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APPENDICES

APPENDIX 1

Information obtained from the Worcestershire Biological Records Centre (WBRC)

No	Scientific Name	Common Name	Grid Ref	Location Name	Date	Comments	Status
313	*Myotis*	Unidentified Bat	SO816767	Baxter College, Kidderminster	12/05/2009	Foraging & flying in locality	WCA NERC s.41 UKBAP ECH4 WorcBAP
1056	*Myotis*	Unidentified Bat	SO8629678170	Hurcott	14/06/10	Whiskered/Brandt's - adult male	WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Myotis*	Unidentified Bat	SO830765		06/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
1056	*Myotis brandtii*	Brandt's Bat	SO8629678170	Hurcott	14/06/10	Pregnant female	WCA ECH4 WorcBAP
136	*Myotis daubentonii*	Daubenton's Bat	SO841805	Steel Stampings, Cookley	10/09/92	singleton, oiled	WCA ECH4 WorcBAP
142	*Myotis daubentonii*	Daubenton's Bat	SO843805	Caunsall	07/06/02		WCA ECH4 WorcBAP
627	*Myotis daubentonii*	Daubenton's Bat	SO830792	Cookley	07/06/02		WCA ECH4 WorcBAP
177	*Myotis daubentonii*	Daubenton's Bat	SO855809	Caunsall	07/06/02		WCA ECH4 WorcBAP
958	*Myotis daubentonii*	Daubenton's Bat	SO853779	Hurcott Pool	05/09/02	aural bat detector; 1	WCA ECH4 WorcBAP
707	*Myotis daubentonii*	Daubenton's Bat	SO834778	Stack Pools	06/09/02		WCA ECH4 WorcBAP
944	*Myotis daubentonii*	Daubenton's Bat	SO852779	Hurcott Pool	18/05/11	Foraging over pool	WCA ECH4 WorcBAP
676	*Myotis daubentonii*	Daubenton's Bat	SO8336277845	Springfield Park, Kidderminster	13/09/11		WCA ECH4 WorcBAP
623	*Myotis daubentonii*	Daubenton's Bat	SO830765		22/07/2015		WCA ECH4 WorcBAP
270	*Myotis nattereri*	Natterer's Bat	SO813772	Briars Hotel site, Habberley Rd	23/06/08		WCA ECH4 WorcBAP
186	*Nyctalus*	Nyctalus sp.	SO857804	Common Farm Barn, Caunsall	05/08/2008	Flying in locality	WCA NERC s.41 UKBAP ECH4 WorcBAP
270	*Nyctalus leisleri*	Lesser Noctule	SO813772	Briars Hotel site, Habberley Rd	31/05/08	Recorded calls sent to expert for ID confirmation	WCA ECH4 WorcBAP
936	*Nyctalus leisleri*	Lesser Noctule	SO8520977913	Hurcott Pool	20/05/11	Foraging over water	WCA ECH4 WorcBAP
623	*Nyctalus leisleri*	Lesser Noctule	SO830765		14/07/2015		WCA ECH4 WorcBAP
77	*Nyctalus noctula*	Noctule	SO821801	Drakelow Lane, Wolverley	07/08/92	juvenile female singleton	WCA NERC s.41 UKBAP ECH4 WorcBAP
958	*Nyctalus noctula*	Noctule	SO853779	Hurcott Pool	05/09/02	aural bat detector; 1	WCA NERC s.41 UKBAP ECH4 WorcBAP
836	*Nyctalus noctula*	Noctule	SO84507783	Kidderminster	29/05/03	aural bat detector	WCA NERC s.41 UKBAP ECH4 WorcBAP
956	*Nyctalus noctula*	Noctule	SO853773	Hodge Hill Farm	26/07/06	Emergence survey; passed over site & foraged over fields to N	WCA NERC s.41 UKBAP ECH4 WorcBAP
270	*Nyctalus noctula*	Noctule	SO813772	Briars Hotel site, Habberley Rd	31/05/08		WCA NERC s.41 UKBAP ECH4 WorcBAP
270	*Nyctalus noctula*	Noctule	SO813772	Briars Hotel site,	19/06/08		WCA NERC s.41 UKBAP ECH4 WorcBAP

				Habberley Rd			
270	*Nyctalus noctula*	Noctule	SO813772	Briars Hotel site, Habberley Rd	23/06/08		WCA NERC s.41 UKBAP ECH4 WorcBAP
143	*Nyctalus noctula*	Noctule	SO843808	Cookley	25/06/08	3 large bats flying above trees along river. Flew lower over car park & heard to 'chirp' in flight.	WCA NERC s.41 UKBAP ECH4 WorcBAP
313	*Nyctalus noctula*	Noctule	SO816767	Baxter College, Kidderminster	12/05/2009	Foraging & flying in locality	WCA NERC s.41 UKBAP ECH4 WorcBAP
360	*Nyctalus noctula*	Noctule	SO819769	The Elms, Habberley Rd	03/06/09	1 in flight	WCA NERC s.41 UKBAP ECH4 WorcBAP
772	*Nyctalus noctula*	Noctule	SO839784	Sion Hill Middle School	26/08/2009		WCA NERC s.41 UKBAP ECH4 WorcBAP
944	*Nyctalus noctula*	Noctule	SO852779	Hurcott Pool	18/05/11	Foraging over pool	WCA NERC s.41 UKBAP ECH4 WorcBAP
936	*Nyctalus noctula*	Noctule	SO8520977913	Hurcott Pool	20/05/11	Foraging over water	WCA NERC s.41 UKBAP ECH4 WorcBAP
414	*Nyctalus noctula*	Noctule	SO822769		01/07/2014		WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Nyctalus noctula*	Noctule	SO830765		06/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Nyctalus noctula*	Noctule	SO830765		14/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Nyctalus noctula*	Noctule	SO830765		22/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
707	*Pipistrellus*	Pipistrelle sp.	SO834778	Stack Pools	06/09/02		WCA NERC s.41 UKBAP ECH4 WorcBAP
172	*Pipistrellus*	Pipistrelle sp.	SO8556780947	Wolverley and Cookley	03/07/13	auditory record	WCA NERC s.41 UKBAP ECH4 WorcBAP
698	*Pipistrellus*	Pipistrelle sp.	SO83457771	Kidderminster	05/08/13	Corpse	WCA NERC s.41 UKBAP ECH4 WorcBAP
70	*Pipistrellus*	Pipistrelle sp.	SO82048022	Kidderminster	17/08/13		WCA NERC s.41 UKBAP ECH4 WorcBAP
944	*Pipistrellus nathusii*	Nathusius's Pipistrelle	SO852779	Hurcott Pool	18/05/11	Foraging over pool	WCA ECH4 WorcBAP
139	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	30/06/92	Roost site: 2 dead babies	WCA ECH4 WorcBAP
159	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	02/07/92	Roost site: 24 in garage	WCA ECH4 WorcBAP
913	*Pipistrellus pipistrellus*	Common Pipistrelle	SO849768	Osborne Close, Kidderminster	24/08/92	singleton, injured	WCA ECH4 WorcBAP

477	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	17/08/94	juvenile female singleton, on floor of garage, broken left forearm	WCA ECH4 WorcBAP
477	*Pipistrellus pipistrellus*	Common Pipistrelle	SO825767	Kidderminster, Hume St	17/08/94	1 present	WCA ECH4 WorcBAP
477	*Pipistrellus pipistrellus*	Common Pipistrelle	SO825767	Stourport Swimming Baths	06/10/94	singleton, flying over indoor pool into false ceiling space	WCA ECH4 WorcBAP
181	*Pipistrellus pipistrellus*	Common Pipistrelle	SO808789	Kidderminster, Hollies Lane	16/10/94	1 present	WCA ECH4 WorcBAP
181	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	16/10/94	singleton, mauled by cat left wing broken, possible roost in loft	WCA ECH4 WorcBAP
931	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	16/07/95	Roost site: 71 visual ID, exit point 50ft up in converted mill building	WCA ECH4 WorcBAP
931	*Pipistrellus pipistrellus*	Common Pipistrelle	SO851778	Kidderminster, Hurcott Lane	16/07/95	1 present	WCA ECH4 WorcBAP
331	*Pipistrellus pipistrellus*	Common Pipistrelle	SO817778	Wilton Avenue, Kidderminster	18/07/95	singleton broken wing, put down by vet	WCA ECH4 WorcBAP
331	*Pipistrellus pipistrellus*	Common Pipistrelle	SO817778	Kidderminster, Wilton Av.	19/07/95	1 present	WCA ECH4 WorcBAP
134	*Pipistrellus pipistrellus*	Common Pipistrelle	SO841802	Cookley, canal	21/02/01	Flying in daylight	WCA ECH4 WorcBAP
605	*Pipistrellus pipistrellus*	Common Pipistrelle	SO829794	Bishop's Field	09/05/01	1 present	WCA ECH4 WorcBAP
76	*Pipistrellus pipistrellus*	Common Pipistrelle	SO821800	Blakeshall	02/06/02		WCA ECH4 WorcBAP
362	*Pipistrellus pipistrellus*	Common Pipistrelle	SO819793	Low Habberley	02/06/02		WCA ECH4 WorcBAP
455	*Pipistrellus pipistrellus*	Common Pipistrelle	SO824794	Kidderminster	02/06/02		WCA ECH4 WorcBAP
627	*Pipistrellus pipistrellus*	Common Pipistrelle	SO830792	Kidderminster Canal	02/06/02		WCA ECH4 WorcBAP
349	*Pipistrellus pipistrellus*	Common Pipistrelle	SO818784	Low Habberley	02/06/02		WCA ECH4 WorcBAP
287	*Pipistrellus pipistrellus*	Common Pipistrelle	SO814773	Habberley Valley	02/06/02		WCA ECH4 WorcBAP
958	*Pipistrellus pipistrellus*	Common Pipistrelle	SO853779	Hurcott Pool	05/09/02	aural bat detector; 2	WCA ECH4 WorcBAP
836	*Pipistrellus pipistrellus*	Common Pipistrelle	SO84507783	Kidderminster	29/05/03	aural bat detector	WCA ECH4 WorcBAP
32	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	16/09/03	ID by sight & sound. Fresh droppings on windowsills. Possibly roosting under slates.	WCA ECH4 WorcBAP
875	*Pipistrellus pipistrellus*	Common Pipistrelle	SO84767775	Hurcott Meadow	09/10/03	45Khz echo-location	WCA ECH4 WorcBAP
531	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	18/08/04	Roost; possibly Pipistrelles from droppings & house owners description	WCA ECH4 WorcBAP
868	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	24/05/05	Roost; access via gable apex,	WCA ECH4 WorcBAP

				[redacted]		droppings	
956	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	26/07/06	Emergence survey; 1+ roosting in farm building. Fresh droppings & feeding remains	WCA ECH4 WorcBAP
270	*Pipistrellus pipistrellus*	Common Pipistrelle	SO813772	Briars Hotel site, Habberley Rd	31/05/08		WCA ECH4 WorcBAP
270	*Pipistrellus pipistrellus*	Common Pipistrelle	SO813772	Briars Hotel site, Habberley Rd	19/06/08		WCA ECH4 WorcBAP
270	*Pipistrellus pipistrellus*	Common Pipistrelle	SO813772	Briars Hotel site, Habberley Rd	23/06/08		WCA ECH4 WorcBAP
360	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	23/07/08	Roost & sighting	WCA ECH4 WorcBAP
186	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	05/08/2008	Roost	WCA ECH4 WorcBAP
313	*Pipistrellus pipistrellus*	Common Pipistrelle	SO816767	Baxter College, Kidderminster	12/05/2009	Foraging & flying in locality	WCA ECH4 WorcBAP
360	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	03/06/09	Roost & sighting	WCA ECH4 WorcBAP
772	*Pipistrellus pipistrellus*	Common Pipistrelle	SO839784	Sion Hill Middle School	26/08/2009	Foraging & flying in locality	WCA ECH4 WorcBAP
130	*Pipistrellus pipistrellus*	Common Pipistrelle	SO840801	Cookley	27/04/10	6 heard & heading from house bordering Lea lane, due NW to canal	WCA ECH4 WorcBAP
944	*Pipistrellus pipistrellus*	Common Pipistrelle	SO852779	Hurcott Pool	18/05/11	Foraging over pool	WCA ECH4 WorcBAP
360	*Pipistrellus pipistrellus*	Common Pipistrelle	SO819769	The Elms Hotel, Habberley Rd	15/06/11	Flying & foraging on site	WCA ECH4 WorcBAP
676	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8336277845	Springfield Park, Kidderminster	13/09/11		WCA ECH4 WorcBAP
360	*Pipistrellus pipistrellus*	Common Pipistrelle	[redacted]	[redacted]	21/09/11	2 present	WCA ECH4 WorcBAP
102	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8295180205	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
69	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8202980137	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
565	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8289379624	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
147	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8459280814	Wolverley and	03/07/13	auditory record	WCA ECH4 WorcBAP

				Cookley			
566	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8291579609	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
106	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8317681131	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
155	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8478280898	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
334	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8183079795	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
332	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8179079848	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
65	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8182880388	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
64	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8180080547	Wolverley and Cookley	03/07/13	auditory record	WCA ECH4 WorcBAP
414	*Pipistrellus pipistrellus*	Common Pipistrelle	SO822769		01/07/2014		WCA ECH4 WorcBAP
414	*Pipistrellus pipistrellus*	Common Pipistrelle	SO822769		08/07/2014		WCA ECH4 WorcBAP
164	*Pipistrellus pipistrellus*	Common Pipistrelle	SO8081977515	Kidderminster Foreign	17/09/14	auditory record	WCA ECH4 WorcBAP
623	*Pipistrellus pipistrellus*	Common Pipistrelle	SO830765		06/07/2015		WCA ECH4 WorcBAP
623	*Pipistrellus pipistrellus*	Common Pipistrelle	SO830765		14/07/2015		WCA ECH4 WorcBAP
623	*Pipistrellus pipistrellus*	Common Pipistrelle	SO830765		22/07/2015		WCA ECH4 WorcBAP
349	*Pipistrellus pipistrellus*	Common Pipistrelle	SO818784	Franche	Jun-03		WCA ECH4 WorcBAP
286	*Pipistrellus pipistrellus*	Common Pipistrelle	SO814772	Blake marsh	Jul-01	1 present	WCA ECH4 WorcBAP
270	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO813772	Briars Hotel site, Habberley Rd	31/05/08		WCA NERC s.41 UKBAP ECH4 WorcBAP
270	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO813772	Briars Hotel site, Habberley Rd	23/06/08		WCA NERC s.41 UKBAP ECH4 WorcBAP
605	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO829794	Bishop's Field	12/09/08	aural bat detector; 4	WCA NERC s.41 UKBAP ECH4 WorcBAP
313	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO816767	Baxter College, Kidderminster	12/05/2009	Foraging & flying in locality	WCA NERC s.41 UKBAP ECH4 WorcBAP
360	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO819769	The Elms, Habberley Rd	03/06/09	1 in flight	WCA NERC s.41 UKBAP ECH4 WorcBAP
772	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO839784	Sion Hill Middle School	26/08/2009		WCA NERC s.41 UKBAP ECH4 WorcBAP
130	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO840801	Cookley	27/04/10	5; heard & heading from house bordering Lea lane, due NW to	WCA NERC s.41 UKBAP ECH4 WorcBAP

						canal	
1056	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO8629678170	Hurcott	14/06/10	Adult male	WCA NERC s.41 UKBAP ECH4 WorcBAP
944	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO852779	Hurcott Pool	18/05/11	Foraging over pool	WCA NERC s.41 UKBAP ECH4 WorcBAP
360	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO819769	The Elms Hotel, Habberley Rd	15/06/11	Flying & foraging on site	WCA NERC s.41 UKBAP ECH4 WorcBAP
676	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO8336277845	Springfield Park, Kidderminster	13/09/11		WCA NERC s.41 UKBAP ECH4 WorcBAP
156	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO8481480905	Wolverley and Cookley	03/07/13	auditory record	WCA NERC s.41 UKBAP ECH4 WorcBAP
58	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO8135180451	Wolverley and Cookley	03/07/13	auditory record	WCA NERC s.41 UKBAP ECH4 WorcBAP
607	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO8300579823	Wolverley and Cookley	03/07/13	auditory record	WCA NERC s.41 UKBAP ECH4 WorcBAP
414	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO822769		01/07/2014		WCA NERC s.41 UKBAP ECH4 WorcBAP
414	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO822769		08/07/2014		WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO830765		06/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO830765		14/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
623	*Pipistrellus pygmaeus*	Soprano Pipistrelle	SO830765		22/07/2015		WCA NERC s.41 UKBAP ECH4 WorcBAP
104	*Plecotus auritus*	Brown Long-Eared Bat	[redacted]	[redacted]	22/05/06	Accumulations of droppings indicate moderate maternity roost used over number of yrs	WCA NERC s.41 UKBAP ECH4 WorcBAP
956	*Plecotus auritus*	Brown Long-Eared Bat	[redacted]	[redacted]	26/07/06	Emergence survey; 1 roosting in farm building, 4 other possible roosting bats. 30 fresh droppings.	WCA NERC s.41 UKBAP ECH4 WorcBAP
186	*Plecotus auritus*	Brown Long-Eared Bat	[redacted]	[redacted]	05/08/2008	Roost	WCA NERC s.41 UKBAP ECH4 WorcBAP
955	*Plecotus auritus*	Brown Long-Eared Bat	[redacted]	[redacted]	19/11/08	Small cluster of relatively fresh droppings in roof void, modern wing of house. Indicated roosting b	WCA NERC s.41 UKBAP ECH4 WorcBAP
313	*Plecotus auritus*	Brown Long-Eared Bat	SO816767	Baxter College, Kidderminster	12/05/2009	Foraging & flying in locality	WCA NERC s.41 UKBAP ECH4 WorcBAP
1056	*Plecotus auritus*	Brown Long-Eared	SO8629678170	Hurcott	14/06/10	1 Female	WCA NERC s.41 UKBAP

		Bat					ECH4 WorcBAP
414	*Plecotus auritus*	Brown Long-Eared Bat	SO822769		01/07/2014		WCA NERC s.41 UKBAP ECH4 WorcBAP
414	*Plecotus auritus*	Brown Long-Eared Bat	SO822769		08/07/2014		WCA NERC s.41 UKBAP ECH4 WorcBAP
760	*Chiroptera*	Bats	[redacted]	[redacted]	16/07/03	Roost; droppings on windowsill	WCA NERC s.41 UKBAP ECH4 WorcBAP

APPENDIX 2

Full details of bat activity surveys

Activity Survey Results

Activity Survey 1 – 22nd May 2018 (dawn)

Project / Location	Lea Castle Farm	**Date**	22/5/2018
Surveyors	Kelly Hopkins and Steven Pagett		
Sun Set	n/a	**Sun Rise**	05.04
Survey Start	03.07	**Survey End**	05.05
Start Temperature	12.5°C	**End Temperature**	10.1°C
Other Weather Conditions (levels of cloud cover, precipitation, wind)	Dry, light breeze (Beaufort Scale 2)		
Bat Detector	EM3 and Bat Box Duet		

Time	**Listening Stop Point**	**Species**	**Levels of Activity * (Rare, Occasional, Frequent, Constant)**	**Behaviour**	**Details**
03.07	Start – 1	Common Pipistrelle (Pip 45)	Rare	Foraging	Heard not seen
03.11	Start – 1	Pip 45	Rare	Foraging	Heard not seen
03.13-03.16	1	Pip 45	Frequent	Foraging	Heard not seen
03.15	1	Soprano Pipistrelle (Pip 55)	Rare	Foraging	Heard not seen
03.27	2	Pip 45	Rare	Foraging	Distant pass

03.38	3	Pip 45	Rare	Foraging	Distant pass

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

Activity Survey 2 –25th July 2018 (dawn)

Project / Location	Lea Castle Farm	**Date**	25/7/2018
Surveyors	Kelly Hopkins		
Sun Set	n/a	**Sun Rise**	05.18
Survey Start	03.12	**Survey End**	05.20
Start Temperature	15.4˚C	**End Temperature**	13.7˚C
Other Weather Conditions (levels of cloud cover, precipitation, wind)	Dry, Light Breeze (Beaufort Scale 2)		
Bat Detector	EM3		

Time	**Listening Stop Point**	**Species**	**Levels of Activity * (Rare, Occasional, Frequent, Constant)**	**Behaviour**	**Details**
03.20	1	Pip55	Rare	Foraging	Brief Pass
03.21	1	Pip45	Rare	Foraging	Brief Pass
03.22	1	Pip55	Rare	Foraging	Brief Pass
03.30	1-2	Pip55	Rare	Foraging	Brief Pass

03.37	2	Pip55	Rare	Foraging	Brief Pass
03.38	2	Pip45	Rare	Foraging	Brief Pass
03.40	2-3	Pip55	Rare	Foraging	Brief Pass
03.36	3-4	Pip45	Rare	Foraging	Brief Pass
04.35	6-7	Pip45	Rare	Foraging	Brief Pass

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

Activity Survey 3 – 11th September (Dusk)

Project / Location	Lea Castle Farm	**Date**	11/9/2018
Surveyors	Nick Staples		

Sun Set	19.34	**Sun Rise**	n/a
Survey Start	19.17	**Survey End**	21.44
Start Temperature	16.2˚C	**End Temperature**	15.1˚C
Other Weather Conditions (levels of cloud cover, precipitation, wind)	Dry, 100% cloud cover, light breeze (Beaufort Scale 2),		
Bat Detector	Echo Meter Touch		

Time	**Listening Stop Point**	**Species**	**Levels of Activity * (Rare, Occasional, Frequent, Constant)**	**Behaviour**	**Details**
19.36	Start – 1	Leisler's	Rare	Commuting	Heard not seen
19.38	Start – 1	Noctule	Rare	Commuting	Heard not seen
19.44	1	Pip45	Occasional	Foraging	Heard not seen
19.47	1	Pip45	Occasional	Foraging	Heard not seen
19.51	1-2	Pip55	Occasional	Foraging	Heard not seen
19.51	1-2	Noctule	Frequent	Foraging	Heard not seen
19.56	1-2	Pip45	Occasional	Foraging	Foraging nearby
19.56	1-2	Noctule	Rare	Commuting	Brief distant pass

19.57	1-2	Pip45 and Pip55	Frequent	Foraging	Frequent foraging along track
19.58	1-2	Pip45 and Pip55	Occasional	Foraging	Heard not seen
20.00	1-2	Leisler's	Frequent	Foraging	Heard not seen
20.00	1-2	Pip55	Rare	Foraging	Brief pass
20.02	1-2	Leisler's	Rare	Commuting	Heard not seen
20.04	1-2	Pip45	Frequent	Foraging	Along track
20.05	1-2	Pip55	Frequent	Foraging	Sudden regular foraging activity. Possible emergence from gatehouse. Not seen.
20.05 – 20.07	1-2	Pip45 and Pip55	Frequent	Foraging	Along arable field edge
20.08	1-2	Pip45	Occasional	Foraging	Along arable field edge
20.09	1-2	Pip45	Occasional	Foraging	Along arable field edge
20.10	1-2	Leisler's	Rare	Commuting	Heard not seen
20.12	1-2	Leisler's	Occasional	Foraging	Faint calls over arable field
20.15	1-2	Noctule	Rare	Commuting	Heard not seen
20.19	2	Leisler's	Rare	Commuting	Heard not seen
20.25	2-3	Leisler's	Rare	Commuting	Heard not seen

20.26	2-3	Pip55	Occasional	Foraging	At edge of arable field
20.27	2-3	Pip55	Occasional	Foraging	At edge of arable field
20.28	2-3	Pip45 and Pip55	Occasional	Foraging	At edge of arable field
20.30	2-3	Pip45	Occasional	Foraging	Along edge of arable field
20.34	2-3	Leisler's	Rare	Commuting	Heard not seen
20.37	2-3	Leisler's	Rare	Commuting	Heard not seen
20.40	2-3	Pip45	Rare	Foraging	Heard not seen
20.43	2-3	Leisler's	Rare	Commuting	Heard not seen
20.47	2-3	Noctule	Rare	Commuting	Heard not seen
20.59	3	Leisler's	Rare	Commuting	Heard not seen
21.02	3-4	Pip45	Rare	Foraging	Heard not seen
21.04	3-4	Leisler's	Frequent	Foraging	Heard not seen
21.09	3-4	Leisler's	Rare	Commuting	Heard not seen
21.11-21.12	4	Pip45 and Pip55	Frequent	Foraging	Close to surveyor
21.13-21.16	4-End	Pip45	Frequent	Foraging	Heard not seen

21.17	4-End	Leisler's	Rare	Commuting	Heard not seen
21.18-21.20	4-End	Pip45	Frequent	Foraging	Heard not seen
21.21	4-End	Noctule	Rare	Commuting	Heard not seen
21.23	4-End	Pip55	Rare	Foraging	Heard not seen
21.25	4-End	Leisler's	Rare	Commuting	Heard not seen
21.26	4-End	Pip55	Occasional	Foraging	Heard not seen
21.28	4-End	Leisler's	Occasional	Foraging	Heard not seen
21.28	4-End	Pip55	Occasional	Foraging	Heard not seen
21.29-21.31	4-End	Pip45 and Pip55	Frequent	Foraging	Heard not seen
21.32	4-End	Myotis sp.	Rare	Commuting	Brief pass
21.34	4-End	Pip45	Frequent	Foraging	Heard not seen
21.34	4-End	Myotis sp.	Rare	Commuting	Brief pass
21.35	4-End	Pip45 and Pip55	Occasional	Foraging	Heard not seen
21.36	4-End	Pip55	Occasional	Foraging	Along grassland edge
21.37	4-End	Pip45 and Pip55	Occasional	Foraging	Along grassland edge

21.38	4-End	Leisler's	Rare	Commuting	Heard not seen
21.38	4-End	Pip55	Occasional	Foraging	Heard not seen
21.39 – 21.41	4-End	Pip45	Frequent	Foraging	Along track
21.43	4-End	Noctule	Rare	Commuting	Heard not seen
21.44	4-End	Pip45	Frequent	Foraging	Along track
21.44	4-End	Myotis sp. - Brandt's characteristics	Occasional	Foraging	Along track

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

APPENDIX 3

Full details of static detector data

Static Detector Full Survey Results for Wolverley

May Static Detector Placement

Date/Time	Species	Activity Level
2018-05-22 4.13	Common Pipistrelle (Pip 45)	Frequent (F)
4.22	Soprano Pipistrelle (Pip 55)	Rare (R)
21.51	Pip 45	Occasional (O)
21.54	Pip 45	O
23.24	Pip 55	O
2018-05-23 00.01	Pip 45	O
00.55	Pip 45	O
01.34	Pip 45	O
01.55	Pip 45	O
01.58	Pip 55	O
02.01	Pip 45	O
02.35	Pip 45	R
02.51	Pip 45	R
22.43	Leisler's	R – Distant
2018-05-24 01.00	Pip 55	O
01.23	Pip 45	R
01.30	Pip 45	O
01.59	Pip 45	O
03.12	Pip 55	O
03.58	Pip 45	O
03.59	Pip 45	O
04.03	Pip 45	R
21.47	Pip 45	O
22.05	Noctule	O
22.08	Pip 55	O
22.15	Pip 45	O
22.32	Leisler's	O
23.12	Pip 55	O
2018-05-25 01.50	Myotis sp. – Daubenton's characteristics	O
02.04	Pip 45	R
02.05	Pip 45	R
03.05	Myotis sp. - Brandt's characteristics	R
2018-05-27 21.53	Pip 45	F
21.54	Pip 45	O
22.03	Pip 45	O
22.19	Pip 45	O
22.38	Brown Long-eared bat (BLE)	R
22.42	Pip 45	R
22.46	Pip 45	R
22.48	Myotis sp. – Daubenton's characteristics	R
22.50	Pip 45	O

22.51	Pip 45	R
22.55	Pip 55	O
23.12	Pip 45	O
23.13	Pip 45	O
23.18	Pip 45	O
23.24	Pip 45	O
23.36	BLE	R – Distant
23.44	Myotis sp. Brandt's characteristics	O
23.52	Pip 55	R
2018-05-28 02.55	Nathusius' pipistrelle	O
03.05	Pip 45	O
03.06	Pip 45	O
03.31	BLE	R – Distant
03.51	Pip 45	O
04.00	Pip 45	O
2018-05-29 01.40	Pip 55	O
02.46	Pip 45	R

Summary

Species	**Activity Level**	**Number of Minutes of Activity**
Common pipistrelle (Pip45)	Rare	10
Pip45	Occasional	25
Pip45	Frequent	2
Soprano pipistrelle (Pip55)	Rare	2
Pip55	Occasional	8
Brown long-eared bat (BLE)	Rare	3
Leisler's	Rare	1
Leisler's	Occasional	1
Noctule	Occasional	1
Myotis with Daubenton's characteristics	Rare	1
Myotis with Daubenton's characteristics	Occasional	1
Myotis with Brandt's characteristics	Rare	1
Myotis with Brandt's characteristics	Occasional	1
Nathusius pipistrelle	Occasional	1

July Static Detector Placement

Date/Time	Species	Activity Level
2018-07-24 22.12	Pip 55	Occasional (O)
22.16	Pip 45	Rare (R)
22.17	Pip 45	O
22.18	Pip 45	Frequent (F)
22.19	Pip 45	O
22.21	Pip 45	R
22.24	Pip 45	R – Distant
22.25	Pip 45	R
22.26	Pip 45	O
22.27	Pip 45	O
22.29	Pip 45	O
22.30	Pip 45	O
22.31	Pip 45	F
22.32	Pip 45	F
22.33	Pip 45	O
22.34	Pip 45	O
22.35	Pip 45	O
22.36	Pip 45	O
22.37	Pip 45	O
22.38	Pip 45	F
22.39	Pip 45	F
22.40	Pip 45	F
22.41	Pip 45	O
22.42	Pip 45	F
22.43	Pip 45	F
22.44	Pip 45	F
22.45	Pip 45	F
22.46	Pip 45	O
22.47	Pip 45	F
22.48	Pip 45	R
22.49	Pip 45	O
22.53	Pip 45	O
22.54	Pip 45	F
22.55	Pip 45	O
22.56	Pip 45	R
22.57	Pip 45	F
22.58	Pip 45	O
22.59	Pip 45	O
23.00	Pip 45	F
23.01	Pip 45	F
23.02	Pip 45	F
23.03	Pip 45	F
23.04	Pip 45	O
23.05	Pip 45	O
23.06	Pip 45	O
23.07	Pip 45	F
23.08	Pip 45	O
23.09	Pip 45	R

23.14	Myotis sp. – Brandt's characteristics	R
23.45	Pip 45	R
23.46	Pip 45	R
23.47	Pip 45	O
23.48	Pip 45	O
23.49	Pip 45	O
23.50	Pip 45	O
23.51	Pip 45	O
23.52	Pip 45	F
23.53	Pip 45	F
23.54	Pip 45	F
23.55	Pip 45	F
23.56	Pip 45	F
23.57	Pip 45	F
23.58	Pip 45	F
2018-07-25 00.06	Pip 45	R
00.16	Pip 55	R
00.23	Pip 45	R
00.26	Pip 45	O
00.27	Pip 45	F
00.28	Pip 45	F
00.29	Pip 45	F
00.30	Pip 45	O
00.44	Pip 45	O
00.48	Pip 45	O
00.49	Pip 45	O
00.50	Pip 45	F
00.51	Pip 45	O
00.52	Pip 45	Constant (C)
00.53	Pip 45	F
01.09	Myotis sp. –Brandt's characteristics	O
01.16	Myotis sp. – Daubenton's characteristics	O
01.27	Pip 45	O
01.28	Pip 45	O
01.37	Pip 45	F
01.39	Pip 45	R
01.40	Pip 45	O
01.43	Pip 45	O
01.44	Pip 45	O
01.45	Pip 45	O
01.46	Pip 45	O
01.47	Pip 45	O
01.48	Pip 45	O
01.49	Pip 45	O
01.50	Pip 45	O
01.51	Pip 45	O
01.52	Pip 45	R
01.53	Pip 45	O

02.27	Pip 45	O
02.27	Myotis sp. – Daubenton's characteristics	O
02.28	Pip 45	O
02.29	Pip 45	O
02.30	Pip 45	O
02.31	Pip 45	O
02.34	Pip 45	O
02.35	Pip 45	R
02.36	Pip 45	O
02.37	Pip 45	O
02.38	Pip 45	O
02.39	Pip 45	O
02.40	Pip 45	O
02.41	Pip 45	R
02.42	Pip 45	R
02.45	Pip 45	O
02.47	Pip 45	R
02.48	Pip 45	O
02.49	Pip 45	O
02.50	Pip 45	O
02.51	Pip 45	O
02.53	Pip 45	R
02.54	Pip 45	O
02.55	Pip 45	R
02.57	Pip 45	O
02.58	Pip 45	O
03.00	Pip 45	O
03.01	Pip 45	O
03.46	Pip 45	O
03.47	Pip 45	O
03.48	Pip 45	O
03.49	Pip 45	O
03.50	Pip 45	O
03.52	Pip 45	O
03.53	Pip 45	F
03.54	Pip 45	O
03.55	Pip 45	O
03.56	Pip 45	O
03.57	Pip 45	O
03.59	Pip 45	O
04.01	Pip 45	O
04.02	Pip 45	F
04.03	Pip 45	R
04.04	Pip 45	O
04.05	Pip 45	O
04.06	Pip 45	O
04.13	Pip 45	F
04.14	Pip 45	F
04.15	Pip 45	O

04.16	Pip 45	O
04.17	Pip 45	O
04.18	Pip 45	F
04.19	Pip 45	F
04.20	Pip 45	O
04.22	Pip 45	R
22.13	Pip 45	O
22.14	Pip 45	F
22.15	Pip 45	O
22.17	Pip 45	O
22.20	Pip 45	O
22.20	Pip 55	R
22.21	Pip 45	O
22.22	Pip 45	O
22.24	Pip 45	O
22.25	Pip 45	O
22.26	Pip 45	O
22.27	Pip 45	O
22.28	Pip 45	O
22.29	Pip 45	F
22.30	Pip 45	O
22.31	Pip 45	F
22.32	Pip 45	O
22.33	Pip 45	R
22.35	Pip 45	O
22.36	Pip 45	R
22.39	Pip 45	O
22.40	Pip 45	O
22.41	Pip 45	O
22.42	Pip 45	F
22.45	Myotis sp. – Brandt's characteristics	R
23.01	Pip 45	R
23.05	Pip 45	O
23.12	Myotis sp. – Brandt's characteristics	O
23.14	Pip 45	O
23.17	Pip 45	O
23.20	Pip 45	O
23.21	Pip 45	F
23.27	Myotis sp. – Daubenton's characteristics	O
23.29	Pip 45	O
23.31	Pip 45	O
23.40	Pip 45	O
23.41	Pip 45	O
23.42	Pip 45	O
23.43	Pip 45	O
2018-07-26 00.01	Noctule	O
00.02	Pip 45	O
00.25	Myotis – Daubenton's	R

	characteristics	
00.32	Pip 45	O
00.37	Pip 45	R
00.48	Pip 45	F
00.49	Pip 45	O
00.50	Pip 45	O
00.51	Pip 45	O
00.53	Pip 45	O
01.00	Pip 45	O
01.04	Pip 45	O
01.05	Pip 45	O
01.10	Pip 45	O
01.11	Pip 45	F
01.12	Pip 45	O
01.13	Pip 45	O
01.32	Pip 45	O
01.34	Pip 45	O
01.35	Pip 45	O
01.36	Pip 45	O
01.37	Pip 45	O
01.38	Pip 45	F
01.39	Pip 45	O
01.40	Pip 45	O
01.41	Pip 45	F
01.42	Pip 45	F
01.43	Pip 45	F
01.44	Pip 45	F
01.45	Pip 45	F
01.46	Pip 45	F
01.47	Pip 45	F
01.48	Pip 45	O
01.49	Pip 45	F
01.50	Pip 45	F
02.13	Pip 45	R
02.23	Pip 45	O
03.39	Pip 55	O
03.58	Pip 45	O
03.58	Pip 55	R
03.59	Pip 55	R
04.01	Pip 45	O
04.14	Pip 45	O
21.56	Pip 45	O
22.03	Pip 55	R
22.17	Noctule	R
22.22	Pip 45	O
22.24	Leisler's	C
22.27	Pip 45	O
22.28	Pip 45	O
22.31	Pip 45	R
22.39	Myotis sp. Daubenton's	O

	characteristics	
22.41	Pip 45	R
22.49	Leisler's	F
22.53	Myotis sp. Daubenton's characteristics	O
23.03	Pip 45	R
23.11	Pip 45	O
23.20	Pip 45	R
23.25	Noctule	O
23.26	Noctule	R
23.53	Pip 45	R
2018-07-27 00.07	Pip 45	O
00.10	Pip 45	R
00.18	Pip 55	R
00.20	Pip 45	O
00.21	Pip 45	O
00.22	Pip 45	O
00.23	Pip 45	O
00.24	Pip 45	O
00.29	Pip 45	O
00.41	Pip 45	R
00.47	Pip 45	O
00.59	Pip 55	R
01.10	Pip 45	R
01.15	Pip 55	O
01.17	Pip 45	R
01.32	Pip 45	R
01.35	Pip 55	O
01.36	Pip 45	O
01.47	Pip 55	F
01.47	Myotis sp. Daubenton's characteristics	O
01.53	Pip 45	O
01.58	Pip 45	O
01.59	Pip 45	F
02.00	Pip 45	F
02.01	Pip 45	O
02.02	Pip 45	F
02.03	Pip 45	F
02.04	Pip 45	F
02.05	Pip 45	F
02.06	Pip 45	F
02.07	Pip 45	F
02.08	Pip 45	F
02.09	Pip 45	F
02.10	Pip 45	O
02.13	Pip 45	O
02.16	Pip 55	O
02.16	Pip 45	R
02.20	Myotis sp. Brandt's characteristics	O

02.22	Pip 45	R
02.38	Pip 45	O
02.39	Pip 45	O
02.40	Pip 45	O
02.41	Pip 45	O
02.42	Pip 45	F
02.43	Pip 45	O
02.49	Pip 45	O
02.50	Pip 45	O
03.06	Pip 45	F
03.49	Pip 55	O
03.59	Pip 45	O
04.14	Pip 45	C
04.15	Pip 45	C
04.16	Pip 45	C
04.17	Pip 45	C
04.18	Pip 45	C
04.19	Pip 45	C
04.20	Pip 45	F
04.29	Pip 45	O
21.47	Pip 55	O
21.56	Pip 45	F
21.57	Pip 45	C
21.58	Pip 45	F
22.00	Pip 45	F
22.01	Pip 45	O
22.02	Pip 45	O
22.04	Pip 45	O
22.05	Pip 45	F
22.05	Leisler's	O
22.06	Pip 45	F
22.07	Pip 45	C
22.08	Pip 45	F
22.09	Pip 45	O
22.09	Pip 55	O
22.10	Noctule	O
22.10	Pip 45	O
22.12	Pip 45	O
22.13	Pip 45	F
22.14	Pip 45	O
22.16	Pip 45	O
22.17	Pip 45	R
22.17	Pip 55	O
22.20	Pip 45	F
22.21	Pip 45	F
22.22	Pip 45	C
22.23	Pip 45	C
22.24	Pip 45	C
22.25	Pip 45	O
22.26	Pip 45	C

22.27	Pip 45	F
22.28	Pip 45	C
22.29	Pip 45	F
22.30	Pip 45	C
22.35	Pip 55	O
22.38	Pip 55	O
22.38	Pip 45	O
22.42	Leisler's	O
22.46	Pip 45	O
22.52	Pip 45	O
23.00	Pip 45	O
23.01	Pip 45	R
23.09	Pip 45	O
23.10	Pip 45	R
23.13	Pip 55	R
23.19	Pip 45	O
23.26	Pip 45	O
23.27	Pip 45	F
23.28	Pip 45	C
23.29	Pip 45	C
23.30	Pip 45	C
23.31	Pip 45	C
23.32	Pip 45	C
23.33	Pip 45	C
23.34	Pip 45	F
23.35	Pip 45	F
23.36	Pip 45	O
23.37	Pip 45	O
23.37	Pip 55	R
23.38	Pip 45	O
23.39	Pip 45	F
23.40	Pip 45	F
23.41	Pip 45	F
23.49	Pip 45	O
23.56	Pip 45	O
2018-07-28 00.06	Pip 45	O
00.13	Pip 45	F
00.14	Pip 45	F
00.20	Leisler's	O
00.22	Pip 45	O
00.31	Pip 55	R
00.44	Pip 45	O
00.46	Pip 45	F
00.47	Pip 45	C
00.48	Pip 45	F
00.49	Pip 45	F
00.50	Pip 45	C
00.51	Pip 45	C
00.52	Pip 45	F
00.53	Pip 45	F

00.54	Pip 45	F
00.55	Pip 45	O
00.56	Pip 45	F
00.57	Pip 45	C
00.58	Pip 45	C
00.59	Pip 45	F
01.00	Pip 45	F
01.01	Pip 45	C
01.02	Pip 45	F
01.03	Pip 45	F
01.04	Pip 45	F
01.05	Pip 45	F
01.08	Pip 45	F
01.09	Pip 45	C
01.10	Pip 45	C
01.11	Pip 45	O
01.12	Pip 45	O
01.15	Pip 45	C
01.16	Pip 45	C
01.17	Pip 45	C
01.18	Pip 45	F
01.44	Pip 55	C
01.45	Pip 55	F
01.46	Pip 45	O
01.55	Pip 55	O
02.19	Pip 45	F
02.20	Pip 45	O
03.24	Pip 55	R
03.48	Pip 55	O
03.49	Pip 55	F
03.50	Pip 55	F
03.51	Pip 55	F
03.52	Pip 55	F
03.53	Pip 55	F
03.54	Pip 55	F
03.55	Pip 55	F
03.56	Pip 55	C
03.57	Pip 55	C
03.58	Pip 55	C
03.59	Pip 55	F
04.00	Pip 55	C
04.01	Pip 55	C
04.02	Pip 55	C
04.03	Pip 55	F
04.04	Pip 55	C
04.05	Pip 55	F
04.06	Pip 55	F
04.07	Pip 55	O
04.08	Pip 55	F
04.09	Pip 55	F

04.10	Pip 55	F
04.11	Pip 55	F
04.12	Pip 55	O
04.13	Pip 55	F
04.14	Pip 55	F
04.15	Pip 55	O
04.16	Pip 55	F
04.17	Pip 55	F
04.18	Pip 55	F
04.24	Pip 55	O
04.25	Pip 55	F
04.26	Pip 55	F
04.27	Pip 55	F
04.28	Pip 55	F
04.29	Pip 55	F
04.30	Pip 55	F
21.57	Pip 45	F
22.02	Pip 45	O
22.04	Pip 45	C
22.05	Pip 45	F
22.06	Pip 45	C
22.11	Pip 45	O
22.12	Pip 45	C
22.13	Pip 45	F
22.14	Pip 45	C
22.15	Pip 45	C
22.16	Pip 45	F
22.17	Pip 45	F
22.18	Pip 45	C
22.19	Pip 45	C
22.20	Pip 45	C
22.21	Pip 45	C
22.22	Pip 45	O
22.23	Pip 45	C
22.24	Pip 45	C
22.25	Pip 45	C
22.26	Pip 45	C
22.27	Pip 45	C
22.28	Pip 45	C
22.29	Pip 45	C
22.30	Pip 45	C
22.31	Pip 45	C
22.32	Pip 45	C
22.33	Pip 45	C
22.34	Pip 45	C
22.35	Pip 45	C
22.36	Pip 45	C
22.37	Pip 45	C
22.38	Pip 45	C
22.39	Pip 45	C

22.40	Pip 45	C
22.41	Pip 45	C
22.42	Pip 45	C
22.43	Pip 45	C
22.44	Pip 45	C
22.45	Pip 45	C
22.46	Pip 45	C
22.47	Pip 45	C
22.48	Pip 45	C
22.49	Pip 45	C
22.50	Pip 45	C
22.51	Pip 45	C
22.52	Pip 45	C
22.53	Pip 45	C
22.54	Pip 45	C
22.55	Pip 45	C
22.56	Pip 45	C
22.57	Pip 45	C
22.58	Pip 45	C
22.59	Pip 45	C
23.00	Pip 45	C
23.01	Pip 45	C
23.02	Pip 45	C
23.03	Pip 45	C
23.04	Pip 45	C
23.05	Pip 45	C
23.06	Pip 45	C
23.21	Pip 45	O
23.22	Pip 45	O
23.29	Pip 45	O
23.45	Pip 45	C
23.49	Pip 55	O
2018-07-29 00.14	Pip 45	O
00.15	Pip 45	O
00.47	Myotis sp. Whiskered characteristics	O
00.48	Pip 45	O
00.49	Pip 45	O
01.02	Pip 55	R
01.47	Pip 45	R
02.07	Pip 55	O
02.44	Pip 55	R
02.50	Pip 55	R
03.53	Pip 45	O
03.58	Pip 55	R
04.03	Pip 45	R
04.04	Pip 45	F
04.16	Pip 45	O

Summary

Species	Activity Level	Number of Minutes of Activity
Pip45	Rare	43
Pip45	Occasional	206
Pip45	Frequent	108
Pip45	Constant	86
Pip55	Rare	15
Pip55	Occasional	19
Pip55	Frequent	28
Pip55	Constant	8
Leisler's	Occasional	3
Leisler's	Frequent	1
Leisler's	Constant	1
Noctule	Rare	2
Noctule	Occasional	3
Myotis with Daubenton's characteristics	Rare	1
Myotis with Daubenton's characteristics	Occasional	6
Myotis with Brandt's characteristics	Rare	2
Myotis with Brandt's characteristics	Occasional	3
Myotis with Whiskered characteristics	Occasional	1

September Static Detector Placement

Date/Time	Species	Activity Level
2018-09-01 20.09	Pip 55	Rare (R)
20.16	Noctule	R
20.18	Pip 55	R
20.24	Pip 45	Occasional (O)
20.26	Pip 45	R
20.59	Pip 45	R
21.06	Pip 45	R
21.06	Myotis – Brandt's characteristics	O
21.08	Pip 45	R
21.09	Pip 45	R
21.11	Pip 45	O
21.13	Pip 55	R
21.15	Pip 55	R
21.19	Pip 45	O

21.26	Pip 45	O
21.27	Pip 45	R
21.29	Pip 45	R
21.30	Pip 45	O
21.31	Pip 45	O
21.34	Pip 45	R
21.35	Pip 45	R
21.36	Pip 45	R
21.37	Pip 45	R
21.39	Pip 45	O
21.44	Pip 45	O
21.50	Leisler's	R
21.52	Pip 45	R
21.53	Pip 45	R
21.54	Pip 45	R
21.56	Pip 45	O
21.57	Pip 45	R
22.06	Pip 45	O
22.07	Pip 45	O
22.11	Pip 45	R
22.13	Pip 55	R
22.14	Pip 55	R
22.17	Pip 45	R
22.26	Pip 45	R
22.26	Pip 55	O
22.28	Pip 45	O
22.34	Pip 45	O
22.35	Pip 45	O
22.37	Pip 45	R
22.38	Pip 45	O
22.39	Pip 45	O
22.40	Pip 45	R
22.43	Pip 45	R
22.44	Pip 45	R
22.45	Pip 45	O
22.49	Pip 45	Frequent (F)
22.53	Pip 45	O
22.54	Pip 45	O
22.54	Myotis sp. Daubenton's characteristics	O
22.55	Myotis sp. Daubenton's characteristics	O
22.57	Myotis sp. Daubenton's characteristics	O
22.57	Pip 45	O
22.59	Myotis sp. Daubenton's characteristics	O
23.00	Noctule	R
23.00	Pip 45	R
23.01	Myotis sp. Daubenton's characteristics	O

23.04	Pip 45	O
23.05	Pip 45	O
23.06	Pip 45	R
23.09	Pip 45	O
23.12	Pip 45	O
23.13	Pip 45	O
23.14	Pip 45	O
23.15	Pip 45	O
23.16	Pip 45	O
23.17	Pip 45	O
23.18	Pip 45	O
23.19	Pip 45	O
23.20	Pip 45	O
23.21	Pip 45	O
23.22	Leisler's	O
23.22	Pip 45	O
23.23	Pip 45	O
23.24	Pip 45	O
23.25	Pip 45	O
23.26	Pip 45	O
23.27	Pip 45	O
23.27	Noctule	O
23.28	Noctule	O
23.29	Pip 55	R
23.30	Pip 45	O
23.31	Pip 45	O
23.32	Pip 45	O
23.33	Pip 45	O
23.34	Pip 45	O
23.35	Pip 45	O
23.36	Pip 45	F
23.37	Pip 45	O
23.38	Pip 45	O
23.40	Pip 45	O
23.41	Pip 45	O
23.42	Pip 45	O
23.44	Pip 45	O
23.45	Pip 45	R
23.46	Pip 45	O
23.47	Pip 45	R
23.49	Myotis sp. – Brandt's characteristics	O
23.50	Pip 45	O
23.51	Pip 45	O
23.52	Pip 45	F
23.53	Pip 45	F
23.54	Pip 45	O
23.55	Pip 45	R
23.57	Pip 45	O
23.57	Pip 55	R

23.58	Pip 45	O
23.59	Pip 45	F
2018-09-02 00.00	Pip 45	O
00.01	Pip 45	O
00.02	Pip 45	R
00.03	Pip 45	O
00.04	Pip 45	O
00.05	Pip 45	O
00.06	Pip 45	O
00.07	Pip 45	R
00.08	Pip 45	R
00.09	Pip 45	O
00.10	Myotis sp. – Brandt's characteristics	O
00.11	Pip 45	R
00.12	Pip 45	O
00.13	Pip 45	O
00.14	Pip 45	O
00.15	Pip 45	R
00.16	Pip 45	O
00.18	Pip 45	R
00.19	Pip 45	O
00.20	Pip 45	O
00.21	Pip 45	O
00.22	Pip 45	O
00.23	Pip 45	O
00.24	Pip 45	O
00.25	Pip 45	O
00.26	Pip 45	O
00.27	Pip 45	O
00.27	Myotis sp. Brandt's characteristics	O
00.28	Pip 45	O
00.28	Pip 45	R
00.29	Pip 45	O
00.30	Pip 45	O
00.31	Pip 45	F
00.32	Pip 45	O
00.33	Pip 45	O
00.34	Pip 55	O
00.35	Pip 45	R
00.36	Pip 45	O
00.37	Pip 45	O
00.37	Pip 55	R
00.38	Pip 45	O
00.39	Pip 45	F
00.40	Pip 45	F
00.41	Pip 45	O
00.42	Pip 45	F
00.43	Pip 45	O

00.44	Pip 45	O
00.45	Pip 45	O
00.46	Pip 45	O
00.48	Pip 45	O
00.49	Pip 45	O
00.50	Pip 45	O
00.51	Pip 45	O
00.52	Pip 45	O
00.53	Pip 55	R
00.54	Pip 45	O
00.55	Pip 45	F
00.56	Pip 45	R
00.57	Pip 45	F
00.58	Pip 45	O
00.59	Pip 45	F
01.00	Pip 45	F
01.01	Pip 45	F
01.02	Pip 45	O
01.03	Pip 45	O
01.04	Pip 55	O
01.04	Pip 45	O
01.05	Pip 45	O
01.06	Pip 45	O
01.07	Pip 45	O
01.08	Pip 45	F
01.09	Myotis sp. Brandt's characteristics	O
01.09	Pip 45	O
01.09	Pip 55	O
01.10	Pip 55	O
01.10	Pip 45	O
01.11	Pip 45	O
01.12	Pip 45	O
01.13	Pip 45	O
01.14	Pip 45	F
01.15	Pip 45	O
01.16	Pip 45	F
01.17	Pip 45	F
01.19	Pip 45	O
01.20	Pip 45	O
01.21	Pip 45	O
01.21	Pip 55	R
01.22	Pip 45	O
01.23	Pip 45	O
01.23	Pip 55	O
01.24	Pip 45	O
01.25	Pip 45	O
01.26	Pip 45	F
01.26	Pip 55	O
01.27	Pip 45	F

01.28	Pip 45	F
01.29	Pip 55	O
01.30	Pip 45	F
01.31	Pip 45	O
01.32	Pip 45	O
01.33	Pip 45	O
01.34	Pip 45	O
01.35	Pip 45	F
01.36	Pip 45	F
01.36	Pip 55	O
01.37	Pip 55	O
01.37	Pip 45	O
01.38	Pip 45	O
01.39	Pip 45	O
01.39	Pip 55	O
01.40	Pip 55	O
01.40	Pip 45	O
01.41	Pip 55	R
01.41	Pip 45	F
01.42	Pip 45	O
01.42	Myotis sp. – Brandt's characteristics	O
01.43	Pip 45	O – Social
01.44	Pip 55	R
01.44	Pip 45	F
01.46	Pip 45	O - Social
01.48	Pip 55	F - Social
01.49	Pip 55	O - Social
01.50	Pip 45	O
01.51	Pip 45	O - Social
01.54	Pip 45	O – Social
01.55	Pip 45	O – Social
01.55	Pip 55	O – Social
01.56	Pip 45	O
01.57	Pip 45	O
01.58	Pip 45	O
01.59	Pip 45	O
02.00	Pip 45	O
02.01	Pip 45	F
02.02	Pip 45	O
02.03	Pip 45	F
02.03	Pip 55	O
02.04	Pip 45	F
02.05	Pip 45	F
02.06	Pip 45	R - Social
02.07	Pip 55	O
02.07	Pip 45	O
02.08	Pip 45	O
02.09	Pip 45	O
02.10	Pip 45	F – Social

02.12	Pip 45	F – Social
02.13	Pip 45	O
02.14	Pip 45	O
02.15	Pip 55	O – Social
02.16	Pip 45	O
02.17	Pip 45	O – Social
02.18	Pip 45	R
02.19	Pip 45	O
02.19	Pip 55	O
02.22	Pip 55	O
02.26	Pip 45	O
02.27	Myotis sp. – Brandt's characteristics	O
02.30	Pip 45	R
02.34	Pip 45	R
02.37	Pip 45	O
02.38	Pip 45	O
02.39	Pip 45	R
02.40	Pip 45	O – Social
02.41	Pip 45	O
02.42	Pip 55	O – Social
02.44	Pip 45	R
02.48	Pip 45	R
02.53	Pip 55	O
02.57	Pip 55	R
02.58	Pip 45	O
02.59	Pip 45	O
03.00	Pip 45	O
03.01	Pip 55	R
03.04	Pip 45	R
03.05	Pip 45	O
03.06	Pip 45	O
03.07	Pip 45	O
03.08	Pip 45	O
03.09	Pip 45	O
03.10	Pip 45	R
03.10	Pip 55	O
03.11	Pip 45	O
03.12	Pip 45	R
03.13	Pip 45	O
03.14	Pip 45	O
03.15	Pip 45	O
03.16	Pip 45	R
03.17	Pip 45	O
03.18	Pip 45	O
03.19	Pip 45	O
03.20	Pip 45	O
03.24	Pip 45	O
03.25	Pip 45	R
03.31	Pip 45	O

03.32	Pip 45	O
03.33	Pip 45	R
03.34	Myotis sp. – Brandt's characteristics	O
03.46	Pip 45	O
03.47	Pip 45	O
03.49	Pip 45	O
03.50	Pip 45	O
03.51	Pip 45	O
03.52	Pip 45	O
04.01	Pip 45	R
04.02	Pip 45	O
04.03	Pip 45	O – Social
04.03	Pip 55	O – Social
04.05	Pip 45	F
04.06	Pip 45	O
04.09	Pip 45	R
04.10	Pip 45	R
04.12	Pip 55	O
04.13	Pip 45	R
04.16	Pip 45	O
04.20	Pip 45	O
04.34	Pip 55	O
04.34	Pip 45	O
04.36	Pip 45	O
04.42	Pip 45	O
04.43	Pip 45	O
04.45	Pip 45	O
04.46	Pip 45	O
04.47	Pip 45	O
04.48	Pip 45	O
04.49	Pip 45	O
04.50	Pip 45	O
04.52	Pip 45	O
04.53	Pip 55	O
04.53	Pip 45	O
04.54	Pip 45	O
04.55	Pip 45	O
04.56	Pip 45	O
04.57	Pip 45	O
04.58	Pip 45	O
04.59	Pip 45	O
05.00	Pip 45	R
05.01	Pip 45	O
05.16	Pip 45	R
05.17	Pip 45	O
05.20	Pip 45	O
05.21	Pip 45	O
05.22	Pip 45	O
05.25	Pip 45	O

05.30	Pip 45	O
05.42	Pip 45	O
05.59	Pip 55	R
05.59	Noctule	R
20.20	Pip 55	R
20.50	Pip 45	R
20.53	Noctule	O
21.06	Pip 45	R
21.25	Pip 45	O
21.29	Pip 45	O
21.30	Pip 45	O
21.31	Pip 45	O
21.32	Pip 45	O
21.34	Pip 45	F
21.35	Pip 45	R
21.36	Pip 45	O
21.38	Pip 45	O
21.39	Pip 45	O
21.42	Pip 45	O
21.43	Pip 45	R
21.46	Pip 45	O
21.48	Pip 45	O
21.51	Noctule	O
21.52	Pip 45	O
22.00	Pip 45	R
22.03	Pip 45	R
22.04	Pip 45	O
22.10	Pip 45	O
22.12	Pip 55	R
22.15	Pip 45	R
22.16	Pip 45	O
22.18	Pip 45	O
22.22	Pip 45	O
22.23	Pip 45	R
22.24	Pip 45	R
22.27	Pip 45	O
22.28	Pip 45	O
22.30	Pip 45	R
22.37	Pip 45	O
22.38	Pip 45	O
22.40	Pip 45	R
22.41	Pip 45	R
22.44	Pip 45	R
22.47	Pip 45	O
22.50	Pip 45	O
22.57	Myotis sp. Brandt's characteristics	O
23.00	Pip 45	O
23.12	Pip 45	O
23.13	Pip 45	R

23.15	Pip 45	R
23.18	Myotis sp. Brandt's characteristics	R
23.25	Pip 45	O
23.26	Pip 45	O
23.27	Pip 45	R
23.28	Pip 45	O
23.29	Pip 45	O
23.30	Pip 45	O
23.32	Pip 45	R
23.37	Pip 45	R
23.39	Pip 45	R
23.40	Pip 45	O
23.46	Pip 45	O
23.47	Pip 45	O
23.48	Pip 45	O
23.54	Pip 45	R
23.55	Pip 45	O
23.56	Pip 45	O
23.57	Pip 45	O
23.58	Pip 45	O
2018-09-03 00.00	Pip 45	O
00.01	Pip 45	O
00.02	Pip 45	O
00.06	Pip 45	O
00.10	Pip 55	R
00.10	Pip 45	R
00.11	Pip 45	R
00.15	Pip 45	O
00.18	Pip 45	O
00.20	Pip 45	O
00.23	Pip 45	O
00.24	Pip 45	O
00.26	Pip 45	R
00.32	Pip 45	O
00.33	Pip 45	O
00.34	Pip 45	R
00.43	Pip 55	R
00.45	Pip 45	R
00.47	Pip 45	O
00.50	Pip 45	O
00.51	Pip 45	R
00.52	Pip 45	R
01.00	Pip 45	R
01.04	Pip 45	O
01.05	Pip 45	R
01.07	Pip 45	R
01.09	Pip 45	R
01.10	Pip 45	O
01.11	Pip 45	R

01.12	Pip 45	R
01.13	Pip 45	R
01.14	Pip 45	R
01.15	Pip 45	R
01.16	Pip 45	R
01.17	Pip 45	R
01.22	Pip 45	O
01.23	Pip 45	R
01.26	Pip 45	R
01.27	Pip 45	O
01.28	Pip 45	F
01.29	Pip 55	O
01.31	Pip 45	O
01.32	Pip 45	O
01.33	Pip 45	R
01.34	Pip 45	O
01.35	Pip 45	O
01.36	Pip 55	O
01.38	Pip 45	O
01.39	Pip 45	R
01.40	Pip 45	O
01.41	Pip 45	O
01.43	Pip 55	R
01.43	Pip 45	O
01.44	Pip 45	O
01.46	Pip 45	O
01.58	Pip 45	O
01.59	Pip 55	O
02.00	Pip 55	O
02.04	Myotis sp. Brandt's characteristics	O
02.17	Pip 55	O
02.29	Pip 45	O
02.41	Pip 45	O
02.42	Pip 45	O
02.46	Pip 45	F
02.47	Pip 45	O
02.49	Pip 45	R
02.51	Pip 45	O
02.52	Pip 45	R
02.53	Pip 45	R
02.55	Pip 45	O
02.56	Pip 45	O
02.57	Pip 45	R
02.58	Pip 45	O
03.02	Pip 45	F
03.04	Pip 45	O
03.05	Pip 45	O
03.06	Pip 55	O
03.06	Pip 45	O

03.07	Pip 45	O
03.08	Pip 45	O
03.09	Pip 55	R
03.09	Pip 45	O
03.12	Pip 45	O
03.13	Pip 45	O
03.14	Pip 45	O
03.15	Pip 45	O
03.16	Pip 45	O
03.17	Pip 45	O
03.19	Noctule	O
03.21	Pip 45	R
03.22	Pip 45	R
03.35	Pip 45	O
03.36	Pip 45	R
03.38	Pip 45	R
03.39	Pip 45	O
03.40	Pip 45	O
03.41	Pip 45	O
03.42	Pip 45	O
03.43	Pip 45	R
03.44	Pip 45	O
03.49	Pip 45	O
03.50	Pip 45	O
03.50	Pip 55	R
03.51	Pip 45	O
03.58	Pip 45	O
04.00	Pip 45	R
04.05	Pip 45	R
04.06	Pip 45	O
04.07	Pip 45	O
04.21	Pip 45	O
04.22	Pip 45	O
04.23	Pip 45	O
04.24	Pip 45	O
04.25	Pip 55	O
04.25	Pip 45	O
04.26	Pip 45	R
04.30	Pip 45	O
04.33	Pip 45	O
04.34	Pip 45	O
04.40	Pip 45	R
04.45	Pip 55	R
04.53	Pip 45	O
04.54	Pip 45	F
04.55	Myotis sp. Brandt's characteristics	O
05.00	Pip 55	O – Social
05.11	Pip 45	R
05.23	Myotis sp. Brandt's	O

	characteristics	
05.26	Pip 45	O
05.45	Pip 45	O
05.48	Noctule	O
20.03	Pip 55	R
20.13	Pip 45	R
20.17	Pip 45	O
20.18	Pip 45	O
20.19	Pip 45	O
20.20	Pip 45	R
20.21	Pip 45	R
20.22	Pip 45	R
20.26	Pip 45	R
20.28	Pip 45	O
20.29	Pip 45	O
20.32	Pip 45	R
20.34	Pip 45	R
20.37	Pip 45	R
20.38	Pip 45	R
20.41	Pip 45	R
20.42	Pip 45	O
20.43	Pip 45	R
20.48	Pip 45	O
20.49	Pip 45	O
20.52	Pip 45	O
20.53	Pip 45	O
20.54	Pip 45	O
20.55	Pip 45	O
20.56	Pip 45	O
20.57	Pip 45	O
20.58	Pip 45	O
20.59	Pip 55	O
21.00	Pip 45	R
21.02	Pip 45	R
21.03	Pip 45	O
21.05	Pip 45	R
21.06	Pip 45	O
21.07	Pip 45	O
21.08	Pip 45	R
21.10	Pip 45	R
21.11	Pip 45	O
21.12	Pip 45	O
21.13	Pip 45	O
21.14	Pip 45	O
21.15	Pip 45	O
21.16	Pip 45	R
21.17	Pip 45	O
21.19	Pip 45	R
21.20	Pip 45	O
21.21	Pip 45	O

21.22	Pip 45	R
21.23	Pip 45	O
21.24	Pip 45	O
21.25	Pip 45	R
21.26	Pip 45	R
21.28	Pip 45	R
21.29	Pip 45	O
21.30	Pip 45	R
21.31	Pip 45	R
21.32	Pip 45	O
21.34	Pip 45	R
21.35	Pip 45	R
21.39	Pip 45	R
21.41	Pip 45	R
21.42	Pip 55	R
21.57	Leisler's	R
22.11	Pip 45	R
22.13	Pip 45	R
22.16	Pip 45	R
22.17	Pip 45	R
22.31	Pip 45	R
22.37	Pip 45	R
22.38	Pip 45	R
22.40	Pip 45	R
22.44	Pip 45	R
22.46	Pip 45	O
22.47	Pip 45	R
22.54	Pip 45	R
22.56	Pip 45	R
22.58	Pip 45	R
23.03	Pip 45	O
23.05	Pip 45	R
23.06	Pip 45	R
23.54	Pip 55	O
2018-09-04 20.27	Pip 45	R
20.29	Pip 45	R
20.52	Pip 45	R
21.00	Pip 45	R
21.01	Pip 45	O
21.02	Pip 45	O
21.06	Pip 45	R
21.09	Pip 45	R
21.10	Pip 45	O
21.13	Pip 45	R
21.16	Pip 45	R
21.21	Pip 45	R
21.47	Leisler's	R
21.48	Pip 45	R
21.50	Pip 45	R
22.02	Pip 55	R

22.15	Pip 55	O
22.17	Pip 55	O
22.33	Pip 45	R
22.54	Pip 45	R
22.57	Pip 45	R
22.58	BLE	R
23.00	Pip 45	R
23.03	Pip 55	R
23.08	BLE	R
23.09	Pip 45	R
23.30	Pip 55	O
2018-09-05 00.07	Pip 45	O
00.15	Pip 55	R
00.22	Pip 45	O
00.23	Pip 45	R
01.03	Pip 45	R
03.09	Pip 45	R
04.16	Leisler's	R
04.56	Serotine	R
20.17	Noctule	R
20.24	Pip 45	O
20.45	Pip 45	R
20.50	Pip 45	R
20.51	Pip 45	R
20.52	Pip 45	R
20.53	Pip 45	R
20.56	Pip 45	R
20.57	Pip 45	R
20.58	Pip 45	O
20.59	Pip 45	R
21.04	Pip 45	O
21.05	Pip 45	O
21.10	Myotis sp. Brandt's characteristics	O
21.12	Pip 45	R
21.14	Pip 45	R
21.20	Pip 45	O
21.21	Pip 45	O
21.25	Pip 45	O
21.33	Pip 45	O
21.46	Pip 45	R
21.51	Pip 45	O
22.04	Pip 45	R
22.05	Pip 45	R
22.07	Pip 45	R
22.22	Pip 55	R
23.00	Myotis sp. Daubenton's characteristics	O
23.09	Myotis sp. Daubenton's characteristics	O
23.59	Leisler's	O

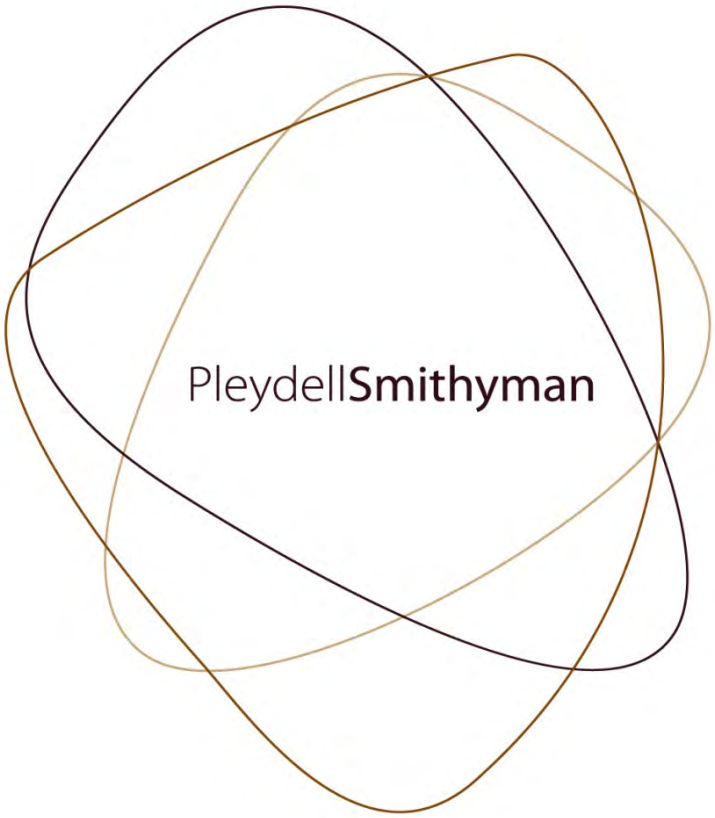
2018-09-06 00.12	Myotis sp. Daubenton's characteristics	O
02.08	Myotis sp. Daubenton's characteristics	O
03.16	Myotis sp. Daubenton's characteristics	R
03.40	Myotis sp. Daubenton's characteristics	R
04.17	Myotis sp. Daubenton's characteristics	R
04.35	Myotis sp. Daubenton's characteristics	R
04.38	Myotis sp. Daubenton's characteristics	R
05.09	Myotis sp. Daubenton's characteristics	O
05.16	Myotis sp. Daubenton's characteristics	O

Summary

Species	**Activity Level**	**Number of Minutes of Activity**
Pip45	Rare	187
Pip45	Occasional	361
Pip45	Frequent	38
Pip55	Rare	30
Pip55	Occasional	39
Pip55	Frequent	1
BLE	Rare	2
Leisler's	Rare	4
Leisler's	Occasional	2
Serotine	Rare	1
Noctule	Rare	4
Noctule	Occasional	6
Myotis with Daubenton's characteristics	Rare	5
Myotis with Daubenton's characteristics	Occasional	11
Myotis with Brandt's characteristics	Rare	1
Myotis with Brandt's characteristics	Occasional	13

TECHNICAL APPENDIX 9/5

REPTILE SURVEY REPORT



REPTILE SURVEY REPORT

RELATING TO LAND AT WOLVERLEY, KIDDERMINSTER

APPLICATION FOR PLANNING PERMISSION

FOR MR LOUIS STRONG

DECEMBER 2016

PSL Report Reference Number: PSC1biii435.R.004

PREPARED BY PLEYDELL SMITHYMAN LIMITED

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Report Prepared for

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REPTILE SURVEY
ON LAND AT WOLVERLEY ROAD,
WOLVERLEY,
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1.0 INTRODUCTION

Background and proposals

1.1 Pleydell Smithyman Limited (PSL) was instructed by Mr Louis Strong to undertake reptile surveys on the land at Wolverley, Kidderminster (hereafter referred to as 'the site').

1.2 The survey was required to inform the preparation and submission of a planning application for the extraction of mineral from the site. The survey was also required to help ensure compliance with national legislation and inform mitigation and enhancement proposals (where necessary and appropriate).

1.3 An initial ecological survey was carried out on the site in January 2016 by Nick Staples of Pleydell Smithyman Limited, which identified areas of suitable terrestrial habitat for reptiles on the site. This included areas of woodland edge, grassland and scrub.

Site Location

1.4 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.

Site Description

1.5 The site comprises approximately 40ha of arable farmland with semi-improved and improved grass headlands. A hard-standing 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 tree standards were present within the fields, including oak, (*Quercus robur*), sweet chestnut, (*Castanea sativa*) and non-native conifers. Please see Drawing Number PSC1biii435.D.006 Extended Phase 1 Habitat Survey for a plan of the habitats on the site.

Aims and Objectives of the Survey

1.6 The key objective of the reptile survey was to determine the presence or absence of reptiles on the site, of which account must be taken prior to and during the planned works in accordance with the Wildlife and Countryside Act 1981 (as amended).

1.7 The survey should begin to enable an assessment of the potential effects of the proposals on reptiles (if present). This will help inform the design and scope of any mitigation measures that might be required.

Legislation

1.8 All reptile species receive protection under the Wildlife & Countryside Act 1981 (as amended), making it illegal to;

- Intentionally kill or injure reptiles;
- Sell, offer for sale, possess or transport reptiles (live or dead, part or derivative) for the purpose of sale or advertise for buying or selling.

1.9 In addition, due to their status as scarce species both smooth snake, (*Coronella austriaca*) and sand lizard, (*Lacerta agilis*) are European protected species, protected under the Conservation of Habitats and Species Regulations, 2010. This affords them additional protection, making it illegal to:

- Deliberately capture smooth snakes or sand lizards;
- Deliberately disturb smooth snakes or sand lizards, including in particular any disturbance which is likely to:
    - impair their ability to survive, reproduce or to rear or nurture their young;
    - impair their ability to hibernate or migrate; or
    - significantly affect their local distribution or abundance.
- Damage or destroy a breeding site or resting place of smooth snakes and sand lizards.
- Possess or control any live or dead specimen or anything derived from a smooth snake or sand lizard.

1.10 It should also be noted that reptiles are species of principal importance listed in Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

1.11 The implications of the above are that the proposed works may result in the death or injury of individual reptiles and therefore measures should be put in place in areas where they are known to be present (or likely to be present) to provide for their individual protection.

2.0 METHODOLOGY

Desk Study

2.1 To support the initial ecological survey carried out in January 2016, information on statutory and non-statutory designated sites and ancient woodland sites within 2km of the site was collected. This was obtained from the Multi-Agency Geographic Information for the Countryside (MAGIC) website. The central grid reference used for the search was SO 840 790.

2.2 In addition, Worcestershire Biological Records Centre (WBRC) was commissioned to undertake a data search for all protected and notable species and all sites of conservation importance within 2km of a central grid reference of the site (SO835789). For relevant information please see Appendix 1.

2.3 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 to provide information on land use and habitat connectivity throughout the area.

Field Survey

Habitat Assessment

2.4 The Ecological Walkover Survey completed in January 2016 by Pleydell Smithyman Limited, involved assessing the habitats in the site for suitability for reptiles. Areas that were identified as suitable were marked on a plan to allow the easy identification of reptile refugia placement.

Reptile Survey

2.5 Pleydell Smithyman Limited follows the guidelines of the Survey Protocols for the British Herpetofauna (Sewell et al., 2013). These guidelines were produced following research and five regional workshops that were held in 2011 – 2012 regarding the survey protocols of herpetofauna.

2.6 These and other widely accepted methods require the placement of artificial refugia on suitable areas of the site for reptiles. Chance sightings of native reptiles are rare and only by concentrating on suitable areas at certain times of day, in the right weather conditions, is it possible to adequately survey reptiles. It is for this reason that the standard method involving the use of refugia has been developed. The artificial refugia used were 0.5m x 0.5m or 0.5m x 1m sheets of bitumen roofing felt.

2.7 These refugia are chosen due to their ability to exaggerate the conditions that reptiles seek to survive. Reptiles are ectotherms, meaning that they are limited in the way that they can control their own body temperature and rely on external weather conditions and local features to adjust their core temperature to be able to function efficiently. Bitumen roofing felt warms quickly in direct sunlight compared to ground temperature and so provides an area where reptiles can increase their body temperature without direct exposure to sunlight and the risk of being targeted by potential predators. The cover provided by the refugia also attracts prey species such as crickets, slugs, spiders and other invertebrates which are attractive to reptile species such as common lizard, (*Zootoca vivipara*) and slow-worm, (*Anguis fragilis*). This in turn can increase the likelihood of recording reptiles on a site. These mats also retain moisture and so increase humidity which also contributes to a favourable reptile micro-climate.

2.8 Reptile mats were placed around the site to conform with the minimum recommended density of between 5 and 10 per hectare of suitable habitat (locations of reptile mats are shown in Drawing PSC1biii435.D.007 Reptile Mat Locations). Refugia were left to settle for a period of two weeks before being first checked in order to ensure that reptiles have had time to become habituated to them.

2.9 The refugia were then checked on 7 separate occasions by Nick Staples, Kelly Downward, Steven Pagett and Stuart Dunlop. Both artificial and natural refugia were checked for reptiles along with areas of suitable reptile habitat occurring within the site. This involved the surveyor walking across the site during every survey visit keeping a close watch for any reptiles within the areas of suitable habitat in particular.

2.10 The surveys were carried out between April and September and were conducted under suitable weather conditions. Details of the weather conditions on each survey are included in the results section.

Survey Constraints and Limitations

2.11 As the surveys were spread out over six months, the vegetation levels varied greatly from the beginning of the surveys when the mats were laid to the middle of the surveys when vegetation levels were very high. The high levels of vegetation made finding some of the reptile refugia difficult. At least 50% of the reptile refugia placed on the site at the start of the surveys, were found and surveyed during each survey and therefore this constraint is not thought to materially alter the results of the surveys.

3.0 RESULTS

Desk Study

Species Records

3.1 The data search from WBRC returned eight records of reptiles within 2km of the site. These were all grass snake, (*Natrix natrix*) between 1996 and 2011. The closest of these was approximately 435m to the west of the site at Wolverley Lock in 2011. For further details please see Appendix 1.

Field Study

Habitat Assessment

3.2 The arable fields present across the majority of the site provide limited suitable habitat for reptiles. The hedgerows, woodland edge and grassland field boundaries provide areas of suitable habitat that reptiles could use to forage, bask and commute. The north-western corner of the site has a small number of south-facing banks that are connected to the woodland that could provide ideal habitat for basking reptiles.

3.3 The surrounding brick estate boundary to the south and east of the site provides a significant boundary to immigration or emigration and the likelihood of historic populations of ground feeding game birds, and more recently, domestic cats from the adjacent properties, suggest that reptile populations may have been lost over time through predation without a chance to rebuild populations through immigration.

3.4 The western part of the site has open connectivity to the woodland and the wider area that connects to the River Stour.

Survey results

3.5 Table 1 presents the dates and prevailing weather conditions of the surveys undertaken between April and September 2016. Table 2 presents the results of the surveys. For specific locations of the reptile mats please see Drawing number: PSC1biii435.D.007 Reptile Mat Locations.

Table 1: Dates and weather conditions of the survey visits.

Date	General Weather Conditions	Air Temperature
19/4/2016 AM	Dry, sunny with 20% cloud cover, Beaufort scale 2 (light breeze)	13°C
17/5/2016 AM	Dry, Beaufort 2	13°C

Date	General Weather Conditions	Air Temperature
24/5/2016 PM	Dry, 90% cloud cover, Beaufort scale 4 (moderate breeze)	15°C
16/6/2016 AM	Dry, overcast, Beaufort 2	13°C
12/7/2016 PM	Dry, 75% cloud cover, Beaufort 3	13°C
12/8/2016 AM	Dry, 10% cloud cover, Beaufort 2	18°C
27/9/2016 AM	75% Cloud Cover, Beaufort 3	14°C

Table 2: Numbers of animals found during the surveys

Survey Number	Common Toad	Wood Mouse	Field Vole
1	0	0	0
2	0	0	0
3	0	0	1
4	0	0	0
5	1	1	0
6	0	0	0
7	0	3	0

3.6 Table 1 shows that the weather conditions across the surveys were optimal throughout.

3.7 The surveys revealed no reptiles within the site. Other species were however recorded including common toad, (*Bufo bufo*), wood mouse, (*Apodemus sylvaticus*) and field vole, (*Microtus agrestis*). These were recorded along the western or northern boundary of the site underneath the mats. Additional evidence of small mammals was recorded under the mats in the form of tunnels and empty nests.

4.0 CONCLUSION

4.1 Reptile surveys were undertaken across the site at Wolverley, Kidderminster following the identification of suitable reptile habitat during the Ecological Walkover Survey carried out in January 2016 by Pleydell Smithyman Limited.

4.2 Surveys were carried out between April and September 2016 in suitable weather conditions. No reptiles were recorded during the surveys. Other species including common toad, wood mouse and field vole were recorded across the site. Wood mouse and field vole are common and widespread across the UK and as such their presence is of little consequence to the proposals across the site. Common toad is a species of principal importance and listed on the UK BAP and therefore their presence should be taken account of. Prior to the removal of any suitable habitat (including semi-improved neutral grassland and hedgerows), a destructive search conducted by an ecologist should be completed to capture any toads that may be sheltering in this habitat. Any toads that are captured will be moved off site to an area that will not be impacted by the proposals. It is advised that all toads are moved into the woodland to the north or west of the site. The landowner's permission must be obtained prior to any destructive searches commencing.

4.3 It is possible that from time to time grass snakes may travel through the site, despite their presence not being recorded during the surveys. Recent records of grass snakes were returned in close proximity to the site from the data search conducted by WBRC. Grass snakes will quickly move when disturbed during their active season and therefore, should they be present on the site prior to any work taking place they are likely to move and not be injured or killed during the works. It is recommended that prior to any works taking place, a toolbox talk is given to all on-site staff to make them aware of the potential presence of grass snake. Should any grass snakes or other reptiles be observed on site, the ecologist must be contacted for advice on the most appropriate way to proceed.

5.0 REFERENCES

1. Froglife, 1999. *Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation.* Froglife Advice Sheet 10.Halesworth, Froglife.

2. Gent, A.H., & Gibson, S.D., *eds,* 1998. *Herpetofauna workers' manual.* Peterborough, Joint Nature Conservation Committee.

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DRAWINGS

DRAWING NUMBER PSC1biii435.D.006

EXTENDED PHASE 1 HABITAT SURVEY

Legend

- Site boundary
- Semi-improved neutral grassland
- I — Improved grassland
- A — Arable
- Defunct hedgerow
- Standard tree
- Hardstanding
- TN1 — Target Note and Number

DRAWING STATUS	**FINAL**
PROJECT	**LAND AT WOLVERLEY**
CLIENT	**Mr Louis Strong**
TITLE	**Extended Phase 1 Habitat Survey**
DATE: **Dec 2016**	SCALE: **1:3,500 @A3**
DRAWN: **KD**	CHECKED: **NS**
DRAW NO.: **Psc1b(iii).435.D.006**	REVISION

PleydellSmithyman

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SHROPSHIRE TF8 7NH
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DRAWING NUMBER PSC1biii435.D.007

REPTILE MAT LOCATIONS

Legend

Site boundary

Location and number of reptile mats
20

DRAWING STATUS
FINAL

PROJECT
LAND AT WOLVERLEY

CLIENT
Mr Louis Strong

TITLE
Reptile Mat Locations

DATE	SCALE
Dec 2016	**1:3,500 @A3**
DRAWN **KD**	CHECKED **NS**
DRAW NO. **Psc1b(iii).435.D.007**	REVISION

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APPENDICES

APPENDIX 1

Information obtained from Worcestershire Biological Records Centre

Worcestershire Biological Records Centre

Protected/notable species and designated sites information

Protected/notable species and designated sites information held by WBRC as at 08/02/16 for 2km radius around Central Grid Ref SO835789 Wolverley.

No	Scientific Name	Common Name	Grid Ref	Location Name	Date	Comments	Status
422	*Natrix natrix*	Grass Snake	SO834774	Springfield Park	2003		WCA NERC s.41 UKBAP
504	*Natrix natrix*	Grass Snake	SO84567796	Pedmore Pool	1996		WCA NERC s.41 UKBAP
441	*Natrix natrix*	Grass Snake	SO836778	Broadwaters	12/06/2001		WCA NERC s.41 UKBAP
433	*Natrix natrix*	Grass Snake	SO835781	Springfield Park	20/07/2007		WCA NERC s.41 UKBAP
364	*Natrix natrix*	Grass Snake	SO829777	Stourvale	20/08/2007		WCA NERC s.41 UKBAP
565	*Natrix natrix*	Grass Snake	SO851778	Hurcott	30/08/2007	Corpse	WCA NERC s.41 UKBAP
400	*Natrix natrix*	Grass Snake	SO832793	Wolverley Lock	06/04/2011		WCA NERC s.41 UKBAP
422	*Natrix natrix*	Grass Snake	SO834774	Springfield Park	Aug-05	6 found.	WCA NERC s.41 UKBAP

TECHNICAL APPENDIX 9/6

ECIA METHODOLOGY

Impact Assessment Methodology

Following consultations, desk study and field surveys, the following criteria are applied to assess the nature conservation value of the 'important ecological features' (IEFs), i.e. the sites, habitats, ecosystems, species, populations, communities or assemblages (both on and off-site) that could be impacted by the proposed development. As there is rarely comprehensive quantitative data on the wider habitat or species population resource, particularly below the international and national level, the nature conservation evaluation of features necessarily also involves a qualitative component. This requires a suitably trained and experienced ecologist to make a professional judgement based upon a combination of published sources, consultation responses and knowledge of both the proposed development and the wider area. Descriptions of geographical areas (values) can become loosely defined at the smaller areas. As a consequence, to fit in with other established values (e.g. Fuller's geographical levels; modified to IEEM 2006 values for EcIA) the latest 2016 CIEEM guidelines have been adapted to include district level. This is an arbitrary value and might correspond to a parish, vice county or specific geographical area within or bounding counties.

The categories of ecological value used in this chapter are described in Table 1.

Table 1: Criteria for the Evaluation of Important Ecological Features

Value	**Criteria**	**Examples**
International	Nature conservation resource, i.e. site, habitat or populations of species, of international importance. N.B. Includes designated sites, but may also include off-site ecological features on which the qualifying population(s) or habitat(s) of designated sites are considered, from the best available evidence, to depend.	European sites: SPAs and SACs; Biosphere reserves; Other International sites: Ramsar wetlands; and Habitats and populations/ assemblages of species that represent the qualifying interests of internationally designated sites and/or are European protected species.
National	Nature conservation resource, i.e. site, habitat or populations of species, of national importance. N.B. Includes designated sites, but may also include off-site ecological features on which the qualifying population(s) or habitat(s) of designated sites are considered, from the best available evidence, to depend.	SSSIs (biological and geological) All populations of W&CA Schedule 8 plants. All viable populations of species listed as Critically Endangered, Endangered, Vulnerable or Threatened in relevant Red Data Books. Nationally important population /assemblage of an EPS, Schedule 1 and/or 5 species. National Nature reserves (NNRs).
Regional	Nature conservation resource, i.e. site, habitat or population of species, of regional importance. Includes high quality undesignated and designated sites, e.g. where a County-designated site is below SSSI	Sites/populations that meet SSSI designation criteria but have not been designated due to better examples having been present in the relevant Area Of Search. Regionally important population/area of a species and habitat of UK priority species and habitats.

Value	Criteria	Examples
	standard but still recognised as being significant in the context of the wider region.	Regionally important population/assemblage of an EPS, Schedule 1 and/or 5 species. Regionally important assemblages of other species.
County	Nature conservation resource, i.e. site, habitat or species, of importance in the context of old County/Vice-County areas.	Local Nature Reserves. County important population/area of a species and habitat of Local Biodiversity Plan (LBAP) species and habitats. County-important population/assemblage of an EPS, Schedule 1 and/or 5 species. County-important assemblages of other species.
District	Nature conservation resource, i.e. site, habitat or species, of importance in the context of the local, district or borough Council or Unitary Authority administrative area.	A breeding population of a species or a viable area of a habitat that is listed in a Local BAP because of its rarity in the locality. A breeding population of a species on the UK Biodiversity List has been identified by the local authority as being a material consideration in terms of its planning process. All breeding populations of an EPS, Schedule 1 and/or 5 species that have not been captured in higher categories above. Assemblages of other species that are of importance in the context of the local authority area.
Local	Unremarkable habitat/common species that are of some value in the context of the local area or parish, but not necessarily more widely.	Other species and habitats which are, in the opinion of the assessor, of note and for which mitigation measures could be recommended as a good practice measure.
Zone of Influence	The project site or an area including the project site.	Common, widespread, modified and/or impoverished habitats. Species of Least Concern which are widespread and/or common locally.

Sites and features that are valued as being important within the immediate zone of influence (i.e. site level) may still have ecological value, for either flora or fauna, but this value is considered to be no greater than is typical for those habitats or species in that locality and they do not have any special nature conservation interest. These categories have been applied to the features identified in the baseline survey described previously. Separate valuations are provided for designated sites, non-designated sites, features and species where appropriate. These categories are then applied to the features identified in baseline surveys and desk-top studies.

Some features can already be recognised as having ecological value and as such they may be designated as a statutory or non-statutory wildlife site, other features may require an evaluation based upon their previously un-assessed biodiversity value.

The evaluations have been applied only to those habitats and species that have been scoped in to the assessment and those that are predicted to be affected by the construction or the operation of the proposed mineral extraction scheme and the proposed restoration. These are termed Important Ecological Features (IEFs).

The baseline information has been used in undertaking an assessment of the value of IEFs within the study area. IEFs are defined as:

- Statutorily protected (Natura 2000 sites, NNR, SSSI and LNR) or locally designated (e.g. County Wildlife Sites) sites and features;
- Sites and features of biodiversity value not designated in this way, e.g. areas listed on published inventory of priority biodiversity habitats (e.g. ancient woodland inventory, lowland grassland inventory) or areas of habitat subject to UK or Local BAP; and
- Species of biodiversity value or significance, including those protected and controlled by law.

An evaluation of each type of IEF has been based upon the CIEEM guidelines (CIEEM 2016).

Approach to Impact Assessment

Impact Assessment Methods

The ways in which the IEFs might be affected by the development are explained and the magnitudes and probabilities of the likely impacts and their subsequent effects are predicted. The term 'impact' is used commonly throughout the EIA process and is usually defined as a change experienced by a feature (this can be positive, neutral or negative). The term 'effect' is commonly used at the conclusion of the EIA process and is usually defined as the consequences for the IEF of an impact. The EIA Regulations specifically require all likely significant effects to be considered. Therefore, impacts and effects are described separately and the effects for the IEFs are assessed as being either significant or not at the assigned level of geographical value.

The assessment of ecological impacts follows the process described by the CIEEM, which can be summarised as:

- Determine the value of ecological features and resources affected through survey and/or research and assess impacts affecting important features and resources (quantifying the proportion affected and reversibility/recoverability of those resources);
- Identify significant impacts in the absence of any mitigation;
- Identify measures to avoid or reduce adverse impacts (and in particular likely significant impacts);
- Demonstrate the likely success of mitigation measures;
- Identify opportunities for enhancement; and
- Produce a clear summary of the significant residual impacts of the proposal incorporating all mitigation and enhancement measures.

All species and populations of species, including those with statutory protection, are evaluated on the same basis. It should be noted that even when a species is protected under European and UK statute, the presence of a small population on a site within a region where this species is widespread is unlikely to be assessed at a value of greater than district-level importance. Equally, a particular feature on a site may attract a large number of an unprotected species that has limited distribution and this may represent a feature of county or even regional importance.

Assessment Criteria - Impact

The criteria used to determine the biodiversity value of a species or features that may support a species include the following general considerations:

- Rarity at a geographical level (international, national or local);
- Endemism and locally distinct varieties or sub-species;
- Species on the edge of a geographic range;
- Size of populations in the local geographical context;
- Species-rich assemblages of a larger taxonomic grouping, e.g. herpetofauna or wintering birds;
- Plant communities, ecosystems or habitat mosaics/associations that provide habitat for any of the above species or assemblages; and
- Populations of species considered as significant under locally published guidelines or Red Data Books (RDB).

The CIEEM guidance states that when describing changes/activities and positive or negative impacts on ecosystem structure and function, reference should be made to the following parameters in Table 2 which identifies the key considerations when characterising impacts on IEFs once the above values have been established.

Table 2: Key Considerations When Characterising Impacts

Assessment Criteria – Significance

Descriptor	**Definition**
Extent	The spatial or geographical area over which the impact/effect may occur
Magnitude	The 'size', 'amount', 'intensity' and volume'. It should be quantified if possible and expressed absolute or terms e.g the amount of habitat loss, percentage change to habitat area, percentage decline in a species.
Duration	Relation to ecological characteristics (such as a species' lifecycle) as well as human timeframes. The duration of an activity may differ from the duration of the resulting effect caused by the activity.
Frequency and timing	The number of times an activity occurs will influence the resulting effect. The timings of an activity or change may result in an impact if it coincides with critical life-stages or seasons.
Reversibility	Irreversible effect is one from which recovery is not possible within a reasonable timescale or there is no reasonable chance of action being taken to reverse it. A reversible effect is one from which spontaneous recovery is possible or which may be counteracted by mitigation.

Assessment Criteria - Significance

CIEEM defines an ecologically significant effect as one that (negatively or positively) should be given weight in judging whether to authorise a project: it can influence whether permission is given or refused and, if given, whether effect is important enough to warrant conditions, restrictions or further requirements such as monitoring.

Conservation status: The Habitats Directive provides a helpful definition of conservation status for habitats and species (as defined by Articles 1 (e) and 1(i)):

For habitats, conservation status is determined by the sum of the influences acting on the habitat and its typical species, that may affect its long-term distribution, structure and functions as well as the long-term survival of its typical species within a given geographical area; and

The conservation status of natural habitats will be taken as 'favourable' when:

I. its natural range and areas it covers within that range are stable or increasing, and

II. the species structure and functions which are necessary for its long term maintenance exist and are likely to continue to exist for the foreseeable future, and

III. the conservation status of its typical species is favourable as defined in Article 1(i).

For species, conservation status is determined by the sum of influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within a given geographical area.

The conservation status of species will be taken as 'favourable' when:

I. population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and

II. the natural range of the species is neither being reduced for the foreseeable future, and

III. there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Conservation status may be evaluated for any defined study area at any defined level of ecological value. The extent of the area used in the assessment relates to the geographical level at which the feature is considered important (see Table2). If an IEF is likely to experience a significant impact, the consequences in terms of development control, policy guidance and legislation will depend on the level at which it is valued. Significant impacts on features of ecological importance should be mitigated (or compensated for) in accordance with guidance derived from policies applied at the scale relevant to the value of the feature or resource.

Assessment Criteria – Success of Mitigation

CIEEM states that, due to the uncertainty associated with the success of proposed mitigation (and particularly compensation) measures, evidence (from other similar projects) should be provided of the effectiveness of agreed or recommended mitigation, compensation and enhancement measures, accompanied by a statement of the level of success that can be expected. The uncertainty will vary according to a number of factors:

- The technical feasibility of the proposals;
- The overall quantity of the proposals;
- The overall quality of the proposals;
- The level of commitment provided to achieve the proposals;
- Provision of long term management; and
- The timescale over which the predicted benefits are to be realised.

Residual Impacts

The significance of residual impacts is assessed on three separate levels. These can be summarised as:

- Impacts upon biodiversity resources;
- Consequences in terms of national and local nature conservation planning policy; and,
- Legal requirements relating to species and habitats.

TECHNICAL APPENDIX 9/7

BIODIVERSITY IMPACT ASSESSMENT CALCULATIONS

Biodiversity Impact Assessment Summary

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)

Site name: **Wolverley Kidderminster**

Planning reference number: **to be copied from the BIA sheet**

Existing	Habitat Area (ha)	Hedgerow impact (km)	Connectivity Features (km)	Habitat Biodiversity Value	Hedgerow Biodiversity Value	Connectivity Biodiversity Value
Onsite Biodiversity Impact	31.90	0.25	0.00	120.90	3.40	0.00
Indirect Biodiversity Impact	0.00	0.00	0.00	0.00	0.00	0.00
Total habitat / linear features impacted	**31.90**	**0.25**	**0.00**	**120.90**	**3.40**	**0.00**
Retained / Created / Enhanced						
Onsite biodiversity retained	9.10	0.00	0.00	24.80	2.40	0.00
Onsite Creation	31.90	0.50	0.00	180.95	4.29	0.00
Biodiversity retained and enhanced	4.70	0.60	0.00	44.66	4.00	0.00
Total biodiversity retained/enhanced	**45.70**	**1.10**	**0.00**	**250.41**	**10.69**	**0.00**
Trading Down	n/a	n/a	n/a	0.00	0.00	0.00
Biodiversity Impact	**n/a**	**n/a**	**n/a**	**129.51**	**7.29**	**0.00**

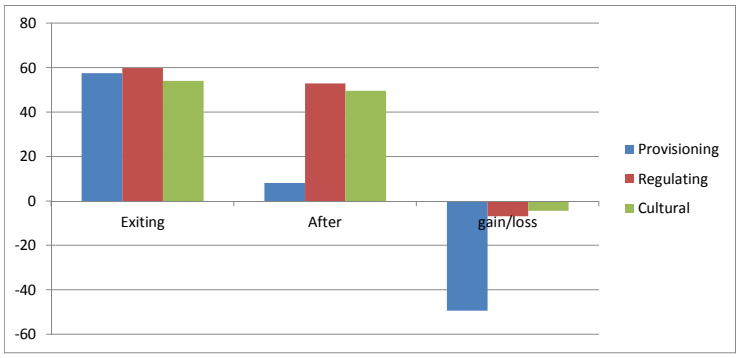
Habitat Impacts	Loss	Gain	Impact	%age losses	Compensatory Unit loss	Indicative Offset (ha)	WCC Offset units	WCC Offset Contribution
Woodland Habitat	0.00	14.12	14.12					
Grassland Habitat	11.60	68.83	57.23					
Wetland Habitat	0.00	1.33	1.33					
Other Habitat (incl. Built Env)	61.00	117.83	56.83					
Total	72.60	202.11	129.51	0.00	0.00	0.00	0.00	**£0**
		Trading down	0.00					
			129.51					

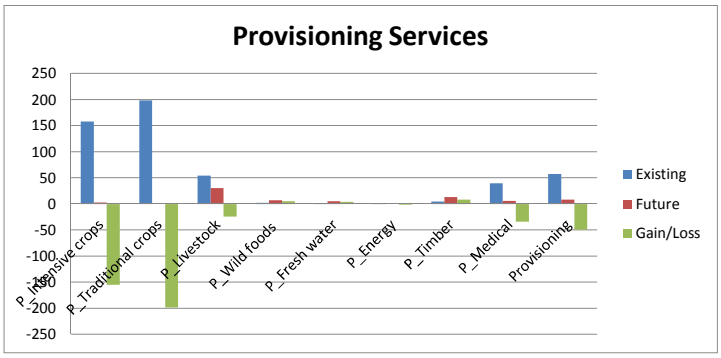
Hedgerow Impacts	Loss	Gain	Trading down	Impact	Unit loss	Indicative Offset (ha)	WCC Offset units	WCC Offset Contribution
Hedgerow	3.40	10.69		7.29				

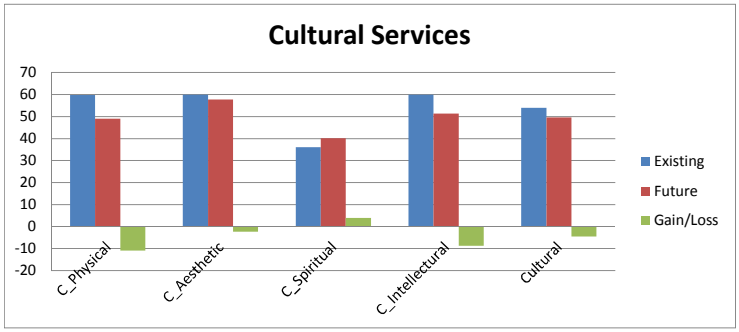
SUMMARY

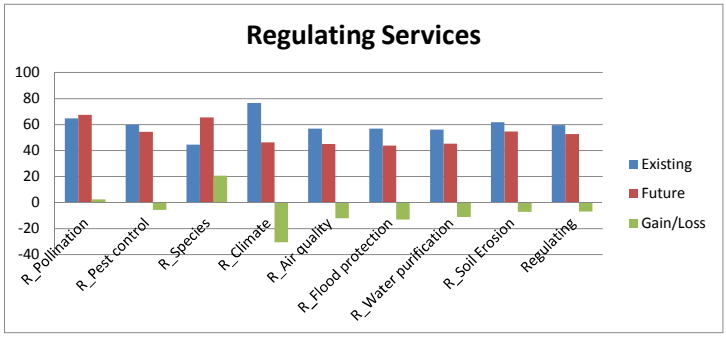
This development will result in 129.51 Habitat Biodiversity Units gain; 7.29 Hedgerow Units gain and 0 Connectivity Biodivesity Units loss

ECOSYSTEM SERVICES ANALYSIS









For any questions with regard to biodiversity impact and this development please contact Warwickshire County Council Ecological Services:
email: planningecology@warwickshire.gov.uk or telephone 01926 418060

Warwickshire, Coventry & Solihull - Habitat Impact Assessment Calculator

KEY	
	No action required
	Enter value
	Drop-down menu
	Calculation
	Automatic lookup
	Automatic Condition setting
	Result

Local Planning Authority:	Other
Site name:	Wolverley Kidderminster
Planning application reference number:	
Assessor:	K.Hopkins
Date:	03/04/2019

Please fill in both tables

Please do not edit the formulae or structure

To condense the form for display hide vacant rows, do not delete them

If additional rows are required, or to provide feedback on the calculator please contact WCC Ecological Services 01926 418060

	Existing habitats on site Please enter all habitats within the site boundary			**Habitat distinctiveness**		**Habitat condition**		**Habitat Biodiversity Value**						
								Habitats to be retained with no change within development		**Habitats to be retained and enhanced within development**		**Habitats to be lost within development**		
T. Note	code	Phase 1 habitat description	*Habitat area (ha)*	*Distinctiveness*	*Score*	*Condition*	*Score*	*Area (ha)*	*Existing value*	*Area (ha)*	*Existing value*	*Area (ha)*	*Existing value*	***Comment***
		Direct Impacts and retained habitats			A		B	C	A x B x C = D		E	A x B x E = F	G	A x B x G = H	
	J11	Other: Arable	39.50	Low	2	Moderate	1	7.60	15.20	2.00	4.00	29.90	**59.80**	
	B4	Grassland: Improved grassland	0.70	Low	2	Moderate	2	0.00		0.40	1.60	0.30	**1.20**	
	B22	Grassland: Semi-improved neutral grassland	3.50	Medium	4	Moderate	2	0.00		2.20	17.60	1.30	**10.40**	
	C31	Other: Tall ruderal	0.50	Medium-Low	3	Poor	1			0.10	0.30	0.40	**1.20**	
	J4	Other: Bare ground	0.40	Low	2	Poor	1	0.40	0.80	0.00				
	A131	Woodland: Mixed semi-natural woodland	1.10	Medium	4	Moderate	2	1.10	8.80	0.00				
		Total	45.70				Total	9.10	24.80	4.70	23.50	31.90	72.60 J	
													∑D + ∑F + ∑H	
											Site habitat biodiversity value		120.90	

Before/after impact	**Indirect Negative Impacts** Including off site habitats	K	Value of loss from indirect impacts K x A x B = Li, Lii	Li - Lii
Before				
After				
Before				
After				
Before				
After				
Before				
After				
Before				
After				
	Total	0.00		0.00 M

	HIS = J + M
Habitat Impact Score (HIS)	**72.60**

	Proposed habitats on site (Onsite mitigation)			Target habitats distinctiveness		Target habitat condition			Time till target condition		Difficulty of creation / restoration		*Habitat biodiversity value*	
T. Note	code	Phase 1 habitat description	*Area (ha)*	*Distinctiveness*	*Score*	*Condition*	*Score*		*Time (years)*	*Score*	*Difficulty*	*Score*		***Comment***
		Habitat Creation	N		O		P			Q		R	(N x O x P) / Q / R	
	B12	Grassland: Semi-improved acidic grassland	6.60	Medium-High	5	Good	3		5 years	1.2	Medium	1.5	**55.00**	
	J4	Other: Bare ground	22.10	Low	2	Good	3		5 years	1.2	Low	1	**110.50**	Bare ground is actually arable. As instructed by Ben Wood, Solihull Metropolitan nBorough Council (04/10/2018
	G1	Wetland: Standing water	0.20	High	6	Moderate	2		5 years	1.2	Medium	1.5	**1.33**	Ephemerally wet grassland/pools to be created
	A112	Woodland: Broad-leaved plantation	3.00	Medium	4	Good	3		15 years	1.7	Medium	1.5	**14.12**	
		Total	**31.90**											
		Habitat Enhancement						Existing value S (= F)					((NxOxP)-S)/Q/R	
	B12	Grassland: Semi-improved acidic grassland	2.30	Medium-High	5	Good	3	**17.90**	5 years	1.2	Low	1	**13.83**	
	J13	Other: Ephemeral/short perennial	2.40	Low	2	Good	3	**5.60**	5 years	1.2	Low	1	**7.33**	2 ha of this habitat is actually arable land, but this isn't a possible option. 0.4ha of this habitat will be pocket park
		Total	**4.70**								Trading down correction value		0.00	
											Habitat Mitigation Score (HMS)		**202.11**	

			HBIS = HMS - HIS
Habitat Biodiversity Impact Score			**129.51** Gain
Percentage of biodiversity impact loss			

	Loss	Gain	Impact
Woodland Habitat	0.00	14.12	**14.12**
Grassland Habitat	11.60	68.83	**57.23**
Wetland Habitat	0.00	1.33	**1.33**
Other Habitat (including Built Environment)	61.00	117.83	**56.83**
Total	72.60	202.11	**129.51**
		Trading down	**0.00**
			129.51

Warwickshire, Coventry & Solihull - Hedge Impact Assessment Calculator

KEY
No action required
Enter value
Drop-down menu
Calculation
Automatic lookup
Result

This sheet calculates the impacts to hedges and lines of trees in and around the site.

These units are not transferrable as compensation for either the Habitat or Connectivity Impact Assessment scores.

Please fill in both tables

Please do not edit the formulae or structure
To condense the form for display hide vacant rows, do not delete them
If additional rows are required,
or to provide feedback on the calculator
please contact WCC Ecological Services

T. Note	code	Existing Hedgerow features on site: Hedgerow habitat description	Feature length (km)	Hedgerow distinctiveness: Distinctiveness	Score	Hedgerow condition assessments: A1	A2	B1	B2	C1	C2	D1	D2	Condition Score	Hedgerow features to be retained with no change within development: Length (km)	Existing value	Hedgerow Biodiversity Value: Hedgerow features to be retained and enhanced within development: Length (km)	Existing value	Hedgerow features to be lost within development: Length (km)	Existing value	Comment
		Direct Impacts and retained features			A										C	A x B x C = D	E	A x B x E = F	G	A x B x G = H	
	n/a	Hedges: non_species rich hedge	0.85	Low	2	Pass	Fail	Pass	Fail	Fail	Fail	Pass	Pass	2	0.00		0.85	2.45	0.25	1.00	
		Total:	0.85												Totals:	0.00	0.00	0.85	2.45	0.25	1.00	∑D = ∑F + ∑H
																				Site Hedge Biodiversity Value	3.45
		Indirect Negative Impacts													Value of loss from indirect impacts K x A x B x Ll_Ld						
		Before/after impact	K													Ll - Ld					
		Before																			
		After																			
		Before																			
		After																			
		Before																			
		After																			
		Before																			
		After																			
		Total:	0.00													0.00 M				HIS = J × M	
																				Hedge Impact Score (HIS)	1.00

T. Note	code	Proposed hedge features on site (Onsite mitigation): Phase 1 habitat description	Length (km)	Target hedge distinctiveness: Distinctiveness	Score	Hedgerow condition assessments: A1	A2	B1	B2	C1	C2	D1	D2	Condition Score	Time till target condition: Time (years)	Score	Difficulty of creation / restoration: Difficulty	Score	Linear biodiversity value	Comment
		Hedgerow Creation	N		O											Q		R	(N x O x P) / Q / R	
	n/a	Hedges: species rich hedge	0.50	Medium	4	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	3	10 years	1.4	Low	1	4.29	
		Total:	0.50	ERROR - Total length of hedges created must equal total loss of hedge km																
		Hedgerow Enhancement													Existing value S = P					(N x O x P) / Q / R	
	n/a	Hedges: species rich hedge	0.60	Medium	4	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	3	2.40	5 years	1.2	Low	1	4.00	
		Total:	0.60																	
																			Trading down correction value	0.00
																			Hedge Mitigation Score (HMS)	8.29
																			HBIS = HMS - HIS	
																			Hedge Biodiversity Impact Score	7.29 Gain
																			Percentage of linear impact lost	

KEY
No action required
Action required
Drop-down menu
Calculation
Automatic lookup
Overall Gain
Overall Loss

TECHNICAL APPENDIX 9/8

CONFIDENTIAL ANNEX

Submitted Seperately