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Ecological Impact Assessment

Little Reeds Farm, Hickstead

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Little Reeds Farm, Hickstead – ECOLOGICAL IMPACT ASSESSMENT

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Report Summary

1. The Ecology Co-op has been commissioned by Mick Cave to undertake an Ecological Impact Assessment for a development on land at Little Reeds Farm. Following a Preliminary Ecological Appraisal of the site by The Ecology Co-op on 7th December 2021, further ecological surveys were undertaken, including protected species surveys and desk-top studies between April and October 2022, in order to provide sufficient baseline information for this assessment. This document presents the findings of these surveys and a full Ecological Impact Assessment in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines to inform a planning application to construct an acoustic bund along the western boundary of the property to provide a barrier to the significant infrastructure of the A23.

2. The site is approximately 4.3 ha in area and comprises of two narrow fields of horse grazed modified grassland, with a roadside verge belt of mixed scrub and trees along the western boundary. There is a cluster of buildings at the centre of the site, including a residential farmhouse and outbuildings with associated hard standing and garden areas. Access to the site is through a gated entrance directly off the A23, via a short slip-road. The acoustic bund will accommodate the existing access with an off-set overlap. To the north, the site is bordered by a watercourse known as Holmbush Gill, flowing east to west to meet the River Adur approximately 3km downstream. The eastern boundary is marked by a row of mature trees and hedgerow. The site progressively narrows towards the south, where the eastern field boundary converges with the A23 verge. At the apex, there is a small cluster of semi-mature trees.

3. The protected species surveys identified a low level of bat activity including common and soprano pipistrelles, brown long-eared, noctules, serotines and *Myotis spp.* A semi mature oak tree within the southern section was assessed to have moderate bat roost potential. No evidence of common dormice was identified; therefore, they are likely to be absent from habitats contained on site. There are no ponds on site and none have been identified as suitable for great crested newt within 250m of the site's boundary; however, one pond could not be assessed, therefore, the presence of the species within the suitable terrestrial habitats on site cannot be completely ruled out.

4. The proposed development will result in an unavoidable loss of a belt of non-priority habitat of scattered trees and scrub. The scattered trees to the south and the line of trees and scrub along the eastern boundary are to be retained and protected during construction through the establishment of buffer zones. Once the bund has been constructed, the planting of native trees and scrub is recommended to compensate for the loss of habitat and will contribute to the effectiveness of the bund. Furthermore, the priority habitat of the Holmbush Gill, a stream along the northern boundary, will need to be protected during the construction phase from any accidental damage to prevent harm to the sensitive aquatic ecosystem on site and downstream towards the River Adur.

5. In order to avoid the unlikely event of killing/injuring a great crested newt which may be present within the scrub and trees along the western boundary a precautionary approach to the vegetation clearance has been advised, through reasonable avoidance measures. A sensitive lighting scheme must be adopted during and post construction to prevent the disturbance to



any foraging, commuting or roosting bats which may be present. Currently, it is understood that the semi-mature oak tree to the south is to be retained and protected, therefore, there are no further recommendations in regard to roosting bats at this stage. However, if the tree is to be impacted in any way, further assessment of the tree will be needed in order to proceed legally.

6. Any vegetation clearance should be timed outside the nesting bird period (1st March–31st August) unless a search by a suitably qualified ecologist confirms the absence of any active nests.

7. In accordance with the National Planning Policy Framework, the proposed development design should incorporate ecological enhancements to ensure that there is a net gain in biodiversity. Due to the nature of the development once it is complete and the newly planted vegetation has established, the bund should naturally provide a positive impact on the biodiversity on site overall, by reducing the sound and light disturbance from the heavy infrastructure of the A23.



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1 INTRODUCTION

1.1 Background

The Ecology Co-op was commissioned by Mick Cave to undertake an Ecological Appraisal of Little Reeds Farm. This report presents the findings of baseline ecological surveys and desk-study research and assesses the likely impacts and significance of effects of the proposed works in relation to protected/notable species, habitats and designated sites.

Little Reed Farm is located on the eastern side of the A23, north of Hickstead, West Sussex. The postcode for the site is RH17 5LY. The central grid reference for the site is TQ 2686 8083. Figure 1. shows the boundary of the site and local context.

The application site comprises two narrow fields comprising of made ground which has succeeded into grassland used for horse grazing, totalling approximately 4.3ha and includes a roadside verge supporting a belt of mixed scrub and trees. There is a cluster of buildings at the centre of the site including a residential farmhouse and outbuildings with associated hard standing and garden areas. Access to the site is through a gated entrance directly off the A23, via a short slip-road. The acoustic bund will accommodate the existing access with an off-set overlap. To the north, the site is bordered by a watercourse known as Holmbush Gill, flowing east to west to meet the River Adur approximately 3km downstream. The eastern boundary is marked by a row of mature trees and scrub. The site progressively narrows towards the south, where the eastern field boundary converges with the A23 verge. At the apex, there is a small cluster of semi-mature trees.

The proposed development comprises the construction of an acoustic bund along the western boundary. At the time of writing this report the final development plans had not been completed, the impact appraisal has been conducted on the understanding that the belt of mixed scrub and trees will be removed and the semi mature oaks to the south will be retained. If the final plans deviate from this, then the impacts will need to be re-evaluated. See Figure 2 for the proposed location of the acoustic bund.

The Ecology Co-op undertook a Preliminary Ecological Appraisal (PEA)¹ of Little Reeds Farm. Based on the findings of this assessment, presence/likely absence surveys for foraging and commuting bats, presence/absence surveys for dormice *Muscardinus avellanarius* and further investigations regarding great crested newts *Triturus cristatus* were recommended.

1.2 Purpose of this Report

Following the recommendations of the PEA, The Ecology Co-op undertook further protected species surveys for common dormice and great crested newts, and activity surveys for foraging and commuting

¹ The Ecology Co-op (2021) *Preliminary Ecological Appraisal. Little Reeds Farm, Hickstead.*



bats.

The purpose of this report is to:

- present the findings of surveys and desk-study research (baseline ecological information);
- identify and evaluate the most ecologically important features present on the site and within the zone of influence of the proposed development;
- describe the impacts of the proposed development and determine the significance of effects on these ecologically important features;
- set out the proposed impact avoidance, mitigation, compensation measures that will be undertaken to reduce significant adverse effects to an acceptable level.
- outline the habitat creation and enhancement measures that will be put into place as part of the proposed development. These are designed to ensure that the proposals contribute to both local and national biodiversity objectives.

This report is intended for submission as part of the planning application for the proposed development.

The surveys and report were carried out and produced at the request of Mick Cave, the owner, and were supervised by Dan Bennet, BSc (Hons), MCIEEM, CEcol and Natural England Level 2 bat survey class licence holder.

1.3 Policy and Legislation

Legal protection applying to relevant bird, mammal, herpetofauna and invertebrate species and current nature conservation planning policy is outlined in Appendix 1 of this report.

Where possible, this report provides information on how the development proposal will be designed to meet the requirements of both the National Planning Policy Framework (NPPF) and local planning policy. Details of the NPPF is provided in Appendix 1 and relevant local planning policy by Mid Sussex District Council is provided in Appendix 2.



Figure 1. An aerial image showing the location of the site with approximate site boundary, (outlined in red). Image produced courtesy of Google maps (map data ©2022 Google).

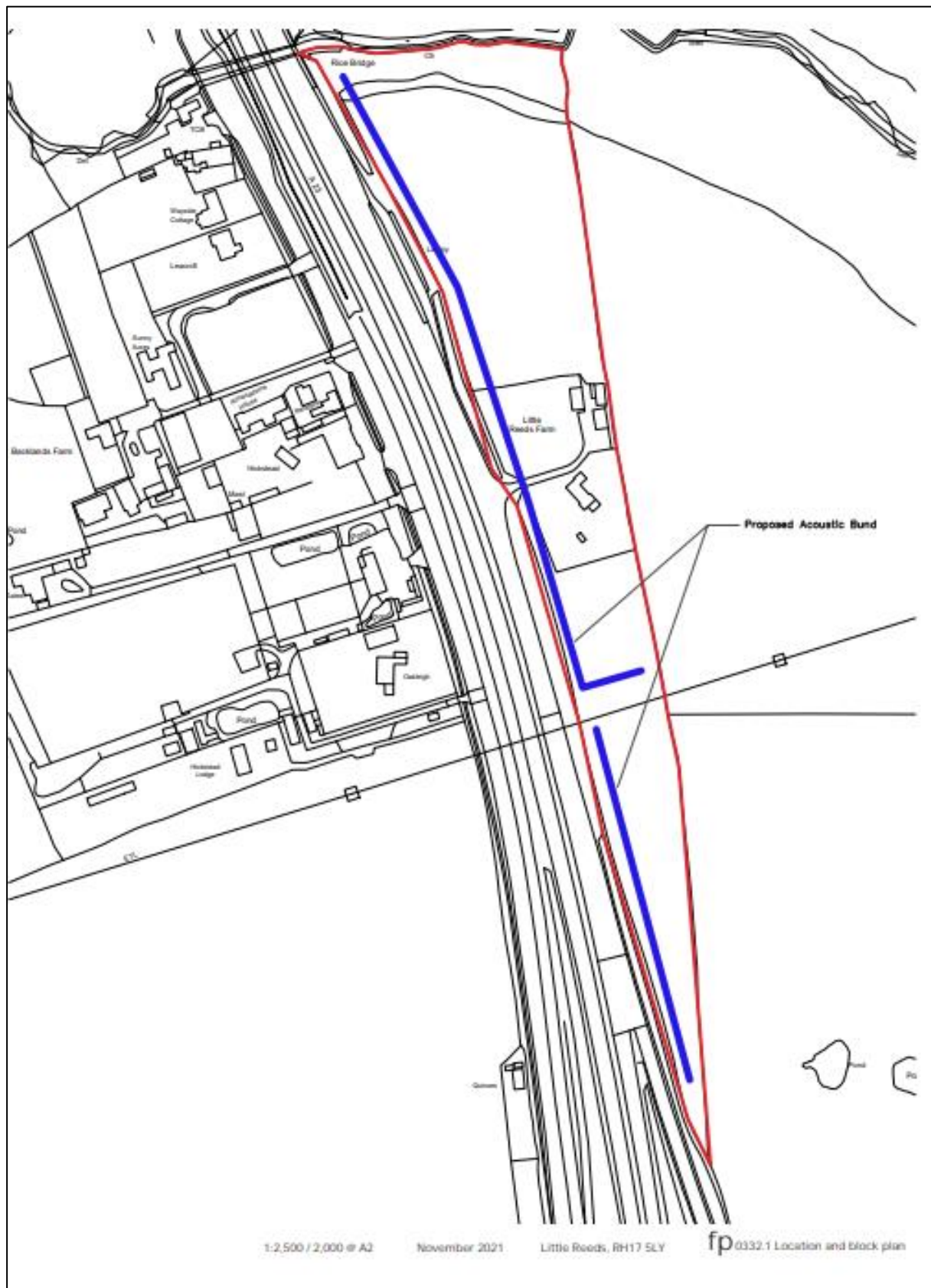


Figure 2. Proposed development plans for acoustic bund. Reproduced with permission from Fluid Planning. Drawing Title 'Little Reed, RH17 5LY'. Proposed location and block plan. Dwg No. 1:2.500/2000, Dated November 2021.



2 SURVEY METHODOLOGY

The following sections describe the methods used in the desk study and protected species/habitat survey(s). All survey methods are in accordance with current best practice guidance for the respective species/taxonomic group and any limitations encountered during the survey are explained in section 2.11.

This document is written in accordance with the CIEEM Guidelines for Ecological Impact Assessment² and CIEEM Guidelines for Ecological Report Writing³ Details of the ecological assessment methods are provided within section 2.10 below.

2.1 Desk Studies

A search for pre-existing records of protected species, priority species for conservation and invasive non-native species was requested from the Sussex Biodiversity Records Centre (SxBRC) within a radius of 2 km of the site boundaries.

A search of on-line mapping resources was undertaken to identify the location of any features of potential ecological interest including ponds within 500 m (relevant to great crested newts), watercourses (relevant to riparian mammals and crayfish for example) and connectivity to woodland, scrub, and hedgerow networks (relevant to bats and dormice, for example) in the wider landscape around the site. The connectivity of the site to these features, buildings and other semi-natural habitats are also relevant to species such as bats, great crested newts and reptiles.

The MAGIC website resource (www.magic.gov.uk) was used to identify the location of designated sites for nature conservation and European Protected Species (EPS) licences granted in relation to the survey site.

2.2 Habitat Survey

A site walkover survey was undertaken on 7th December 2021, during which the habitats contained within the site were described and evaluated in accordance with standard UK Habitat Classification (UKHab)⁴. The dominant species and indicators of important habitat types such as ancient woodland or unimproved grassland, were recorded.

UKHab survey presents a standardised system for classifying and mapping wildlife habitats in all parts of Great Britain, including urban areas. The aim of the survey is to provide, relatively rapidly, a record of the vegetation and wildlife habitats present over large areas of countryside. The habitat classification

² CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. Chartered Institute of Ecology and Environmental Management, Winchester.

³ CIEEM (2017) *Guidelines for Ecological Report Writing, 2nd edition*. Chartered Institute of Ecology and Environmental Management, Winchester.

⁴ The UK Habitat Classification Working Group (2018) *The UK Habitat Classification User Manual* at <http://ecountability.co.uk/ukhabworkinggroup-ukhab>



is based principally on vegetation, augmented by reference to topographic and substrate features, particularly where vegetation is not the dominant component of the habitat.

Data was gathered through a site walkover survey and use of on-line aerial photography to broadly categorise the habitats present using the UKHab classifications⁵. The results are presented as a map showing the distribution of habitat categories across the site. Target notes are used to describe specific features of biodiversity interest and record indicator species where appropriate. In addition to this, notable habitats, such as habitats listed under the NERC Act, 2006 are highlighted.

The UKHab methodology is a recognised tool for initial scoping of potential ecological constraints and opportunities, and for identifying potential effects of the proposed development as part of the planning application process.

As part of the Preliminary Ecological Appraisal, the site features were evaluated for their potential to support legally protected species and observations of any important plant communities, bird assemblages or other potentially valuable ecological features were recorded. Details of the preliminary survey methods for each legally protected species are given below and any specific limitations to the survey(s), such as access constraints, are set out in section 2.11.

2.3 Badgers

Badgers *Meles meles* tend to live in family groups with clearly defined territories with the main sett, used throughout the year, as a focal point. The territory often also contains a number of 'annex', 'subsidiary' and outlier setts that are used intermittently. Badgers can exist in a variety of habitats, but a mixed farmland landscape containing pasture and arable land, studded with woodland, scrub and hedgerows support the highest population density.

Evidence of badger activity was recorded during the Preliminary Ecological Assessment survey, during which surveyors searched for badger setts, latrines, foraging marks, footprints and worn pathways, and trapped hairs on fences, with special attention paid to linear features.

2.4 Bats

There are 18 species of bat resident in the UK, each with their own specific habitat requirements. Bats can use a wide range of features for roosting purposes including loft spaces, cavity walls, loose tiles, mortice joints and cracks/gaps in a variety of built structures. They can also be found in trees with holes, splits, cracks, cavities, ivy and loose bark. Bats are generally active at night and utilise a wide range of habitats for foraging and commuting between roost sites, hibernation sites and foraging habitats. Linear features such as hedgerows, woodland edges, even fences can be important for navigation between roosting and foraging habitats.

⁵ UK Habitat Classification Working Group (2018). *UK Habitat Classification – Habitat Definitions V1.0* at <http://ecountability.co.uk/ukhabworkinggroup-ukhab>



2.4.1 Natural Roost Features – Trees

All trees likely to be affected directly or indirectly by the proposed development were subject to a ground-based visual inspection to identify potential roost features, followed by climbing inspections where necessary and safe, to look for evidence of roosting bats and to further assess the suitability of the feature. Each tree/feature was categorised for its potential to support roosting bats as shown in Table 1 in accordance with best practice guidance⁶.

Table 1. Characterising potential roost features in trees.

Category	Description
Negligible	A tree with negligible roosting habitat features likely to be used by bats.
Low	A tree of sufficient size to potentially support roosting features, but with none seen from the ground or features identified of limited roosting potential.
Medium	A tree with one or more potential roost sites that could be used by bats due to their size, conditions and surrounding habitat, but unlikely to support a roost of high conservation status such as a maternity or hibernation roost.
High	Trees with one or more potential roost sites that appear suitable for large numbers of bats or use as maternity or hibernation roosts.

2.4.2 Bat Activity Surveys – Walked Transects

Bat activity surveys followed best practice guidelines⁶. Pre-determined transect routes were followed by surveyors (Figure 3), focussing on all linear features within the site boundary (tree-lines, and hedgerows). The transect routes were walked at a slow pace during the period from sunset to two hours after sunset by a team of surveyors, such that each part of the route was passed approximately every twenty minutes. All surveys were undertaken during weather conditions suitable for bat activity and at ambient temperatures above 10°C. The surveyors recorded bat activity using 'Echo Meter Touch' bat detectors featuring auto-identification of bat species and automatically triggered recording for later review. The locations of all bat 'registrations' was recorded onto a field map during the survey to correspond with all sound recordings.

2.4.3 Bat Activity Surveys – Automated Static Bat Detecting

Two Elekon Batlogger A static bat detectors were deployed across the site (Figure) on three separate occasions, in May, July and September 2022, and left in the field for a minimum of five days – the expected maximum lifetime of the battery. Static bat detectors comprise a passive recording device with real-time full-spectrum calls that can be viewed in detail once downloaded on analysis software, allowing accurate identification of most bat calls to species level (or genus level in the case of *Myotis* and *Plecotus* spp.).

⁶Collins, J.(ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*. The Bat Conservation Trust, London.

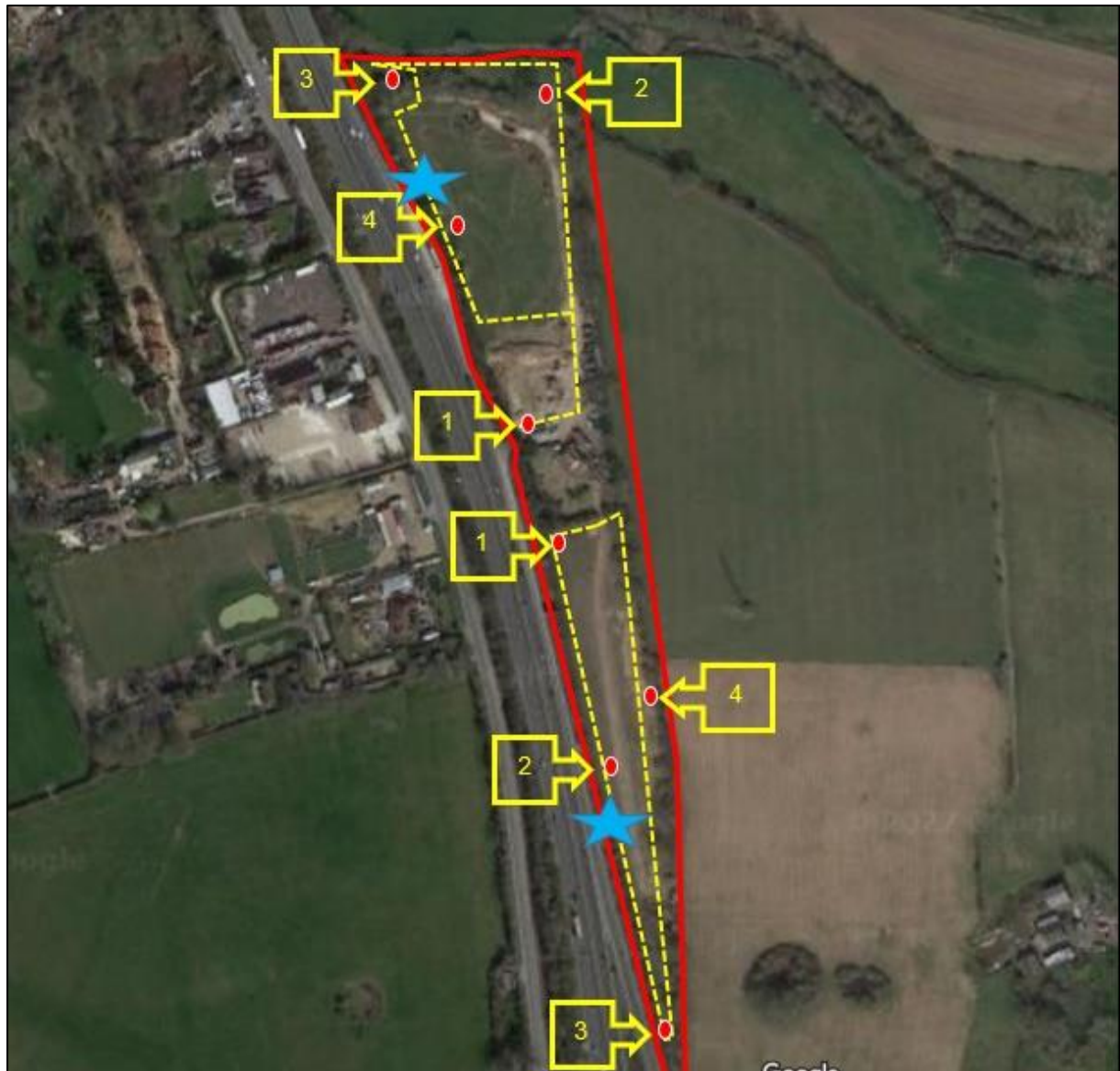


Figure 3. The transect routes of surveyors with stops (yellow numbers) and the position of the two of static bat detectors deployed on the site (blue stars). Image produced courtesy of Google maps (map data ©2022 Google).

The walked transect and static bat detector ('bat logger') survey methods complement each other with the transect surveys providing information on foraging and commuting patterns, and distribution across the site; and automated static detector surveys giving more prolonged coverage through consecutive nights, thus increasing the likelihood of detecting scarce species.

2.5 Breeding Birds

The habitats contained within the site and adjacent areas were broadly assessed for their potential to support important bird species/assemblages and breeding birds. Any birds identified during the site visit were recorded. Special attention was paid to notable species such as red-listed Birds of Conservation Concern (Stanbury *et al.* 2021)⁷ and those species afforded special protection on Schedule 1 of the

⁷ Stanbury, A., Eaton, M., Aebischer, N., Balmer, N., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I.



Wildlife and Countryside Act (1981). Further surveys are recommended as appropriate.

2.6 Common Dormouse

Common dormice are typically associated with broadleaved woodland habitat, hedgerows and scrub. They tend to occur at low density and good habitat connectivity is important. Common dormice need a constant supply of food throughout the active season over a large home range. A diversity of tree and shrub species will provide a range of fruit, nuts and insects. They hibernate during the winter – typically at ground level amongst leaf litter and mosses protected by coppice stools, tree stumps or piles of brash wood.

2.6.1 Nest Tube/Box Survey

Dormouse surveys are undertaken by attaching purpose built ‘nest tubes’ on trees and shrubs in suitable habitat such as woodland, scrub and hedgerows. Nest tubes are used by dormice as places of shelter and they will often construct their nests within them during their periods of activity (typically between April and November). In accordance with current best practice guidelines⁸, 50 nest tubes were deployed approximately 20m apart in the mixed shrub on 29th March 2022 and left *in situ* for the survey season (see Figure 4). These were checked on a monthly basis for presence of animals and evidence of dormouse presence (distinctively woven nests) from the 20th April until the 25th October 2022. Since the likelihood of use by dormice varies through the year, an index of probability score is used to determine confidence in a particular survey (see Table 3 below, comprising checks over several months. A minimum score of 21 is normally accepted to establish ‘likely absence’ in the event that no signs of dormice are found during the survey.

Table 2. Search effort score for each month that dormouse tubes are out on the site and subject to checks for occupation.

Month of check	Index of probability
April	1
May	4
June	2
July	2
August	5
September	7
October	2
November	2

Dormice checks were undertaken in the mornings and commenced one month after the nest-tubes were positioned. Surveys were undertaken under the supervision of licensed surveyors: Dan Bennett and Kate Lewis.

(2021). Birds of Conservation Concern 5: the status of bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man. British Birds 114, pp 723-747..

⁸ Bright, B., Morris, P., Mitchell-Jones, A.J. and Mitchell-Jones, T (1997) *The Dormouse Conservation Handbook*. English Nature.



Figure 4. Dormouse nest tube locations (identified by yellow dotted line) across all suitable habitat. Image produced courtesy of Google maps (map data ©2022 Google).

2.7 Great Crested Newts

Great crested newts require ponds for breeding that meet a series of habitat criteria including good quality water, aquatic plants and an absence of predatory fish. The ponds must have good connectivity to semi-natural terrestrial habitats that provide their invertebrate food sources and suitable safe places to rest and hibernate outside the breeding season. Great crested newts tend to occur more frequently in areas of high pond density across the landscape in ‘metapopulations’ where habitat occupancy ebbs and flows according to changes in conditions.

2.7.1 Habitat Suitability Assessment

Little Reeds Farm does not contain any ponds within its boundaries. The desk study revealed four waterbodies within 250m of the site boundary. Where ponds were visible from public rights of way or



access permission was granted, they were assessed for their potential to support great crested newts using the Habitat Suitability Index (HSI) (Oldham et al 2000).

Those ponds within 250m of the site's boundaries, and with 'average' or 'above average' suitability for breeding great crested newts, were carried forward for Environmental DNA (eDNA) sampling and/or presence/likely absence surveys.

2.7.2 Environmental DNA Sampling and Analysis

This relatively new technique allows a quick and reliable qualitative measure of the presence/likely absence of great crested newts. It involves collection of water samples from a pond, using a standard protocol set out by Natural England⁹. The samples are sent to an approved laboratory to isolate and determine presence of environmental DNA (eDNA) shed into the water by amphibians during the breeding season. The eDNA samples were taken on 20th April 2022.

Ponds that were confirmed as positive for great crested newt DNA were then carried forward to full field survey (population size class assessment).

2.8 Other Notable Species

The site's habitats were broadly assessed for their potential to support species of principal importance for nature conservation (Section 41 NERC Act 2006) and other notable species. This includes mammals such as harvest mouse *Micromys minutus*, hedgehog *Erinaceus europaeus*, brown hare *Lepus europaeus*, and many bird species. The site was broadly assessed for its potential to support important invertebrate assemblages with specific attention paid to features such as standing dead-wood, wet flushes, bare earth banks and botanically rich areas.

2.9 Invasive Non-native Species

No specific surveys for invasive non-native species (INNS) were undertaken. However, the presence of any invasive non-native species encountered during other fieldwork, was recorded.

2.10 Impact Assessment Methodology and Mitigation

The assessment of ecological impacts and mitigation recommendations in this report follow CIEEM Guidelines for Ecological Impact Assessment (EcIA)². This involves evaluating the importance of an 'ecological feature' (habitat, vegetation community, population of a single species or assemblages of species) in terms of nature conservation priority, followed by the application of the 'mitigation hierarchy'.

2.10.1 Importance of Ecological Features

A level of importance was assigned to all existing ecological features through consideration of the rarity

⁹ Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F 2014. *Analytical and methodological development for improved surveillance of the Great Crested Newt*. Defra Project WC1067. Freshwater Habitats Trust: Oxford.



and distribution of a habitat or species, the population size, ecological function, and trends (declining/expanding), together with any designations, legal status, or conservation policies. CIEEM recommend that the importance of an ecological feature, in terms of nature conservation priority, should be considered within a defined geographical context (for definitions used by The Ecology Co-op, see Appendix 3):

- international and European
- national
- regional
- county
- local or parish
- site/negligible.

Where protected species are present and there is the potential for a breach of the legislation as a result of the development proposals, those species are considered as ‘important’ features and included in the EcIA. However, the level of importance assigned to the affected population of a protected species will vary depending on contextual information about the population size, distribution, abundance and trends across the range of geographical scales.

Similarly, irreplaceable habitats such as ancient broadleaved woodland are considered as important features and included in the EcIA. The level of importance will vary depending on the size of the habitat parcel, its distribution and abundance at different geographical scales.

Features that are considered to be important at site level only or are of negligible importance (such as paved ground or amenity grassland) are excluded from this EcIA and it should be reasonable to assume that if a feature is not mentioned, it is not ecologically important.

2.10.2 Significance of Effects

In accordance with EcIA (CIEEM 2018)², a significant effect is defined as “an effect that either supports or undermines biodiversity conservation objectives for important ecological features”. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy). The effects may be described as significant at a range of geographic scales as defined above.

The impacts are identified and described in relation to the following characteristics:

- *adverse or positive* – does the impact result in the loss or gain in biodiversity/quality of the environment?
- *extent, magnitude* – the spatial area over which the impact may occur, the area of habitat lost, or the number of individuals/populations affected
- *timing* – in relation to the life cycle of the ecological feature (e.g. nesting bird season)
- *duration, frequency* – is the impact temporary or permanent, frequently repeated or a one-off event?
- *reversibility* – is the impact temporary or permanent? Would the ecological feature recover after the impact?



- *cumulative impacts* – in combination with other plans/projects.

This report has only sought to describe in detail the impacts that are likely to be significant. Impacts that are either unlikely to occur, or if they did occur are unlikely to have a significant effect have been discounted or ‘scoped out’ at an earlier stage. Effects on the conservation status of ecological features are only assessed in detail if they have a high enough value (local or above) and impacts upon them may be a material consideration in decision-making in terms of legislation and planning policy. Impacts on features below local value are categorised as of neutral significance and are not considered further. However, where it has not been possible to robustly conclude that there are no significant effects (due to insufficient survey data or scientific research for example), then the precautionary principle will be applied and a significant effect is assumed.

2.10.3 The ‘Mitigation Hierarchy’

The assessment of the significance of an effect is made initially in the absence of mitigation. This is followed by a sequential process of determining the most appropriate way to remove or minimise significant effects. The preferred option is to avoid impacts in the first place, for example by redesigning the scheme to retain an important area of habitat, or timing works sensitively. Mitigation measures such as translocation or displacement of populations is only applied as a last resort where significant effects are unavoidable.

When residual significant adverse effects remain after all practicable measures to avoid and/or minimise impacts have been applied, compensation measures are required. Compensation measures include habitat creation in alternative locations that offset unavoidable habitat loss.

Finally, enhancements are proposed that do not relate to a specific impact and effect but provide net gains in biodiversity – taking advantage of opportunities in the design and operation of the proposed development. These measures are intended to ensure that the proposed development contributes towards national and local biodiversity objectives.

2.11 Constraints/Limitations to Surveys

Surveys record any flora or fauna that is present at the time of the survey visits. It is therefore possible that some species may not have been present during the surveys but may be evident at other times of the year and may appear or disappear from the site if habitat conditions change. For this reason, the surveys are considered valid for up to eighteen months for badgers and bats, two years for reptiles and three years for great crested newts and dormice. If the habitat conditions change significantly in the intervening period, then it is recommended that the surveys be updated.

3 ECOLOGICAL BASELINE

3.1 Designated Sites

The site is outside the zone of influence of all designated sites and, based on this and the small scale of the development, there are no identified mechanisms of impact on designated sites as a result of the proposed development.



Therefore, in relation to designated sites, the proposed development is considered to pose a ‘negligible’ impact risk.

There are several small parcels of ancient and replanted woodland in a 1km radius of the site boundary (Figure 5). The nearest woodlands are known as Hickshaw Wood, a small pocket (0.38 ha) 260m to the north-east and the larger Wontly Wood (8.66ha) 383m directly north.

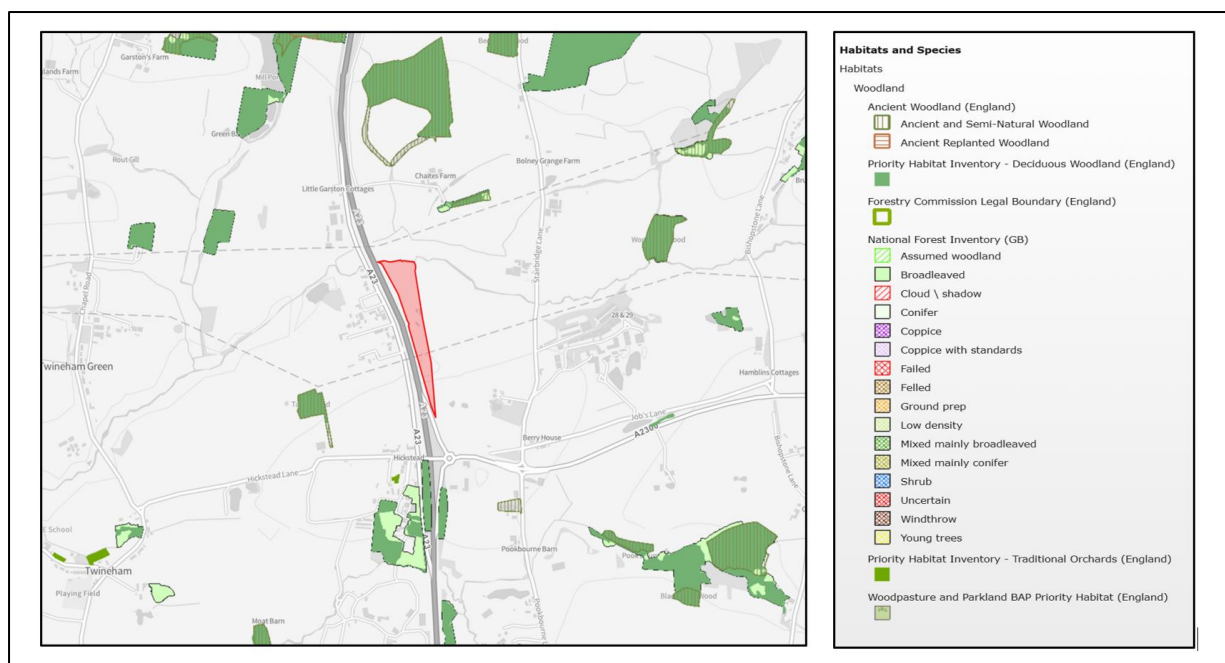


Figure 5. Ancient and semi-natural woodland, and deciduous woodland (green) in relation to Little Reed Farm (outlined in red). Image produced courtesy of Magic maps (<http://www.magic.gov.uk/>, contains public sector information licensed under the Open Government Licence v3.0)

3.2 Habitats

The application site comprises two field parcels containing horse pasture grassland that is intermediate between ‘*Lolium-Cynosurus* neutral grassland (UK HAB code = g3c6)’ and ‘modified grassland (UK HAB code = g4)’. Both fields have a domed topography formed of ‘made ground’ from the construction of the A23 dual carriageway. The continuous horse grazing has produced a short sward of perennial rye grass *Lolium perenne*, Yorkshire fog *Holcus lanatus*, false oat-grass, cocksfoot *Dactylis glomerata*, creeping thistle *Cirsium arvense*, creeping buttercup, creeping cinquefoil *Potentilla reptans*, common sorrel *Rumex acetosa*, lesser stitchwort *Stellaria graminea*, white clover *Trifolium repens*, common mouse-ear *Cerastium fontanum* and hard rush *Juncus inflexus*. The grass species dominate, with over 75% cover, and forbs associated with less fertile soil are present, but rare. The field to the south has a shorter sward with a more broken substrate, due to recent intensive grazing pressure (Photograph 6 & 7).

The A23 verge bordering the full length of the application site supports a belt of ‘mixed scrub (UK HAB code = h3h)’, with scattered trees (UK HAB code= 11), comprising hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, hazel *Corylus avellana*, field maple *Acer campestre*, spindle *Euonymus*



europaeus and crab apple *Malus sylvestris*. Trees include immature oak *Quercus robur*, silver birch *Betula pendula*, ash *Fraxinus excelsior* and occasional weeping willow *Salix babylonica* and gum *Eucalyptus* spp. The herb layer is predominantly common nettle *Urtica dioica* with patches of ground ivy *Glechoma hederacea* (Photograph 9). The scrub is growing between the road itself and the timber post-and-rail highway fence with badger and rabbit netting (Photograph 10). Towards the entrance into the site, this scrub gives way to a planted belt of Leyland cypress *Cupressus x leylandii* trees which form an evergreen visual screen. Associated with the cluster of buildings (UK HAB code = u1b5) at the centre of the site and entrance, there is an area of bare ground that has been recently cleared (UK HAB code = 'artificial unvegetated unsealed surface u1c') and residential gardens, where a new timber panel fence has been erected along the A23 highway boundary.

A short section of similar mixed scrub and trees connects the highway verge scrub to the eastern field boundary across the northern end of the application site. This section contains at least one large mature English oak and separates the horse pasture from the corridor of the flowing watercourse, the Holmbush Gill that forms the northern boundary to the site. This watercourse fits UKHab category 'Other rivers and streams (UK HAB code = r2a)'. The channel is contained within steep eroded clay banks, and has a sand and silt dominated substrate. It is sparsely vegetated with clumps of reed canary grass *Phalaris arundacea*, visible above the waterline. However, at the time of the visit the flow and water levels appeared higher than the base flow carrying a high suspended silt load.

The area between the watercourse and the scrub belt comprises a mix of tall ruderal herb vegetation and annuals, (UK HAB code =17), comprising common nettle, broad leaf dock *Rumex obtusifolius*, cleavers *Galium aparine*, creeping buttercup *Ranunculus repens*, smooth sow thistle *Sonchus oleraceus*, common figwort *Scrophularia nodosa*, groundsel *Senecio vulgaris*, common field speedwell *Veronica persica*, mustard spp. *Sisymbrium* spp., false oat grass *Arrhenatherum elatius*, goosefoot spp. *Chenopodium* spp., and cocksfoot *Dactylis glomerata*.

The eastern boundary of the site is marked by a line of trees (UK HAB code = w1g6) and scrub dominated by blackthorn and hawthorn (UK HAB codes = h3a6 and h3f). There is a group of sixteen semi mature oak trees growing in the southern tip of the site where the eastern boundary converges with the A23 verge.



Photograph 1. The Holmbush Gill, in the north-east corner of the site, towards spate conditions.



Photograph 2. The Holmbush Gill, running along the northern boundary.



Photograph 3. Tall ruderal herb community between the watercourse and scrub on the northern boundary.



Photograph 4. Narrow belt of scrub separating the floodplain from the grassland beyond.



Photograph 5. View of southern edge of narrow belt of scrub, illustrating the mature oak tree.



Photograph 6. Northern field of neutral grassland looking north, with western boundary.



Photograph 7. Southern field of neutral grassland, looking south with western boundary.



Photograph 8. Semi mature oaks in the southern tip of site.



Photograph 9. Western boundary of mixed scrub, looking south.



Photograph 10. Timber 'post and rail', fence along the verge of the A23 on the western boundary.



Photograph 11. Eastern boundary, taken from the entrance to the southern field.



Photograph 12. New timber fencing around the entrance and line of leyland cypress.



Photograph 13. Western boundary near recent earthworks.



Photograph 14. Recent earthworks adjacent to the entrance.



Photograph 15. Unsealed hardstanding used to park vehicles, and the workshop and temporary dwelling near the entrance.



Photograph 16. Oak tree supporting potential bat roosting feature.

3.3 Bats

3.3.1 Roost Features

The buildings contained within the application site remain unaffected by the proposed acoustic bund and are considered separately as part of another proposed development project. As such, they were not assessed in detail for their potential to support roosting bats during the current survey.

The linear features formed by the scrub belt along the A23 verge, the tree lined eastern field boundary and the Holmbush Gill flowing along the north boundary are all ecologically connected to the local landscape and have potential to be used by bats for commuting and foraging as part of their home ranges. Overall, the habitats contained within the site represent 'moderate quality' foraging habitat for bats; the section of the A23 is not street-lit but carries a high traffic load and vehicle headlights are likely to discourage more light-sensitive bat species.

A ground-based assessment of the semi mature oak trees within the southern tip of the site identified a rot hole within one tree near the western boundary, at a height of approximately 15m, which could potentially extend further inside the tree (Photograph 16). This tree has 'moderate potential for roosting bats.

3.3.2 Bat Activity Surveys – Walked Transects

A total of five species groups were recorded across the site: common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared *Plecotus auritus*, *Nyctalus* sp, (which may have been either noctule *Nyctalus noctule* or Leisler's bat *Nyctalus leisleri* which are difficult to differentiate). A *Myotis* sp. was also one of the five bats recorded, but due to echolocation overlap it is impossible to accurately separate the individual species. The majority of bat activity was from both common and soprano pipistrelles recorded foraging continuously during surveys along linear features



such as the site boundaries, and the along the Holmbush Gill along the northern boundary as well as in the yard in the centre during the May and July survey visits. There were also multiple passes from *Myotis* sp. and *Nyctalus* sp. mainly noctule's; however, a higher frequency was recorded to the south on the September visit which may have been a Leisler's bat.

Survey conditions and timings are presented in Table 3. The cumulative results of both the northern and southern walked transect surveys are summarised in Figure . This shows the distribution of all bat 'observations' on each walked transect, during which the route was covered at least three times in a session.

Table 3. Walked transect metadata: dates, times, temperature, weather conditions.

Date	Survey start time/end time	Temp. degrees centigrade, weather conditions	Surveyors
19 th May 2022	20:50–22:50 Sunset: 20:50	Max/Min temp.: 18-16°C 10% cloud cover, calm, dry.	Dan Bennett, BSc, MCIEEM, Class licence: 2017-27499-CLS-CLS Rebecca Mortensen
18 th July 2022	21.05-23.05 Sunset: 21.05	Max/Min temp.: 26-24°C 0% cloud cover, calm, dry. (Very warm and dry)	Rebecca Mortensen Aaron Hart
12 th September 2022	19:24–21.24 Sunset: 19.24	Max/Min temp.: 19-14°C 100% cloud cover, calm, started dry, light drizzle towards the end of the survey.	Dan Bennett, BSc, MCIEEM, Rebecca Mortensen

Key to Bat Activity Survey

Species of bats seen or heard

- = brown long-eared bat
- = soprano pipistrelle
- = common pipistrelle
- = Noctule
- = *Nyctalus* species (potentially Liesler's)
- = *Myotis* species

Line thickness indicates the frequency of passes

-  = multiple passes
-  = +10 passes



Figure 6. Cumulative summary of distribution of bats detected over three walked surveys on the northern transect. Coloured dots represent bat activity. The thickness of any lines indicates the intensity of activity. Coloured dots represent bat activity. Image produced courtesy of Google maps (map data ©2022 Google).

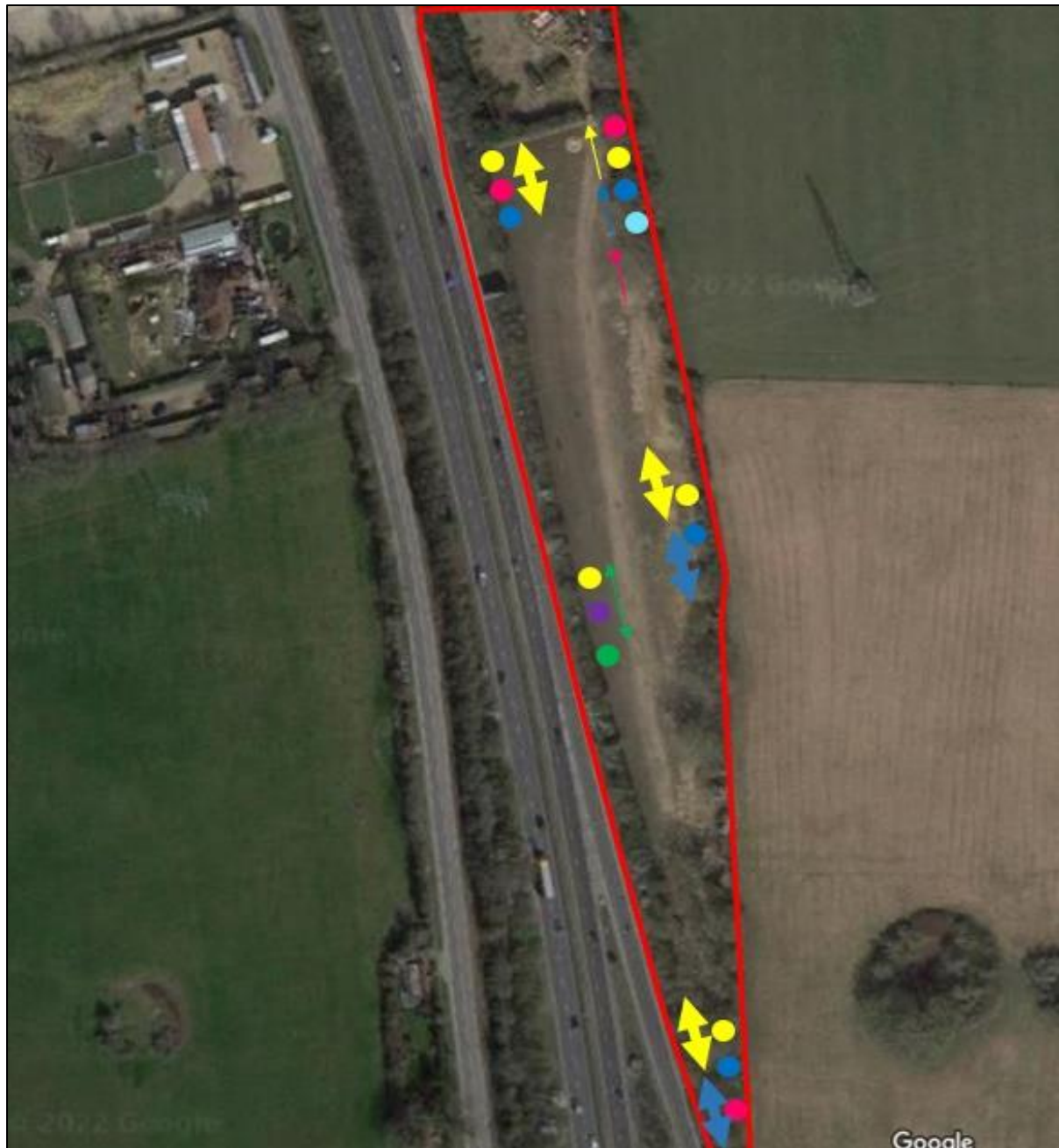


Figure 7. Cumulative summary of distribution of bats detected over three walked surveys on the southern transect. Coloured dots represent bat activity. The thickness of any lines indicates the intensity of activity. Coloured dots represent bat activity. Image produced courtesy of Google maps (map data ©2022 Google).

3.3.3 Bat Activity Surveys – Automated Static Bat Detecting

The results of the automated static bat detector surveys are summarised in Table 4.

Two static detectors were deployed for five or more nights during May, July and September 2022.

A total of seven species of bat were recorded across the site included a species regarded as vulnerable in England (the serotine *Eptesicus serotinus*) and one as near threatened, *Nyctalus* sp. (if Leisler's),



according to the IUCN red list¹⁰. A *Myotis* sp. was also recorded due to the difficulty of accurately separating individual species their importance within the context of their conservation status cannot be obtained.

Serotine (vulnerable, south and south-east England)

Serotines were recorded in very low numbers on five of the six deployments in both the north and the south field. An average of one pass was recorded during September in the northern field and in July in the southern field, less than one pass was recorded during other deployments and there were no passes of serotines in the northern field during the six nights in May.

***Nyctalus* sp. (near threatened if Leisler's, widespread in England and Ireland, localised populations in Scotland and Wales).**

Low activity of *Nyctalus* sp. was recorded in the southern field during the May and July deployments, with an average of one bat pass during the six nights in July and less than one in May. No other passes were recorded during the other deployments.

***Myotis* (species dependent)**

Myotis sp. were consistently active during each deployment; the higher number of passes were recorded during July and September in the northern field, with an average of four passes a night, whereas the other deployments recorded an average of two passes per night.

Common pipistrelle (least concern, widespread)

Common pipistrelles were the most frequently recorded species; a high level of activity was recorded in May in the northern field with an average of 178 passes per night, which is substantially higher than other deployments. This result was not reflected in the southern field where an average of 16 passes was recorded; higher activity was recorded during July.

Soprano pipistrelle (least Concern, widespread))

Soprano pipistrelles were also recorded in high numbers during the May deployment in the north, with an average of 82 passes per night. They were the most active bat during the six nights in September in the northern field.

Noctule (least Concern, widespread))

Noctule activity was generally recorded consistently at moderate levels, with the exception of July, where there were substantially more passes recorded in both the north and south fields compared to other species and other deployments. An average of 40 passes were recorded per night to the north and 18 to the south. Other deployments ranged between 3 and 5 passes per night.

Brown long-eared bats (least concern, widespread)

Low levels of activity were recorded for this species which peaked in July with a single pass per night to the south, on average, no passes were recorded in the north during this deployment.

¹⁰ The Mammal Society (2020): <https://www.mammal.org.uk/science-research/red-list/>



Table 4. Mean number of passes recorded by each static detector (rounded to nearest whole number) per night.

Location	Date	Common pipistrelle	Soprano pipistrelle	Brown long-eared	Myotis sp.	Serotine	Noctule	Nyctalus sp.
North field	May (5 nights)	178	82	<1	2	0	5	0
	July (6 nights)	18	20	0	4	<1	40	0
	September (6 nights)	6	33	<1	4	1	4	0
South field	May (5 nights)	16	10	<1	2	<1	4	<1
	July (6 nights)	18	7	1	2	1	18	1
	September (6 nights)	5	9	<1	2	<1	3	0
Total		241	161	3	16	4.5	74	1.5

3.3.4 Pre-existing Records

The SxBRC search indicates the presence of eight species of bat, as well as unidentified pipistrelles and long-eared bats within 2km of the site (Table 4) including seven maternity and two hibernation roosts.

Table 4. Bat records returned within a 2km radius of the site.

Species	Number of records	Number roost records	Maximum abundance
Pipistrelle bat <i>Pipistrellus</i> sp.	6	1	75
Common pipistrelle <i>Pipistrellus pipistrellus</i>	11	3	101
Soprano pipistrelle <i>Pipistrelle pygmaeus</i>	2	1	5
Long-eared bat <i>Plecotus</i> sp.	4	4	1
Brown long-eared bat <i>Plecotus auritus</i>	11	9	24
Serotine <i>Eptesicus serotinus</i>	4	4	50
Noctule <i>Nyctalus noctula</i>	1	0	1
Daubenton's bat <i>Myotis Myotis daubentonii</i>	11	0	26
Whiskered bat <i>Myotis mystacinus</i>	1	0	1
Bechstein's bat <i>Myotis bechsteinii</i>	1	0	1

3.3.5 Interpretation

Moderate activity levels were recorded from noctule's, and common and soprano pipistrelles, with low levels of activity from myotis sp. Extremely low levels of brown long-eared and *Nyctalus* sp. activity suggests that they are infrequent visitors to the site. The majority of bat passes were recorded in the northern field, this is likely due to the location of the watercourse along the northern boundary. May was by far the busiest month with high activity from both common and soprano pipistrelles recorded in the north. July's deployment recorded a higher number of passes of noctule bats, it is also worth noting that



record breaking temperatures were recorded by the Met office¹¹ during this deployment, which may have impacted bat behaviour. Overall, the surveys demonstrate that the habitats contained within the development site do support foraging and commuting bats at low to moderate levels, peaking in May, and are sustained throughout the summer season. Bats are opportunistic and will exploit a range of habitats across the landscape in response to the rise and fall of insect populations. These surveys indicate that the habitats contained within the site are utilised intermittently as part of the wider landscape by common and widespread bat species.

The most important species identified was serotine, which was recorded in very low numbers on the static loggers. Serotine bats specialise on large beetle prey and are often associated with grazing pastures where there is an abundance of dung beetles, but they can be found in a wide range of habitats including towns and villages, where they roost in buildings.

As such, the development site is considered to be important to bats at the **local level**.

3.4 Dormice

3.4.1 Nest-tube Survey

No evidence of dormice was identified during the survey; nest material was present in tubes; however, this was unwoven and likely to be that of wood mouse *Apodemus sylvaticus* (Photograph 17). Food caches were recorded on two occasions, consisting of acorns, which dormice do not consume on account of their toxicity; however, wood mice are tolerant of them. Furthermore, nesting birds were recorded using the tubes during May and June.

The survey findings, dates of checks and weather conditions are presented in Appendix 4.

3.4.2 Pre-existing Records

SxBRC provided one dormouse record in the search area, from Dumbrells Farm way area, dated 2005, approximately 1km to the south-east of the site.

3.4.3 Interpretation

The survey results indicate the likely absence of dormice on the potential development site, despite the moderate potential of the scrub habitat bordering the A23 and eastern boundary to support common dormouse. These habitats are ecologically well connected to a network of woodland and similar habitats across the local landscape and contains the shrub species such as hazel that are typically considered important sources of food for this species and there are woodland blocks directly connected to the site.

Based on these results, the application site is considered unlikely to support common dormice and is considered to be of **negligible** importance to dormice conservation.

¹¹ The Met Office (2022): [Record breaking temperatures for the UK - Met Office](#)



Photograph 17. Two wood mice found during the October check of nesting tubes.

3.5 Great Crested Newts

3.5.1 Habitat Suitability, eDNA Testing and Field Survey Results

There are no ponds contained within the site. The PEA identified four ponds within 250m of the site. Habitat assessments were undertaken, where access was granted, during a site visit on the 20th April 2022, water samples were taken from any ponds which scored a HSI value of 'average' or above. The belt of scrub and trees along the western boundary of the site is suitable terrestrial habitat. However, the grassland was assessed to be unsuitable due to the grazing pressure and the continued disturbance caused by heavy vehicles.

Letters were sent out to landowners requesting access permission to sample ponds 3 and 4, no response was received (see Appendix 6 for example letters). However, Pond 4 could be seen from public footpaths to complete a HSI assessment; pond 3 was behind a fence and therefore, could not be assessed.

Pond 1 (Photograph 18), was dry and scored 'below average' on the HSI. Pond 2 (Photograph 19) HSI value suggested 'good suitability' due to good water quality and only drying up rarely, therefore, this pond was subject to eDNA analysis. The results were negative for the presence of great crested newts. Pond 4 was identified as 'below average' due to poor water quality and cover of common duckweed *Lemna minor*, (Photograph 20).

Details of the HSI assessments and eDNA results are presented in Appendix 5.

Error! Reference source not found. 5 presents a summary of all surveys undertaken at ponds within 250m of the proposed development boundary. The location of each pond is presented in order of distance from the site boundary, nearest first. All ponds identified within 250m have been assessed in some way or another and have been accounted for, for the purposes of this EcIA.



Table 5. Summary of great crested newt assessments and surveys.

Ref.	NGR	Distance/ direction	Description	HSI value	Interpretation	Survey results
1	TQ 2701 2050	60m, south-east of the site.	Dry, at the time of field survey, pond in an agricultural field, edged with scrub.	0.59	'Below average suitability'	Dry at the time, no water samples could be collected for eDNA analysis
2	TQ 2706 2050	109m, south- east	Edged with scrub, in an agricultural field, daphnia present and toad tadpoles.	0.79	'good suitability'	Negative eDNA result
3	TQ 2718 2049	237m, south-east	No visual	n/a	n/a	No access gained, for HSI or eDNA sampling
4.	TQ 2694 2133	263m, north-east	Surrounded by semi mature trees with a 100% cover of common duckweed.	0.60	'below average'	No access gained for eDNA sampling

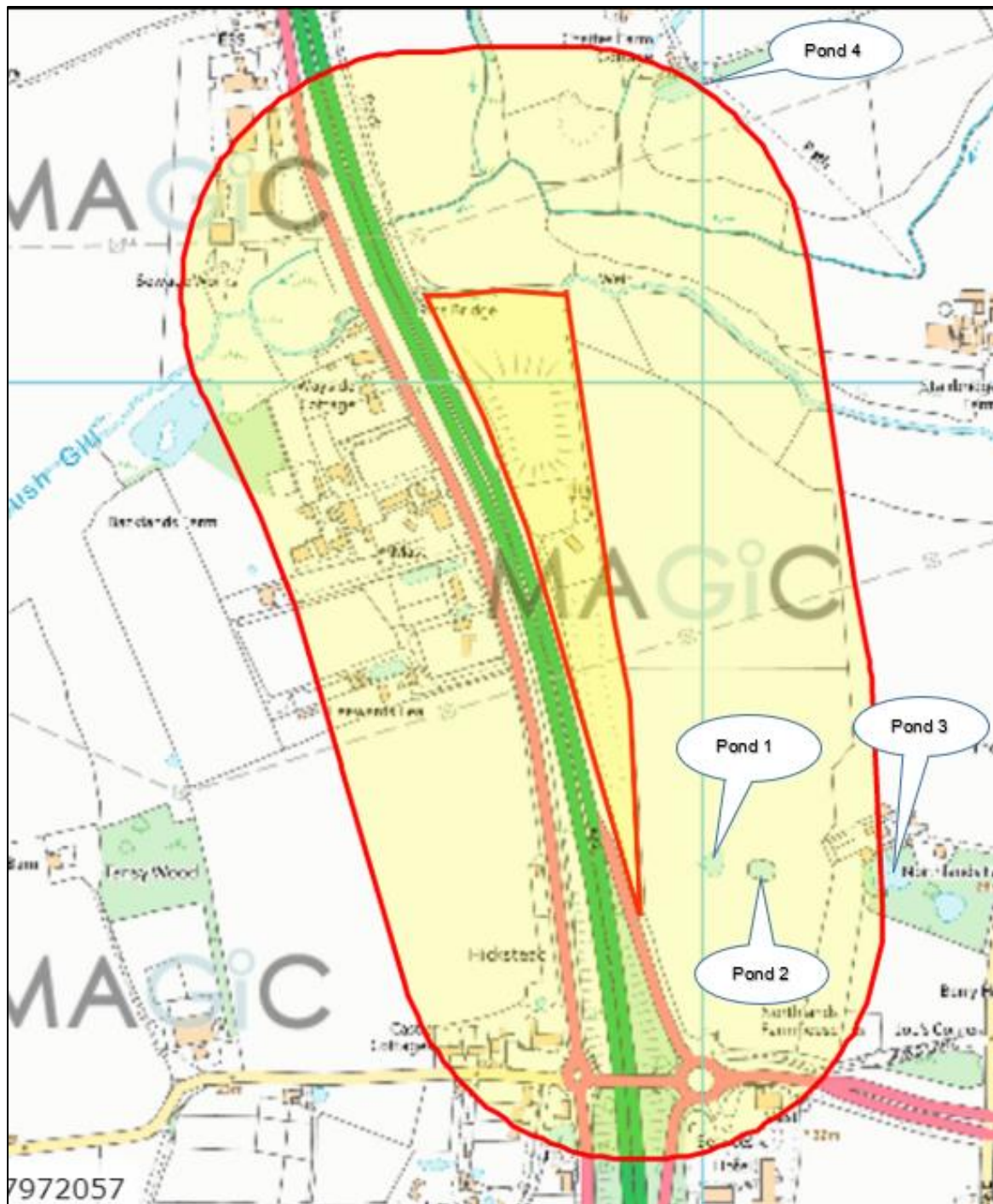


Figure 8. Ponds within 250m of the site (yellow shaded area). Image produced courtesy of Magic maps (<http://www.magic.gov.uk/>, contains public sector information licensed under the Open Government Licence v3.0).

3.5.2 Pre-existing Records

The SxBRc search indicated the presence of 40 records of great crested newts within 2km of the site, 32 are on the western side of the A23 which could be considered as a significant barrier to the movement of the species, and 8 are on the same side as the development site. However, none of the records are within 250m of the site. Additionally, there are 182 records of common toad *Bufo bufo* within



the search area.

3.5.3 Interpretation

No ponds have been assessed as suitable for great crested newts; however, one pond has not been assessed (Pond 3), therefore the presence of great crested newts cannot be completely ruled out. The terrestrial habitat within the impact zone of the proposed bund, i.e. the belt of scrub and scattered trees, is suitable for the species.

Based on these factors, the habitats supported by Little Reeds Farm is considered to be important for the conservation of great crested newts at **site level**.



Photograph 18. Pond 1, taken during HSI assessment, April 2022.



Photograph 19. Pond 2, taken during HIS assessment, April 2022.



Photograph 20. Pond 4 taken during HSI assessment, April 2022.

3.6 Other Notable Species

3.6.1 Survey Results

All scrub, saplings, semi-mature and mature trees contained within the site have the potential to support



a variety of common nesting birds. However, these are unlikely to support important bird assemblages or priority species of bird this close to the significant infrastructure of the A23.

The habitats contained within the site are suitable for West European hedgehog *Erinaceus europaeus*, harvest mouse *Micromys minutus*, and a suite of common invertebrate species. The hedgerow, woodland and scattered scrub habitats are also likely to support an assemblage of common breeding birds.

The Holmbush Gill, flows west across the northern boundary of the site and joins the River Adur approximately 3km away. During the site visit, the river was subject to high flow conditions and any evidence of riparian wildlife is likely to have been washed away. Based, on the recent recovery of populations in recent years across Sussex, there is a possibility that it is used occasionally by otters as part of a wider home range. Based on the habitat conditions, it is highly unlikely to support water voles and American mink are likely to be widespread across the catchment.

3.6.2 Pre-existing Records

SxBRC provided many bird records within the 2km search radius. Many of these records are for non-breeding visitors passing through the area (e.g. herring gull *Larus argentatus*). Within the last ten years there are 26 records of species listed as a priority for conservation under the S41, NERC Act (2006) including nightingale *Luscinia megarhynchos*, dunnoek *Prunella modularis*, skylark *Alauda arvensis*, and lapwing *Vanellus vanellus*.

SxBRC provided 23 records of hedgehog dated between 2001 and 2020, and one record of European water vole *Arvicola amphibius* dated 2008; furthermore, there are 20 records of European eels *Anquilla anguilla* from 1997–2015 within the 2km search area.

3.6.3 Interpretation

Based on these findings, the breeding bird assemblage supported by Little Reeds Farm is considered to be important for the conservation of birds at the **local level**.

European hedgehog is a species of principal importance for nature conservation under Section 41 of the NERC Act (2006) (S41) that has suffered dramatic population declines in recent years. While the habitats contained within the site provide suitable foraging habitat for hedgehogs, they represent a small proportion of that available in the wider landscape. As such, it is not considered important beyond the **local level**.

The Holmbush Gill, is likely to have a conservation importance for otters at a **local level** and is negligible for the conservation of water voles.

4 IMPACT ASSESSMENT

In this section, the predicted impacts and effects of the proposed scheme are described for each



important ecological feature in turn. This is based on the best available information, both on the baseline ecological condition and on the method of construction, timescale and other development/planning constraints known at the time. The significance of the impact on nature conservation is recorded in accordance with CIEEM guidance and the degree of uncertainty relating to the occurrence and severity of an impact is discussed.

The are no detailed plans available at the time of this impact assessment it is therefore, based on “Proposed development plans for acoustic bund. By Fluid Planning. Drawing Title ‘Little Reed, RH17 5LY’. Proposed location and block plan. Dwg No. 1:2.500/2000, Dated November 2021”.

The proposed scheme comprises the construction of a bund which runs the length of the western boundary and will replace the belt of scrub and scattered trees. The scheme will retain all buildings within Little Reeds Farm. It is understood that the semi-mature oak trees to the south will be retained.

Activities that will occur during the proposed construction and operational phases that could give rise to significant ecological impacts include:

Construction:

- direct harm from pollution, noise, lighting, vibration and the movement of people and construction machinery
- soil compaction
- habitat severance caused by construction works on-site
- habitat destruction during site clearance activities

Post construction/operation:

- permanent habitat loss

4.1 Designated Sites

4.1.1 Impact Characterisation

Little Reeds Farm lies some distance from all statutory designated nature conservation sites. In terms of significant adverse effects resulting from the proposed development, the designated sites are outside the zone of influence in all cases.

4.1.2 Significance of Effects

Based on the above, with regards to designated sites, in the absence of mitigation the proposed development is considered to be of negligible significance.

4.2 Priority Habitats

4.2.1 Impact Characterisation



The current development scheme does not directly impact the Holmbush Gill stream along the northern boundary, which is the only priority habitat within Little Reeds Farm. However, the proposed bund is close to the banks; any accidental release of pollutants or fine sediments into the watercourse could have long term and far-reaching effects without the inclusion of mitigation measures.

In addition, the scheme will result in the permanent loss of the belt of scrub and scattered trees along the western boundary and a small section of grassland habitat. The semi mature oak trees within the southern tip and the line of mature trees which mark the eastern boundary are to be retained.

Construction impacts, in the absence of mitigation, create a risk of damage to all retained trees, scrub, grassland and river habitats, through physical damage to root systems and stems, soil compaction, dust and contamination.

Post construction, negative impacts to remaining habitats would be negligible and the disturbance from the A23 due to passing vehicles – from noise, light and air pollution – would be reduced.

4.2.2 Significance of Effects

In absence of mitigation the impacts of the proposed development could have significant negative effects relating to the release of sediments and accidental spills into the Holmbush Gill which could have long-term far-reaching effects on this priority habitat for conservation at a **local level**. Furthermore, without precautionary steps heavy vehicles and ground works could damage the retained trees and their roots which would be considered relevant to conservation at **site level**. The most significant permanent impact to habitats will be the loss of the belt of scrub and scattered trees along the western boundary; however, this does not qualify as a priority habitat for conservation and is not significant beyond **local level**.

4.3 Bats

4.3.1 Impact Characterisation

The scheme does have the potential to impact upon bats roosting in trees, in particular the semi mature oak tree to the south. The proposed scheme retains the tree but the vegetation clearance nearby could impact upon roosting bats in the tree through noise disturbance, alteration to commuting routes and light disturbance.

The proposed development has potential to result in disturbance to commuting and foraging bats, both during construction and in the long term after completion, through removal of commuting corridors and direct loss of grassland habitat that could be an important source of insect prey for bats.

4.3.2 Significance of Effects

Since the activity surveys did not reveal use of the site by large numbers of foraging bats or the presence of rare species, these impacts before mitigation are not considered to be significant beyond **site level**.



4.4 *Common Dormice*

4.4.1 Impact Characterisation

No evidence of dormice has been identified, therefore, they are unlikely to be impacted by the proposed development scheme.

4.4.2 Significance of Effects

Since the surveys did not find any evidence of dormice within the site the effects of the development are considered to be of negligible significance.

4.5 *Great Crested Newts*

4.5.1 Impact Characterisation

Based on the survey results, great crested newts are most likely absent from the site but their presence cannot be completely ruled out due to the unassessed pond within 250m (their accepted natural range), of the site's boundary. Therefore, the removal of the scrub and scattered trees along the western boundary could result in the permanent loss of habitat and, without avoidance measures, there is a risk of killing/injuring any individuals which may be present during construction. This would also be true for common toads, which have been found to be present in the surrounding landscape.

4.5.2 Significance of Effects

Loss of suitable habitat and the killing/injury of great crested newts and common toads would result in a likely adverse effect on amphibian species, considered significant at the **local level**.

4.6 *Other Notable Species*

4.6.1 Impact Characterisation

Based on the low biodiversity value of most of the existing habitats that will be lost to the proposed development, in general it can be concluded that important assemblages of other notable species are unlikely to be supported by the application site (section 3.7) and significant effects are unlikely to occur.

However, based on pre-existing records, the scheme has potential to impact European hedgehog and harvest mice, though no evidence of either species was found during other survey fieldwork. The suitable habitat will be replaced with similar habitat post construction, and in time, become suitable for hedgehogs and largely replace the habitat lost temporarily. In the absence of mitigation, however, there remains a risk of direct harm to hedgehogs during construction activities, if present on the development site during initial vegetation clearance.

Furthermore, there will be a permanent loss of all scrub and trees along the western boundary which



has high potential to support a variety of common nesting birds.

4.6.2 Significance of Effects

The hedgehog has suffered dramatic declines in population in recent decades, although it remains fairly widespread and has declined less in urban areas than rural areas (Warwick, H. (2016) Britain's Hedgehogs: research and the conservation effort in the face of serious decline. British wildlife Vol. 28, pp78-86). There is a high degree of uncertainty of impacts occurring but based on the relatively low quality habitat contained on the site for hedgehogs and harvest mice, the proposed scheme is unlikely to result in impacts that are significant beyond **local level**. The impacts on breeding birds is unlikely to be significant beyond **local level**.

5 MITIGATION PROPOSALS

5.1 Priority Habitats

5.1.1 Impact Avoidance

The Holmbush Gill will be retained, as the proposed bund will be positioned to the south. The semi mature trees to the south and the line of trees along the eastern boundary will be retained alongside the majority of grassland habitat.

The loss of non-priority habitats such as the belt of scrub and scattered trees, and a small section of grassland along the western boundary is unavoidable in order to construct an acoustic bund to minimise the impact of the A23.

5.1.2 Mitigation Measures

It is very important that strict measures are put in place to prevent pollution and the release of sediments from entering the stream during construction. This is to prevent harm to the aquatic ecosystem in general. During construction, standard pollution control measures and good 'housekeeping' must be applied to prevent accidents, and measures must be put in place in advance to deal with surface water run-off from the construction zone (for example, temporary drainage ditches, soak-aways and use of sediment traps).

Retained trees will be protected during the construction phase. A buffer must be established, to ensure that construction activity cannot damage tree roots and that wildlife within them will be protected from direct disturbance. The buffer should be marked appropriately with heras fencing, or similar, outside of root protection areas. All machinery and materials must operate and be stored only within the fenced construction area.

All other vegetation removal will be undertaken sensitively in accordance with the mitigation measures set out under the following sections for protected species.



5.1.3 Residual Effects

With the protection and retention of the Holmbush Gill and the trees to the south and the east, there is negligible residual impacts on priority habitats, and the impacts on non-priority habitat has been minimized.

5.1.4 Compensation Measures

Once the proposed bund has been constructed, new trees and scrub should be planted. They will provide nesting opportunities for birds once established and foraging resources for invertebrates that subsequently provide food for bats and birds.

5.2 Bats

5.2.1 Impact Avoidance

The current proposed scheme retains the semi mature oak tree and therefore avoids any potential direct impact on roosting bats that may use it. However, if arboricultural works to the mature oak tree in the southern tip of the site are necessary to facilitate the development, i.e. felling or reductions, a repeat bat tree assessment of the mature oak tree should be undertaken.

The temporary loss of foraging and commuting routes for bats is unavoidable.

5.2.2 Mitigation Measures

Any arboreal works to the semi mature oak tree (such as raising the crown or de-limbing for safety reasons) in the southern tip of the site should be preceded by a climbed aerial assessment by a qualified ecologist. This will ascertain whether the potential roost features are suitable for bat roosts.

It is important that the proposed scheme incorporates a 'sensitive lighting plan' developed as part of the detailed design, in accordance with guidelines set out by the Bat Conservation Trust (summarised in Appendix 8). This should include measures to create 'dark corridors' around the development site along the retained hedgerows and tree belts, and measures to minimize light spill onto all semi-natural habitats.

5.2.3 Residual Effects

With the adoption of the above avoidance and mitigation measures, residual impacts on roosting, commuting and foraging bats are considered to be negligible.

5.2.4 Compensation Measures

Loss of habitat used by foraging bats will be adequately compensated for through the habitat



compensation measures outlined in section 5.2 above.

5.3 Great Crested Newts

5.3.1 Impact Avoidance

The loss of habitats suitable for great crested newts and common toads cannot be avoided, and since the presence of the species has not been completely ruled out, there remains a very small risk of direct harm to any resting or hibernating individuals which may be present in the belt of scrub and trees which need to be removed before constructing the bund.

5.3.2 Mitigation Measures

A precautionary approach is recommended during the removal of vegetation before the construction commences. This should be recorded under a 'Reasonable Avoidance Method Statement', which would be sufficient to prevent impacts on any newts and toads that may be present and comply with wildlife legislation. RAMS typically include the following measures:

- wherever possible suitable existing habitat (scrub, and grassland) should be retained and protected;
- the removal of vegetation must take place during the summer months when the amphibians are most active (i.e. between April and September only);
- the clearance of vegetation must take place when the daytime temperature are between 16-24°C, this is when amphibians are alert and mobile enabling them to move away from the areas being disturbed;
- the clearance works must be overseen by a suitably qualified ecologist, so that in the event protected species be found within the construction zone, they can be safely relocated to suitable habitats in the surrounding landscape;
- if great crested newts are discovered at any time during the above process, all works should cease immediately until an appropriate mitigation strategy has been agreed with the relevant authorities.

Using Natural England's Rapid Risk Assessment Tool, it can be calculated that with these suggested precautionary measures in place, an offence is 'highly unlikely' (see Figure 9 below). However, it is important to note that if a great crested newt is found during this process or during the construction works, work must cease immediately, and an ecologist must be contacted. An EPS licence for this species may need to be sought to complete works on the site lawfully.



Component	Likely effect (select one for each component; select the most harmful option if more than one is likely; lists are in order of harm, top to bottom)	Notional offence probability score
Great crested newt breeding pond(s)	No effect	0
Land within 100m of any breeding pond(s)	No effect	0
Land 100-250m from any breeding pond(s)	0.1 - 0.5 ha lost or damaged	0.1
Land >250m from any breeding pond(s)	0.1 - 0.5 ha lost or damaged	0.005
Individual great crested newts	No effect	0
	Maximum:	0.1
Rapid risk assessment result:	GREEN: OFFENCE HIGHLY UNLIKELY	

Guidance on risk assessment result categories

"Green: offence highly unlikely" indicates that the development activities are of such a type, scale and location that it is highly unlikely any offence would be committed should the development proceed. Therefore, no licence would be required. However, bearing in mind that this is a generic assessment, you should carefully examine your specific plans to ensure this is a sound conclusion, and take precautions (see **Non-licensed avoidance measures tool**) to avoid offences if appropriate. It is likely that any residual offences would have negligible impact on conservation status, and enforcement of such breaches is unlikely to be in the public interest.

Figure 9. 'Rapid risk assessment' extracted from Natural England's great crested newt mitigation method statement template instructions¹².

5.3.3 Residual Effects

With the adoption of the above avoidance and mitigation measures, residual effects on great crested newt and common toads are considered to be negligible.

5.3.4 Compensation Measures

Loss of habitat used great crested newts will be adequately compensated for through the habitat compensation measures outlined in section 5.2 above.

5.4 Other Notable Species

5.4.1 Impact Avoidance

All excavations should be covered up overnight to prevent hedgehogs falling into any open holes or pits. If this is not possible, then escape routes should be provided to allow hedgehogs and other wildlife to climb out of their own accord. The scrub and trees within the rest of the site habitat will be retained, and the boundary habitats are well connected to the surrounding landscape.

5.4.2 Mitigation Measures

All the scrub and trees contained within the site have a high potential to support a variety of common

¹² Available from <https://www.gov.uk/government/publications/great-crested-newts-apply-for-a-mitigation-licence>



nesting birds. It will be essential for any future development to consider the nesting bird season and any vegetation removal should be timed outside of the nesting bird season (typically 1st March to 31st August), unless features are first searched by a suitably qualified ecologist and no active nests are found.

5.4.3 Residual Effects

With the adoption of the above avoidance and mitigation measures, residual impacts on hedgehogs, birds and other small mammal species are considered to be negligible.

5.4.4 Compensation Measures

Loss of habitat used by hedgehogs, birds and other small mammals will be adequately compensated for through the habitat compensation measures outlined in section 5.2 above.

6 BIODIVERSITY ENHANCEMENTS

The proposed development represents an opportunity for habitat enhancement to benefit insects, birds, and bats. Any planting scheme should include native shrub species and flowering species known to encourage insect diversity (see Appendix 9 for example seed mixes and native tree/shrub planting species lists). Such enhancement measures are in line with the recommendations of the NPPF and as such would be considered favourably when determining the planning application.

The developer is also encouraged to consider including bat roosting opportunities into surrounding trees and buildings. For example, 2FE Schwegler Wall-Mounted bat shelters could be installed upon the external faces of the building close to the eaves of the building on the south or eastern face. As best practice, the lighting scheme should be designed to minimize light spill (see Bat Conservation Trust website), around these roosting features and potential commuting routes.

These measures could be secured through the production of a Landscape and Ecology Management Plan (LEMP) document that sets out the number, type and location of habitat enhancements that will be provided, the on-going maintenance needs and responsibilities.

7 CONCLUSIONS

The proposed development to construct a new acoustic bund along the western boundary of the site will result in the loss of a belt of trees and scrub, and a small section of grazed grassland on made ground with low ecological value. Mitigation measures have been recommended to prevent the accidental damage to the Holmbush Gill to the north and any trees which are to be retained, during the construction. Post construction the planting of native trees and scrub should take place to compensate for the loss of habitat.

The findings of the baseline surveys conducted between April to October 2022 have identified a low



level of activity from foraging and commuting bats, and the likely absence of common dormice. An oak tree in the to the south of the site was assessed to have moderate bat roost potential, at present it is understood that the tree is to be retained, however, if this is to change then an aerial assessment of its roost potential will be needed.

No ponds have been identified within 250m as suitable for great crested newts, however, one pond could not be assessed, therefore, the presence of great crested newts within the suitable terrestrial habitat within the impact zone cannot be ruled out and a precautionary approach to vegetation clearance has been recommended.

Once the proposed acoustic bund is in place and the newly planted trees and scrub has established, the development should have a positive impact due to the reduced light and sound disturbance from the heavy infrastructure from the A23, which will benefit, foraging and commuting bats, breeding birds and European hedgehogs as well as any other wildlife which may be present.

A summary of the EcIA process is presented in Table 6 below.

Table 6. EcIA summary table

Ecological feature	Importance	Impact characterisation	Level of significance	Mitigation	Residual effects	Compensation required? (Y/N)
Habitats contained within site	Local	Direct loss of belt of scrub and scattered trees, with a small section of grazed grassland with low ecological value	Local	Biodiversity enhancements incorporated into soft landscape and drainage schemes	Site	Y
Stream: Holmbush Gill	Local	Potential damage through accidental spills and excess dust.	Local	Protection measures, during construction phase	None	N
Semi mature scattered trees	Site	Potential damage to trees and roots from heavy vehicles and ground works.	Site	Buffer zones to be established during construction phase	None	N
Foraging and commuting bats	Local	Temporary loss of foraging habitat and change of habitat characteristics	Local	Biodiversity enhancements incorporated into soft landscape and drainage schemes; ecologically sensitive lighting design	Site, potential positive through reduces light and noise disturbance.	Y
Roosting bats (tree)	Site	Potential noise and light disturbance	Site	Will be protected from buffer zones and	None	N



Little Reeds Farm, Hickstead – ECOLOGICAL IMPACT ASSESSMENT

Ecological feature	Importance	Impact characterisation	Level of significance	Mitigation	Residual effects	Compensation required? (Y/N)
				sensitive light scheme		
Breeding bird assemblage on development site	Local	Direct loss of breeding habitat of low importance;	Local,	Appropriate Construction methods (timed outside breeding season); biodiversity enhancements incorporated into soft landscape and drainage schemes	Site, potential positive from less disturbance from the new bund.	N
Great crested newts	Uncertain; local	Impact uncertain due to survey limitations. Based on the quality of existing habitats near a possible breeding pond that are lost to the scheme, the impact is not likely to be significant even if they are present	Uncertain - site	Precautionary approach to construction methods; 'reasonable avoidance measures'; biodiversity enhancements incorporated into soft landscape and drainage schemes	Potentially positive Site	N
Other notable species: European hedgehog	Uncertain; local	Temporary loss of foraging habitat and change of habitat characteristics	Uncertain; local	Appropriate construction methods (timed outside breeding season); biodiversity enhancements incorporated into soft landscape and drainage schemes	Potentially local positive impact	N



APPENDIX 1 – LEGISLATION AND POLICY

Introduction

The following text is intended for general guidance only and does not constitute comprehensive professional legal advice. It provides a summary of the current legal protection afforded to wildlife in general and certain species. It includes current national planning policy relevant to nature conservation.

The ‘Birds Directive’, ‘Habitats Directive’ and ‘Natura 2000 Sites’

The Council Directive 79/409/EEC on the Conservation of Wild Birds (“the Birds Directive”) sets a framework for the protection of wild birds. Under the Directive, several provisions are made including the designation and protection of ‘Special Protection Areas’ (SPAs) – areas which support important bird populations, and the legal protection of rare or vulnerable species.

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the “Habitats Directive”) directs member states of the EU to take measures to maintain the favourable conservation status of important habitats and species. This requires the designation of a series of sites which contain important populations of species listed on Annex II of the Directive. Together with ‘Special Areas of Conservation’ (SACs), SPAs form a network across Europe of protected areas known as the ‘Natura 2000’.

Annex IV lists species in need of more strict protection, these are known as “European Protected Species (EPS)”. All bat species, common dormice *Muscardinus avellana*, otter *Lutra lutra* and great crested newts *Triturus cristatus* are examples of EPS that are regularly encountered during development projects.

The ‘Habitats Regulations’

The Conservation of Habitats and Species Regulations 2017, as amended (the Habitats Regulations”) is the principle means of transposing the Habitats Directive and the Birds Directive, and updates the Conservation (Natural Habitats, &c.) Regulations 1994 (“the 1994 regulations”) in England and Wales.

‘Natura 2000’ sites, now known as National Site Network sites under the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, receive the highest level of protection under the Regulations which requires that any activity within the zone of influence of these sites would be subject to a Habitats Regulations Assessment (HRA) by the competent authority (e.g. planning authority), leading to an Appropriate Assessment (AA) in cases where ‘likely significant effects’ to the conservation objectives are identified.

For European Protected Species, Regulation 41 makes it a criminal offence to:

- deliberately capture, injure or kill any such animal;
- deliberately disturb wild animals of such species;
- deliberately take or destroy their eggs (where relevant);
- damage or destroy a *breeding or resting place* of such an animal;
- possess, control, sell or exchange any live or dead animal or plant, of such species;
- deliberately pick, collect, cut, uproot or destroy a wild plant of such species.



The Habitats Directive and Habitats Regulations provide for the derogation from these prohibitions for specific reasons provided certain conditions are met. An EPS licensing regime allows operations that would otherwise be unlawful acts to be carried out lawfully. Natural England is the licensing Authority and, in order to grant a license, ensures that three statutory conditions (sometimes referred to as the ‘three derogation tests’) are met:

- a licence can be granted for the purposes of “preserving public health or safety or for other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment” (Regulation 53 (2) (e);
- a licence can be granted if “there are no satisfactory alternatives” to the proposed action;
- a licence shall not be granted unless the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

Wildlife and Countryside Act (1981) as amended

The Wildlife and Countryside Act (1981)¹³ remains one of the most important pieces of wildlife legislation in the UK. There are various schedules to the Act protecting birds (Schedule 1), other animals including insects (Schedule 5), plants (Schedule 8), and control of invasive non-native species (Schedule 9).

Under the Wildlife and Countryside Act (WCA) 1981, all wild birds (with the exception of those listed on Schedule 2), their eggs and nests are protected by law and it is an offence to:

- take, damage or destroy the nest of any wild bird while it is in use or being built
- take or destroy the egg of any wild bird
- disturb any bird listed on Schedule 1, while it is nest building, or at a nest with eggs or young, or disturb the dependant young of any such bird.

Schedule 5 lists all non-avian animals receiving protection to a varied degree. At its strongest, the Act makes it an offence to intentionally kill, injure or take any wild animal listed on Schedule 5, and prohibits interference with places used for shelter or protection, or intentionally disturb animals while occupying such places. Examples of species with *full protection* include all EPS, common reptile species, water vole *Arvicola amphibius*, white-clawed crayfish *Austropotamobius pallipes* and Roman snail *Helix pomatia*. Other species are protected from sale, barter or exchange only, such as white letter hairstreak *Satyrrium w-album*.

The Act makes it an offence to intentionally pick, uproot or destroy any plant or seed, and sell or possess any plant listed on Schedule 8. It is also an offence to intentionally uproot any wild plant not listed on Schedule 8 unless authorised [by the land owner]. Species on Schedules 5 and 8 are reviewed every 5 years when species can be added or removed.

Measures for the prevention of spreading non-native species which may be detrimental to native wildlife is included in the Act, which prohibits the release of animals or planting of plants into the wild of species listed on Schedule 9 (for example Japanese knotweed *Fallopia japonica*, Himalayan balsam *Impatiens glandifera*, New Zealand Pygmyweed *Crassula helmsii*).

¹³ Wildlife and Countryside Act (WCA) (1981). HMSO London.



The Wildlife and Countryside Act 1981 (as amended) also prohibits certain inhumane methods of traps and devices for the capture or killing of wild animals and certain additional methods such as fixed trap, poisoning with gas or smoke, or spot-lighting with vehicles for killing species listed on Schedule 6 of the Act (this includes all bat species, badger, otter, polecat, dormice, hedgehog and red squirrel).

Natural Environment and Rural Communities (NERC) Act (2006)

The NERC Act (2006)¹⁴ places a statutory duty under Section 40 on all public bodies, including planning authorities, to take, or promote the taking by others, steps to further the conservation of *habitats and species of principal importance for the conservation of biodiversity* in England (commonly referred to as the 'Biodiversity Duty'). This duty extends to all public bodies the biodiversity duty of Section 74 of the Countryside and Rights of Way (CROW) Act 2000, which placed a duty only on Government and Ministers. Section 41 lists the habitats and species of principle importance. This includes a wide range of species from mosses, vascular plants, invertebrates through to mammals and birds. It originates from the priority species listed under the UK Biodiversity Action Plan (UK BAP) with some omissions and additions.

Environment Act (2021)

The Environment Act sets a target of halting the decline in species through the inclusion of a legally binding 2030 species abundance target. Aiming to restore natural habitats and enhance biodiversity, the Act requires new developments to improve or create habitats for nature (through mechanisms such as mandatory Biodiversity Net Gain), and tackle deforestation. Going forwards, UK businesses will need to look closely at their supply chains as amongst other measures they will be prohibited from using commodities associated with wide-scale deforestation. Woodland protection measures are also strengthened through the Act.

The Act enables the reform of the Habitats Regulations and further improves protection for nature through the establishment of Local Nature Recovery Strategies that support national Nature Recovery Networks. In addition, the Act provides for the production of Protected Site Strategies and Species Conservation Strategies, aimed at supporting the design and delivery of strategic approaches to deliver better outcomes for nature.

Protection of Badgers Act (1992)

The Badger *Meles meles* is afforded specific legal protection in Britain under the Protection of Badgers Act (1992)¹⁵, and Schedule 6 of the Wildlife and Countryside Act 1981 (as amended) (see above).

Under this legislation, it is a criminal offence to:

- intentionally kill, injure, take, possess, or cruelly ill-treat, a Badger, or to attempt to do so;
- interfere with a sett, by damaging or destroying it;
- to obstruct access to, or any entrance of, a badger sett; or
- to disturb a badger when it is occupying a sett.

A licence may be obtained from Natural England to permit certain prohibited actions for a number of defined reasons including interference of a sett for the purpose of development, provided that a certain

¹⁴ Natural Environment and Rural Communities Act (2006). HMSO London.

¹⁵ Protection of Badgers Act (1992). HMSO London.



number of conditions are met. Note that licenses are not normally granted for works affecting badgers between the end of November and the start of July.

National Planning Policy Framework

The National Planning Policy Framework (NPPF 2021)¹⁶ sets out the Government's view on how planners should balance nature conservation with development and helps ensure that Government meets its biodiversity commitments with regard to the operation of the planning system.

Paragraph 179b, which states that council policies should “*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.*” The Office of the Deputy Prime Minister (ODPM) Circular 06/2005, 2005)¹⁷. In accordance with the NPPF, it is important that developments should contribute to and enhance the natural and local environment by:

- minimising impacts on existing biodiversity and habitats;
- providing net gains in biodiversity and habitats, wherever possible;
- establishing coherent ecological networks that are more resilient to current and future pressures.

UK Post-2010 Biodiversity Framework

The UK Biodiversity Action Plan (UK BAP), published in 1994, was the UK's response to the commitments of the Rio Convention on Biological Diversity (1992). The UK BAP was replaced by the UK Post-2010 Biodiversity Framework. This framework covers the period 2011 to 2020 and forms the UK government's response to the new strategic plan of the United Nations Convention on Biodiversity (CBD) published in 2010. This promotes a focus on individual countries delivering target for protection for biodiversity through their own strategies.

The most recent biodiversity strategy for England, 'Biodiversity 2020: A strategy for England's wildlife and ecosystem services' was published by Defra (2011)¹⁸, and a progress update was provided in July 2013 (Defra 2013)¹⁹.

'Biodiversity 2020' builds on the Natural Environment White Paper for England – 'The Natural Choice', published on 7 June 2011, and sets out the strategic direction for biodiversity policy for the next decade.

Biodiversity 2020 deliberately avoids setting specific targets and actions for local areas because

¹⁶ HM Government (2021). National Planning Policy Framework. Department for Communities and Local Government. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

¹⁷ HM Government (2005) ODPM Circular 06/05 Government Circular: *Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System*. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/7692/147570.pdf.

¹⁸ Defra (2011) Biodiversity 2020: A strategy for England's wildlife and ecosystem services. Available at: <https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services>.

¹⁹ Defra (2013) Progress Update. Available at: <https://www.gov.uk/government/publications/biodiversity-2020-simple-guide-and-progress-update-july-2013>.



Government believes that local people and organisations are best placed to decide how to implement the strategy in the most appropriate way for their area or situation.

Birds of Conservation Concern (BoCC)

In 1996, the UK's leading non-governmental bird conservation organisations reviewed the conservation status of all bird species in the UK against a series of criteria relating to their population size, trends and relative importance to global conservation. The lists, known as the 'Red', 'Amber' and 'Green' lists (in order of decreasing concern) are used to inform key conservation policy and decisions. The lists are reviewed every five years and are a useful reference for determining the current importance of a particular site for birds. The most recent review was undertaken in 2021²⁰ (Stanbury et al, 2015), which provides an up to date assessment of the conservation status of birds in the UK.

²⁰ Stanbury, A., Eaton, M., Aebischer, N., Balmer, N., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (2021). Birds of Conservation Concern 5: the status of bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man. *British Birds* 114, pp 723-747.



APPENDIX 2 – MID SUSSEX DISTRICT COUNCIL PLANNING POLICY

Mid-Sussex District Council – Mid Sussex District Plan 2014-2031 (March 2018)

Policy number/title	Policy summary
DP38 - Biodiversity	• Protect landscape for biodiversity qualities • Maintain green corridors to act as wildlife corridors Biodiversity will be protected and enhanced by ensuring development: • Contributes and takes opportunities to improve, enhance, manage and restore biodiversity and green infrastructure so there is a net gain in biodiversity including through creating new designated sites and locally relevant habitats, and incorporating biodiversity features within developments • Protects existing biodiversity, so there is no net loss of biodiversity • Unavoidable damage to biodiversity should be offset through enhancements and mitigation measures • Minimises habitat and species fragmentation and maximises opportunities to enhance and restore ecological corridors to connect natural habitats and increase coherence and resilience • Promotes the restoration, management and expansion of priority habitats in the district • Avoids damage to, protects and enhances the qualifying features of internationally designated sites of importance Designated sites will be given protection and appropriate weight according to their importance and the contribution they make to the wider ecological networks Valued soils will be protected and enhanced, including the best and most versatile agricultural land and development should not contribute to unacceptable levels of soil pollution.



APPENDIX 3 - IMPORTANCE OF ECOLOGICAL FEATURES

Table 1. Determining importance of an ecological feature.

Level of importance	Criteria
International	Internationally designated site; Special Protected Area (SPA), Special Areas of Conservation (SAC), Ramsar, Biosphere Reserves; Regularly occurring population of internationally important species listed in Annex 1, 2 or 4 of the Habitats Directive and Annex 1 of the Birds Directive; A viable area of a habitat listed in Annex 1 of the Habitats Directive or area important for maintaining viability listed as in Annex 1 of the Habitats Directive; Areas outside designated sites that are important for supporting and maintaining the viability of the above designated habitats and/or species.
National	Nationally designated sites; Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), Local Nature Reserves (LNR). A sufficiently large population of a species or area of habitat listed as a priority for nature conservation (S41 NERC Act) to make a significant contribution to the national conservation status (e.g. greater than 1% of the national total). A viable or regularly occurring population of a species that is nationally scarce, threatened or declining on a national scale. A habitat type that is nationally scarce, threatened or declining on a national scale.
Regional	A habitat type that is scarce, threatened or declining on a regional scale. A sufficiently large population of a species or area of habitat listed as a priority for nature conservation (S41 NERC Act) to make a significant contribution to the regional conservation status (e.g. greater than 1% of the national total).
County	Locally designated sites; Local Wildlife Sites (LWSSs), Sites of Nature Conservation (SNCIs) and Site of Importance for Nature conservation (SINCs). A sufficiently large population of a species or area of habitat listed as a priority for nature conservation (S41 NERC Act) to make a significant contribution to the conservation status of the species at county level (e.g. greater than 10% of the county total). A viable or regularly occurring population of a species that is rare in the county, but may be common and widespread elsewhere, For example, a population at the edge of a species' range. A habitat type that is scarce in a county but may be more frequent elsewhere.
Local/parish	Habitats and species which are scarce in the local area but are sufficiently common and widespread elsewhere that they do not meet the above criteria.
Site/negligible	Habitats with little to no ecological value (e.g. amenity grassland and hardstanding)



APPENDIX 4 – COMMON DORMOUSE SURVEY RESULTS

Abbreviations: DM=dormouse; WM=wood mouse; YN=yellow-necked mouse; ad=adult; juv=juvenile, N=nest only; NM=nest material, not woven, unspecified; F=food cache (wood mouse); Bird=bird nest (BTO codes apply to species); nf=tube not found or tube damaged.

Table 3. Full dormouse presence/absence survey results.

Completion date	20 th April 2022	19 th May 2022	20 th June 2022	18 th July 2022	24 th August 2022	12 th September 2022	25 th October 2022
Initial of surveyors	RM & DB	RM & DB	RM	RM & AH	RM & KL	RM & DB	RM & DB
Precipitation	Dry	Dry	Dry	Dry	Dry	Dry	Dry
1	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	F
2	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
3	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
4	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
5	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
6	EMPTY	EMPTY	NM	EMPTY	EMPTY	EMPTY	EMPTY
7	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
8	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
9	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
10	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
11	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
12	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
13	EMPTY	EMPTY	NM	EMPTY	NM	NM	NM
14	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
15	EMPTY	EMPTY	EMPTY	EMPTY	NM		NM
16	EMPTY	EMPTY	NM	EMPTY	EMPTY	EMPTY	EMPTY
17	EMPTY	NM	NM	EMPTY	EMPTY	NM	WM x 2
18	EMPTY	EMPTY	EMPTY	NM	EMPTY	EMPTY	EMPTY
19	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
20	EMPTY	BIRD; wr	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
21	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
22	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
23	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
24	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	F	EMPTY
25	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
26	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
27	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
28	EMPTY	BIRD	EMPTY	EMPTY	EMPTY	NM	EMPTY
29	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
30	Bird	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
31	moss	EMPTY	EMPTY	NM	EMPTY	EMPTY	EMPTY
32	EMPTY	EMPTY	NM	EMPTY	EMPTY	EMPTY	EMPTY
33	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
34	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
35	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY



Completion date	20 th April 2022	19 th May 2022	20 th June 2022	18 th July 2022	24 th August 2022	12 th September 2022	25 th October 2022
36	EMPTY	EMPTY	EMPTY	NM	EMPTY	EMPTY	EMPTY
37	EMPTY	EMPTY	EMPTY	NM	NM	EMPTY	EMPTY
38	EMPTY	EMPTY	NM	NM	NM	NM	EMPTY
39	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
40	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
41	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
42	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
43	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
44	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
45	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
46	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
47	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
48	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
49	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
50	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY



APPENDIX 5 - GREAT CRESTED NEWT SURVEY RESULTS

Table 4. HSI calculation for ponds assessed during the survey.

	Pond 1		Pond 2		Pond 3	
NGR	TQ 2701 2050		TQ 2706 2050		TQ 2718 2049	
SI attribute	SI value	Notes	SI value	Notes	SI value	Notes
Location	1.00	A	1.00	A	1.00	A
Pond area	0.75	375m ²	0.75	518m ²	0.96	945m ²
Pond drying	0.10	Frequently	1.00	rarely	-	-
Water quality	0.67	Moderate	1.00	good	-	-
Shade cover	1.00	50%	0.70	75%	-	-
Water-fowl	1.00	Absent	0.67	Minor	-	-
Fish presence	1.00	Absent	1.00	Absent	-	-
No. ponds	1.00	16	1.00	16	-	-
Terrestrial habitat	0.67	Moderate	0.67	Moderate	-	-
Macrophytes	0.31	0%	0.31	40%	-	-
HSI value	0.59	'below average'	0.79	'good'	-	-

	Pond 4	
NGR	TQ 2694 2133	
SI attribute	SI value	Notes
Location	1.00	A
Pond area	0.36	179m ²
Pond drying	1.00	rarely
Water quality	0.33	Poor
Shade cover	0.70	100%
Water-fowl	1.00	Absent
Fish presence	0.67	Possible
No. ponds	1.00	16
Terrestrial habitat	0.67	Moderate
Macrophytes	0.80	100%
HSI value	0.60	'below average'



APPENDIX 6 - GREAT CRESTED NEWT SURVEY ACCESS REQUEST EXAMPLE LETTER



Building B, Lords Wood Barns, Petworth, GU28 9BS
Tel: 01798 861 800, E-Mail: info@ecologyco-op.co.uk

27th April 2022

**R.E. Request for access permission to carry out ecology survey of pond at ~~Chaites~~ Farm,
Hickstead**

Dear Sir/Madam,

We are currently conducting wildlife surveys including great crested newt surveys in your area and wish to request permission to assess a pond on your property/landholding for its potential to support a population of this legally protected amphibian. The ponds have the grid references TQ 2695 2129 and, and a map showing the location of the pond is attached overleaf.

Initially, we are asking for permission to visit the ponds and conduct a visual assessment only, for their suitability for this species using a standardised scoring system. We may also carry out an eDNA survey where water samples are taken and analysed to determine if great crested newt DNA is present in the pond. However, if the pond is found to have a high score or likely to support great crested newts, or has a positive eDNA result, we may need to ask permission to undertake more thorough surveys to establish presence or absence and a population estimate.

The findings of the survey would be made available to you, and we would be happy to provide impartial advice on the management of the pond to benefit wildlife conservation, if you are interested, under no obligation.

We would be grateful if you could complete and return the attached form using the address below or send us an email confirming that you would be happy to give permission for us to undertake this work. If you have any questions, please feel free to give us a call or email us with your enquiry.

Kind regards,

Rebecca Mortensen
BSc (Hons), MSc, qualifying CIEEM

Email: rebecca@ecologyco-op.co.uk

Office: Barn B Lords Wood Barns, ~~Lodsworth~~, West Sussex, GU28 9BS

Phone: 01798 861 800

For further information on The Ecology Co-op, please visit www.ecologyco-op.co.uk





Contact Name:

Email:

Address:

Telephone number(s):

Please tick to confirm if you are happy to provide access for one of our ecologists to visually assess the pond

☐

Please tick to confirm if you are happy to provide access for one of our ecologists to carry out full surveys if necessary"

☐

Is the pond lined?

☐

Yes

☐

No

☐

Unknown

Is the pond stocked with fish?

☐

Yes

☐

No

☐

Unknown

Has this pond been surveyed in the past?

☐

Yes

☐

No

☐

Unknown

If yes

What was the date of the survey(s)?

Who undertook the surveys?

Were great crested newts identified?

☐

Yes

☐

No

☐

Unknown

If yes, please provide the peak count of great crested newts if known

If you have any special access requirements please let us know in the box below:

*All great crested newt presence/absence and population assessments are undertaken in accordance with Natural England's 'Great Crested Newt Mitigation Guidelines'. These guidelines determine that 4 surveys visits are carried out between mid- March and mid-June, with two surveys timed between mid- April and mid- May. Where great crested newts are identified, a population assessment is completed which requires 6 surveys visits in total with three timed between mid- April and mid- May. In accordance with these guidelines, surveys are carried out on evenings when the ambient temperature is not less than 5°C. This timing ensures that surveys are carried out when newts are most likely to be breeding, thus maximizing the potential to identify newt presence and establish a population. Surveys use a combination of four survey techniques which include: torching at night, bottle trapping, egg searching and/or hand nets. Bottle trapping involves setting plastic bottle traps or floating nets, secured with sticks or canes pushed into the sediment, in the evening – these are then collected early the following morning.

All great crested newt surveys are led by a Natural England licensed great crested newt surveyor. The Ecology Co-op staff follow a strict code of health and safety. Where any activities include working at night, at height or near or in water, a 'buddy' system is used to ensure that in the unlikely event any accidents occur, then help is at hand. All of The Ecology Co-op ecologists are members of the Chartered Institute for Ecology and Environmental Management.



APPENDIX 7 - GREAT CRESTED NEWT eDNA RESULTS LETTER



Folio No: E12968
Report No: 1
Purchase Order: P4697
Client: THE ECOLOGY CO-OP
Contact: Dan Bennett

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (TRITURUS CRISTATUS)

SUMMARY

When great crested newts (GCN), *Triturus cristatus*, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

RESULTS

Date sample received at Laboratory: 26/04/2022
Date Reported: 05/05/2022
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
1943	Pond 2 Little Reeds Farm	TQ 2706 2049	Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com

Reported by: Chris Troth

Approved by: Esther Strafford



Forensic Scientists and Consultant Engineers
SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE
UK Tel: +44 (0)1332 292003 Email: scientifics@surescreen.com
Company Registration No. 08950940



APPENDIX 8 - ARTIFICIAL LIGHTING AND WILDLIFE

Bright external lighting can have a detrimental impact upon foraging and commuting bat flight paths, but more importantly can also cause bats to remain in their roosts for longer. Artificial lighting can also cause significant impacts to other nocturnal species, most notably moths and other nocturnal insects. It can also result in disruption of the circadian rhythms of birds, reducing their fitness.

Guidelines issued by the Bat Conservation Trust²¹ should be referred to when designing the lighting scheme. Note that lighting designs in very sensitive areas should be created with consultation from an ecologist and using up-to-date bat activity data where possible. The guidance contains techniques that can be used on all sites, whether a small domestic project or larger mixed-use, commercial or infrastructure development. This includes the following measures:

Avoid lighting key habitats and features altogether

There is no legal duty requiring any place to be lit. British Standards and other policy documents allow for deviation from their own guidance where there are significant ecological/environmental reasons for doing so. It is acknowledged that in certain situations lighting is critical in maintaining safety, such as some industrial sites with 24-hour operation; however, in the public realm, while lighting can increase the perception of safety and security, measurable benefits can be subjective. Consequently, lighting design should be flexible and be able to fully consider the presence of protected species.

Apply mitigation methods to reduce lighting to agreed limits in other sensitive locations – lighting design considerations

Where bat habitats and features are considered to be of lower importance or sensitivity to illumination, the need to provide lighting may outweigh the needs of bats. Consequently, a balance between a reduced lighting level appropriate to the ecological importance of each feature and species, and the lighting objectives for that area will need to be achieved. The following are techniques which have been successfully used on projects and are often used in combination for best results:

- dark buffers, illuminance limits and zonation;
- sensitive site configuration, whereby the location, orientation and height of newly built structures and hard standing can have a considerable impact on light spill;
- consideration of the design of the light and fittings, whereby the spread of light is minimised ensuring that only the task area is lit. Flat cut-off lanterns or accessories should be used to shield or direct light to where it is required. Consideration should be given to the height of lighting columns. It should be noted that a lower mounting height is not always better. A lower mounting height can create more light-spill or require more columns. Column height should be carefully considered to balance task and mitigation measures. Consider no lighting solutions where possible such as white lining, good signage, and LED cat's eyes. For example, light only high-risk stretches of roads, such as crossings and junctions, allowing headlights to provide any necessary illumination at other times;
- screening, whereby light spill can be successfully screened through soft landscaping and the installation of walls, fences and bunding;

²¹ Bat Conservation Trust and Institute for Lighting Professionals (2018) Guidance note 8. Bats and Artificial Lighting. <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>



- glazing treatments, whereby glazing should be restricted or redesigned wherever the ecologist and lighting professional determine there is a likely significant effect upon key bat habitat and features;
- creation of alternative valuable bat habitat on site, whereby additional or alternative bat flightpaths, commuting habitat or foraging habitat could result in appropriate compensation for any such habitat being lost to the development;
- dimming and part-night lighting. Depending on the pattern of bat activity across the key features identified on site it may be appropriate for an element of on-site lighting to be controlled either diurnally, seasonally or according to human activity. A control management system can be used to dim (typically to 25% or less) or turn off groups of lights when not in use.

Demonstrate compliance with illuminance limits and buffers

- *Design and pre-planning phase*; it may be necessary to demonstrate that the proposed lighting will comply with any agreed light-limitation or screening measures set as a result of your ecologist's recommendations and evaluation. This is especially likely to be requested if planning permission is required.
- *Baseline and post-completion light monitoring surveys*; baseline, pre-development lighting surveys may be useful where existing on or off-site lighting is suspected to be acting on key habitats and features and so may prevent the agreed or modelled illuminance limits being achieved.
- *Post-construction/operational phase compliance-checking*; as a condition of planning, post-completion lighting surveys by a suitably qualified person should be undertaken and a report produced for the local planning authority to confirm compliance. Any form of non-compliance must be clearly reported, and remedial measures outlined. Ongoing monitoring may be necessary, especially for systems with automated lighting/dimming or physical screening solutions.

Lighting Fixture Specifications

The Bat Conservation Trust recommends the following specifications for lighting on developments to prevent disturbance:

- Lighting spectra: peak wavelength >550nm
- Colour temperature: <2700K (warm)
- Reduction in light intensity
- Minimal UV emitted
- Upward light ratio of 0% and good optical control

Further reading:

Buglife (2011) A review of the impact of artificial light on invertebrates.

Royal Commission on Environmental Pollution (2009) Artificial light in the environment. HMSO, London.
Available at: <https://www.gov.uk/government/publications/artificial-light-in-the-environment>

Rich, C., Longcore, T., Eds. (2005) Ecological Consequences of Artificial Night Lighting. Island Press.
ISBN 9781559631297.



CPRE (2014) Shedding Light: A survey of local authority approaches to lighting in England. Available at: <http://www.cpre.org.uk/resources/countryside/dark-skies/item/3608-shedding-light>

Planning Practice Guidance guidance (2014) When is light pollution relevant to planning? Available at: <https://www.gov.uk/guidance/light-pollution>

Institution of Lighting Professionals (2021) Guidance Notes for the Reduction of Obtrusive Light GN01:2011. Available at: <https://www.theilp.org.uk/resources/free-resources/>

Voigt, C.C., Azam, C., Dekker, J., Ferguson, J., Fritze, M., Gazaryan, S., Hölker, F., Jones, G., Leader, N., Lewanzik, D. and Limpens, H., 2018. *Guidelines for consideration of bats in lighting projects*. Unep/Eurobats. Available at: https://cdn.bats.org.uk/uploads/pdf/Resources/EUROBATGuidelines8_lightpollution.pdf?v=1542109376



APPENDIX 9 - EXAMPLE PLANTING SCHEMES

Table 1. Composition of EM4 – meadow mixture for clay soils.

Wildflowers		
%	Latin name	Common name
0.5	<u><i>Achillea millefolium</i></u>	<u>Yarrow</u>
1	<u><i>Betonica officinalis</i> - (<i>Stachys officinalis</i>)</u>	<u>Betony</u>
3.5	<u><i>Centaurea nigra</i></u>	<u>Common Knapweed</u>
1	<u><i>Filipendula ulmaria</i></u>	<u>Meadowsweet</u>
2.5	<u><i>Galium verum</i></u>	<u>Lady's Bedstraw</u>
0.4	<u><i>Lathyrus pratensis</i></u>	<u>Meadow Vetchling</u>
1	<u><i>Leucanthemum vulgare</i></u>	<u>Oxeye Daisy</u>
0.5	<u><i>Lotus corniculatus</i></u>	<u>Bird's-foot Trefoil</u>
1	<u><i>Plantago lanceolata</i></u>	<u>Ribwort Plantain</u>
0.3	<u><i>Primula veris</i></u>	<u>Cowslip</u>
2	<u><i>Prunella vulgaris</i></u>	<u>Selfheal</u>
3	<u><i>Ranunculus acris</i></u>	<u>Meadow Buttercup</u>
1.5	<u><i>Rhinanthus minor</i></u>	<u>Yellow Rattle</u>
1.5	<u><i>Rumex acetosa</i></u>	<u>Common Sorrel</u>
0.2	<u><i>Silene flos-cuculi</i> - (<i>Lychnis flos-cuculi</i>)</u>	<u>Ragged Robin</u>
0.1	<u><i>Trifolium pratense</i></u>	<u>Wild Red Clover</u>
Grasses		
10	<u><i>Agrostis capillaris</i></u>	<u>Common Bent</u>
2	<u><i>Alopecurus pratensis</i></u>	<u>Meadow Foxtail (w)</u>
2	<u><i>Anthoxanthum odoratum</i></u>	<u>Sweet Vernal-grass (w)</u>
1	<u><i>Briza media</i></u>	<u>Quaking Grass (w)</u>
36	<u><i>Cynosurus cristatus</i></u>	<u>Crested Dogstail</u>
24	<u><i>Festuca rubra</i></u>	<u>Slender-creeping Red-fescue</u>
1	<u><i>Hordeum secalinum</i></u>	<u>Meadow Barley (w)</u>
4	<u><i>Phleum bertolonii</i></u>	<u>Smaller Cat's-tail</u>

Table 3. Composition of EM10 – tussock mixture.

Wildflowers		
%	Latin name	Common name
0.5	<u><i>Achillea millefolium</i></u>	<u>Yarrow</u>
1.5	<u><i>Agrimonia eupatoria</i></u>	<u>Agrimony</u>
1	<u><i>Arctium minus</i></u>	<u>Lesser burdock</u>
2.5	<u><i>Centaurea nigra</i></u>	<u>Common Knapweed</u>
2	<u><i>Centaurea scabiosa</i></u>	<u>Greater knapweed</u>
2	<u><i>Daucus carota</i></u>	<u>Wild carrot</u>
1	<u><i>Dipsacus fullonum</i></u>	<u>Wild teasel</u>
1	<u><i>Galium album (mollugo)</i></u>	<u>Hedge bedstraw</u>
0.2	<u><i>Geranium pratense</i></u>	<u>Meadow cranesbill</u>
0.5	<u><i>Leucanthemum vulgare</i></u>	<u>Ox-eye daisy</u>
1	<u><i>Pastinaca sativa</i></u>	<u>Wild parsnip</u>



0.1	<u><i>Plantago lanceolata</i></u>	<u>Ribwort Plantain</u>
2	<u><i>Pulicaria dysenterica</i></u>	<u>Common fleabane</u>
2	<u><i>Silene dioica</i></u>	<u>Red campion</u>
2	<u><i>Vicia sativa</i></u>	<u>Common vetch</u>
Grasses		
2	<u><i>Alopecurus pratensis</i></u>	<u>Meadow Foxtail (w)</u>
20	<u><i>Cynosurus cristatus</i></u>	<u>Crested Dogtail</u>
16	<u><i>Dactylis glomerata</i></u>	<u>Cocksfoot</u>
2	<u><i>Deschampsia cespitosa</i></u>	<u>Tufted hair-grass</u>
20	<u><i>Festuca rubra</i></u>	<u>Strong-creeping Red-fescue</u>
2	<u><i>Holcus lanatus</i></u>	<u>Yorkshire fog</u>
10	<u><i>Schedonorus arundinaceus</i></u>	<u>Tall fescue</u>
8	<u><i>Schedonorus pratensis</i></u>	<u>Meadow fescue</u>

Table 3. Recommended list of native trees and shrubs

Native trees and shrubs		
	Latin name	Common name
1	<i>Prunus avium</i>	Wild cherry
2	<i>Sorbus aucuparia</i>	Rowan
3	<i>Malus sylvestris</i>	Crab apple
4	<i>Corylus avellana</i>	Hazel
5	<i>Cornus sanguinea</i>	Dogwood
6	<i>Crataegus monogyna</i>	Hawthorn
7	<i>Prunus spinosa</i>	Blackthorn
8	<i>Viburnum opulus</i>	Guelder rose
9	<i>Viburnum lantana</i>	Wayfaring-tree
10	<i>Ilex aquifolium</i>	Holly
11	<i>Rhamnus cathartica</i>	Buckthorn
12	<i>Eunonymus europaea</i>	Spindle
13	<i>Ligustrum vulgare</i>	Wild privet
14	<i>Quercus robur</i>	English oak
15	<i>Betula pendula</i>	Silver birch
16	<i>Prunus avium</i>	Wild cherry
17	<i>Carpinus betulus</i>	Hornbeam
18	<i>Fagus sylvatica</i>	Beech