LAND AT
SCOTLAND FARM

REPRESENTATIONS IN RESPECT OF ECOLOGY

Prepared on behalf of:
Dry Drayton Estate Ltd & Hallam Land Management

By:
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EXECUTIVE SUMMARY

Existing Baseline Condition

An Extended Phase 1 Habitat survey and detailed hedgerow survey determined that a majority of the habitats falling within the Site are of overall low ecological value and largely without significant floristic diversity, predominantly comprising farmed land and secondary habitats of relatively recent origin.

Small areas of greater ecological interest exist. These include several small areas of woodland supporting good structural diversity and amounts of standing and fallen dead wood.

Hedgerows are generally considered not to be of high inherent value in themselves, predominantly being of interest within the context of the otherwise agriculturally managed site itself. Their main value lies in their functionality as connective habitat through the site and beyond.

Running water in the form of a large land drain to the west of Scotland Road and Callow Brook to the east of Scotland Road provide good wildlife corridors through the Site. They support well vegetated earth banks with scattered trees. There are significant areas of collapsed banks on both water courses and water levels are variable.

A comprehensive suite of faunal surveys has been undertaken to determine the faunal ecological baseline within the Site.

There are several ponds within Dry Drayton village to the north of the Site that support breeding great crested newt (GCN) *Triturus cristatus*. The closest pond with known GCN presence is 150m east of the Site. There are no GCN in the three ponds within the Site boundary.

Water vole *Arvicola amphibius* are present on both water courses on the Site, feeding piles, burrows, prints and latrines were found.

There are many badger *Meles meles* setts throughout the Site including two main setts and several outlier and subsidiary setts.

A foraging/commuting assemblage of at least seven bat species was recorded at the Site. This includes common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P. pygmaeus*, noctule *Nyctalus noctula*, brown long eared *Plecotus auritus* and undetermined *Myotis* species and undetermined *Nyctalus/Eptesicus* species as well as the Annex II species, barbastelle *Barbastella barbastellus*.

There is a good assemblage of farmland specialist birds both foraging and potentially breeding on the Site; skylark *Alauda arvensis*, grey partridge *Perdix perdix*, linnet *Linaria cannabina*, yellowhammer *Emberiza citrinella*, reed bunting *Emberiza schoeniclus* and corn bunting *Emberiza calandra*.

There is a good assemblage of generalist species both foraging and potentially breeding including the notable stock dove *Columba oenas*, dunnock *Prunella modularis*, starling *Sturnus vulgaris*, willow warbler *Phylloscopus Trochilus*, song thrush *Turdus philomelos* and bullfinch *Pyrrhula pyrrhula*.

Ecological Constraints and Opportunities

Given that much of the Site is of low ecological value, which does not present a constraint to development, the proposed development provides the opportunity to positively contribute to the biodiversity of both the Site and of the local and wider area.

Creation of a country park within the east of the Site provides significant opportunities for biodiversity enhancement and net gain as well as providing alternative accessible green space to reduce any potential increases in visitor pressure on nearby designated sites.

Areas of greater ecological value will be incorporated into the development's green infrastructure. All areas of woodland are retained with the potential for enhancing linkages between them through green corridors. Additional woodland planting in the eastern land parcel will increase the prevalence of this habitat in the area and add to the overall structure diversity of the Site.

The majority of the hedgerows would be retained, with those that are to be removed being of lower ecological value and the retained hedgerows can be enhanced through additional planting provided in green corridors. This strengthening could comprise the implementation of wildflower grassland planting at the bases, planting up of any gaps with native species and sympathetic management regimes designed with wildlife in mind.

Both water courses are retained but with significant improvement works both for drainage and bank stabilisation. With the banks stabilised and habitat creation in the form of small attenuation basins and additional wetland planting throughout, these corridors area can provide greater species richness and diversity, increasing overall biodiversity value than at present.

Maintenance and enhancement of habitat corridors provided by the hedgerows and water courses and the continuous semi-natural habitat maintained along the western and eastern boundaries will ensure that the proposals do not isolate surrounding habitats. This will enhance the value of the Site for bats, especially Barbastelle that have been recorded as using the Site and are known to be breeding in Eversden and Wimpole Woods SAC, approximately 6km to the south.

Drainage requirements for the Site mean that the creation of an extensive wetland area in the north of the Site can provide additional opportunities for great crested newt and other amphibians as well as water vole. These can also function as 'receptor' areas for the licencing requirements for these species.

Mitigation for the arable habitat loss will be created by way of enhancements to offsite arable habitat in the wider area.

New habitats for fauna would be created, additional to the overall green infrastructure habitats described, with a range of bat and bird boxes, log piles and hibernacula suitable for herpetofauna installed.

Development will allow for the introduction of an active and more sensitive management regime for all new and retained habitats, aiding their successful establishment and development with the aim of maximising their biodiversity value in the long term.

It is considered that the potential for habitat creation within the green infrastructure of the scheme will enhance the opportunities on site for all species groups with the exception of farmland birds.

INTRODUCTION

1.1 The following report has been prepared on behalf of Dry Drayton Estate Ltd. and Hallam Land Management Ltd. and provides an assessment of the ecological interest of a site on land at Dry Drayton Estate, Cambridge (hereafter referred to as 'the Site') and how this has influenced the design and layout for the proposed development.

1.2 FPCR is a multi-disciplinary environmental and design consultancy established over 60 years, with expertise in architecture, landscape, ecology, arboriculture, urban design, masterplanning and environmental impact assessment. The practice is a member of the Landscape Institute and Institute of Environmental Management and Assessment and is frequently called upon to provide expert evidence on landscape and visual issues at Public and Local Plan Inquiries.

Site Context

1.3 The Site is located approximately 6km from the western edge of Cambridge and is situated on the northern side of the A428, covering a linear tract of land which stretches between Hardwick to the south and Dry Drayton to the northeast. It comprises two main areas of land to the east and west of Scotland Road. **Figure 1** shows the location of the Site with the local context.

Development Proposals

1.4 The Site has been put forward to the Great Cambridge Local Plan process as a potential new community of around 6000 homes, business space, park and ride, community and education uses, leisure and retail uses, and green infrastructure.

Scope of Report

1.5 This Ecological Representations report describes the current ecological interest within and around the Site, which has been identified through standard desk- and field-based investigations. It then considers the potential ecological impacts and opportunities for ecological enhancement based on the land use budget plan (**Appendix A**) in the context of relevant legislation and planning policy. Finally, it identifies the necessary additional measures to avoid, mitigate or provide compensation for potential impacts, and the mechanisms for securing such measures.

2.0 METHODOLOGY

Desk Study

2.1 In order to compile existing baseline information, relevant ecological information was requested from both statutory and non-statutory nature conservation organisations including:

- Multi Agency Geographic Information for the Countryside website (www.magic.gov.uk);
- Cambridgeshire and Peterborough Environmental Records Centre (CPERC); and
- Cambridgeshire Bat Group.

2.2 Further inspection, using colour 1:25,000 base maps (www.ordnancesurvey.co.uk) and aerial photographs (maps.google.co.uk), was also undertaken to provide additional context and identify any features of potential importance for nature conservation in the wider countryside.

2.3 The search area for biodiversity information was related to the significance of sites and species and the potential zones of influence (ZoI)[1], as follows:

- 15km around the Site for sites of International importance (e.g. Special Area of Conservation [SAC], Special Protection Area [SPA] and Ramsar);
- 5km around the Site for sites of National or Regional Importance (e.g. Sites of Special Scientific Interest [SSSI] and National Nature Reserves [NNRs]; and
- 2km around the Site for non-statutory sites of County Importance (e.g. Local Wildlife Sites [LWS] and species records (e.g.: protected, UK priority or notable species).

Extended Phase I Survey

2.4 The Site (outlined in **Figure 1**) was surveyed by an appropriately experienced and qualified ecologist on 22 March 2021.

2.5 Survey methods followed the extended Phase 1 Survey technique as recommended by Natural England[2]. This involved a systematic walk over of the Site to classify the broad habitat types and to particularly identify any habitats of principal importance for the conservation of biodiversity as listed within Section 41 (S41) of Natural Environment and Rural Communities (NERC) Act 2006[3].

Limitations

2.6 Although March is outside of the recognised botanical survey period, the intensively managed agricultural nature of the sites meant that the broad habitats could be classified at any time. Habitats with more ecological potential (the hedgerows) were identified and surveyed in more detail during the optimal botanical survey period.

Hedgerow Survey

2.7 The hedgerow survey was conducted on 12 May 2021. Hedgerows were surveyed using the wildlife and landscape criteria of the Hedgerow Evaluation and Grading System (HEGS)[4]. This method of assessment includes noting down canopy species composition, associated ground

[1] Zone of Influence - the areas and resources that may be affected by the proposed development.
[2] JNCC. 1990. *Handbook for Phase 1 habitat survey – a technique for environmental audit.* Peterborough: JNCC
[3] *The Natural Environment and Rural Communities Act 2006.* [Online]. London: HMSO Available at: http://www.legislation.gov.uk/ukpga/2006/16/contents
[4] Clements, D.K., & Tofts, R.J. 1992. *Hedgerow Evaluation and Grading System (HEGS): A methodology for the ecological survey, evaluation and grading of hedgerows.* Countryside Planning and Management

flora and climbers, structure of the hedgerow including height, width and gaps, associated features including number and species of mature trees, banks, ditches and grass verges.

2.8 Each hedgerow is given a grade using HEGS with the suffixes '+' and '-', representing the upper and lower limits of each grade respectively. These grades represent a continuum on a scale from 1+ (the highest score and denoting hedges of the greatest nature conservation priority) to 4- (representing the lowest score and hedges of the least nature conservation priority) as follows:

Grade 1 – High to very high value
Grade 2 – Moderately high to high value
Grade 3 – Moderate value
Grade 4 – Low value

2.9 Hedgerows graded 1 or 2 are considered to be a priority for nature conservation.

2.10 The hedgerows were also assessed against the Wildlife and Landscape criteria contained within Statutory Instrument No: 1160 – The Hedgerow Regulations 1997[5] to determine whether they qualified as 'Important Hedgerows' under the Regulations. This was achieved using a methodology in accordance with both the Regulations and DEFRA guidance[6]. Hedgerow numbers can be found on **Figure 2**.

Protected Species Surveys

2.11 Throughout the Phase 1 Habitat Survey, consideration was given to the actual or potential presence of protected species, such as (although not limited to) those protected under the Wildlife and Countryside Act 1981 (as amended), the Protection of Badgers Act 1992, and Conservation of Habitats and Species Regulations 2017 (as amended). Consideration was also given to the existence and use of the Site by other notable fauna such as species of principal importance for the conservation of biodiversity under S41 of the NERC Act 2006, or Birds of Conservation Concern (BoCC) Red listed species.

Great Crested Newt (GCN) *Triturus cristatus*

Habitat Suitability Index (HSI) Assessment

2.12 All accessible ponds within the site or within 500m of the site boundary were evaluated using the HSI scoring system developed by Oldham *et al*[7]

2.13 The HSI scoring system produces a single index value of habitat suitability, derived from individual scores achieved under the following categories:

- Location within the UK
- Pond area
- Frequency of pond drying
- Water quality
- % shade
- Presence of water-fowl
- Presence of fish
- Number of other ponds within 1km
- Quality of surrounding terrestrial habitat
- % cover by macrophytes

[5] http://www.legislation.gov.uk/uksi/1997/1160/contents/made
[6] DEFRA 1997. *The Hedgerow Regulations 1997. A Guide to the Law and Good Practice.* London: HMSO
[7] Oldham, R.S., Keeble, J., Swan, M.J.S. and Jeffcote, M. (2000) Evaluating the suitability of habitat for the great crested newt (*Triturus cristatus*). Herpetological Journal 10(4), 143-155pp

2.14 A score is assigned according to the most appropriate criteria level set within each attribute and a total score calculated of between 0 and 1. Pond suitability is then determined according to the scale shown in **Table 1**.

Table 1: HSI Scores as a Measure of Pond Suitability

HSI score	Pond Suitability
<0.5	Poor
0.5 – 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
>0.8	Excellent

Presence/ Absence Survey

2.15 Ponds were identified within the Site and surrounding area using OS maps / aerial images and are shown on **Figure 3**. Landowners were identified through Land Registry searches and letters sent to them requesting land access permissions for pond surveys.

2.16 Access was granted to ponds P1, P2, P3, P10, P11, P13, P21 and P22. Ponds Survey work on these ponds was conducted following best practice guidance[8] and was undertaken by surveyors who hold current Natural England GCN survey licences in the appropriate GCN survey season between 08 April and 03 June 2021. Ponds P4, P5, P6, P19 and P20 were ruled out from assessment due to the A428 providing a significant barrier to dispersal between these ponds and the Site and P15 was dry.

2.17 Waterbodies were initially surveyed on four separate visits, which was increased to a total of six visits where GCN were found to be present, in order to give more data for a better population size class estimate. Where possible, a combination of three of the following survey methods were used on all survey visits, with bottle trapping, egg searching and torchlight survey being the favoured methods but netting being used on some occasions.

- Egg searching: Newts lay eggs singly on leaves of aquatic plants or other suitable pliable material, after which the material is folded over the egg to protect it. Great crested newt eggs can be distinguished from those of the other newts by their size, shape and colour. Submerged and floating vegetation and leaf litter is examined for folded leaves containing newt eggs. Once a great crested newt egg is identified at the waterbody, no further egg searching takes place, as evidence of breeding has then been confirmed, and so as to minimise further disturbance.
- Torchlight surveys: carried out after dark using 1,000,000 candlepower torches. Surveyors slowing walk around the perimeter of each waterbody and searched by torchlight for amphibians in the shallows and the deeper areas used by great crested newt for courtship display.
- Bottle trapping: involves the placement of traps, comprising inverted two-litre plastic bottles fixed in place with bamboo canes, at an average of one every 2metres around the margins of the pond. The traps are partially submerged with an air bubble trapped inside. The traps are

[8] English Nature (2001) Great Crested Newt Mitigation Guidelines, English Nature, Peterborough.

then checked for the presence of amphibians early the next morning, with any captive animals released back into the pond and the traps removed.

- Netting: using a long-handled dip-net the pond edges are swept for approximately 15 minutes per 50m of shoreline. This technique is one of the least effective for capturing adult newts, and cannot be used to estimate a population size, although can be very effective for detecting newt larvae, especially later in the season.

2.18 The population size class estimate is based on either the peak adult count overall for the survey for each pond i.e. not summed across multiple survey visits, as the same individuals may be recorded each time the pond is surveyed. Or alternatively, for ponds within 250m of each other that are not separated by barriers to dispersal, the total number of GCN can be summed for all ponds per survey occasion to give a population size class estimate. The population is classed as follows:

- Small for maximum counts up to 10
- Medium for maximum counts between 11 and 100
- Large for maximum counts over 100

2.19 The dates of each survey visit and the weather conditions are provided in **Table 2**.

Table 2: Survey Visit Schedule and Conditions

Survey Dates	Air Temps	Weather Conditions During Torchlight Survey
08/04/21	8ºC	No wind, no rain
21/04/21	8ºC	Light wind, no rain.
28/04/21	9ºC	Light wind, no rain.
11/05/21	11ºC	No wind, no rain
22/05/21	11ºC	Light wind, drizzle
02/06/21	18°C	No wind, no rain

Bats - Roosting

Assessment of Trees

2.20 Tree assessments were undertaken from ground level, with the aid of a torch and binoculars (where appropriate) on 22 April and 10 May 2021. During the survey Potential Roosting Features (PRFs) for bats such as the following were sought (based on p16, British Standard 8596:20159):

- natural holes (e.g. knot holes) arising from naturally shed branches or branches previously pruned back to a branch collar;
- man-made holes (e.g. cavities that have developed from flush cuts or cavities created by branches tearing out from parent stems);
- woodpecker holes;

[9] British Standard 2015. BS 8596:2015 Surveying for bats in trees and woodland – Guide, October 2015.

- cracks/splits in stems or branches (horizontal and vertical);
- partially detached, loose or bark plates;
- cankers (caused by localised bark death) in which cavities have developed;
- other hollows or cavities, including butt rots;
- compression of forks with occluded bark, forming potential cavities;
- crossing stems or branches with suitable roosting space between;
- ivy stems with diameters in excess of 50mm with suitable roosting space behind (or where roosting space can be seen where a mat of thinner stems has left a gap between the mat and the trunk);
- bat or bird boxes; and/or
- other suitable places of rest or shelter.

2.21 Based on the above, trees were classified into general bat roost potential groups based on the presence of such features. Table 2 classifies the potential categories as accurately as possible as well as discussing the relevance of the features. This table is broadly based upon Table 4.1 in The Bat Conservation Trust (BCT) survey guidelines[10].

Table 3: Classification and Survey Requirements for Bats in Trees

Classification of Tree	**Description of Category and Associated Features (based on Potential Roosting Features listed above)**	**Likely Further Survey work** (where tree(s) will be likely affected by the proposed development)
Confirmed Roost	Evidence of roosting bats in the form of live bats, droppings, urine staining, mammalian fur oil staining, etc.	A Natural England derogation licence application will be undertaken. This will require a combination of aerial assessment by roped access bat workers and nocturnal survey during the appropriate period (May to August). Replacement roost sites commensurate with status of roost to be provided. Works to be undertaken under supervision using a good practice method statement.
High Potential	A tree with one or more Potential Roosting Features that are obviously suitable for larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter protection, conditions (height above ground level, light levels, etc.) and surrounding habitat but unlikely to support a roost of high conservation status (i.e. larger roost, irrespective of wider conservation status). Examples include (but are not limited to); woodpecker holes, larger cavities, hollow trunks, hazard beams, etc.	Where the tree(s) will likely be affected by development a combination of aerial assessment by roped access bat workers **and/or** nocturnal survey during the appropriate period (May to August). Following additional assessments, a tree may be upgraded or downgraded based on findings. After completion of survey work, some good practice removal operations likely to be required.

[10] Collins, J. (ed.) 2016. Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust.

Classification of Tree	Description of Category and Associated Features (based on Potential Roosting Features listed above)	**Likely Further Survey work** (where tree(s) will be likely affected by the proposed development)
Moderate Potential	A tree with Potential Roosting Features which could support one or more potential roost sites due to their size, shelter protection, conditions (height above ground level, light levels, etc.) and surrounding habitat but unlikely to support a roost of high conservation status (i.e. larger roost, irrespective of wider conservation status). Examples include (but are not limited to); woodpecker holes, rot cavities, branch socket cavities, etc.	Where the tree(s) will likely be affected by development a combination of aerial assessment by roped access bat workers **and /or** nocturnal survey during appropriate period (May to August). Following additional assessments, a tree may be upgraded or downgraded based on findings. After completion of survey work, some good practice removal operations likely to be required.
Low Potential	A tree of sufficient size and age to contain Potential Roosting Features but with none seen from ground or features seen only very limited potential. Examples include (but are not limited to); loose/lifted bark, shallow splits exposed to elements or upward facing holes.	No further survey required but some good practice removal operations **may** be required in certain circumstances.
Negligible / No potential	Negligible/no habitat features likely to be used by roosting bats	None.

* The Conservation of Habitats & Species Regulations 2017 (*as amended*) affords protection to "breeding sites" and "resting places" of bats. The EU Commission's Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC, February 2007 states that these are places "where there is a reasonably high probability that the species concerned will return".

Assessment of Buildings

2.22 During the Extended Phase 1 Survey, several of the buildings at Rectory Farm appeared to have potential to support roosting bats. No access was granted to these buildings for an internal and external inspection. These will be surveyed as part of any updated surveys for future applications.

Bats – Foraging and Commuting

2.23 The potential for the Site to support foraging and commuting bats was assessed, with particular regard being given to the presence of linear features such as hedgerows providing suitable connectivity to the wider landscape, and of varied habitat such as scrub and open water. The large size of the field parcels and lack of hedgerows meant that the Site was considered to have low potential to support roosting bats and so seasonal transects were conducted.

Transect Surveys

2.24 Walked transects were completed throughout the Site in May, June and September 2021 (spring, summer and autumn) including parts of the Site that area potential foraging areas and commuting routes.

2.25 The transect routes were predetermined prior to survey in order to comprehensively sample all representative habitats within the Site as per recognised guidelines[11]. These commenced at

[11] Bat Conservation Trust 2016. *Bat Surveys for Professional Ecologists: Good Practice Guidelines.* 3rd Edition.

sunset and were two hours in duration for the May transect. This was increased to three hours for the future transects to allow a more steady pace of walking. Point count stops were incorporated into the transects to provide further information regarding bat activity levels. These were strategically located throughout the Site to ensure coverage of habitats present, and included features of potential value to bats (e.g. hedgerows etc.). Each point count was five minutes long, during which time all bat activity was recorded.

2.26 The transect routes were walked at a steady pace and when a bat passed by, the species, time and behaviour was recorded on a plan. This information provides a general view of the bat activity present on Site and helps to identify any key foraging areas and/or commuting routes.

2.27 Transects were completed using Wildlife Acoustics Inc. Echo Meter Touch® bat detectors in conjunction with the Echo Meter Touch® app and Apple Inc. iPad®.

2.28 Post-survey, bat calls were analysed using Kaleidoscope Pro 5 (Wildlife Acoustics Inc.) software package by taking measurements of the peak frequency, inter-pulse interval, call duration and end frequency. From this the level of bat activity across the site in relation to the abundance of individual species foraging and commuting along habitats was assessed.

2.29 All transects were undertaken when conditions were suitable (i.e. when the ambient air temperature exceeded 10ºC and there was little wind or rain), see Table 4 below.

Table 4: Bat Transect Survey Conditions

Date	Sunset	Survey times	Temperature °C	Rain	Wind (Beaufort)	Cloud %
10.05.21	20:40	20:40-23:00	12-10	Nil	1	30
14.06.21	21:22	21:22-00:22	19-16	Nil	1-3	90-100
02.09.21	19:45	19:45-22:45	15-17.5	Nil	2-3	100

Automated Static Bat Detector Surveys

2.30 Static passive recording broadband detectors were deployed on the Site to supplement the manual transects surveys, as recommended within the BCT guidance[11] (**Figure 4**).

2.31 Passive monitoring was undertaken using an automated logging system (Wildlife Acoustics Inc. Song Meter® SM4BAT in 2020) with the output saved to an internal storage device. The devices were placed along linear features such as hedgerows considered to be of value to bats as shown on **Figure 4**. Devices were placed in each location during suitably mild weather conditions and were programmed to activate 30 minutes before dusk and record continuously until 30 minutes following sunrise for an extended period on each occasion (five consecutive nights).

2.32 The output from the detectors was subjected to computer analysis using Kaleidoscope Pro 5 (Wildlife Acoustics Inc.) to assess the amount of bat activity on site by recording the number of bat passes.

Water Vole and Otter

2.33 There are a number of ditches within the Site that feed into two main water courses – a central 'drain' within the area west of Scotland Road and Callow Brook to the East of Scotland Road as shown on **Figure 2**. These were assessed for their suitability to support water vole *Arvicola amphibius* and otter *Lutra lutra* during the Extended Phase 1 Survey on 22 March 2021.

2.34 Suitable Habitat for water voles includes:

- Water more than 50cm deep and relatively stable;
- Muddy bottom;
- Static or slow flowing water;
- Earth banks of >45° (for burrowing);
- Dense vegetation cover on the banks of a good mix of grasses and herbs for summer food and cover and some berry bearing bushes, tubers and trees for autumn and winter food;
- Emergent, in-channel vegetation; and
- 1-2m wide.

2.35 Otter have been known to exploit virtually any aquatic habitat and no specific variables have been found to be preferred by otter, thus suitable habitat is a loose term[12].

2.36 A water vole and otter survey was carried out on the two main water courses on 22 April and 25 May 2021 which involved searching the banks of each ditch for evidence of water voles as per best practice guidelines[13].

2.37 Evidence for the presence of water voles includes:

- Feeding signs (neat piles of short pieces of vegetation cut at a 45° angle),
- Latrines (piles of droppings),
- Burrows
- Footprints and pathways; and
- Actual sightings

2.38 Evidence of Otter includes[14]:

- Dung (spraints);
- Tracks (footprints);
- Feeding remains;
- Otter slides (into water);
- Holts (underground dens); and
- Couches (above ground sites where otters rest during the day).

2.39 Banks were searched from within the water channel.

[12] Chanin P (2003). Ecology of the European Otter. Conserving Natura 2000 Rivers Ecology Series No. 10. English Nature, Peterborough.
[13] Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016), Water Vole Mitigation Handbook (Mammal Society Mitigation Guidance Series). Eds Fiona Matthews and Paul Channin. Mammal Society, London.
[14] https://www.gov.uk/guidance/otters-protection-surveys-and-licences#survey-methods

Limitations

2.40 Whilst the water vole surveys were carried out during the optimal period for water vole survey (Mid-April to end of September), the unusually cold April of 2021 meant that the active season could have been delayed. However, the second survey was conducted in May and these surveys in combination are considered sufficient to determine the presence or absence of water voles on the Site.

Breeding Birds

2.41 The survey methodology employed was broadly based on that of territory mapping as used for the British Trust for Ornithology (BTO) Common Bird Census (CBC)[15]. Standard BTO species codes and symbols for bird activities were used to identify birds and denote activity, sex and age where appropriate. Birds were considered to be holding a territory and therefore likely to be utilising the site for breeding activities if they were displaying breeding behaviours, such as: singing, nest building, food carrying or territorial defence. If birds did not display such behaviours, e.g. they were only recorded flying over the site, they were considered non breeders.

2.42 To provide a reasonable level of accuracy for determining the population status of the breeding birds on the site, two surveys were undertaken between 05.00 and 11.00 during April and May 2021 (**Table 5**). A route was mapped out prior to the surveys being undertaken, paying particular attention to any linear features such as watercourses, hedgerows and tree lines, and natural features such as areas of scrub and woodland. Surveys were not undertaken in unfavourable conditions, such as heavy rain or strong wind, which may negatively affect the results. The update survey was undertaken to determine whether the bird population had undergone any significant change since the original surveys.

Table 5: Survey Dates and Conditions for Breeding Bird Surveys

Date	Cloud Cover (%)	Rain	Wind	Visibility
6th April 2021	0	None	Moderate – Fresh breeze	Excellent
24th May 2021	10	None	Light air	Excellent

Badger

2.43 A thorough search of the Site was undertaken for evidence indicating the presence of badger *Meles meles* using standard survey methodology[8]. Evidence of badger occupation and activity sought included:

- setts: including earth mounds, evidence of bedding and runways between setts;
- latrines: often located close to setts, at territory boundaries or adjacent to favoured feeding areas;
- prints and paths or trackways;
- hairs caught on rough wood or fencing; and
- other evidence: including snuffle holes, feeding and playing areas and scratching posts.

[15] British Trust for Ornithology, Common Bird Census. www.bto.org.

3.0 RESULTS

Statutory Designations

3.1 The Site itself is not covered by any statutory designations; however, two international and five national designations lie within the potential ZoI as shown in **Table 6**.

Table 6: Statutory sites of nature conservation importance within the Site's potential zone of influence

Site name	Designation	Size (ha)	Approx. distance from site	Interest feature(s)
Eversden and Wimpole Woods	SAC	66	6.7km S	Annex II species: Barbastelle *Barbastella barbastellus* Site comprises a mixture of ancient coppice woodland (Eversden Wood) and high forest woods likely to be of more recent origin (Wimpole Woods). A colony of barbastelle is associated with the trees in Wimpole Woods. Trees are used as a summer maternity roost. Most of the roost sites are within tree crevices. They also use the site as a foraging area and some is also used as a flight path when bats forage outside the site.
Ouse Washes	Ramsar/ SAC/ SPA	2498 ha SPA 2518 ha Ramsar	12.5km N	SAC: Annex II species: Spined loach *Cobitis taenia*
Caldecote Meadows	SSSI	9.1	1.8km S	An area of herb-rich grassland of a calcareous loam type, holding plant communities which are of nationally restricted distribution. 100% favourable
Madingly Wood	SSSI	15.4	1.8km E	An example of the ash-maple woodland type characteristic of the chalky Boulder Clay of eastern England. 100% favourable
Hardwick Wood	SSSI	15.4	1.9km S	The ancient core of the site is ash-field maple woodland containing both oxlip *Primula elatior* and Primrose *Primula vulgaris*, a woodland type which is nationally restricted to small parts of Cambridgeshire, Suffolk and Essex 100% favourable

Site name	Designation	Size (ha)	Approx. distance from site	Interest feature(s)
Overhall Grove	SSSI	17.4	2.8km W	An ancient secondary woodland now dominated by small-leaved elm *Ulmus minor* and represents a woodland type which is nationally restricted in its distribution 100% unfavourable recovering
Elsworth Wood	SSSI	6.9	4.8km W	Surviving fragment of a curious ring-shaped wood unusually situated on a ridge between two valleys. Has probably existed since the late 13th Century. Three types of woodland are represented, all nationally uncommon. It is the best example in Cambridgeshire of a wood whose canopy is dominated by field maple *Acer campestre* 100% unfavourable declining

Non-Statutory Designations

3.2 Non-statutory designations in Cambridgeshire are known as Local Wildlife Sites (LWSs) and three lie within 2km of the Site as show in **Table 7**.

Table 7. Non Statutory Sites of Nature Conservation Importance within 2km of the Site

Site name	Designation	Size (ha)	Approx. distance from site	Interest feature(s)
Bucket Hill Plantation Grassland	LWS	1.64	1.5km SW	Supports frequent numbers of at least 3 strong neutral grassland indicator species and at least 8 neutral grassland indicator species
Jason Farm Grassland	LWS	2.32	1.8km S	Supports at least 0.05ha of the NVC community MG5 Crested Dog's-tail - Black Knapweed grassland.
Madingly Slip Road road side verge	LWS	1.47	1km E	Supports frequent numbers of at least 6 strong calcareous grassland indicator species.

Habitats

3.3 The habitats recorded during the Extended Phase 1 Survey are discussed in detail below.

Arable Land

3.4 A majority of the Site comprises large parcels of arable land. These are intensively managed monocultures with narrow field margins.

Species Poor Semi Improved Grassland/Tall ruderal Vegetation Mosaic

3.5 The field margins and banks of the ditches/brooks comprise several grass special and tall ruderal vegetation. Species include cow parsley *Anthriscus sylvestris*, hogweed *Heracleum sphondylium*, dandelion *Taraxacum officinale*, nettle *Urtica dioica*, goose grass *Gallium aparine*, bristly ox tongue *Helminthotheca echioides*, spear thistle *Cirsium vulgare*, lesser burdock *Arctium minus* and grasses such as cocksfoot *Dactylis glomerata*, Yorkshire fog *Holcus lanatus*, sterile brome *Bromus sterilis*, false oat grass *Arrhenatherum elatius* meadow foxtail *Alopecurus pratensis* and red fescue *Festuca rubra*.

Ponds

3.6 There are three ponds on the Site. These are labelled as P1, P2 and P3 on **Figure 3.** Two of the ponds (P2 and P3) are within the Dry Drayton Estate. These ponds are heavily used by water fowl and surrounded by amenity grassland and planted weeping willow *Salix babylonica* and cherry *Prunus* sp. trees. Pond P2 has little to no aquatic vegetation and P3 is well stocked with large koi carp and contains a fountain.

3.7 Pond P1 is within Fishpond plantation. It has steep sides covered with bramble *Rubus fruticosus* agg. and is heavily shaded by the surrounding trees. Further detail is given in relation to their suitability for great crested newt below.

Ditches

3.8 There are a number of ditches within the Site. These are either dry or damp and are mostly filled with tall ruderal vegetation species dominated by willowherb *Epilobium* sp., and the species listed above in relation to the tall ruderal/grassland mix.

Flowing Water

3.9 There are two main flowing water courses within the Site. Within the western parcel is a flowing land drain into which many of the damp/dry ditches connect.

3.10 This ditch has steep vegetated sides approximately 3 m high. Vegetation is predominantly a tall ruderal/grassland mix with scattered willow trees and bramble scrub. The water channel is narrow (mostly less than 1 metre wide) and becoming 1-2m wide in the north. There are several culverts and bridges over this water course and the substrate varies widely from stones and gravel to silt and mud. The water level is very variable.

3.11 Callow brook flows through the land on the eastern side of Scotland Road. At the northern end of the Site, it is shallow and sandy with a channel 1-2m wide. Further south the channel narrows significantly and the banks become steep and vegetated, similar to the water course on the western side. There are significant areas of bank collapse in the middle section of Callow Brook but these stops in the south. There are several culverts and bridges over the brook and a public footpath runs along the eastern side. Water level is variable.

Woodland

3.12 There are several areas of woodland within the Site as shown on **Figure 2**. These areas of woodland are dominated by oak *Quercus robur* with some sycamore and ash *Fraxinus excelsior* trees. The ground flora is varied and dominated by grass species but includes species such as lords and ladies *Arum maculatum* and wood avens *Geum urbanum*. There are large amounts of standing and fallen dead wood and a shrub layer of wild privet *Ligustrum vulgare*, black thorn *Prunus spinosa*, hawthorn *Crataegus monogyna* and elder *Sambucus nigra*.

Scattered Trees

3.13 There are scattered willow and alder *Alnus glutinosa* trees along the banks of both water courses and some ditches. Many of the ditches on the eastern parcel are lined with heavily pollarded willow.

3.14 Along the northern boundary, part of the boundary vegetation turns from hedgerow to line of trees. Species comprise hawthorn, blackthorn, field maple *Acer campestre*, oak, elm *Ulmus* sp. and ash. There is a row of trees in the southwest corner predominantly comprising Lombardy poplar *Populus nigra italica*.

Hedgerows

3.15 Hedgerows are at the peripheries of the Site with some dividing the field compartments. They comprise between three and five woody species per average 30m section and many were associated with dry ditches and were generally well connected to other hedgerows.

3.16 Analysed under the HEGS criteria, a majority of the hedgerows are considered to be of moderate to moderately high conservation value Hedgerow 29 is considered to be of high value due to its structure, diversity and lack of gaps. Only hedgerows H11, H14 and H16 are considered "important" for nature conservation under the Hedgerow Regulations 1997. The canopies of the hedgerows comprised over 80% native species, therefore all qualify as habitat of principle importance as listed under S41 of the NERC Act 2006[16].

3.17 Details of the hedgerows are provided in **Table 8** below.

Table 8. Hedgerow Summary Table

Hedge	Woody Canopy Species	Mature trees/100m	% gaps	End Conns	Assoc. features	Total Woody spp	HEGS	Important under REGS
H1	*Al, Cm, Ps, Fe, Rc, U, Cs*	3	>30	2	PROW	7	4+	N
H2	*Cm, Ps, U, Fe, Qr, Rl, Ac, Sn, Ap*	3	10-30	2		10	2-	N
H3	*Fe, Cm, Ps, Ac, Rc, U, Qr*	3	<10	3	Standards <10% gaps PROW	7	3+	N
H4	*Fe, Cm, Ps, U, Ah, Qr*	0	>30	2	Standards PROW	6	3-	N
H5	*Cm, Csm U, Ac*	0	None	1		4	3	N
H6	*Cm, Cs, Lo*	0	>10	1		3	4	N
H7	*Cm, Ac, Ps, Rc, Lo, Cs*	1	<10			6	3	N

[16] UK BiodiversH12ity Action Plan Priority Habitat Descriptions Hedgerows From: *UK Biodiversity Action Plan; Priority Habitat Descriptions*. BRIG (H13ed. Ant Maddock) 2008.

Hedge	Woody Canopy Species	Mature trees/100m	% gaps	End Conns	Assoc. features	Total Woody spp	HEGS	Important under REGS
H8	*Pa, Ps, Rc, Cm, Ms, Ac, Fe*	1	<10	3	Dry ditch	7	3+	N
H9	*Ac, Fe, U, Qr, Ps, Cm, Rc, Pa*	>5	<10	2	Standards >50% Ditch	8	3+	N
H10	*Cm, Ac, Rc, Ps, Fe, U, Cherry sp*	<1	<10	3	>50% ditch	9	2-	N
H11	*Ps, Cm, Ac, Sn, Ms, Rc, Cs, Fe, Ac, Qr,U*	>5	>10	2	Standards <10% gaps PrOW	12	2+	Y
H12	*Cm, Ac, Fe, U, Rc, Qr*	>5	0	>4	Standard <10% gaps	7	2+	N
H13	*Sn, Cm, U, Ac*	>5	<10	>4	Standards	4	2	N
H14	*Ps, Sn, Cm, Rc, ?U, Fe, Ac,*	>5	<10	2	Standards <10% gaps	8	2	Y
H15	*Cm, Lv U, Rc, Qr, Ps*	0	<10	2	<10% gaps PROW	6	3	N
H16	*Cm, Ps, Sn, Fe, Rc, Qr, U, Ms, Ac,*	1-3	<10	2	<10% gaps >50% ditch	11	2	Y
H17	*U, Fe, Cm, Ps, Ms, Sn, Rc, Lv, Ac, Sn,*	1-3	10-30	2		10	2	N
H18	*Cm, Ps, U, Lv*	0	<10	0		5	-3	N
H19	*Rc, Cm, Tulip tree*	0	0	1		3	4+	N
H20	*Cm, Cs, Ac, U, Bp, Sn, Fe, C, Ca*	>5	<10	2	standards	9	3+	N
H21	*Cm, Ac*	0	<10	2		2	4	N
H22	*Ps, Cm, Rc, U, Ms*	0	10-30	2	Less than 10% gaps	5	3+	N
H23	*Cm, Qr, Ps, Rc, Pm, U, Fe, Ac*	1-3	0	2	No gaps	8	-2	N
H24	*Cm, Fe, Rc, Ac*	0	0	1	No gaps	4	3	N
H25	*Rc, Cm, Fe, V, Ps, U, Aps, U*	1-3	>30	2	Ditch for over 50%	8	3	N
H26	*Cm, U, Ps, Fe, Qr, Rc, Sn*	1-3	<10	3	<10% gaps >50% ditch	8	-2	N
H27	*Cm, U, Qr, Rc, Ps, Fe Rca, Sn*	1-3	<10	>4	<10% gaps	9	-2	No
H28	*U, Sn, Fe, Sm, Ac, Ps, Rca, Rc*	>5	<10	2	Standards 10% gaps	8	-2	N
H29	*Fe, Cm, Ps, Sn, Rc, Pni, U, Lv*	>5	<10	3	Standards <10% gaps	8	-1	N
H30	*Cm, U, Sm*	1-3	10-30	1	Standards	3	-3	N

Species Key: *Ac Acer campestre* Field maple; *Cm: Crataegus monogyna* hawthorn; *Fe: Fraxinus excelsior* ash; M *Malus sp* apple; *Ps Prunus spinosa* blackthorn; *Qr Quercus robur* English oak*; Rc Rosa canina* dog rose*; U Ulmus sp.*elm. Ah *Aesculus hippocastanum* horse chesnut, *Ap Acer platanoides* Norway maple, *Pa Populus alba* white poplar *Pni Populus nigra 'Italica'* Lombardy poplar *Sn Sambucus* nigra elder, *Lv Ligustrum vulgare* wild privet, *C Carpinus* sp. Hornbeam, *Bp Betula pendula* silver birch *V Vibernum* sp. Guelder rose *Aps Acer Pseudoplanatus* sycamore, *Rca Rhamnus cathartica* buckthorn, *Cs Cornus sanguinea* dogwood, *Ca Corylus avellana* hazel, *Ms Malus sylvestris* crab apple.

Fauna

GCN

3.18 The HSI scores of the surveyed ponds can be found in **Table 9** and presence/absence results are summarised on **Figure 3.**

3.19 **Table 9**: HSI Scores of the Accessed Ponds

Pond	HSI Score	Category
1	0.64	Average
2	0.49	Poor
3	0.33	Poor
10	0.54	Below average
11	0.52	Below average
13	0.92	Excellent
21	0.82	Excellent
22	0.82	Excellent

3.20 Great crested newt were not recorded within any of the ponds within the Site boundary (P1, P2 and P3). The aquatic habitat present in ponds 2 and 3 are unsuitable for GCN containing little aquatic vegetation and high levels of waterfowl use. P3 also supported a large Koi carp population and a fountain. Pond 1 was of average suitability, mostly due to the high levels of shading.

3.21 Within the offsite ponds surveyed, GCN were found in P10, P11 and P13 with peaks counts of 4 (1 males, three female), 9 (2 male and 7 female) and 59 (47 Male and 12 female), respectively. Pond P15 was dry.

3.22 It is considered likely that GCN move between the ponds within Dry Drayton village including the six others not accessed. This is likely to make a 'medium' metapopulation and this population potentially uses the terrestrial habitats at the northern peripheries of the Site.

Bats

Roosting

3.23 The ground level assessments of trees recorded a number of moderate and low potential trees within the Site as shown on **Figure 5a** and **5b**.

3.24 In addition, the woodland areas (locations on **Figure 2**) all contain significant numbers of trees with bat roost potential but these were not inspected individually.

3.25 There are several buildings within Rectory Farm that appear to provide suitable features which could be used as a bat roost however, access was not granted for a detailed internal/external inspection. These buildings will be surveyed for any future applications.

Foraging/commuting

Transects

3.26 In May, the transects recorded relatively low levels of activity from common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *P. pygmaeus*, noctule *Nyctalus noctula*, *Nyctalus* sp, *Myotis* sp., brown long eared *Plecotus auritus* and barbastelle *Barbastella barbastellus* bats. Results are shown on **Figure 6a**. Activity was greatest along boundary hedgerows/tree lines and woodland patches with little or no activity along water courses or hedgerows in the centre of the Site.

3.27 In June, the transects also recorded low levels of activity from common and soprano pipistrelle and noctule with a single pass along the water course in the western land parcel of a *Myotis* species. There was a more even coverage of activity during June with activity along both water courses and almost all hedgerows surveyed. Results are shown on **Figure 6b**.

3.28 In September, transects recorded a slightly higher level of activity. Activity was predominantly of common pipistrelle with relatively regular passes of soprano pipistrelle and noctule and very few passes from brown long eared, barbastelle and a Myotis species. Activity was spread throughout the site with no obvious 'hot spots' of activity. Results are shown in **Figure 6c**.

Statics

3.29 Three static detectors were deployed across the Site in May, June and September 2021 as shown in **Figure 4**. Detailed results are displayed in **Appendix B**.

May

3.30 The unit towards the north of the Site at the western end of the woodland at Rectory Farm recorded 554 registrations across the 5 nights; an average of 11.6 registrations per hour or recording. The majority of activity was identified as common pipistrelle (60%) with a lower number of contacts by noctule (11%), soprano pipistrelle (15%) and barbastelle (3%) bats and very low numbers of contacts by *Myotis* species and *Nyctalus* species.

3.31 The unit in the southeast of the Site on the edge of the woodland recorded 348 registrations over three nights; an average of 12.4 per hour of recording. The majority of activity was from common pipistrelle (79%) with 14% from barbastelle, 4% from soprano pipistrelle and 2% from an undetermined *Myotis* sp.. Noctule and another an undetermined *Nyctalus* sp. had single registrations.

3.32 The unit in the southwest of the Site on the edge of the woodland recorded 261 registrations over three nights; an average of 5.6 per hour of recording. The majority of activity was from common pipistrelle (85%) with 6% from barbastelle, 3% from an undetermined *Myotis* sp.. Soprano pipistrelle, brown long eared, Noctule and another an undetermined *Nyctalus/Eptesicus* sp. had 5 or less registrations.

June

3.33 The unit towards the north of the Site at the western end of the woodland at Rectory Farm recorded 1074 registrations across the 5 nights; an average of 26.1 registrations per hour or recording. The majority of activity was identified as common pipistrelle (59%) with a lower number of contacts by noctule (6%), soprano pipistrelle (18%) and a *Nyctalus* species (11%) bats and very low numbers of contacts by Myotis species, brown long eared, barbastelle and *Nyctalus/Eptesicus* species.

3.34 The unit in the southeast of the Site on the edge of the woodland recorded 605 registrations over five nights; an average of 14.7 per hour of recording. The majority of activity was from common pipistrelle (64%) with 20% from soprano pipistrelle, 6% from unidentified pipistrelle species and 3% from barbastelle. Other bat species were recorded in much lower numbers.

3.35 The unit in the southwest of the Site on the edge of the woodland recorded 652 registrations over five nights; an average of 15.8 per hour of recording. The majority of activity was from common pipistrelle (61%) with 27% from soprano pipistrelle and 5% from barbastelle. Other bat species were recorded in much lower numbers.

3.36 Activity from the pipistrelle species and noctule was highest in the north of the Site and activity from barbastelle bats, although relatively low, was at a higher level in the south of the Site. Other species activity was very low and showed no concentration of activity anywhere on the Site.

September

3.37 The unit towards the north of the Site at the western end of the woodland at Rectory Farm recorded 3011 registrations over five nights, an average of 51.5 per hour – much more than in May and June. A majority of the activity recorded was of common pipistrelle (60%) with 15% from soprano pipistrelle, 10% from pipistrelle species and 9% from brown long eared bat. Other species (noctule, *Myotis* and barbastelle) contributed less than 4%.

3.38 The unit in the southeast of the Site on the edge of the woodland recorded 2988 registrations, an average of 51.1 per hour – again, much more than in May and June. A majority of activity was again from common pipistrelle (54%) with 23% from soprano pipistrelle and 10% from pipistrelle species. Barbastelle accounted for 7% of activity and brown long eared, *Myotis* and noctule all accounted for less than 4% each.

3.39 The unit in the southwest of the Site on the edge of the woodland recorded only 843 registrations, an average of 14.4 per hour. Activity was 57% common pipistrelle with soprano pipistrelle accounting for 25%. Barbastelle accounted for 6% and noctule, brown long eared and *Myotis* all less than 5% each.

Overall

3.40 The water courses and hedgerows provide foraging corridors across the large field parcels that make up a majority of the Site. The woodland edges are used by foraging and commuting bats. The woodland and adjoining hedgerows on the eastern boundary were more heavily used by barbastelle, especially in September. The south of the site appears to be more used by barbastelle than the north.

3.41 A foraging/commuting assemblage of at least seven species was recorded at the Site during the surveys. This includes common pipistrelle, soprano pipistrelle, barbastelle, noctule, brown long eared an undetermined *Myotis* species and an undetermined *Nyctalus/Eptesicus* species.

3.42 The Myotis species is mostly likely to be a Daubenton's *M. daubentonii* or Natterer's *M. nattereri* bat as other Myotis species (Alcathoe *M. alcathoe*, Bechsten's *M. bechsteinii*, Brandts *M. brandtii* and Whiskered *M. mystacinus* bats) are either extremely rare and/or not found in this area of the UK[17].

3.43 The *Nyctalus/Eptesicus* species if not noctule, will be serotine *Eptesicus serotinus* or Leisler's *Nyctalus leisleri* bat.

[17] https://www.bats.org.uk/about-bats/what-are-bats/uk-bats

Water Vole

3.44 Records of water vole were returned during the desk study from Bar Hill Reserve 450m north of the Site. This stream connects to that which runs through the western part of the Site.

3.45 The drainage ditches feeding into the two main water courses on the east and west were dry and thus were not surveyed for water vole. Both main water courses supported suitable habitat for water voles. Whilst water levels were low, banks were steep and vegetated and supported a good variety of vegetation for year-round feeding. Some areas of Callow Brook had suffered sever erosion and collapse, making these areas less suitable for water vole. Habitat suitability is shown on **Figure 7**.

3.46 Latrines, footprints and burrows were found on both water courses during the water vole surveys indicating presence on both water courses. This is shown on **Figure 7**.

Otter

3.47 A single otter record was returned during the desk study of an individual dead on the A428 immediately south of the Site. Otter could potentially use the main water courses on the Site to move through a territory but neither water course supports fish populations so will not form a significant part of a territory. No evidence of otter was found during the desk study and no suitable resting places were identified.

Breeding Birds

3.48 The desk study returned many bird records within 2km including within Dry Drayton village, immediately north as shown in **Figure 8**.

3.49 A total of 45 bird species were recorded within the survey area during the 2021 surveys. Of these, 18 appear on one or more of the following and are hereinafter referred to as 'notable' species.

- Schedule 1 of the Wildlife & Countryside Act 1981 (as amended);
- BoCC Red or Amber lists; and
- Section 41 of the NERC Act 2006.

3.50 Of the 45 species recorded during breeding bird surveys, one was confirmed as breeding (robin *Erithacus rubecula*).

3.51 A total of 14 species were considered probable breeders, including notable species song thrush *Turdus philomelos*, skylark *Alauda arvensis*, dunnock *Prunella modularis*, yellowhammer *Emberiza citrinella*, corn bunting *Emberiza calandra* and linnet *Linaria cannabina*. The remaining eight probable breeding species were all BoCC green-listed species (low conservation concern).

3.52 The remaining species recorded were considered possible breeders or non-breeders on site.

3.53 **Table 10** provides a summary of the notable bird species and their breeding status on site, whilst **Figure 9** shows the approximate locations of where they were recorded.

Table 10: Notable Species during Breeding Bird Surveys 2021, and their Recent Status within Oxfordshire

Species	Legal/ Conservation status	Peak Count / Number of Survey Occasions Recorded	Breeding Status*	Recent Status in Cambridgeshire
Mallard *Anas platyrhynchos*	Amber list	2 + 4 flyovers / 1	Possible	Very common resident.
Grey partridge *Perdix perdix*	Red list NERC S.41	4 / 1	Possible	Scarce resident, population much declined and fairly local.
Lapwing *Vanellus vanellus*	Red list NERC S.41	1 / 1	Possible	Fairly common but decreased resident.
Black-headed gull *Chroicocephalus ridibundus*	Amber list	3 flyovers / 1	Non-breeder	Common but very local breeder.
Stock dove *Columba oenas*	Amber list	4 / 2	Possible	Common resident.
Kestrel *Falco tinnunculus*	Amber list	1 / 1	Possible	Fairly common resident.
Skylark *Alauda arvensis*	Red list NERC S.41	38 + 1 flyovers / 2	Probable	Abundant but much declined resident.
Willow warbler *Phylloscopus trochilus*	Amber list	1 / 1	Possible	Common and widespread migratory breeder.
Starling *Sturnus vulgaris*	Red list NERC S.41	4 + 29 flyovers / 2	Possible	Very common but declined resident.
Song thrush *Turdus philomelos*	Red list NERC S.41	5 / 2	Probable	Common but declined resident.
Dunnock *Prunella modularis*	Amber list NERC S.41	14 / 2	Probable	Widespread and abundant resident.
House sparrow *Passer domesticus*	Red list NERC S.41	1 colony / 2	Possible	Abundant but declining resident.
Meadow pipit *Anthus pratensis*	Amber list	4 + 2 flyovers / 2	Possible	Common, somewhat local, resident.
Bullfinch *Pyrrhula pyrrhula*	Amber list NERC S.41	1 / 1	Possible	Common but declined resident.
Linnet *Linaria cannabina*	Red list NERC S.41	28 + 10 flyovers / 2	Probable	Very common but declined resident.
Yellowhammer *Emberiza citrinella*	Red list NERC S.41	21 / 2	Probable	Common but declined resident.
Reed bunting *Emberiza schoeniclus*	Amber list NERC S.41	4 / 2	Possible	Common but declined resident.
Corn bunting *Emberiza calandra*	Red list NERC S.41	8 / 2	Probable	Fairly common but much declined local resident.

Description

3.54 The majority of bird species recorded were typical of the range of habitats that dominate the Site, being heavily influenced by the current agricultural management. The internal parts of the arable fields provided limited breeding opportunities for the majority of species recorded, with the exception of skylark and lapwing *Vanellus vanellus*, both declining farmland species. A single

lapwing was recorded on one occasion within the Site, therefore this species was considered to be only a possible breeder within the Site.

3.55 Field margins and interiors provided breeding and foraging habitat for a range of notable species such as skylark, yellowhammer, linnet, corn bunting, grey partridge *Perdix perdix*, kestrel *Falco tinnunculus*, lapwing, and meadow pipit *Anthus pratensis*. Skylark, yellowhammer, linnet and corn bunting all exhibited behaviours that indicate probable breeding within on-site arable habitats.

3.56 Hedgerows, scrub and woodland habitats provided foraging and breeding opportunities for notable species stock dove *Columba oenas*, dunnock, starling *Sturnus vulgaris*, willow warbler *Phylloscopus trochilus*, song thrush, meadow pipit and bullfinch *Pyrrhula pyrrhula*, as well as widespread generalist and woodland species such as blackbird *Turdus merula*, green woodpecker *Picus viridus*, chaffinch *Fringilla coelebs* and other common tit and finch species.

3.57 Mallard *Anas platyrhynchos* were recorded in association with a wet ditch and were therefore considered possible breeders within the site. House sparrow *Passer domesticus* were recorded within boundary hedges. Due to the presence of suitable nesting buildings to the north of the Site, this species was also considered a possible breeder.

3.58 Black-headed gull *Chroicocephalus ridibundus* were recorded flying over the Site only and were therefore considered to be non-breeders within the Site.

3.59 Arable habitats and their associated field margins provided suitable foraging and/or breeding habitat for several declining farmland bird species, including skylark, grey partridge, linnet, yellowhammer, reed bunting and corn bunting. Skylark, linnet, yellowhammer and corn bunting were considered probable breeders within the Site.

3.60 The hedgerows, woodland and scrub provide breeding and foraging habitat for a range of generalist species including the notable stock dove, dunnock, starling, willow warbler, song thrush and bullfinch.

Badger

3.61 There are several badger setts located within the Site boundary. A majority of these setts are considered to be subsidiary setts and outlier setts. Two main setts have been recorded, one in the south west corner and another on the northwest boundary. The sett locations can be seen on **Figure 10**.

Other Notable Mammals

3.62 Records of polecat *Mustela putorius* and brown hare *Lepus europaeus* were returned during the desk study. No evidence of either of these species was found during any of the surveys conducted at the Site however, the Site holds suitable habitat. They are considered likely to be present in small numbers.

3.63 No records of hedgehog *Erinaceous europaeus* were returned during the desk study however, the hedgerows and woodland patches provide good foraging opportunities for this species. Small numbers of hedgehog are considered likely to be present within the Site.

4.0 ECOLOGICAL CONSTRAINTS AND OPPORTUNITIES

Biodiversity Net gain

4.1 There is significant scope for ecological enhancement within the Site through the delivery of two main areas that will be managed for nature. These areas are shown on the Land use Budget Plan (**Appendix A**) and Concept Masterplan (**Appendix C**) and consist of a large country park in the eastern side of the Site and a wetland area with further country park in the north. These two areas in conjunction with the significant SUDs corridors through the centre of the eastern and western areas provide the Site with the scope to deliver a biodiversity net gain.

4.2 National Planning Policy Framework 2021 (Paragraph 174) recommends that "planning policies and decisions should…. minimise impacts on and provide net gains for biodiversity." However, the government is seeking to mandate biodiversity net gain across all future developments in England, with the forthcoming Environment Bill to be used to make the statutory changes necessary to implement mandatory net gain. This legislation is not currently mandated. However, the Greater Cambridge shared planning Biodiversity Supplementary Planning Document[18] (currently out for consultation) is seeking 20% net gain on new development sites.

4.3 To assess whether or not the proposals are capable of delivering a biodiversity gain, the Department for Environment, Food and Rural Affairs (DEFRA) Biodiversity Impact Assessment (BIA) Calculator v3.0 was used, based on the areas devised from the Extended Phase 1 Habitat Survey and the Land Use Budget (provided as **Appendix A**). Results are provided in **Appendix D**.

Assumptions - Habitats

4.4 At this stage, there is no detailed design so a certain number of assumptions have been made when completing the BIA.

Developed land

4.5 All residential land, employment land, schools, local centres, district centres and primary street infrastructure has been calculated as sealed surface. This will not be the case but prior to detailed design, areas of planting and gardens etc. are not known. Therefore, these figures are a worst-case scenario. There is scope for further biodiversity gain from these areas through the inclusion of tree planting, shrub planting, gardens, green roofs, green walls etc.

Green Infrastructure

4.6 All land shown as SUDs on **Appendix A** has been calculated as holding water and therefore as ponds. The water courses are going to be retained and will link these ponds, therefore the green infrastructure between these ponds has been roughly calculated and assumed to be planted with a wet tolerant grass mix or other appropriate meadow mix. These have been set to 'moderate condition' as it is assumed access will be limited. Areas of each habitat at this stage are purely indicative.

4.7 Other green infrastructure has been calculated for now as modified grassland for the heavily used areas and smaller corridors between development plots, and within the larger areas and on the Site boundaries there is an assumption these areas will be dedicated to a more biodiverse grassland and scrub mix to buffer the existing trees and hedgerows and provide further biodiversity value within these recreation areas. These areas are set to 'fairly poor' condition due

[18] https://www.greatercambridgeplanning.org/media/2316/gcsp-biodiversity-planning-doc.pdf

to the access meaning a higher condition cannot be assured. Areas of each habitat at this stage are purely indicative.

Country Park

4.8 The country park has been assumed to comprise woodland to strengthen and existing woodland on the eastern boundary, scrub to buffer the woodlands and diverse grassland and tall herb communities to provide further biodiversity benefits. Condition is set to moderate as it is assumed that with the production of a management plan and monitoring of these areas, this condition can be achieved and maintained. Areas of each habitat at this stage are purely indicative.

4.9 With the above assumptions, and so at the worst-case scenario, the scheme would result in a **net biodiversity gain of 22.84%**.

Assumptions – Hedgerows

4.10 At this stage, without detailed design, it is impossible to determine lengths of hedgerow that will be created. A rough estimate of hedgerows to be lost has been calculated and is shown in **Table 11** below and displayed on **Figure 11**. Those highlighted in orange are the hedgerows deemed to be of most wildlife and biodiversity value either under The Hedgerow Regulations 1997 or the HEGs criteria (scoring 1 or 2). A total of 2.7km of hedgerows of wildlife value are likely to be lost.

4.11 It is worth noting that a majority of the valuable hedgerows are retained and that there is great scope for further species rich hedgerow planting within the extensive green space provision on Site and the Concept Plan (**Appendix C**) does show a large amount of hedgerow planting.

4.12 There is also considerable scope within the scheme for enhancement of the retained hedgerows through strengthening of the corridors they provide with further landscape planting and linkage of these corridors to each other and wider area. Additional species planting and establishment of a more sympathetic management regime will also enhance these hedgerows further. It is considered very likely that the scheme will result in a net hedgerow gain.

Table 11. Hedgerows likely to be Lost and Retained

Hedge	Type	HEGS	Important under REGS	Length (m)	Length retained (m)	Length Lost (m)
H1	Intact species poor	4+	N	926.8	368.9	557.9
H2	Intact species poor	2-	N	398.0	0	398.0
H3	Intact species poor	3+	N	534.3	0	534.3
H4	Intact species poor	3-	N	247.5	247.5	0
H5	Intact species poor	3	N	83.5	0	83.5
H6	Intact species poor	4	N	164.7	164.7	0
H7	Intact species poor	3	N	210.8	0	210.8
H8	Intact species poor	3+	N	432.3	432.3	0
H9	Intact species poor	3+	N	234.5	0	234.5
H10	Intact species poor with trees	2-	N	593.3	0	593.3
H11	Intact species poor with trees	2+	Y	1476.9	1089.8	387.1
H12	Intact species poor with trees	2+	N	182.1	182.1	0

Hedge	Type	HEGS	Important under REGS	Length (m)	Length retained (m)	Length Lost (m)
H13	Intact species poor	2	N	141.2	141.2	0
H14	Intact species poor	2	Y	348.1	348.1	0
H15	Intact species poor	3	N	400.1	400.1	0
H16	Intact species poor	2	Y	1040.2	0	1040.2
H17	Intact species poor	2	N	375.2	308.2	67.1
H18	Intact species poor	-3	N	234.4	0	234.4
H19	Defunct species poor	4+	N	177.5	104.3	73.2
H20	Intact species poor	3+	N	57.5	57.5	0
H21	Intact species poor	4	N	83.0	83.0	0
H22	Intact species poor with trees	3+	N	90.4	90.4	0
H23	Intact species poor with trees	-2	N	246.5	0	246.5
H24	Intact species poor with trees	3	N	96.0	96.0	0
H25	Intact species poor with trees	3	N	573.0	573.0	0
H26	Intact species poor with trees	-2	N	331.8	331.8	0
H27	Intact species poor with trees	-2	N	384.5	384.5	0
H28	Intact species poor	-2	N	526.7	526.7	0
H29	Intact species poor with trees	-1	N	722.8	722.8	0
H30	Intact species poor with trees	-3	N	51.9	51.9	0
Total length (m)				**11365.6**	**6704.9**	**4660.7**
Total length (km)				**11.4**	**6.7**	**4.7**
Total length lost (km)				**2.7**		

Assumptions - Watercourses

4.13 At this stage, the impact assessment on the two water courses has not been completed as the extent of works has not yet been decided. This will be conducted prior to any applications going forwards.

4.14 The impact of the layout in **Appendix A** and **Appendix C** on each of the ecological receptors identified in Section 3 is discussed in turn below.

Statutory Designations

4.15 Eversden and Wimpole Woods SPA is situated 6.7km south of the Site. It is designated for a breeding colony of barbastelle bats.

4.16 The Standard Data form for this SAC[19] identifies outside threats from management practices, air pollution and changes to biotic conditions.

[19] https://jncc.gov.uk/jncc-assets/SAC-N2K/UK0030331.pdf

4.17 The intervening distance between the Site and this Ramsar/SPA and the habitat composition of the Site (predominantly agricultural land) means that the Site is very unlikely to contribute to the integrity or supporting habitat of the SPA. However, whilst the Site may not be of strategic importance to Barbastelle bats, they were recorded as using the Site (albeit in low numbers). Woodland creation within the country park in the east of the Site will greatly enhance the Site for Barbastelle bats and it is recommended that the retained patches of woodland (that all support trees with roosting potential) are linked through the green infrastructure network which will provide an enhanced foraging network across the Site. It is considered that development at the Site could provide enhancements for barbastelle bats in the area and thus have a positive impact on this SAC. Opportunities for bat, including barbastelle are discussed further in the species section below.

4.18 Ouse Washes SAC and Ramsar lies 12.5km north of the Site. The Standard Data Form for this SAC[20] identifies outside threats from human induced changes to hydraulic conditions and ground water pollution. Foul water run off from the Site will not reach this SAC. The drainage strategy for the Proposed Development is planned for the surface water from the development to go through a series of SUDS which will form a treatment train for the surface water run off from the development and consequently towards the SAC. Therefore, no impacts on this SAC are considered likely from surface or foul water drainage from the proposed development.

4.19 There are five SSSIs within 5km of the Site. The Site falls within an IRZ[21] for these SSSIs where: *"New housing developments will require an assessment of recreational pressure on relevant SSSIs and measures to mitigate adverse impacts e.g. alternative open space provision. For further advice contact Natural England's Discretionary Advice Service."*

4.20 All of the SSSIs, except Elsworth Wood are in favourable or recovering condition. The intervening distance between Elsworth Wood and the Site means that an increase in recreation pressure is unlikely. The provision of extensive alternative green space within the Site, especially of the country park in the east, will reduce any potential recreational pressure on the other SSSIs within 5km. Advice will be sought from Natural England about additional measures considered necessary.

Non-Statutory Designations

4.21 There are three LWSs within 2km of the Site as shown on **Figure 1**. These are all designated for grassland habitats. There are no terrestrial habitat links between the Site and these LWSs and therefore no significant impacts on them are expected as a result of development at the Site.

4.22 In addition, within the green infrastructure there is scope for creation of diverse grassland habitats along hedgerow and water course corridors and within the country park. This is discussed below and would increase the prevalence of this habitat type in the area.

[20] https://jncc.gov.uk/jncc-assets/SAC-N2K/UK0013011.pdf

[21] The Impact Risk Zones (IRZs) are a GIS tool developed by Natural England to make a rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

Habitats

4.23 The degree to which habitats receive consideration within the planning system relies on a number of mechanisms, including:

- Inclusion within a specific policy, for example veteran trees, ancient woodland and linear habitats within the National Planning Policy Framework (NPPF);
- A non-statutory site designation;
- Habitats considered as habitats of principal importance for the conservation of biodiversity as listed within Section 41 (S41) of the NERC Act 2006; or
- Habitats identified as being a Priority Habitat within the local Biodiversity Action Plan (LBAP).

4.24 Onsite habitats identified during the survey which fall within the above listed categories are the hedgerows, ponds and lowland deciduous woodland; all three being habitats of Principle Importance nationally local Priority habitats for Cambridgeshire[22].

4.25 Development at the Site has the potential to provide and enhance all three habitat types within green infrastructure as well as create additional habitat types of national and local importance. Examples include:

- Creation of additional woodland areas within the country park on the eastern boundary;
- Linkage of retained and newly created woodland patches through green corridor creation composed of hedgerows, scrub and trees;
- Buffering of retained woodland patches through boundary scrub and grassland planting;
- Creation of wetland areas including ponds and reedbeds along the water courses on the eastern and western areas and reprofiling of the banks to prevent future collapses;
- Extensive wetland planting along these water courses to create a strong, diverse and attractive green wetland corridor throughout the Site;
- Strengthening and enhancement of the retained hedgerow network through planting up of gaps with native species and additional hedgerow creation; and
- Further widening and strengthening of these hedgerow corridors through diverse wildflower grassland planting at the bases.

Fauna

Great Crested Newt

4.26 GCN are afforded legal protection by Schedule 5 of the WCA 1981 (as amended) and under the Conservation of Habitats and Species Regulations 2017 (as amended). GCN are also listed as a Species of Principal Importance under the NERC Act. There is a large 'metapopulation' of GCN within 150m of the Site and likely using the habitats on the peripheries of the Site during their terrestrial phase.

[22] http://www.cpbiodiversity.org.uk/habitats

4.27 No breeding ponds will be lost to development at the Site but the development will likely result in impacts to GCN due to the presence of terrestrial habitat on the Site in close proximity to known breeding ponds. Any proposed operations will need to be legitimised through the granting of a Derogation Licence under the Conservation of Habitats and Species Regulation 2017 (as amended). Actions taken under this licence will include:

- The capture of GCN from suitable terrestrial habitat within the Site and translocation to a suitable area of cover; and
- The provision of required habitats in a secure, GCN reserve area, managed in the long-term.

4.28 The required GCN 'receptor' area will be provided within the proposed wetland area to be created in the north of the western land parcel. This area will include additional ponds, grassland creation and shrub planting and will be linked to the existing breeding ponds within Dry Drayton. It will provide a significant enhancement to the habitat currently present within the Site for GCN.

4.29 Inherent to the scheme's design, mitigation measures during operation would include the provision of culverts, dropped kerbs and off-set gullies to allow safe movement across roads on Site.

4.30 In addition, the areas of woodland, hedgerows, grassland and scrub planting discussed in paragraph 4.21 will provide additional GCN habitat where there currently is none. Hibernacula and log piles will be provided to increase opportunities for GCN (and other amphibians) within wetland areas. Following the implementation of mitigation, the proposals are likely to provide positive enhancements for the local population.

Bats

Roosting

4.31 A majority of the trees with bat roost potential (shown in **Figures 5a** and **5b**) can be retained within green infrastructure with 11 potentially requiring removal. There is potential to retain some of these trees at the detailed design stage but for any that are to be removed; prior to removal, these trees will be subject to the relevant surveys and should a roost be found, a derogation Licence under the Conservation of Habitats and Species Regulation 2017 (as amended) be obtained. Any mitigation and roosting provision required under these licence(s) can be readily accommodated within the green infrastructure in the form of bat boxes on existing mature trees.

4.32 Should the buildings at Rectory Farm be demolished or undergo works, then these will be subject to the relevant surveys to determine the presence or absence of a roost and actions taken accordingly. Any mitigation potentially required should a roost be discovered can be readily provided within the green infrastructure or within new dwellings.

4.33 Further enhancements in the form of a variety of bat roost boxes on new buildings and retained trees would provide additional opportunities.

Foraging

4.34 So far a foraging/commuting assemblage of at least seven species was recorded at the Site including: common pipistrelle, soprano pipistrelle, barbastelle, noctule, brown long eared and undetermined *Myotis* species and undetermined *Nyctalus/Eptesicus* species.

4.35 Currently, foraging opportunities at the Site are limited to the hedgerows, water courses and woodland patches. All woodland, both main water courses and a majority of the hedgerows are to

be retained and enhanced. The proposed woodland planting within the country park will be especially beneficial to bat species.

4.36 As good practice, to minimise potential effects to the local bat population, lighting at the peripheries of the Site and on any retained and created green infrastructure should be carefully designed in order to minimise light spill onto vegetated areas, particularly adjacent to those mentioned above. This could be achieved through a combination of positioning of fittings/luminaires and other design features such as directional hoods/baffles, timers, low level bollards, etc., to maintain 'dark zones' in key locations.

4.37 In addition, the habitat enhancement measures discussed in paragraph 4.21 will enhance the foraging opportunities available to bats on the Site. Especially the retention and linking of the woodland patches as the highest numbers of barbastelle bat registrations were on the static detectors close to woodland areas.

Water Vole

4.38 Water vole are present along the entire length of the water course on the western land area and considered likely to be present along most of the water course in the eastern area.

4.39 The water courses will be retained within the development but extensive bank stabilisation works and pond/basin creation is required along their lengths. This work will require trapping and translocation of the water voles under a conservation licence. To ensure the conservation status of the species is maintained, a 'receptor site' will be created to move the voles into whilst the works to the water courses are being completed.

4.40 The large wetland/SUDs area proposed in the north of the Site could function as this area (as well as the GCN receptor area discussed above). Here, in addition to pond creation and wetland/scrub planting, a series of ditches can be created and the main water course channel retained.

4.41 In the long term, the bank stabilisation and additional wetland creation along the length of the water courses will greatly enhance the Site for water voles and provide additional foraging, shelter and breeding opportunities and reduce the risk of bank collapse.

Breeding Birds

4.42 The hedgerows and woodland provide suitable nesting habitat for an assemblage of breeding birds. There are buildings at Rectory Farm with potential for breeding house sparrow and the arable farmland provides habitat for skylark, lapwing, linnet, yellow hammer, grey partridge and corn bunting.

4.43 Removal of arable habitats from the Site will lead to the loss of skylark and corn bunting as probable breeding species since they require large open fields for nesting but this impact will be reduced by the abundance of further suitable arable habitats in the wider landscape. Enhancements for these species will be provided on other agricultural land controlled by Dry Drayton Estate.

4.44 The creation of native wildflower meadows within the green infrastructure, subject to appropriate management, would provide partial compensation for the arable habitat loss to species such as grey partridge, yellowhammer and linnet which depend on the habitat for foraging resources by providing new foraging resources. The inclusion of native mixed scrub adjacent to these

meadows would provide some suitable breeding habitat, as would the retention of wide grassy margins along hedgerows.

4.45 The habitat creation described in paragraph 4.21 within the green infrastructure will enhance opportunities for the notable species song thrush and dunnock as well as other generalist bird species.

4.46 The retention of existing watercourses and ponds, in addition to the creation of new water features has the potential to result in a beneficial impact on a local level to the wetland species recorded on site including reed bunting and mallard. The permanent water in the new wetland features and the planting of the peripheries of these wet areas with an appropriate native marginal vegetation mix that includes common reed *Phragmites australis*, will provide good nesting opportunities. The creation of wetland grassland within the temporarily wet / inundated parts of features, along with sensitive management, would provide valuable foraging habitat for many breeding birds.

4.47 Further enhancements in the form of a variety of bird nest boxes on new buildings and retained trees would provide additional opportunities for a variety of species.

Badger

4.48 Two main setts and several outlier and annex setts have been identified within the Site. The two main setts can easily be retained within the green infrastructure however, should they require closure, the site provides adequate scope to provide artificial setts within other areas of green infrastructure. The habitat measures discussed in paragraph 4.21 will provide adequate foraging for badger within the Site and ensure their continued movement through the Site to the wider area.

Other Mammals

4.49 It is considered that the potential for habitat creation at the Site as discussed in paragraph 4.21 will also provide additional opportunities for hedgehog, polecat and brown hare.

5.0 CONCLUSIONS

5.1 The desk- and field-based baseline investigations have demonstrated that the habitats and species present within and around the Site do not pose an 'in principle' constraint to the proposed development. There are no statutorily protected nature conservation interests within the Site and none nearby that would be materially affected by the proposals.

5.2 There are a number of habitat features and protected species that will need to be respected and relevant mitigation embedded into any future application but there are no protected or notable species or habitats present that cannot be accommodated and additional opportunities provided for, within the proposed green infrastructure.

Key

- Site Boundary
- 1km Search Area
- 2km Search Area
- Sites of Special Scientific Interest (SSSI)
- Local Wildlife Sites (LWS)

Notable Species

- Brown Hare
- Brown Long-eared Bat
- Common Frog
- Common Pipistrelle
- Common Toad
- Daubenton's Bat
- Eurasian Badger
- European Otter
- European Water Vole
- Grass Snake
- Great Crested Newt
- Myotis
- Natterer's Bat
- Noctule Bat
- Pipistrelle Bat species
- Polecat
- Serotine
- Soprano Pipistrelle
- Unidentified Bat
- West European Hedgehog
- Crosswort
- Dwarf Spurge
- Giant Hogweed
- Hoary Plantain
- Japanese Knotweed
- New Zealand Pigmyweed
- Sea-buckthorn
- Slender Tare
- Stinking Chamomile
- Stinking Hellebore
- Yellow Archangel

Madingley Slip Road RSV LWS
Madingley Wood SSSI
Bucket Hill Plantation Grassland LWS
Jason Farm Grassland LWS
Caldecote Meadows SSSI
Hardwick Wood SSSI

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0 500 1000 m

client
Dry Drayton Estate Ltd and Hallam Land Management

project
Land at Scotland Farm Estate

drawing title
Consultation & Site Location Plan

scale 1:30000 | drawn CDM/VF | issue 2/6/2021

drawing / figure number **Figure 1** | rev **9962-E-01**

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Key

- Site Boundary
- Survey Area

Phase 1 Habitats

- Broadleaved woodland - plantation
- Broadleaved woodland - semi-natural
- Built Environment: Buildings/hardstanding
- Cultivated/disturbed land - arable
- Scrub - dense/continuous
- Broadleaved trees
- Standing water
- Running water
- Intact hedge - species-poor
- Hedge with trees - species-poor
- Fence
- Dry ditch
- Defunct hedge - species-poor
- Broadleaved tree
- No Access
- Pond

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PHASE 1 HABITAT PLAN

scale
1:12000

drawn
FMH / HET

issue
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drawing / figure number
Figure 2

rev
9962 - E - 02

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Key

- Site Boundary
- 250m radius
- 500m radius

Ponds - Great Crested Newt Status

- GCN Present
- Not Present
- Pond Dry
- No Access

0 500 1000 m

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drawing title
WATERBODY LOCATION PLAN

scale @ A3
1:16000

drawn
FMH/WVR/VF

issue
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drawing / figure number
Figure 3

rev
9962 - E - 03

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Key:

- Site Boundary
- Start point
- Finish point
- Transect Route 1
- Transect Route 2
- Transect Route 3
- Static Locations (W/reference label)

S1
S2
S3
Dry Drayton
Childerley Farm
Bricklamps
Carrot Ground
Gaylors
Scotland Farm
Park Farm
Childerley Gate
A428
Saint Neots Road
Scotland Road
High Street
Park Street
Oakington Road
Madingley Road

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0 25 50 75 100 m

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Dry Drayton Estate Ltd and Hallam Land Management

project
Land at Scotland Farm Estate, Cambridge

drawing title
Bat transect routes and static locations

scale @ A3 1:12500 | drawn CW/VF | issue 7/6/2021

drawing / figure number **Figure 4** | rev -

K:\9900\9962\ECO\QGIS\QGIS 2.14\Plans\Bat Figures\9962-E-XX Transect Plan(s) (10.05.21).qgs

Key

- Site Boundary
- Survey Area

Trees with potential to support roosting bats

- Low Bat Potential
- Moderate Bat Potential

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0 250 500 m

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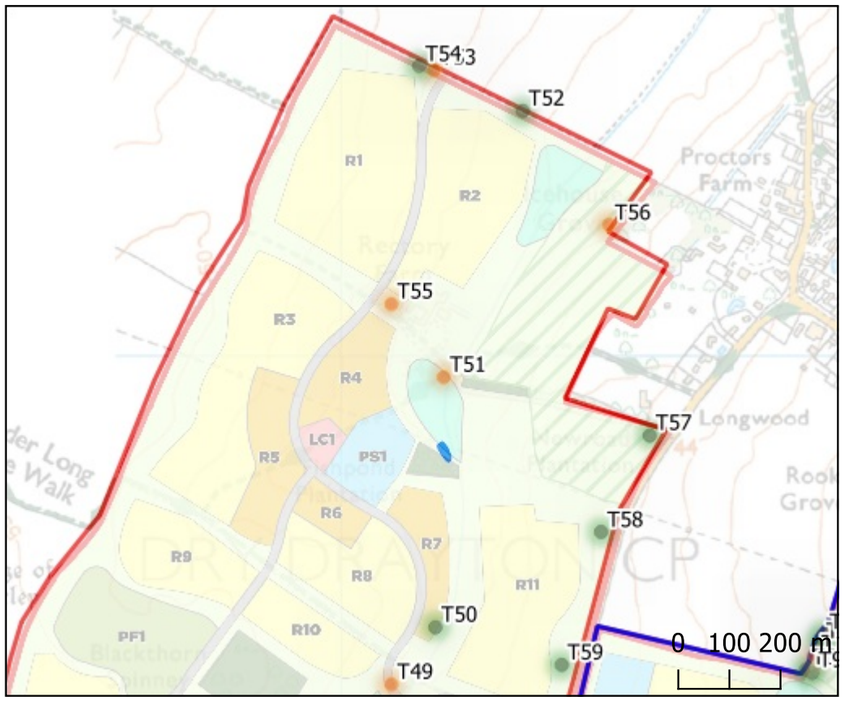
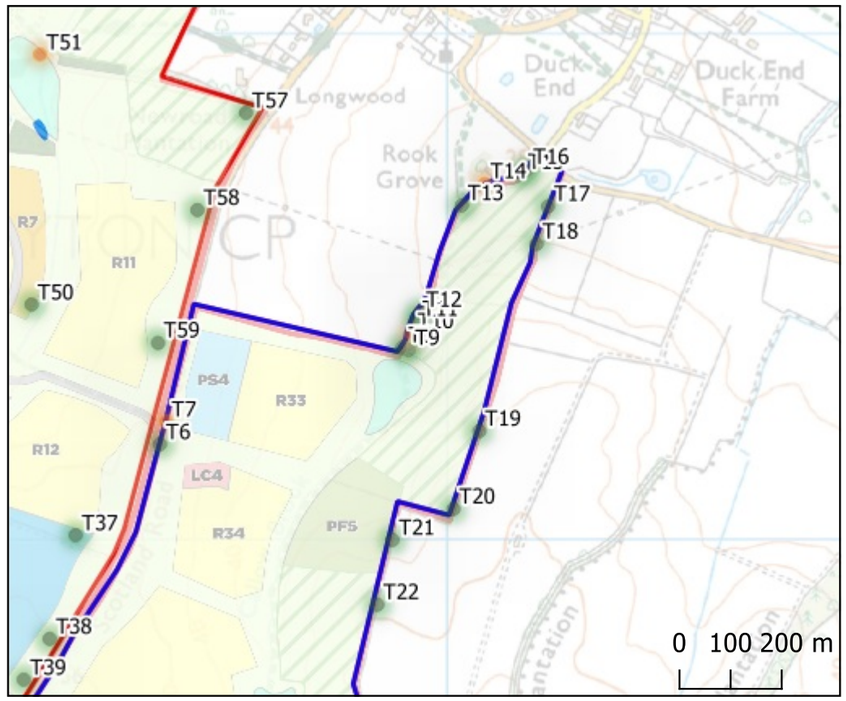
drawing title
Overview of Preliminary Roost Assessment on Trees

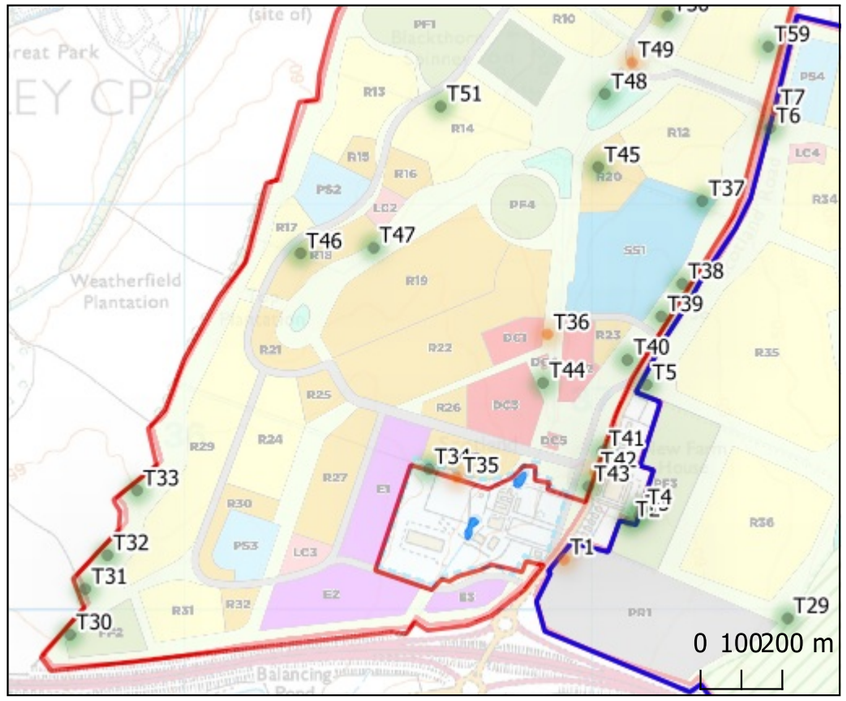
scale 1:12500 | drawn MJ / VF | issue 1/6/2021

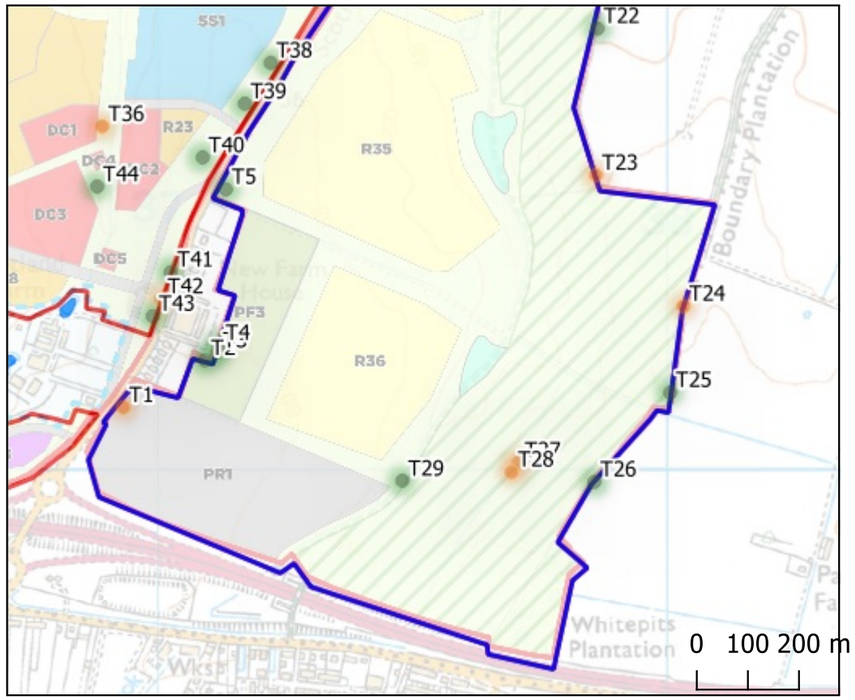
drawing / figure number **Figure 5a** | rev -

K:\9900\9962\ECO\QGIS\QGIS 2.14\Species\Bats\PRA Trees overview









Key

- Site Boundary
- Survey Area

Trees with potential to support roosting bats

- Low Bat Potential
- Moderate Bat Potential

0 250 500 m

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Land at Scotland Farm Estate

drawing title
Preliminary Roost Assessment on Trees

scale 1:12500 | drawn MJ / VF | issue 1/6/2021

drawing / figure number **Figure 5b** | rev -

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Site Boundary

Start & Finish Points

- Start point
- Finish point
- Transect Route 1
- Transect Route 2
- Transect Route 3
- Point Count Locations

Species Results

- Common Pipistrelle
- Myotis Species
- Barbastelle
- Soprano Pipistrelle
- Nyctalus Species
- Noctule
- Brown Long-eared

client
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project
Land at Scotland Farm Estate, Cambridge

drawing title
Bat Transect Results - May

scale @ A3
1:12811

drawn
CW/VF

issue
3/8/2021

drawing / figure number
Figure 6a

rev
-

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0 25 50 75 100 m

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Site Boundary

Start & Finish Points

- Start point
- Finish point
- Transect Route 1
- Transect Route 2
- Transect Route 3
- Point Count Locations
- Flight Arrow

Species Results

- Common Pipistrelle
- Soprano Pipistrelle
- Myotis Species
- Noctule

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0 25 50 75 100 m

client
Dry Drayton Estate Ltd and Hallam Land Management

project
Land at Scotland Farm Estate, Cambridge

drawing title
Bat Transect Results - June

scale @ A3
1:12868

drawn
MJ/VF

issue
3/8/2021

drawing / figure number
Figure 6b

rev
-

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Key:

- Site Boundary
- Start point
- Finish point
- Point Counts
- Route 1
- Route 2
- Route 3
- Flight Arrows

Bat Contacts:

- Common Pipistrelle
- Soprano Pipistrelle
- Myotis Species
- Noctule
- Barbastelle
- Brown Long-eared
- Common/Soprano Pipistrelle

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client
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project
Land at Scotland Farm Estate, Cambridge

drawing title
BAT TRANSECT RESULTS PLAN (02.09.2021)

scale @ A3 1:12500 | drawn FMH / VF | issue 29/9/2021

drawing / figure number **Figure 6C** | rev -

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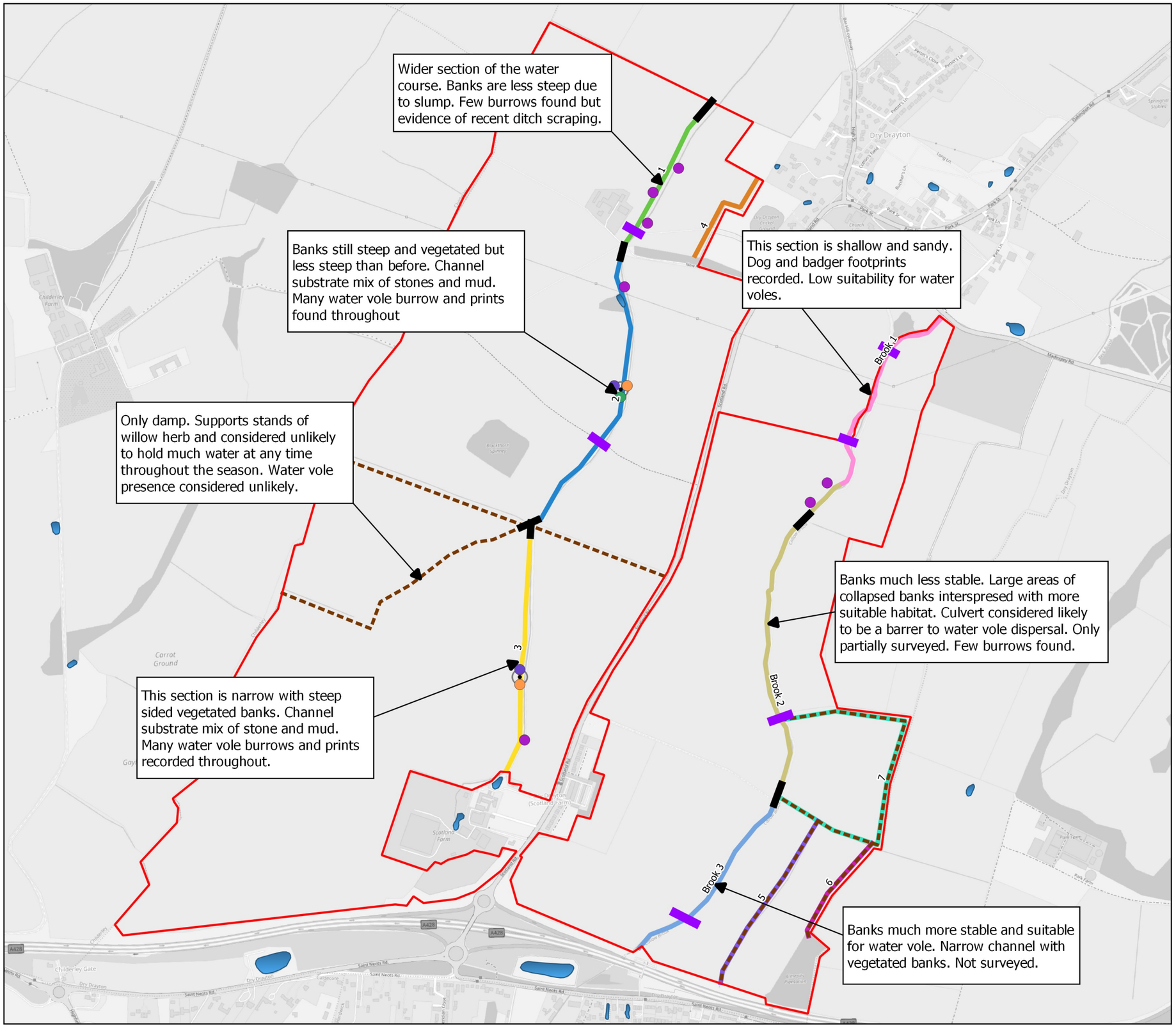

Key

- Site Boundary
- Pond Locations

Ditch References

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- Brook 1
- Brook 2
- Brook 3
- Dry ditch

Foot Bridges and Culverts

- culvert
- ft bridge

Water Vole Survey

- Burrows
- Feeding Station
- Footprint
- Untrampled Latrine

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0 250 500 750 1000 m

client
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project
Land at Scotland Farm Estate

drawing title
WATER VOLE RESULST PLAN

scale @ A3
1:12000

drawn
HET / VF

issue
7/6/2021

drawing / figure number
Figure 7

rev
-

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Key

Site Boundary

1km Search Area

Birds

- Arctic Tern
- Barn Owl
- Black Kite
- Brambling
- Bullfinch
- Canada Goose
- Common (Mealy) Redpoll
- Common Sandpiper
- Corn Bunting
- Cuckoo
- Dunnock
- Fieldfare
- Firecrest
- Golden Plover
- Grasshopper Warbler
- Great Black-backed Gull
- Green Sandpiper
- Grey Wagtail
- Hen Harrier
- Herring Gull
- Hobby
- House Martin
- House Sparrow
- Kestrel
- Kingfisher
- Lapwing
- Lesser Redpoll
- Lesser Spotted Woodpecker
- Linnet
- Little Egret
- Little Ringed Plover
- Mallard
- Marsh Harrier
- Meadow Pipit
- Merlin
- Mistle Thrush
- Montagu's Harrier
- Mute Swan
- Nightingale
- Osprey
- Peregrine
- Quail
- Red Kite
- Redstart
- Redwing
- Reed Bunting
- Shoveler
- Skylark
- Snipe
- Song Thrush
- Spotted Flycatcher
- Starling
- Stock Dove
- Swift
- Tawny Owl
- Tree Sparrow
- Turtle Dove
- Whooper Swan
- Willow Warbler
- Woodcock
- Wryneck
- Yellow Wagtail
- Yellowhammer

client
Dry Drayton Estate Ltd and

project
Land at Scotland Farm Estate

drawing title
Bird Consultation Plan

scale 1:20000 | drawn CDM/VF | issue 1/6/2021

drawing / figure number **Figure 8** | rev **9962-E-8**

0 500 1000 m

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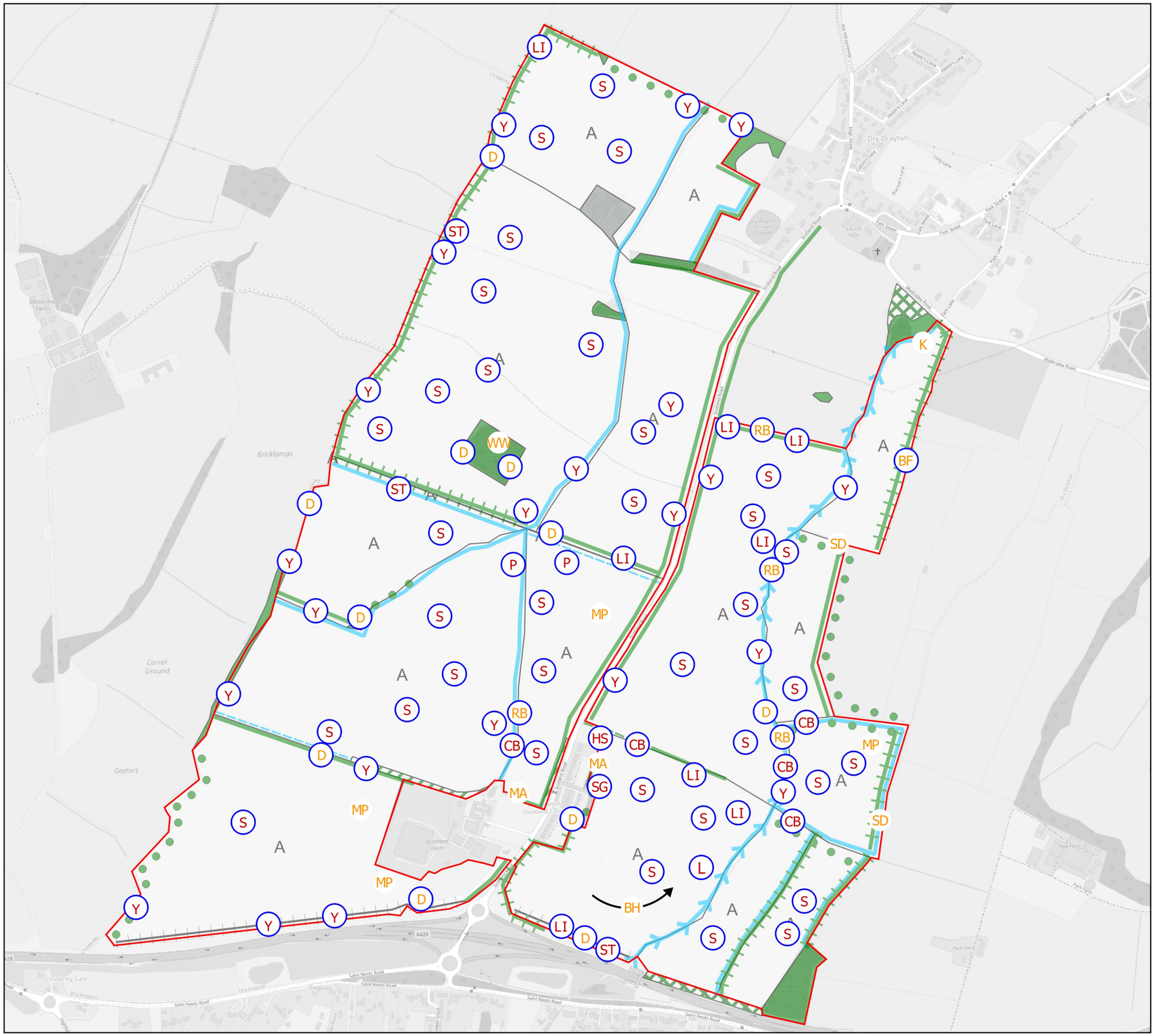

Key

BoCC Red-Listed Species		BoCC Amber Listed Species	
CB	Corn Bunting	BH	Black-headed Gull
P	Grey Partridge	BF	Bullfinch
HS	House Sparrow	D	Dunnock
L	Lapwing	K	Kestrel
LI	Linnet	MA	Mallard
S	Skylark	MP	Meadow Pipit
ST	Song Thrush	RB	Reed Bunting
SG	Starling	SD	Stock Dove
Y	Yellowhammer	WW	Willow Warbler

Site Boundary
Fly over only
NERC Species of Principle Importance

client
Dry Drayton Estate Ltd and Hallam Land Management
project
Land at Scotland Farm Estate

drawing title
BREEDING BIRD SURVEY RESULTS - DISTRIBUTION OF NOTABLE SPECIES

scale 1:12000 | drawn BRJ / VF | issue 1/6/2021

drawing / figure number **Figure 9** | rev **9962-E-9**

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Key

- Updated Site Boundary
- Species Poor Defunct Hedge - Lost
- Species Poor Defunct Hedge - Retained
- Species Poor Hedge with Trees - Lost
- Species Poor Hedge with Trees - Retained
- Species Poor Intact Hedge - Lost
- Species Poor Intact Hedge - Retained

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client
Dry Drayton Estate Ltd and Hallam Land Management

project
Land at Scotland Farm Estate

drawing title
POTENTIAL HEDGEROW LOSS AND RETENTION

scale 1:12500 | drawn FMH / VF | issue 5/8/2021

drawing / figure number **Figure 11** | rev **9962 - E - 11**

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Scotland Farm Summary Land Use Budget *(Based on Drawing HLM059-011 Rev E Dated 27-07-21)*

	Area (Ha)	Area (Ac)	Density	Plot Ratio	Dwellings	Floorspace (sqm)	Floorspace (sqft)
Medium Density Residential	84.68	209.24	*35*		***2964***		
Higher Density Residential	41.54	102.64	*50*		***2077***		
Highest Density Residential	9.19	22.71	*70*		***643***		
District Centre	7.81	19.29	*40*	*0.4*	***312***	**31,235**	**336,209**
Local Centres	2.65	6.54	*40*	*0.25*	***106***	**6,621**	**71,271**
Employment	8.06	19.90		*0.75*		**60,415**	**650,305**
Secondary School	8.00	19.77					
Primary Schools (x4)	8.00	19.77					
Park & Ride	10.61	26.22					
Primary Street Infrastructure	14.12	34.88					
Playing Fields *(WIP)*	21.00	51.89					
Existing Woodland	2.16	5.35					
Green Infrastructure	117.29	289.83					
Country Park	40.73	100.64					
Allotments	2.88	7.11					
Water Attenuation/SuDS *(WIP)*	9.02	22.30					
Existing Land at Scotland Farm	9.69	23.96					
Gross Development Area	**397.44**	**982.05**			***6102***	**98,271**	**1,057,785**

- Land at Scotland Farm (PPA Full Extent)
  West: 266.37 ha, East: 131.07 ha, Total: 397.44 ha
- Existing Land at Scotland Farm (9.69 ha)
- Medium Density Residential
- Higher Density Residential
- Highest Density Residential
- Mixed Use Local Centre
- Mixed Use District Centre
- Employment
- Secondary School
- Primary Schools
- Infrastructure
- Park & Ride
- Green Infrastructure
- Existing Woodland
- Playing Fields
- Country Park
- Allotments
- Surface Water Attenuation / SUDS

Rev	Description	Date

Notes:
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Client:

Hallam Land Management

Scotland Farm

Land Use Budget Plan

Scale@A3:	Drawn:	Designed:	Approved:
1:12,500	**CE**	**-**	**SJP**

0 — 500 m

Drawing Number:	Revision:	Date:
HLM059-011	**E**	**05/07/2021**

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DAVID LOCK ASSOCIATES

APPENDIX B. STATIC DETECTOR RESULTS

Unit Location (Figure 4)	Start Date	End Date	Survey Hours	Total Av. per hour	Total Registrations	Noctule		Common Pipistrelle		Soprano Pipistrelle		Brown Long-eared		*Nyctalus* Species		Barbastelle		*Myotis* species		*Nyctalus / Eptesicus*		*Pipistrelle* species	
						Period Total	Peak Count	Period Total	Peak Count	Period Total	Peak Count	Period Total	Peak Count	Period Total	Peak Count	Period Total	Peak Count	Period Total	Peak Count	Period Total	Peak Count	Period Total	Peak Count
S1	11/05/2021	15/05/2021	46.5	11.9	554	3	2	377	230	86	55	3	2	3	2	17	8	7	1	0	0	0	0
S2	11/05/2021	15/05/2021	46.5	5.61	261	5	3	222	154	5	3	4	4	5	3	18	8	8	3	2	2	0	0
S3	11/05/2021	15/05/2021	28	12.4	348	1	1	274	223	18	14	0	0	1	1	48	37	6	5	0	0	0	0
S1	14/06/2021	19/06/2021	41	26.1	1074	69	39	630	308	193	83	4	3	118	84	5	3	8	3	5	4	42	17
S2	14/06/2021	19/06/2021	41	15.8	652	19	11	396	127	179	95	1	1	8	5	33	13	7	5	0	0	9	6
S3	14/06/2021	19/06/2021	41	14.7	605	11	8	389	306	124	94	10	7	3	2	20	20	8	8	3	3	37	33
S1	02/09/2021	06/09/2021	58.5	51.5	3011	100	29	1798	971	442	210	287	75	0	0	55	27	16	9	0	0	313	97
S2	02/09/2021	06/09/2021	58.5	14.4	843	40	10	478	132	210	114	37	19	0	0	52	29	21	8	0	0	5	2
S3	02/09/2021	06/09/2021	58.5	51.1	2988	38	13	1616	563	668	225	62	19	0	0	238	91	60	22	0	0	286	179

Appendix D: Preliminary BIA Results

Headline Results

Return to results menu

On-site baseline	*Habitat units*	800.48
	Hedgerow units	0.00
	River units	0.00
On-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	983.34
	Hedgerow units	0.00
	River units	0.00
On-site net % change (Including habitat retention, creation & enhancement)	*Habitat units*	22.84%
	Hedgerow units	0.00%
	River units	0.00%
Off-site baseline	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Off-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	182.86
	Hedgerow units	0.00
	River units	0.00
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	22.84%
	Hedgerow units	0.00%
	River units	0.00%
Trading rules Satisfied?		Yes

A-1 Site Habitat Baseline

Condense / Show Columns | Condense / Show Rows | Main Menu | Instructions

	Habitats and areas			Distinctiveness		Condition		Strategic significance			Suggested action to address habitat losses	Ecological baseline	Retention category biodiversity value						Bespoke compensation agreed for unacceptable losses	Comm
Ref	Broad habitat	Habitat type	Area (hectares)	Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic Significance multiplier		Total habitat units	Area retained	Area enhanced	Baseline units retained	Baseline units enhanced	Area lost	Units lost		Assessor comments
1	Cropland	Cereal crops	378.86	Low	2	N/A - Agricultural	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness or better habitat required	757.72			0.00	0.00	378.86	757.72		
2	Woodland and forest	Other woodland; broadleaved	2.16	Medium	4	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same broad habitat or a higher distinctiveness habitat required	17.28	2.16		17.28	0.00	0.00	0.00		all woodlands
3	Urban	Developed land; sealed surface	1.1	V.Low	0	N/A - Other	0	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Compensation Not Required	0.00			0.00	0.00	1.10	0.00		rectory farm
4	Urban	Developed land; sealed surface	9.69	V.Low	0	N/A - Other	0	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Compensation Not Required	0.00	9.69		0.00	0.00	0.00	0.00		dry drayton estate
5	Woodland and forest	Other woodland; broadleaved	2.8	Medium	4	Poor	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same broad habitat or a higher distinctiveness habitat required	11.20			0.00	0.00	2.80	11.20		new planted woodland bits around Dry Drayton estate
6	Grassland	Other neutral grassland	2.38	Medium	4	Fairly Poor	1.5	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same broad habitat or a higher distinctiveness habitat required	14.28			0.00	0.00	2.38	14.28		banks of the water courses
7																				

A-2 Site Habitat Creation

Condense / Show Columns | Condense / Show Rows | Main Menu | Instructions

Post development/ post intervention habitats																					Co
Broad Habitat	Proposed habitat	Area (hectares)	Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic position multiplier	Temporal multiplier: Standard time to target condition/years	Habitat created in advance/years	Delay in starting habitat creation/years	Standard or adjusted time to target condition	Final time to target condition/years	Final time to target multiplier	Difficulty multipliers: Standard difficulty of creation	Applied difficulty multiplier	Final difficulty of creation	Difficulty multiplier applied	Habitat units delivered	Assessor comments
Urban	Developed land; sealed surface	135.41	V.Low	0	N/A - Other	0	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	0			Standard time to target condition applied	0	1.000	Low	Standard difficulty applied	Medium	0.67	0.00	residential
Urban	Developed land; sealed surface	7.81	V.Low	0	N/A - Other	0	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	0			Standard time to target condition applied	0	1.000	Low	Standard difficulty applied	Medium	0.67	0.00	district centre
Urban	Developed land; sealed surface	2.65	V.Low	0	N/A - Other	0	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	0			Standard time to target condition applied	0	1.000	Low	Standard difficulty applied	Medium	0.67	0.00	local centre
Urban	Developed land; sealed surface	8.06	V.Low	0	N/A - Other	0	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	0			Standard time to target condition applied	0	1.000	Low	Standard difficulty applied	Medium	0.67	0.00	employment
Urban	Developed land; sealed surface	16	V.Low	0	N/A - Other	0	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	0			Standard time to target condition applied	0	1.000	Low	Standard difficulty applied	Medium	0.67	0.00	school
Urban	Developed land; sealed surface	10.61	V.Low	0	N/A - Other	0	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	0			Standard time to target condition applied	0	1.000	Low	Standard difficulty applied	Medium	0.67	0.00	park n ride
Urban	Developed land; sealed surface	14.12	V.Low	0	N/A - Other	0	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	0			Standard time to target condition applied	0	1.000	Low	Standard difficulty applied	Medium	0.67	0.00	roads
Grassland	Modified grassland	21	Low	2	Fairly Poor	1.5	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	2			Standard time to target condition applied	2	0.931	Low	Standard difficulty applied	Low	1	58.67	playing fields
Urban	Allotments	2.88	Low	2	Fairly Poor	1.5	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	1			Standard time to target condition applied	1	0.965	Low	Standard difficulty applied	Low	1	8.34	allotments
Lakes	Ponds (Non- Priority Habitat)	9.02	Medium	4	Moderate	2	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1	3			Standard time to target condition applied	3	0.899	Low	Standard difficulty applied	Low	1	71.33	SUDS
Woodland and forest	Other woodland; broadleaved	13.29	Medium	4	Moderate	2	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1	15			Standard time to target condition applied	15	0.586	Low	Standard difficulty applied	Low	1	68.54	country park
Heathland and shrub	Mixed scrub	7	Medium	4	Moderate	2	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1	5			Standard time to target condition applied	5	0.837	Low	Standard difficulty applied	Low	1	51.55	country park
Grassland	Other neutral grassland	17	Medium	4	Moderate	2	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1	5			Standard time to target condition applied	5	0.837	Low	Standard difficulty applied	Low	1	125.19	country park
Grassland	Tall herb communities	3	High	6	Moderate	2	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1	20			Standard time to target condition applied	20	0.490	High	Standard difficulty applied	High	0.33	6.41	country park
Grassland	Modified grassland	50	Low	2	Fairly Poor	1.5	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	2			Standard time to target condition applied	2	0.931	Low	Standard difficulty applied	Low	1	139.68	GI - recreation areas and small corridor
Grassland	Other neutral grassland	37.29	Medium	4	Moderate	2	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1	5			Standard time to target condition applied	5	0.837	Low	Standard difficulty applied	Low	1	274.61	GI connecting SUDs
Grassland	Other neutral grassland	20	Medium	4	Fairly Poor	1.5	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	3			Standard time to target condition applied	3	0.899	Low	Standard difficulty applied	Low	1	107.84	GI large area in NE and boundaries
Heathland and shrub	Mixed scrub	10	Medium	4	Fairly Poor	1.5	Area/compensation not in local strategy/ no	Low Strategic	1	3			Standard time to target condition applied	3	0.899	Low	Standard difficulty applied	Low	1	53.92	GI large area in NE and boundaries