HIMOR

ECOLOGYSOLUTIONS

Part of the ES Group

LAND AT BIRMINGHAM ROAD GREAT BARR, SANDWELL

Ecological Assessment

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ecology solutions for planners and developers

CONTENTS

PLANS

PHOTOGRAPHS

APPENDICES

1. INTRODUCTION

1.1. Background & Proposals

1.1.1. Ecology Solutions (Manchester) Limited was commissioned in January 2020 by HIMOR (hereafter referred to as "the Client") to undertake an Ecological Assessment of the land at Birmingham Road, Great Barr, Sandwell (see Plan ECO1), hereafter referred to as the Site. The aim of this Ecological Assessment is to determine any potential ecological constraints associated with the Site, which is being promoted for residential led development.

1.1.2. The Site comprises several improved agricultural fields used for silage production, and horse paddocks which are well intersected by field boundary hedgerows.

1.2. Site Characteristics

1.2.1. The Site is located to the north-east of Sandwell, approximately 5.3 km to the south-west of West Bromwich, and extends to an area of approximately 27 hectares (ha). The Site is bound by field boundary hedgerows, most of which are well established. To the east and south-east of the Site lies the minor B Road; Wilderness Lane, which mostly serves as access to existing residential development. To the south and west of the Site lie areas of recreational sports grounds. The northern boundary is bound by the A34 dual carriageway.

1.2.2. As stated above, the Site comprises a series of silage fields and horse paddocks, intersected by well-established field boundary hedgerows, particularly in the west and south of the Site. Two ponds, as well as several small horse stables, are present within the Site. The Site is centred on the Ordnance Survey Grid Reference (OSGR) SP0391595491 and lies within the Sandwell Metropolitan Borough of the West Midlands.

1.3. Ecological Assessment

1.3.1. This document assesses the ecological interest of the Site. The importance of the habitats within the Site are evaluated with due consideration given to the guidance published by the Chartered Institute of Ecology and Environmental Management (CIEEM)[1].

1.3.2. Where necessary, mitigation measures are recommended to safeguard any significant existing ecological interest within the Site and, where appropriate, potential enhancement measures are put forward, and reference made to both Priority Species and Priority Habitats (formerly National and Local Biodiversity Habitat Plans).

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

2. SURVEY METHODOLOGY

2.1. The methodology utilised for the survey work can be split into three areas; desk study, habitat survey, and faunal survey. These are discussed in more detail below.

2.2. Desk Study

2.2.1. In order to compile background information on the Site and the surrounding area, the local records centre was contacted; EcoRecord. Data from EcoRecord was requested for a 2 km buffer from the centre of the Site. The records were requested in January 2020 and are referenced where appropriate within this report.

2.2.2. Further information on designated sites from a wider search area was obtained from the online Multi-Agency Geographic Information for the Countryside (MAGIC)[2] database, which uses information held by Natural England (NE) and other organisations. This information is reproduced at Appendix 1, and where appropriate on Plan ECO1.

2.2.3. Further consideration has also been given to reports/documents of relevance to the proposed designation of the Site as a Site of Importance for Nature Conservation (SINC), including:

- The Wildlife Trust for Birmingham and the Black Country (March 2018) *Birmingham and Black Country Local Wildlife Sites – Guidance for Selection.*
- Sandwell Metropolitan Borough Council (August 2019) *Report to Cabinet – Designation of Nature Conservation Sites.*

2.3. Habitat Survey

2.3.1. Initial habitat surveys were carried out by Ecology Solutions in March 2020 to ascertain the general ecological value of the land contained within the boundaries of the Site, and to identify the main habitats and associated plant species. An updated walkover survey was undertaken in August 2021 to determine if the habitat information collected in 2020 remained appropriate and representative, which it did. This update walkover also allowed for habitat information to be collected in accordance with the UK Habitat Classification approach.

2.3.2. The Site was surveyed based around Extended Phase 1 Survey methodology[3], as recommended by NE, whereby the habitat types present are identified and mapped, together with an assessment of the species composition of each habitat. This technique provides an inventory of the basic habitat types present and allows identification of areas of greater potential which require further survey. Any such areas identified may then be examined in more detail.

[2] http://www.magic.gov.uk
[3] Joint Nature Conservation Committee (2010). *Handbook for Phase 1 Habitat Survey – a Technique for Environmental Audit*. England Field Unit, Nature Conservancy Council, reprinted JNCC, Peterborough.

2.3.3. Using the above method, the Site was classified into areas of similar botanical community types, with a representative species list compiled for each habitat identified.

2.3.4. In addition, and noting part of the Site is identified as a Site of Local Importance to Nature Conservation (SLINC) (with the whole Site proposed as a SINC), a National Vegetation Classification (NVC) survey was undertaken of the supported grassland habitats, using an accepted methodology whereby identified homogenous stands of vegetation were surveyed using randomly placed quadrats (2m x 2m), with a minimum of 5 quadrates per homogenous vegetation type. The NVC survey work was completed in optimal conditions in late May 2020.

2.3.5. The recorded quadrat data was subsequently referenced against the relevant NVC handbook[4], and the habitat descriptions used to guide conclusions as to which vegetation type is present.

2.3.6. A Hedgerow Regulations survey was also undertaken alongside the NVC work in May 2020, with this specifically considering the nature conservation elements of the Regulations.

2.3.7. Further details on the methodologies adopted for the NVC work and Hedgerow Regulations work are detailed at Appendix 2.

2.3.8. All the species which occur in each habitat would not necessarily be detectable during survey work carried out at any given time of the year, since different species are apparent in different seasons. Nonetheless, the surveys were undertaken within the optimal period for habitat and botanical surveys and, given the habitats present, it is considered an accurate and robust assessment has been made of the botanical interest.

2.3.9. No significant limitations to the survey (*e.g.* access restrictions, timings or weather conditions) were encountered during its completion.

2.4. Faunal Survey

2.4.1. Obvious faunal activity, such as birds or mammals, observed visually or by call during the course of the surveys, was recorded. Specific attention was paid to any potential use of the Site by protected species, Priority Species (formerly Biodiversity Action Plan (BAP) species), or other notable species. In addition, specific surveys were completed for Badgers *Meles meles*, bats, reptiles, Great Crested Newts *Triturus cristatus* (GCN) and breeding birds.

2.4.2. In each instance, surveys were completed by ecologists and with regard to best practice and guidance issued by NE. Details of the methodologies employed are given below.

Badgers

2.4.3. The Site was surveyed for Badgers in March 2020, and again in August 2021. The survey comprised two main elements: firstly, searching

[4] Rodwell, J.S. (Ed.) (1992). *British Plant Communities Volume 3: Grasslands and montane communities.* Cambridge University Press.

thoroughly for evidence of Badger setts. For any setts encountered each sett entrance was noted and plotted, even if the entrance appeared disused. The following information was recorded:

i) The number and location of well used or very active entrances; these are clear of any debris or vegetation and are obviously in regular use and may, or may not, have been excavated recently.

ii) The number and location of inactive entrances; these are not in regular use and have debris such as leaves and twigs in the entrance or have plants growing in or around the edge of the entrance.

iii) The number of disused entrances; these have not been in use for some time, are partly or completely blocked, and cannot be used without considerable clearance. If the entrance has been disused for some time all that may be visible is a depression in the ground where the hole once was, together with the remains of the spoil heap.

2.4.4. Secondly, evidence of Badger activity such as well worn paths, run-throughs, snagged hair, footprints, latrines and foraging signs was recorded so as to build up a picture of the use of the Site by Badgers.

Bats

2.4.5. The Site was surveyed to assess its potential to support bats in March 2020.

2.4.6. All trees within the Site were assessed for their potential to support roosting bats. Features typically favoured by bats, or evidence of past use by bats, were searched for, including:

- Obvious holes, e.g. rot holes and old Woodpecker holes;
- Dark staining on the tree below the hole;
- Tiny scratch marks around a hole from bat claws;
- Cavities, splits and or loose bark from broken or fallen branches, lightning strikes etc.; and
- Very dense covering of mature Ivy *Hedera* over trunk.

2.4.7. The buildings on Site were also assessed for their potential to support roosting bats.

2.4.8. The probability of a building being used by bats as a summer roost site increases if it:

- is largely undisturbed;
- dates from pre-20th century;
- has a large roof void with unobstructed flying spaces;
- has access points for bats (though not too draughty);
- has wooden cladding or hanging tiles; and/or
- is in a rural setting and close to woodland or water.

2.4.9. Conversely, the probability decreases if a building is of a modern or pre-fabricated design/construction, is in an urban setting, has small or cluttered roof voids, has few gaps at the eaves or is a heavily disturbed premises.

2.4.10. The main requirements for a winter/hibernation roost site are it maintains a stable (cool) temperature and humidity. Sites commonly utilised by bats as winter roosts include cavities/holes in trees, underground sites, and parts of buildings. Whilst different species may show a preference for one of these types of roost site, none are solely dependent on a single type.

2.4.11. To ascertain the current bat activity within the Site, two static SM4BAT bat detectors were placed within the Site for at least five nights in each of May, June, July, August, September and October 2020, to record any foraging or commuting activity throughout the night. These detectors were programmed to record from half an hour before sunset until half an hour after sunrise.

2.4.12. In addition to the static SM4BAT detectors, the Site was also subject to activity surveys undertaken on 26 May, 23 June, 30 July, 31 August, 15 September, and 1 November 2020, across two set transect routes which covered the majority of the Site, especially the features that were more likely to attract bat activity (see Plans ECO3.A to ECO3.F). The transects commenced 15 minutes before sunset and continued for approximately two hours in order to maximise the encounter rate of bats i.e. both early and late emerging species. The surveys were undertaken with regard to the guidelines issued by the Bat Conservation Trust, and aimed to identify any bats using the Site for foraging or commuting.

2.4.13. The echolocation calls of bats were recorded using iPhones combined with Echo Meter Touch 2 PRO bat detectors to record the data which, together with direct observation, were used to identify the species present and record the number of bat passes. If bats were detected, walking stopped and observations were made on the bats' behaviour i.e. foraging or commuting, species identification, and numbers present.

2.4.14. Following the completion of the surveys, all the recorded data was analysed using the Kaleidoscope Pro bat sound analysis software.

2.4.15. Surveys were conducted when the night-time temperature was above 10°C. The insectivorous diet of bats means there is reduced food available when temperatures fall below this level, and consequently levels of activity are low and may not accurately reflect the value of the Site for bats. The weather conditions for the surveys were recorded and any limitations noted.

2.4.16. Field surveys were undertaken with regard to best practice guidelines issued by NE (2004[5]), the Joint Nature Conservation Committee (JNCC) (2004[6]) and the Bat Conservation Trust (2016[7]).

[5] Mitchell-Jones, A. J. (2004). *Bat Mitigation Guidelines*. English Nature, Peterborough.
[6] Mitchell-Jones, A.J. & McLeish, A.P. (Eds.) (2004). *Bat Workers' Manual*. 3rd edition. Joint Nature Conservation Committee, Peterborough.
[7] Collins, J. (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines*. 3rd Edition. The Bat Conservation Trust, London.

2.5. Breeding Bird Survey

2.5.1. Owing to the size of the Site and the habitats present (most notably the hedgerows), the Site was deemed to be of potential value for local bird populations. As such a suite of breeding bird surveys were completed to ascertain the breeding bird species present, and level of ornithological interest. A total of three surveys were carried out on 23 March, 6 May and 3 June 2020.

2.5.2. The breeding bird surveys followed a modified version of the Common Birds Census (CBC) technique. The CBC involves walking transect routes through the area being studied, and recording and plotting all bird species, observed or heard, and their behaviour (see Plan ECO4.A to Plan ECO4.C).

2.5.3. An experienced ornithologist walked a circuitous route around all parts of the Site, recording the locations, numbers and activity of all bird species present within (and around) the area during this time. The transect was designed to take in all the different habitats within the Site and to allow visual inspections of all the open habitats within these areas.

2.5.4. All birds seen or heard within the survey area were identified and recorded, as was their behaviour. Binoculars and a telescope were used when necessary. The surveys began at around sunrise and took approximately two hours.

2.5.5. Special attention was given to determine if the Site supports owl species, by searching for evidence such as owl pellets or other direct evidence of owls during bat surveys.

2.5.6. To ascertain the breeding status of birds using the Site, the following criteria were applied following the methodology used in the 'Atlas' surveys (Gibbons et al., 1993)[8]. This accepts the following activities as denoting breeding (including those probably breeding although proof was lacking):

- Bird apparently holding territory.
- Courtship and display, including distraction display or feigning injury.
- Nest-building (including excavating nest-hole).
- Adult carrying faecal sac or food.
- Adult entering or leaving apparently occupied nest Site.
- Nest with eggs or eggshells found, or bird sitting but not disturbed.
- Nest with young; or downy young of ducks, game-birds, waders and other nidifugous species.
- Recently fledged young.

2.6. Reptiles

2.6.1. On account of the Site supporting some limited areas of suitable reptile habitats, specific surveys for reptiles were undertaken in September 2020.

[8] Gibbons, D., Reid, J. & Chapman, R. (1993). *The New Atlas of Breeding Birds in Britain and Ireland: 1988-1991.* Poyser, London.

2.6.2. The methodology utilised for the surveys principally derives from guidance given in Froglife Advice Sheet 10[9], the Herpetofauna Workers' Manual[10], the Herpetofauna Groups of Britain and Ireland's (HGBI) advisory note[11] and NE's Standing Advice for Reptiles.

2.6.3. Areas of suitable habitat within the Site were surveyed for the presence of reptiles by using artificial refugia ("tins"). A total of 40 x 0.5m x 0.5m roofing felt tins were used as part of the survey effort across suitable and sub-optimal habitats within the Site (see Plan ECO5). These tins were left in place for two weeks to 'bed in', and subsequently surveyed for reptiles beneath or upon the tins during suitable weather conditions.

2.6.4. The tins provide shelter, heat up more quickly than the surroundings in the morning, and can remain warmer than the surroundings in the late afternoon. Being ectothermic (cold blooded), reptiles use them to bask under and raise their body temperature, allowing them to forage earlier and later in the day.

2.6.5. To determine presence/absence the tins were checked for reptile activity over seven visits at appropriate times of the day (avoiding the middle of the day when the ambient air temperature is at its highest) in accordance with NE guidance. Optimum weather conditions for reptile surveying are temperatures between 10°C and 20°C, intermittent or hazy sunshine, and little or no wind.

2.6.6. Noting the Site's use for silage, wider areas of grassland would periodically be suitable for reptiles. Nonetheless, the sample area surveyed in 2020 was the only area of particular suitability in late summer 2020 and, indeed, is likely to remain of relatively heightened suitability in the context of the Site. As such, these surveys are considered to provide a good representation of likely presence/absence across the Site.

2.7. **Amphibians (Great Crested Newts)**

2.7.1. The land within and surrounding the Site was assessed in terms of its habitat quality, and its ability to support GCN. In addition, waterbodies, where access was granted, were subject to a Habitat Suitability Index (HSI) assessment. There are two ponds within the Site boundary; Pond P1 located in the southeast, and Pond P2 located in the north-east (as shown on Plan ECO6). There are also two ponds within 250m of the Site; Pond P3 located south of the Site boundary, and Pond P4 located north of the Site boundary, which is intercepted by Birmingham Road.

2.7.2. The HSI for GCN was developed by Oldham et al. (2000) and was applied during the surveys according to guidance set out by the National Amphibian and Reptile Recording Scheme.

[9] Froglife (1991). *Froglife Advice Sheet 10: reptile survey.* Froglife, London.
[10] Gent, T. & Gibson, S. (2003). *Herpetofauna Workers' Manual (revised reprint)*. JNCC, Peterborough.
[11] HGBI. (1998). *Evaluating local mitigation/translocation programmes: Maintaining Best Practices and lawful Standards. HGBI advisory notes for Amphibian and Reptiles Groups (ARGs).* Herpetofauna Groups of Britain and Ireland, c/o Froglife, Halesworth.

2.7.3. An HSI survey is a measure of habitat suitability for GCN, and is based on ten suitability indices. The ten suitability indices are:

- Location;
- Pond area;
- Pond drying;
- Water quality;
- Shade;
- Fowl;
- Fish;
- Ponds;
- Terrestrial habitat; and
- Macrophytes cover.

2.7.4. Scores are attributed to each index and are then converted to SI scores, on a scale from 0.01 to 1. The ten scores are then multiplied together, and the tenth root of this number is then calculated.

2.7.5. The calculation then gives a score of between 0 and 1 (1 represents optimal suitability, a score of below 0.5 represents poor suitability) and the overall HSI of a pond can then be determined. The scoring system is shown in Table 2.1 below.

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

Table 2.1. Habitat Suitability Index (HSI) for GCN Scores Summary

2.7.6. There were two waterbodies within the Site (albeit one remains predominantly dry) and a further two within a 250m radius which were found to hold water for at least part of each year (see Plan ECO6).

2.7.7. A GCN Environmental DNA (eDNA) survey was undertaken in June 2020 at the on Site Pond P1. No survey was undertaken for P2, as this feature was dry at the time of survey. Access to off site Ponds P3 and P4 was not granted, albeit P4 was on the far side of a busy road and not considered to be in any way functionally connected to the Site. The survey followed the methodology set out in the technical advice note for field and laboratory sampling of GCN environmental DNA[12].

2.7.8. Using the current guidance, the following methodology for the sampling procedure for eDNA analysis was applied in the field:

- A total of 20 samples of 30ml each were taken from locations around the pond, as equally spaced as possible. The locations of the samples were chosen to sample the entire margin of the pond,

[12] Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F (2014). *Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt Triturus cristatus environmental DNA*. Freshwater Habitats Trust, Oxford.

with areas targeted where there may be newt egg laying and/or displaying activities;

- The sample ladle was stirred gently in the pond before the sample was retrieved, in order to mix the water column, with care being taken not to stir up the sediment;
- All 20 samples were emptied into a Whirl-Pack bag, which was then sealed and mixed for 10 seconds;
- Upon mixing, approximately 15ml of the sample was transferred from the Whirl-Pack bag into each of the six sterile tubes, which contained 35ml of ethanol to preserve the eDNA, using a sterile pipette. The sample was stirred between filling each tube to homogenize the water;
- Once filled to 50ml, each tube was mixed for 10 seconds to mix the sample and preservative; and
- Samples were then sent directly for laboratory analysis.

2.7.9. The following precautions were adhered to, which ensure no cross contamination of samples occur:

- sterile gloves were worn by all surveyors at all times during the sampling process;
- gloves were replaced with a new pair between sample collection from the pond and pipetting into the sub-sampling tubes; and
- samples were collected without the surveyor entering the water (i.e. the surveyors stood on the pond bank or edge).

2.7.10. The samples were subsequently sent for laboratory analysis. The ponds within the Site were confirmed not to support GCN.

3. ECOLOGICAL FEATURES

3.1. A habitat survey was undertaken across the Site by Ecology Solutions in March 2020, with an update walkover undertaken in August 2021. Further habitat survey work in the form of NVC grassland surveys and Hedgerow Regulation surveys were undertaken on behalf of Ecology Solutions in late May 2020.

3.2. The following main habitat /vegetation types were identified within the Site during the survey undertaken:

- Hardstanding;
- Buildings;
- Semi-improved grassland
- Hedgerows;
- Ponds; and
- Trees.

3.3. The locations of these habitats are shown on Plan ECO2 and described individually below.

3.1. Hardstanding

3.1.1. There is a small area of hardstanding in the north-east of the Site. This is composed of a gravel road and a small area of concrete associated with horse stables and paddocks. They are of no intrinsic ecological interest.

3.2. Buildings

3.2.1. There are 3 small stable blocks situated in the north-east of the Site, as shown on Plan Eco2. They are wooden clad with corrugated iron sheet roofing, and stable doors. They are of no intrinsic ecological interest.

3.3. Semi-improved Grassland

3.3.1. In total there are 14 semi-improved grassland fields. Generally, these are species-poor in nature, dominated by a range of generally common and widespread grass and forb communities. However, a subset of the fields support communities of relatively higher nature conservation interest as shown on Plan ECO2.

3.3.2. The majority of fields are of low nature conservation value, comprising species-poor grassland, and are deemed to comprise of NVC communities MG6a/MG6b or MG1a as shown in Appendix 2. These fields are largely managed for hay/silage production and consist of Perennial Rye-grass *Lolium perenne* and Clover *Trifolium* sp., However, Fields F7, F8 and F11 appeared to have lacked recent management. Typical of their respective communities, these fields are dominated by a range of widespread grasses indicative of an agriculturally improved setting, with herbs tending to comprise a minority component of the sward.

3.3.3. A subset of the fields supported grassland communities of slightly elevated interest, comprising areas of wet/marshy grassland or otherwise localised populations of notable species.

3.3.4. These communities were recorded within Fields F3, F5 and F14. F3 was deemed to support an area of NVC community MG4, within which Great Burnet *Sanguisorba minor* was well represented. Fields F5 and F14 were noted to support areas of marshy grassland with an affiliation to NVC community MG10b, with the notable Oval Sedge *Carex leporina* present.

3.3.5. Detailed findings for the NVC work undertaken, including full species lists for the Site, are included at Appendix 2 (land at Great Barr, NVC and Hedgerow Survey).

3.4. **Hedgerows**

3.4.1. Overall, the Site supports 37 hedgerows (H1 to H37). These hedgerows vary in structure and species composition, with many being species-poor in nature. However, approximately half (18) of the hedgerows are of improved structure and/or species diversity and are likely to qualify as 'important' under the Hedgerow Regulations on this basis. The locations of hedgerows are detailed on Plan ECO2 and are described in the text below, as well as at Appendix 2.

3.4.2. Hedgerow H1, is located between Wilderness Lane and Field F14, which is flailed on the sides but unmanaged on top. There is a narrow species-poor grassy verge on roadside. It is a species-poor hedgerow consisting predominantly of Hawthorn *Crataegus monogyna*. English Oak *Quercus robur* and Ash *Fraxinus excelsior* are present at approximately 15% of the hedgerow total. Also present are Elder *Sambucas nigra* and Bramble *Rubus fruticosus*.

3.4.3. Hedgerow H2 located between Wilderness Lane and Field F1 is atop a low bank and has a 0.5 to 1.5m wide species-poor grassy verge on the roadside. The hedgerow is species-poor and is dominated with Hawthorn and Bullace *Prunus institia*.

3.4.4. Hedgerow H3, located between Wilderness Lane and Field F2, is regularly flailed to a height of 2m. The hedgerow appears to have been planted approximately 40 years ago, and is species-poor, dominated by Hawthorn. Bracken *Pteridium aquilinum* is occasionally present on the field side.

3.4.5. Hedgerow H4, located between Fields F1 and F2, is very gappy, species-poor with a high abundance of Bramble, and a variable height averaging 3m. A shallow dry ditch is present on the southern side with some Soft Rush *Juncus effusus* and Great Willowherb *Epilobium hirsutum*.

3.4.6. Hedgerow H5, located east of Pond P1, comprises of 3 mature English Oak trees, with some Hawthorn and Bramble scrub.

3.4.7. Hedgerow H6, located north of Field F1 is a variable and unmanaged species-poor hedgerow with an average height of 3 to 4m. Hawthorn and Bullace are predominant species. Less frequent are Wych Elm *Ulmus glabra*, English Oak, Elder and Blackthorn *Prunus spinosa*. In addition, there is a small amount of Honeysuckle *Lonicera periclymenum.* A small dry ditch with frequent Soft Rush is present on the southern side of the hedgerow.

3.4.8. Hedgerow H7, located between Fields F2 and F3 is a 6m tall hedgerow dominated by Hazel *Corylus avellana.* Also present are Bramble, Holly *Ilex aquifolium*, Field Maple *Acer campestre,* English Oak and Elder. There are 2 standards present in the north of the hedgerow.

3.4.9. Hedgerow H8 located in between Field F2 and F12, is a 6m tall hedgerow on average, and approximately 2 to 3m wide. It is unmanaged and has a broad and shallow dry ditch on its northern side. There are 2 standards present, and it is dominated by Hazel. Commonly present are Hawthorn and English Oak, with Field Rose *Rosa arvensis* and Holly present less frequently. Male Fern *Dryopteris filix-mas* is rarely present in the hedgerow base.

3.4.10. Hedgerow H9 is located in between Fields F3 and F12, is a short length of unmanaged hedgerow, and averages 6m in height and 2 to 3m in width. It consists of dominant Hazel and commonly occurring Hawthorn. Elder and Blackthorn are present in small quantities.

3.4.11. Hedgerow H10 is located in between Field F3 and Field F4, is approximately 4 to 5m tall and 2 to 3m wide, with a shallow dry ditch on its northern side. It has a co-dominance of Hawthorn, Hazel, and Blackthorn, with small quantities of Dog Rose *Rosa canina* agg. and Field Maple.

3.4.12. Hedgerow H11 forms much of the Site's southern boundary, is a long section of unmanaged hedgerow which is 7m tall on average, and has a variable width averaging 3m. The hedgerow supports numerous mature and semi-mature standards. The most prominent species are Bullace, Alder *Alnus glutinosa,* English Oak, Hazel and Hawthorn. Also present are Ash, Blackthorn, Field Maple, Goat Willow *Salix caprea*, Field Elm *Ulmus minor* and Guelder Rose *Viburnum opulus.* Ivy is locally common in the hedgerow base.

3.4.13. Hedgerow H12, located in the north-west of Field F3, is approximately 5m to 6m tall with an average width of 2m to 5m, and has a small muddy ditch on its south-eastern side. It is Hazel dominated, and also present are Field Elm, Blackthorn, English Elm *Ulmus procera*, Ash, Elder and Hawthorn. Ivy is commonly present within the hedgerow base.

3.4.14. Hedgerow H13, located in the west of Field F4, is effectively continuing Hedgerow H11. It is 6m tall on average, and is unmanaged, with a dry ditch on its western side. There are 2 standards present in the north, and 1 in the south. Of particular interest are 2 mature small-leaved Lime *Tilia cordata* standards. The hedgerow consists of dominant Hazel and Field Maple with also present Blackthorn, Field Rose, Hawthorn and Elder. Ivy is dominant in the hedgerow base.

3.4.15. Hedgerow H14 located to the north of Field F4, and forms a significant part of the Site's western boundary. It measures, on average, 8m to 10m in height and 3m to 4m in width. There are several Ash standards, and a dry inner ditch. Hawthorn, Field Elm and Hazel are co-dominant, and Field Maple, English Oak, Blackthorn and Elder are also common. The hedgerow base is one of the most noteworthy on the Site, largely dominated by Ivy, with significant quantities of Dog's Mercury *Mercurialis perennis* and Ramsons *Allium ursinum.*

3.4.16. Hedgerow H15, located in the north of Field F4, is a continuation of H14 and is similar in height and structure. It has a substantial and deep inner ditch and 5 standards. Bluebell *Hyacinthoides non-scripta* are locally common.

3.4.17. Hedgerow H16, located between Fields F4 and F5, is an unmanaged hedgerow with an average height of 6m and width of 4m. It is dominated by Hawthorn, with Hazel relatively common. There is a dry shallow inner ditch with Dog's Mercury and Male Fern occurring commonly. A single standard is also present.

3.4.18. Hedgerow H17, located between Fields F4 and F12 measures 7m in height and 3m in width on average. There are several short gaps, and 4 standards, one of which is a large, coppiced Ash stool with multiple stems. The hedgerow base consists of occasional Ivy and rare Male Fern.

3.4.19. Hedgerow H18, located to the west of Field F5, is an unmanaged hedgerow measuring on average 6m to 8m in height and 4m to 5m in width. It consists of commonly present Hawthorn and Blackthorn, with also present Hazel, Field Maple, Ash, Holly, Elder and English Oak. The hedgerow base is poor but does include a small quantity of Male Fern. A single Cultivate Pear *Pyrus communis* is also present within the hedgerow.

3.4.20. Hedgerow H19, located in the north of Field F12, is an unmanaged hedgerow with an average height of 6m to 7mm and width of 3m with occasional small gaps, and a single standard. It consists of dominant Hazel and common Hawthorn and Field Elm. The base consists of locally common Ivy and occasional Male Fern.

3.4.21. Hedgerow H20, located west of Field F10, is an unmanaged hedgerow with an average height of 6m and width of 3m. It consists of dominant Hawthorn, common Hazel and frequent Bullace. A single Rowan *Sorbus aucuparia* is also present and notable as it is the only record on Site. The base flora is poor but includes occasional Male Fern.

3.4.22. Hedgerow H21, located in the north-east of Field F11, is an unmanaged hedgerow dominated by Hawthorn, and averages 7m in height.

3.4.23. Hedgerow H22, located to the west of Field F6, is an unmanaged and very gappy hedgerow, averaging 5m in height. It comprises Goat Willow, Elder, Hawthorn, Bramble and Holly.

3.4.24. Hedgerow H23, located to the north of Field F5, is an unmanaged hedgerow averaging 4m to 5m in height and 2m to 3m in width. It comprises largely Bramble, but Hazel, Hawthorn and Field Maple make up approximately 80% of the woody species. Blackthorn is also found commonly in the west of the hedgerow. A dry, shallow inner ditch is also present.

3.4.25. Hedgerow H24, located to the west of Field F11, is an unmanaged hedgerow with an average height of 5m to 6m and width of 2m. It is dominated by Hawthorn with Bramble also present.

3.4.26. Hedgerow H25, located to the north of Field F7, is largely similar to H24. However, occasional young Common Lime *Tilia x vulgaris* is present.

3.4.27. Hedgerow H26, located to the north-west of Field F7, is a roadside hedgerow averaging 8m in height and 2m to 3m in width. It consists of common Bullace, with Hawthorn and Hazel frequently present, and Oak also present.

3.4.28. Hedgerow H27, located to the west of Field F7 measures an average height of 7m and width of 3m to 5m. It consists of mature English Oak, Ash, Field Maple, Elder, Bramble and Blackthorn.

3.4.29. Hedgerow H28, located to the south of Field F7, is an unmanaged hedgerow measuring a height of 8m on average, and 2m in width. There are 2 large standards consisting of English Oak and Ash. Blackthorn and Hawthorn are commonly present, and Field Maple, Holly, Hazel, and Elder are also present.

3.4.30. Hedgerow H29, located to the north of Field F9, measures an average of 7m in height and 6m in width. There are 2 very large English Oak standards that are prominent features. The hedgerow is dominated by dense Blackthorn.

3.4.31. Hedgerow H30, located to the east of Field F10, is a broken line of mature Hawthorn bushes with frequent Bramble, and occasional Bullace of varying height and thickness.

3.4.32. Hedgerow H31, located to the north of Field F13, is an unmanaged, 5m tall, 2m to 3m wide hedgerow dominated by Hazel and Field Maple. There is some Male Fern in the hedgerow base, but it is dominated by Ivy and Nettle *Urtica dioica,* with some Bracken present in the west.

3.4.33. Hedgerow H32, located to the north of Field F10, is very similar to H31, consisting of dominant Hazel and Field Maple However, there are very small quantities of Holly and Elder.

3.4.34. Hedgerow H33, located to the west of Field F8, is effectively a continuation of Hedgerow H18. It is unmanaged, averaging 7m in height and 4m to 5m in width, and has a single Field Maple standard. It consists of dominant Blackthorn, and frequent Hazel, Hawthorn, English Oak and Field Maple. The dense Blackthorn restricted access into the hedgerow base.

3.4.35. Hedgerow H34, located to the west of Field F9, is essentially a continuation of Hedgerow H29 which forms the majority of the Site's north-western boundary. It is unmanaged, with scrub and planted woodland to its north forming a 5m to 6m wide band of semi-natural broadleaved woodland. It has an average height of 8m, and incorporates many English Oak standards. It consists of dominant Blackthorn, locally common Sycamore *Acer pseudoplatanus,* and relatively common Hazel, Field Maple, and Hawthorn. English Elm is also recorded, and small quantities of Elder, Ash, and Bramble.

3.4.36. Hedgerow H35, located to the east of Field F12, is an unmanaged hedgerow with an average height of 6m and a width of between 2m to 3m. There are 3 Ash standards and a single Sycamore. It consists of dominant

Hawthorn, common Blackthorn and Bramble, and small quantities of Elder, Field Maple, and Holly.

3.4.37. Hedgerow H36, located to the east of Field F13, forms much of the Site's eastern boundary, and is a mix of native shrubs, fences, walls, and planted non-native trees and shrubs against the curtilages of residential properties. The height and width are variable with some sections unmanaged and others trimmed to 1.5m. In the north of the hedgerow there are many gaps. The base flora is very poor.

3.4.38. Hedgerow H37 located to the north of Field F14, is a line of mature English Oak standards with small quantities of Hazel, Hawthorn, Blackthorn, Holly and Bramble.

3.5. **Ponds**

3.5.1. There are two ponds located on the Site. Pond P1 is located in the south-east of the Site, Pond P2 is located in the north-east of the Site.

3.5.2. Pond P1 is well established and contains a moderate range of emergent and aquatic vegetation. This includes for Yellow Flag Iris *Iris pseudacorus*, along with Greater Reed-mace *Typha latifolia*, Soft Rush *Juncus effusus*, Water Mint *Mentha aquatica*, Marsh Horsetail Equisetum *palustre*, and Broad-leaved Pondweed *Potamogeton natans*. Common Water-plantain *Alisma plantago-aquatica* and Cyperus Sedge *Carex pseudocyperus* are also present.

3.5.3. Pond P1 measures approximately 150m^2 in area, and 0.3m to 0.5m in depth. The pond is also surrounded by mature Pedunculate Oak trees.

3.5.4. Pond P2, a shallow and seasonally wet depression, is densely surrounded by trees and tall ruderal vegetation. It is heavily shaded and contains limited aquatic flora. It was dry on more than 3 occasions during Site visits, and only held water after periods of intense rainfall.

3.6. **Trees**

3.6.1. There are a number of standard trees present throughout the Site, located exclusively within the hedgerows, as described above. A majority of the trees are Ash, Sycamore, and English Oak. There are a small number of mature trees including English Oak, Ash, and Small-leaved Lime.

4. WILDLIFE USE OF THE SITE

4.1. General observations were made during the surveys of any faunal use of the Site, with specific attention paid to the potential presence of protected species. In addition, specific surveys were undertaken with regard to bats, Badgers, reptiles, breeding birds and GCN.

4.2. Badgers

4.2.1. Specific surveys for Badger were undertaken in March 2020, with due regard also given to this faunal group as part of the survey work undertaken throughout 2020. Updated inspections were also completed by Ecology Solutions in August 2021.

4.2.2. Whilst the habitats on Site would provide suitable habitat for Badgers, no evidence of their presence, such as sett digging, latrines, snuffle holes or tracks, was recorded within or adjacent to the Site. As such there is nothing to indicate the Site would be of any particular importance to Badger populations in the local area.

Background records

4.2.3. Five records of Badger were returned by EcoRecord. The closest and most recent record relates to a location approximately 0.8km north-east of the Site, and dates from 2012.

4.2.4. It is noted evidence of a potential outlier Badger sett was recorded within the Site by The Wildlife Trust for Birmingham & the Black Country during a survey of the Site in 2018.

4.3. Bats

4.3.1. Buildings B1 to B3, in the north-east section of the Site, do not offer any suitable opportunities for roosting bats owing to their construction materials and design. The structures have no suitable voids and are exposed to the elements from numerous aspects.

4.3.2. Several trees within the Site offer potential to support roosting bats. In particular, the mature Pedunculate Oak, in the south-east of the Site, adjacent to Pond P1, within Hedgerow H35, is noted to contain multiple Potential Roost Features (PRFs), including a large tear out with significant splits and cracks in the heartwood of the tree. In addition, the Pedunculate Oak located in the east of the Site, within the defunct Hedgerow H37 separating the horse paddocks, is also noted to contain multiple PRFs, including a number of large cavities.

4.3.3. The habitats deemed likely to be of primary interest are the network of trees and hedgerows throughout the Site, noting also their connectivity to habitats present in the wider local area.

4.3.4. To ascertain the use of the Site by foraging and dispersing bats the Site was subject to activity transects and static automated surveys in accordance with survey guidelines (see Section 2 of this report). These monthly surveys commenced in May 2020 and concluded in October 2020, the results of which are detailed below.

Transect Surveys

4.3.5. Transect surveys were completed at the Site on 26 May, 23 June, 30 July, 31 August, 15 September, and 1 July 2020.

4.3.6. The surveys were undertaken in favourable weather conditions. The prevailing weather conditions for each of the bat activity surveys undertaken at the Site are presented in Table 4.1 below.

Survey Date	Weather	Temp (°C)	Cloud Cover (%)
26 May 2020	Warm and dry with passing clouds and a light breeze.	15	30
23 June 2020	Warm and dry. Still all evening with an intermittent light breeze.	20	10
30 July 2020	Warm and dry. Still all evening with an intermittent light breeze.	24	5
31 August 2020	Cloudy, warm, and dry. Still all evening with an intermittent light breeze.	17	50
15 September 2020	Cloudy, warm, dry, and a light breeze.	22	80
1 October 2020	Cloudy, dry, and slightly mild even with a light breeze.	12	50

Table 4.1. Prevailing weather conditions for bat surveys

4.3.7. Overall, a low level of bat activity was recorded during the surveys, as illustrated on Plans ECO3.A to ECO3.F. Species recorded were Nathusius Pipistrelle, *Pipistrellus nathusii* ,Common Pipistrelle *Pipistrellus pipistrellus*, Soprano Pipistrelle *Pipistrellus pygmaeus*, Noctule *Nyctalus noctula* and Lesser Noctule *Nyctalus leisleri*, with the largest proportion of recordings associated with Common Pipistrelles. Similar results were obtained from the static SM4 recordings, with a larger proportion of Common Pipistrelle registrations recorded than any other species.

4.3.8. As shown on Plans ECO3.A to ECO3.F, registrations were noted throughout the transect length, although areas in the north, south-east, and south-west of the Site registered greater interest overall. Consistently, registrations of Common Pipistrelle were noted around Hedgerows H9, H10, H23, H28 and H37. In addition, the highest activity was noted in the June activity survey.

<u>Transect Survey 26 May 2020</u>

4.3.9. The results of the activity survey undertaken on the evening of 26 May 2020 are summarised below, and in Table 4.2. The results are also illustrated on Plan ECO3.A.

4.3.10. The survey was undertaken in favourable weather conditions. The night was warm, with no precipitation, a light breeze and some cloud cover.

4.3.11. The survey recorded a low level of bat activity, with a majority of the activity associated with Common Pipistrelle and Noctule bats, located along Hedgerows H8 and H10 in the south-west of the Site, and Hedgerows H23 and H28 located in the north of the Site.

4.3.12. The recorded registrations were from Nathusius' Pipistrelle *Pipistrellus nathusii*, Common Pipistrelle, Soprano Pipistrelle and Noctule.

Species	Number of Registrations	First Registration after Sunset (21:13)
Nathusius' Pipistrelle	1	1 hour & 7 mins
Common Pipistrelle	79	29 mins
Soprano Pipistrelle	5	36 mins
Noctule	5	14 mins
Total	**90**	

Table 4.2. Combined bat activity survey results 26.05.20.

Transect Survey 23 June 2020

4.3.13. The results of the activity survey undertaken on the evening of 23 June 2020 are summarised below, and in Table 4.3. The results are also illustrated on Plan ECO3.B.

4.3.14. The survey was undertaken in favourable weather conditions. The night was warm, with no precipitation, with an intermittent light and very low cloud cover.

4.3.15. The survey recorded a slightly higher level of bat activity than in June. A majority of the activity associated to Pipistrelle *Pipistrellus sp.,* and Noctule located along Hedgerow H9 in the south-west of the Site, Hedgerow H37 in the south-east of the Site, and Hedgerow H23 in the north of the Site.

4.3.16. The recorded registrations were from Common Pipistrelle, Soprano Pipistrelle, Nathusius Pipistrelle, Lesser Noctule and Noctule.

Species	Number of Registrations	First Registration after Sunset (21:34)
Nathusius' Pipistrelle	4	37 mins
Common Pipistrelle	85	16 mins
Soprano Pipistrelle	4	37 mins
Lesser Noctule	32	16 mins
Noctule	8	17 mins
Total	**133**	

Table 4.3. Combined bat activity survey results 23 June 2020

Transect Survey 30 July 2020

4.3.17. The results of the activity survey undertaken on the evening of 30 July 2020 are summarised below, and in Table 4.4. The results are also illustrated on Plan ECO3.C.

4.3.18. The survey was undertaken in favourable weather conditions. The night was warm, with no precipitation, an intermittent light and very low cloud cover.

4.3.19. The survey recorded a low level of bat activity, with a majority of the activity associated with Common Pipistrelle and Noctule bats, located along Hedgerows H4, H8 and H9 in the south-west of the Site, Hedgerow H37 in the south-east of the Site, and Hedgerows H23 and H28 in the north of the Site. Due to an error with recording equipment, one of the surveyors had a nil return for the survey. It is determined the extended route taken by the second surveyor, and the position of the static detectors, provide a robust assessment of the Site with regards for its suitability for foraging and commuting bats.

4.3.20. The recorded registrations were from Nathusius Pipistrelle, Common Pipistrelle and Noctule.

Species	Number of Registrations	First Registration after sunset (21:02)
Nathusius' Pipistrelle	1	1 hr & 8 mins
Common Pipistrelle	14	34 mins
Noctule	2	50 mins
Total	**17**	

Table 4.4. Combined bat activity survey results 30 July 2020

Transect Survey 31 August 2020

4.3.21. The results of the activity survey undertaken on the evening of 31 August 2020 are summarised below, and in Table 4.5. The results are also illustrated on Plan ECO3.D.

4.3.22. The survey was undertaken in favourable weather conditions. The night was warm, with no precipitation, a slight breeze and moderate cloud cover.

4.3.23. The survey recorded a very low level of bat activity, with a majority of activity associated with Common Pipistrelle and Noctule, located around the Hedgerow H6 in the south-east of the Site, Pond P1 in the south-east of the Site, and Hedgerow H31 in the north-east of the Site.

4.3.24. The recorded registrations were from Nathusius Pipistrelle, Common Pipistrelle, Soprano Pipistrelle, and Noctule.

Species	Number of Registrations	First Registration after Sunset (19:57)
Nathusius' Pipistrelle	1	46 mins
Common Pipistrelle	54	24 mins
Soprano Pipistrelle	2	44 mins
Noctule	4	8 mins
Total	**61**	

Table 4.5. Combined bat activity survey results 31 August 2020

Transect Survey 15 September 2020

4.3.25. The results of the activity survey undertaken on the evening of 15 September 2020 are summarised below, and in Table 4.6. The results are also illustrated on Plan ECO3.E.

4.3.26. The survey was undertaken in favourable weather conditions. The night was warm, with no precipitation, a slight breeze and thick cloud cover.

4.3.27. The survey recorded a very low level of bat activity, with a majority of the activity associated with Hedgerow H12 in the south-west of the Site, and Hedgerow H37 in the south-east of the Site.

4.3.28. The recorded registrations were from Common Pipistrelle and Noctule.

Species	Number of Registrations	First Registration after Sunset (19:22)
Common Pipistrelle	44	29 mins
Noctule	11	2 mins
Total	**55**	

Table 4.6. Combined bat activity survey results 15 September 2020

Transect Survey 1 October 2020

4.3.29. The results of the activity survey undertaken on the evening of 1 October 2020 are summarised below, and in Table 4.7. The results are also illustrated on Plan ECO3.F.

4.3.30. The survey was undertaken in favourable weather conditions. The night was mild, with no precipitation, and a slight breeze with moderate cloud cover.

4.3.31. The survey recorded a very low level of bat activity, with a majority of the activity associated with Common Pipistrelle and Noctule, located around Hedgerow H37 in the south-east of the Site, and Hedgerow H28 in the north of the Site.

4.3.32. The recorded registrations were from Common Pipistrelle and Noctule.

Species	Number of Registrations	First Registration after sunset (18:44)
Common Pipistrelle	4	29 mins
Noctule	2	22 mins
Total	**6**	

Table 4.7. Combined bat activity survey results 1 October 2020

Remote (Static) Surveys

4.3.33. SM4BAT detectors were deployed on six occasions between May and October 2020 to monitor activity across a minimum of five consecutive nights. For each night of survey the total number of bat registrations per species was calculated. This gives an impression of the overall level of bat activity on a given survey night, as well as the proportion of activity

attributed to a given species or group of species (*Myotis* species are not generally separated).

4.3.34. Secondly, for each night of survey the bat registrations were calculated on a minute-by-minute basis for each species, allowing data to be presented for an entire survey night.

4.3.35. The results of the static detector surveys are summarised below. The locations of the SM4BAT bat detectors are shown on Plans ECO3.A to ECO3.F.

Static Detector Surveys (SM4BAT) 26 May to 1 June 2020

4.3.36. Two static detectors were deployed across the Site, with these located in the south-west and north-west of the Site (as shown on Plan ECO3.A to ECO3.F).

4.3.37. The results of the surveys are summarised below in Tables 4.8 and 4.9.

Night	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle	Noctule	Lesser Noctule	Brown Long-eared bat	Total
26 May 2020	428	7	1	51	1	0	488
27 May 2020	524	11	1	71	7	5	619
28 May 2020	573	11	0	50	8	1	643
29 May 2020	404	22	0	29	2	3	460
30 May 2020	509	46	1	16	1	1	574
31 May 2020	366	17	1	20	2	2	408
1 June 2020	0	0	0	1	0	0	1
Total	**2804**	**114**	**4**	**238**	**21**	**12**	**3193**

Table 4.8. Summary of static bat detector at Position 1 in May and June 2020

Night	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle	Noctule	Lesser Noctule	Brown Long-eared bat	Myotis sp	Total
26 May 2020	31	2	0	51	1	8	2	95
27 May 2020	28	2	3	69	6	3	2	113
28 May 2020	27	2	1	26	5	6	0	67
29 May 2020	16	0	0	17	2	2	1	38
30 May 2020	10	0	0	20	4	1	5	40
31 May 2020	14	0	0	24	1	3	3	45
1 June 2020	0	0	0	0	0	0	0	0
Total	**126**	**6**	**4**	**207**	**19**	**23**	**13**	**398**

Table 4.9. Summary of static bat detector at Position 2 in May and June 2020

4.3.38. A total of 3,591 registrations were recorded over the course of the seven night period. The majority of registrations recorded were attributed to Common Pipistrelle (2,930 (81%) registrations). Other species recorded less frequently include Soprano Pipistrelle, Nathusius' Pipistrelle, Noctule, Lesser Noctule, Brown Long-eared bat *Plecotus auritus* and *Myotis* sp.

4.3.39. A higher amount of activity was recorded at Position 1 in the south-west boundary of the Site, with 3,193 (89%) of the total records registered from this location.

Static Detector Surveys (SM4BAT) 23 to 29 June 2020

4.3.40. Two static detectors were deployed across the Site; on each aspect of the Site's boundary.

4.3.41. The results of the surveys are summarised in Tables 4.10 and 4.11.

Night	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle	Noctule	Lesser Noctule	Myotis sp	Brown Long-eared bat	Total
23 June 2020	69	3	6	3	0	0	1	82
24 June 2020	108	15	5	2	1	1	0	132
25 June 2020	110	11	3	1	0	0	0	125
26 June 2020	213	15	19	0	0	1	0	248
27 June 2020	54	0	2	2	1	0	0	59
28 June 2020	113	0	0	1	0	0	0	114
Total	**667**	**44**	**35**	**9**	**2**	**2**	**1**	**760**

Table 4.10. Summary of static bat detector at Position 1 in June 2020.

Night	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle	Noctule	Lesser Noctule	Brown Long-eared bat	Total
23 June 2020	0	0	0	1	0	0	1
24 June 2020	19	1	2	8	0	1	31
25 June 2020	25	3	1	3	0	0	32
26 June 2020	127	3	2	6	0	0	138
27 June 2020	41	1	0	1	1	1	45
28 June 2020	33	0	0	3	0	1	37
Total	**245**	**8**	**5**	**22**	**1**	**3**	**284**

Table 4.11. Summary of static bat detector at Position 2 in June 2020

4.3.42. A total of 1,044 registrations were recorded over the course of the six night period. The majority of registrations recorded were, once again, attributed to Common Pipistrelle (912 (87%)). Other species recorded less frequently include Soprano Pipistrelle, Nathusius' Pipistrelle, Noctule, Lesser Noctule, Brown Long Eared and *Myotis* sp.

4.3.43. A higher amount of activity was recorded at Position 1 in the south-west boundary of the Site, with 760 (73%) of the total records registered from this location.

Static Detector Surveys (SM4BAT) 30 July to 3 August 2020

4.3.44. Two static detectors were deployed across the Site; on each aspect of the Site's boundary.

4.3.45. The results of the surveys are summarised below in Tables 4.12 and 4.13.

Night	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle	Noctule	Lesser Noctule	Myotis sp	Brown Long-eared bat	Total
30 July 2020	153	12	4	0	0	0	0	169
31 July 2020	112	4	0	4	1	0	1	122
1 August 2020	57	3	0	3	0	1	0	64
2 August 2020	97	4	2	1	1	1	2	108
3 August 2020	28	3	0	0	0	2	0	33
Total	**447**	**26**	**6**	**8**	**2**	**4**	**3**	**496**

Table 4.12. Summary of static bat detector at Position 1 in July to August 2020

Night	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle	Noctule	Lesser Noctule	Myotis sp	Brown Long-eared bat	Total
30 July 2020	**8**	**0**	**1**	**3**	**2**	**0**	**0**	**14**
31 July 2020	**23**	**9**	**0**	**7**	**0**	**1**	**0**	**40**
1 August 2020	**5**	**1**	**0**	**1**	**0**	**0**	**0**	**7**
2 August 2020	**10**	**0**	**0**	**6**	**1**	**0**	**1**	**18**
3 August 2020	**5**	**2**	**0**	**4**	**1**	**1**	**2**	**15**
Total	**51**	**12**	**1**	**21**	**4**	**2**	**3**	**94**

Table 4.13. Summary of static bat detector at Position 2 in July to August 2020

4.3.46. A total of 590 registrations were recorded over the course of the five night period. A majority of registrations recorded were, once again, attributed to Common Pipistrelle (447 (76%)). Other species recorded less frequently include Soprano Pipistrelle, Nathusius' Pipistrelle, Noctule, Lesser Noctule, Brown Long Eared and *Myotis* sp.

4.3.47. A higher amount of activity was recorded at Position 1 in the south-west boundary of the Site, with 496 (84%) of the total records registered from this location.

Static Detector Surveys (SM4BAT) 19 to 31 August 2020

4.3.48. Two static detectors were deployed across the Site; on each aspect of the Site's boundary. However, due to a technical issue with static 2, no results were recorded for this location.

4.3.1. The results of the surveys are summarised below in Tables 4.14 and 4.15

Night	Common Pipistrelle	Soprano Pipistrelle	Noctule	Lesser Noctule	Myotis sp	Brown Long-eared bat	Total
19 August 2020	126	5	4	1	0	1	137
20 August 2020	105	0	3	2	2	6	118
21 August 2020	103	2	4	0	1	2	112
22 August 2020	84	5	1	0	5	6	101
23 August 2020	67	12	1	0	2	5	87
Total	**485**	**24**	**13**	**3**	**10**	**20**	**555**

Table 4.14. Summary of static bat detector at Position 1 in August 2020

Night	Common Pipistrelle	Soprano Pipistrelle	Noctule	Lesser Noctule	Myotis sp	Brown Long-eared bat	Total
19 August 2020	5	0	15	0	0	3	23
20 August 2020	5	0	5	1	0	0	11
21 August 2020	19	1	2	1	3	0	26
22 August 2020	12	6	0	0	4	1	23
Total	**41**	**7**	**22**	**2**	**7**	**4**	**83**

Table 4.15. Summary of static bat detector at Position 2 in August 2020

4.3.2. Due to a technical error the static detector at Position 2 was unable to record for the full five nights. The species registered on the detector were identical to those observed on previous surveys. It is determined the registrations observed at Position 1, along with the registrations observed across the suite of surveys, provides a robust assessment with regards to the Site's suitability for foraging and commuting bats. By looking solely at Position 1, the majority of the registrations were attributed to Common Pipistrelle (485 (87%)). The majority of the activity was refined to Position 1, given greater numbers were observed at this location compared to Position 2 on a day-by-day comparison.

<u>Static Detector Surveys (SM4BAT) 15 to 21 September 2020</u>

4.3.3. Two static detectors were deployed across the Site; on each aspect of the Site's boundary.

4.3.4. The results of the surveys are summarised below in Tables 4.16 and 4.17.

Night	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle	Noctule	Lesser Noctule	Myotis sp	Brown Long-eared bat	Total
15 September 2020	55	3	2	11	0	1	2	74
16 September 2020	38	1	1	6	0	0	1	47
17 September 2020	10	2	0	0	2	2	4	20
18 September 2020	12	1	0	3	1	1	1	19
19 September 2020	19	2	0	1	0	0	2	24
20 September 2020	16	2	0	4	0	3	2	27
21 September 2020	54	2	2	6	2	7	4	77
Total	**204**	**13**	**5**	**31**	**5**	**14**	**16**	**288**

Table 4.16. Summary of static bat detector at Position 1 in September 2020

Night	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle	Noctule	Lesser Noctule	Myotis sp	Brown Long-eared bat	Total
15 September 2020	36	4	1	12	0	1	0	24
16 September 2020	24	2	0	7	0	1	3	7
17 September 2020	3	3	0	7	3	1	1	68
18 September 2020	2	2	0	2	0	1	2	2
19 September 2020	11	3	0	17	2	3	2	116
20 September 2020	8	1	0	11	0	1	3	18
21 September 2020	32	3	1	12	2	16	5	16
Total	**116**	**18**	**2**	**68**	**7**	**24**	**16**	**251**

Table 4.17. Summary of static bat detector at Position 2 in September 2020

4.3.5. A total of 539 registrations were recorded over the course of the seven night period. A majority of registrations recorded were, once again,

attributed to Common Pipistrelle (320 (59%)), with moderate levels of Noctule recorded in static 2. Other species recorded less frequently include Soprano Pipistrelle, Nathusius' Pipistrelle, Noctule, Lesser Noctule, Brown Long Eared and *Myotis* sp.

4.3.6. Similar levels of registrations were received from both positions.

Static Detector Surveys (SM4BAT) 1 to 5 October 2020

4.3.7. Two static detectors were deployed across the Site; on each aspect of the Site's boundary.

4.3.8. The results of the surveys are summarised below in Tables 4.18 and 4.19.

Night	Common Pipistrelle	Soprano Pipistrelle	Noctule	Myotis sp	Total
1 October 2020	3	0	3	0	6
2 October 2020	10	0	1	0	11
3 October 2020	2	0	0	0	2
4 October 2020	14	1	1	1	17
5 October 2020	43	2	1	1	47
Total	**72**	**3**	**6**	**2**	**83**

Table 4.18. Summary of static bat detector at Position 1 in October 2020

Night	Common Pipistrelle	Soprano Pipistrelle	Noctule	Lesser Noctule	Myotis sp	Brown Long-eared bat	Total
1 October 2020	0	0	2	0	5	0	7
2 October 2020	6	1	2	0	1	0	10
3 October 2020	0	0	0	0	0	0	0
4 October 2020	13	2	4	1	5	1	26
5 October 2020	26	4	5	2	3	2	42
Total	**45**	**7**	**13**	**3**	**14**	**3**	**85**

Table 4.19. Summary of static bat detector at Position 2 in October 2020

4.3.9. A total of 168 registrations were recorded over the course of the five night period. A majority of registrations recorded were once again attributed to Common Pipistrelle (117 (70%)). Other species recorded less frequently include Soprano Pipistrelle, Nathusius' Pipistrelle, Noctule, Lesser Noctule, Brown Long Eared and *Myotis* sp.

4.3.10. Similar levels of registrations were received from both positions.

Background Records

4.3.11. Multiple bat records were returned by EcoRecord, including eleven records for Brown Long-eared. The closest and most recent record of Brown Long-eared bat relates to a record approximately 0.2km north-east of the Site boundary, and dates from 2016.

4.3.12. Seventy one records of Common Pipistrelle were returned. The closest relates to a record approximately 100 metres north-east of the Site boundary, and dates from 1994. The most recent record relates to a location approximately 0.2km north-east of the Site boundary, and dates from 2015.

4.3.13. Four records of Natterer's were returned. The closest and most recent record relates to a location approximately 0.2km north-east of the Site boundary, and dates from 2015.

4.3.14. Thirteen records of Soprano Pipistrelle were returned. The closest record relates to a location approximately 150m north-east of the Site boundary, and dates from 2013. The most recent record relates to a location approximately 0.2km north-east of the Site boundary, and dates from 2016.

4.3.15. Two records of Serotine were returned. The closest record relates to a location approximately 0.6km south of the Site boundary, and dates from 2010. The most recent record relates to a location approximately 0.8km north-east of the Site, and dates from 2014.

4.3.16. Twenty four records of Noctule were returned. The closest record relates to a location approximately 1.5km north-east of the Site boundary, and dates from 2013. The most recent record relates to a location approximately 0.2km north-east of the Site boundary, and dates from 2017.

4.3.17. Two records of Lesser Noctule were returned. The closest and most recent record relates to a location approximately 0.2km north-east of the Site boundary, and dates from 2016.

4.3.18. Five records of Daubenton's were returned. The closest record relates to a location approximately 0.6km south of the Site boundary, and dates from 2010. The most recent record relates to a location approximately 1.4km south-east of the Site boundary, and dates from 2012.

4.3.19. A single record of Whiskered *Myotis mystacinus* was returned and relates to a location approximately 0.2km north-east of the Site boundary, and dates from 2015.

4.4. **Other Mammals**

4.4.1. No evidence of other protected or notable mammal species were observed on the Site.

4.4.2. Noting the habitats present (and the presence of the species in the local area – see data search below), it is considered the Site would provide a

degree of suitable opportunities for European Hedgehog *Erinaceus europaeus* populations in the local area. Whilst no evidence of this species presence was recorded, regard is had for potential in considering the appropriateness of emerging proposals.

4.4.3. Given the habitats present, as well as the location of the Site, it is considered small common mammal species would also be present. However, there is nothing to indicate any other protected or notable species are present.

4.4.4. Consideration was given to Dormouse *Muscardinus avellanarius*. However, due to geographical restrictions of this species range, noting the highly urbanised context of the Site and its immediate surroundings (with roads and built form encapsulating the Site and its surroundings), and noting that no records were returned as part of the desk study exercise, it is not considered this species would be present in the local area.

4.4.5. With regards Water Vole *Arvicola amphibius* and Otter *Lutrinae*, the Site lacks the necessary wetland habitat to support these species.

Background records

4.4.6. Thirteen records of Hedgehog were returned by EcoRecord; the closest lies approximately 0.3km south-east of the Site boundary, within a residential area, whilst the most recent record relates to a location approximately 1km west of the Site boundary, and dates from 2017.

4.4.7. The data search returned three records for Water Vole; the closest and most recent record relates to a location approximately 0.7km east of the Site boundary, and dates from 1988.

4.5. **Birds**

4.5.1. The habitats within the Site, namely the hedgerows, trees, and ponds are of interest for foraging and nesting birds. Noting the established habitats present, alongside the size of the Site, a suite of breeding bird surveys were undertaken in 2020.

4.5.2. Three breeding bird surveys were undertaken on 23 March, 6 May and 3 June 2020.

4.5.3. The majority of birds were recorded along the hedgerows and trees at the field margins. A few birds were recorded using the fields, including Buzzard *Buteo buteo*, Common Gull *Larus canus* and Carrion Crow *Corvus corone.*

4.5.4. A total of twenty six bird species were recorded during the breeding bird survey work, as detailed in Table 4. 20 overleaf. Of the 26 species, a total of 22 species were observed to be possibly breeding within the Site.

Species (and BTO species code)	RSPB Listed	March 23	May 6	June 3	Notes
Robin (R.)	-	16	18	15	Possibly Breeding
Blackbird (B.)	-	13	9	12	Possibly Breeding
Yellowhammer (Y.)	Red	1	-	1	Possibly Breeding
Starling (SG)	Red	40	6	34	Possibly Breeding
Wren (WR)	-	7	14	10	Possibly Breeding
Woodpigeon (WP)	-	8	14	16	Possibly Breeding
Blue Tit (BT)	-	7	3	7	Possibly Breeding
Great Tit (GT)	-	13	5	5	Possibly Breeding
Carrion Crow (C.)	-	1	3	-	Possibly Breeding
Magpie (MG)	-	16	10	10	Possibly Breeding
Jackdaw (JD)	-	-	13	4	Possibly Breeding
Goldfinch (GO)	-	8	4	13	Possibly Breeding
Buzzard (BZ)	-	3	-	4	Possibly Breeding
Greenfinch (GR)	-	8	7	1	Possibly Breeding
Dunnock (D.)	Amber	3	5	5	Possibly Breeding
House Sparrow (HS)	Red	6	8	8	Possibly Breeding
Long-tailed Tit (LT)	-	3	7	3	Possibly Breeding
Reed Bunting (RB)	Amber	2	-	-	Possibly Breeding
Coal Tit (CT)	-	1	-	-	Possibly Breeding
Song Thrush (ST)	Red	1	7	10	Possibly Breeding
Chiffchaff (CC)	-	-	4	2	Possibly Breeding
Blackcap (BC)	-	-	6	-	Possibly Breeding
Black-headed Gull (BH)	Amber	-	2	-	Non-breeder
Grasshopper Warbler (GH)	Red	-	-	1	Non-breeder
Common Gull (CM)	Amber	8	4	-	Non-breeder
Herring Gull (HG)			2	-	Non-breeder

Table 4.20. Breeding bird survey results from 2020 surveys

Background records

4.5.5. Records of a number of species listed under Annex I of the Birds Directive or Schedule 1 of the Wildlife and Countryside Act 1981 (as Amended) were returned by the data search. The most relevant of these are detailed below.

4.5.6. Three records of Barn Owl *Tyto alba* were returned. The closest and most recent record relates to a location approximately 0.9km west of the Site boundary, and dates from 2012.

4.5.7. A single record of Merlin *Falco columbarius* was returned. The record relates to a location approximately 1.4km south-west of the Site boundary, and dates from 2013.

4.5.8. Records of a number of species listed under UK BAP, Section 41 of the NERC Act and IUCN Red List were returned by the data search. The most relevant of these are detailed below.

4.5.9. Seven records of Bullfinch *Pyrrhula pyrrhula* were returned. The closest record relates to a location approximately 0.2km north-west of the Site boundary, and dates from 1998. The most recent record relates to a location approximately 1.5km north-west of the Site boundary, and dates from 2012.

4.5.10. A single record of Marsh Tit *Poecile palustris* was returned. This record relates to a location approximately 1.4km south-east from the Site, and dates from 2012.

4.5.11. Twenty seven records of Song Thrush *Turdus philomelos* were returned. The closest and most recent record relates to a location approximately 150m south-east of the Site boundary, and dates from 1987. The most recent record relates to a location approximately 1.3km south-west of the Site boundary and dates from 2017.

4.5.12. Two records of Willow Tit *Poecile montana* were returned. The closest record relates to a location approximately 0.2km west of the Site boundary, and dates from 1988. The most recent record relates to a record located approximately 1.4km south-west of the Site boundary, and dates from 2012.

4.6. **Reptiles**

4.6.1. Suitable habitat for common reptile species is periodically present throughout the Site, particularly the area of rough grassland in the north-east of the Site. The most optimal reptile habitat was subject to a suite of reptile presence/absence surveys in September 2020. The areas subject to surveys can be seen in Plan ECO5.

4.6.2. The results of the surveys can be seen in Table 4.20 overleaf.

Survey Number	Date	Temperature °C	Weather Conditions	Results
1	7 September 2020	13	60% cloud cover, dry	No reptiles observed
2	9 September 2020	18	10% cloud cover, dry	No reptiles observed
3	16 September 2020	19	75% cloud cover, dry	No reptiles observed
4	18 September 2020	18	<5% cloud cover, dry	No reptiles observed
5	21 September 2020	18	<5% cloud cover, dry	No reptiles observed
6	23 September 2020	13	clear, dry	No reptiles observed
7	28 September 2020	15	60% cloud cover, dry	No reptiles observed

Table 4.21. Dates, weather conditions and results for reptile surveys

4.6.3. No background records of reptiles were returned.

4.6.4. Given the nil return of records from the detailed survey work and the desk study, it can be assumed reptiles are likely absent from the Site. As such, no further consideration will be given to this species group as part of this report.

4.7. Amphibians (Great Crested Newts)

4.7.1. GCN are known to travel up to 500m – without barriers that inhibit dispersal – to a breeding pond. However, it is widely accepted they most commonly utilise suitable terrestrial habitat within a much closer distance, and activity is usually concentrated within 100m of breeding ponds, with key habitat being located within 50m[13]. Indeed, Research Report 576 produced by English Nature (now NE) concludes "Captures on fences (and by other methods) at distances between 100m and 200-250m from breeding ponds tended to be so low as to raise serious doubts about the efficacy of this as an approach".

4.7.2. There is potentially suitable aquatic breeding habitat within the Site, namely Pond P1, with P2 being highly sub-optimal. Hedgerows, farmland and rough grassland could offer suitable terrestrial habitat, superficially at least, for GCN and other amphibians. During the Phase 1 survey, Ecology Solutions sought to review all ponds within 250m of the Site that were not separated by significant dispersal barriers. These are discussed in detail below and given HSI scores (see Table 4.21).

4.7.3. Pond P1, located in the south-east of the Site is approximately 150m^2 in size and dominated by Greater Reedmace *Typha latifolia*. At the time of the survey, frog/toad spawn was present. The eDNA survey undertaken in

[13] English Nature (2001) *Great Crested Newt Mitigation Guidelines*. Version: August 2001

June 2020 (Appendix 3) returned a negative result, indicating absence of GCN.

4.7.4. Pond P2, located in the north-east of the Site, is approximately 50m^2 in size. The 'pond' is likely to be heavily shaded throughout the summer months and ephemeral in nature, and more representative of seasonally inundated land. During the time of the eDNA survey the pond was dry. The pond was regularly found to be dry throughout the surveys undertaken in 2020. As such it is determined the pond would not support any population of breeding amphibians.

4.7.5. From assessment of aerial imagery, Pond P3, located to the south of the Site boundary, appears to be an ornamental feature which is partially overshaded. Whilst letters were issued to the landowner to seek access, no access was granted.

4.7.6. Pond P4, located to the north-east of the Site boundary appears to be heavily shaded. No access was granted. Due to the dispersal barriers between the off-site pond and the Site, it is determined, should any amphibians be present in this pond, they would not be able to pass the dispersal barrier to populate the Site.

Pond	Habitat Suitability Index (HSI) score	Pond Suitability
Pond P1	0.72	Good
Pond P2	0.44	Poor

Table 4.22. Habitat Suitability Index (HSI) scores of on Site ponds

4.7.7. It is further noted that no evidence of amphibians was recorded during the completion of the reptile surveys on Site, nor during opportunistic checks of natural refugia within the Site during the course of the habitat survey work.

4.7.8. Given the negative eDNA result of Pond P1, that no GCN were recorded during the course of the reptile surveys, the low density of ponds in the local area (with one off-site feature having no connectivity with the Site when accounting for dispersal barriers,) and that no recent records of GCN were returned within a close proximity of the Site (whilst records of common species were), it is considered highly unlikely the Site supports GCN. As such, no further consideration is given to this faunal group as part of this assessment.

Background records

4.7.9. Six records of GCN were returned. The closest record relates to a location approximately 0.5km south-west of the Site boundary, and dates from 1998. The most recent record relates to a location approximately 0.7km north-east of the Site boundary, and dates from 2000.

4.7.10. Thirty nine records of Common Frog *Rana temporaria* were returned. The closest and most recent record relates to a location approximately 60m south-east of the Site boundary, and dates from 2005.

4.7.11. Thirteen records of Common Toad *Bufo Bufo* were returned. The closest record relates to a location approximately 0.3km west of the Site boundary, and dates from 1998. The most recent record relates to a location approximately 0.6km east of the Site boundary and dates from 2012.

4.7.12. Fourteen records of Smooth Newt *Lissotriton vulgaris* were returned. The closest and most recent record relates to a location approximately 0.2km north-east of the Site, and dates from 2012.

4.8. **Invertebrates**

4.8.1. Given the habitats present it is likely a moderate assemblage of common invertebrate species would be present within the Site. However, there is no evidence to suggest any rare or notable species would be present, nor that any assemblage would be of heightened importance.

4.8.2. No background records for invertebrates were returned.

4.8.3. No further consideration to this group is required as part of this assessment.

5. ECOLOGICAL EVALUATION

5.1. The Principles of Ecological Evaluation

5.1.1. The guidelines for ecological evaluation produced by CIEEM propose an approach that involves professional judgement, but makes use of available guidance and information, such as the distribution and status of the species or features within the locality of the project.

5.1.2. The methods and standards for Site evaluation within the British Isles have remained those defined by Ratcliffe[14]. These are broadly used across the United Kingdom to rank Sites, so priorities for nature conservation can be attained. For example, current Sites of Special Scientific Interest (SSSI) designation maintains a system of data analysis that is roughly tested against Ratcliffe's criteria.

5.1.3. In general terms, these criteria are size, diversity, naturalness, rarity, and fragility, while additional secondary criteria of typicalness, potential value, intrinsic appeal, recorded history, and the position within the ecological/geographical units are also incorporated into the ranking procedure.

5.1.4. Any assessment should not judge sites in isolation from others, since several habitats may combine to make it worthy of importance to nature conservation.

5.1.5. Further, relying on the national criteria would undoubtedly distort the local variation in assessment, and therefore additional factors need to be taken into account, e.g. a woodland type with a comparatively poor species diversity, common in the south of England, may be of importance at its northern limits, say in the border country.

5.1.6. In addition, habitats of local importance are often highlighted within a local BAP. The Birmingham and Black Country BAP has been considered as part of this assessment and is referenced where relevant.

5.1.7. The Birmingham and Black Country region also benefits from the *Nature Improvement Area Ecological Strategy (2017 to 2022)*. This strategy seeks to identify areas of comparatively greater ecological value in a landscape context and to produce an 'ecological network map' so areas of value can be protected, enhanced, and created.

5.1.8. Levels of importance can be determined within a defined geographical context, from the immediate site or locality through to the international level.

5.1.9. The legislative and planning policy context are also important considerations and have been given due regard throughout this assessment.

[14] Ratcliffe, D A (1977). *A Nature Conservation Review: The Selection of Study areas of Biological National Importance to Nature Conservation in Britain*. Two Volumes. Cambridge University Press, Cambridge.

5.2. Habitat Evaluation

Designated Sites

5.2.1. **Statutory Sites.** There are no statutory designations of nature conservation value within or immediately adjacent to the Site. The closest statutory designated site is Merrion's Wood Local Nature Reserve (LNR), located approximately 50m north-east of the Site boundary, on the far side of the A34 dual carriageway. The LNR is designated on account of its woodland and pond habitats, in addition to its landscape value. A proportion of the LNR is also designated as an Ancient and Semi-Natural Woodland.

5.2.2. Noting this LNR is actively managed by Walsall Metropolitan Borough Council, with public access promoted along footpaths within the site, and given the urban context of the LNR, it is not considered the proposed development would have the potential to give rise to significant recreational impacts, either alone or in combination with other plans or projects. In reaching this conclusion it is noted emerging proposals would come forward, with substantial accessible open space, providing on the doorstep opportunities for any future residents.

5.2.3. Several other LNRs are also present in the local area, albeit all are well distanced from the Site with roads and urban development between. These include:

- Holly Wood LNR, located approximately 1.3km south-east of the Site boundary, supports woodland likely to pre-date 1830.
- Gorse Farm Wood LNR, located approximately 1.6km south of the Site boundary, is an area designated for supporting a diverse range of habitats including wet woodlands, scrub, and unimproved grassland.
- Forge Mill Lake, Sandwell Valley LNR, is located approximately 1.7km south-west of the Site boundary. The LNR is designated as a large area of former farmland with remnant features, including grassland and hedgerows, with a stretch of the River Tame, and artificially created balancing lakes. It is a regionally important bird site.

5.2.4. As with Merrion's Wood LNR, given these sites are all actively managed and promoted for recreational purposes, and moreover noting they are well separated from the Site, it is not considered emerging proposals for a residential led development would have the potential to result in any significant impact on these LNRs, either alone or in combination with other plans and projects.

5.2.5. The closest SSSI to the Site is Sutton Park SSSI, located in excess of 4.2km to the east at its closest point. This site is also designated as a National Nature Reserve (NNR).

5.2.6. The nearest internationally designated site is Cannock Extension Canal Special Area of Conservation (SAC), which is located approximately 9km north of the Site boundary. The SAC is designated for supporting a large population of Floating Water-plantain *Luronium natans*. This is considered

the species' most eastern distribution limit in England. In addition to this, the SAC has a wide diversity of aquatic flora and dragonflies.

5.2.7. Neither of these statutory sites are considered likely to be affected by the proposed development at the Site, given their spatial separation and existing, intervening built form. In support of this conclusion, the Site does not fall within a SSSI Impact Risk Zone for any SSSIs and as such no 'likely impacts' have been identified by NE.

5.2.8. **Non-statutory Sites.** There are two tiers of non-statutory designations within Birmingham and the Black Country: SINCs and Sites of SLINCs.

5.2.9. SINCs are defined as '*Sites of substantive nature conservation value in the context of Birmingham and the Black Country*' whilst SLINCs are defined as '*Sites of substantive nature conservation value in the context of a metropolitan borough*'.

5.2.10. Both SLINC and SINC sites are designated on the basis of how they 'score' under a series of different criteria, for example 'Habitat Diversity' and 'Species Diversity'. These criteria can be scored as 'low', 'moderate' or 'high'. The following guidance is offered on designation thresholds[15]:

"Those Sites scoring mostly 'Highs' will tend to meet the threshold for SINC status whereas those scoring mostly 'Mediums' will tend to meet the threshold for SLINC status. Sites scoring mostly 'Lows' will tend not to meet the threshold for selection as a Local Wildlife Site. Not all criteria, however, are of equal weight. In some cases a Site may justify selection where very few criteria score highly (e.g. where the Site supports a population of a protected or priority species, or displays a single important geological feature)."

5.2.11. The Site includes for the 'Farmland at Great Barr or Peak House Farm', a site currently afforded SLINC status, but proposed as a SINC following survey work undertaken by the Wildlife Trust for Birmingham and the Black Country in 2018. As part of this proposed re-classification the boundary of the designation would be extended to encompass a wider area, including the series of on-site grassland fields not covered in the current SLINC designation.

5.2.12. The current SLINC designation primarily relates to the network of hedgerows running throughout the Site, in addition to small SLINC field parcels in the north-east, a waterbody, and surrounding wetland habitat in the south-east of the Site. The SLINC citation notes the presence of 'traditional small fields with a mixture of marshy, neutral and some calcareous grassland' as well as 'an extensive network of hedgerows, several of high species diversity'. The ponds are not described in the SLINC citation.

5.2.13. The citation for the proposed SINC covers an expanded area, encompassing all habitats within the Site boundary (approximately 27ha). In addition to those habitats detailed within the SLINC, it additionally includes extensive areas of grassland. Reference is also made to the

[15] Birmingham and Black Country Local Wildlife Sites - Guidance for Selection - March 2018. The Wildlife Trust for Birmingham & the Black Country

Site's geographical context within a wider 'Nature Improvement Area (NIA)'.

5.2.14. It is noted this re-classification of the Site is proposed despite the surveys identifying a vast majority of the fields (10 out of 13 compartments) support grassland of "*low species and forb diversity*" or otherwise *"semi-improved neutral grassland – species poor*". Indeed, mapping produced in support of the classification identifies these fields to be 'improved grassland', a common and widespread habitat of extremely limited conservation significance. Indeed, the one previous field included in the existing SLINC designation appears to have since substantially declined in value since the initial assessment, now being dominated by Bramble scrub and rank grassland. Resultantly, this field is not considered to be of any heightened ecological interest and would no longer warrant designation as a SLINC.

5.2.15. Having reviewed the assessment of the Site[16] in respect of the designation criteria for Birmingham and the Black Country, Ecology Solutions hold several concerns as to the efficacy of the assessment and the weighting attributed to various criteria. These concerns are expanded upon in the relevant sub-headings below, with reference to the criteria as set out within the selection guidance.

5.2.16. As an over-arching concern, Ecology Solutions note the selection criteria are particularly subjective in nature. Whilst professional judgment is an essential aspect of any decision making, the lack of clear criteria, thresholds, or qualifying species (etc) to guide designation will undoubtedly impair the ability of decision makers to reach consistent and proportional decisions as to a site's ecological interest.

5.2.17. Notwithstanding the flexibility afforded by these selection criteria, Ecology Solutions nonetheless consider the below examples are conspicuous in the contrast between true intrinsic value and the assigned 'score'.

5.2.18. As above, a site would typically be expected to score mostly 'high' in individual attributes in order to warrant SINC status. As set out below, it is considered a 'high' threshold would be inappropriate for the majority of assessment criteria.

Habitat Diversity

5.2.19. The Site is defined as M/H (moderate to high) under this criterion due to the "wide range of farmland habitats". Nonetheless, the document notes "Structural diversity is limited within much of the grassland habitat".

5.2.20. Noting the hedgerow habitats are already designated as a SLINC (and it is acknowledged these are of higher interest), it is unclear what justification there is to not only expand the designation boundary to include grassland habitats of predominantly low value, but also upgrade the status of the site.

5.2.21. The Assessment Report implicitly acknowledges the limited structural diversity of this habitat, and it is illogical to conclude that extensive areas of 'improved grassland' could contribute positively to the Habitat Diversity criterion.

[16] Birmingham & Black Country Local Sites Assessment Report. Peakhouse Farm (SA007)

5.2.22. Indeed, these extensive grassland areas serve to dilute overall habitat diversity, with the vast majority of the habitats (>80% in area terms) within the proposed SINC comprising species-poor grassland.

5.2.23. In isolation, these areas of grassland could only reasonably be scored as 'low', therefore not warranting either SLINC or SINC status under this criterion. Moreover, there is no indication given within the Assessment Report for the Site that the quality or value of the hedgerow network has improved since surveys were previously undertaken to inform the SLINC designation.

Species Diversity

5.2.24. As above, the vast majority of the proposed designation would comprise species poor fields, identified as 'improved' within the Assessment Report. Improved grasslands are, by definition, grassland habitats of the lowest species diversity and conservation significance. Again, the findings of the assessment appear at odds with the recommendation to expand and upgrade the conservation designation for the Site.

5.2.25. In terms of faunal diversity, surveys undertaken by Ecology Solutions indicate the Site to be used by typically common assemblages of bats and breeding birds. GCN were confirmed as absent through eDNA surveys, and no evidence of reptile presence was recorded. Moreover, there is no reason to consider the predominantly species poor nature of the fields would be of any heightened interest to invertebrate assemblages. These survey findings do not indicate the Site as of heightened local importance for faunal assemblages and would not support the proposed re-classification of the Site.

Habitat Rarity

5.2.26. In terms of habitat rarity, it is acknowledged the hedgerows are of greater distinction, and indeed this is reflected in the existing SLINC citation, which is an accurate representation of the habitat.

5.2.27. The BAP designation of the hedgerows is not, in itself, of significance, noting that 84% of countryside hedgerows in Great Britain are deemed likely to meet BAP criteria. As above, no evidence is provided within the Assessment Report to indicate the quality or value of the hedgerow network has improved since surveys were previously undertaken to inform the SLINC designation.

5.2.28. Equally, it is accepted some localised pockets of grassland are of comparatively higher interest. However, MG1 and MG6 grasslands (the 'improved grassland' and the most prevalent habitats on Site) are some of the commonest grassland communities in Britain, and can be considered common both at a national and regional level. These habitats could only be classified as common and therefore would score 'low' in habitat rarity terms.

5.2.29. Despite acknowledgement that much of the Site supports species-poor grassland, the Wildlife Trust Assessment Report does not attempt to quantify the extent of more diverse habitats. The blanket designation

therefore fails to provide protection commensurate with the true value of the habitats present.

Size of Extent,

5.2.30. Larger sites of course, have the potential to be of greater ecological importance, other factors being equal. Nonetheless, size in and of itself is not an indication of quality or value.

5.2.31. In this instance the proposed re-classification of the Site simply serves to greatly increase overall Site area by virtue of encompassing large expanses of low value habitat. Noting this, very little weight can be attributed to the size criterion, when the proposed extent is identified on the basis of a flawed assessment process.

Naturalness

5.2.32. Much is made of the unchanged nature of the Site, with the report inferring habitats have remained 'relatively' unchanged for perhaps over 250 years. In fact, botanical surveys of the Site identify the grassland habitats to predominantly comprise species-poor habitats typical of more enriched soils. Indeed, the grassland across much of the Site would be described as 'improved grassland' on account of the evident impact of modern agricultural practices (not least chemical application and drilling in of vigorous fodder grasses – both of which are evident).

5.2.33. Such grassland can be considered heavily 'modified' in nature and therefore bears little resemblance to old or good quality meadows in a natural state. The 'high' score for this attribute therefore appears at odds with the designating criteria.

Summary of SINC/SLINC Position

5.2.34. As is noted within this report, updated botanical survey work completed in 2020 and 2021 has reaffirmed that much of the grassland within the Site is unremarkable from a nature conservation perspective. It is not considered the common grassland communities present warrant SINC (or even SLINC) status. The value of the hedgerow network is acknowledged, and a good proportion of the individual hedgerows are deemed to be 'Important' on grounds of their nature conservation value. The existing SLINC citation is considered proportional to this interest.

5.2.35. Notwithstanding the above, the primary requirement from a biodiversity perspective is to assess the true ecological value of an area of land as part of this ecological assessment. It is the true ecological value of a non-statutory Site which should be attributed weight in planning decisions, rather than the designation per-se.

5.2.36. This position is made clear by the Inspector considering proposals for a scheme at Hermitage Quarry[17] who concludes:

[17] Appeal Ref: APP/W2275/V/11/2158341. Report to the Secretary of State for Communities and Local Government by J I McPherson JP BSc CEng CEnv CWEM MICE MCIWEM MCMI. 11 March 2013.

"7.39 It would be equally inappropriate if, in the face of evidence to the contrary, the quality of all Local Wildlife Sites (LWS) were treated as identical, notwithstanding the absence of any explicit policy distinction between one LWS and another"

5.2.37. In reviewing this decision, the Secretary of State confirmed his broad agreement with the inspector's conclusions in this respect, as stated in paragraphs 14 to 18 of his letter[18].

5.2.38. In line with the above, it is clear appropriate avoidance, mitigation and/or enhancement measures should be identified to reflect the true ecological value of the land in question, as opposed to the designation it holds. This is the approach proposed as part of emerging proposals for the Site.

5.2.39. Indeed, emerging proposals seek to retain and enhance a substantial area of informal open space as a Country Park in the west of the Site, to be created and managed specifically for the purposes of nature conservation. Importantly, this area will retain the highest value grassland within the Site (F3). In addition to the Country Park land, it is anticipated extensive areas of grassland in the east of the Site would be retained, as would the vast majority of the Site wide existing hedgerow network. Indeed, the emerging proposals for habitat retention and creation on Site would adopt biodiversity net gain as a guiding principle, with the design of greenspace targeted to seek:

- Retention of the majority of higher value habitats, with losses limited to small sections of hedgerow, Field F14 and part of Field F5;
- Instigation of habitat creation and enhancement of retained habitats such that:
    - Higher value habitats (to be lost) be subject to a translocation exercise, allowing their retention within areas of proposed Green Infrastructure (such as a Country Park).
    - All retained grassland to be managed as neutral meadow (wet and dry mosaic), with the target of achieving a species-rich sward across the proposed Country Park.
    - The existing hedgerows to be subject to appropriate management/bolster planting as required, such that all constituent features are species-rich and of optimal structure.
    - A mosaic of wetland habitat is delivered, more than mitigating for minor losses to marshy grassland habitat and indeed delivering enhanced opportunities for a range of wetland fauna.

5.2.40. It is considered the retention and enhancement/creation of areas of meadow grassland, as well as the hedgerow network within the Site will realise significant qualitative gains for the Site in the longer term, achieving significant net gains in higher quality grassland, and more than mitigating for losses to a grassland sward which is relatively herb poor in nature. The retention of a vast majority of the hedgerow network, and the instigation of measures to enhance (approximately) 50% of features which are currently

[18] Appeal Ref: APP/W2275/V/11/2158341. Town and Country Planning Act 1990 (Sections 73 & 77) Application by Gallagher Aggregates Ltd Hermitage Quarry, Hermitage Lane, Aylesford, Application Ref. TM/10/2158341. 11 July 2013.

of reduced ecological interest, would also be of particular ecological interest, safeguarding a valuable local asset and ensuring betterment relative to a no-development situation.

5.2.41. Indeed, long-term management provides a mechanism whereby retained habitats can be substantially enhanced, ensuring these attain high ecological interest and true SINC quality post-development, and that long-term biodiversity enhancements can be realised. Such a benefit is of particular importance to this Site, where ongoing management practices (or lack thereof) are resulting in the gradual decline of biodiversity value in favour of agricultural productivity.

5.2.42. In some areas, such as F11 which forms part of the existing SLINC designation, an absence of recent management has resulted in the ingress of Bramble scrub and ruderal vegetation, largely resulting in the loss of more valuable meadow habitat. Elsewhere, more intensive agricultural management has included for the application of fertiliser to fields, as well as the introduction of fast growing fodder grasses such as Timothy; management approaches that will continue to result in the gradual loss of botanical interest. The instigation of an appropriate, biodiversity led management scheme for the Site would halt and reverse this botanical impoverishment – something unlikely to be achieved in a no development scenario.

5.2.43. Subject to adherence of the above principles, it is considered direct impacts on 'Farmland at Great Barr or Peak House Farm' can be appropriately mitigated for and, indeed, enhancements realised such that the true value of the Site can be enhanced as part of any emerging proposals for the Site. Further consideration is given to on Site habitats in the 'Habitat' Section below.

5.2.44. With regard to faunal species, the survey work undertaken identified the Site as supporting a surprisingly limited range of protected and notable species. Surveys found no evidence of reptiles, GCN or Badgers. The breeding bird assemblage was of a modest nature, and typical for the habitats present, whilst only a low range of bats were recorded. It is possible the urbanised context of the Site, with major roads and built form segregating the Site from much of the wider landscape, has inhibited or tempered its colonisation by many of these species groups, with the past (and ongoing) agricultural management of the fields further tempering the Site's suitability for some of the above faunal groups. Further consideration is given to species in the 'Fauna' Section below.

5.2.45. As part of any emerging proposals, it will also be important to consider the potential for indirect impacts to arise, both in respect of the on Site SLINC and, indeed, those off-site SINCS located in close proximity to the Site (see Table 5.1 below). In this regard, any forthcoming proposals would come forward in accordance with best practice construction measures, including in relation to dust suppression, sensitive lighting, material storage, and noise pollution. Such measures would be detailed within a Construction Management Plan (CMP) (or similar) and would be sufficient to ensure adverse impacts could be adequately mitigated.

Site Name	Description	Distance
Hill Farm Bridge Fields SINC	Grassland field supporting calcareous flora with good quality hedgerows and scattered scrub.	Adjacent south-west
Wilderness Wood SINC	Small Ancient Semi-Natural Woodland formerly managed as Oak/Hazel coppice with some wet woodland areas and a pond.	15m south
Merrion's Wood SINC	Mature broad-leaved Ancient Semi-Natural Woodland, formerly part of Great Barr Park.	50m north-east
Wilderness Lane SLINC	Public open space supporting neutral and marshy grasslands, hedgerows, scrub, and a pond.	250m south
Land at Yew Tree SLINC	The Site supports a range of habitats including wet Ancient Semi-Natural Woodland, scrub, and unimproved grassland	350m south-west
Shustoke Farm SLINC	Mixture of horse paddocks, scrub, tall herb, and hedgerows located within an area of open grassland and playing fields.	400m north-west

Table 5.1. Description of SINCs and SLINCs within 0.5km of Site boundary

5.2.46. As discussed for 'Farmland at Great Barr or Peak House Farm' SLINC above, the implementation of best practice measures during the construction phase would be sufficient to ensure potential adverse effects (direct or indirect) on these non-statutory sites may be fully mitigated or avoided as part of any emerging proposals.

Nature Improvement Areas.

5.2.47. As outlined previously, a Nature Improvement Area Ecological Strategy has been prepared for the region. Under this strategy, land within the borough has been assigned to one of three 'broad categories', these being 'Core Ecological Areas', 'Ecological Linking Areas', and 'Ecological Opportunity Areas'. These categories have been assigned following a desk based exercise which, amongst other parameters, considers the presence of key species (within a $1km^2$ grid square resolution) as well as the proximity of designated sites.

5.2.48. Under this exercise, the grid square(s) including the Site have been assigned as 'Core Ecological Areas', where protection of biodiversity assets is identified as the priority target.

5.2.49. Whilst some habitats of value are recorded within the Site (as evaluated in the Habitat Section below), the majority of the Site comprises species-poor grassland fields which are of low ecological interest. It is not considered the protection of these low value habitats would contribute meaningfully to the local ecological network.

5.2.50. Nonetheless, it is noted the location of the Site (i.e. part of a wider area of greenspace between conurbations) offers a degree of functional importance. As such, and in line with the ethos of the NIA Ecological Strategy, careful consideration has been given, as part of the emerging proposals, to ensuring the intrinsic and functional value of the Site as a whole can be protected and enhanced as part of the development proposals, complementing the targets of the NIA Ecological Strategy, and

ensuring compliance with legislation and policy of relevance to Nature Conservation.

5.2.51. In particular, emerging proposals seek to deliver a substantial area of high quality semi-natural habitat in the west of the Site. At this stage, it is envisaged this western open space will be managed as a Country Park, within which targeted ecological management will be secured in the long-term. Such measures will offer opportunities for substantial qualitative enhancements within the western section of the Site, allowing the delivery of a high quality habitat corridor spanning north to south across the Site, and ensuring continued (and enhanced) ecological connectivity across the landscape.

5.2.52. As above, the emerging development proposals would also secure appropriate long-term management for the Site, replacing the intensive agricultural management currently undertaken. In securing biodiversity led management, the proposals offer an opportunity to halt and reverse botanical declines and secure qualitative enhancements in the long-term.

5.2.53. Further consideration is given to appropriate habitat creation and management measures below.

Habitats

5.2.54. The majority of the Site comprises species-poor grassland fields which are botanically unremarkable and not deemed to be of any particular ecological significance. No specific mitigation would be required to account for losses, and, indeed, there is ample scope for enhancements through the adoption of an appropriate management regime for retained habitats.

5.2.55. A subset of the fields (F3, F5 and F14) are of greater botanical interest on account they support either Great Burnet, a species identified as ‘very rare’ in the region, or otherwise marshy grassland habitats which include for Oval Sedge, an uncommon species in the locality. Notwithstanding that overall these fields support only a modest range of herbs, they are deemed to be of relatively high value in the context of the Site. Noting the prevalence of Great Burnet in F3, as well as the local rarity of this species, this field is deemed to be of some value in the local context. Reflecting this heightened interest, emerging proposals have been designed to secure the retention and long-term enhancement of F3.

5.2.56. The hedgerow network and associated trees are also deemed to be of higher value in the context of the Site, with a good proportion (50%) of the constituent features assessed as ‘Important’ under the Hedgerow Regulations on nature conservation grounds. Whilst many of the hedgerows support only a modest range of species, the network overall is considered of value in a local context. In this regard, the hedgerow network is likely to satisfy the criteria to achieve SLINC status.

5.2.57. Of the ponds on Site only P1 is deemed to be of some ecological value, and this only within the context of the Site. P2 is more representative of seasonally inundated grassland and is of no significant interest.

5.2.58. The remaining habitats within the Site are typically of very limited ecological interest, comprising small pockets of ruderal vegetation, species-poor scrub, buildings, and hardstanding.

5.2.59. The emerging development proposals will seek to retain much of the existing grassland areas, incorporating these habitats within a Country Park style open space, which will additionally include areas of wetland features and high quality hedgerow. The emerging landscape strategy in this regard has been informed by the existing biodiversity assets of greatest interest within the Site, allowing for the retention of a vast majority of boundary features, areas of higher value grasslands (not least F3 and part of F5), and pond P1, incorporating these habitats into an extensive Country Park where they will be protected, buffered, and enhanced as part of the emerging scheme.

5.2.60. Where areas of higher value grassland are likely to be lost, it is proposed for these areas to be subject to a habitat translocation, ensuring their long-term retention within the Site.

5.2.61. The retention of a vast majority of the hedgerow network, as well as extensive areas of grassland within a Country Park style open space, alongside the provision of new habitats as part of an appropriately designed landscape planting scheme, would fully mitigate for any losses and realise significant biodiversity enhancements over the existing situation, ensuring qualitative and quantitative gains for grassland within the Site.

5.2.62. As stated above, the habitats of relatively higher interest are to be largely retained, protected, and enhanced as part of the emerging proposals. Further consideration is given to these habitats below.

Hedgerows and trees

5.2.63. The hedgerow network, and associated standard trees, are considered of high intrinsic value within the context of the Site, with many of the individual features (50%) meeting the criteria for ‘Important’ under the Hedgerow Regulations.

5.2.64. The emerging development proposals for the Site seek to protect and retain a vast majority of the tree belt and hedgerow network, with only very minor losses to facilitate access. It is anticipated the network of hedgerows throughout the Site will be retained within a 10m vegetated corridor, ensuring a suitable natural buffer either side of retained hedgerows as part of emerging proposals.

5.2.65. The emerging proposals could more than mitigate for minor access related losses through both new hedge planting and the instigation of an enhancement regime for the retained features. Collectively such measures would allow for both quantitative and qualitative enhancements for hedgerows within the Site.

5.2.66. The management regime would appropriate long-term management of all new and retained hedgerows and standard trees, ensuring these may attain or retain optimal biodiversity value. Primarily, management would be in the form of rotational cutting, seeking to attain traditional ‘A’ shaped hedgerows with a minimum height of 2.5m, whilst allowing the retention of standard tree

specimens. Standard trees would be subject to appropriate arboriculture management where required, to promote tree health and longevity. Wherever feasible, management will seek to promote the retention of deadwood and potential 'veteran' features in order to further enhance the ecological interest of standard trees (as well as ensure natural roosting/nesting features for faunal species).

5.2.67. Where necessary, management would include for the bolster planting of those hedgerows which have become gappy and partial as a result of inappropriate management in recent years (such as H4 and H22), and would moreover allow for the botanical diversification of features currently dominated by only a limited range of woody species. Further opportunities for enhancement could be sought through the implementation of traditional management practices such as hedge laying, whilst the cessation of un-checked grazing and/or chemical application, and the retention of sufficient buffers along retained features would allow for the establishment of a desirable ground flora absent from the vast majority of the network.

5.2.68. The retention and protection of existing linear features and woodland would complement the ethos of the NIA Ecological Strategy, ensuring the protection and enhancement of the hedgerow network within the Site. Indeed, the proposals offer a mechanism through which these features may be enhanced in the longer-term, ensuring the Site is enhanced as a valuable Green Infrastructure component at a landscape scale.

Grassland

5.2.69. As above, the majority of grassland on Site has been assessed as being of low conservation value, supporting communities which are widespread and common in both a national and regional context. Nonetheless, a subset of the grassland is deemed to be of higher ecological interest, not least on account of the locally rare Great Burnet. F3 is considered of the highest ecological value in the Site, whilst F5 and F14 were also deemed to be of some heightened interest.

5.2.70. At this early stage, it is likely emerging proposals would allow for the retention and enhancement of F3, and it is anticipated Field F5 will be subject to partial losses, whilst F14 will be largely lost (with the exception of the substantial hedgerow buffers). However, it is considered enhancements to significant areas of retained grassland in the west of the Site will outweigh these losses, and indeed allow for net gains for the extent of higher value grassland post-development.

5.2.71. Indeed, opportunities exist as part of the proposals to safeguard and enhance an extensive area of grassland, providing a mechanism to facilitate long-term habitat management, and to secure a high value habitat corridor spanning north-south across the Site, and linking to the wider landscape. As detailed above, a no development scenario would otherwise be likely to result in the continued degradation of the grassland habitats (as is evident for F11), with neglect or agricultural 'improvement' leading to a reduction in botanical diversity.

5.2.72. It is proposed any forthcoming scheme to come forward with a detailed habitat creation and management plan for the western open space (and other on-Site green infrastructure), with this including for detailed proposals

to secure long-term enhancements to the grassland. At this stage it is considered the following measures would be secured within this management strategy:

- Enhancements to higher value habitats to be retained as part of emerging proposals, particularly Field F3 and areas of Field F5;
- Localised grassland translocations to retain localised areas of higher value habitat which may otherwise be lost to the emerging proposals;
- Instigation of a long-term meadow management regime to include annual hay cuts at appropriate times of the year;
- Localised wetland and waterbody creation to allow for a mosaic of wet and dry grassland communities;
- Localised scrub removal and on-going management to prevent succession into meadow habitats;
- The provision of interpretation boards and signage as an educational tool for visitors to the Country Park.

5.2.73. The instigation of the above measures would allow the grassland communities of heightened interest to be retained within the Site, whilst long-term management would ensure a mechanism for qualitative grassland enhancements post-development. Indeed, the instigation of appropriate management for an extensive area of open space in the west of the Site, in addition to F1 in the east, would ensure a substantial net gain in the extent of good quality meadow grassland, more than off-setting losses to low conservation value habitats.

5.2.74. As detailed above, the location and extent of the proposed open space has also given regard to the potential value of the Site in a landscape context, ensuring the provision of a high quality habitat corridor which traverses north to south across the Site, and provides continued functional links to greenspace in the local landscape, as desired within the NIA Strategy for the region.

Ponds

5.2.75. Pond P1 is considered of value within the context of the Site, supporting a moderate range of aquatic flora, as well as providing potential opportunities for faunal species. It is envisaged this pond will be retained as part of the emerging proposals, whilst opportunities for enhancement exist through the instigation of biodiversity led, rotational management. Pond P2, effectively a seasonally wet depression, will be lost to the proposals. This feature lacks any true aquatic vegetation and does not have the potential to provide significant opportunities to faunal species. No mitigation would be required for this loss.

5.2.76. In any event, emerging proposals seek to deliver new wetland habitats within the Site, allowing for a net gain in seasonal and permanent water features. The provision of a series of dedicated biodiversity pools would offer opportunities for further habitat diversity within the Site, providing valuable stepping-stone habitats for floral and faunal species of local importance.

Summary

5.2.77. It is considered the adoption of a suitable landscaping scheme for the Site, in line with the recommendations set out above, will ensure the biodiversity value of the habitats present are retained and indeed enhanced as part of any development.

5.2.78. In functional terms, the protection, restoration and enhancement of valuable biodiversity assets (such as the mature hedgerows which will benefit from new planting to restore these gappy features or improve species diversity) will enhance the value of the Site as a linking habitat between biodiversity important Sites within the wider landscape, and will provide new and/or enhanced opportunities for faunal species present in the local area.

5.2.79. The biodiversity value of these habitats would be further enhanced through the establishment of an appropriate management regime, and would form an integral component of the emerging development proposals for the Site.

5.2.80. It is considered, subject to above principles, a biodiversity net gain of at least 10% would be achievable, whilst the qualitative enhancement to habitats would moreover allow for substantial areas of the Site to attain SINC quality in future years.

5.2.81. The BIA Note and accompanying metric, prepared alongside this Ecological Assessment, further serve to demonstrate emerging development proposals at the Site may will secure significant biodiversity net gains in the long-term.

5.3. **Faunal Evaluation**

Badgers

5.3.1. **Legislation**. The Protection of Badgers Act 1992 consolidates the previous Badgers Acts of 1973 and 1991. The legislation aims to protect the species from persecution, rather than being a response to an unfavourable conservation status.

5.3.2. As well as protecting the animal itself, the 1992 Act also makes the intentional or reckless destruction, damage or obstruction of a Badger sett an offence. A sett is defined as *"any structure or place, which displays signs indicating current use, by a Badger"*. 'Current use' is defined by NE as any use within the preceding 12 months.

5.3.3. In addition, the intentional elimination of a sufficient foraging area supporting a known social group of Badgers may, in certain circumstances, be construed as an offence by constituting 'cruel ill treatment' of a Badger.

5.3.4. Local authorities are therefore obliged to consult NE on any application likely to adversely affect Badgers.

5.3.5. Any work that disturbs Badgers is illegal without a licence granted by NE. Unlike the general conservation legislation, the Badgers Act 1992 makes specific provision for the granting of licences for development purposes, including for the destruction of setts.

5.3.6. Guidance produced by NE in 2002 developed guidelines on the types of activity, within certain distances of sett entrances, it considers should be licensed. For example, using heavy machinery within 30m of any entrance to an active sett, lighter machinery within 20m, or light work such as hand digging within 10m, all may require a licence.

5.3.7. 'Interim guidance' issued by NE in September 2007 specifically states *"it is not illegal, and therefore a licence is not required, to carry out disturbing activities in the vicinity of a sett if no badger is disturbed and the sett is not damaged or obstructed."*

5.3.8. The guidance goes on to state, *"Where interference with a sett showing signs of use cannot be avoided during the development, a licence should be sought from Natural England"*.

5.3.9. This guidance does not make reference to any 30m/20m/10m radius as a threshold for whether a licence would be required. Nonetheless, it is stated that tunnels may extend for 20m, so care needs to be taken when implementing excavating operations within the vicinity of a sett, and for appropriate precautions to be taken with vibrations and noise, etc. Fires/chemicals within 20m of a sett should specifically be avoided.

5.3.10. This interim guidance allows greater professional judgement as to whether an offence is likely to be committed by a particular development activity and therefore whether a licence is required or not. For example, if a sett clearly orientates southwards into an embankment it may be somewhat redundant to have a 30m exclusion zone to the north.

5.3.11. It should be noted, a licence cannot be issued until the site is in receipt of a full and valid planning permission, and that generally licenses are not granted between December and June inclusive, to avoid disruption to the Badger breeding cycle.

5.3.12. **Site Usage.** The grassland present throughout the Site, in addition to the hedgerows, offers suitable foraging habitat for Badgers. However, no evidence of dispersal of Badgers such as setts or latrines was identified during the course of survey work.

5.3.13. **Mitigation and Enhancements.** Given the absence of Badgers, no specific mitigation would be required.

5.3.14. On a precautionary basis, given the mobile nature of Badgers and their ability to rapidly excavate new setts, it is recommended an updated Badger walkover is undertaken prior to construction commencing. This survey will be sufficient to reaffirm the absence of Badgers from the Site or, if necessary, to identify any additional mitigation measures which may be required. In the unlikely event it is required, there is ample scope within areas of proposed greenspace to provide an artificial sett for Badgers.

5.3.15. Emerging landscape proposals for the Site would offer continued and improved foraging opportunities for Badgers within the local area, retaining extensive areas of grassland as well as the hedgerow network and its associated fruiting species. The inclusion of a range of native, berry bearing species as part of a forthcoming planting regime (such as Crab Apple, Damson, Dogwood and Elder) would provide additional opportunities in this regard.

5.3.16. In addition, the potential exists for Badgers to roam into areas where construction is underway and become trapped in trenches, excavate new setts in piles of subsoil, or disturb chemicals which may be being used for development.

5.3.17. All Site personnel will be made aware of the potential presence of this species; any trenches or other hazards to Badgers within the construction zone will be identified, and measures undertaken to minimise any risk. Furthermore, to prevent any additional constraints arising, special measures will be taken to reduce the chance of Badgers occupying any temporary mounds of stored materials. Areas of topsoil and subsoil will be compacted as soon as practicable to discourage excavation of new setts.

5.3.18. The adoption of the above measures would avoid the potential for adverse impacts during creation, and would ensure the continued suitability of the Site for Badgers post-development.

Bats

5.3.19. **Legislation.** All bats are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as Amended) and included on Schedule 2 of the Conservation of Habitats and Species Regulations 2017 ("the Habitats Regulations"). These include provisions making it an offence to:

- Deliberately kill, injure or take (capture) bats;
- Deliberately disturb bats in such a way as to significantly:-
  (i) be likely to impair their ability to survive, to breed or rear or nurture their young; or to hibernate or migrate; or
  (ii) affect the local distribution or abundance of the species to which they belong;
- Damage or destroy any breeding or resting place used by bats;
- Intentionally or recklessly to obstruct access to any place used by bats for shelter or protection (even if bats are not in residence).

5.3.20. The words 'deliberately' and 'intentionally' include actions where a court can infer the defendant knew the action taken would almost inevitably result in an offence, even if that was not the primary purpose of the act.

5.3.21. The offence of damaging (making it worse for the bat) or destroying a breeding Site or resting place is an absolute offence. Such actions do not have to be deliberate for an offence to be committed.

5.3.22. In accordance with the Habitats Regulations the licensing authority (NE) must apply the three derogation tests as part of the process of considering a licence application. These tests are that:

1. the activity to be licensed must be for imperative reasons of overriding public interest or for public health and safety;
2. there must be no satisfactory alternative; and
3. the favourable conservation status of the species concerned must be maintained.

5.3.23. Licences can usually only be granted if the development is in receipt of full planning permission.

5.3.24. **Site Usage.** There are a number of trees present within the Site which have features of potential value for roosting bats. The buildings on Site are unsuitable to support roosting bats.

5.3.25. The network of hedgerows and trees within the Site offer suitable foraging and commuting opportunities to bats. Areas of species-poor grassland are deemed to be of low value in this regard.

5.3.26. Despite the stature and extent of the existing hedgerow network, specific bat surveys completed throughout 2020 identified relatively limited levels of bat activity across the Site, with this activity dominated by common and widespread bat species. Bat activity was unsurprisingly focused along the existing hedgerow networks, with little activity noted across open fields. Activity was noted to be higher in the south of the Site, including the hedgerows bounding F3, otherwise overall activity was broadly comparable across the hedgerow network.

5.3.27. **Mitigation and Enhancements.** The hedgerows and associated trees on Site are used by a generally low number of foraging and commuting bats. The emerging proposals seek to retain a vast majority of the existing hedgerow network, with only very minor losses to facilitate access. Much of the retained hedgerow network will be incorporated into areas of open space, not least within the proposed Country Park area. The retention of these features will ensure continued navigational opportunities for bats to remain largely undisturbed, whilst extensive areas of high quality grassland and wetland habitat will realise improved foraging opportunities within the Site.

5.3.28. Where the hedgerows are within areas of proposed open space, it is anticipated artificial lighting will be avoided or otherwise limited to sensitive waymarking (such as downward facing bollard lighting) which will retain a dark environment and avoid adverse levels of light spill onto linear features.

5.3.29. Where hedgerows will be retained between development parcels, careful consideration will be given to lighting design such that adverse light spill can be avoided, with lighting directed only to where it is required. The design of any lighting will give due regard to the Bats and Artificial Lighting in the UK (Guidance Note 08/18) as issued by the Bat Conservation Trust. Measures in this regard will include:

- The adoption of a sensitive lighting configuration to avoid light spill onto linear features;
- Additionally, accessories (such as baffles, hoods or louvres) will be utilised to further minimise light spillage and direct light below the

horizontal plane to where it is required (limiting light to an angle of 70 degrees or below wherever possible);
- External lighting to comprise LED luminaries with no UV content and a colour temp of <3000K.

5.3.30. The above measures will ensure the functional value of hedgerows will be retained as part of the emerging proposals.

5.3.31. At this stage, it is envisaged trees with the potential to support roosting bats will be retained and safeguarded as part of the emerging proposals. In the event any trees identified to have potential for roosting bats are to be adversely affected by the proposed scheme, further survey work, such as a tree climbing survey or emergence survey, would need to be undertaken in order to ascertain whether they support a bat roost. Should any bat roosts be found during further survey work a NE European Protected Species Licence would be required for works likely to disturb bats and their roosting sites, and would include details of any mitigation measures required.

5.3.32. Given the nature of any potential roosts (i.e. crevices and holes in trees); it is considered any required mitigation measures could easily be accommodated within the emerging scheme. Indeed, the emerging development proposals would include for the provision of a high number of bat roosting features to be associated with new buildings and retained trees, allowing for a significant net gain in roosting opportunities as part of the proposals, and more than mitigating for any potential losses.

5.3.33. The retention of the hedgerow network (the habitat of greatest value for bats), alongside the creation of a Country Park which supports high quality habitats such as species-rich grassland and wetland, would offer continued and enhanced opportunities for foraging bats whilst ensuring the Site continues to function as a navigational resource for local populations. These measures, alongside a net gain in roosting opportunities, would allow emerging proposals to enhance the overall value of the Site for bats, contributing positively to the conservation status of local populations and benefitting species recognised as national and local conservation targets.

Breeding Birds

5.3.34. Legislation. Section 1 of the Wildlife & Countryside Act is concerned with the protection of wild birds. With certain exceptions, all wild birds and their eggs are protected from intentional killing, injuring, and taking; and their nests, whilst being built or in use, cannot be taken, damaged or destroyed.

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

5.3.36. **Site Usage.** The hedgerow and tree network within the Site supports a modest range of breeding birds, albeit these assemblages were typical for an agricultural landscape and were not deemed to be of heightened interest for the local area.

5.3.37. The remaining habitats within the Site, including the extensive areas of grassland, were of very limited ornithological interest and did not support any notable breeding activity.

5.3.38. **Mitigation and Enhancements.** As all species of birds receive general protection whilst nesting, to avoid a possible offence it is recommended any clearance of suitable nesting habitat (including grassland) is undertaken outside the breeding season (March to August inclusive) or, alternatively, checks for nesting birds be made by an ecologist immediately prior to any vegetation removal.

5.3.39. With the exception of minor losses to facilitate access, it is envisaged the vast majority of the hedgerow network will be retained as part of the proposals. This will ensure continued nesting opportunities for local bird populations. Any minor losses to the network would be more than mitigated for through new planting, or otherwise the implementation of enhancements to retained habitats, including the bolster planting of gappy and or species-poor features, as well as the establishment of a long-term sensitive management regime for the Site. These enhancements will both improve hedgerow structure (and therefore the quality of breeding habitats), and moreover allow for a greater diversity of berry bearing species as a food source.

5.3.40. The retention and enhancement of areas of meadow grassland, as well as areas of wetland, will improve habitat diversity within the Site, offering additional opportunities for foraging and nesting.

5.3.41. In due course simple enhancements for this group of species could be provided by the provision of suitable bird boxes on retained trees or new buildings within the Site. As well as benefitting species already present in the Site, this will offer new opportunities for urban bird populations such as House Sparrow *Passer domesticus*, Swallows *Hirundinidae*, Swifts *Apodidae* and House Martins *Delichon urbicum*, many of which are of conservation concern as a result of historic population declines.

Invertebrates

5.3.42. It is considered habitats present within the Site are likely to support a limited range of common invertebrate species. However, given the limited range of habitats present, and noting these habitats in turn are generally of limited species diversity, there is no reason to suspect the Site to be of any elevated entomological interest.

5.3.43. The provision of new areas of landscaping, to include a range of species-rich habitats, will provide a range of new opportunities for invertebrates within the Site.

5.3.44. In particular, the provision of new wetland habitat, as well as the enhancement of retained grassland habitats, will serve to enhance the structural and botanical diversity of on-Site habitats, ensuring an improved range of micro-habitats capable of supporting a more diverse invertebrate assemblage.

Other Species

5.3.45. In addition to those species recorded on Site during the completion of survey work in 2020, consideration has been given to opportunities for other notable faunal groups which may be present in the local area, and which may have the potential to colonise the Site in future years.

5.3.46. For example, The European Hedgehog, a UK BAP Priority Species, will benefit from the retention and enhancement of the hedgerow networks, as well as the diversification of meadow habitats. The instigation of long-term management will retain an optimal mosaic of shrub within the Site, whilst provision of log and brash piles (as part of future management) would provide high quality nesting and hibernation sites for this species. Moreover, it is proposed development plots would include for integrated 'hedgehog highways' at boundary treatments (including garden fences), ensuring development plots promote dispersal of this species within and across the Site.

5.3.47. The provision of new wetland habitats will provide new opportunities for common amphibians which may be present in the local area and, indeed, the provision of stepping-stone ponds across the western greenspace would offer opportunities to enhance dispersal across the Site, with the potential of allowing enhanced faunal connectivity for a range of wetland fauna (including invertebrates).

6. PLANNING POLICY CONTEXT

6.1. The planning policy framework that relates to nature conservation in the Black Country is issued nationally through the National Planning Policy Framework and locally through The Black Country Core Strategy 2011 and the Sandwell Site Allocation and Delivery Development Plan Document 2012.

6.2. National Policy

National Planning Policy Framework

6.2.1. Guidance on national policy for biodiversity and geological conservation is provided by the National Planning Policy Framework (NPPF), published in March 2012, revised 24 July 2018, 19 February 2019 and again on 20 July 2021. It is noted the NPPF continues to refer to further guidance in respect of statutory obligations for biodiversity and geological conservation and their impact within the planning system provided by Circular 06/05 (DEFRA/ODPM, 2005) accompanying the now-defunct Planning Policy Statement 9 (PPS9).

6.2.2. The key element of the NPPF is there should be “a presumption in favour of sustainable development” (paragraphs 10 to 11). It is important to note this presumption “does not apply where the plan or project is likely to have a significant effect on a habitats Site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded the plan or project will not adversely affect the integrity of the habitats Site” (paragraph 182). ‘Habitats Site’ has the same meaning as the term ‘European Site’ as used in the Habitats Regulations 2017.

6.2.3. Hence, the direction of Government policy is clear. That is, the presumption in favour of sustainable development is to apply in circumstances where there is potential for an effect on a European Site, if it has been shown there will be no adverse effect on that designated Site as a result of the development in prospect.

6.2.4. A number of policies in the NPPF are comparable to those in PPS9, including reference to minimisation of impacts to biodiversity and provision of net gains to biodiversity (paragraph 174).

6.2.5. The NPPF also considers the strategic approach local authorities should adopt with regard to the protection, maintenance and enhancement of green infrastructure, priority habitats and ecological networks, and the recovery of priority species.

6.2.6. Paragraphs 179 to 181 of the NPPF comprise a number of principles local authorities should apply, including encouraging opportunities to incorporate biodiversity in and around developments; provision for refusal of planning applications if significant harm cannot be avoided, mitigated or compensated for; applying the protection given to European Sites to potential SPA, possible SAC, listed or proposed Ramsar Sites and Sites identified (or required) as compensatory measures for adverse effects on European Sites; and the provision for the refusal for developments resulting in the loss or deterioration of ‘irreplaceable’ habitats – unless there are ‘wholly exceptional reasons’ (for instance, infrastructure projects

where the public benefit would clearly outweigh the loss or deterioration of habitat) and a suitable compensation strategy exists.

6.2.7. National policy therefore implicitly recognises the importance of biodiversity and that with sensitive planning and design, development and conservation of the natural heritage can co-exist and benefits can, in certain circumstances, be obtained.

6.3. Local Policy

6.3.1. Local planning policy for the Site is detailed within the Sandwell Site Allocations and Delivery Development Plan Document 2012 and the Black Country Strategy 2011.

The Black Country Core Strategy February 2011

6.3.2. The Black Country Plan comprises a number of documents. The main document is the Core Strategy, which was adopted in February 2011 and will cover development in the borough until 2026.

6.3.3. **CSP3: Environmental Infrastructure** states all development proposals will need to demonstrate the strategic network of environmental infrastructure will be protected, enhanced, and expanded at every opportunity. The environmental infrastructure network comprises open space, sport and recreation facilities, areas of biodiversity and geodiversity importance, wildlife corridors, canals, watercourses and drainage system, and the special character and historic aspects of locally distinctive elements of the Black Country.

6.3.4. **ENV1: Nature Conservation** states development within the Black Country will safeguard nature conservation, both within and outside the boundaries:

- Development is not permitted where it would harm internationally, nationally, or regionally designated nature conservation sites;
- Development proposals must ensure protection from harm to locally designated nature conservation sites (Sites of Local Importance for Nature Conservation), important habitats and geological features;
- Development must not impede the movement of wildlife within the Black Country and its adjoining areas, through linear habitats and wider urban matrix; and

- All species that are legally protected, declining, or rare within the Black Country, or within national or local BAPs must not be harmed through development.

6.3.5. **Policy ENV4** relates to canals and identifies the need to, amongst other matters, protect and enhance the nature conservation value of these features.

6.3.6. **Policy ENV5** relates to sustainable drainage and encourages the use of sustainable drainage, including that which restores or replicates naturalistic features, and to buffer existing waterways.

6.3.7. **Policy ENV6** relates to the provision of open space, identifying that development should ensure this contributes towards the preservation and enhancement of biodiversity.

6.3.8. All development should contribute positively to the natural environmental of the Black Country by the extension of nature conservation sites, through improvements of wildlife movements, and through the restoration or creation of habitats which can contribute to the implementation of BAPs on a national, regional or local level.

Sandwell Metropolitan Borough Council Site Allocations and Delivery Development Plan Document 2012

6.3.9. The Site Allocation and Delivery Development Plan Document (SAD DPD) was adopted in December 2012, and guides development in the borough of Sandwell until 2021. It achieves this by providing land use allocations, designations, and local policies, with particular regard to housing, employment, town centre uses, open spaces, and the historic and green environment.

6.3.10. In regards nature conservation policies, the SAD DPD endorses the above policies detailed in respect of the Black Country Core Strategy, providing additional policies to supplement the Core Strategy.

6.3.11. Of relevance to nature conservation, policy **SAD EOS 5** identifies that new development should seek to promote 'environmental infrastructure'.

6.4. Discussion

6.4.1. Careful consideration has been given at Section 5 of this Ecological Assessment to the appropriateness of a SINC designation of the Site. This Section concludes a reclassification of the Site as a SINC is not supported by evidence, and the pre-existing SLINC designation for select habitats remains generally proportionate. The protection afforded through Policy ENV1 should be considered in this light.

6.4.2. Moreover, previous Secretary of State decisions have made clear protection afforded to non-statutory sites (i.e. both SLINC and SINC Sites) must be commensurate with the sites true ecological value, notwithstanding the

designation per-se. This is the approach adopted as part of this Ecological Assessment report.

6.4.3. Accordingly, recommendations have been put forward in this report which allow the proposals to fully safeguard the existing ecological interest of the Site. Wherever possible measures to enhance ecological and biodiversity value have been set out. Based on surveys undertaken and assessment, the presence and potential presence of protected species has been given due regard, and measures to retain and enhance the value of the Site for such species have been put forward.

6.4.4. With regards the proposed 'Farmland at Great Barr or Peak House Farm' SINC, specific consideration has been given to retaining those features of higher value (namely the hedgerow network). Targeted habitat creation and enhancement measures have moreover been identified which would ensure qualitative enhancements to the habitats within the Site, whilst also ensuring the functional value of this Site (as a green corridor) can be retained and enhanced as part of emerging proposals. Collectively, it is considered the measures proposed in this report would allow adverse biodiversity impacts within the Site to be avoided and enhancements delivered, as desired by local and nationally policy.

6.4.5. In contrast, a no development scenario would allow no assurances on future management and, indeed, would likely maintain the status quo where agricultural led management is continuing to result in botanical degradation of the Site.

6.4.6. In conclusion, implementation of the avoidance, mitigation, and enhancement measures set out in this report would enable the development proposals for the Application Site to fully accord with planning policy for ecology and nature conservation at all administrative levels.

7. SUMMARY AND CONCLUSIONS

7.1. Ecology Solutions (Manchester) Limited was commissioned in January 2020 by HIMOR to undertake an Ecological Assessment of land at Birmingham Road, Great Barr, Sandwell. The aim of this Ecological Assessment is to determine any potential ecological constraints associated with the Site which is being promoted for residential led development.

7.2. The Site comprises several improved agricultural fields used for silage production, and horse paddocks which are intersected by field boundary hedgerows.

7.3. There are no statutory designations of nature conservation value within or immediately adjacent to the Site. The closest statutory designated Site is Merrion's Wood LNR located approximately 50m north-east of the Site boundary, on the far side of the A34 dual carriageway. Several other LNRs are also present in the local area, albeit all are well distanced from the Site, with roads and urban development between.

7.4. Subject to the adoption of the measures set out in this report, it is considered potential adverse impacts on these sites will be fully avoided, either when considered alone or in combination with other plans or projects.

7.5. The Site includes for the 'Farmland at Great Barr or Peak House Farm', currently afforded SLINC status, but proposed as a SINC following survey work undertaken by the Wildlife Trust for Birmingham and the Black Country in 2018. As part of this proposed re-classification, the boundary of the designation would be extended to encompass a wider area, including the series of on-site grassland fields not covered in the current SLINC designation.

7.6. Notwithstanding the value of some habitat components of the Site, not least the hedgerow network, the status of SINC would be unwarranted for the Site. Indeed, such a status would be at odds with the true value of the Site, which is accepted as predominantly comprising species poor grassland. In contrast, and with the exception of F11 which has declined in interest, the existing SLINC citation, targeted towards habitats of higher value, is considered proportional to the Site's interest.

7.7. Noting the value of a sub-set of on-Site habitats, emerging proposals seek to retain and enhance a substantial area of informal open space as a Country Park in the west of the Site; to be created and managed specifically for the purposes of nature conservation. In addition to the Country Park land, it is anticipated extensive areas of grassland in the east of the Site would be retained, as would the vast majority of the Site wide existing hedgerow network, with only very minor losses to facilitate access. Indeed, the emerging proposals for habitat retention and creation on Site would adopt biodiversity net gain as a guiding principle.

7.8. Subject to adherence to the above principles, it is considered direct impacts on 'Farmland at Great Barr or Peak House Farm' can be appropriately mitigated for and, indeed, enhancements realised such that the true value of the Site can be enhanced as part of any emerging proposals for the Site.

7.9. In regards faunal species, the survey work undertaken identified the Site as supporting a surprisingly limited range of protected and notable species. Surveys found no evidence of reptiles, GCN or Badgers. The breeding bird assemblage

was of a modest nature and typical for the habitats present, whilst only a low range of bats were recorded. It is possible the urbanised context of the Site, with major roads and built form segregating the Site from much of the wider landscape, has inhibited or tempered its colonisation by many of these species groups, with the past (and ongoing) agricultural management of the fields further tempering the Sites suitability for the above faunal groups.

7.10. Subject to the measures set out in this report, it is considered notable and protected species will be fully safeguarded during the construction and operational phases of the development. Indeed, the proposals offer a mechanism to enhance the value of the Site for a range of Priority Species and local conservation priorities, ensuring the favourable conservation status of faunal species to be retained and enhanced.

7.11. From Ecology Solutions' Site survey and the background information obtained, there is no evidence to suggest there are any overriding ecological constraints which would prevent an appropriate planning application coming forward for the Application Site. In reaching this conclusion it is noted the proposed designation of the Site as a SINC is unwarranted and at odds with the true ecological value of the Site.

7.12. With the implementation of the recommendations in this report, including measures to safeguard the existing features of value (including the features noted within the SLINC citation), it is considered any forthcoming proposals may conform to relevant national and local policy with respect to nature conservation and biodiversity and further realise an enhancement over the current situation.

Conclusions

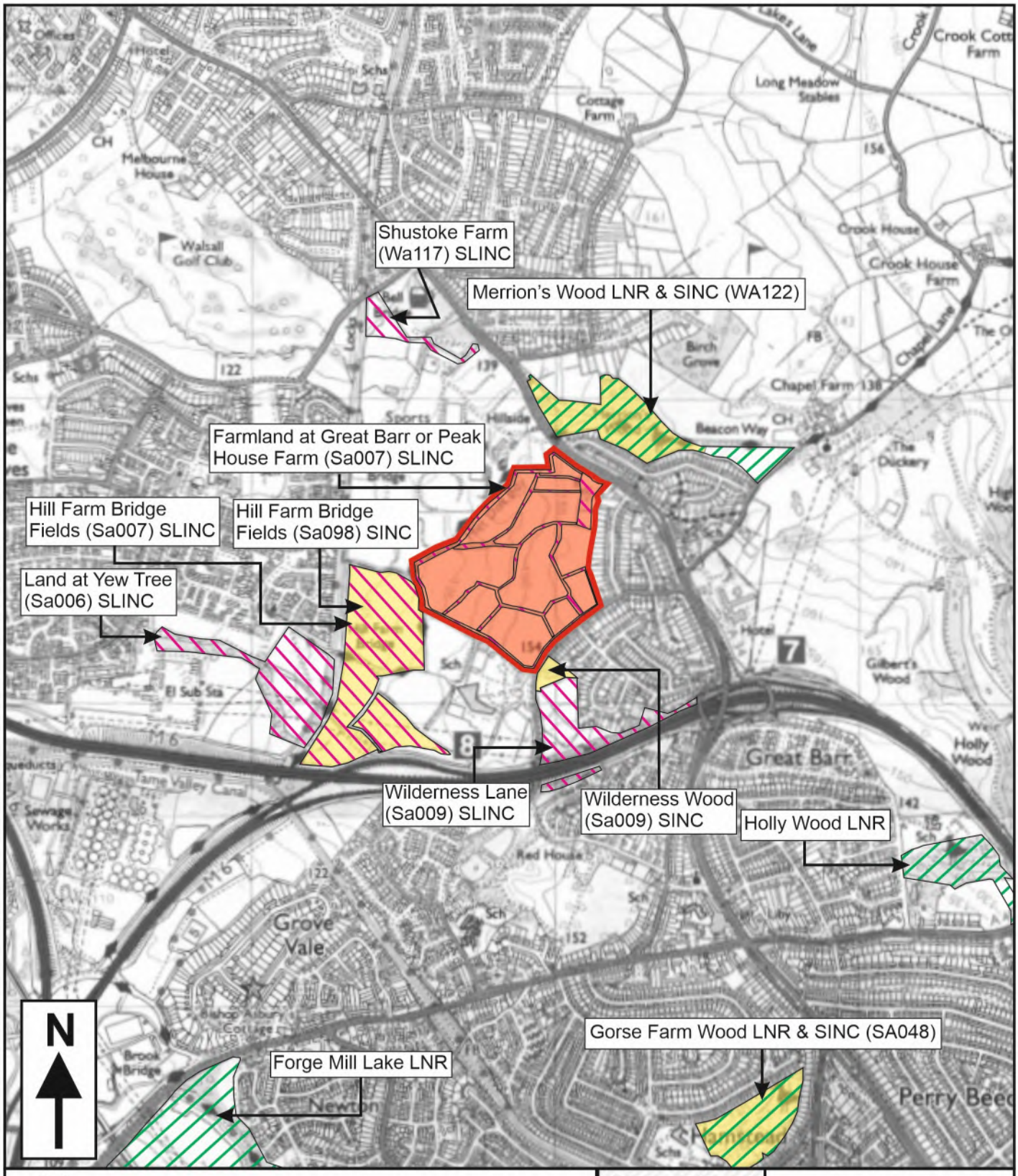
7.13. In conclusion, with the implementation of the recommendations in this report, it is considered any forthcoming proposals will conform to relevant national and local policy with respect to nature conservation and biodiversity, and further realise an enhancement over the current situation, contributing to local biodiversity targets for the area.

PLANS, PHOTOGRAPHS & APPENDICES

PLANS

PLAN ECO1

Site Location & Ecological Designations



KEY:

- SITE LOCATION
- LOCAL NATURE RESERVE (LNR)
- SITES OF IMPORTANCE FOR NATURE CONSERVATION (SINC)
- SITES OF LOCAL IMPORTANCE FOR NATURE CONSERVATION (SLINC)

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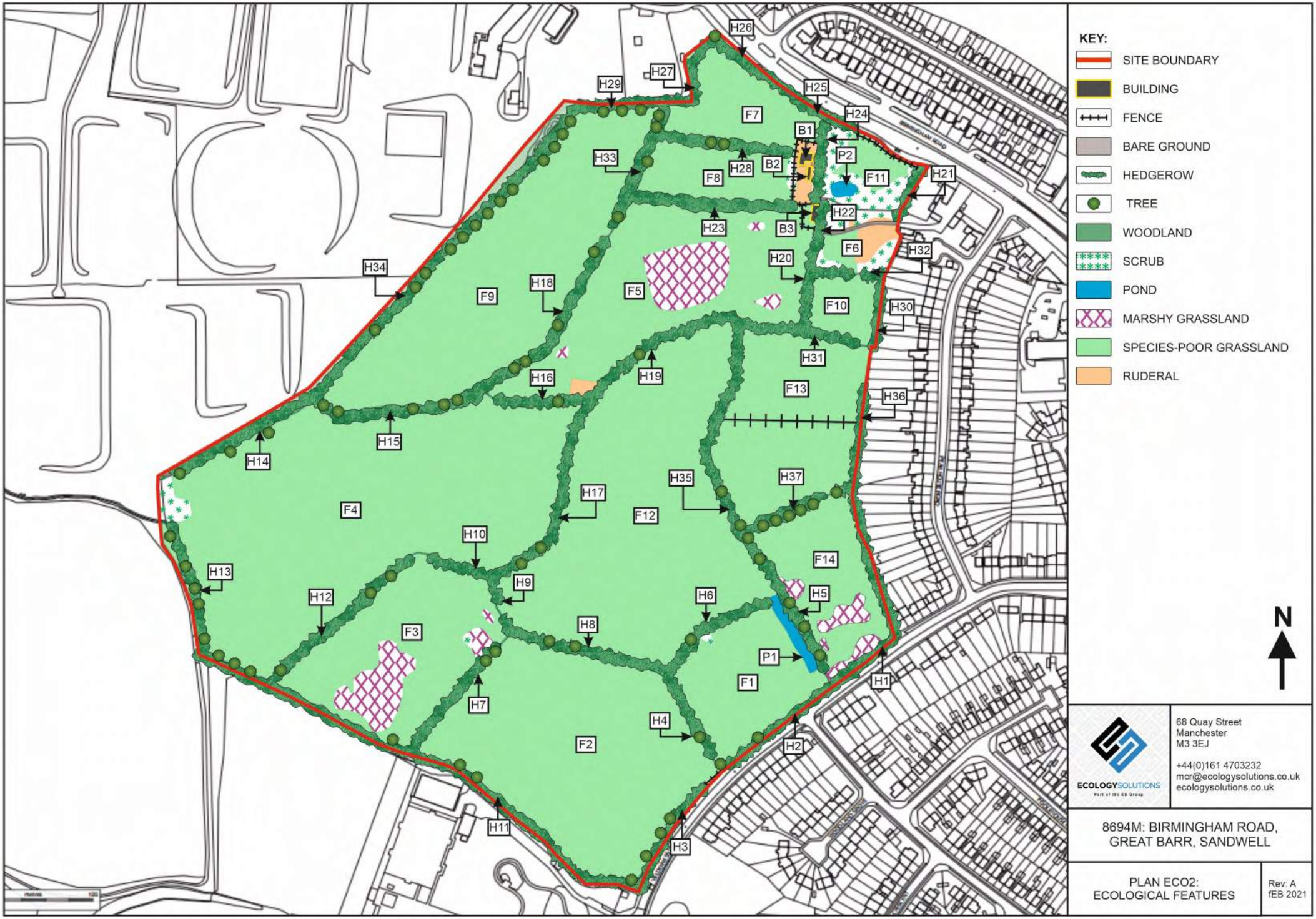
PLAN ECO1: SITE LOCATION AND ECOLOGICAL DESIGNATIONS

Rev: A

Feb 2021

PLAN ECO2

Ecological Features



PLAN ECO3.A

Bat Activity Survey

26 May 2020

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PLAN ECO3.A: BAT ACTIVITY SURVEY 26.05.20

Rev: A
Feb 2021

PLAN ECO3.B

Bat Activity Survey

23 June 2020

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PLAN ECO3.B: BAT ACTIVITY SURVEY 23.06.20

Rev: A
Feb 2021

PLAN ECO3.C

Bat Activity Survey

30 July 2020

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PLAN ECO3.C: BAT ACTIVITY SURVEY 30.07.20

Rev: A
Feb 2021

PLAN ECO3.D

Bat Activity Survey

31 August 2020

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PLAN ECO3.D: BAT ACTIVITY SURVEY 31.08.20

Rev: A
Feb 2021

PLAN ECO3.E

Bat Activity Survey

15 September 2020

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PLAN ECO3.E: BAT ACTIVITY SURVEY 15.09.20

Rev: A
Feb 2021

PLAN ECO3.F

Bat Activity Survey

1 October 2020

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PLAN ECO3.F: BAT ACTIVITY SURVEY 01.10.20

Rev: A
Feb 2021

PLAN ECO4.A

Breeding Bird Survey

23 March 2020

KEY:

- SITE BOUNDARY
- NORTH TRANSECT ROUTE
- SOUTH TRANSECT ROUTE
- CONFIRMED BREEDER
- PROBABLE BREEDER
- NONE BREEDER

N

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PLAN ECO4.A: BREEDING BIRD SURVEY 23.03.20

Rev: A
Feb 2021

PLAN ECO4.B

Breeding Bird Survey

6 May 2020

KEY:

- SITE BOUNDARY
- NORTH TRANSECT ROUTE
- SOUTH TRANSECT ROUTE
- CONFIRMED BREEDER
- PROBABLE BREEDER
- NONE BREEDER

N

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PLAN ECO4.B: BREEDING BIRD SURVEY 06.05.20

Rev: A
Feb 2021

PLAN ECO4.C

Breeding Bird Survey

3 June 2020

KEY:

- SITE BOUNDARY
- NORTH TRANSECT ROUTE
- SOUTH TRANSECT ROUTE
- CONFIRMED BREEDER
- PROBABLE BREEDER
- NONE BREEDER

N

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PLAN ECO4.C: BREEDING BIRD SURVEY 03.06.20

Rev: A
Feb 2021

PLAN ECO5

Reptile Survey Area

KEY:

- SITE BOUNDARY
- REPTILE TINNING AREA
- (1) REPTILE TIN LOCATIONS

N

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PLAN ECO5:
REPTILE SURVEY AREA

Rev: A
Feb 2021

PLAN ECO6

Pond Summary

P4

P2

P1

P3

KEY:

- SITE BOUNDARY
- POND
- POND - GCN eDNA NEGATIVE
- POND - NO ACCESS GRANTED
- POND - DRY

N

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PLAN ECO6:
POND SUMMARY

Rev: A
Jan 2021

PHOTOGRAPHS

PHOTOGRAPH 1: Ruderal surrounding Building B2

PHOTOGRAPH 2: Hedgerow H2 in field F1

PHOTOGRAPH 3: Scrub in field F11

PHOTOGRAPH 4: Pond P1 in field F1

PHOTOGRAPH 5: Marshy grassland in field F14

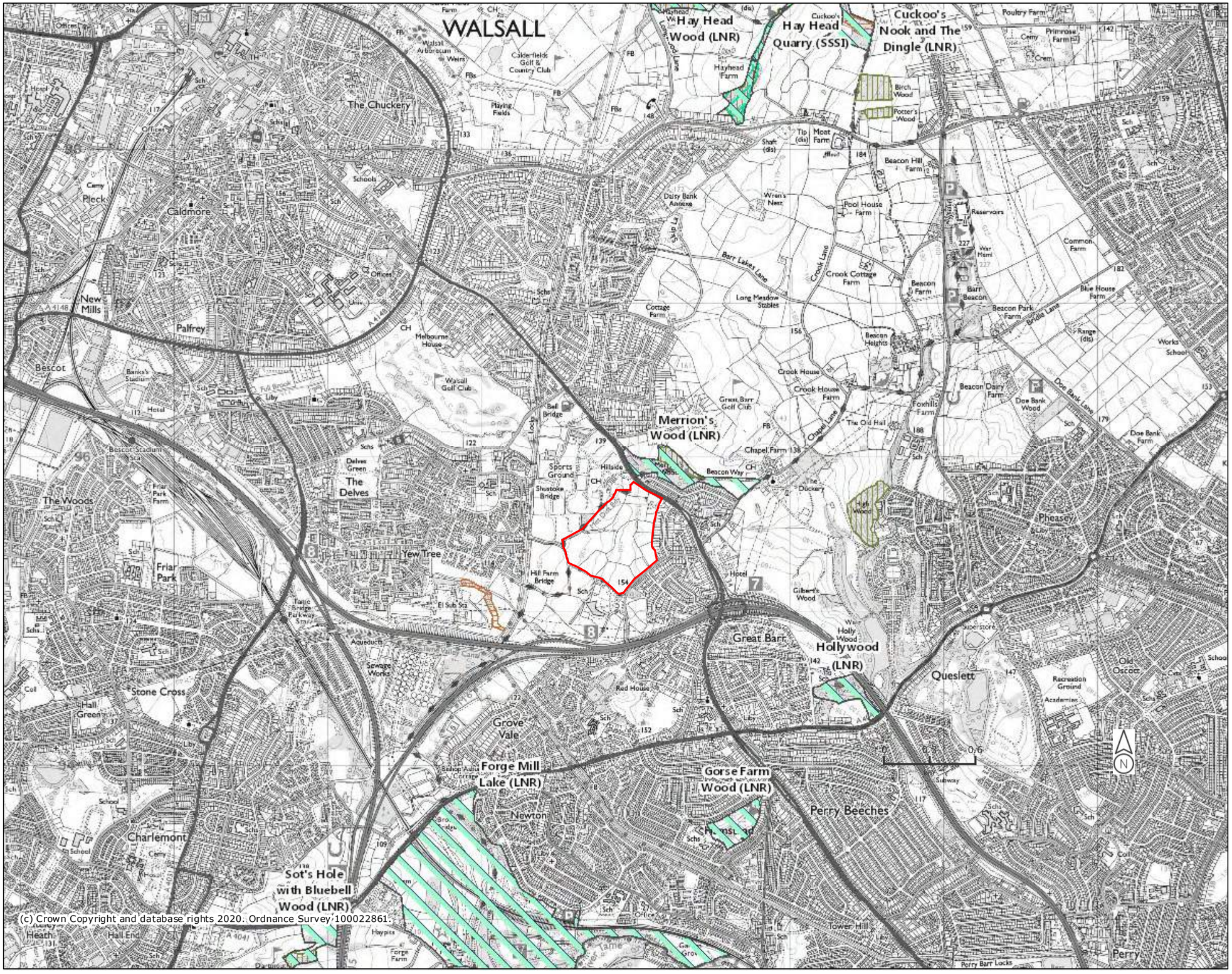
PHOTOGRAPH 6: Improved grassland in field F13

APPENDICES

APPENDIX 1

Information Obtained From MAGIC

8694M Great Barr



Legend

- Local Nature Reserves (England)
- National Nature Reserves (England)
- Ramsar Sites (England)
- Sites of Special Scientific Interest (England)
- Special Areas of Conservation (England)
- Special Protection Areas (England)

Ancient Woodland (England)

- Ancient and Semi-Natural Woodland
- Ancient Replanted Woodland

Projection = OSGB36
xmin = 397600
ymin = 292600
xmax = 410200
ymax = 299000

0 0.5 1
km

Map produced by MAGIC on 8 December, 2020.

APPENDIX 2

NVC and Hedgerow Survey Results

Land at Great Barr, Sandwell

NVC and hedgerow survey

May 2020

For Ecology Solutions (Manchester) Limited

Phil Quinn **(Ecology and land use) MCIEEM**
33 Kewstoke Road, Stoke Bishop, Bristol BS9 1HA
Tel. 0117 0796 2062917; email: philrquinn@aol.com

Contents

1. Summary

A detailed botanical survey was undertaken over this large agricultural site on the north-eastern edge of Sandwell Metropolitan Borough. The survey was undertaken at an optimal time of year for determining the botanical interest in both hedgerows and grasslands –the principal habitats on this site.

The survey utilised the National Vegetation Classification (NVC) methodology to identify the grassland types (communities and sub-communities) present here and utilised the Hedgerow Regulations (1997) methodology to help determine whether a hedgerow was "Important" with regard to the Wildlife and Landscape elements of the Regulations.

With regard to NVC categorisation this survey has identified that the majority of the grassland habitat on this site is species-poor and comprises swards that have low nature conservation value and are typically either MG6a / MG6b or MG1a with some swards appearing transitional between MG6 and MG1 and possibly reflecting a lightening of management pressure favouring coarser grasses.

Of the fourteen fields on this site only three (Fields F3, F5 and F14) are of any botanical interest. Field F3 is of the greatest interest as it supports an extensive area of MG4 vegetation where an extensive area of great burnet *Sanguisorba minor* (an increasingly uncommon species in the UK) was recorded. Fields F3, F5 and F14 support areas of marshy grassland (MG10b in the NVC) where oval sedge *Carex leporina* is of some note. However it is to be noted that yellowrattle *Rhinanthus minor* –a relatively uncommon hemi-parasitic plant – is locally common within five of the fields on this site: fields which otherwise have very low botanical interest.

The hedgerows on this site are nearly all of moderate woody species diversity; however very few supported vernal herb species (such as bluebell *Hyacinthoides non-scripta* or dog's mercury *Mercurialis perennis*). Mature standards, mostly of English oak *Quercus robur*, are common in the hedgerows but of most note are two mature small-leaved lime *Tilia cordata* which are present in boundary B13 on the site's south-western boundary. Half of hedgerows on this site are "Important" with regard to the Wildlife and landscape elements of the Hedgerow Regulations.

2. Remit

To undertake an NVC and Hedgerow Regulations survey over this site to help determine the site's ecological value; a report to be produced detailing the survey findings which include data tables that will allow for objective analysis of the relative botanical interest in the site's principal habitat features.

3. Site description

The survey site comprises fourteen fields of varying sizes and 36 hedgerows of varying lengths located in the north-east of Sandwell Metropolitan Borough which is situated within the northern part of the greater Birmingham urban area. Its central Ordnance Survey grid reference is SK038955 and the site has a general south-westerly aspect. Drainage is impeded in places, particularly at the site's lowest point (Field 5) which lies at approximately 140m above sea level.

The site is bounded by public highways and associated residential properties on its northern and eastern sides and by educational and commercial premises on its western and southern sides. The public highway of Wilderness Lane forms the site's eastern boundary whilst the A34 Birmingham Road forms part of the site's northern boundary.

At the time of survey two fields (F13 and F14) were being grazed by horses and it was apparent that a further field (F10) had recently been grazed by horses. Abandoned stables are present in the north-eastern corner of the site. Many of the remaining fields appeared to be shut up for hay although fields F7, F8 and F11 were abandoned and had not been subject to management for at least one year (Fields F7 ad F8) or longer (Field F11). Field F6 has an area of short grass but this field is mostly scrub and tall herbs and it is not apparent how the grassland here is managed.

Mature unmanaged hedgerows form most of the field boundaries although along the survey site's eastern boundary (boundaries B21, B30 and B36) there are not hedgerows but lines of scrub and sections of garden fence and wall. In addition, most of the site's south-eastern boundary (boundaries B2 and B3) hedgerows appear to be flailed on an annual basis.

4. Methodology

4.1 General

The site was surveyed in detail over two days (fourteen hours) on 27th and 28th May 2020 by Phil Quinn MCIEEM: a field ecologist with over 30 years' experience of specialist botanical survey and habitat survey and in southern Britain.

Weather conditions during the survey were dry and bright and there was full access to the survey site. The survey followed approximately two months of dry weather with very little rainfall over that period.

Only grassland and hedgerows were subject to detailed survey. Small areas of scrub and tall herb vegetation were recorded however and brief descriptions of some of them appear in the accounts of the individual fields in which they occur.

4.2 NVC survey

All vascular plant species in all non-woody plant communities were identified and distinct plant communities and sub-communities were identified within the field. Where each community / sub-community was sufficiently large enough five 2m square quadrats were recorded in each community / sub-community with the quadrats being scored in accordance with standard NVC methodology. Some small stands of vegetation could only offer sufficient area for three quadrats. The species scores were referenced to the plant community tables contained within British Plant Communities Volume 3: Grasslands and montane communities. Ed J.S. Rodwell. Cambridge University Press 1992 (1998 edition)

4.3 Hedgerow Regulations

The Hedgerow Regulations (1997) make provision for the protection of important hedgerows in England and Wales and oblige landowners who seek to remove sections of hedgerow to prove the hedgerows are not “Important” as defined within the Regulations. Should the hedgerow be deemed to be “Important” the landowner must apply to the relevant local authority for permission to remove any section of that hedgerow.

Determination of an “Important” hedgerow is arrived at by assessing both Archaeology and history, and Wildlife and landscape elements, as set out within the Regulations. This survey only assesses the Wildlife and landscape elements as detailed in Appendix 2 of this report.

Hedgerow Survey detail

Each of the field boundaries on this site was initially assessed to determine whether it was a hedgerow –that is at least 20% of its length comprising of predominantly woody species as defined within the Hedgerow Regulations. If a boundary met this definition it was further assessed to determine whether those woody species were native or non-native. Where the woody species are entirely, or almost entirely, non-native and any native species appeared to be the same age as or younger than the non-natives, these boundaries are not sampled.

Where boundaries met both of the above criteria – more than 20% of their length comprising native woody species and with no or very few non-native woody species within them - they were subject to the following sampling methodology:

Hedgerows of less than 100m in length had the central 30m length taken as the sample length. Hedgerows in excess of 100m in length were split into two or more equal sections with the central 30m of those sections taken as the sample lengths. All woody and non-woody vascular plant species were recorded within the sample lengths with each of the woody species being scored as a percentage of all woody species within the sample length and notes made on the structure of the hedgerow. In addition all non-woody species were scored according to the DAFOR methodology where:

D = Dominant
A = Abundant
F = Frequent
O = Occasional
R = Rare

Where a non-woody plant species had a notably local DAFOR status within the sample length this was recorded using the letter L representing Local. Reference was made to the Hedgerow Regulations Schedules 2 and 3 of “Hedgerow Woody Species” and “Woodland Species” to determine whether plants recorded along a length of hedgerow were of significance in determining whether that plant was an indicator of an Important hedgerow.

An “Important” hedgerow in the Wildlife and Landscape element of the Hedgerow Regulations is deemed to be one that includes one of more of the following:

- at least 7 woody species from Schedule 3 of the Regulations
- at least 6 woody species from schedule 3 plus at least three Associated Features (see below)
- at least 6 woody species including a black poplar, large-leaved lime, small-leaved lime or wild service tree
- at least 5 woody species and at least 4 Associated Features

Associated Features are defined as:

- A bank or ditch for at least half the length of the hedge
- A ditch for at least half the length of the hedge
- Gaps of no more than 10% of the length
- At least one standard tree per 50m
- At least 3 ground flora woodland species as defined in Schedule 2 of the Regulations within 1m of the hedgerow
- Connections scoring 4 or more points, where connection with another hedgerow counts as one point and connection with a broad-leaved woodland or pond counts as two points.
- A parallel hedge within 15m of the hedge in question

5. Caveat

These surveys aimed to establish the value of the principal habitats (grasslands and hedgerows) on this site at a particular time of year. The timing and thoroughness of the surveys were satisfactory; however it cannot be claimed that all plant species present on this site will have been recorded, nor will relative abundances of all grass species in particular have been recorded given that several grass species are not readily identifiable at the time of year when the survey was conducted.

6. Results

6.1 Fields

F1. A small field located on the eastern side of the site this has an undulating surface which may be indicative of small-scale mineral extraction or the deposition of soil. There is a strip on the south-eastern side of the field which has a fairly fine sward and is moderately species diverse – common bird's-foot trefoil *Lotus corniculatus* and lesser stitchwort *Stellaria graminea* are occasional here. Areas of a similar finer sward, but dominated by red fescue *Festuca rubra* are present in discrete areas in the centre of the field however these areas are largely species-poor. A small amount of great burnet is present in the south-west of this field. The remainder of the sward in this field is relatively coarse and species-poor.

Five quadrats were taken in the area of finer sward (Community 1) and five in the area of coarser sward (Community 2). Community 1 has a fair similarity to the **MG6a** *Lolium pernne-Cynosurus cristatus* grassland Typical sub-community *Alopecurus pratensis* variant but also shows an association with the **MG6b** *Anthoxanthum odoratum* sub-community. Community 2 is a more satisfactory **MG6b** *Lolium perenne-Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community

On the northern edge of the field there is a salient of species-poor dense scrub associated with the northern boundary hedgerow whilst on the eastern side of the field there is a large rectangular water body which is heavily shaded by mature English oaks in the eastern boundary (B5). This water body supports much yellow flag iris *Iris pseudacorus*, along with greater reed-mace *Typha latifolia*, soft rush *Juncus effusus*, water mint *Mentha aquatica*, marsh horsetail *Equisetum palustre*, and broad-leaved pondweed *Potamogeton natans*. Common water-plantain *Alisma plantago-aquatica* and cyperus sedge *Carex pseudocyperus* are also present.

Waterbody in the east of Field F1

F2. A large species-poor field in the south-west of the survey site with the northern half of the field marked by a large quantity of meadow buttercup *Ranunculus acris*. The only species of any note here is the hemi-parasite yellow-rattle which is present in several small clumps. This field is a single community: **MG6a** *Lolium pernne-Cynosurus cristatus* grassland Typical sub-community *Alopecurus pratensis* variant.

Field 2 –looking north-west

F3. This field, situated on the south-western edge of the site has the most botanical interest of any of the fields subject to this survey. Of particular note is the very extensive area (approximately 50% of the field area) where great burnet is the dominant herb species. The great burnet surrounds an area of marshy grassland where rushes predominate and which occupies the lowest point within the survey site. Surrounding the great burnet area on its northern and eastern sides is a species-poor sward dominated by common coarse grasses although pignut *Conopodium majus* is also frequent here. Two small areas of marshy grassland are recorded in the east of the field where great willowherb *Epilobium hirsutum* is predominant; the larger of these two areas abuts a small area of dense scrub.

Community 1, the area dominated by coarse grasses, does not satisfactorily fit within any NVC community but is perhaps closest to an **MG6a** *Lolium perenne-Cynosurus cristatus* grassland Typical sub-community *Alopecurus pratensis* variant but also demonstrates some affinity to the **MG6b** *Lolium perenne-Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community.

Community 2, the area dominated by great burnet, best approximates to the **MG4** *Alopecurus pratensis-Sanguisorba officinalis* grassland. Community 3, the marshy grassland most closely approximates to the **MG10b** *Holcus lanatus-Juncus effusus* rush-pastur

Juncus inflexus sub-community although the two small areas in the east of the field show some resemblance to the **OV26a** *Epilobium hirsutum* community *Filipendula ulmaria- Juncus effusus-Ranunculus repens* sub-community.

Field 5 – overlooking Community 2, the area dominated by great burnet

F4. A very large species-poor field in the west of the site which supports a single community dominated by coarse grass species; small pockets of yellow-rattle are the only plant species of interest here. This field supports an **MG1a** *Arrhrenatherum elatius* grassland *Festuca rubra* sub-community.

Field 4 –looking west

F5. Situated in the northern centre of the site this field has a pronounced south-westerly aspect and has a number of distinct plant communities; a small stable block bordered by post and rail fencing is located in the north-eastern corner of this field. At the foot of the slope there are small pockets of great burnet amidst a relatively fine sward where pignut is locally common. Although this is a distinctive sward it does not demonstrate sufficient distinctiveness to be a separate community or sub-community but instead fits within the wider and more species-poor sward which surrounds it and which forms the bulk of the vegetation here: an **MG6b** *Lolium perenne-Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community.

There are also four distinct areas of marshy grassland in this field where both hard rush and soft rush are common but neither of which form dense stands. This is an **MG10** *Holcus lanatus-Juncus effusus* rush-pasture *Juncus inflexus* sub-community and there are no species of particular note here except in the small area of marshy grassland in the south of the field where a population of oval sedge *Carex leporina* is recorded.

Field 5 -looking east

F6. A small field lying to the east of Field F5 and mostly comprising species-poor dense scrub and tall herb communities of very low botanical value, dominated by bramble *Rubus fruticosus* agg., nettle *Urtica dioica*, rosebay *Chamerion angustifolium*, and broad-leaved dock *Rumex obtusifolius*; some Japanese knotweed *Fallopia japonica* is also recorded here.

The open area of this field mainly supports access tracks leading from the public highway to the stable complex to the west and horse-grazed fields to the south. However there are small species-poor areas of grassland recorded in this field and these most closely approximate to the **MG6b** *Lolium perenne-Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community**.**

Central area of grassland in Field F6 – looking north

F7. A small field in the north of the site sub-divided into three units by post and rail fencing and horse tape fencing. This field appears to have been abandoned for at least one year and supports a species-poor sward dominated by common coarse grass species and common herb species of low botanical interest. This field supports a single community which is most accurately described as an **MG1a** *Arrhrenatherum elatius* grassland *Festuca rubra* sub-community developing out of an **MG6b** *Lolium perenne-Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community such as would be expected where a former pasture has been abandoned.

Field 7 –looking east

F8. Situated to the south of field F7 this is another species-poor pasture which appears to have been abandoned. There is no satisfactory NVC community or sub-community designation here but the sward most closely approximates to an **MG6b** *Lolium perenne-Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community.

F9. A large field situated on the western side of the survey site this has pronounced easterly and south-easterly aspects. Although in general this is a very species-poor sward dominated by coarse grasses this field is notable for the large and extensive population of yellow-rattle recorded here. A single community, this field best approximates to a sward in transition to an **MG1a** *Arrhrenatherum elatius* grassland *Festuca rubra* sub-community from an **MG6b** *Lolium perenne-Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community.

Field 9 –looking north-east

F10. A small field on the eastern edge of the survey site this had been grazed very tight by horses prior to the survey but it was clear that the sward was species poor and best approximates to the **MG7c** *Lolium perenne* leys and related grasslands *Lolium perenne-Alopecurus pratensis-Festuca pratensis* grassland sub-community. A small area of trampled ground on the northern edge of the field supported a population of marsh cudweed *Gnaphalium uliginosum*; this is not a species of any nature conservation value but is one that is not recorded elsewhere on the site.

F11. Situated in the north-east of the survey site this small field has been abandoned for a considerable time and most of it comprises dense scrub. However approximately 30% of the field area remains as grassland, albeit a very species-poor sward dominated by rank grasses and it is a good approximation to the **MG1a** *Arrhrenatherum elatius* grassland *Festuca rubra* sub-community.

Field 11- looking south

F12. This is a large field situated in the centre of the survey site and supports a species-poor uniform sward where the only botanical interest lies in small scattered populations of yellowrattle. This sward best approximates to the **MG6b** *Lolium perenne-Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community.

F13. Sub-divided into five units by horse tape fencing this is a tightly grazed field lying on the eastern edge of the survey site. This species-poor sward is all of one community and approximates best to the **MG6b** *Lolium perenne-Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community.

Field 13 –looking south

F14. Lying on the south-eastern edge of the survey site this field is sub-divided into four units by horse tape fencing although only an area in the north-east of the field was being grazed at the time of survey. The majority of the field supports a relatively species-poor **MG6b** *Lolium perenne-Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community but there are also four distinct blocks of marshy grassland which approximates well to the **MG10b** *Holcus lanatus-Juncus effusus* rush-pasture *Juncus inflexus* sub-community. Small populations of oval sedge are recorded here and there is also some scattered scrub which mainly comprises young whips and saplings of native deciduous species recorded in the adjacent hedgerows.

Field 14 –looking north-west

6.2 Hedgerows

The majority of hedgerows on this site had recently experienced cutting of bramble scrub that had been encroaching from them into the adjacent fields. In addition the majority of hedgerows here have cow parsley *Anthriscus sylvestris* growing on their outer edges and bramble is present in every hedgerow. To avoid repetition these factors are not necessarily referred to in the following hedgerow descriptions.

B1. Forming the boundary between Wilderness Lane and field F14 this hedgerow is flailed on the sides but unmanaged on the top and has a very narrow species-poor grassy verge on the roadside. This is a species-poor hedge where hawthorn *Crataegus monogyna* is dominant, English oak and ash *Fraxinus excelsior* are each present at approximately 15% of the hedgerow total, and some elder and bramble are also present. No hedge base species of any note were recorded.

B2. This hedgerow forms the boundary between Wilderness Lane and Field F1. It is atop a low bank and has a 0.5-1.5m wide species-poor grassy verge on the roadside. The hedge has a very slight bank incorporated into its base and appears to be flailed each year and is species poor being dominated by hawthorn and bullace *Prunus institia* with no hedge base species of any note.

B3. The southernmost of the hedgerows bordering Wilderness Lane this is regularly flailed on top and on both sides to a height of 2m. This species-poor hedge appears to have been planted approximately 40 years ago and is dominated by hawthorn. There is no ditch or bank; on the roadside is a pavement and a species-poor grass-dominated verge; four relatively young standard trees are present on the roadside edge of the hedgerow. No hedge base species of any note were recorded although bracken *Pteridium aquilinum* is occasional on the field side of this hedgerow.

B4. A very gappy species-poor hedgerow with much bramble and a variable height but

averaging 3m. There is a shallow dry ditch on the southern side with some soft rush and great willowherb. No hedge base flora of any note was recorded here.

B5. A boundary comprising three mature English oaks with some hawthorn and bramble scrub. No hedge base flora of any note was recorded here.

B6. A variable and unmanaged species-poor hedgerow with an average height of 3-4m. hawthorn and bullace are the predominant species here although there is some wych elm *Ulmus glabra*, English oak, elder and blackthorn. Honeysuckle *Lonicera periclymenum* is present here in small quantity: this is one of the few hedgerows on the site where this species is recorded. A small dry ditch with frequent soft rush is present on the southern side of the hedge.

Boundary B6 –looking south-west

B7. A 6m tall unmanaged hedgerow with no bank or ditch but with a pronounced drop in ground level on its north-western side. Two standards are present in the north. Hazel *Corylus avellana* is dominant here whilst bramble, holly *Ilex aquifolium*, field maple, English oak and elder are also recorded.

Boundary B7 –looking north-east

B8. Averaging 6m in height and 2-3m wide this unmanaged hedgerow has a broad but shallow dry ditch on its northern side. Two standards are present and hazel is dominant but hawthorn and English oak are also common whilst field rose *Rosa arvensis* and holly are present in small quantity. Male fern *Dryopteris filix-mas* is present but rare in the hedge base.

B9. This short length of unmanaged hedgerow averages 6m in height and 2-3m in width and although there is no bank here the ground level drops noticeably on its north-western side. Hazel is dominant but hawthorn is very common whilst elder and blackthorn *Prunus spinosa* are also present but in small quantity.

B10. A 4-5m tall 2-3m wide hedgerow with a dry shallow ditch on its northern side this has a co-dominance of hawthorn, hazel and blackthorn with small quantities of dog rose *Rosa canina* agg. and field maple *Acer campestre*. No hedge base species of note were recorded here.

B11. This is a long section of unmanaged hedgerow and forms much of the survey site's southern boundary. The hedgerow supports numerous mature and semi-mature standards. The average height of this hedgerow is 7m and the width varies but averages 3m; a dry ditch is present on the southern side for much of its length. Bullace, alder *Alnus glutinosa*, English oak, hazel and hawthorn are the most prominent woody species here but ash, blackthorn, field maple, goat willow *Salix caprea*, field elm *Ulmus minor*, and guelder rose *Viburnum opulus* are also present. Ivy is locally common in the hedge base but no non-woody species of any note were recorded.

Boundary B11 –looking north-west

B12. Dominated by hazel this 5-6m tall hedge averages 2-5m in width and there is a small muddy ditch on its south-eastern side. Field elm, blackthorn, field maple, English elm, ash, elder and hawthorn are also present here. Ivy is common but no hedge base species of any note were recorded.

Boundary B12 –looking north-east

B13. A substantial length of hedgerow on the site's southern boundary and effectively continuing the hedge line of boundary B11 this too is tall (averaging 6m) and unmanaged with a dry ditch on its western side. Two standards are present in the north and one in the

south. Of particular note here are two mature standards of small-leaved lime *Tilia cordata*. Hazel and field maple are dominant whilst blackthorn, field rose, hawthorn and elder are also present. Ivy is dominant in the hedge base but no species of note were present.

B14. Averaging 8-10m in height and 3-4m in width this is one of the most substantial hedgerows in the survey site and forms a significant part of the site's western boundary. There are several ash standards here and a dry inner ditch. Hawthorn, field elm and hazel are co-dominant but field maple, English oak, blackthorn and elder are also common. The hedge base, although largely dominated by ivy, is one of the most noteworthy on the site as there are significant quantities of both dog's mercury *Mercurialis perennis* and ramsons *Allium ursinum* here.

Hedgerow B14 –looking north-west

B15. A continuation of B14 and very much like it in height, width and structure, this has a substantial and relatively deep inner ditch and five standards. Bluebell *Hyacinthoides non-scripta*, otherwise very rare across this site, is locally common in this hedgerow.

B16. Unmanaged and with an average height of 6m and a width of 3m this short section of hedgerow has one standard within it and is dominated by hawthorn although hazel is also relatively common here. There is a dry and shallow inner ditch; dog's mercury is common and male fern rare.

B17. Averaging 7m in height and 3m in width there are several short gaps here and four standards, one of which is a large coppiced ash stool with multiple stems. There is a 2m drop in ground level from the east (where the hedge base is located) to the west but no bank or ditch. Ivy is occasional and male fern rare.

B18. A long section of unmanaged hedgerow averaging 6-8m in height and 4-5m in width with hawthorn and blackthorn being the commonest species here although hazel, field maple, ash, holly, elder and English oak are also present. The hedge base is poor but does

include a small quantity of male fern. A pear *Pyrus* is present in this hedge and appears to be cultivated pear *P. communis*.

B19. An unmanaged length of hedgerow averaging 6-7m in height and with an average width of 3m with the occasional small gap and one standard present. Hazel is the dominant woody species here although both hawthorn and field elm are also common; ivy is locally common and there are occasional specimens of male fern.

B20. Averaging 6m in height and 3m wide this unmanaged hedgerow is on a low west facing slope; hawthorn is dominant and there is also much hazel along with frequent bullace. A single young rowan *Sorbus aucuparia* is of note as this species is not recorded elsewhere on the site. The hedge base flora is poor but includes occasional male fern.

B21. An unmanaged hedgerow dominated by hawthorn and averaging 7m in height.

B22. An unmanaged and very gappy hedgerow comprising goat willow *Salix caprea*, elder, hawthorn, bramble and holly averaging 5m in height. No hedge base species of any note were recorded here and no bank or ditch were recorded.

B23. Forming the boundary between fields F5 and F8 this is an unmanaged hedgerow averaging 4-5m in height and 2-3m in width. There is much bramble here but hazel, hawthorn and field maple comprise approximately 80% of the woody species recorded whilst blackthorn is common in the west. There is a dry shallow inner ditch but no hedge base species of any note were recorded.

Boundary B23 –looking north-west

B24. This unmanaged hedgerow averages 5-6m in height and is 2m in width although for much of its length the hedgerow is quite thin. This hedgerow is dominated by hawthorn but bramble is also present.

B25. This roadside hedgerow has many similarities to B24 but there are occasional young common lime *Tilia x vulgaris* planted within it; bramble is common. No hedge base species of any note were recorded here.

B26. A section of roadside hedgerow lying west of B25 and averaging 8m in height and 2-3km in width, Bullace is the most commonly recorded species here but hawthorn and hazel are also frequent and both ash and oak are also present. There were no hedge base species of note recorded here.

B27. Averaging 7m in height and 3-5m in width this hedgerow becomes taller and thicker to the south-west however it is difficult to determine here what is hedgerow and what is the landscaped surrounds of the adjacent property. Mature English oak and ash are present along with field maple, elder, bramble and blackthorn.

B28. Similar in height to boundary B27 but only 2m in width this unmanaged hedgerow has two large standards –one English oak and one ash. Blackthorn and hawthorn are the two commonest woody species and field maple, holly, hazel and elder are also present. No hedge base species of note were recorded here.

B29. Two very large English oak standards are prominent features in this short length of hedgerow in the north of the site which is otherwise dominated by dense blackthorn that averages 7m in height and 6m in width. The blackthorn was too dense to allow for visual access into the hedge base.

Hedgerow B29 – looking east

B30. Forming part of the site's eastern boundary this is a broken line of mature hawthorn bushes with much bramble and occasional bullace of varying height and thickness against fences and walls of the adjacent domestic properties. No hedge base species of note were recorded here.

Boundary B30 - looking east onto residential properties

B31. An unmanaged 5m tall and 2-3m wide hedgerow dominated by hazel and field maple. There is some male fern here but the hedge base flora is dominated by ivy and nettle *Urtica dioica* with some bracken in the west.

B32. Very similar to B31 in its proportions and similarly dominated by hazel and field maple with very small quantities of holly and elder.

B33. Effectively a continuation of hedgerow B18 on the eastern side of Field F9 this is an unmanaged boundary averaging 7m in height and 4-5m in width with a field maple standard. Blackthorn dominates here but there is also much hazel along with some hawthorn, English oak and field maple. The blackthorn was too dense to allow visual access into the hedge base.

Hedgerow B33 – looking north

B34. Essentially a continuation of hedgerow B29 to its south-west, and thus forming the majority of the site's north-western boundary, this is an unmanaged hedgerow with much scrub and planted woodland to its north forming a 5-6m wide band of semi-natural broadleaved woodland. Only the edge immediately facing field F9 is described here.

With an average height of 8m the hedgerow incorporates many standard trees –principally English oak. Blackthorn is dominant but field elm and sycamore *Acer psudoplatanus* are locally common; hazel, field maple and hawthorn are also relatively common. English elm *Ulmus procera* is recorded here – this being one of only two hedgerows in which this species was recorded on the site – and there are also small quantities of elder, ash, and bramble.
There was very poor visual access into the hedge base.

B35. Unmanaged with an average height of 6m and a width between 2-3m this hedgerow sits atop a low bank in places and forms the eastern boundary of Field F12. There are three ash standards and a stag-headed sycamore standard here. Hawthorn is dominant but both blackthorn and bramble are also common; other species such as elder, field maple and holly are present but in small quantity.

B36. Forming much of the site's eastern boundary this is a mix of native shrubs, fences, walls and planted non-native trees and shrubs against the curtilages of residential properties. The height and width is very variable with some sections unmanaged and others neatly trimmed to 1.5m; in the north of this boundary there are many gaps where no woody vegetation is present. Hedge base flora is very poor and no species of any note were recorded.

B37. This is a line of mature English oak standards, (two of which have been partly ring-barked by grazing horses), along with small quantities of hazel, hawthorn, blackthorn, holly

and bramble. It is effectively just a line of mature trees with thin blocks of short scrub; the plants at its base are of no botanical interest.

Boundary B37 –looking south-west

7. Discussion

7.1 Timing of survey

The timing of the survey sought to allow both the hedgerow interest and grassland interest of this site to be measured with an acceptable level of completeness. Hedgerow base species of note are often vernal and thus can go unrecorded during mid and late summer, whilst grassland species are typically unrecorded or recorded in poor quantity in early spring. The timing of this survey (late May) proved satisfactory as vernal hedge base species such as bluebell were still readily identifiable yet many of the site's grass species were also readily identifiable and in quantities that allowed for an assessment of their relative abundance. Furthermore all trees and shrubs were in full leaf and those with distinctive flowers or fruits were also clearly identifiable.

However several species of grass are more satisfactorily recorded later in the summer and it is likely that these either went unrecorded or were under-recorded during this survey. Of particular concern will be perennial rye-grass *Lolium perenne*, crested dog's-tail *Cynosurus cristatus,* Timothy *Phleum pratense,* and the bents *Agrostis* spp.

The majority of the grasslands were unmanaged at the time of survey and this allowed a high degree of survey accuracy with regard to obtaining reliable estimates of the relative abundances of species, grasses in particular.

7.2 Accuracy of NVC assignment

The absence or under-recording of some grass species due to the timing of the survey is unlikely to have negatively impacted the assignment of a particular sward to an NVC community / sub-community. Most NVC grassland communities and sub-communities are readily identifiable despite the occasional absence or temporal under-recording of key species of grass. Thus the relative absence of both perennial rye-grass and crested dog's-tail were not detriments to assigning certain swards to the MG6 community as other species present in those swards allowed such an assignment to be made.

7.3 Relative importance of the hedgerows

With regard to the Wildlife and Landscape elements of the Hedgerow Regulations (as defined within Part 2 of Schedule 1 of the Regulations) eighteen of the thirty-six hedgerows satisfy the definition of Important (these are listed in Appendix 3 of this report) on the basis of their botanical composition and connectivity to other hedgerows. Of those that do not satisfy the definition of Important by their botanical and connectivity status many are clearly part of a pre-Inclosure Age landscape and could well satisfy the paragraph 5(a) criteria of Part II within Schedule 1 of the Regulations.

The hedge base flora throughout this site is notably poor; this may be due to a history of horse grazing associated with poor field boundary fencing. Thus horses may have had access to many of the hedge bases and have either browsed out herbaceous species or caused their localised extinction from the site through trampling or dunging. The few sections of hedgerow where the hedge base flora is slightly richer are typically where fencing is present on the field side thus browsing and trampling pressure will have been reduced.

8. Conclusions

The grasslands on this site are typically species-poor and are of NVC communities and sub-communities that are not noted for their nature conservation importance. The exceptions to this rule are fields F3, F5, and F14. Field F3 is notable for an extensive area dominated by great burnet as well as for a large area of marshy grassland; field F5, has some great burnet and also areas of marshy grassland; field F14 also has areas of marshy grassland. The marshy grasslands are not particularly species-rich but do include populations of oval sedge.

The hedgerows are largely unmanaged and form striking landscape features; however their botanical diversity is often only low to moderate, especially with regard to hedge base species. The presence of two small leaved-lime standards in hedgerow B13 is of high botanical importance and there are numerous mature and semi-mature standards (particularly English oak) throughout the hedgerows on this site. Exactly 50% of the hedgerows satisfy the criteria for being Important with regard to the Wildlife and Landscape elements of the Hedgerow Regulations.

APPENDIX 1: Plant species recorded in the fields (NVC survey)

Field F1: Community 1 MG6a *Lolium pernne-Cynosurus cristatus* grassland Typical sub-community *Alopecurus pratensis* variant / MG6b *Anthoxanthum odoratum* sub-community

Common name	Scientific name	Quadrat number					DOMIN
		1	2	3	4	5	
Meadow foxtail	Alopecurus pratensis	6	8	7	6	6	V (6-8)
Sweet vernal grass	Anthoxanthum odoratum	5	7	6	6	7	V (5-7)
False oat-grass	Arrhenatherum elatius	6	5	6	4	4	V (4-6)
Hairy sedge	Carex hirta		1		3		II (1-3)
Common mouse-ear	Cerastium fontanum	2		2	1		III (1-2)
Pignut	Conopodium majus		4			4	II (4)
Cocksfoot	Dactylis glomerata	4		1	3	4	IV (1-4)
Marsh horsetail	Equisetum palustre					2	I (2)
Meadow fescue	Festuca pratensis	5		2	6	1	IV (1-6)
Red fescue	Festuca rubra	4	2	7	5		IV (2-7)
Yorkshire fog	Holcus lanatus	6	5	6	7	5	V (5-7)
Common cat's-ear	Hypochaeris radicata				2	2	II (2)
Soft rush	Juncus effusus			2			I (2)
Meadow vetchling	Lathyrus pratensis	2			2	2	III (2)
Common bird's-foot trefoil	Lotus corniculatus				1		I (1)
Field wood-rush	Luzula campestris			1			I (1)
Ribwort	Plantago lanceolata	4	2	3	5	2	V (2-5)
Annual meadow-grass	Poa annua		3	3		4	III (3-4)
Meadow buttercup	Ranunculus acris	3			2	2	III (2-3)
Creeping buttercup	Ranunculus repens			2	4	3	III (2-4)
Sorrel	Rumex acetosa	2	2	1	3	3	V (1-3)
Great burnet	Sanguisorba officinalis	2					I (1)
Common ragwort	Senecio jacobaea			1		1	II (1)
Lesser stitchwort	Stellaria graminea		3				I (3)
Dandelion	Taraxacum officinale agg.			1	1		II (1)
Red clover	Trifloium pratense			3		2	II (1-3)
White clover	Trifolium repens	1		2			II (1-2)

Field F1: Community 2 MG6b *Lolium perenne-Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community

Common name	Scientific name	Quadrat number					DOMIN
		1	2	3	4	5	
Meadow foxtail	Alopecurus pratensis	5	4		3	5	IV (3-5)
Sweet vernal grass	Anthoxanthum odoratum	7	7	7	4	6	V (4-7)
False oat-grass	Arrhenatherum elatius		3		2	3	III (2-3)
Cuckoo flower	Cardamine pratensis	1					I (1)
Common mouse-ear	Cerastium fontanum		2		1	2	III((1-2)
Creeping thistle	Cirsium arvense		1				I (1)
Pignut	Conopodium majus	3				3	II (3)
Cocksfoot	Dactylis glomerata			4	2	2	III (2-4)
Meadow fescue	Festuca pratensis	5		1			II (1-5)
Red fescue	Festuca rubra	7	8	5	7	7	V (5-8)
Yorkshire fog	Holcus lanatus	4	5	8	3	8	V(3-8)
Common cat's-ear	Hypochaeris radicata		1		2	3	III (1-3)
Meadow vetchling	Lathyrus pratensis	3	3	2			III (1-3)
Common bird's-foot trefoil	Lotus corniculatus	6			2		II (2-6)
Field wood-rush	Luzula campestris		2	2		3	III (2-3)
Ribwort	Plantago lanceolata	4	3	3	4		IV (3-4)
Smooth meadow-grass	Poa pratensis				2		I (2)
Rough meadow-grass	Poa trivialis	3	5	4	8	6	V (3-8)
Creeping cinquefoil	Potentilla reptans			2	4		II (2-4)
Selfheal	Prunella vulgaris		2			2	II (2)
Meadow buttercup	Ranunculus acris			1	2	1	III (1-2)
Creeping buttercup	Ranunculus repens	3					I (3)
Sorrel	Rumex acetosa	1	1		1	1	IV (1)
Common ragwort	Senecio jacobaea					2	I (2)
Dandelion	Taraxacum officinale agg.		2			4	II (2-4)
Lesser trefoil	Trifolium dubium	2	3				II (2-3)
Red clover	Trifloium pratense	2		1	2	4	IV (1-4)
White clover	Trifolium repens	1	2		2		III (1-2)
Thyme-leaved speedwell	Veronica serpyllifolia				3		I (3)

Field F2: MG6a *Lolium pernne-Cynosurus cristatus* grassland Typical sub-community *Alopecurus pratensis* variant

Common name	Scientific name	Quadrat number					DOMIN
		1	2	3	4	5	
Meadow foxtail	Alopecurus pratensis	3		2	4	3	IV (2-4)
Sweet vernal grass	Anthoxanthum odoratum	3	1	4	5	4	V (1-5)
Smooth brome	Bromus hordaceus hordaceus				1		I (1)
Black knapweed	Centaurea nigra				2		I (2)
Common mouse-ear	Cerastium fontanum			3	1	1	III (1-3)
Creeping thistle	Cirsium arvense		1				I (1)
Cocksfoot	Dactylis glomerata		2		2	1	III (1-2)
Field horsetail	Equisetum arvense	2					I (2)
Meadow fescue	Festuca pratensis		2				I (2)
Red fescue	Festuca rubra			1	1	4	III (1-4)
Hogweed	Heracleum sphondylium		2	2			II (2)
Yorkshire fog	Holcus lanatus	7	4	6	7	7	V (4-7)
Meadow vetchling	Lathyrus pratensis			3	3	3	III (3)
Perennial rye-grass	Lolium perenne	4	4				II (4)
Ribwort	Plantago lanceolata		3	3	1	2	IV (1-3)
Rough meadow-grass	Poa trivialis	7	5	8	8	7	V (5-8)
Creeping cinquefoil	Potentilla reptans	3				5	II (3-5)
Meadow buttercup	Ranunculus acris	1	1	5	4	5	V (1-5)
Bulbous buttercup	Ranunculus bulbosus			2			I (2)
Creeping buttercup	Ranunculus repens				4	2	II (2-4)
Yellowrattle	Rhinanthus minor		2				I (2)

Sorrel	Rumex acetosa	2	3	4	3	4	V (2-4)
Dandelion	Taraxacum officinale agg.			2	1	2	III (1-2)
Red clover	Trifloium pratense				3	1	II (1-3)
White clover	Trifolium repens	3					I (3)
Tufted vetch	Vicia cracca	5	2		3		III (2-5)
Bush vetch	Vicia sepium					3	I (3)

Field F3: Community 1 MG6a *Lolium perenne-Cynosurus cristatus* grassland Typical sub-community *Alopecurus pratensis* variant / but also demonstrating some affinity to the **MG6b** *Lolium perenne-Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community

Common name	**Scientific name**	**Quadrat number**					**DOMIN**
		1	**2**	**3**	**4**	**5**	
Marsh foxtail	Alopecurus geniculatus			3	1		II (1-3)
Meadow foxtail	Alopecurus pratensis	6	6	2	7	3	V (2-7)
Sweet vernal grass	Anthoxanthum odoratum	4	2	5	1	1	V (1-4)
False oat-grass	Arrhenatherum elatius	8	8	8	9	7	V (7-9)
Common mouse-ear	Cerastium fontanum		2				I (2)
Creeping thistle	Cirsium arvense			2	1		II (1-2)
Pignut	Conopodium majus	2	4	3	4	3	V (2-4)
Cocksfoot	Dactylis glomerata	1	5		3	2	IV (1-5)
Marsh horsetail	Equisetum palustre	2			2		II (2)
Meadow fescue	Festuca pratensis		1			1	II (1)
Hogweed	Heracleum sphondylium			4	1	4	III (1-4)
Yorkshire fog	Holcus lanatus	7	9	6	8	7	V (6-9)
Common cat's-ear	Hypochaeris radicata				3		I (3)
Hard rush	Juncus inflexus	1	2			2	III (1-2)
Perennial rye-grass	Lolium perenne			4			I (4)
Ribwort	Plantago lanceolata	2	1				II (1-2)
Annual meadow-grass	Poa annua			2	3		II (2-3)
Smooth meadow-grass	Poa pratensis		2				I (2)
Rough meadow-grass	Poa trivialis			2	3	3	III (2-3)
Silverweed	Potentilla anserina	5					I (5)
Creeping cinquefoil	Potentilla reptans			3	3	1	III (1-3)
Selfheal	Prunella vulgaris						
Meadow buttercup	Ranunculus acris			3		2	II (2-3)
Creeping buttercup	Ranunculus repens	2			4		II (2-4)
Sorrel	Rumex acetosa			1	3	1	III (1-3)
Clustered dock	Rumex conglomeratus			2			I (2)
Dandelion	Taraxacum officinale agg.	3	2	2			III (2-3)
White clover	Trifolium repens		1				I (1)
Tufted vetch	Vicia cracca				2	5	II (2-5)

Field F3: Community 2 MG4 *Alopecurus pratensis-Sanguisorba officinalis* grassland

Common name	**Scientific name**	**Quadrat number**					**DOMIN**
		1	**2**	**3**	**4**	**5**	
Sneezewort	Achillea ptarmica				2		I (2)
Marsh foxtail	Alopecurus geniculatus	2				2	II (2)
Meadow foxtail	Alopecurus pratensis	5		1	1	3	IV (1-5)
Sweet vernal grass	Anthoxanthum odoratum	3	4		1	4	IV (1-4)
Glaucous sedge	Carex flacca			3	4		II (3-4)
Cocksfoot	Dactylis glomerata		2	2		4	III (2-4)
Tufted hair-grass	Deschampsia caespitosa	3	2		3	1	IV (1-3)
Great willowherb	Epilobium hirsutum	6	4	7	2	5	V (2-7)
Square-stemmed willowherb	Epilobium tetragonum				3	2	II (2-3)
Tall fescue	Festuca arundinacea	6		2		5	III (2-6)
Red fescue	Festuca rubra		3		5	2	III (2-5)
Yorkshire fog	Holcus lanatus	4	5	3	5	5	V (3-5)
Soft rush	Juncus effusus		4	2		4	III (2-4)
Hard rush	Juncus inflexus	7		2	5	6	IV (2-7)
Meadow vetchling	Lathyrus pratensis	3	2	3			III (2-3)
Greater bird's-foot trefoil	Lotus pedunculatus	1	1		3	1	IV (1-3)
Ribwort	Plantago lanceolata				1	2	II (1-2)
Rough meadow-grass	Poa trivialis	6		6	6	7	IV (6-7)
Creeping buttercup	Ranunculus repens			4			I (4)
Sorrel	Rumex acetosa	1	1		3	3	IV (1-3)

Great burnet	Sanguisorba officinalis	7	5	5	6	7	V (5-7)
Water figwort	Scrophularia auriculata					2	I (2)
Hoary ragwort	Senecio erucifolius	3			2		II (2-3)
Dandelion	Taraxacum officinale agg.	3	2	2			III (2-3)
White clover	Trifolium repens		1				I (1)
Tufted vetch	Vicia cracca				2	5	II (2-5)

Field F3: Community 3 MG10b *Holcus lanatus-Juncus effusus* rush-pasture *Juncus inflexus* sub-community

Common name	**Scientific name**	**Quadrat number**					**DOMIN**
		1	**2**	**3**	**4**	**5**	
Wild angelica	Angelica sylvestris				3	3	II (3)
False oat-grass	Arrhenatherum elatius	5		5	4	7	IV (4-7)
Wavy bittercress	Cardamine flexuosa			2		1	II (1-2)
Cuckoo flower	Cardamine pratensis		1				I (1)|
Cocksfoot	Dactylis glomerata		2			3	II (2-3)
Great willowherb	Epilobium hirsutum	3	7	5	8	4	V (3-8)
Marsh horsetail	Equisetum palustre	6	4		3	4	IV (3-6)
Meadowsweet	Filipendula ulmaria		3		4	3	III (3-4)
Goosegrass	Galium aparine			5	5		II (5)
Yorkshire fog	Holcus lanatus		4	3	2	3	IV (2-4)
Hard rush	Juncus inflexus	8	8	7	9	6	V (6-9)
Greater bird's-foot trefoil	Lotus pedunculatus	2	2		2		III (2)
Rough meadow-grass	Poa trivialis	2					I (2)
Silverweed	Potentilla anserina		3			1	II (1-2)
Meadow buttercup	Ranunculus acris			4	2		II (2-4)
Creeping buttercup	Ranunculus repens	1	1				II (1)
Bramble	Rubus fruticosus agg.			2	3		II (2-3)
Sorrel	Rumex acetosa	1	3		1		III (1-3)
Water figwort	Scrophularia auriculata					1	I (1)
Nettle	Urtica dioica	4	4		2		III (2-4)

Field F4: MG1a *Arrhrenatherum elatius* grassland *Festuca rubra* sub-community

Common name	**Scientific name**	**Quadrat number**					**DOMIN**
		1	**2**	**3**	**4**	**5**	
Meadow foxtail	Alopecurus pratensis	1	1		3	3	IV (1-3)
Sweet vernal grass	Anthoxanthum odoratum	6	6	2	7	8	V (2-8)
False oat-grass	Arrhenatherum elatius	7	9	4	6	7	V (4-9)
Black knapweed	Centaurea nigra				2	1	II (1-2)
Common mouse-ear	Cerastium fontanum	2	1	2	1		IV (1-2)
Creeping thistle	Cirsium arvense					3	I (3)
Cocksfoot	Dactylis glomerata	4	6	5	8	7	V (4-8)
Tall fescue	Festuca arundinacea			4	4		II (4)
Red fescue	Festuca rubra		3	1	1	4	IV (1-4)
Hogweed	Heracleum sphondylium			1	3	1	III (1-3)
Yorkshire fog	Holcus lanatus	7	5	7	9	6	V (5-9)
Common cat's-ear	Hypochaeris radicata				1		I (1)
Meadow vetchling	Lathyrus pratensis	5	5	1			III (1-5)
Ribwort	Plantago lanceolata	3	1			4	III (1-4)
Smooth meadow-grass	Poa pratensis		5		4	3	III (3-5)
Rough meadow-grass	Poa trivialis	6		7	7	4	IV (4-7)
Meadow buttercup	Ranunculus acris	5	2	2	4	3	V (2-5)
Yellow-rattle	Rhinanthus minor			3		2	II (2-3)
Sorrel	Rumex acetosa				2		I (2)
Clustered dock	Rumex conglomeratus		1			1	II (1)
Broad-leaved dock	Rumex obtusifolius	1					I (1)
Dandelion	Taraxacum officinale agg.	1		3		2	III (1-3)
Goatsbeard	Tragopogon pratense					2	I (2)
Red clover	Trifloium pratense		3			4	II (3-4)
Tufted vetch	Vicia cracca	1	1			4	III (1-4)
Common vetch	Vicia sativa	3	1				II (1-3)
Bush vetch	Vicia sepium	1		4	3	1	IV (1-4)

Field F5: Community 1 MG6b *Lolium perenne-Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community

Common name	**Scientific name**	**Quadrat number**					**DOMIN**
		1	**2**	**3**	**4**	**5**	
Meadow foxtail	Alopecurus pratensis					3	I (3)
Sweet vernal grass	Anthoxanthum odoratum	6	6	5	7	6	V (5-7)
False oat-grass	Arrhenatherum elatius	4			3		II (3-4)
Black knapweed	Centaurea nigra	4			3	1	III (1-4)
Common mouse-ear	Cerastium fontanum			2	2	2	III (2)
Creeping thistle	Cirsium arvense		1				I (1)
Cocksfoot	Dactylis glomerata	5	5	5	4	1	V (1-5)
Marsh horsetail	Equisetum palustre		1	1			II (1)
Meadow fescue	Festuca pratensis			2		3	II (2-3)
Red fescue	Festuca rubra	1					I (1)
Hogweed	Heracleum sphondylium	1	2		1	2	IV (1-2)
Yorkshire fog	Holcus lanatus	7	8	4	7	6	V (4-8)
Common cat's-ear	Hypochaeris radicata				1	1	II (1)
Perennial rye-grass	Lolium perenne	1				1	II (1)
Field wood-rush	Luzula campestris				2		I (2)
Ribwort	Plantago lanceolata	6	4	3	5	5	V (3-6)
Annual meadow-grass	Poa annua	1			1		II (1)
Rough meadow-grass	Poa trivialis			3	3	4	III (3-4)
Creeping cinquefoil	Potentilla reptans					3	I (3)
Meadow buttercup	Ranunculus acris	5	3	6	5	4	V (3-6)
Creeping buttercup	Ranunculus repens		2				I (2)
Yellow-rattle	Rhinanthus minor			3		3	II (3)
Sorrel	Rumex acetosa		5	4			II (4-5)
Great burnet	Sanguisorba officinalis		3				I (3)
Common ragwort	Senecio jacobaea	1			2	1	III (1-2)
Red clover	Trifloium pratense			1			I (1)
Tufted vetch	Vicia cracca	2					I (2)
Common vetch	Vicia sativa				3		I (3)
Bush vetch	Vicia sepium	2	1	1	3		IV (1-3)

Field F5: Community 2 MG10 *Holcus lanatus-Juncus effusus* rush-pasture *Juncus inflexus* sub-community

Common name	Scientific name	Quadrat number					DOMIN
		1	2	3	4	5	
Bugle	Ajuga reptans				2		I (2)
Marsh foxtail	Alopecurus geniculatus	1	1				II (1)
Meadow foxtail	Alopecurus pratensis					3	I (3)
Sweet vernal grass	Anthoxanthum odoratum	4	3		1	3	IV (1-4)
False oat-grass	Arrhenatherum elatius				2		I (2)
Wavy bittercress	Cardamine flexuosa		1				(1)
Cuckoo flower	Cardamine pratensis					1	(1)
Hairy sedge	Carex hirta		2	3		5	III (2-5)
Oval sedge	Carex leporina	5					I (5)
Black knapweed	Centaurea nigra				2		I (2)
Common mouse-ear	Cerastium fontanum	3	1	2			III (1-3)
Marsh thistle	Cirsium palustre				1		I (1)
Cocksfoot	Dactylis glomerata			2	2		II (2)
Square-stemmed willowherb	Epilobium tetragonum	1					I (1)
Marsh horsetail	Equisetum palustre		3		3	4	III (3-4)
Red fescue	Festuca rubra			2			I (2)
Meadowsweet	Filipendula ulmaria				1		I (1)
Hogweed	Heracleum sphondylium		1			1	II (1)
Yorkshire fog	Holcus lanatus	5	5	5	2	4	V (2-5)
Compact rush	Juncus conglomeratus			2	3		II (2-3)
Soft rush	Juncus effusus	1	6	5		4	IV (1-6)
Hard rush	Juncus inflexus	4	3	5	2	5	V (2-5)
Meadow vetchling	Lathyrus pratensis				2		I (2)
Greater bird's-foot trefoil	Lotus pedunculatus	2					I (2)
Redleg	Persicaria maculosa				3		I (3)
Ribwort	Plantago lanceolata		1	1	1		III (1)
Smooth meadow-grass	Poa pratensis	3		3			II (3)
Rough meadow-grass	Poa trivialis	3				2	II (2-3)
Creeping cinquefoil	Potentilla reptans		2				I (2)
Meadow buttercup	Ranunculus acris				1		I (1)
Creeping buttercup	Ranunculus repens			3		2	II (2-3)
Sorrel	Rumex acetosa				1	1	II (1)
Dandelion	Taraxacum officinale agg.			1	3	2	III (1-3)
Red clover	Trifloium pratense				2		I (2)
White clover	Trifolium repens	2					I (2)
Thyme-leaved speedwell	Veronica serpyllifolia		1				I (1)
Tufted vetch	Vicia cracca				3	3	II (3)

Field F6: MG6b *Lolium perenne-Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community

Common name	Scientific name	Quadrat number			DOMIN
		1	2	3	
Meadow foxtail	Alopecurus pratensis		5	3	III (3-5)
Sweet vernal grass	Anthoxanthum odoratum	3	4	1	IV (1-4)
Common mouse-ear	Cerastium fontanum		2	2	III (2)
Cocksfoot	Dactylis glomerata			2	I (2)
Red fescue	Festuca rubra		3	3	III (3)
Yorkshire fog	Holcus lanatus	4	2	4	V (2-4)
Perennial rye-grass	Lolium perenne	3	4	4	V (3-4)
Common bird's-foot trefoil	Lotus corniculatus			2	I (2)
Ribwort	Plantago lanceolata			3	II (3)
Narrow-leaved meadow-grass	Poa angustifolia		3		I (3)
Annual meadow-grass	Poa annua	5	7	4	V (4-7)
Smooth meadow-grass	Poa pratensis	5	4	5	V (4-5)
Rough meadow-grass	Poa trivialis	7	6	7	V (6-7)
Silverweed	Potentilla anserina		4		I (4)
Creeping cinquefoil	Potentilla reptans	1			I (1)
Meadow buttercup	Ranunculus acris		1	1	II (1)
Creeping buttercup	Ranunculus repens	2		3	III (2-3)
Dandelion	Taraxacum officinale agg.				
Goatsbeard	Tragopogon pratense			2	II (2)
Lesser trefoil	Trifolium dubium	1			I (1)
White clover	Trifolium repens	4	7	7	V (4-7)
Thyme-leaved speedwell	Veronica serpyllifolia			2	I (2)

Field F7: MG1a *Arrhrenatherum elatius* grassland *Festuca rubra* sub-community developing out of an **MG6b** *Lolium perenne-Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community

Common name	Scientific name	Quadrat number					DOMIN
		1	2	3	4	5	
Meadow foxtail	Alopecurus pratensis	3	1	6		3	IV (1-6)
Sweet vernal grass	Anthoxanthum odoratum	9	7	9	4	7	V (4-9)
Cow parsley	Anthriscus sylvestris					2	I (2)
False oat-grass	Arrhenatherum elatius	5	7		5	5	IV (5-7)
Smooth brome	Bromus hordaceus hordaceus			2	2	3	III (2-3)
Common mouse-ear	Cerastium fontanum	1				2	II (1-2)
Creeping thistle	Cirsium arvense					1	I (1)
Crested dog's-tail	Cynosurus cristatus				5	5	II (5)
Cocksfoot	Dactylis glomerata		2	6	3	7	IV (2-7)
Hoary willowherb	Epilobium parviflorum			2			I (2)
Marsh horsetail	Equisetum palustre	1	7				II (1-7)
Tall fescue	Festuca arundinacea			7		9	II (7-9)
Red fescue	Festuca rubra		2		1		II (1-2)
Hogweed	Heracleum sphondylium		3	3	1		III (1-3)
Yorkshire fog	Holcus lanatus	5	3	7	7	7	V (3-7)
Meadow vetchling	Lathyrus pratensis			3	4	3	III (3-4)
Perennial rye-grass	Lolium perenne		2				I (2)
Ribwort	Plantago lanceolata	2			8	3	III (2-8)
Smooth meadow-grass	Poa pratensis	4	4			4	III (4)
Rough meadow-grass	Poa trivialis	6	6	7	5	5	V (5-7)
Creeping cinquefoil	Potentilla reptans				1		I (1)
Meadow buttercup	Ranunculus acris	3		4	3	1	IV (1-4)
Broad-leaved dock	Rumex obtusifolius		2		1	3	III (1-3)
Common ragwort	Senecio jacobaea		1				I (1)
Dandelion	Taraxacum officinale agg.			2			I (2)
Red clover	Trifloium pratense	1	1	1		1	IV (1)
White clover	Trifolium repens	4	1	3	4		IV (1-4)
Nettle	Urtica dioica		3	2			II (2-3)
Common vetch	Vicia sativa				1		I (1)

Field F8: A poor fit but most closely approximates to an **MG6b** *Lolium perenne-Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community

Common name	Scientific name	Quadrat number					DOMIN
		1	2	3	4	5	
Meadow foxtail	Alopecurus pratensis	6	7	4	6	6	V (4-7)
Sweet vernal grass	Anthoxanthum odoratum	7		7	3	6	IV (3-7)
False oat-grass	Arrhenatherum elatius		4	4		5	III (4-5)
Common mouse-ear	Cerastium fontanum	2	2	2	1	2	V (1-2)
Creeping thistle	Cirsium arvense		2				I (2)
Cocksfoot	Dactylis glomerata	8	6	7	3	7	V (3-8)
Red fescue	Festuca rubra	5	5	7	7	6	V (5-7)
Hogweed	Heracleum sphondylium	2			1	4	III (1-4)
Yorkshire fog	Holcus lanatus	9	7	8	7	8	V (7-9)
Common cat's-ear	Hypochaeris radicata				2	1	II (1-2)
Meadow vetchling	Lathyrus pratensis	1		1			II (1)
Perennial rye-grass	Lolium perenne			2	3		II (2-3)
Ribwort	Plantago lanceolata	4	4	7	3	6	V (3-7)
Smooth meadow-grass	Poa pratensis	1	1	6		4	IV (1-6)
Rough meadow-grass	Poa trivialis	6	6	6	4	5	V (4-6)
Meadow buttercup	Ranunculus acris	5		3	1	4	IV (1-5)
Creeping buttercup	Ranunculus repens				4		I (4)
Sorrel	Rumex acetosa		4	2			II (2-4)
Broad-leaved dock	Rumex obtusifolius				4	2	II (2-4)
Red clover	Trifloium pratense	2			2		II (2)
Nettle	Urtica dioica					1	I (1)
Common vetch	Vicia sativa	2					I (2)
Bush vetch	Vicia sepium			2	1	1	III (1-2)

Field F9: MG1a *Arrhrenatherum elatius* grassland *Festuca rubra* sub-community developing out of an **MG6b** *Lolium perenne-Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community

Common name	Scientific name	Quadrat number					DOMIN
		1	2	3	4	5	
Meadow foxtail	Alopecurus pratensis	3	5	6	6	7	V (3-7)
Sweet vernal grass	Anthoxanthum odoratum	8	6	7	7	6	V (6-8)
False oat-grass	Arrhenatherum elatius	8	8	8	7	7	V (7-8)
Black knapweed	Centaurea nigra		2				I (2)
Common mouse-ear	Cerastium fontanum		1		1		II (1)
Pignut	Conopodium majus				2		I (2)
Cocksfoot	Dactylis glomerata	4	5	6	1	7	V (1-7)
Tall fescue	Festuca arundinacea		6	2	5		III (2-6)
Meadow fescue	Festuca pratensis	1		2		1	III (1-2)
Red fescue	Festuca rubra	2				1	II (1-2)
Hogweed	Heracleum sphondylium		4	1	2	4	IV (1-4)
Yorkshire fog	Holcus lanatus	4			2	4	III (2-4)
Meadow vetchling	Lathyrus pratensis			3	1		II (1-3)
Perennial rye-grass	Lolium perenne	5	3	6	2	4	V (2-6)
Ribwort	Plantago lanceolata	2	3	2	2		IV (2-3)
Rough meadow-grass	Poa trivialis	7	7	8	6	7	V (6-8)
Meadow buttercup	Ranunculus acris	4	3	4	2	4	V (2-4)
Creeping buttercup	Ranunculus repens		2	2			II (2)
Yellow-rattle	Rhinanthus minor	5	5	6			III (5-6)
Sorrel	Rumex acetosa				3	1	II (1-3)
Dandelion	Taraxacum officinale agg.	1				1	II (1)
Red clover	Trifloium pratense		3	5	4		III (3-5)
Tufted vetch	Vicia cracca				2	2	II (2)
Bush vetch	Vicia sepium		1				I (1)

Field F10: MG7c *Lolium perenne* leys and related grasslands *Lolium perenne-Alopecurus pratensis-Festuca pratensis* grassland sub-community

Common name	Scientific name	Quadrat number					DOMIN
		1	2	3	4	5	
Marsh foxtail	Alopecurus geniculatus			4			I (4)
Meadow foxtail	Alopecurus pratensis	2	2		3	4	IV (2-4)
Sweet vernal grass	Anthoxanthum odoratum			3		2	II (2-3)
Cow parsley	Anthriscus sylvestris				2	1	II (1-2)
Smooth brome	Bromus hordaceus hordaceus	3					I (3)
Common mouse-ear	Cerastium fontanum		2	2	2		III (2)
Creeping thistle	Cirsium arvense				2		I (2)
Cocksfoot	Dactylis glomerata	4		4	2	2	IV (2-4)
Red fescue	Festuca rubra			3		3	II (3)
Hogweed	Heracleum sphondylium	2	2				II (2)
Yorkshire fog	Holcus lanatus		5			2	II (2-5)
Common cat's-ear	Hypochaeris radicata				3		I (3)
Perennial rye-grass	Lolium perenne	7	6	8	7	7	V (6-8)
Ribwort	Plantago lanceolata		3	4	5	5	IV (3-5)
Greater plantain	Plantago major	2		3			II (2-3)
Annual meadow-grass	Poa annua	6			4	4	III (4-6)
Rough meadow-grass	Poa trivialis		5	3	6	2	IV (2-6)
Silverweed	Potentilla anserina					3	I (3)
Selfheal	Prunella vulgaris	2		2			II (2)
Meadow buttercup	Ranunculus acris	2	4	3	3	4	V (2-4)
Bulbous buttercup	Ranunculus bulbosus	3		1	1		III (1-3)
Creeping buttercup	Ranunculus repens		5				I (5)
Sorrel	Rumex acetosa				2		I (2)
Dandelion	Taraxacum officinale agg.			2	2		II (2)
Goatsbeard	Tragopogon pratense						
Lesser trefoil	Trifolium dubium				3	1	II (1-3)
Red clover	Trifloium pratense	1			1	2	III (1-2)
White clover	Trifolium repens	1		1		2	III (1-2)
Germander speedwell	Veronica chamaedrys				2		I (2)
Thyme-leaved speedwell	Veronica serpyllifolia	3	1				II (1-3)
Common vetch	Vicia sativa					1	I (1)

Field F11: MG1a *Arrhrenatherum elatius* grassland *Festuca rubra* sub-community

Common name	Scientific name	Quadrat number					DOMIN
		1	2	3	4	5	
Meadow foxtail	Alopecurus pratensis			2		3	II (2-3)
Cow parsley	Anthriscus sylvestris	3			3		II (3)
False oat-grass	Arrhenatherum elatius	9	9	10	8	9	V (8-10)
Common mouse-ear	Cerastium fontanum					1	I (1)
Creeping thistle	Cirsium arvense		3				I (3)
Cocksfoot	Dactylis glomerata	1	1				II (1)
Male fern	Dryopteris filix-mas				1		I (1)
Red fescue	Festuca rubra		2	2	2	3	IV (2-3)
Goosegrass	Galium aparine	1	1				II (1)
Hogweed	Heracleum sphondylium			3			I (3)
Yorkshire fog	Holcus lanatus	4		4	2	2	IV (2-4)
Rough meadow-grass	Poa trivialis		4		4	2	III (2-4)
Broad-leaved dock	Rumex obtusifolius	1				2	II (1-2)
Common ragwort	Senecio jacobaea				1		I (1)
Nettle	Urtica dioica		5	7		3	III (3-7)
Bush vetch	Vicia sepium	2					I (2)

Field F12: MG6b *Lolium perenne-Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community

Common name	Scientific name	Quadrat number					DOMIN
		1	2	3	4	5	
Meadow foxtail	Alopecurus pratensis		2	2	4		III (2-4)
Sweet vernal grass	Anthoxanthum odoratum	6	6	7	5	4	V (4-7)
False oat-grass	Arrhenatherum elatius	3		2	2	3	IV (2-3)
Cuckoo flower	Cardamine pratensis		1				I (1)
Hairy sedge	Carex hirta				3		I (3)
Black knapweed	Centaurea nigra			2			I (2)
Common mouse-ear	Cerastium fontanum	1	2	1		2	IV (1-2)
Creeping thistle	Cirsium arvense				2	4	II (2-4)
Crested dog's-tail	Cynosurus cristatus				2		I (2)
Cocksfoot	Dactylis glomerata	3		2	4	4	IV (2-4)
Marsh horsetail	Equisetum palustre			2			I (2)
Meadow fescue	Festuca pratensis				2		I (2)
Red fescue	Festuca rubra	1		1		4	III (1-4)
Hogweed	Heracleum sphondylium	1		4		2	III (1-4)
Yorkshire fog	Holcus lanatus	6	4	7	3	6	V (3-7)
Meadow vetchling	Lathyrus pratensis		2		4	4	III (2-4)
Perennial rye-grass	Lolium perenne			4			I (4)
Ribwort	Plantago lanceolata		3	3	3	2	IV (2-3)
Rough meadow-grass	Poa trivialis		5	4	6	4	IV (4-6)
Meadow buttercup	Ranunculus acris	2	2	2	3	3	V (2-3)
Yellow-rattle	Rhinanthus minor	3			3		II (3)
Sorrel	Rumex acetosa		1	1	3	2	IV (1-3)
Common ragwort	Senecio jacobaea				1		I (1)
Red clover	Trifloium pratense		1	3	1	2	IV (1-3)
Tufted vetch	Vicia cracca			6	2		II (2-6)
Common vetch	Vicia sativa				3	3	II (3)
Bush vetch	Vicia sepium				1	2	II (1-2)

Field F13: MG6b *Lolium perenne-Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community

Common name	Scientific name	Quadrat number					DOMIN
		1	2	3	4	5	
Sweet vernal grass	Anthoxanthum odoratum	8	6	7	8	6	V (6-8)
False oat-grass	Arrhenatherum elatius	3		1	2	4	IV (1-4)
Common mouse-ear	Cerastium fontanum			1		1	II (1)
Creeping thistle	Cirsium arvense					2	I (2)
Crested dog's-tail	Cynosurus cristatus	3		4	4		III (3-4)
Cocksfoot	Dactylis glomerata	5	4	3	4	6	V (3-6)
Meadow fescue	Festuca pratensis		2				I (2)
Red fescue	Festuca rubra				1		I (1)
Yorkshire fog	Holcus lanatus	5	7	3	6	7	V (3-7)
Common cat's-ear	Hypochaeris radicata				5		I (5)
Ribwort	Plantago lanceolata	6		2	5	3	IV (2-6)
Greater plantain	Plantago major	2		3	3		III (2-3)
Annual meadow-grass	Poa annua		3	4	3	4	IV (3-4)
Rough meadow-grass	Poa trivialis	7	2	6	3	4	V (2-7)
Creeping cinquefoil	Potentilla reptans				4		I (4)
Selfheal	Prunella vulgaris	1				1	II (1)
Meadow buttercup	Ranunculus acris	3	4	4		4	IV (3-4)
Bulbous buttercup	Ranunculus bulbosus				2		I (2)
Creeping buttercup	Ranunculus repens		2		2	2	III (2)
Sorrel	Rumex acetosa	2					I (2)
Broad-leaved dock	Rumex obtusifolius			1	1		II (1)
Dandelion	Taraxacum officinale agg.		1	1			II (1)
Red clover	Trifloium pratense	1			1	2	III (1-2)
Thyme-leaved speedwell	Veronica serpyllifolia					3	I (3)

Common vetch	Vicia sativa		1				I (1)

Field F14 Community 1: MG6b *Lolium perenne-Cynosurus cristatus* grassland *Anthoxanthum odoratum* sub-community

Common name	**Scientific name**	**Quadrat number**					**DOMIN**
		1	**2**	**3**	**4**	**5**	
Meadow foxtail	Alopecurus pratensis	4	1		4	1	IV (1-4)
Sweet vernal grass	Anthoxanthum odoratum	6	3	7	5	6	V (3-7)
Cow parsley	Anthriscus sylvestris				1		I (1)
Common mouse-ear	Cerastium fontanum	1	1			3	III (1-3)
Creeping thistle	Cirsium arvense				2		I (2)
Crested dog's-tail	Cynosurus cristatus		4		2	5	III (2-5)
Cocksfoot	Dactylis glomerata	3	1	5			III (1-5)
Red fescue	Festuca rubra			4	4	5	III (4-5)
Yorkshire fog	Holcus lanatus	4	8	3	6	8	V (3-8)
Perennial rye-grass	Lolium perenne		2		3	4	III (2-4)
Common bird's-foot trefoil	Lotus corniculatus				3	2	II (2-3)
Ribwort	Plantago lanceolata	5		3	4	6	IV (3-6)
Greater plantain	Plantago major	2	3		2	1	IV (2-3)
Annual meadow-grass	Poa annua	2	4				II (2-4)
Rough meadow-grass	Poa trivialis	5	6	1	4	3	V (1-6)
Creeping cinquefoil	Potentilla reptans	3					I (3)
Meadow buttercup	Ranunculus acris	1	2	1		3	IV (1-3)
Creeping buttercup	Ranunculus repens				2		I (2)
Sorrel	Rumex acetosa			2	2		II (2)
Common ragwort	Senecio jacobaea				2		I (2)
Dandelion	Taraxacum officinale agg.	5	2			2	III (2-5)
Lesser trefoil	Trifolium dubium				3		I (3)
Red clover	Trifloium pratense			2			I (2)
White clover	Trifolium repens	2		4			II (2-4)
Thyme-leaved speedwell	Veronica serpyllifolia				2	2	Ii (2)
Tufted vetch	Vicia cracca				1		I (1)
Common vetch	Vicia sativa		1				I (1)

Field F14 Community 2: MG10b *Holcus lanatus-Juncus effusus* rush-pasture *Juncus inflexus* sub-community

Common name	**Scientific name**	**Quadrat number**			**DOMIN**
		1	**2**	**3**	
Marsh foxtail	Alopecurus geniculatus	3	3		IV (3)
Meadow foxtail	Alopecurus pratensis		2		II (2)
Sweet vernal grass	Anthoxanthum odoratum		2	3	III (2-3)
Cuckoo flower	Cardamine pratensis	1			I (1)
Hairy sedge	Carex hirta	2	5		III (2-5)
Oval sedge	Carex leporina		3	5	III (3-5)
Creeping thistle	Cirsium arvense		1		I (1)
Marsh thistle	Cirsium palustre			1	I (1)
Cocksfoot	Dactylis glomerata	3			II (3)
Tufted hair-grass	Deschampsia caespitosa		2	3	II (2-3)
Square-stemmed willowherb	Epilobium tetragonum			1	I (1)
Marsh horsetail	Equisetum palustre	6		3	III (3-6)
Marsh bedstraw	Galium palustre			1	I (1)
Yorkshire fog	Holcus lanatus	5	4	5	V (4-5)
Common cat's-ear	Hypochaeris radicata		2		II (2)
Compact rush	Juncus conglomeratus	6	2	5	IV (2-6)
Soft rush	Juncus effusus	4	7	7	V (4-7)
Hard rush	Juncus inflexus	5	7	5	V (5-7)
Meadow vetchling	Lathyrus pratensis	3			II (3)
Perennial rye-grass	Lolium perenne		2	3	III (2-3)
Ribwort	Plantago lanceolata	1	1		II (1)
Annual meadow-grass	Poa annua			3	II (3)
Smooth meadow-grass	Poa pratensis	2	2		III (2)
Rough meadow-grass	Poa trivialis	4	4	3	IV (3-4)
Creeping cinquefoil	Potentilla reptans		4		I (4)
Selfheal	Prunella vulgaris	2			II (2)
Meadow buttercup	Ranunculus acris			2	II (2)
Creeping buttercup	Ranunculus repens		2	1	III (1-2)
Clustered dock	Rumex conglomeratus	1			II (1)
Broad-leaved dock	Rumex obtusifolius			1	II (1)
Dandelion	Taraxacum officinale agg.		3		I (3)
Common vetch	Vicia sativa	1		4	III (1-4)

APPENDIX 2: Hedgerow species tables

Percentage presence of each woody species and DAFOR score of non-woody species. Common grasses and herbs not particularly associated with hedgerows are not recorded. Note: on this site cherry *Prunus avium* is unlikely to be native and is thus not treated as a woody species.

Common name	Scientific name	Hedgerow						
		B1	B2	B3	B4	B5	B6	B7
Field maple	**Acer campestre**							**2**
Sycamore	Acer pseudoplatanus		5	1			5	
Alder	**Alnus glutinosa**							
Dogwood	**Cornus sanguinea**							
Hazel	**Corylus avellana**						**5**	**80**
Hawthorn	**Crataegus monogyna**	**50**	**55**	**90**	**35**	**10**	**40**	**5**
Spindle	**Euonymus europaeus**							
Ash	**Fraxinus excelsior**	**15**		**1**				
Holly	**Ilex aquifolium**			**1**				**2**
Garden privet	Ligustrum ovalifolium							
Wild privet	**Ligustrum vulgare**							
Crab apple	**Malus sylvestris**							
Cherry	Prunus avium			1				
Bullace	Prunus institia		33	1			20	
Blackthorn	Prunus spinosa						10	
English oak	**Quercus robur**	**15**				**30**		
Field rose	**Rosa arvensis agg.**							
Dog rose	**Rosa canina agg.**	**10**	**2**		**2**		**2**	
Bramble	Rubus fruticosus agg.	5	5	6	60	20	13	10
Goat willow	**Salix caprea**							
Hybrid willow	**Salix x reichardtii**			**1**		**10**		
Elder	**Sambucus nigra**	**5**		**1**	**3**		**5**	**1**
Small-leaved lime	**Tilia cordata**							
Wych elm	**Ulmus glabra**							
Field elm	**Ulmus minor**							
English elm	**Ulmus procera**							
Guelder rose	**Viburnum opulus**							
Gaps						30		
Total native woody species		**5**	**2**	**5**	**3**	**3**	**4**	**5**
Hedge garlic	Alliaria petiolata							
Cow parsley	Anthriscus sylvestris	A	O	R				
Cuckoo pint	**Arum maculatum**							
False wood-brome	**Brachypodium sylvaticum**							
Male fern	**Dryopteris filix-mas**							
Herb robert	**Geranium robertianum**		**R**	**O**				**R**
Herb benet	**Geum urbanum**	**O**	**R**					**R**
Ivy	Hedera helix							F
Bluebell	**Hyacinthoides non-scripta**							
Honeysuckle	Lonicera periclymenum						R	
Dog's mercury	**Mercurialis perennis**							
Wood dock	Rumex sanguineus							
Red campion	Silene dioica							
Hedge woundwort	Stachys sylvatica							
Black bryony	Tamus communis	R	R					
Total "Woodland species"		**1**	**2**	**1**	**0**	**0**	**0**	**2**

Common name	Scientific name	Hedgerow						
		B8	B9	B10	B11	B12	B13	B14
Field maple	**Acer campestre**			**3**	**7**		**25**	**3**
Sycamore	Acer pseudoplatanus							
Alder	**Alnus glutinosa**				**10**			
Dogwood	**Cornus sanguinea**							
Hazel	**Corylus avellana**	**65**	**55**	**25**	**30**	**60**	**50**	**20**
Hawthorn	**Crataegus monogyna**	**15**	**30**	**30**	**10**	**10**		**25**
Spindle	**Euonymus europaeus**							
Ash	**Fraxinus excelsior**				**3**		**2**	**2**
Holly	**Ilex aquifolium**	**3**						
Garden privet	Ligustrum ovalifolium							
Wild privet	**Ligustrum vulgare**							
Crab apple	**Malus sylvestris**							
Cherry	Prunus avium				1			
Bullace	Prunus institia							
Blackthorn	**Prunus spinosa**		**5**	**35**	**15**	**15**	**5**	**10**
English oak	**Quercus robur**	**10**			**5**			
Field rose	**Rosa arvensis**	**2**						
Dog rose	**Rosa canina agg.**			**2**				
Bramble	Rubus fruticosus agg.	5	5	5	8	10	6	10
Goat willow	**Salix caprea**				**2**			
Hybrid willow	**Salix x reichardtii**				**2**		**2**	
Elder	**Sambucus nigra**		**5**					
Small-leaved lime	**Tilia cordata**						**10**	
Field elm	**Ulmus minor**				**5**	**5**		**30**
English elm	**Ulmus procera**							
Guelder rose	**Viburnum opulus**				**2**			
Gaps								
Total native woody species		**5**	**4**	**5**	**11**	**3**	**5**	**6**
Hedge garlic	Alliaria petiolata				R		R	R
Ramsons	Allium ursinum							O
Cow parsley	Anthriscus sylvestris	R	R	O	F	O		F
Cuckoo pint	**Arum maculatum**						**R**	
False wood-brome	**Brachypodium sylvaticum**							
Male fern	**Dryopteris filix-mas**	**R**					**R**	
Herb robert	**Geranium robertianum**					**R**	**R**	
Herb benet	**Geum urbanum**	**R**					**R**	**O**
Ivy	Hedera helix	O			F	F	A	F
Bluebell	**Hyacinthoides non-scripta**							
Honeysuckle	Lonicera periclymenum							
Dog's mercury	**Mercurialis perennis**							**F**
Wood dock	Rumex sanguineus			R			R	R
Red campion	Silene dioica		R					
Hedge woundwort	Stachys sylvatica					R	R	R
Black bryony	Tamus communis		R		R	R		
Total "Woodland species"		**2**	**0**	**0**	**0**	**1**	**4**	**2**

Common name	Scientific name	Hedgerow						
		B15	B16	B17	B18	B19	B20	B21
Field maple	**Acer campestre**	**5**	**5**		**2**	**10**	**5**	
Sycamore	Acer pseudoplatanus							
Alder	**Alnus glutinosa**							
Dogwood	**Cornus sanguinea**							
Hazel	**Corylus avellana**	**30**	**10**	**30**	**8**	**40**	**20**	
Hawthorn	**Crataegus monogyna**	**25**	**75**	**30**	**45**	**35**	**60**	**65**
Spindle	**Euonymus europaeus**				**7**			
Ash	**Fraxinus excelsior**	**5**	**2**	**20**	**5**			
Holly	**Ilex aquifolium**			**6**	**2**			
Garden privet	Ligustrum ovalifolium							
Wild privet	**Ligustrum vulgare**							
Crab apple	**Malus sylvestris**							
Wild cherry	**Prunus avium**			**5**				
Bullace	Prunus institia						10	
Blackthorn	**Prunus spinosa**				**20**	**2**		
Pear	Pyrus communis				5			
English oak	**Quercus robur**		**3**	**2**	**1**		**1**	
Field rose	**Rosa arvensis**							
Dog rose	**Rosa canina agg.**							
Bramble	Rubus fruticosus agg.	5	5	5	3	5	2	15
Goat willow	**Salix caprea**							
Hybrid willow	**Salix x reichardtii**							
Elder	**Sambucus nigra**	**5**		**2**	**2**	**3**	**1**	**20**
Rowan	**Sorbus aucuparia**						**1**	
Small-leaved lime	**Tilia cordata**							
Wych elm	**Ulmus glabra**							
Field elm	**Ulmus minor**	**25**				**15**		
English elm	**Ulmus procera**							
Guelder rose	**Viburnum opulus**							
Gaps								
Total native woody species		**6**	**5**	**7**	**9**	**6**	**6**	**2**
Hedge garlic	Alliaria petiolata		R				R	
Ramsons	Allium ursinum							
Cow parsley	Anthriscus sylvestris	F	R	O	R	O	O	O
Cuckoo pint	**Arum maculatum**	**R**						
False wood-brome	**Brachypodium sylvaticum**							
Male fern	**Dryopteris filix-mas**		**R**	**R**	**R**	**R**	**R**	
Herb robert	**Geranium robertianum**	**R**	**R**		**R**		**R**	
Herb benet	**Geum urbanum**	**R**		**R**	**R**			
Ivy	Hedera helix	F	O	F	O	A	O	O
Bluebell	**Hyacinthoides non-scripta**	**LA**						
Honeysuckle	Lonicera periclymenum							
Dog's mercury	**Mercurialis perennis**		**F**					
Wood dock	Rumex sanguineus	R	R		R		R	R
Red campion	Silene dioica		R					
Hedge woundwort	Stachys sylvatica							
Black bryony	Tamus communis	R					R	
Total "Woodland species"		**4**	**3**	**2**	**3**	**1**	**2**	**0**

Common name	Scientific name	Hedgerow						
		B22	**B23**	**B24**	**B25**	**B26**	**B27**	**B28**
Field maple	**Acer campestre**		**25**				**10**	**15**
Sycamore	Acer pseudoplatanus							
Alder	**Alnus glutinosa**							
Dogwood	**Cornus sanguinea**							
Hazel	**Corylus avellana**		**25**			**10**		**5**
Hawthorn	**Crataegus monogyna**	**15**	**25**	**95**	**85**	**20**		**20**
Spindle	**Euonymus europaeus**							
Ash	**Fraxinus excelsior**					**5**	**10**	**5**
Holly	**Ilex aquifolium**	**5**	**5**					**5**
Garden privet	Ligustrum ovalifolium							
Wild privet	**Ligustrum vulgare**							
Crab apple	**Malus sylvestris**							
Wild cherry	**Prunus avium**							
Bullace	Prunus institia					55		
Blackthorn	**Prunus spinosa**		**15**				**25**	**40**
Pear	Pyrus communis							
English oak	**Quercus robur**					**5**	**15**	**5**
Field rose	**Rosa arvensis**							
Dog rose	**Rosa canina agg.**							
Bramble	Rubus fruticosus agg.	30	5	5	10	5	30	5
Goat willow	**Salix caprea**	**5**						
Hybrid willow	**Salix x reichardtii**							
Elder	**Sambucus nigra**	**30**					**10**	
Rowan	**Sorbus aucuparia**							
Small-leaved lime	**Tilia cordata**							
Common lime	Tilia x vulgaris				5			
Wych elm	**Ulmus glabra**							
Field elm	**Ulmus minor**							
English elm	**Ulmus procera**							
Guelder rose	**Viburnum opulus**							
Gaps		15						
Total native woody species		**4**	**5**	**1**	**1**	**4**	**5**	**7**
Hedge garlic	Alliaria petiolata		R				R	
Ramsons	Allium ursinum							
Cow parsley	Anthriscus sylvestris	O	F	F	O	O	O	O
Cuckoo pint	**Arum maculatum**							
False wood-brome	**Brachypodium sylvaticum**							
Male fern	**Dryopteris filix-mas**							
Herb robert	**Geranium robertianum**		**R**	**R**			**R**	
Herb benet	**Geum urbanum**						**R**	
Ivy	Hedera helix	O	F	O			O	O
Bluebell	**Hyacinthoides non-scripta**							
Honeysuckle	Lonicera periclymenum							
Dog's mercury	**Mercurialis perennis**							
Wood dock	Rumex sanguineus	R	R		R			R
Red campion	Silene dioica							
Hedge woundwort	Stachys sylvatica							
Black bryony	Tamus communis			R			R	
Total "Woodland species"		**0**	**1**	**1**	**0**	**0**	**2**	**0**

Common name	Scientific name	Hedgerow						
		B29	B30	B31	B32	B33	B34	B35
Field maple	**Acer campestre**	**10**		**35**	**45**	**5**	**6**	**5**
Sycamore	Acer pseudoplatanus						12	1
Alder	**Alnus glutinosa**							
Dogwood	**Cornus sanguinea**							
Hazel	**Corylus avellana**			**55**	**45**	**20**	**8**	**2**
Hawthorn	**Crataegus monogyna**		**70**			**5**	**18**	**61**
Spindle	**Euonymus europaeus**							
Ash	**Fraxinus excelsior**						**2**	**1**
Holly	**Ilex aquifolium**				**1**			**1**
Garden privet	Ligustrum ovalifolium							
Wild privet	**Ligustrum vulgare**							
Crab apple	**Malus sylvestris**							
Wild cherry	**Prunus avium**							
Bullace	Prunus institia		20					
Blackthorn	**Prunus spinosa**	**55**			**4**	**65**	**20**	**10**
Pear	Pyrus communis							
English oak	**Quercus robur**	**30**				**2**	**16**	**3**
Field rose	**Rosa arvensis**							
Dog rose	**Rosa canina agg.**							
Bramble	Rubus fruticosus agg.	5	10	5	5	3	2	15
Goat willow	**Salix caprea**							
Hybrid willow	**Salix x reichardtii**							
Elder	**Sambucus nigra**			**5**			**3**	**1**
Rowan	**Sorbus aucuparia**							
Small-leaved lime	**Tilia cordata**							
Common lime	Tilia x vulgaris							
Wych elm	**Ulmus glabra**							
Field elm	**Ulmus minor**						**10**	
English elm	**Ulmus procera**						**3**	
Guelder rose	**Viburnum opulus**							
Gaps								
Total native woody species		**3**	**1**	**3**	**4**	**5**	**9**	**8**
Hedge garlic	Alliaria petiolata					R	R	
Ramsons	Allium ursinum							
Cow parsley	Anthriscus sylvestris	O	R	O	O	R	O	O
Cuckoo pint	**Arum maculatum**							
False wood-brome	**Brachypodium sylvaticum**							
Male fern	**Dryopteris filix-mas**							
Herb robert	**Geranium robertianum**							
Herb benet	**Geum urbanum**	**R**				**R**		**R**
Ivy	Hedera helix	O	R	O	O	R		O
Bluebell	**Hyacinthoides non-scripta**							
Honeysuckle	Lonicera periclymenum							
Dog's mercury	**Mercurialis perennis**							
Wood dock	Rumex sanguineus			R			R	R
Red campion	Silene dioica			R				
Hedge woundwort	Stachys sylvatica							
Black bryony	Tamus communis					R		R
Total "Woodland species"		**1**	**0**	**0**	**0**	**1**	**0**	**1**

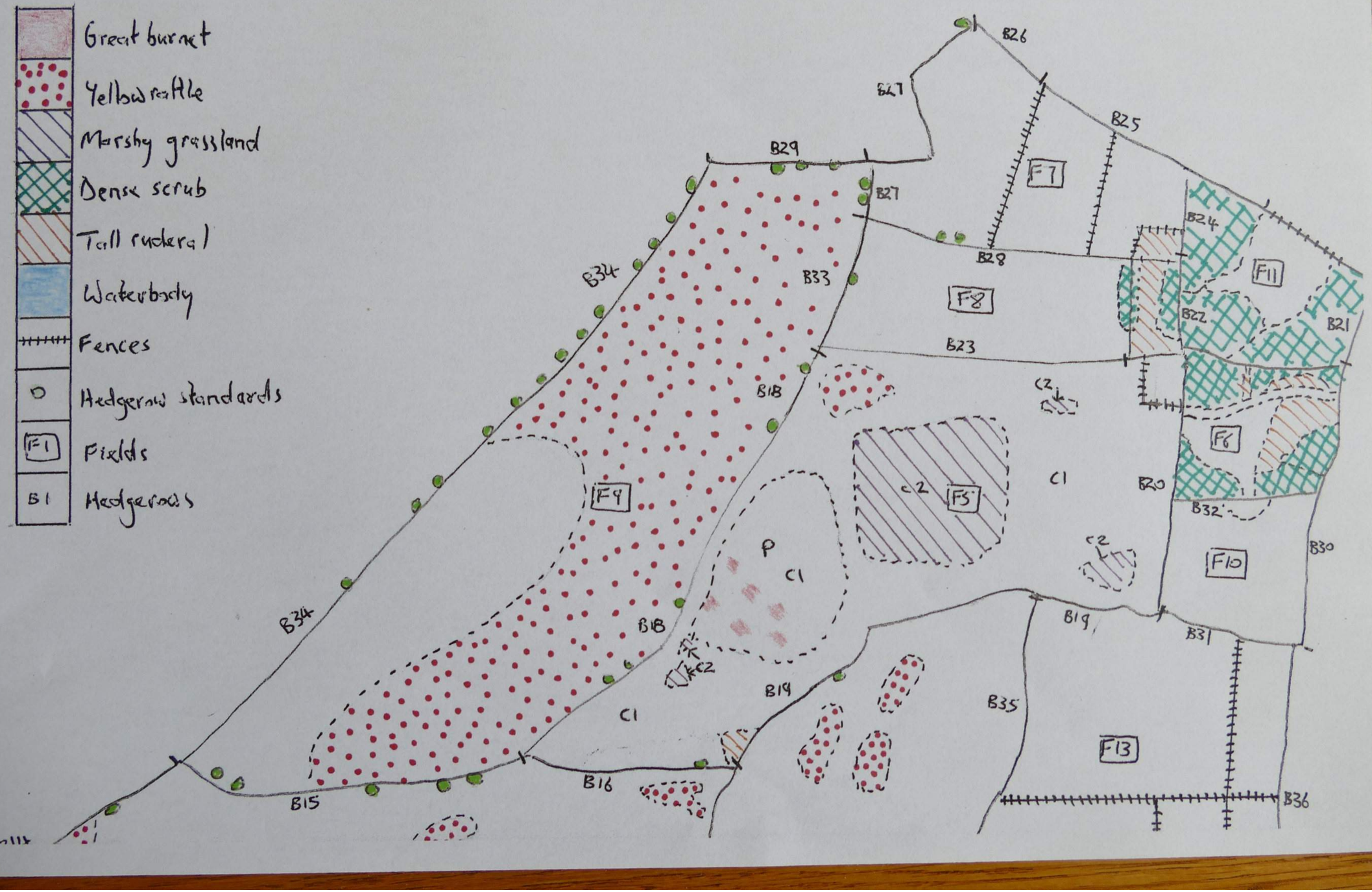
Common name	Scientific name	Hedgerow						
		B36	**B37**					
Field maple	**Acer campestre**	**1**						
Sycamore	Acer pseudoplatanus	3						
Alder	**Alnus glutinosa**							
Dogwood	**Cornus sanguinea**							
Hazel	**Corylus avellana**	**2**	**2**					
Hawthorn	**Crataegus monogyna**	**12**	**10**					
Spindle	**Euonymus europaeus**							
Ash	**Fraxinus excelsior**	**5**						
Holly	**Ilex aquifolium**	**1**	**5**					
Garden privet	Ligustrum ovalifolium	5						
Wild privet	**Ligustrum vulgare**							
Crab apple	**Malus sylvestris**							
Wild cherry	**Prunus avium**							
Bullace	Prunus institia	7						
Blackthorn	**Prunus spinosa**	**8**	**5**					
Pear	Pyrus communis							
English oak	**Quercus robur**	**2**	**30**					
Field rose	**Rosa arvensis**							
Dog rose	**Rosa canina agg.**							
Bramble	Rubus fruticosus agg.	30	10					
Goat willow	**Salix caprea**	**1**						
Hybrid willow	**Salix x reichardtii**							
Elder	**Sambucus nigra**	**3**						
Rowan	**Sorbus aucuparia**							
Small-leaved lime	**Tilia cordata**							
Common lime	Tilia x vulgaris							
Wych elm	**Ulmus glabra**							
Field elm	**Ulmus minor**							
English elm	**Ulmus procera**							
Guelder rose	**Viburnum opulus**							
Gaps		20	37					
Total native woody species		**9**	**5**					
Hedge garlic	Alliaria petiolata							
Ramsons	Allium ursinum							
Cow parsley	Anthriscus sylvestris	O	O					
Cuckoo pint	**Arum maculatum**							
False wood-brome	**Brachypodium sylvaticum**							
Male fern	**Dryopteris filix-mas**	**R**						
Herb robert	**Geranium robertianum**	**R**						
Herb benet	**Geum urbanum**	**R**	**R**					
Ivy	Hedera helix	F	O					
Bluebell	**Hyacinthoides non-scripta**							
Honeysuckle	Lonicera periclymenum	R						
Dog's mercury	**Mercurialis perennis**							
Wood dock	Rumex sanguineus	R						
Red campion	Silene dioica							
Hedge woundwort	Stachys sylvatica							
Black bryony	Tamus communis							
Total "Woodland species"		**3**	**1**					

APPENDIX 3: Numbers of Woody species and Woodland species recorded in each hedgerow (as recorded within the 30m surveyed lengths) and their relative Importance with regard to the Wildlife and landscape criteria within the Hedgerow Regulations

Hedgerow number	Woody species	Woodland species	Important or Not
B1	5	1	N
B2	3	2	N
B3	5	1	N
B4	3	0	N
B5	3	0	N
B6	4	0	N
B7	5	2	N
B8	5	2	Y
B9	4	0	N
B10	5	0	N
B11	11	0	Y
B12	3	1	N
B13	6	4	Y
B14	6	2	Y
B15	6	4	Y
B16	5	3	Y
B17	7	2	Y
B18	9	3	Y
B19	6	1	Y
B20	6	2	Y
B21	2	0	N
B22	4	0	N
B23	5	1	Y
B24	1	1	N
B25	1	0	N
B26	4	0	N
B27	5	2	Y
B28	7	0	Y
B29	3	1	N
B30	1	0	N
B31	3	0	N
B32	4	0	N
B33	5	1	Y
B34	9	0	Y
B35	8	1	Y
B36	9	3	Y
B37	8	1	Y

Site plan

Land at Great Barr, Sandwell : NVC and hedgerow survey May 2020



B14 B15 B16 B17 B36 B35 B37 B10 B13 B12 B9 B8 B6 B5 B1 B7 B4 B2 B11 B3

F4 F12 F14 F3 F1 F2

C1 C2 C3

C1 = Community 1
C2 = Community 2
C3 = Community 3

N

APPENDIX 3

Great Crest Newt eDNA Results

SureScreen Scientifics

Folio No: E7668
Report No: 1
Purchase Order: 8694/GH
Client: ECOLOGY SOLUTIONS LTD
Contact: Gareth Hey

TECHNICAL REPORT

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

SUMMARY

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

RESULTS

Date sample received at Laboratory: 09/06/2020
Date Reported: 16/06/2020
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
2924	Pond (On Site), Great Barr		Pass	Pass	Pass	Negative	0

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

Reported by: Sarah Evans **Approved by:** Chris Troth

METHODOLOGY

The samples detailed above have been analysed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5.' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample which then undergoes DNA extraction. The extracted sample is then analysed using real time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. True positive controls, negative controls and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd is ISO9001 accredited and participate in Natural England's proficiency testing scheme for GCN eDNA testing. We also carry out regular inter-laboratory checks on accuracy of results as part of our quality control procedures.

INTERPRETATION OF RESULTS

SIC: **Sample Integrity Check** [Pass/Fail]
When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.

DC: **Degradation Check** [Pass/Fail]
Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.

IC: **Inhibition Check** [Pass/Fail]
The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected, samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.

Result: **Presence of GCN eDNA** [Positive/Negative/Inconclusive]
Positive: GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location.
Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence.
Negative: GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.

ECOLOGYSOLUTIONS

Part of the ES Group

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