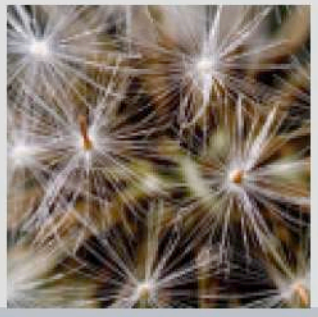
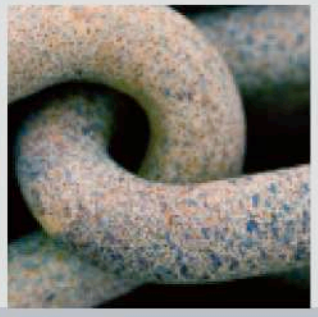
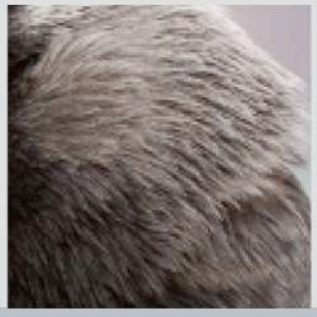
Hemingfield, Barnsley
Ecological Appraisal

Incorporating Biodiversity Net Gain Assessment

February 2024

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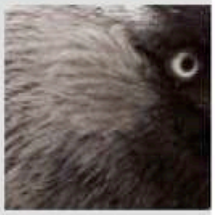

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Baker Consultants comprises a highly experienced team of professional ecologists. We do wildlife surveys - but they are only the first steps in the process for most projects. We are also involved in ecological assessment, environmental law, biodiversity management and design planning.

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Where field investigations have been carried out, these have been restricted to the agreed scope of works and carried out to a level of detail required to achieve the stated objectives of the services. Natural habitats and species distributions may change over time and further data should be sought following any significant delay from the publication of this document.

Report Contents

1 Summary

1.1 The Proposed Development

1.1.1 This document provides an ecological appraisal of the site in Hemingfield, Barnsley, related to an application for outline planning permission for the demolition of existing structures and the erection of residential dwellings with associated infrastructure and open space.

1.1.2 This report describes and assesses features of ecological value found to be present at the site. It also provides advice to help minimise any adverse ecological impacts, thereby enabling the development to comply with current nature conservation policy and legislation.

1.2 Ecological Receptors

1.2.1 The ecological assessment, set out in detail below, has found a low level of nature conservation interest on the site including:

- Wombwell Wood Local Wildlife Site (LWS) which is located 100m to the west of the site;
- Buildings which are used by nesting swallows;
- Three species-rich hedgerows which provide foraging and commuting habitat for bats and nesting habitat for birds; and,
- A woodland pond which is situated 218m to the north of the development site.

1.3 Recommended Actions

1.3.1 Further survey is recommended for breeding birds; within the next available breeding season. In addition, the pond to the north of the site should be surveyed for great crested newts using eDNA sampling. An additional bat static deployment should be undertaken to record bat activity in spring and a Hedgerow Regulations survey will be required to assess whether the hedgerows on-site are 'important'.

1.3.2 Ecological impacts on features of interest will need to be avoided, or appropriate mitigation put in place to reduce the effects of development.

1.4 Conclusions

1.4.1 Overall, the conclusion of this report is that there will be no significant constraints to the development that cannot be addressed through appropriate mitigation measures. The proposed development will produce an on-site Biodiversity Net Gain (BNG) of 2.31 habitat units (14.85%) and 7.11 hedgerow units (122.08%), through the creation and enhancement of high-quality habitats.

1.4.2 It is anticipated that these measures will be fully incorporated into the masterplan, the detailed design of the scheme and through biodiversity and ecological management plans

that will be implemented prior to, during and after construction.

2 Introduction

2.1 Site Description

2.1.1 The site is located to the north and east of Hemingfield Road, to the north of Hemingfield, Barnsley at Ordnance Survey grid reference SE393018. Adjacent to the site boundary there are linear parcels of deciduous woodland which run along Hemingfield Road to the west and the A6195 to the north. The wider landscape consists of mostly agricultural land, with the village of Hemingfield to the south and a larger area of deciduous woodland further to the west.

2.1.2 The site itself comprises agricultural land and hedgerows with a collection of farm buildings in the south west corner (Figure 1).

Figure 1. Site Location

2.2 Study Scope

2.2.1 Baker Consultants was commissioned by the client to undertake the following works in relation to the site:

- Desk-based study with local records centres and online databases to identify designated sites of nature conservation importance, areas of priority habitats and records of protected and/or notable species;

- UKHab Habitat survey to record the nature and extent of vegetation and habitats within and adjacent to the site;
- Appraisals for protected and/or notable flora and fauna;
- Habitat condition assessment;
- BNG assessment;
- Bat emergence surveys of existing farm buildings;
- Bat static detector deployment, and,
- Bird static detector deployment.

2.2.2 This report takes into account standard guidance from a variety of sources including the Chartered Institute of Ecology and Environmental Management [1] [2] [3], British Standards Institution [4], and www.gov.uk [5].

2.2.3 The report considers, in particular, potential effects on the following biodiversity features:

- Designated Sites (international, national and local)
- European Protected Species
- National Protected Species
- Habitats and Species of Principal Importance for Conservation
- Habitats and species of local interest

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 CIEEM (2015). Guidelines on Ecological Report Writing. Chartered Institute of Ecology and Environmental Management, Winchester.
3 CIEEM (2017). Guidelines for Preliminary Ecological Appraisal. Chartered Institute of Ecology and Environmental Management, Winchester.
4 BSI (2013). BS42020:2013 Biodiversity – Code of Practice for Planning and Development
5 https://www.gov.uk/guidance/protected-species-how-to-review-planning-applications

3 Methods

3.1 Surveyor Qualifications and Experience

3.1.1 Ecologist Isabel Syddall BSc, Qualifying member of CIEEM, carried out the Preliminary Ecological Appraisal and is the team leader for this project. Isabel has over three years of professional experience in consultancy and has carried out numerous ecological appraisals in this time. Isabel is a competent bat surveyor with a Class 1 licence to survey bats (NE: 2022-10869-CL17-BAT).

3.1.2 The bat emergence surveys were undertaken by suitably qualified, experienced and appropriately licensed surveyors. These are listed in Table 1 below.

Table 1. Surveyor Details

Surveyor	Bat Licence Holder	Accomplished Bat Surveyor
Isabel Syddall*	Yes	Yes
Jed Weaver*		Yes
Martin Ledger ACIEEM	Yes	Yes

*Qualifying member of CIEEM

3.1.3 Wherever appropriate during surveys, Natural England's Standing Advice on Protected Species [6] was taken into account, along with a wide range of other best practice guidance on survey methods. These are referenced in the text below. However, the professional judgement of the surveyors was also applied in relation to the site conditions and target species/habitats being considered. This may have required changes to the published guidance.

3.2 Desk-study

3.2.1 A data search was undertaken for designated sites of nature conservation interest, priority habitats and records of protected and priority species. Data for these was gained through the sources listed in Table 2 below:

Table 2. Desk-study Data Sources

Organisation/source	Data sought	Search area
Multi-Agency Geographic Information for the Countryside (MAGIC)	Statutory designated sites, Habitats of Principal Importance and Ancient Woodland	2km
Local Biological Records Centre	Non-statutory designated sites of nature conservation and records of protected/notable species. Old species records dated before 2000 were filtered out.	2km

3.2.2 Natural England's online Impact Risk Zone tool was utilised [7]. This identifies whether developments are likely to have an impact on Sites of Special Scientific Interest (SSSIs), based upon their type and location, and whether Natural England should be consulted as

[6] https://www.gov.uk/guidance/protected-species-how-to-review-planning-applications
[7] Available at: http://www.magic.gov.uk

part of proposals.

3.3 Habitat Survey

3.3.1 A Habitat Survey was carried out by Isabel Syddall on the 11th July 2023. The vegetation types and habitats present were described and mapped during a walkover of the site, using the standard published guidelines for the UK Habitat Classification System (V2)[8]. Features of particular interest were recorded as Target Notes (TNs).

3.3.2 In addition, the habitats within the site and surrounding land were appraised for their suitability to support protected or notable species, or assemblages that could be sensitive to the development proposals, in accordance with 'Guide lines for Preliminary Ecological Appraisal' [9].

3.3.3 During the survey, consideration was given to features such as potential breeding bird habitat, bat roosting locations, badger sett locations, reptile habitat and the suitability of water features for amphibians and riparian mammals.

3.3.4 Invasive species, such as Japanese knotweed *Reynoutria japonica* and giant hogweed *Heracleum mantegazzianum*, were noted by the surveyor if present. These species can have implications for development activity and human health respectively.

3.3.5 Weather conditions during the survey were mild (15ºC) with light rain, 100% cloud cover and wind BF1.

3.3.6 The survey approach taken is designed to identify broad habitat types at a site and the potential of these habitats to support notable/protected species, and to assist in providing an overview of the ecological interest at a site. It is the most widely used and professionally recognised method for initial ecological site appraisal.

3.4 Biodiversity Net Gain Assessment

3.4.1 To obtain a baseline biodiversity score the following information was entered onto the Statutory Biodiversity Metric Calculator:

- Habitat types and area measurements (ha);
- The ecological condition, assessed using Technical Annex 1[10], of each habitat parcel, and,
- The strategic significance of the individual habitats (determined by reference to the Biodiversity and Geodiversity SPD (Adopted May 2019)).

3.4.2 To obtain a post-development biodiversity score the Landscape Masterplan (drawing number: P23-0749_EN_08E) was reviewed (Appendix 4). The following detailswere entered onto the calculator:

- The area of retained and proposed habitats including gardens, buildings and associated

[8] UKHab Ltd (2023). UK Habitat Classification Version 2.0 (at https://www.ukhab.org)
[9] CIEEM (2017). Guidelines for Preliminary Ecological Appraisal. Chartered Institute of Ecology and Environmental Management, Winchester.
[10] https://www.gov.uk/government/publications/statutory-biodiversity-metric-tools-and-guides

infrastructure;
- The proposed ecological condition of retained and proposed habitats;
- The strategic significance of the individual habitats, and
- Time taken to deliver new habitats or management, restoration or enhancement of retained habitats and location (in a strategic landscape or not).

3.4.3 The difference between pre- and post-development scores provides the percentage difference in biodiversity value.

3.5 Bat Survey

Bat Roost/Habitat Survey

3.5.1 The habitats within the survey area were assessed for their potential to support roosting bats in accordance with current guidelines *11*. This involved inspection of features such as mature trees and buildings for evidence indicating the presence of roosting bats or for features with the potential to provide bat roost habitats. Evidence indicating the presence of bats would normally include droppings, characteristic staining, scratch marks or the presence of live or dead bats.

3.5.2 Trees were inspected for the presence of rot holes, scar crevices, loose bark and covering of dense ivy, while buildings were searched externally and internally for cavities in masonry, the eaves or roof spaces that might offer potential roosting opportunities for bats.

3.5.3 The roost inspection systematically assessed trees and buildings from all sides. A high-powered torch and close-focusing binoculars were used, where necessary, to inspect cavities and features in shaded areas and/or at height.

3.5.4 The roost/habitat inspection was undertaken by Isabel Syddall during the PEA survey on 11th July 2023.

3.5.5 Following the roost/habitat inspection, potential roost features and bat habitats were categorised according to the following criteria (Table 3):

Table 3. Bat Roost/Habitat Assessment Categories

Potential Suitability	Roosting sites in Structures	Commuting and foraging habitats
None	No habitat features on site likely to be used by any roosting bats at any time of the year (i.e. a complete absence of crevices/suitable shelter at all ground/underground levels).	No habitat features on site likely to be used by any commuting or foraging bats at any time of the year (i.e. no habitats that provide continuous lines of shade/protection for flight-lines, or generate/shelter insect populations available to foraging bats)
Negligible	No obvious habitat features on site likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.	No obvious habitat features on site likely to be used as flight-paths or by foraging bats; however, a small element of uncertainty remains in order to account for non-standard bat behaviour.

11 Collins, J.(ed.) (2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition). The Bat Conservation Trust, London.

Potential Suitability	Roosting sites in Structures	Commuting and foraging habitats
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of the year. However, these potential roost site do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity and not a classic cool/stable hibernation site, but could be used by individual hibernating bats).	Habitat that could be used by small numbers of bats as flight-paths such as a gappy hedgerow or unvegetated stream, but isolated, ie. Not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure with one of more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation – the categorization described in this table is made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used for flight-paths such as lines of trees and scrub or linked back gardens. Habitats that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat. These structures have the potential to support high conservation status roosts, e.g. maternity or classic cool/stable hibernation site.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by bats for flight-paths such as river valleys, streams, hedgerow, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

Tree Assessment Categories	
Suitability	**Description**
PRF-I	Potential Roost Feature is only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitats.
PRF-M	Potential Roost Feature is suitable for multiple bats and may therefore be used by a maternity colony.

Bat Activity Survey

3.5.6 To record bat roost activity, the surveys listed in Table 4 below were carried out. These were all undertaken in accordance with standard survey guidance.[12]

3.5.7 The surveyors used Wildlife Acoustics Echo Meter Touch bat detectors to record bat calls. These have in-built recogniser software to aid the identification of species, and will record geo-tagged call data for more detailed computer analysis.

3.5.8 The surveyors used a Flir E76 advanced thermal imaging camera on the 21st August and 4th September and an infra-red Canon XA-10 professional night-vision camera was used with additional Tracer LEDray infrared torches on 21st August. These cameras supplemented surveys to aid visualisation in dark conditions and to also record and time stamp any activity.

3.5.9 The locations of the surveyors were planned to allow viewing of the elevations where potential roost features had been identified during the roost inspection survey. Building

[12] Collins,J.(ed.) (2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition). The Bat Conservation Trust, London.

numbers are shown in Figure 2.

Table 4. Emergence Survey Conditions

Date	Surveyors	Cameras	Buildings	Weather	Sunset times	Survey start/ finish times
21/08/23	IS, ML, JW	Flir, IR	1, 4 & 5	Warm (20ºC), very light drizzle during first hour then dry, wind BF1, 100% cloud cover	20:21	20:07 / 21:50
04/09/23	IS, ML	Flir	4 & 5	Warm (23ºC), dry, wind BF0, <5% cloud cover	21:49	19:34 / 21:05

Key: IS = Isabel Syddall, ML = Martin Ledger, JW = Jed Weaver, IR = Infrared camera

Automated Bat Survey

3.5.10 Wildlife Acoustics SM Mini automated bat detectors were deployed within the development site according to the details provided below in Table 5. These detectors record nearby bat calls automatically, with each digital file being appropriately date and time-stamped. After recording, the data collected is downloaded for analysis on computer

3.5.11 The locations of the detectors are shown in Figure 2 below.

Table 5. Automated Bat Surveys

Detector ID	Map Ref.	Deployment Start	Dates Analysed	
			Bats	Birds
SMU03670 SMU10216	1a 1b	27/07/2023	08/08/2023 – 12/08/2023	27/07/2023 – 21/08/2023
SMU03670 SMU10216	2a 2b	21/08/2023	31/08/2023 – 04/08/2023	21/08/2023 – 04/09/2023

Figure 2. Static Detector Locations

Bat Call Analysis

3.5.12 Bat call data was analysed using Wildlife Acoustics Kaleidoscope software, which separated the recording into segments of up to 15 seconds, to be identified to species/group and counted.

3.5.13 The identification of bat calls was based on the experience of the analysts and reviewers (including bat survey licence holders). This experience was backed up by the use of an identification spreadsheet and published guidance on recognised call parameters *13 14 15 16*.

3.6 Birds

Automated Bird Survey

3.6.1 Due to the timing of the PEA survey further survey for breeding birds could not be carried out in 2023. To gain an understanding of the species assemblage on site the SM Mini automated detectors which were deployed to record bats were also programmed to record birds within and around the central hedgerow on site. The details of these

13 Russ, J. (1999). The Bats of Britain and Ireland: Echolocation calls, sound analysis and species identification. Alana Books.
14 Vaughan, N., Jones, G. & Harris, S. (1997). Identification of British Bat Species by Multivariate Analysis of Echolocation Call Parameters. The International Journal of Animal Sound and its Recording 7: 189-207.
15 Middleton, N., Froud, A. & French, K. (2014). Social Calls of the Bats of Britain and Ireland. Pelagic Publishing, Exeter.
16 Russ, J. (2012). British Bat Calls: A Guide to Species Identification. Pelagic Publishing, Exeter.

deployments are provided in Table 5 with their locations shown in Figure 2 above. The survey was undertaken in accordance with the bird survey guidelines *17* and Abrahams (2018)*18*, Brandes (2008)*19*, Evans *et al*. (1998)*20* and Zwart *et al*. (2014)*21.*

3.6.2 The acoustic frequency range 180 Hz to 10 kHz was recorded for 24 hours to create a soundscape dataset including both the dawn and dusk chorus times. The deployment period was a total of 69 days (four deployments over two periods). One minute acoustic recordings were saved at 10-minute intervals.

3.6.3 After collection, the acoustic recordings were analysed to quantify the number of bird vocalisation and the bird species type. The audio recordings were processed using Kaleidoscope Pro software, with bird vocalisation phrases then being subject to identification through using Cornell Lab @Birdnet Analyzer *22*.

17 Bird Survey & Assessment Steering Group. (2023). Bird Survey Guidelines for assessing ecological impacts, v.1.1.1. https://birdsurveyguidelines.org
18 Abrahams, C. (2018). Bird bioacoustic surveys - developing a standard protocol. *In Practice*, 102, 20-23.
19 Brandes, T. S. (2008) 'Automated sound recording and analysis techniques for bird surveys and conservation.' *Bird Conservation International*, 18 pp. S163-S173.
20 Gilbert, G., Gibbons, D. W. and Evans, J. (eds.) *Bird Monitoring Methods: a manual of techniques for key UK species*. Sandy, RSPB.
21 Zwart, M. C., Baker, A., McGowan, P. J. K. and Whittingham, M. J. (2014) 'The Use of Automated Bioacoustic Recorders to Replace Human Wildlife Surveys: An Example Using Nightjars.' *Plos One*, 9(7) pp. 1-8.
22 https://github.com/kahst/BirdNET-Analyzer

4 Results

4.1 Study Limitations

4.1.1 It is important to note that, even where data is returned for a desk-study, a lack of records for a defined geographical area does not necessarily mean that there is a lack of ecological interest since the area may simply be under-recorded. Equally, due to the level of recording, some species should be considered more frequent than indicated by the records provided within a desk-study.

4.1.2 Whilst every effort was made in the field survey to provide a comprehensive description of the site, no investigation can ensure the complete characterisation and prediction of the natural environment. Also, natural and semi-natural habitats are subject to change, species may colonise the site after surveys have taken place and results included in this report may become less reliable over time.

4.1.3 Survey data is generally only considered valid if it is from the current or previous active season. In some cases, surveys up to 3 years old may be considered acceptable by consultees if the habitats have not significantly changed in the intervening period.

4.1.4 To the east of the site, access was limited to the public footpaths which border the fields, however an accurate description of this area was possible from the footpaths, aided by binoculars.

4.1.5 No access was provided to the land surrounding the development site. Consequently, searches for evidence of badger activity within 30m of the site boundary were based on available views from within the site and adjacent public rights of way.

4.1.6 At the time that the PEA survey was conducted the grassland at TN5 had been recently cut which hindered the surveyor's ability to classify the habitat. However, this grassland was returned to on the 27th July and a more accurate description was possible.

4.1.7 Given the time of year that the PEA was conducted, further survey for breeding birds was not possible, however, static detectors were deployed in July and August to gain an understanding of what species may use the site. Further surveys are recommended for the next available breeding bird season.

4.1.8 The site has been assessed as low value for foraging and commuting bats due to being largely arable land with limited features. Static detectors were deployed in August and September (a total of four deployments) concentrating on potential areas of bat habitat interest, together with bat evening emergence surveys of the buildings. No walked seasonal transect surveys were carried out, deviating from the bat survey guidelines [23]. However, as outlined in the guidance, professional judgement should be applied to take a proportionate approach. The likelihood of bats being present, the species concerned, together with levels of activity, the habitats affected and type and scale of the proposed

23 Collins, J.(ed.) (2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition). The Bat Conservation Trust, London.

development were considered to inform this decision. The combined results of the static deployment and emergence surveys support this assessment and have identified a very low level of common bat activity and low diversity of species on the site. A walked transect of the site would only provide a screen shot of bat activity compared to the static monitoring, and would not, overall, provide any additional information that would influence the assessment of the site. To ensure full seasonal coverage of the site, one additional static deployment is recommended to cover the spring season. It should also be noted that habitats of interest to bats are to be largely retained and enhanced as part of the proposed layout.

4.1.9 A pond is located within 218m from the development site boundary within a woodland copse to the north. This pond has the potential to support great crested newts and, due to seasonal constraints, an eDNA survey for GCN is recommended within the next available survey season.

4.2 Designated Sites

4.2.1 The desk-study provided information on the designated sites listed below in Table 6.

Table 6. Designated Sites

Name	Status	Location/distance	Interest
Dearne Valley Wetlands	Site of Special Scientific Interest (SSSI)	1.6km to northeast	Artificial waterbodies and surrounding habitat which were restored from a post-industrial mining landscape and now supports a wide range of ornithological interest.
Parkhill Nature Reserve	Local Wildlife Site (LWS)	1.6km to northeast	Former LWS now included within the Dearne Valley Wetlands SSSI.
Wombwell Wood	LWS, Ancient Woodland	0.1km to west	Ancient woodland, lowland mixed deciduous woodland, ponds and remnants of lowland heath.
Elsecar Colliery	LWS	1.3km to south	Historical coal mines.

4.2.2 Natural England's online MAGIC tool identified that Dearne Valley Wetlands SSSI is within 2km of the site.

4.2.3 The site is designated for the following nationally important features: The open water and marginal vegetation supports nationally important numbers of non-breeding gadwall *Mareca strepera* and shoveler *Spatula clypeata*. Additional habitats including reedbed, fen, grassland and scrub support nationally important numbers of breeding gadwall, shoveler, bittern *Botaurus stellaris*, garganey *Spatula querquedula*, pochard *Aythya farina* and black-headed gull *Chroicocephalus ridibundus*. The site also supports important numbers of breeding willow tit *Poecile montanus klienschmidti*, a red listed bird of high conservation concern.

4.2.4 The site falls within the Impact Risk Zone (IRZ) of the Dearne Valley Wetlands SSSI and therefore, Natural England will need to be consulted with because the proposed development is for >100 residential units located outside of existing settlement.

4.3 Habitats

4.3.1 Scientific names are provided in Appendix 2, with common names only used in the text

below. Standard nomenclature [24] is used for vascular plant species. The habitat types recorded during the habitat survey are described in turn below (and illustrated in Figure 13). Particular features of interest, recorded during the survey, are listed as Target Notes in Appendix 2.

Hedgerows and Boundaries

4.3.2 There are species-rich native hedgerows located along the southern and eastern boundaries with the third hedgerow separating the arable field from the grassland to the east (TN1, 2 & 6, Figure 4).

4.3.3 A range of species occur within all three hedgerows such as hazel, blackthorn, field maple, a rose sp. and hawthorn. There is evidence of nutrient enrichment within the ground flora of all three hedgerows with species such as common nettle and cleavers present.

4.3.4 Invasive buddleia is locally abundant within the western section of the hedgerow at TN1 (Figure 3). This hedgerow is less dense than the others, it is also narrower and abuts a wall along the southern boundary.

4.3.5 A line of young trees is present at TN7 along the southern boundary, which includes field maple, a *Prunus* sp. and horse chestnut.

4.3.6 The other boundaries are formed by wooden fences. A belt of lowland deciduous woodland abuts the fence along the west and northern boundaries of the site.

Figure 3. Hedgerow at TN1

Figure 4. Hedgerow at TN2

[24] Stace, C. (2012). New Flora of the British Isles. Third Edition. Cambridge University Press, Cambridge.

Arable

4.3.7 The larger western section of the site is occupied by arable land which contained a legume non-cereal crop at the time of survey. The margins were recently mown modified grassland and bare-earth along tracks which surround the field.

Grassland

4.3.8 The modified grassland to the east of the site was assessed in three sections according to management at the time of survey and species composition. All three grasslands are modified with perennial rye-grass dominant.

4.3.9 The grasslands at TN3 & 4 are both species-poor containing less than six species per m^2. There was some variation in sward height as they had not been recently mown at the time of survey. Both are dominated by perennial rye-grass with frequent red fescue and soft brome, other grasses occur occasionally such as cock's-foot. Herbs are limited to dandelion sp., broadleaved plantain and white clover with broad-leaved dock occurring occasionally. The TN4 grassland has dense patches of white clover which dominate the sward and creeping buttercup occurs occasionally.

4.3.10 The grassland at TN5 had been cut prior to the habitat survey, however, it was re-surveyed at a later date when regrowth was present so the species composition could be accurately identified (Figure 5). This grassland has a higher number of species per m^2 compared with TN3 and TN 4, however, perennial rye-grass still dominates the sward with white clover, creeping buttercup, a dandelion sp. and broadleaved plantain present. The margins appear to be less frequently managed and contain a number of herbs such as meadow vetchling, red clover and a cranesbill sp.

4.3.11 At the southwest corner of the site there are some patches of other neutral grassland which have been partially mown with rougher areas surrounding disused farming machinery (TN7, Figure 6). Yorkshire fog, cocksfoot and red fescue dominate the sward with a number of herbs present such as common vetch, red valerian, ribwort plantain, meadow vetchling, creeping buttercup, a dandelion sp., red clover and white clover. Bramble scrub is encroaching in unmanaged areas.

Figure 5. Grassland at TN5

Figure 6. Grassland at TN7

Scrub

4.3.12 A dense patch of bramble scrub is present at the north west corner of the farmyard (TN8). Tall ruderal vegetation occurs amongst the scrub such as rosebay willowherb, creeping thistle, a horsetail sp. and common nettle.

Buildings

4.3.13 A number of farm buildings are present within the southwest corner of the site. This includes:

- Building 1 – an open wooden barn with a corrugated sheet roof.
- Building 2 – used as a hay store and has concrete slab lower walls with corrugated sheet upper walls and roof.
- Building 3 – used for timber storage and has painted breeze block walls with corrugated sheet upper walls on the gable ends and a corrugated sheet roof.
- Building 4 – similar to Building 3 however the southern end has been converted into an office with an upper floor.
- Building 5 – used for vehicle storage but the northern section has been converted into a living space. The building has timber panel walls, except for the southern elevation, which is breezeblock, with a corrugated sheet roof.

4.4 Biodiversity Net Gain

Baseline

4.4.1 At present, the majority of the site comprises an arable field with a collection of farm

buildings to the west, modified grassland fields to the east, and a number of hedgerows bounding the fields. The baseline habitats are shown with Target Notes in Figure 7.

Figure 7. Baseline Habitat Plan

4.4.2 The baseline biodiversity value of the site is 15.55 habitat units and 5.83 hedgerow units, as summarised in Tables 7 and 8. There are no river units present within the baseline. See Appendix 3 for details of the condition assessment.

Table 7. Baseline Habitat Calculation Summary

Habitat Type	Area (ha)	Distinctiveness	Condition	Baseline Habitat Units
Modified grassland	1.12	Low	Poor	2.25
Modified grassland	0.78	Low	Good	4.66
Other neutral grassland	0.03	Medium	Poor	0.13
Developed land; sealed surface	0.69	V.Low	N/A	0.00
Bramble scrub	0.08	Medium	N/A	0.37
Vegetated garden	0.05	Low	N/A	0.10
Cereal crop	4.02	Low	N/A	8.04
Artificial unvegetated unsealed surface	0.01	V.Low	N/A	0.00
			Total Habitat Units	**15.55**

Table 8. Baseline Hedgerow Calculation Summary

Hedgerow Type (TN)	Length (km)	Distinctiveness	Condition	Baseline Hedgerow Units
Species-rich native hedgerow (TN1)	0.11	Medium	Moderate	0.98
Species-rich native hedgerow (TN2)	0.17	Medium	Good	2.37
Species-rich native hedgerow (TN6)	0.17	Medium	Good	2.37
Line of trees (TN7)	0.02	Low	Moderate	0.11
			Total Hedgerow Units	**5.83**

Post-development

4.4.3 Figure 8 provides details of the post-development layout of the site. Tables 9 and 10 summarise the post-development calculations.

Figure 8. Post-development Habitats Plan

Table 9. Post-development Habitat Calculation Summary

Habitat Type	Area (Ha)			Distinctiveness	Condition	Habitat Units
	Retained	Created	Enhanced			
Modified grassland (good) – other neutral grassland			0.21	Medium	Moderate	1.67
Modified grassland (poor) – other neutral grassland			0.12	Medium	Moderate	0.85
Modified grassland		0.84		Low	Moderate	2.92
Other neutral grassland		0.85		Medium	Moderate	6.52
Mixed scrub		0.03		Medium	Moderate	0.14

Habitat Type	Area (Ha)			Distinctiveness	Condition	Habitat Units
	Retained	Created	Enhanced			
Developed land sealed surface		2.39		V.Low	N/A	0.00
Introduced shrub		0.004		Low	N/A	0.01
Sustainable Drainage System (SUDs)		0.13		Low	Moderate	0.30
Vegetation garden		2.17		Low	N/A	4.20
Traditional orchard		0.04		High	Moderate	0.24
Urban tree (small x77)		0.31		Medium	Poor	1.01
					Total Habitat Units	**17.86**

Table 10. Post-development Hedgerow Calculation Summary

Hedgerow Type	Length (km)			Distinctiveness	Condition	Hedgerow Units
	Retained	Created	Enhanced			
Species-rich native hedgerow (TN1)*			0.11	Medium	Good	1.43
Species-rich native hedgerow (TN2)	0.14			Medium	Good	1.96
Species-rich native hedgerow (TN6)*			0.15	Medium	Good	2.79
Species-rich native hedgerow		0.70		Medium	Good	6.32
Line of trees (TN7)	0.02			Low	Moderate	0.11
Line of trees		0.15		Low	Moderate	0.33
					Total Hedgerow Units	**12.94**

*Enhanced to include native tree planting

4.4.4 The strategic significance of other neutral grassland, bramble scrub, mixed scrub, traditional orchard, urban trees, and all hedgerow types has been set to high as these habitats are listed as Local Priority Habitats in the Barnsley Biodiversity Action Plan which underpins the vision for the Dearne Valley Green Heart Improvement Area strategy.

4.4.5 The post-development calculations are based on the latest landscape masterplan which is currently at an illustrative stage and, therefore, the following assumptions regarding tree planting have been made based on this layout.

4.4.6 The calculations include provision of 77 small urban trees, this number does not include trees that are to be planted within private gardens (see Appendix 4 for locations). The urban trees have been assumed to be in poor condition.

4.4.7 The calculations will need to be amended once the landscape scheme is at a more detailed stage.

4.5 Species Overview

4.5.1 The notable species recorded on or near the site by desk-study or field survey are summarised in the following sections. Further details of the desk-study results are also provided in Appendix 1.

4.6 Bats

4.6.1 The data search provided 37 records of bats within 2km of the site. There are records of seven species including common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared bat *Plecotus auratus*, Daubenton's *Myotis daubentonii*, Myotis sp. and noctule *Nyctalus noctula* along with a number of unidentified bats. The records include identified roosts for soprano pipistrelle, brown long-eared bat and Daubenton's. None of the records were from within the site and the closest roost record was approximately 1.4km to the south of the site.

Bat Roost/Habitat Survey

4.6.2 The hedgerows within the site and woodland edge adjacent to the north and western boundaries provide foraging resources for bats and potential connective route for commuting bats from ancient woodland to the west to woodland blocks and hedgerows to the east.

4.6.3 However, these habitats represent only a small proportion of those available in the wider landscape and the site is polluted by artificial lighting from the farm buildings and residential development to the west and south. Taking the above into consideration, the site is, therefore, assessed to have 'low' suitability for foraging/commuting bats.

4.6.4 The trees present within the development site (TN7) are young and well-sealed, and therefore possess no features suitable for roosting bats.

4.6.5 The buildings on the site can be assessed for their bat roosting potential using the factors listed in Table 11 below, and also with reference back to the BCT categories in Table 3.

Table 11. Bat Roost Building Assessment

Positive indicators for roosting bats	Negative indicators for roosting bats
Cluster of old buildings with varied structure	Modern, active industrial premises, built after the 1970s
Not affected by artificial light levels	Potential roost sites with high levels of artificial light
In rural location, close to woodland or water	In a heavily urbanized area with few green spaces
Immediately connected to commuting habitats	Isolated from commuting habitat
In sheltered lowland location	Exposed site at high altitude
Has numerous cracks or crevices present	Intact and tightly sealed structure
Pitched roof with an uneven clay tile/slate covering	Flat roof with sheet material construction
Large internal roof space, with clear flying spaces	Small or cluttered roof space
Large rough roof timbers with cracks, joints and holes	Modern smooth timber roof trusses
Hanging tiles or wood cladding, esp. on south-facing walls	Walls prefabricated with steel and sheet materials

4.6.6 The building inspection found a number of features suitable for roosting bats within some of the buildings. Descriptions of these are detailed below.

Building 1

4.6.7 A number of shallow gaps are present throughout the building between timber panels and behind a barge board on the northern and southern gable ends, and within the internal apex. These could support low numbers of bats but provides limited shelter from the elements. Overall, Building 1 is considered to offer low roost potential.

Building 2

4.6.8 There are no suitable roost features present throughout the building. There is a gap where the corrugated sheet upper wall overlaps the lower concrete slab wall, however, this does not lead to a suitable crevice. Internally there are no suitable features that could provide shelter to bats. Building 2 is considered to offer negligible roost potential.

Building 3

4.6.9 There are no suitable roost features present internally or externally except for one crack within the breeze block wall on the southern elevation which, at the time of survey, was densely packed with cobwebs. Building 3 is considered to offer negligible roost potential.

Building 4

4.6.10 The southern elevation has a number of suitable features present including a crack in the breeze block, a gap next to the window lintel and a small amount of missing mortar between breeze blocks. On the eastern elevation there are gaps behind the concrete eaves. Internally there are gaps between the concrete roof structures, however, bird nesting material is present here. Building 4 is considered to offer moderate roost potential.

Building 5

4.6.11 A number of gaps are present throughout the building between timber panels and behind the roofing felt overlap at the verges of the gable ends. Building 5 is considered to have moderate roost potential.

Bat Emergence Survey

4.6.12 Based on the results of the above building assessment, two nocturnal emergence surveys were conducted. The surveys have confirmed that there are no bat roosts present within the existing farm buildings on site. A summary of each survey visit is provided below.

Survey 1

4.6.13 Bat activity was extremely low throughout the survey with just one noctule pass recorded by all three surveyors at 20:52. The noctule bat was not seen but was thought to be flying high over the site. No other bats were recorded during the survey and there were no bats recorded on the camera footage.

Survey 2

4.6.14 The first bat recorded was a distant noctule pass at 20:02. Five other noctule passes were recorded by surveyors, some of these bats were seen flying over the site to the north and to the west. At 20:43, one hour and nine minutes after sunset, the surveyor positioned at the north east corner of Building 5 recorded a single soprano pipistrelle pass. Between 21:00 – 21:02 the same surveyor recorded several common pipistrelle passes. No other bats were recorded during the survey. Overall, bat activity was extremely low throughout the survey and no emergences were recorded.

Automated Bat Survey

4.6.15 The results of the static detector monitoring shown in Table 12 illustrates the frequency with which bat species occur within and adjacent to the site. The total number of registrations recorded for each bat species is shown in Table 13, which shows the

regularity with which they were recorded at fixed points.

4.6.16 The tables show that up to five species of bat are found to use the site at some point, with just common pipistrelle and soprano pipistrelle using it regularly. Both Myotis sp. and noctule were also fairly frequent visitors to the site but in low numbers.

4.6.17 Brown long-eared bat was recorded on detector 1a and 2a in very low numbers; however, it is possible that this species is more widespread than that recorded, due to its echolocation being quiet and often missed by bat detectors.

4.6.18 A similar diversity of species and number of call registrations was recorded across all deployment locations. Overall, the level of bat activity recorded was very low.

Table 12. Bat Diversity and Number of Nights Recorded

Ref.	Season	Myotis sp.	Noctule	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	No of Species
1a	Summer	5	4	5	5	1	5
1b		1	4	5	4	-	4
2a	Autumn	2	3	5	4	2	5
2b		2	3	5	5	-	4
Total*		10/20	14/20	20/20	18/20	2/20	

***NB.** Number of nights recorded over a total of 20 monitoring nights.

Table 13. Summary of Bat Species Registrations

Ref.	Season	Myotis sp.	Noctule	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Total
1a	Summer	6	24	223	30	3	286
1b		2	23	200	30	-	255
2a	Autumn	4	7	66	17	2	96
2b		2	14	108	20	-	144
Total*		14	68	597	97	5	781
Total %		1.8%	8.7%	76.4%	12.4%	0.6%	

***NB.** Number of bat passes over total 20 nights recording

4.7 Badger

4.7.1 There is one record of a badger sett recorded in 2013 approximately 2km from the development site. The location is geographically separated from the development site by a large area of housing and several main roads, both of which would act as a barrier to dispersal.

4.7.2 No evidence of the presence of badgers (setts, latrines, snuffle holes, pathways, tracks, etc.) were recorded during the field survey.

4.7.3 The areas of woodland adjacent to the site are suitable for future sett building. The grassland within the eastern section of the site provides potential foraging opportunities for badgers, but these would represent only a small proportion of those available within the wider landscape.

4.8 Water Vole

4.8.1 The data search provided 43 records of water vole *Arvicola amphibius* from within 2km of the site dated between 2000 to 2013. Most of these records (32) are associated with Elsecar Canal.

4.8.2 There is no suitable habitat for water vole within the development site and therefore they are no longer considered within this report.

4.9 Harvest Mouse

4.9.1 The data search provided seven records of harvest mouse *Micromys minutus* from within 2km of the site, all of these records were recorded in 2015.

4.9.2 The habitats present on site are sub-optimal for this species, which prefers long tussocky grassland and reedbeds for nest building. Therefore, this species is not considered further within this report.

4.10 Other Mammals

4.10.1 The data search provided two records of brown hare *Lepus europaeus* and eight records of West European hedgehog *Erinaceus europaeus* between 2004 and 2019.

4.10.2 No brown hare *Lepus europaeus* were identified on site but the hedgerows, grassland margins and arable fields offer suitable habitat for this species.

4.10.3 No West European hedgehog were seen on site but suitable habitat is present on site for this species within the hedgerows. The arable field, however, provides sub-optimal habitat for this species.

4.11 Amphibians

4.11.1 The data search provided 53 records of amphibians from within 2km of the site. Most of these were for common frog *Rana tempraria* and common toad *Bufo bufo*. There are seven records of great crested newt *Triturus cristatus* and five records of smooth newt *Lissotriton vulgaris*. The closest GCN record is for a positive eDNA result for a pond 1.8km to the north of the site.

Habitat Appraisal

4.11.2 There is terrestrial habitat for amphibians on site within the hedgerows, however the rest of the site is unsuitable due to high levels of disturbance associated with agricultural use and frequent mowing of the grasslands.

4.11.3 A pond is located 218m to the north of the development site within a wooded copse. Whilst the two parcels are separated by the A6195 road there is an underpass tunnel which connects them.

4.11.4 The Habitat Suitability Index (HSI) survey of the pond was undertaken to determine suitability for supporting great crested newt populations (Table 14). The pond was found

to be of 'Average' suitability (HSI = 0.66).

Table 14. Habitat Suitability Index Assessment

Feature	Category	Pond HSI score
SI1 - Location	Zone A - Optimal	1
SI2 - Pond area	220m2	0.5
SI3 - Pond drying	Rarely	1.0
SI4 - Water quality	Moderate	0.67
SI4 - Shade	Up to 80%	0.6
SI6 - Fowl	Minor	0.67
SI7 - Fish	Possible	0.67
SI8 - Ponds	1 per 1km	0.45
SI9 - Terrestrial habitat	Moderate	0.67
SI10 - Macrophytes	30%	0.6
Habitat Suitability Index		**0.66 - Average**

4.12 Reptiles

4.12.1 The data search provided 12 records of grass snake *Natrix Helvetica* from within 2km of the site between 2011 to 2020. Most of these records are associated with the Wombwell Wood LWS to the west of the development site.

4.12.2 Whilst the site offers limited suitable habitat for grass snake, the hedgerows and woodland habitat adjacent to the northern boundary could support this species. However, the Dearne Valley parkway separates Wombwell Wood LWS from the development site, acting as a potential barrier for dispersal to grass snake and the site itself is subject to high levels of disturbance associated with agricultural use. Therefore, this species is unlikely to be present and is no longer considered within this report.

4.13 Birds

4.13.1 The data search provided a total of 883 records of birds from within 2km of the site between 2002 and 2022. Of these records there are 22 that are Bird of Conservation Concern (BoCC) red listed species, 25 BoCC amber listed species and 17 species of Principal Importance under the Natural Environment and Rural Communities (NERC) Act (2006). A total of ten species are protected under Schedule 1 of the Wildlife & Countryside Act (1981), as amended.

Automated Bird Survey

4.13.2 A total of 7,603 bird vocal registrations and 58 different bird species were identified during the automated detector survey, conducted during the bird breeding season. The highest number of vocalisations recorded were of robin (3,500), chiffchaff (724), wren (700), dunnock (596), long-tailed tit (466), blackbird (229), woodpigeon (209), greenfinch (82), linnet (153), magpie (116) and grey wagtail (103).

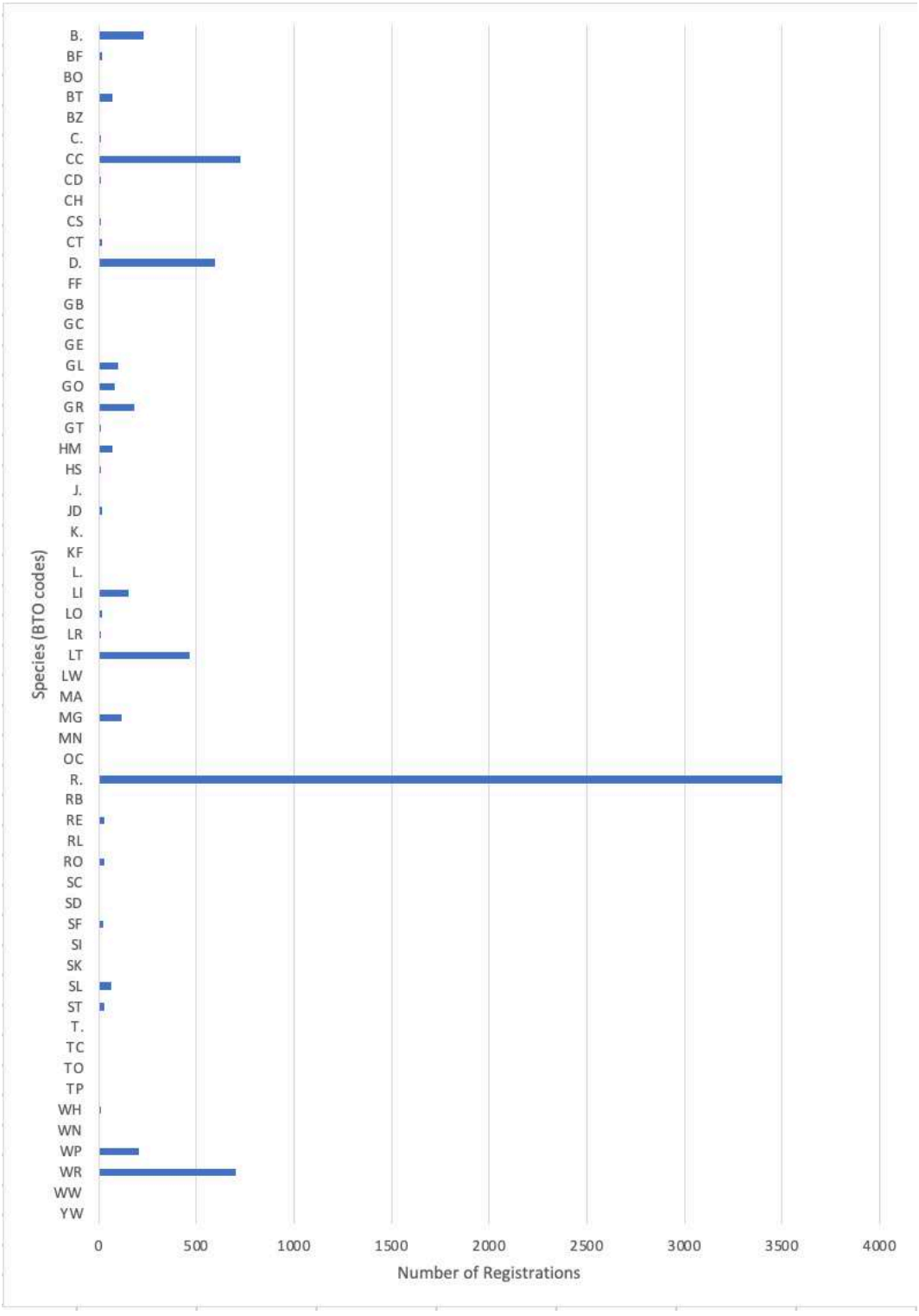
4.13.3 The data includes a total of 62 registrations of swallows. This species was recorded nesting within buildings 4 and 5 during the bat emergence surveys.

4.13.4 None of the species associated with the Dearne Valley SSSI designation were recorded

using the site.

4.13.5 The total number of vocalisations recorded for each bird species over a 69-day period is shown in Figure 9 below.

Figure 9. Total Number of Vocal Registrations per Species



4.14 Invertebrates

4.14.1 The data search provided three records of cinnabar moth *Tyria jacobaeae*, one record of

latticed heath *Chiasmia clathrate*, and three records of small heath *Coenonympha pamphilus* from between 2015 – 2017.

4.14.2 The habitat types present within the development site are considered sub-optimal to support notable invertebrate assemblages and, therefore, this species group is no longer considered within this report.

4.15 Plants

4.15.1 The data search provided a total of 34 records of notable plants. These were mostly for bluebell *Hyacinthoides non-scripta* located within LWSs. There are three species of orchid within these records; bee orchid *Ophrys apifera*, common spotted-orchid *Dactylorhiza fuchsii,* and southern marsh-orchid *Dactylorhiza praetermissa*.

4.15.2 Given none of the species provided within the data search were present within the development site, the habitat types present are unlikely to support other notable plants. Therefore, this species group is no longer considered within this report.

5 Assessment

5.1 National Policy

5.1.1 The National Planning Policy Framework (NPPF 2023) sets out the Government's planning policies for England and how these should be applied. It states that the purpose of the planning system is to contribute to the achievement of sustainable development, combining economic, social and environmental objectives, and 'protecting and enhancing our natural --- environment; including ---helping to improve biodiversity'. Within this framework, the requirements in relation to biodiversity are included within several policies. The two most relevant to individual planning decisions are Paragraphs 174 and 180, shown below:

180. Planning policies and decisions should contribute to and enhance the natural and local environment by:

a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;

c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;

d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures; etc…

186. When determining planning applications, local planning authorities should apply the following principles:

a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;

c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and

d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate

5.1.2 Section 40 of the Natural Environment and Rural Communities (NERC) Act 2006 places a duty on every public authority to have regard to conserving biodiversity. Section 41 of the same Act requires that the Secretary of State must publish a list of the living organisms and types of habitats that are of 'Principal Importance' for the purpose of conserving biodiversity. The Secretary of State must take steps, as appear reasonably practicable, to further the conservation of those living organisms and habitats in any list published under this section. The list of species and habitats of principal importance currently includes 943 species and 56 habitats.

5.2 Local Policy

5.2.1 The Local Plan along with the NPPF sets out how to manage sustainable development in the area.

5.2.2 The Barnsley Local Plan, which was adopted in 2019, includes Policy GI1 Green Infrastructure which states: *we will protect, maintain, enhance and create an integrated network of connected and multi-functional Green Infrastructure assets that: ... Enhance biodiversity and landscape character.*

5.2.3 The Barnsley Green Infrastructure Network includes the Dearne Valley Corridor. The development site is located within this area. The Local Plan states: *The network of Green Infrastructure will be secured by protecting open space, creating new open spaces as part of new development, and by using developer contributions to create and improve Green Infrastructure.*

5.3 Legislation

5.3.1 The Wildlife and Countryside Act 1981 (as amended) provides for the notification and confirmation of Sites of Special Scientific Interest (SSSIs). These sites are identified for their flora, fauna, geological or physiographical features by Natural England. The Act also contains measures for the management of SSSIs and protection against damaging operations. Impact Risk Zones (IRZs) define zones around each site which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts [25].

5.3.2 The Wildlife and Countryside Act 1981 (as amended) is the primary legislation which protects native animals, plants and habitats in the UK. The Act makes it an offence to intentionally kill, injure or take any wild animal listed on Schedule 5, and prohibits interference with places used for shelter or protection, or intentionally disturbing animals occupying such places. The Act also makes it an offence to intentionally pick, uproot or destroy any wild plant listed in Schedule 8, or any seed or spore attached to any such wild plant.

25 Available at: http://www.magic.gov.uk

5.3.3 European Protected Species (EPS), such as bats and great crested newts, are protected under both the Wildlife and Countryside Act 1981 (as amended) and under the Conservation of Habitats and Species Regulations 2017 (as amended). Taken together, these make it an offence to:

a) Deliberately capture, injure or kill a EPS;

b) Deliberately disturb any EPS, in particular any disturbance which is likely to (i) impair their ability to survive, breed, reproduce or to rear or nurture their young; or in the case of hibernating or migratory species, to hibernate or migrate; or (ii) to affect significantly the local distribution or abundance of the species to which they belong.

c) To be in possession or control of any live or dead EPS or any part of, or anything derived from a EPS;

d) Damage or destroy a breeding site or resting place of a EPS;

e) Intentionally or recklessly obstruct access to any place that a EPS uses for shelter or protection;

f) Intentionally or recklessly disturb a EPS while it is occupying a structure or place that it uses for shelter or protection.

5.4 Impacts on Designated Sites

5.4.1 The section below provides an evaluation, description of potential impacts and assessment of ecological effects for designated sites relevant to the study area. This information is summarised in Table 15.

Table 15. Designated Sites Potential Impacts Summary

Is the development within 10km of a Special Area of Conservation (SAC), Special Protection Area (SPA) or Ramsar Site?	No
Is the development within the Impact Risk Zone of a Site of Special Scientific Interest (SSSI)?	Yes
Is the development within 250m of a Local Wildlife Site and/or Ancient Woodland?	Yes

5.4.2 The closest statutory designated site to the study area is Dearne Valley Wetlands SSSI. The site is important because of the artificial waterbodies and surrounding habitat which was restored from a post-industrial mining landscape and now supports a wide range of ornithological interest.

5.4.3 Natural England (NE) have set out 'Impact Risk Zones' (IRZ) for each SSSI and recommend that they are consulted with if a proposal is listed in the potential impact categories likely to affect a certain SSSI. The site lies within the risk zone associated with the Dearne Valley Wetlands SSSI because the proposed developments exceeds 100 residential units outside of existing settlements NE will need to be consulted with.

5.4.4 The site is geographically separated from the Dearne Valley Wetlands SSSI by the town of Wombwell and therefore there is no potential for direct or indirect impacts to the SSSI.

5.4.5 The majority of the non-statutory designated sites are geographically isolated from the

site and therefore unlikely to be affected by the development.

5.4.6 The closest non-statutory site to the study area is Wombwell Wood which is designated as a LWS and contains Ancient woodland. The proposed development could cause direct and indirect impacts on the LWS given that it is located just 100m to the east, and these impacts are described below.

5.4.7 Whilst Wombwell Wood LWS is likely to be already regularly used by the public there is a potential for impacts through disturbance associated with increased footfall, including dog walkers. Dog litter can cause localised nutrient enrichment which will result in a loss of species diversity within the grassland. Other impacts could include increased lighting and fly tipping/littering. There is also a risk of impacts during construction such as pollution through accidental release of contaminants (sediment, oils, etc.) via run off or dust.

5.4.8 Mitigation measures should be put in place to minimise disturbance to these designated sites, see section 6.3 below.

5.5 Impacts on Habitats

Habitats Overview

5.5.1 56 Habitats of Principal Importance are included on the Section 41 list under the NERC Act. These are all the habitats in England that are regarded as conservation priorities in the UK Post-2010 Biodiversity Framework [26].

5.5.2 The sections below provide an evaluation, description of potential impacts and assessment of ecological effects for each habitat type relevant to the study area.

Hedgerows and Boundaries

5.5.3 Unlike most other habitat types, hedgerows have specific legislation affording them protection. The Hedgerows Regulations 1997 are intended to protect 'important' countryside hedgerows from destruction or damage. A hedgerow is considered important if (a) has existed for 30 years or more; and (b) satisfies at least one of the criteria listed in Part II of Schedule 1 of the Regulations. Under the Regulations, it is against the law to remove or destroy certain hedgerows without permission from the local planning authority.

5.5.4 The hedgerows within the development site have not yet been assessed against the Hedgerow Regulations. Further survey will be required to determine if these hedgerows are 'important'. See Section 6 below.

5.5.5 Due to their locations within the field boundaries, the hedgerows will be largely retained within the development site, but a loss of approximately 30m of the hedgerow at TN2, and 23m of the hedgerow at TN6 is likely in order to provide access. The loss of these sections of hedgerow will cause a local adverse scale impact through fragmentation and

26 Maddock, A. (2010) UK Biodiversity Action Plan Habitat Descriptions. BRIG.

habitat loss.

5.5.6 The hedgerow loss will be mitigated for through planting of additional species-rich hedgerows and enhancement of the hedgerow at TN1. This will offset potential impacts and re-establish green corridors through the site.

5.5.7 Broadleaved woodland is present adjacent to the northern boundary of the site. Development can affect mature woodland and trees, and the wildlife they support, on the site and nearby. The woodland habitat is off-site and fenced off from the development, so impacts will be limited to potential increases in lighting.

Grassland

5.5.8 Some areas of modified grassland within the eastern section of the site will be permanently lost to make way for housing and associated infrastructure. Whilst this is a low value habitat the amount of habitat loss has the potential to cause a local adverse scale impact.

5.5.9 The remaining areas of grassland habitat in the eastern section of the site will be enhanced to a more species-rich grassland. The grassland can be overseeded with an appropriate locally sourced green hay and/or seed mix, and a low intensity management plan can be implemented. See section 6 for further details.

5.5.10 A very small amount (0.03ha) of other neutral grassland will be lost (TN7) however at present this habitat parcel occurs in two small patches and is regularly disturbed. Its loss will not be significant in the local context and it will be replaced with a larger and more appropriately managed other neutral grassland park area.

Scrub

5.5.11 A very small amount (0.08ha) of bramble scrub will be lost from the south west corner of the site (TN8). The area is highly disturbed and appears to be cleared periodically. This habitat is of minimal ecological value given its size and isolation from surrounding habitats, being located amongst the existing farm yard and arable field. Its loss will not result in an adverse impact.

5.6 Assessment of Biodiversity Net Gain

5.6.1 The biodiversity net gain assessment process has implemented principles of the mitigation hierarchy – avoid, reduce compensate and enhance. The hedgerows on site are considered to be ecologically valuable and provide habitats for nesting birds and foraging/commuting habitat for bats. Based on recommendations from the results of the habitat survey the scheme was designed to largely avoid hedgerow loss. Where avoidance is not possible due to access requirements, the hedgerow loss was reduced as far as possible and compensation and enhancement measures are being proposed to result in an overall net gain in hedgerow units.

5.6.2 The post-development calculations are based on the landscape masterplan (Appendix 4), which will include retention, enhancement and creation of hedgerows, enhancement and creation of grassland and creation of a community orchard, SUDs area, mixed scrub and

urban tree planting.

5.6.3 The biodiversity net gain assessment results in an on-site net gain of 2.31 habitat units (14.85%) and a gain of 7.11 hedgerow units (122.08%). See spreadsheet ref (1835 Statutory_Biodviersity_Metric_IS_V5).

5.6.4 The gain in biodiversity units will be achieved through prescriptions set out in a Habitat Management and Monitoring Plan (HMMP) to ensure the proposed habitat types and conditions will be achieved. Outline measures to create and enhance the proposed habitats post-development are summarised in Section 6.3 below.

5.7 Species Overview

5.7.1 The sections below provide an evaluation, description of potential impacts and assessment of ecological effects for European and nationally protected species/group, or priority species/group, relevant to the study area.

5.7.2 There are 943 Species of Principal Importance included on the Section 41 list under the NERC Act. These are the species found in England which are regarded as conservation priorities under the UK Post-2010 Biodiversity Framework.

5.8 Bats

5.8.1 Bats and their habitats are protected under the Wildlife and Countryside Act 1981 (as amended) and by the Conservation of Habitats and Species Regulations 2017 (as amended). Seven bat species are also listed as Species of Principal Importance under the provisions of the NERC Act 2006.

5.8.2 The emergence surveys have confirmed there are no bat roosts within the existing farm buildings on the development site.

5.8.3 In undertaking an evaluation of the bat interest at the site [27] [28], the following factors can be taken into account: the value of roost types, commuting routes and foraging habitats; the rarity of the species involved; the approximate number of bats using them; the proximity to known roosts; and the nature and complexity of landscape features. The criteria used to assess the importance of the bat assemblage on this site are given in Table 16 below.

Table 16. Assessing the Importance of a Bat Assemblage

Geographic Rarity Category (points/species)	**Northern England**
Widespread geographies (score 1)	Common pipistrelle Soprano pipistrelle Brown-long-eared bat

[27] Wray, S., Wells, D., Long, E., Mitchell-Jones, T. (2010). Valuing Bats in Ecological Impact Assessment, IEEM In-Practice pp23-25.
[28] Reason, P.F and Wray, S. (2023). UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats. Chartered Institute of Ecology and Environmental Management, Ampfield.

Geographic Rarity Category (points/species)	Northern England
Widespread in many geographies, but not as abundant in all (score 2)	Natterer's bat Whiskered bat Daubenton's bat Brandt's bat Noctule
Local Importance Threshold	<10
County Importance Threshold	10
Regional Importance Threshold	12
National Importance Threshold	15

5.8.4 With reference to the above table, the site is considered to be of Local value for bats. Results of the bat surveys showed that the site is used regularly by a low number of common and widespread species.

5.8.5 A total of five 'widespread' species were recorded using the site, however, species from the Myotis genus were not individually identified due to the difficulty in identifying these species by call alone. It has been assumed that a maximum of one Myotis species is likely to have been present on site. This assumption is based on the desk study data which identifies Daubenton's in the local area, the overall low number of Myotis registrations over the deployment period (14), and the habitat types present on site and within the local area which are unlikely to support the rarer Myotis species.

5.8.6 Bat activity was consistently low throughout the site with the highest number of registrations (286) associated with the woodland belt adjacent to the northern boundary, which acts as a dark corridor for commuting bats.

5.8.7 Increases in lighting within the northern section of the development site could have an adverse impact on the function of the habitats used by bats if appropriate mitigation were not put in place. Some species are light adaptive and likely to continue to use the site, for example, common pipistrelle, but other species such as Myotis are more likely to adversely impacted by an increase of light, although these species are only an occasional visitor to the site and in very low numbers. The rest of the site is already well-lit from street lights to the south and security lighting at the existing farm buildings.

5.8.8 The loss of small sections of the hedgerows at TN2 & 6 to facilitate access could have an adverse impact on bats without suitable mitigation / compensation. Such minor initial habitat severance through the loss of hedgerow is unlikely to adversely affect common and soprano pipistrelle bats, and the habitat creation measures will prevent adverse impact on other species. Additionally, the current plans allow for enhancement of the hedgerow at TN1 and provisions of seven newly planted species-rich native hedgerows, which will significantly enhance the site for bats overall.

5.8.9 Recommendations for appropriate mitigation measures for bats are provided in Section 6.3.

5.9 Badger

5.9.1 Badgers are protected under the Badgers Act 1992. This makes it an offence to willfully

kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so; or to intentionally or recklessly interfere with a sett. Sett interference includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it. Removal of significant areas of badger foraging habitat may also contravene the Act, as it could be regarded as cruelty.

5.9.2 No badger setts or any other evidence of badgers was noted on the site during any of the surveys, however, it should be noted that the site does have suitable habitat for badgers and it is considered likely that badgers may occasionally use the site and the wider study area for foraging and/or commuting purposes.

5.9.3 Likely impacts of the development on badgers are therefore considered to be minimal, although badgers are mobile and may move into an area where they were absent before. A re-survey of the site is recommended immediately prior to commencement of any on-site works and this measure is outlined in more detail in Section 6.3 of this report.

5.10 Hedgehog and Brown Hare

5.10.1 Hedgehogs and brown hare are listed as Species of principal Importance under the NERC Act, they are also covered under the Wild Mammals (Protection) Act 1996. This makes it an offence to harm any wild mammal with the intent to inflict unnecessary suffering. To avoid a possible offence, due care and attention should be taken when carrying out works (for example operations near burrows or nests) with the potential to affect any wild mammal in this way, regardless of whether they are legally protected through other conservation legislation or not.

5.10.2 There are recent hedgehog and hare records adjacent to the site and it is likely that they may use the site for foraging on occasions. Therefore, the loss of scrub and hedgerow may have an adverse effect on hedgehogs, although this can easily be mitigated if provision can be made.

5.10.3 There is a risk of construction activities also having an adverse impact upon these species, and therefore mitigation measures are recommended to avoid harm.

5.11 Amphibians

5.11.1 Great crested newts and their habitats in water and on land are protected under the Wildlife and Countryside Act 1981 (as amended) and under the Conservation of Habitats and Species Regulations 2017 (as amended). In addition, great crested newt is a and is listed as a Species of Principal Importance under the provisions of the NERC Act 2006.

5.11.2 The nearest record for GCN is located 1.8km to the north of the development site. This population is geographically separated from the development site by the village of Wombwell which acts as a barrier to dispersal.

5.11.3 There is terrestrial habitat for great crested newt within the hedgerows and scrub on the development site, however, given that the site is highly disturbed through agricultural use the overall suitability of these habitats is limited.

5.11.4 The pond to the north of the development site is of 'Average' suitability for great crested newts. Although there are significant barriers to movement such as main roads the sites are connected by an underpass tunnel which could allow movement of GCN. Therefore, further survey will be required for great crested newts before impacts can be assessed and mitigation measures put in place. See Section 6.2 of this report.

5.12 Birds

5.12.1 All nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to intentionally kill, injure or take any wild bird or take, damage or destroy its nest whilst in use or being built, or take or destroy its eggs. In addition to this, for some rarer species (listed on Schedule 1 of the Act), it is an offence to intentionally or recklessly disturb them while they are nest building or at or near a nest with eggs or young, or to disturb the dependent young of such a bird.

5.12.2 The Birds of Conservation Concern initiative [29] publishes lists of Red and Amber species. Birds on the Red list are of high conservation concern within the UK, while those on the Amber list are of medium conservation concern. In addition, a number of bird species are also included as Species of Principal Importance under the provisions of the NERC Act 2006.

5.12.3 A total of 58 species were recorded using the acoustic detectors between 27th July – 4th September 2023. The species list includes 12 species that are BoCC red listed and a further 20 that are BoCC amber listed. Some of the species reordered are considered to have been flying over only, given the species and type of habitat available. There is however suitable breeding habitat for many of the more notable farmland species such as Linnet and Dunnock within the hedgerows, arable field, scrub and existing farm buildings.

5.12.4 A low number of barn owl calls were recorded but visits to site found no evidence to suggest that they nest on site or are using it as a significant foraging resource. Impacts are therefore not anticipated towards this species.

5.12.5 During the bat emergence surveys swallows were recorded breeding within buildings 4 and 5. The demolition of these buildings if undertaken during the bird breeding season, could potentially damage or disturb active nests and result in an offence under the legislation. Impacts to consider include damaging or removing breeding sites, disturbing birds and their young, and changing access to structures with active nests. Measures to avoid this are detailed in Section 6.3.

5.12.6 Overall, whilst the automated bird surveys have provided insight into the species assemblage, further survey is required to understand the breeding status of those species recorded on site. Recommendations for further survey are detailed in Section 6.2.

[29] Eaton, M.A. et al (2015). Birds of Conservation Concern 4: The population status of birds in the UK, Channel Islands and the Isle of Man. British Birds 108, pp708-746.

5.13 Constraints and Opportunities Summary

5.13.1 Based on the assessment set out above, Table 17 below provides a summary of the potential impacts of the proposed development, prior to the consideration of survey and mitigation recommendations set out in the next section of the report.

Table 17. Assessment Summary

Feature/ receptor	Likely ecological impact	Survey needed?	Mitigation needed?
Dearne Valley Wetlands SSSI	Neutral	✗	✗
Wombwell Wood LWS & Ancient Woodland	Adverse	✗	✓
Scrub	Neutral	✗	✗
Hedgerows & Boundaries	Adverse	✓	✓
Grassland	Adverse	✗	✓
Bats	Adverse	✓	✓
Badger	Adverse	✗	✓
Other mammals	Adverse	✗	✓
Amphibians	Adverse (If GCN are present within pond to north)	✓	?
Birds	Adverse	✓	?

5.13.2 Table 17 highlights that Wombwell Wood LWS, hedgerows, grassland, bats, badgers, other mammals, amphibians and birds could, without mitigation, be subject to adverse effects by the proposed development, e.g. through loss or reduction of habitat and/or severance or disturbance of critical habitat linkages.

5.13.3 Measures to avoid, reduce and compensate for impacts are detailed below in Section 6.3.

6 Recommendations

6.1 Introduction

6.1.1 The recommendations below for further survey and mitigation are based on the results and assessment set out above, taking into account standard published guidance from a number of sources (as referenced through the report), including the GOV.UK information on Planning and Development [30] [31].

6.1.2 Individual Local Planning Authorities have their own requirements for ecological information to support the validation and assessment of planning applications. These requirements often vary widely between Authorities and sometimes do not accord with national guidance- including that issued by the statutory nature conservation organisations. As a result we have applied the more consistent national guidance to our survey and mitigation recommendations set out below.

6.2 Further Survey

6.2.1 This habitat survey has provided a baseline of ecological information to describe the main characteristics of the proposed development site. To fully assess the potential ecological impacts of the proposed development, further survey has been recommended for the habitats and species listed in Table 17.

6.2.2 The methods entailed in surveying these habitats and species are outlined below.

Habitat Surveys

6.2.3 It is recommended that the hedgerows on site which are to be partially lost as a result of the proposed development are assessed to determine if they qualify as ecologically 'important' under The Hedgerow Regulations 1997. The standard survey methodology (Defra 2007) should be used to determine the condition of the hedgerows on site.

Bats

6.2.4 The value of the site for bats has been assessed using the data gathered during two static deployment periods (summer and autumn) together with the two emergence surveys of the existing farm buildings. To supplement this data, it is recommended that an additional two static bat detectors are deployed within the spring period (April – May) to provide assessment of use of the site by bats during this period of the year.

Great Crested Newts

6.2.5 The presence of great crested newts in the pond at TN14 will be determined by use of eDNA [32] sampling. This entails the collection of samples from the pond, which are then

[30] https://www.gov.uk/topic/planning-development/protected-sites-species
[31] https://www.gov.uk/guidance/natural-environment#biodiversity-and-ecosystems
[32] Biggs, J., Ewald, N., Valentini, A., Gaboriaud, C., Griffiths, R. A., 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.

sent for analysis to determine if great crested newt DNA is present. If the sampling returns a positive result for the pond, further survey will be required to determine the population size class to inform an application for a mitigation licence from Natural England – this generally involves a minimum of four visits during April, May, and June, with methods to include bottle trapping, egg searching and torching of ponds.

6.2.6 If GCN presence is confirmed an alternative option is to join Natural England's District Level Licensing (DLL) scheme. A DLL will allow the developer to pay into a Natural England led scheme to provide off-site compensation for the loss of any GCN habitat on site. The charge to developers is proportionate to their likely impact on great crested newt populations, depending on where the development is geographically and relation to known GCN populations, and how large it is. The pond is within an 'amber zone' and is therefore suitable for DLL.

Birds

6.2.7 The bird static deployments have been able to provide a detailed bird species assemblage associated with site. However, due to the potential for habitat loss and/ or general disturbance as a result of development activities, further information is required in order to understand and assess breeding status and how each species is using the site. This will ensure that potential impacts from habitat loss can be properly assessed and mitigated for.

6.2.8 Further survey should be undertaken following the methodology stated in the Bird Survey Guidelines to assess bird interest on site (https://birdsurveyguidelines.org). At least three visits should be undertaken to each part of the site during the optimum bird breeding season (which runs from mid-March to early-July) in suitable weather conditions. This number has been reduced from the recommended six survey visits in order to take a proportionate approach given the size of the site and limited habitat diversity. In addition, the surveys can be supplemented by additional automated detector deployments.

6.3 Mitigation Measures

6.3.1 Mitigation measures should be considered through the masterplan design and planning application process, with actions during the construction and operation phases agreed and established in a Construction Environmental Management Plan (CEMP), Landscape and Ecology Management Plan (LEMP) and Habitat Management and Monitoring Plan (HMMP). This whole process from proposal to implementation should consider the 'mitigation hierarchy' – avoid, reduce, compensate and enhance:

- • Aim to avoid negative effects, e.g. by redesigning the scheme
- • If this isn't possible, use mitigation measures to reduce the impacts
- • Use compensation measures if there are still negative impacts, e.g. by replacing
- habitats
- • Seek opportunities to make enhancements for biodiversity

6.3.2 It is recommended that there are planning conditions for the proposed mitigation and enhancement measures that are detailed in the biodiversity net gain assessment. These

should include a HMMP for the creation and enhancement of grassland, orchard, hedgerows and scrub.

Designated Sites

6.3.3 Mitigation measures will need to be included into the design of the scheme to reduce the impacts of the development upon the Wombwell Wood LWS. This includes (but not exhaustive) the following:

- Local funding towards maintenance of footpaths and signage to encourage people to stay on the paths within the LWS.
- Rubbish bins located in suitable places within the development site to reduce the risk of littering on the LWS.

Off-site Woodland

6.3.4 Potential impacts to the woodland adjacent to the site boundary to the north should be addressed through appropriate mitigation. These mitigation measures will be detailed within the LEMP, and will include:

- Standard pollution prevention measures
- putting up screening barriers to protect the retained habitats from dust and pollution
- during construction
- noise reduction measures
- implementation of root protection zones
- Sensitive lighting scheme to reduce light spill towards the woodland.

Biodiversity Net Gain

6.3.5 The following habitats will be created and managed in accordance with the prescriptions set out in a HMMP, to ensure they meet their appropriate target conditions set out in the calculation sheet; other neutral grassland, traditional orchard, mixed scrub and species-rich native hedgerows.

6.3.6 The exact grassland enhancement methods will be dependent on the results of soil sampling but it is assumed that the outline objectives set out below will form part of the HMMP.

6.3.7 The modified grassland will be overseeded with a wildflower seed mix containing hay rattle *Rhinanthus minor* to suppress undesirable species and improve overall species richness. Measures to reduce ground compaction will be implemented. The grassland will be managed by annual cutting with removal of arisings which will be disposed of offsite to reduce nutrient inputs. These measures will enhance the existing modified grassland to create other neutral grassland in 'moderate' condition.

6.3.8 The proposed traditional orchard and will be planted with a range of species including filbert, apple and pear trees. Scrub encroachment will be managed and restorative pruning will be used to maintain longevity of trees. The surrounding grassland will be other neutral grassland.

6.3.9 The mixed scrub around the SUDs basin will be planted with a diverse range of native

species including dogwood, spindle, oak, dog rose, elder, wych elm and guelder-rose. The scrub will be managed to encourage regeneration of shrubs and a well-developed edge which will provide an ecotone with the other neutral grassland in the surrounding area.

6.3.10 The proposed species-rich native hedgerows will be planted with field maple, hawthorn, apple, blackthorn, holly, rowan, hazel and honeysuckle. As detailed in the HMMP they will be laid, coppiced and cut to encourage a dense growth structure.

6.3.11 The lines of trees and individually planted urban trees will include a wide range of both native and non-native species which are listed within the landscape masterplan (Appendix 4).

Bats

6.3.12 A dark corridor for movement along the woodland edge habitat should be maintained, in particular along the woodland located on the northern boundary of the site, to preserve a commuting route for bats.

6.3.13 A sensitive lighting scheme should be incorporated into the design following guidelines set out in BCT's artificial lighting guidance [33]. This should include the following key measures:

- Pedestrian lighting should be as low intensity as possible. Overhead lighting should be avoided for lighting footpaths to prevent light spill.
- Light spill can also be prevented on the site by using directional lighting features e.g. use of appropriate column heights and horizontally mounted luminaires, use of LED luminaires and warm light sources (2700Kelvin or lower) with peak wavelengths >550nm.

6.3.14 During works, lighting must be kept to a minimum to avoid any adverse impacts on the diversity or numbers of bats within the site – this includes night working or illumination of the site, or parts of the site, for security purposes. Other measures to enhance the site for bats may include bat boxes or bat bricks for roosting, and the native planting mentioned above, to preserve and extend the current foraging and commuting value of the site.

6.3.15 If bats are unexpectedly discovered after development has started, then all work that could harm bats or damage/obstruct their roosts must stop. Expert help should be sought as soon as possible from a qualified and licensed ecologist, before works continue.

Badgers (and other mammals)

6.3.16 It is recommended that a pre-commencement badger survey is undertaken to confirm that the status of badgers within the site and adjacent land within 30m of the work area remains unchanged.

6.3.17 If no evidence of badgers is identified, works can proceed without further constraint. Where badgers are present and may represent a constraint to development, the

[33] Institute of Lighting Professionals, ILP and Bat conservation Trust, BCT (2023). Bats and Artificial Lighting at Night.

requirement for further licensable actions would be required.

6.3.18 During construction, any excavations must be covered up to prevent foraging mammals from becoming trapped and potential injury/death. If covering up is not possible, a means of escape should be provided, such as a ramp.

6.3.19 Enhancement of the site for hedgehogs should be considered through provision of hedgehog highways to ensure connectivity between gardens. Nest boxes should be supplied to provide cover and winter hibernation opportunities.

Birds

6.3.20 Specific mitigation for birds will be dependent upon the outcome of the further surveys recommended in Section 6.2.

6.3.21 However, the following generic mitigation measures should be implemented:

- Site clearance works to be undertaken outside of the bird breeding season (i.e. between November and February inclusive; or
- If the timing of work activities cannot be programmed in this way to avoid affecting breeding birds, then works should only take place after the site has been checked by an experienced ecologist and found to be clear of nests.
- Enhancement of the site for nesting birds should be considered by providing artificial nest boxes, to be installed on retained trees and/or integrated within new housing.

Appendix 1: Desk-study

Common Name	Scientific Name	Conservation Status	Latest Record
Badger	*Meles meles*	PBA	2013
Brown Hare	*Lepus europaeus*	Sect.41	2014
Brown Long-eared Bat	*Plecotus auritus*	EPS, Sect.41, WCA5	2020
Common Pipistrelle	*Pipistrellus pipistrellus*	EPS, WCA5	2020
Daubenton's Bat	*Myotis daubentonii*	EPS, WCA5	2017
European Water Vole	*Arvicola amphibious*	Sect.41	2013
Noctule Bat	*Nyctalus noctula*	EPS, Sect.41, WCA5	2013
Soprano Pipistrelle	*Pipistrellus pygmaeus*	EPS, Sect.41, WCA5	2020
West European Hedgehog	*Erinaceus europaeus*	Sect.41	2019
Common Lizard	*Zootoca vivipara*	Sect.41, WCA5	2020
Common Frog	*Rana temporaria*	WCA5	2020
Common Toad	*Bufo bufo*	Sect.41, WCA5	2020
Great Crested Newt	*Triturus cristatus*	EPS, Sect.41, WCA5	2019
Smooth Newt	*Lissotriton vulgaris*	WCA5	2019
Bluebell	*Hyacinthoides non-scripta*	WCA8	2017

Key	
EPS	European Protected Species (listed in Annex 4 of the EC Habitats Regulations and Schedule 2 of the Habitats Regulations)
PBA	Protection of Badgers Act 1992
Sect.41	Section 41 species on Natural Environment and Rural Communities Act (2006)
WCA5	Listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended)
WCA8	Listed in Schedule 8 of the Wildlife and Countryside Act 1981 (as amended)
ALIEN	Non-native invasive species

Appendix 2: Target Notes

No.	Habitat Type	Description
1	Native Species Rich Hedgerow	Approximately 3m tall and 0.5-1.5m wide, sparse in place as shrubs are young. Species include blackthorn *Prunus spinosa*, hawthorn *Crataegus monogyna*, hazel *Corylus avellana*, sycamore *Acer pseudoplatanus*, silver birch *Betula pendula*, a birch *Betula* sp. and a willow *Salix* sp. Invasive buddleia *Buddleja davidii* locally abundant to west. Nutrient enriched ground dominated by common nettle *Urtica dioica*, cleaver's *Gallium aparine*, hogweed *Heracleum sphondylium* and rosebay willowherb *Chamaenerion angustifolium*.
2	Native Species Rich Hedgerow	Approximately 2.5m tall and 3m wide, unmanaged but dense structure. Species include a willow sp., a rose *Rosa* sp., hazel, blackthorn, a cherry *Prunus* sp., a hawthorn sp., field maple *Acer campestre*, silver birch and elder *Sambucus nigra*. Nutrient enriched ground dominated by dense bracken *Pteridium aquilinum* with common nettle, cleaver's, creeping buttercup *Ranunculus repens* and rosebay willowherb.
3	Modified grassland	Species-poor (less than 6 species per m^2) with some variation in sward height. Dominated by perennial rye-grass *Lolium perenne* with soft brome *Bromus hordeaceus*, and red fescue *Festuca rubra* occurring frequently and cock's-foot *Dactylis glomerata* occurring occasionally. Herbs include a dandelion *Taraxacum* agg. greater plantain *Plantago major*, white clover *Trifolium repens* and occasionally broad-leaved dock *Rumex obtusifolius*.
4	Modified grassland	Species-poor (less than 6 species per m^2) with some variation in sward height. Dominated by perennial rye-grass with soft brome, and red fescue occurring frequently and cock's-foot occurring occasionally. Herbs include a dandelion sp. greater plantain and occasionally broad-leaved dock and creeping buttercup. There are a few fairly large locally dominant patches of white clover.
5	Modified grassland	Uniform short sward (even when regrowth has occurred following initial visit). The same species are present as TN4 but there is more of a range in species per m^2. A narrow 0.5m rough margin exists which is richer in herbs, species here include a vetch *Vicia* sp., curled dock *Rumex crispus*, a cranes-bill *Geranium* sp., salsify *Tragopogon pratensis*, ribwort plantain *Plantago lanceolata* and red clover *Trifolium pratense*.
6	Native Species Rich Hedgerow	Approximately 2.5m tall and 3m wide, dense structure frequently managed. Species include, elder, hawthorn, field maple, blackthorn, hazel and a rose sp. Nutrient enriched ground dominated by common nettle and rosebay willowherb.
7	Other neutral grassland and line of trees	Patches of other neutral grassland partially mown with some rougher areas. Yorkshire fog *Holcus lanatus*, cock's-foot and red fescue dominate with common vetch *Vicia sativa*, red valerian *Centranthus ruber*, ribwort plantain, meadow vetchling *Lathyrus pratensis*, creeping buttercup, a dandelion sp., red clover and white clover also present. Bramble scrub *Rubus fruticosus* is invading. Line of trees present along southern boundary with young field maple, a *Prunus* sp. and horse chestnut *Aesculus hippocastanum*.
8	Bramble scrub	Patch of dense bramble scrub and tall ruderal vegetation. Rosebay willowherb, creeping thistle *Cirsium arvense*, a horsetail *Equisetum* sp. and common nettle.

Appendix 3: Condition Assessment

Development Site

	Condition Assessment Criteria	Criteria Passed (Yes / No)		
		TN3 & 4	**TN5**	
Grassland low distinctiveness	**A - There are 6-8 vascular plant species per m²**	No	Yes	
	B – Sward height is varied	Yes	No	
	C – Scrub <20% of total grassland	Yes	Yes	
	D – Physical damage <5%	Yes	Yes	
	E – Bare ground 1 - 10%	Yes	Yes	
	F – Cover of bracken <20%	Yes	Yes	
	G – Absence of invasive non-native species	Yes	Yes	
	Condition	**Poor**	**Good**	
Condition Assessment Criteria		**TN7**		
Grassland med – high distinctiveness	**A – Good representation of UKHab description**	No		
	B – Sward height is varied	Yes		
	C – Bare ground <1-5%	Yes		
	D – Bracken < 20%, bramble scrub <5%	No		
	E – Undesirable species cover and damaged ground <5%	Yes		
	F – 10 or more species per m²	No		
	Condition	**Poor**		
Condition Assessment Criteria		**TN1**	**TN2**	**TN6**
Hedgerows	**A1 – Average height >1.5m**	Yes	Yes	Yes
	A2 – Average width >1.5m	Yes	Yes	Yes
	B1 – Vertical gaps <0.5m for >90% of length	Yes	Yes	Yes
	B2 – Horizontal gaps <10% of total length	Yes	Yes	Yes
	C1 - >1m of undisturbed ground for >90% of length	No	Yes	Yes
	C2 - <20% cover of nutrient enriched ground	No	No	No
	D1 – >90% of ground is free of invasive/non-natives	No	Yes	Yes
	D2 >90% of ground. is free of damage from human activities	Yes	Yes	No
	E1 - >1 age class of tree present and 1 mature tree per 20-50m	-	-	-
	E2 - >95% of trees are in a healthy condition	-	-	-
	Condition	**Moderate**	**Good**	**Good**
Condition Assessment Criteria		**TN7**		
Individual Trees (Line of trees)	**A - 70% native in block**	Yes		
	Tree canopy is continuous	Yes		
	>50% of trees are mature	No		
	No anthropogenic damage or regular pruning regime	Yes		
	Natural ecological niches present	No		
	>20% tree canopy is oversailing vegetation	Yes		
	Condition	**Moderate**		

Appendix 4: Landscape Masterplan

KEY

- Site boundary
- Existing site vegetation to be retained to BS 5837
- Existing public right of way
- Existing sewer to be retained with easement
- Key pedestrian routes
- Proposed feature tree planting
- Proposed public open space tree planting
- Proposed Orchard tree planting
- Proposed native hedgerow
- Proposed native shrub planting
- Proposed ornamental shrub/herbaceous planting
- Proposed bulb planting
- Amenity grass - e.g. A22 mix by Germinal or similar
- Long grassland - e.g. EM10 mix by Emorsgate or similar
- Wildflower meadow - e.g. EM2 mix by Emorsgate or similar
- Hedgerow mixture - e.g. EH1 mix by Emorsgate or similar
- Seasonally wet meadow mix within attenuation basin - e.g. EM8 mix by Emorsgate or similar
- On-plot soft landscape proposals - shown for context, details to be confirmed
- Proposed footpaths within public open space
- Areas of safety surfacing within play area

INDICATIVE PLANT SCHEDULE

Proposed Tree Planting
Acer campestre
Acer platanoides 'Royal Red'
Acer pseudoplatanus
Alnus glutinosa
Amelanchier lamarckii (ms)
Betula nigra (ms)
Betula pendula
Betula pubescens
Carpinus betulus
Carpinus betulus 'Lucas'
Castanea satvia
Corylus colurna
Fagus sylvatica
Liriodendron tulipifera
Prunus 'Accolade'
Prunus avium 'Plena'
Prunus padus
Quercus robur
Sorbus aria
Sorbus aucuparia
Tilia cordata
Tilia tomentosa 'Brabant'

Proposed Orchard Tree Planting
Coylus maxima
Malus domestica 'Discovery'
Malus domestica 'Golden Delicious'
Pyrus communis 'Doyenné du Comice'
Pyrus communis 'Conference'

Proposed Native Hedgerow Planting Mix
Acer campestre (15%)
Corylus avellana (20%)
Crataegus monogyna (30%)
Ilex aquifolium (10%)
Lonicera periclymenum (2.5%)
Malus domestica (2.5%)
Prunus spinosa (15%)
Sorbus aucuparia (5%)

Proposed Ornamental Hedgerow Planting
Berberis thunbergia 'Erecta'
Escallonia 'Iveyi'
Euonymus 'Green Spire'
Rosmarinus officinalis 'Miss Jessop's Upright'
Viburnum tinus 'Eve Price'

Proposed Native Shrub Planting Mix
Cornus sanguinea (10%)
Euonymus europaea (20%)
Quercus robur (15%)
Rosa canina (10%)
Sambucas nigra (20%)
Ulmus glabra (10%)
Viburnum opulus (15%)

Proposed Ornamental Planting
Anemone x hybrida 'September Charm'
Bergenia 'Silberlicht'
Ceanothus thyrsiflorus var. repens
Deschampsia cespitosa 'Goldtau'
Euonymus fortunei 'Emerald Gaity'
Geranium 'Rozanne'
Hebe 'Red Edge'
Hebe 'Sapphire'
Hebe rakaiensis
Lavandula angustifolia 'Hidcote'
Persicaria bistorta 'Superba'
Pervoskia 'Blue Spire'
Philadelphus 'Manteau d'Hermine'
Pittosporum tenuifolium 'Tom Thumb'
Prunus laurocerasus 'Otto Luyken'
Sarcococca hookeriana var.digyna
Skimmia confusa 'Kew Green'
Skimmia japonica 'Rubella'
Stachys byzantina 'Silver Carpet'
Verbena bonariensis
Viburnum davidii
Viburnum opulus

Proposed Bulb Planting
Crocus tommasinianus
Crocus 'Prins Claus'
Crocus speciosus 'Albus'
Narcissus 'Spring Dawn'

ILLUSTRATIVE LANDSCAPE MASTERPLAN

HEMINGFIELD ROAD, HEMINGFIELD

CLIENT
PTARMIGAN LAND NORTH LTD

DATE	SCALE	TEAM	APPRVD
06/02/2024	1:500 @A0	LAB	FH

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