



Harworth Estates

Rockingham Business Park, Barnsley

ECOLOGICAL APPRAISAL

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1.0 INTRODUCTION

- 1.1 FPCR Environment and Design Ltd were commissioned by Harworth Estates to undertake an ecological assessment of a site adjacent to Shortwood Business Park, Barnsley.
- 1.2 The report provides the details of an Extended Phase 1 habitat survey and a series of faunal surveys undertaken during 2015.

Site Location and Context

- 1.3 The subject site is located adjacent to the west of Shortwood Business Park in Barnsley, South Yorkshire (central grid ref: SE356 010) and includes parcels of land to the north and south of the A6195 dual carriageway. The subject site consists of a former quarry restored to arable and improved pasture with associated native hedgerows and plantation broad-leaved woodland. An attenuation pond, drainage channel (partially culverted) and associated semi-improved grassland are in the southwest and further limited parcels of semi-improved grassland are associated with plantation margins.
- 1.4 In terms of surrounding habitats, the existing residential development of Birdwell is situated to the north west and to the south the more extensive residential area of Hoyland. Junction 36 of the M1 Motorway lies less than 600m to the west. The surrounding land use is largely arable and pasture with an area of broad-leaved semi-natural woodland to the north.

Development Proposals

- 1.5 Proposals are for a mixed used development including B1, B2 and D1 uses.

2.0 METHODOLOGY

Desk Study

- 2.1 In order to compile existing baseline information, relevant ecological information was requested from both statutory and non-statutory nature conservation organisations for the purposes of this appraisal, including:
- Multi Agency Geographic Information for the Countryside (MAGIC) website¹
 - Rotherham Biological Records Centre (RBRC)
 - South Yorkshire Badger Group (SYBG)
- 2.2 Further inspection, using colour 1:25,000 OS base maps (www.ordnancesurvey.co.uk) and aerial photographs from Google Earth (www.maps.google.co.uk) was undertaken in order to provide additional context and identify any features of potential importance for nature conservation in the wider countryside.
- 2.3 The search area for biodiversity information was related to the significance of sites and species and potential zones of influence, as follows:
- 5km around the subject site for sites of International Importance (e.g. Special Area of Conservation, Special Protection Area, Ramsar site)
 - 2km around the subject site for sites of National/ Regional (e.g. Sites of Special Scientific Interest)
 - 1km around the subject site for sites of County Importance species records (e.g. protected, Local Wildlife Sites or UK BAP and notable species).

Extended Phase 1 Survey

- 2.4 The site was surveyed on the 8th June 2015 using the standard Extended Phase I Habitat Survey methodology (JNCC, 2010)², as recommended by Natural England to identify specific habitats of ecological interest. Whilst the species list should not be regarded as exhaustive, sufficient information was gained during the survey to enable classification and assessment of broad habitat types and identify features likely to be of interest.
- 2.5 Hedgerows were surveyed individually using the Hedgerow Evaluation and Grading System (HEGS) (Clements and Toft (1993)³) to enable identification and evaluation of hedgerows of nature conservation importance within the site. Hedgerows were graded on a scale of 1-4, within which grades 1 and 2 are generally considered to be of nature conservation priority (Table 1).

¹ <http://www.magic.defra.gov.uk/>

² JNCC, (2010), Handbook for Phase 1 habitat survey - a technique for environmental audit

³ Clements, D. & Toft, R. (1992). *Hedgerow Evaluation and Grading System (HEGS) – a methodology for the ecological survey, evaluation and grading of hedgerows*. Countryside Planning and Management

Table 1: Conservation Value of Hedgerows

Grade	Value of Hedgerow
-1, 1, 1+	High to Very High
-2, 2, 2+	Moderately High to High
-3, 3, 3+	Moderate
-4, 4, 4+	Low

Protected Species Surveys

- 2.6 Throughout the Extended Phase 1 survey, consideration was given to the actual or potential presence of protected species, such as, although not limited to those protected under the Wildlife and Countryside Act 1981 (as amended)⁴, the Protection of Badgers Act 1992⁵ and the Conservation of Habitats and Species Regulations 2010 (as amended)⁶. Consideration was also given to the existence and use of the site by other notable fauna such as Species of Principal Importance NERC (2006)⁷, or Red Data Book (RDB) species.
- 2.7 As a result of the findings of the desk study and the Extended Phase 1 habitat survey, further faunal surveys were undertaken for a number of species / assemblages as identified below;
- Great crested newt (GCN) *Triturus cristatus* presence / absence survey
 - Badger *Meles meles* survey;
 - Bat surveys (including roost assessment, transect surveys and automated (static surveys to identify potential foraging and commuting routes);
 - Water vole *Arvicola amphibius* survey
 - Breeding bird; and
 - Reptile presence / absence survey
- 2.8 The full reports of these surveys are provided within separate protected species reports. Summary results and evaluation of the findings of these surveys are presented within Sections 3 and Section 4, respectively. Due to limited field signs of the species observed within the site, no separate badger report has been produced. The badger survey was undertaken on 28th October 2015 and followed the methods described in Cresswell, Harris and Jeffries (1989)⁸, including searching for evidence of the species occupation or use of the site as foraging habitat or as a commuting corridor.

⁴ The Wildlife and Countryside Act 1981 (as amended). [Online]. London:HMSO Available at <http://www.legislation.gov.uk/ukpga/1981/69> [Accessed 02/12/2014]

⁵ The Protection of Badgers Act 1992 (as amended). [Online]. London:HMSO Available at: <http://www.legislation.gov.uk/ukpga/1992/51/contents> [Accessed 02/12/2014].

⁶ The Conservation of Habitats and Species Regulations 2010 – Statutory Instrument 2010 No.490. [Online]. London: HMSO. Available at: <http://www.legislation.gov.uk/uksi/2010/490/introduction/made> [Accessed 02/12/2014].

⁷ The Natural Environment and Rural Communities Act 2006. [Online]. London: HMSO Available at: <http://www.legislation.gov.uk/ukpga/2006/16/contents> [Accessed 02/12/2014]

⁸ Cresswell, P., Harris, S. & Jafferries, D.J. (1989) The history, distribution, status and habitat requirements of badger in Britain, Nature Conservancy Council, Peterborough.

3.0 RESULTS

Desk Study

Designated Sites

- 3.1 The locations of all statutory and non-statutory designated sites described in the subsequent two sections are shown in Figure 1.

Statutory Designated Sites

- 3.2 No international sites of nature conservation importance are present within a 5km radius of the subject site.
- 3.3 Two statutory designated sites of local nature conservation importance are located within 2km of the site. Potter Holes Plantation Local Nature Reserve (LNR) comprises a semi mature plantation located approximately 1.3km to the west and is noted for its breeding bird populations. Worsborough Country Park LNR lies approximately 1.5km to the north and comprises an extensive area of reed bed, scrub fen, grasslands and ancient woodland. The site is noted for its breeding bird populations as invertebrate and amphibian interest.

Non-statutory Designated Sites

- 3.4 Data obtained from RBRC indicates the presence of two Local Wildlife Sites (LWS) as detailed within Table 2 below.

Table 2: Designated Sites within Zones of Influence

Site Name/Ref	Designation	Designation Feature	Approximate Distance and Orientation from Site
Short Wood and Hay Green/637	Local Wildlife Site (LWS)	Ancient woodland	50m north
Barrow Colliery Site – Candidate Site/1158	LWS	Ancient woodland and semi-improved neutral grassland	700m north-east

Protected / Notable Species

- 3.5 A number of records for protected and notable species were returned by RBRC for the vicinity of the site. For the sake of conciseness only records for the last 20 years are annotated on Figure 1 and summarised below.
- 3.6 Noctule *Nyctalus noctula* and Pipistrelle bats were recorded within Shortwood Business Park in 2004. Foraging Pipistrelle and *Nyctalus* bat species have been recorded within Barrow Colliery c.700m north-east of the subject site in 2001.
- 3.7 Previous amphibian surveys undertaken by Applied Ecological Services Ltd during 2013 and 2014 (AES Ltd⁹) confirmed the presence of GCN within pond P2 (See Great Crested Newt

⁹ AES Ltd 2013 *Great Crested Newt Late Season Survey: Rockingham* & AES Ltd 2014 *Survey and Assessment for Great Crested Newt (Triturus cristatus) and other Amphibian Species: Rockingham*

Report, FPCR 2016) during 2014 with great crested newt nymphs also stated as being recorded in pond P1 during 2013.

- 3.8 Smooth Newt *Lissotriton vulgaris*, Common Frog *Rana temporaria*, and Common Toad *Bufo bufo* were recorded c.60m north of the subject site within Shortwood Business Park in 2009. Common Frog and Smooth Newt were recorded within the on-site pond P1 in 2005; and Smooth Newt and Common Toad were recorded c.100m west of the subject site in 2005.
- 3.9 Dingy Skipper *Erynnis tages* and Small Heath *Coenonympha pamphilus* were recorded within Barrow Colliery c.700m north-east of the subject site in 2013.
- 3.10 Brown Hare *Lepus europaeus* have been recorded north of the subject site around Barrow Farm in 2013 and 2011
- 3.11 A number of Red and Amber List Birds of Conservation Concern have been recorded c.200m east; 100m north; and 1km north of the subject site. For further details refer to the separate breeding bird report.

Field Survey – Habitats/Flora

- 3.12 The locations of the habitats described below are illustrated in Figure 2: Phase 1 Habitat Plan. Details of Target Notes are included within Appendix A. Full vegetative species-lists are provided in Appendix B.

Broadleaved Woodland

- 3.13 A small belt of semi-natural broadleaved trees was noted at the northern extent of the site. Silver Birch *Betula pendula* dominated the canopy and Elder *Sambucus nigra* and Hawthorn *Crataegus monogyna* were occasional in the shrub layer. Bramble *Rubus fruticosus* dominated the ground flora; Common Nettle *Urtica dioica* and Cleavers *Galium aparine* were frequent and Rough Meadow-grass *Poa trivialis* was occasional.

Plantation Broadleaved Woodland

- 3.14 This habitat was noted in fenced compartments throughout the site bordering improved grassland and arable field compartments. In the thicket stage of establishment it comprised dense plantings of native trees and shrubs with a c.5-7m high canopy casting a dense shade. A mix of native broadleaved trees were noted with Silver Birch, Common Alder *Alnus glutinosa*, and Grey Alder *A. incana* dominating some stands. Heavily shaded ground flora was limited to sparse patches of Rough Meadow-grass *Poa trivialis*, Common Nettle, Cow Parsley *Anthriscus sylvestris* and was dominated by Bramble. Where the canopy thinned out small glades supporting poor semi-improved grassland were noted. Here Yorkshire Fog *Holcus lanatus* dominated whilst Creeping Buttercup *Ranunculus repens* was frequent, Hairy Tare *Vicia hirsuta*, Common Birds-foot Trefoil *Lotus corniculatus*, White Clover *Trifolium repens* and Meadow Vetchling *Lathyrus pratensis* were occasional, and Glaucous Sedge *Carex flacca* was rare.
- 3.15 Target Note 1 (Appendix A) details the location of Common Spotted-orchid *Dactylorhiza fuchsii* within the site.

Scattered Scrub

- 3.16 Some limited areas of scattered scrub were noted at the periphery of plantation woodlands in the north and west. Japanese Rose *Rosa rugosa* (refer to Target Note 2, Appendix A), Dog Rose *R. canina* and Common Ash *Fraxinus excelsior* were noted colonising poor semi-improved grassland.

Species-poor Semi-improved Grassland

- 3.17 The margins of plantation woodland and some limited open areas within woodland stands supported species-poor semi-improved grassland.
- 3.18 Compartment SI1 bordering a public footpath running north to south through the western half of the site supported a mown sward c.50-200mm high (shortest adjacent the path margins). Red Fescue *Festuca rubra* dominated and Meadow Buttercup was locally abundant; Common Mouse-ear *Cerastium fontanum*, Common Birds-foot Trefoil and Ribwort Plantain *Plantago lanceolata* were frequent. Creeping Buttercup and Meadow Vetchling were occasional and False Fox-sedge *Carex otrubae*, Hairy Sedge *C. hirta* and Hairy Tare were rare. At the grasslands southern extent associated with the on-site attenuation pond a small number of Orchid spikes were noted. Two Early Marsh-orchid *Dactylorhiza incarnata* (highlighted at Target Note 3, Appendix A) were recorded here and two spikes of Northern Marsh-orchid *D. purpurella* were noted outside the site boundary at the west margin of the attenuation pond.
- 3.19 Compartments SI2-SI4 comprised a mid-length sward (c.400mm) in semi-shade on a south-west facing slope. They were also dominated by Red Fescue but were less herb-rich than SI1. Other species noted included: Red Clover *Trifolium pratense*, Tufted Vetch *Vicia cracca* and Cat's-ear *Hypochaeris radicata*.
- 3.20 Compartment SI5 comprised an intensively grazed horse paddock with a short sward and poached earth evident in places. Perennial Rye-grass *Lolium perenne* dominated and frequent herbs were limited to Meadow Buttercup, White Clover, Dandelion *Taraxacum officinale* and Common Mouse-ear.
- 3.21 Compartment SI6-SI8 comprised little-managed grassland sward c.500mm high and dominated variously by Red Fescue, Rough Meadow-grass and Crested Dog's-tail *Cynosurus cristatus*.
- 3.22 Compartment SI6 in the east supported frequent Meadow Buttercup and Red Clover and occasional Common Bird's-foot Trefoil, Meadow Vetchling and Common Sorrel. Curled Dock *Rumex crispus* and Oval Sedge *Carex leporina* were rare.
- 3.23 Compartment SI7 colonised a dry drainage channel within plantation woodland. Meadow Buttercup, Red Clover and Common Bird's-foot Trefoil were frequent, Ribwort Plantain was occasional and Hairy Tare was rare.
- 3.24 Compartment SI8 comprised a coarse sward with locally abundant Tall Fescue *Festuca arundinacea* and frequent Yorkshire Fog. Common Spotted-orchid *Dactylorhiza fuchsii* was rare.
- 3.25 The semi-improved grassland verge (SI9) bordering the A6195 comprised a mid-length sward of common and widespread species dominated by Yorkshire Fog. The ruderal component, more noticeable in the western extent included locally abundant Cow Parsley *Anthriscus sylvestris* and rare Wild Teasel *Dipsacus fullonum*. Hairy Tare and Common Vetch *Vicia sativa* were also rare components.

Improved Grassland

- 3.26 Five compartments of intensively managed improved pasture were recorded in the south of the site. Perennial Rye-grass dominated and both White Clover and Creeping Buttercup were frequent.

Standing Water

- 3.27 A eutrophic attenuation pond (P1) was recorded at the site boundary (western half outside the site). The standing water was characterised by an abundance of floating vegetation dominated by Ivy-leaved Duckweed *Lemna trisulca* and gently sloping margins dominated by Common Reed *Phragmites australis* together with abundant Reed Sweet-grass *Glyceria maxima* and Reedmace *Typha latifolia*. Other flora noted included Water Forget-me-not *Myosotis aquatic* and Celery-leaved Buttercup *Ranunculus sceleratus*. A steep-sided drainage channel terminating at a culvert head at the north bank was dominated by Water-cress *Nasturtium officinale*.
- 3.28 A second pond (P1a) comprising a pooled section of ditch approximately 6m² with steep margins and marginal aquatic flora limited to frequent Reedmace. The open water was dominated by Broad-leaved Pondweed *Potamogeton natans*.

Arable

- 3.29 Two compartments of cereal crops were noted in the north supporting margins of less than 1m wide. Weed species noted included Barren Brome *Anisantha sterilis*, Annual Meadow-grass *Poa annua* and Broadleaved Dock *Rumex obtusifolius*.

Hedgerows

- 3.30 Thirteen native hedgerows were recorded within the site, all were of uniform structure and appeared to have been planted within the past thirty years meaning they do not qualify under 1997 Hedgerow Regulations. None supported standard trees though most had good connectivity to young plantation woodland and supported a moderate number of native canopy species. The majority of lengths were therefore assessed as being of conservation priority under the Hedgerow Evaluation and Grading System (HEGS) (scoring -2 or 2).

Table 3: Hedgerow Summary

Ref.	Total Canopy Species	Length (M)	Height x Width (M)	Gaps	Connections	HEGS score	Conservation Value
1	7	200	1-2m x 1-2m	Nil	4	-2	Moderately high-high
2	8	315	1-2m x 1-2m	Nil	3	3+	Moderate
3	7	150	2-4m x 2-3m	Nil	4	2	Moderately high-high
4	7	150	2-4m x 2-3m	Nil	4	2	Moderately high-high
5	7	90	2-4m x 2-3m	Nil	4	2	Moderately high-high

Ref.	Total Canopy Species	Length (M)	Height x Width (M)	Gaps	Connections	HEGS score	Conservation Value
6	6	356	2-4m x 2-3m	Nil	4	2	Moderately high-high
7	5	60	1-2m x 2-3m	Nil	4	2	Moderately high-high
8	6	135	2-4m x 2-3m	Nil	3	2	Moderately high-high
9	6	325	2-4m x 2-3m	10-0%	2	-2	Moderately high-high
10	6	260	1-2m x 2-3m	Nil	2	2	Moderately high-high
11	7	120	1-2m x 2-3m	10-0%	2	-2	Moderately high-high
12	6	252	2-4m x 2-3m	Nil	4	2	Moderately high-high
13	5	150	2-4m x 2-3m	Nil	2	-2	Moderately high-high

Wet Ditch

- 3.31 A steep sided wet ditch (D1) was noted flowing south to north close to the western site boundary from a culvert head in the south through P1a. The southern section was c.500mm deep and 500mm wide and had a moderate flow. It supported c.500mm of water and banks were vegetated by coarse grasses and tall herbs including Common Nettle. The northern section was heavily shaded by young plantation woodland and the channel broadened to over 1m supporting abundant Common Reed within c.50m of P1. Much of the northern section was dry.

Buildings

- 3.32 Four buildings were noted within short horse grazed pasture (SI5) at the south-west boundary and are described in the faunal section below.

Field Results - Fauna

Badger

- 3.33 No evidence of badger was observed within the application site.
- 3.34 Habitats within the site, including the expanses of grassland and woodland habitats provide suitable foraging habitat for any local social groups present within the wider local area.

Bats

Roost Assessment

- 3.35 A number of buildings within the site were inspected for their potential to support roosting bats by a licensed bat worker.
- 3.36 B1 and B2 comprised single-storey sheds built from a single skin of scrap wooden boards and used for equipment storage. Many gaps were visible and the western aspect of B1 and eastern aspect of B2 were open to the elements.
- 3.37 B3 comprised a corrugated metal shed of a single skin with many gaps. The eastern aspect was open to the elements and the structure was used to shelter horses.
- 3.38 The above buildings supported no potential bat roost features and no evidence of bats was found. None were considered to be suitable for roosting bats.
- 3.39 B4 comprised a tightly sealed steel shipping container with no potential bat access points. No evidence of bats or suitable features was noted and the structure is considered to be unsuitable for roosting bats.
- 3.40 No trees were present on site that offered any roosting potential for bats, due to the relatively young age of all of the trees and consequent lack of features.

Activity Surveys

- 3.41 *Walked Transect Surveys* – A total of six transect surveys were undertaken during May to September 2015. During the surveys bat activity ranged from between seventeen passes during the first survey in May and zero during the final September Dawn Survey. Overall only common pipistrelle was identified to species level however passes from *Nyctalus* and *Myotis* species were also recorded. Whilst they couldn't be identified to species level they were strongly believed to be Noctule and Daubenton's *Myotis daubentonii*. Although such low numbers of bats were recorded to render the peak areas of activity to be largely academic, the southernmost cattle grazed area had the highest number of contacts whilst the whole of the site north of the road presented very little bat activity.
- 3.42 *Static Surveys* - Passive monitoring was undertaken during May to September 2015, with a minimum of two static detectors placed within locations considered to be of value to bats, for up to six consecutive nights. During the surveys the greatest levels of activity was recorded on static detector number 1 during the first survey in May with a total of 1237 registrations with the lowest, aside from detector 4 in June which did not register a single pass, being recorded from detector 6 in July which received 47 registrations. The total numbers of bats recorded during the survey period from all species is as follows:

- Common pipistrelle – 3523
- Nyctalus species – 318
- Soprano pipistrelle – 67
- Noctule – 24
- Myotis species – 15
- Pipistrelle species – 9
- Brown long-eared – 1

Detailed survey information is provided in the separate bat survey report (FPCR 2016¹⁰).

Breeding Birds

- 3.43 A total of 32 bird species were recorded during the breeding bird surveys in 2015. Of the species observed, 11 are either protected, appear on the RSPB BoCC as declining (red or amber lists); or are identified as priority species for nature conservation under S41 of the NERC Act. A full list of results can be found in Appendix B, whilst the recorded locations of the 13 notable species can be found on Figure 1 and detailed in Table 4.
- 3.44 Of the 32 species recorded, 11 were confirmed as breeding; blackbird *Turdus merula*, blue tit *Parus caeruleus*, bullfinch *Pyrrhula pyrrhula*, carrion crow *Corvus corone*, goldfinch *Carduelis carduelis*, great tit *Parus major*, long-tailed tit *Aegithalos caudatus*, magpie *Pica pica*, mallard *Anas platyrhynchos*, moorhen *Gallinula chloropus* and woodpigeon *Columba palumbus*. A further 10 species were considered probable breeders whilst the remaining 13 species were considered to be possible or non-breeders.

Table 4. Protected Species of Principal Importance, BoCC Red and Amber Listed Bird Species Recorded on site during Breeding Bird Surveys 2015 and their Recent Status within Yorkshire.

Species	Conservation Status	Peak Count / Survey Occasions Recorded	Breeding Status	Recent Status within Yorkshire
Black-headed Gull	Amber List	1/1	Non-breeder	Common breeder and abundant in winter
Bulfinch	Amber List NERC ACT (S41)	5/2	Breeding	Uncommon breeder; scarce passage migrant / winter visitor
Dunnock	Amber List NERC ACT (S41)	3/3	Probable-breeder	Abundant resident; passage migrant
House sparrow	Red List NERC ACT (S41)	1 colony/2	Non-breeder	Abundant resident but has decreased
Kestrel	Amber List	1/1	Non-breeder	Fairly common resident and passage migrant

¹⁰ FPCR 2016 Bat Survey Report

Species	Conservation Status	Peak Count / Survey Occasions Recorded	Breeding Status	Recent Status within Yorkshire
Mallard	Amber List	2/1	Confirmed Breeder	Fairly common breeder; common migrant and winter visitor
Reed bunting	Amber List NERC ACT (S41)	1/2	Probable-breeder	Fairly common breeding resident and passage migrant
Skylark	Red List NERC ACT (S41)	2/3	Probable-breeder	Common resident; passage migrant and winter visitor
Starling	Red List NERC ACT (S41)	40/3	Non-breeder	Abundant but decreasing resident, passage migrant and winter visitor
Willow warbler	Amber List	7/3	Probable-breeder	Common to abundant breeding summer visitor and passage migrant
Yellowhammer	Red List NERC ACT (S41)	1/1	Non-breeder	Fairly common resident and passage migrant

3.45 Many habitats are of recent origin, having been created as part of a restoration scheme of the former colliery site. Habitats on site include areas of open improved pasture, recent plantation woodland/scrub and open water with associated reeds/ephemeral habitats. The following provides a summary of the breeding bird assemblages recorded during the breeding bird surveys within these different habitat types.

- **Grassland** – large areas of improved grassland with smaller areas of semi/unimproved grassland were present on-site. The grasslands generally supported few bird species however swallow were recorded foraging overhead presumably due to the high numbers of winged invertebrates resulting in part no-doubt from the presence of dairy cattle. Rook were also recorded foraging within the grassland areas, also believed to be in connection with the cattle. No skylark were recorded during any of the surveys within these compartments which although the habitats were considered to be suitable, the intensive grazing regime was considered to cause levels of disturbance greater than that which skylark, or other ground nesting birds, were willing to tolerate.
- **Plantation** – compartments of young mixed species plantation were present located throughout the site. These areas offered suitable foraging and nesting habitat to a wide number of woodland edge specialists including long-tailed tit, robin *Erithacus rubecula*, wren *Troglodytes troglodytes*, magpie *Pica pica*, chaffinch *Fringilla coelebs*, great tit *Parus major*, blue tit *Parus caeruleus*, willow warbler *Phylloscopus trochilus*, blackcap *Sylvia atricapilla*, blackbird and wood pigeon. Active carrion crow and wood pigeon nests were recorded within these areas along with a number of disused carrion crow and wood pigeon nests from previous attempts.
- **Waterbodies** – two waterbodies were present within the survey area associated with which were all of the aquatic species including mallard, moorhen, reed bunting and reed warbler. The northernmost pond held the majority of the species with mallard, moorhen, reed bunting

and reed warbler all present with only moorhen present on the southern waterbody. The northernmost waterbody was densely vegetated with a variety of emergent aquatic plants with only a small area of open water and had large quantities of deep silt. The southernmost waterbody was densely fringed with common reed *Phragmites australis* with a central area of open water and firm banks which dropped vertically away into several feet of water. Although no nests were observed, behaviour strongly indicative of nesting was present from all of the above species with moorhen chicks being recorded.

- **Hedgerows, Scrub** – Hedgerows abounded several of the fields, often forming the boundary between field compartments and the plantation woodland. These areas offered nesting and foraging opportunities for a variety of species including blackbird, dunno, wren and robin. Whilst no nests were recorded within these areas they were considered to provide excellent opportunities for a range of species.
- **Farmland** – A small assemblage of birds indicative of farmland habitats were recorded including skylark and yellowhammer, both BoCC red list and Species of Principle Importance however these were recorded in very low numbers with peak counts of just 2 and 1 birds respectively. Yellowhammer was recorded during a single survey occasion and so not considered to be a breeding species with skylark being recorded on 2 survey occasions making this a probable breeder.

- 3.46 Detailed survey information is provided in the separate Breeding Bird survey report (FPCR 2016¹¹) which includes a location plan of all the notable bird species recorded.

Herpetofauna

Amphibians

- 3.47 To the north of the A6195 the site was divided between arable fields and plantation broad-leaved woodland. The arable habitats offered extremely limited suitability for GCN due to their exposed nature and lack of habitat structure. The plantation woodland comprised habitat of greater value providing potential connectivity between the ponds surrounding with potential habitat for sheltering and over-wintering. To the south of the A6195 the majority of the site was split between further areas of plantation broad-leaved woodland providing habitat of greater value and intensively managed improved grassland which was considered to be generally unsuitable for GCN. The remainder of the habitats included scrub, hedgerows and wet and dry ditches, all of which had value providing potential sheltering and foraging habitat and links across the site and into the wider area.
- 3.48 Aquatic surveys were undertaken on ponds P1 - P5 during May and June 2015. No great crested newts were recorded during the surveys (Table 5). Smooth newts were recorded in ponds P1, P2 and P4 with a peak count of 9 recorded in pond P1 on the 8th May 2015. No other amphibians were recorded.

¹¹ FPCR 2016 Breeding Bird Survey Report

Table 5: Great Crested Newt Survey Results

Pond Number	Total Count							
	GCN		Smooth		Toad		Frog	
	Num	Eggs	Num	Eggs	Num	eggs	Num	eggs
1	-	-	14	Y	-	-	-	-
1a	Dry							
2	-	-	1	-	-	-	-	-
3	-	-	-	-	-	-	-	-
4	-	-	2	-	-	-	-	-
5	-	-	-	-	-	-	-	-

(B=Bottle Trapping, T=Torching, N=Sweep Netting, E=Egg Search)

- 3.49 Surveys of the site were undertaken by Applied Ecological Services Ltd during 2013 and 2014 (AES Ltd¹²). A single great crested newt was recorded in pond P2 during 2014 with great crested newt nymphs also stated as being recorded in P1 during 2013 (although the photograph presented in the report appears to be inconclusive).
- 3.50 Detailed survey information is provided in the separate great crested newt report (FPCR 2016¹³) which includes a location plan of all the water bodies surveyed.

Reptiles

- 3.51 The south of the site comprised 5 compartments of improved grassland in association with several young plantation woodland compartments and semi-improved grassland margins. While the margins between woodland and grassland provided some suitable habitat for reptile species, the majority of these areas were characterised by grassland compartments that abruptly abutted woodland habitats providing a limited extent of edge habitat favoured by reptile species. These areas were therefore considered unsuitable for further survey. The north of the site comprised two arable fields and a plantation woodland compartment. Reptile refugia were placed along habitats that were considered suitable for reptile species including:
- A wet ditch and 2 ponds were present along south-western boundary of the site offering suitable foraging habitat for grass snake.
 - A dry ditch on the south-east of the site offered seasonally wet habitat for foraging grass snake.
- 3.52 During the surveys no reptiles were recorded, Table 6 presents the full survey conditions, timings and results.

¹² AES Ltd 2013 Great Crested Newt Late Season Survey: Rockingham & AES Ltd 2014 Survey and Assessment for Great Crested Newt (*Triturus cristatus*) and other Amphibian Species: Rockingham

¹³ FPCR 2016 Great Crested Newt Report

Table 6: Reptile Survey Results

Survey Occasion	Date	Time	Weather	Reptile Sightings
1	04.06.15	08:00	Sunny, 14°C	None
2	08.06.15	08:50	Sunny, cloud cover, 13°C	None
3	04.09.15	09:00	Overcast, 13°C	None
4	10.09.15	17:00	Cloud cover, 15°C	None
5	21.09.15	17:15	Sunny, cloud cover, 15°C	None
6	25.09.15	17:00	Sunny, cloud cover, 13°C	None
7	29.09.15	17:15	Sunny, 14°C	None

- 3.53 Further detailed survey information is provided in the separate Reptile Survey Report (FPCR, 2016¹⁴).

Water Vole

- 3.54 The wet ditch (D1) and the two ponds (P1 and P1a) present within the site were considered to provide some limited suitability for Water Vole *Arvicola amphibius*. No evidence, including latrines, prints, feeding evidence or runs, to confirm the presence of water vole was noted at the time of the survey in either of the ponds or ditch. Detailed survey information is provided in the separate water vole report (FPCR 2016¹⁵).

¹⁴ FPCR 2016 Reptile Survey Report

¹⁵ FPCR 2016 Water Vole Report

4.0 DISCUSSION AND RECOMMENDATIONS

Statutory Designations

- 4.1 No statutory designations will be affected by the proposals.

Non-statutory Designations

- 4.2 Short Wood and Hay Green LWS (ref.637) is separated from the subject site by existing residential and the subject site supports no ancient or mature woodland for which this non-statutory site is designated. Short Wood and Hay Green LWS is also inaccessible to the public and therefore will not be affected by increased foot traffic as a result of the proposed development.
- 4.3 Given the separation of the subject site (c.700m including existing residential and woodland) from Barrow Colliery Site LWS loss of habitat to the proposals is not considered likely to significantly affect this LWS. Barrow Colliery Site LWS is accessible via c.1km of public footpath however given that proposals are for a business park it is considered unlikely to result in an increase in pedestrian traffic sufficient to significantly impact the designating habitats of the LWS.
- 4.4 The proposals are not considered likely to significantly affect the above non-statutory designated sites which therefore do not represent a constraint to the proposals.

Habitats

- 4.5 The semi-natural and plantation woodland, scrub, improved grassland, arable and much of the semi-improved habitats are considered to be of low ecological value and do not meet the Local Wildlife Site (LWS) selection criteria for Barnsley¹⁶ due to their limited floristic diversity. The small compartment of broadleaved woodland is considered to be a habitat of principal importance under the NERC Act 2006¹⁷ and is a Local Biodiversity Action Plan (LBAP) habitat for Barnsley.
- 4.6 The semi-improved grassland associated with P1 (southern extent of SI1) though not supporting sufficient species diversity to meet LWS selection criteria is considered to be of greater diversity when assessed in a site context.
- 4.7 The hedgerows comprised at least 80% native species and are a habitat of principal importance under the NERC Act. Planted species-rich hedgerows are also an LBAP habitat for Barnsley. Though the hedgerows were heavily managed and supported limited structural diversity the majority were assessed as being of conservation priority under HEGS.
- 4.8 Under the NPPF development should seek to contribute a net gain in biodiversity where possible.
- 4.9 It is recommended that the semi-natural woodland and native hedgerows are retained within the proposed development where feasible. Hedgerow losses should be replaced on at least like-for-like basis.

¹⁶ Rotherham Metropolitan Borough Council (March 2011) *Rotherham Local Wildlife Site System – Part 2 Site Selection Guidelines For Rotherham*.

- 4.10 It is recommended that the southern extent of SI1 is retained within the proposals with connectivity to similar off-site habitats to the west.
- 4.11 Japanese Rose *Rosa rugosa* which is listed under Schedule 9 Part 2 of the Wildlife and Countryside Act 1981 (amended) as a non-native invasive species was recorded in association with plantation woodland. Under Section 14 (2) of the above act it is an offence to cause to grow in the wild a Schedule 9 plant. It is recommended that this plant be dug up and buried on-site during works and plant material from this species should not be removed off-site.

Protected and or notable species

- 4.12 Consideration was given throughout the survey to the potential presence of protected species. Principal pieces of legislation protecting wild species to be considered are Part 1 of the Wildlife and Countryside Act 1981(as amended) (WCA) and the Conservation of Habitats and Species Regulations 2010 (as amended) (Habitats Regulations). The impact that this legislation has on the Planning system is outlined in ODPM 06/2005 Government Circular: Biodiversity and Geological Conservation – Statutory obligations and their Impact within the Planning System.
- 4.13 This guidance states that as the presence of protected species is a material consideration in any planning decision, it is essential that the presence or otherwise of protected species, and the extent to which they are affected by proposals is established prior to planning permission being granted. Furthermore, where protected species are present and proposals may result in harm to the species or its habitat, steps should be taken to ensure the long-term protection of the species, such as through attaching appropriate planning conditions for example.
- 4.14 The NPPF advises that LPA's should aim to conserve and enhance biodiversity by applying a set of principles including:
- If significant harm resulting from a development cannot be avoided....., adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
 - Development proposals where the primary objective is to conserve or enhance biodiversity should be encouraged.
- 4.15 Retention of habitats and species of principal importance under the NERC act 2006 (also previously UK BAP priority species) will assist in conserving the biodiversity value of the site.
- 4.16 The implications that European protected species have for the proposed development are covered in separate reports referenced in this document.

Badger

- 4.17 Badgers are protected by statute under The Protection of Badgers Act 1992. This legislation makes it an offence to wilfully kill, injure, take possess or cruelly ill-treat a badger, or intentionally or recklessly interfere with a sett.
- 4.18 No evidence of badger was observed during the specific badger survey undertaken or incidentally during the suite of additional surveys undertaken on the site during 2015. The grassland and woodland habitats within the site offer suitable foraging habitat to badgers, however, based on the absence of field signs, the site does not provide areas of important forage for any local group. No impacts to any social group are therefore anticipated and the species does not pose a constraint to development.

- 4.19 In accordance with best practice, a full badger survey will be conducted prior to each stage of site clearance in the development programme. Where in the unlikely events any setts are identified and disturbance impacts are considered significant, mitigation will be put in place for any affected setts and may be ratified under licence by Natural England. This is likely to involve either supervised and licensed sett closure and / or the use of protective badger fencing where appropriate.

Bats

- 4.20 All bat species and their habitats are protected under the Wildlife and Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations 2010. In summary these make it an offence to damage, destroy or obstruct any place used by bats for breeding and shelter, disturb a bat, or kill, injure or take a bat.

Roost Habitat

- 4.21 Ground based assessments of the trees were made, during which no features suitable to support bats were recorded largely due to the species of trees and their immaturity.
- 4.22 As such bats within trees need not be considered further and arboricultural works can take place without the need for further survey nor supervision of works.
- 4.23 A total of four buildings B1, B2, B3 and B4 were present within an area of horse grazed pasture to the extreme south of the site, all of which were predominantly corrugated metal horse shelters none of which offered any potential to support roosting bats beyond perhaps occasional feeding roosts however the lack of prey remains suggested that they were not used for this purpose.
- 4.24 During the building inspections no evidence of bats was recorded nor was there considered to be any potential for the structures to support roosting bats.
- 4.25 As such bats are not considered to pose a constraint to the removal of any of the on-site buildings.

Commuting and Foraging Habitat

- 4.26 Taking into account the results of both transect and static surveys, the features considered to be of greatest value to bats is the southernmost field compartment of the southern part of the main site. That being said, even the peak levels of activity were considered to be so low as to raise doubt as to the value of these areas and it is considered more likely that the higher levels of bats has arisen by chance as opposed to numbers of bats regularly using the same routes. The species recorded during both surveys is considered to be unremarkable both in terms of overall bat numbers and the species recorded with both the levels of activity and individual species present being typical of both the local and wider area. That being said, an assemblage of bats was recorded and the site did hold value for this group, albeit limited.
- 4.27 Proposals should focus on ensuring that as little foraging habitat as possible is removed, lighting and noise are both kept to a minimum and where possible habitats are enhanced to improve their ability to support invertebrates. Connectivity through the site should be maintained and enhanced where possible, particularly the boundary habitats and hedgerows which should not be breached if possible. Lighting will be implemented as part of the development. All species of bats are sensitive to artificial light and will avoid well-lit areas. The lighting scheme would be designated

with regard to current guidance provided by the Bat Conservation Trust¹⁸ and the Institution of Lighting Professionals¹⁹ and adopt the following principles:

- The avoidance of direct lighting of existing trees, hedgerows, woodland edges and wetland habitats, or areas of habitat creation / landscape planning;
- Where appropriate the road and any flood lighting should use low pressure sodium or high pressure sodium instead of mercury or metal halide lamps;
- Lighting will be directional so that unnecessary light spillage is avoided;
- Lighting columns would in general be as short as possible, although in some locations taller columns would allow reduced horizontal spill, and
- Lighting levels would be as low as guidelines permit and only used where required for public safety.

- 4.28 Additional enhancement in the form of bat boxes on suitable semi-mature/ mature trees around the site, especially in association with linear features or woodland and edge habitats would also create additional opportunities for roosting bats.

Breeding Birds

- 4.29 The principal legislation afforded to the protection of UK wild birds is the Wildlife and Countryside Act 1981 (as amended). Under this legislation all birds, their nests and eggs are protected by law and it is an offence, with certain exceptions to recklessly or intentionally kill take or injure a wild bird, to take, damage or destroy a nest of any wild bird while in use or being built and to take or destroy the egg of a wild bird. Those listed on Schedule 1 of this Act are afforded protection from disturbance when on nest. In addition a number of birds are listed as species of principal importance under the NERC Act (2006)
- 4.30 The breeding bird surveys have highlighted that the site supports a breeding bird assemblage typical of the habitats present on-site. The young plantation and scrub habitats that were considered to be of most note however these were still considered to be low in overall numbers with no rare species or assemblages considered to be notable. The breeding bird assemblage recorded is considered to be of no more than Local Nature Conservation Value.
- 4.31 The site is not considered to support any bird species considered to be particularly sensitive to disturbance with the vast majority of species recorded being typical of urban/suburban habitats whilst the remainder, including yellow hammer, whilst typically found in rural areas are not particularly sensitive to disturbance.
- 4.32 It should however be noted that some disturbance will occur from activities including construction work, mainly machinery noise and construction personnel. Such impacts could potentially cause the temporary displacement of some birds from the site and a consequent reduction in breeding success.
- 4.33 To avoid disturbance to breeding birds, ground clearance works and vegetation will be undertaken prior to the bird-breeding season (March to September inclusive). If this is not possible, vegetation will be checked prior to removal by an experienced ecologist. If active nests

¹⁸ Bat Conservation Trust (2011) Statement of the impact and design of artificial light on bats

¹⁹ Institution of Lighting Professionals (2011) Guidance Notes for Reduction of Obtrusive Light

are found, vegetation will be left untouched and suitably buffered from works until all birds have fledged. Specific advice will be provided prior to undertaking the clearance. This would be a statutory requirement due to the protection of all nesting birds and their nests under the Wildlife and Countryside Act, 1981. A suitably qualified ecologist would supervise this.

Herpetofauna

Amphibians

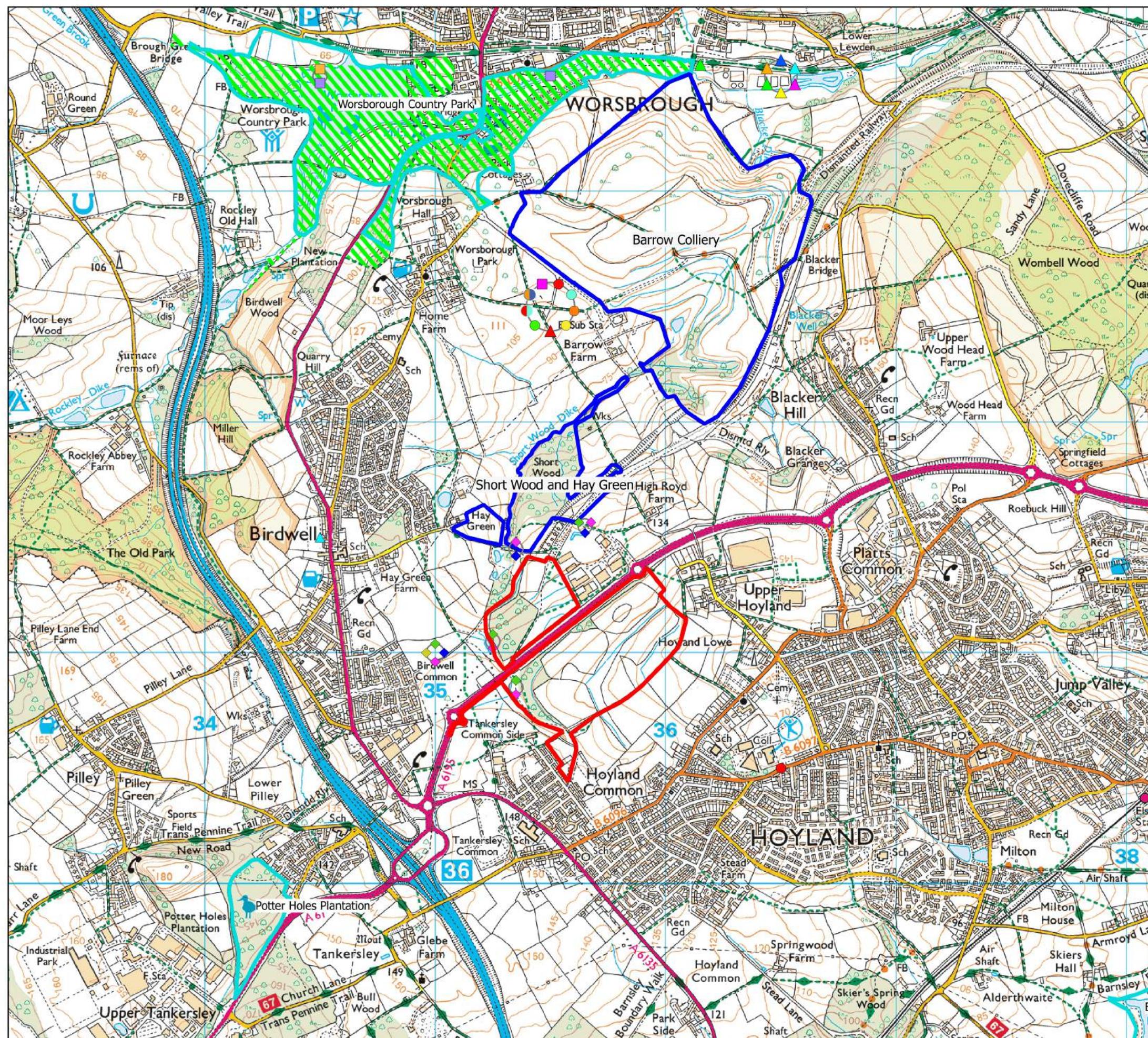
- 4.34 Great crested newts and their habitats in water and on land are protected under the Wildlife and Countryside Act 1981 (as amended), and by the Conservation of Habitats and Species Regulations 2010. These make it an offence to damage, destroy or obstruct any place used by great crested newts for breeding or shelter, disturb a great crested newt, or kill, injure or take any great crested newts. In addition, great crested newt is listed as a species of principal importance under the provisions of the NERC Act 2006.
- 4.35 GCN nymphs were stated as being present within P1 during netting surveys in 2013 undertaken by AES; however, aquatic surveys completed by AES the following year and by FPCR in 2015 found no evidence of GCN during any of the survey occasions. It is therefore considered reasonably unlikely that GCN are present within this waterbody.
- 4.36 No GCN were found during works to 'Phase 1' of the development and the GCN surveys undertaken by FPCR in 2015 also observed no GCN. Based on this in conjunction with the results of previous survey it is considered likely that only a very small number of individual GCN are present within P2. In order to ensure that no GCN or common amphibians are harmed as part of the proposals the following precautionary mitigation shall be implemented (as detailed further within the great crested newt report (FPCR 2016):
- Any areas proposed for works to habitats within 60 m of P2 shall be subject to a 'finger-tip' search by a qualified ecologist immediately prior to works commencing. This should take place outside of the hibernating season (typically November – February inclusive) and will include searching all areas that have the potential to be utilised by GCN (and common amphibian) such as scrub, tussocky grassland, woodland and any refuge or form of potential sheltering habitat. Vegetation should be removed within 24hrs and checked again if there is a delay past this period. In the event that GCN are found works will stop and advice sought from the LPA.
 - To avoid creation of new habitat all vegetation should be removed from site, raised on pallets or centrally located within arable compartments to remove any potential for habitation and subsequent harm to these species.
 - Protective fencing should be installed around all ponds and surrounding terrestrial habitat that will not be affected by the works to ensure that there are no direct impacts to these habitats. Fencing should remain in place for the duration of works and there should be no transgression of people or machinery past this point.
 - No machinery / plant or construction material should be stored within fenced areas to avoid potential harm to GCN and all appropriate pollution-prevention measures shall be undertaken to ensure no adverse impacts upon any waterbodies.

Reptiles

- 4.37 Although habitats within the site were considered to provide some potential for occupation by reptile species, none were recorded during the presence/absence surveys undertaken in 2015. It is possible that the isolation of the site by surrounding roads and residential development has prevented colonisation.
- 4.38 Therefore, based on the above, it is considered that the presence of reptiles can be reasonably discounted and that there are no constraints to the proposals from the presence of reptile species. As such no further survey or mitigation is considered necessary

Water Vole

- 4.39 The absence of local recent records and field signs indicates that the site is of negligible interest for water vole. The pond was considered to be the only feature on-site which offered any potential to support this species. The site is considerably separated from all surrounding records of water vole both in term of distance and connectivity, with all of the records being historical. It is therefore considered that if populations were still present in the wider area, individuals would be highly unlikely to colonise the limited area of suitable habitats within site. It is therefore considered that this species does not provide a constraint to the proposed development and that no further survey or mitigation is required.



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Key

- Site Boundary
- Local Wildlife Sites (LWS)
- Local Nature Reserves (LNR)
- Country Parks
- Soprano Pipistrelle
- Bats
- Brown Long-Eared Bat
- Leisler's Bat
- Noctule
- Nyctalus Bat species
- Pipistrelle Bat species
- ◆ Common Frog
- ◆ Common Toad
- ◆ Great Crested Newt
- ◆ Smooth Newt
- ▲ Black-Tailed Godwit
- ▲ Brambling
- ▲ Fieldfare
- ▲ Firecrest
- ▲ Green Sandpiper
- ▲ Kingfisher
- ▲ Redwing
- Harvest Mouse
- Hedgehog
- Water Vole

client
Harworth Estates Ltd.

project
Rockingham Business Park, Barnsley

drawing title
SITE LOCATION AND COSULTATION RESULTS PLAN

scale
1:17,245

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ABS / TM

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Figure 1

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- Application Site Boundary
- Broadleaved Woodland
- Plantation Broadleaved Woodland
- Scattered Scrub
- Semi-improved Grassland
- Improved Grassland
- Arable
- Hedgerow
- Fence
- Pond
- Wet Ditch
- Dry Ditch
- Building
- Target Note with reference



Harworth Estates

Rockingham Business Park, Bamsley

PHASE I HABITAT PLAN

Not to scale @ A3 AWB / 01.07.2015

Figure 2

Appendix A: Target Notes

Target Note	Description
1	3 spikes of Common Spotted-orchid <i>Dactylorhiza fuchsii</i> were noted within plantation broadleaved woodland.
2	Schedule 9 invasive non-native Japanese Rose <i>Rosa rugosa</i> .
3	2 spikes of Early Marsh-orchid <i>Dactylorhiza incarnata</i> were noted within poor semi-improved woodland

Appendix B: Botanical Species Lists

Broadleaved Woodland

Common Name	Scientific Name	Frequency
Cow Parsley	<i>Anthriscus sylvestris</i>	O
Silver Birch	<i>Betula pendula</i>	D
Hawthorn	<i>Crataegus monogyna</i>	O
Broom	<i>Cytisus scoparius</i>	R
Cock's-foot	<i>Dactylis glomerata</i>	O
Field Horsetail	<i>Equisetum arvense</i>	R
Cleavers	<i>Galium aparine</i>	F
Apple	<i>Malus domestica</i>	R
Rough Meadow-grass	<i>Poa trivialis</i>	O
Hybrid Oak	<i>Quercus petraea x robur (Q. x rosacea)</i>	O
Meadow Buttercup	<i>Ranunculus acris</i>	R
Bramble	<i>Rubus fruticosus agg.</i>	D
Sallow	<i>Salix sp.</i>	O
Elder	<i>Sambucus nigra</i>	O
Dandelion	<i>Taraxacum officinale agg.</i>	R
Common Nettle	<i>Urtica dioica</i>	F

Plantation Broadleaved Woodland

Common Name	Scientific Name	Frequency
Alder	<i>Alnus glutinosa</i>	D
Grey Alder	<i>Alnus incana</i>	D
Wild Angelica	<i>Angelica sylvestris</i>	LF
Cow Parsley	<i>Anthriscus sylvestris</i>	O
Daisy	<i>Bellis perennis</i>	R
Silver Birch	<i>Betula pendula</i>	D
Glaucous Sedge	<i>Carex flacca</i>	R
Common Mouse-ear	<i>Cerastium fontanum</i>	O
Creeping Thistle	<i>Cirsium arvense</i>	O
Hawthorn	<i>Crataegus monogyna</i>	F
Crested Dog's-tail	<i>Cynosurus cristatus</i>	R
Cock's-foot	<i>Dactylis glomerata</i>	F
Red Fescue	<i>Festuca rubra agg.</i>	R
Cleavers	<i>Galium aparine</i>	P
Yorkshire-fog	<i>Holcus lanatus</i>	D

Common Name	Scientific Name	Frequency
Meadow Vetchling	<i>Lathyrus pratensis</i>	O
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>	O
Ribwort Plantain	<i>Plantago lanceolata</i>	O
Rough Meadow-grass	<i>Poa trivialis</i>	P
Hybrid Oak	<i>Quercus petraea x robur (Q. x rosacea)</i>	P
Creeping Buttercup	<i>Ranunculus repens</i>	F
Bramble	<i>Rubus fruticosus agg.</i>	D
Curled Dock	<i>Rumex crispus</i>	R
Sallow	<i>Salix sp.</i>	P
Dandelion	<i>Taraxacum officinale agg.</i>	P
White Clover	<i>Trifolium repens</i>	O
Tufted Vetch	<i>Vicia cracca</i>	LF
Hairy Tare	<i>Vicia hirsuta</i>	O
Common Vetch	<i>Vicia sativa</i>	P

Poor Semi-improved Grassland (SI1)

Common Name	Scientific Name	Frequency
Yarrow	<i>Achillea millefolium</i>	R
Common Bent	<i>Agrostis capillaris</i>	LF
Creeping Bent	<i>Agrostis stolonifera</i>	O
Alder	<i>Alnus glutinosa</i>	
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>	O
Silverweed	<i>Argentina anserina</i>	
Daisy	<i>Bellis perennis</i>	R
Glaucous Sedge	<i>Carex flacca</i>	O
Hairy Sedge	<i>Carex hirta</i>	R
False Fox-sedge	<i>Carex otrubae</i>	R
Common Centaury	<i>Centaurium erythraea</i>	R
Common Mouse-ear	<i>Cerastium fontanum</i>	F
Rosebay Willowherb	<i>Chamerion angustifolium</i>	R
Spear Thistle	<i>Cirsium vulgare</i>	R
Crested Dog's-tail	<i>Cynosurus cristatus</i>	
Cock's-foot	<i>Dactylis glomerata</i>	O
Common Spotted Orchid	<i>Dactylorhiza fuchsii</i>	R
Early Marsh-orchid	<i>Dactylorhiza incarnata</i>	R
Northern Marsh-orchid	<i>Dactylorhiza purpurella</i>	R
Wild Carrot	<i>Daucus carota</i>	R
Tufted Hair-grass	<i>Deschampsia caespitosa</i>	O

Common Name	Scientific Name	Frequency
Teasel	<i>Dipsacus fullonum</i>	R
Broad-leaved Willowherb	<i>Epilobium montanum</i>	R
Field Horsetail	<i>Equisetum arvense</i>	O
Red Fescue	<i>Festuca rubra</i> agg.	F
Cleavers	<i>Galium aparine</i>	F
Dove's-foot Crane's-bill	<i>Geranium molle</i>	R
Bristly Oxtongue	<i>Helminthotheca echinoides</i>	R
Yorkshire-fog	<i>Holcus lanatus</i>	F
Cat's-ear	<i>Hypochaeris radicata</i>	O
Compact Rush	<i>Juncus conglomeratus</i>	O
Soft Rush	<i>Juncus effusus</i>	LF
Hard Rush	<i>Juncus inflexus</i>	O
Meadow Vetchling	<i>Lathyrus pratensis</i>	O
Oxeye Daisy	<i>Leucanthemum vulgare</i>	R
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>	F
Gypsywort	<i>Lycopus europaeus</i>	O
Black Medic	<i>Medicago lupulina</i>	R
White Melilot	<i>Melilotus albus</i>	R
Red Bartsia	<i>Odontites verna</i>	O
Timothy	<i>Phleum pratense</i>	O
Ribwort Plantain	<i>Plantago lanceolata</i>	F
Greater Plantain	<i>Plantago major</i>	O
Rough Meadow-grass	<i>Poa trivialis</i>	O
White Poplar	<i>Populus alba</i>	
Pedunculate Oak	<i>Quercus robur</i>	
Common Sorrel	<i>Rumex acetosa</i>	R
Silverweed	<i>Potentilla anserina</i>	R
Meadow Buttercup	<i>Ranunculus acris</i>	O
Creeping Buttercup	<i>Ranunculus repens</i>	O
Common Sorrel	<i>Rumex acetosa</i>	R
Goat Willow	<i>Salix caprea</i>	
Autumn Hawkbit	<i>Scorzoneroides autumnalis</i>	O
Hoary Ragwort	<i>Senecio erucifolius</i>	O
Common Dandelion	<i>Taraxacum officinale</i>	O
Hop Trefoil	<i>Trifolium campestre</i>	O
Lesser Trefoil	<i>Trifolium dubium</i>	R
Red Clover	<i>Trifolium pratense</i>	F
White Clover	<i>Trifolium repens</i>	R
Colt's-foot	<i>Tussilago farfara</i>	R
Tufted Vetch	<i>Vicia cracca</i>	O

Common Name	Scientific Name	Frequency
Hairy Tare	<i>Vicia hirsuta</i>	O
Bush Vetch	<i>Vicia sepium</i>	R

Poor Semi-improved Grassland (SI2)

Common Name	Scientific Name	Frequency
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>	R
False Oat-grass	<i>Arrhenatherum elatius</i>	O
Daisy	<i>Bellis perennis</i>	R
Common Mouse-ear	<i>Cerastium fontanum</i>	F
Creeping Thistle	<i>Cirsium arvense</i>	P
Crested Dog's-tail	<i>Cynosurus cristatus</i>	R
Cock's-foot	<i>Dactylis glomerata</i>	R
Red Fescue	<i>Festuca rubra</i> agg.	D
Yorkshire-fog	<i>Holcus lanatus</i>	F
Cat's-ear	<i>Hypochaeris radicata</i>	F
Soft Rush	<i>Juncus effusus</i>	F
Meadow Vetchling	<i>Lathyrus pratensis</i>	P
Oxeye Daisy	<i>Leucanthemum vulgare</i>	R
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>	F
Ribwort Plantain	<i>Plantago lanceolata</i>	F
Meadow Buttercup	<i>Ranunculus acris</i>	F
Creeping Buttercup	<i>Ranunculus repens</i>	LF
Dog Rose	<i>Rosa canina</i> agg.	R
Common Sorrel	<i>Rumex acetosa</i>	R
Hoary Ragwort	<i>Senecio erucifolius</i>	R
Dandelion	<i>Taraxacum officinale</i> agg.	R
Red Clover	<i>Trifolium pratense</i>	O
White Clover	<i>Trifolium repens</i>	F
Colt's-foot	<i>Tussilago farfara</i>	O
Tufted Vetch	<i>Vicia cracca</i>	P
Common Vetch	<i>Vicia sativa</i>	O

Poor Semi-improved Grassland (SI3)

Common Name	Scientific Name	Frequency
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>	O
False Oat-grass	<i>Arrhenatherum elatius</i>	F
Common Mouse-ear	<i>Cerastium fontanum</i>	F
Rosebay Willowherb	<i>Chamerion angustifolium</i>	P
Smooth Hawk's-beard	<i>Crepis capillaris</i>	O
Crested Dog's-tail	<i>Cynosurus cristatus</i>	P

Common Name	Scientific Name	Frequency
Cock's-foot	<i>Dactylis glomerata</i>	F
Tufted Hair-grass	<i>Deschampsia caespitosa</i>	R
Red Fescue	<i>Festuca rubra</i> agg.	D
Yorkshire-fog	<i>Holcus lanatus</i>	F
Cat's-ear	<i>Hypochaeris radicata</i>	P
Meadow Vetchling	<i>Lathyrus pratensis</i>	R
Rough Meadow-grass	<i>Poa trivialis</i>	O
Meadow Buttercup	<i>Ranunculus acris</i>	F
Red Clover	<i>Trifolium pratense</i>	P

Poor Semi-improved Grassland (SI4)

Common Name	Scientific Name	Frequency
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>	R
Common Mouse-ear	<i>Cerastium fontanum</i>	R
Smooth Hawk's-beard	<i>Crepis capillaris</i>	R
Cock's-foot	<i>Dactylis glomerata</i>	R
Red Fescue	<i>Festuca rubra</i> agg.	D
Yorkshire-fog	<i>Holcus lanatus</i>	F
Perforate St. John's-wort	<i>Hypericum perforatum</i>	R
Cat's-ear	<i>Hypochaeris radicata</i>	R
Ribwort Plantain	<i>Plantago lanceolata</i>	R
Common Sorrel	<i>Rumex acetosa</i>	LF
Hop Trefoil	<i>Trifolium campestre</i>	R
Red Clover	<i>Trifolium pratense</i>	O
Tufted Vetch	<i>Vicia cracca</i>	F
Common Vetch	<i>Vicia sativa</i>	O

Poor Semi-improved Grassland (SI5)

Common Name	Scientific Name	Frequency
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>	R
Daisy	<i>Bellis perennis</i>	O
Common Mouse-ear	<i>Cerastium fontanum</i>	F
Perennial Rye-grass	<i>Lolium perenne</i>	D
Ribwort Plantain	<i>Plantago lanceolata</i>	P
Annual Meadow-grass	<i>Poa annua</i>	O
Meadow Buttercup	<i>Ranunculus acris</i>	F
Broad-leaved Dock	<i>Rumex obtusifolius</i>	O
Common Ragwort	<i>Senecio jacobaea</i>	R
Dandelion	<i>Taraxacum officinale</i> agg.	F
White Clover	<i>Trifolium repens</i>	F

Common Name	Scientific Name	Frequency
Common Nettle	<i>Urtica dioica</i>	R
Common Vetch	<i>Vicia sativa</i>	O

Poor Semi-improved Grassland (SI6)

Common Name	Scientific Name	Frequency
Creeping Bent	<i>Agrostis stolonifera</i>	O
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>	O
Cow Parsley	<i>Anthriscus sylvestris</i>	R
Oval Sedge	<i>Carex ovalis</i>	R
Common Mouse-ear	<i>Cerastium fontanum</i>	O
Creeping Thistle	<i>Cirsium arvense</i>	O
Marsh Thistle	<i>Cirsium palustre</i>	R
Crested Dog's-tail	<i>Cynosurus cristatus</i>	D
Common Couch	<i>Elytrigia repens</i>	LD
Field Horsetail	<i>Equisetum arvense</i>	LA
Red Fescue	<i>Festuca rubra</i> agg.	LA
Yorkshire-fog	<i>Holcus lanatus</i>	F
Cat's-ear	<i>Hypochaeris radicata</i>	R
Compact Rush	<i>Juncus conglomeratus</i>	R
Hard Rush	<i>Juncus inflexus</i>	R
Meadow Vetchling	<i>Lathyrus pratensis</i>	O
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>	O
Annual Meadow-grass	<i>Poa annua</i>	O
Rough Meadow-grass	<i>Poa trivialis</i>	D
Meadow Buttercup	<i>Ranunculus acris</i>	F
Common Sorrel	<i>Rumex acetosa</i>	O
Curled Dock	<i>Rumex crispus</i>	R
Broad-leaved Dock	<i>Rumex obtusifolius</i>	R
Dandelion	<i>Taraxacum officinale</i> agg.	P
Hop Trefoil	<i>Trifolium campestre</i>	R
Red Clover	<i>Trifolium pratense</i>	F
Colt's-foot	<i>Tussilago farfara</i>	O
Tufted Vetch	<i>Vicia cracca</i>	O
Hairy Tare	<i>Vicia hirsuta</i>	O
Common Vetch	<i>Vicia sativa</i>	F

Poor Semi-improved Grassland (SI7)

Common Name	Scientific Name	Frequency
Daisy	<i>Bellis perennis</i>	R
Common Knapweed	<i>Centaurea nigra</i>	O

Common Name	Scientific Name	Frequency
Crested Dog's-tail	<i>Cynosurus cristatus</i>	D
Yorkshire-fog	<i>Holcus lanatus</i>	F
Cat's-ear	<i>Hypochaeris radicata</i>	F
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>	F
Ribwort Plantain	<i>Plantago lanceolata</i>	O
Meadow Buttercup	<i>Ranunculus acris</i>	F
Dandelion	<i>Taraxacum officinale</i> agg.	R
Hop Trefoil	<i>Trifolium campestre</i>	F
Red Clover	<i>Trifolium pratense</i>	F
White Clover	<i>Trifolium repens</i>	F
Hairy Tare	<i>Vicia hirsuta</i>	R
Common Vetch	<i>Vicia sativa</i>	F

Poor Semi-improved Grassland (SI8)

Common Name	Scientific Name	Frequency
Crested Dog's-tail	<i>Cynosurus cristatus</i>	R
Common Spotted-orchid	<i>Dactylorhiza fuchsii</i>	R
Tall Fescue	<i>Festuca arundinacea</i>	LA
Red Fescue	<i>Festuca rubra</i> agg.	D
Yorkshire-fog	<i>Holcus lanatus</i>	F
Meadow Buttercup	<i>Ranunculus acris</i>	F
Creeping Buttercup	<i>Ranunculus repens</i>	F
Common Sorrel	<i>Rumex acetosa</i>	P
Broad-leaved Dock	<i>Rumex obtusifolius</i>	P
Common Vetch	<i>Vicia sativa</i>	F

Poor Semi-improved Grassland (SI9)

Common Name	Scientific Name	Frequency
Cow Parsley	<i>Anthriscus sylvestris</i>	LA
Mugwort	<i>Artemisia vulgaris</i>	R
Common Mouse-ear	<i>Cerastium fontanum</i>	F
Creeping Thistle	<i>Cirsium arvense</i>	O
Rough Hawk's-beard	<i>Crepis biennis</i>	LF
Cock's-foot	<i>Dactylis glomerata</i>	F
Wild Teasel	<i>Dipsacus fullonum</i>	R
Red Fescue	<i>Festuca rubra</i> agg.	O
Dove's-foot Crane's-bill	<i>Geranium molle</i>	R
Yorkshire-fog	<i>Holcus lanatus</i>	D
Oxeye Daisy	<i>Leucanthemum vulgare</i>	R
Ribwort Plantain	<i>Plantago lanceolata</i>	O

Common Name	Scientific Name	Frequency
Rough Meadow-grass	<i>Poa trivialis</i>	O
Meadow Buttercup	<i>Ranunculus acris</i>	P
Creeping Buttercup	<i>Ranunculus repens</i>	R
Broad-leaved Dock	<i>Rumex obtusifolius</i>	R
Sallow	<i>Salix sp.</i>	R
Colt's-foot	<i>Tussilago farfara</i>	P
Common Nettle	<i>Urtica dioica</i>	O
Tufted Vetch	<i>Vicia cracca</i>	O
Hairy Tare	<i>Vicia hirsuta</i>	R
Common Vetch	<i>Vicia sativa</i>	R