Midland Road, Royston - Ecological Appraisal

Kier Living Ltd

Report prepared by:
Ecus Ltd.
Brook Holt
3 Blackburn Road
Sheffield
S61 2DW
0114 266 9292

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Ecus Ltd

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Approved By:	 Robert Bell Senior Ecologist Date: June 2016

Prepared by:
Ecus Ltd.
Brook Holt
3 Blackburn Road
Sheffield
S61 2DW
0114 2669292

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Summary

Ecus Ltd was commissioned in June 2016 to undertake an Ecological Appraisal of an area of land off Midland Road, Royston, South Yorkshire.

The site comprises a large area of semi-improved neutral grassland with areas of tall ruderal vegetation, scrub, introduced shrub, scattered trees, one hedgerow and areas of hardstanding. The site is surrounded by existing housing and local shops. The housing on the northern boundary of the site has been recently constructed, leaving small areas of spoil and construction material on site.

Proposals for the site include the construction of 80 residential dwellings, associated residential roads, gardens and an area of public open space.

Habitats on site are considered to be of importance to nature conservation at the site level only.

Great crested newts are not considered a receptor for works, and it is considered highly unlikely that other amphibian species will be found on site. In the event that an amphibian is encountered it should be carefully picked up in gloved hands and moved to an area of safety.

Badgers are considered an unlikely receptor for the site, however foxes and other mammals may be resident in the local area. A best practice approach to works is therefore recommended that all deep excavations should be covered overnight unless completely fenced off and any unfenced/uncovered shallow excavations should have a scaffold board or equivalent placed in them to one side to act as an escape ramp should small mammals fall in.

Tree 1 (Figure 1) is considered to display low bat roost potential. While no further survey is required a precautionary approach to felling should be undertaken, to include cross cutting away from sections of the tree which may support cavities and leaving of the felled tree *in-situ* overnight prior to removal from site. The lighting plan for the proposed development should be carefully considered to ensure it avoids or minimises light spill across scattered trees outwith, but adjacent to the western boundary to maintain their functionality for commuting and foraging bats.

Nesting birds are considered to be a potential receptor for the proposed development. Any removal of trees, scrub or hedgerows should be ideally undertaken between September and February (inclusive), outside the bird breeding season. Should this not be possible, it is recommended a nesting bird check of vegetation is undertaken by an ecologist prior to removal.

No other ecological constraints have been identified during the ecological assessment.

Ecological enhancement recommendations appropriate to the site have been included within the report.

1. Introduction

1.1.1 Ecus Ltd was commissioned in June 2016 to undertake an Ecological Appraisal of an area of land located off Midland Road, Royston, South Yorkshire (central national grid reference: SE 36318 11748), to inform a planning application for the development of the site.

1.1.2 The site comprises an area of semi-improved neutral grassland, scrub, tall ruderal vegetation, introduced shrub, areas of hardstanding and bare ground. Approximately half of the site has been cleared of a previous development leaving several raised bunds and areas of compacted ground where standing water collects. A row of mature trees lines outwith, but immediately adjacent to the western boundary of the site and a small section of hedgerow planting is present at the south-eastern corner of the site. The site is surrounded by local housing and infrastructure, with a new housing development in the final stages of construction present directly to the north of the site.

1.1.3 The purpose of survey was to carry out an extended Phase 1 habitat survey and to review the potential for the site to contain, or be used by, species protected under either UK or European nature conservation legislation, namely, the Wildlife & Countryside Act 1981 (as amended), the Conservation of Habitats and Species Regulations 2010 and the Natural Environment and Rural Communities Act 2006. Any impact upon such habitats or species that is likely to result from the proposed development has been assessed.

1.1.4 This report details the findings of the survey work and subsequent impact assessment. Methodologies employed are described including site surveys and evaluation and the need for any further survey work and/or mitigation measures are included, where appropriate. Ecological enhancements are also provided.

2. Methodology

2.1 Data Consultation

2.1.1 Data consultation was undertaken by Ecus Ltd in June 2016 with Barnsley Biological Records Centre (BBRC) as part of the ecological assessment process, to determine whether there are any existing biological records or locally designated sites of nature conservation interest within 1 km of the survey area.

2.1.2 South Yorkshire Bat Group (SYBG) was also consulted for any additional records of bats within 1 km of the site. South Yorkshire Badger Group (SYBadgerG) was contacted for badger records, but no response was received.

2.1.3 The Multi-Agency Geographic Information for the Countryside (MAGIC) website (http://magic.defra.gov.uk) was consulted for information on statutory designated sites of nature conservation interest within 1 km of the survey area in June 2016.

2.1.4 Information returned from BBRC, SYBG and MAGIC is incorporated within this report in the relevant sections.

2.2 Extended Phase 1 Habitat Survey

2.2.1 The site was surveyed on 13th June 2016 using extended Phase 1 habitat survey methodology (JNCC, 2010) by graduate ecologist Sarah Unsworth GradCIEEM. The habitats and vegetation types present were recorded on to a field map. This survey method aims to characterise habitats and communities present and is not intended to provide a complete list of all plants occurring across the site.

2.2.2 Notable, rare or scarce plant species were highlighted if present. Evidence of protected species or species of nature conservation importance was recorded where present at the time of survey. Species recorded are included within the report as appropriate and a full list of species recorded on the day of survey is provided in Appendix 2. Information is presented in Figure 1, using Target Notes (TN) to identify particular features of interest, where appropriate.

2.2.3 Habitats present that are listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 or the local Biodiversity Action Plan (LBAP) for the Barnsley Area were noted.

2.2.4 LBAP habitats discussed within this report include:

- Semi-improved grassland;
- previously developed land;
- deciduous woodland and
- hedgerow

2.2.5 Relevant LBAP species include:

- bats;
- reptiles; and
- hedgehog.

2.2.6 The value and sensitivity of ecological features present on site were determined based on the guidance given in 'Guidelines on Ecological Impact Assessment' (CIEEM, 2016). Individual ecological receptors (habitats and species that could be affected by the development) for the scheme were assigned levels of importance for nature conservation. The highest level is international, then decreasing in order of importance through national, regional, county, local, and lastly site level.

Hedgerow Assessment

2.2.7 A hedgerow is defined as "...*any boundary line of trees or shrubs over 20 m long and less than 5 m wide, and where any gaps between the trees and shrub species are less than 20 m wide"* (Bickmore, 2002). Any bank, wall, ditch or tree within 2 m of the centre of the hedgerow is considered to be part of the hedgerow habitat, as is the herbaceous vegetation within 2 m of the centre of the hedgerow."

2.2.8 The hedgerow was assessed under the landscape and wildlife criteria listed in Schedule 1 Part II of the Hedgerow Regulations 1997, using the standard methodology in the Regulations, which is detailed below.

2.2.9 For hedgerows of 30 m in length or less, the entire hedgerow is surveyed. Hedgerows greater than 30 m in length are split in to 100 m sections and the central 30 m of each 100 m section is surveyed. The number of woody species present is recorded within each length along with the presence of any of the features listed in Sub-paragraph 4 of the Regulations, including presence of a bank, wall, or ditch, less than 10 % gaps, at least one standard tree per 50 m, at least three woodland plant species, at least four points achieved from connections to other hedgerows, woods or ponds, and/or a parallel hedge within 15 m.

2.2.10 A hedge is considered important under the Regulations if:

- It has an average of seven or more woody species in the surveyed section(s);
- It has an average of six woody species in the surveyed section(s) and three or more features from Sub-paragraph 4;
- It has six woody species and one of the following rare trees – black poplar, large-leaved lime, small-leaved lime, wild service tree;
- It has an average of five woody species on average in the survey section(s) and has four or more features from Sub-paragraph 4;
- It has four woody species on average in surveyed section(s), is adjacent to a footpath, bridleway or byway open to all traffic (BOAT) and has two or more features from Sub-paragraph 4.

2.3 Protected and Key Species

2.3.1 Any evidence of protected species or groups encountered during the survey

was recorded. This included observations of field signs and an assessment of the suitability of the habitats present to support protected species. For full details of legislation relating to all habitats and species discussed within this report visit http://www.legislation.gov.uk.

Amphibians

2.3.2 Ponds within 500 m of the site, which are not separated from the site by a major barrier, were searched for using an Ordnance Survey (OS) map. No ponds were identified and therefore great crested newts (*Triturus cristatus*) are not considered to be a receptor for the proposed development. It is possible that garden ponds are present in neighbouring housing and therefore site habitats suitability to support other amphibian species was considered.

Badger

2.3.3 Signs of badger (*Meles meles*) activity were searched for within the survey area as part of the extended Phase 1 survey. Survey followed standard methodology detailed in Surveying Badgers (Harris *et al*., 1989). This included survey for badger setts, along with survey of linear features and boundaries for signs of badger activity including dung pits, foraging marks, feeding signs and pathways.

Bats

2.3.4 No buildings are present on site, however all trees were inspected to assess their potential to support roosting bats. In accordance with best practice, the potential suitability of tree features to support roosting bats was categorised as negligible, low, moderate or high, based on the number and type of roosting features and surrounding landscape character (Collins, 2016).

2.3.5 The survey area was also assessed for its suitability for foraging and commuting bats.

Birds

2.3.6 Detailed bird survey was not undertaken as part of this assessment, however whilst on site the opportunity was taken to record all species of birds encountered and habitats on site were assessed for their value to nesting and foraging birds.

Reptiles

2.3.7 The habitats present on site were assessed for their suitability to support basking, foraging and hibernating reptiles, with reference to their connectivity with other suitable habitat in the surrounding area.

Riparian mammals and white-clawed crayfish

2.3.8 A desk based search for watercourses on site, and within 30 m of the site, which are not separated from the site by a major barrier, was undertaken using an Ordnance Survey (OS) map.

2.3.9 None were identified and therefore otter (*Lutra lutra*), water vole (*Arvicola amphibius*) and white-clawed crayfish (*Austropotamobius pallipes*) are not considered to be a constraint for the proposed development and are not considered further within this report.

Other protected and key species

2.3.10 The opportunity was taken whilst on site to assess habitats for their potential to support other protected species, search for signs of nationally or locally scarce or notable species, or any species protected under national or international nature conservation law.

2.4 Invasive species

2.4.1 During the extended Phase 1 habitat survey, any evidence of invasive species, as listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), was recorded where seen.

2.5 Limitations

2.5.1 Two areas of dense vegetation could not be fully explored to check for the present of mammal holes, however these areas are limited in extent and the perimeters were walked to search for mammal signs. It is therefore considered that a robust assessment of mammal activity on site has been made.

3. Findings and Evaluation

3.1 Site Description

3.1.1 The site comprises an area of semi-improved grassland with areas of scattered scrub, introduced shrub and trees, tall ruderal vegetation and bare ground also present. The grassland across the western half of the site has colonised bare ground left following clearance of buildings, and several large bunds are present within this area that support tall ruderal vegetation. The grassland across the eastern half of the site supports a greater diversity of species having been established for a longer period of time.

3.1.2 Works are currently underway to create new footpaths through the north of the site, to inter-link the new housing development to the north with the site itself. These works, along with construction of the new housing development has left areas of bare and disturbed ground. The disturbed ground has been colonised by semi-improved grassland; however, the grassland is still establishing and bare ground is still visible throughout much of this area.

3.1.3 A hardstanding playground is present at the south-eastern corner of the site, which is surrounded by fencing. A narrow strip of dense bramble scrub is present between the playground area the site boundary. Remnant introduced shrubs are also present around the boundary of the playground, with other areas of introduced shrub present at the west of the site.

3.2 Designated Sites

3.2.1 There are no statutory or non-statutory designated sites of importance to nature conservation within 1 km of the site.

3.3 Habitats

Semi-improved grassland

3.3.1 The site is dominated by neutral semi-improved grassland. The grassland is in a tall sward across the majority of the site. The establishing grassland at the north of the site is still developing, at a lower height and with a more open sward.

3.3.2 The grassland to the east of the survey area (TN1) appears to have previously been a playing field that has been left unmanaged for a number of years. While dominated by grass species the sward contains a relatively diverse assemblage of species. Species recorded include dominant red fescue (*Festuca rubra*), with frequent Yorkshire fog (*Holcus lanatus*), occasional rough meadow grass (*Poa trivialis*) and soft brome (*Bromus hordeaceus*). Forbs include common mouse ear (*Cerastium fontanum*), creeping buttercup (*Ranunculus repens*), lesser stithwort (*Stellaria graminea*), red clover (*Trifolium repens*), common vetch (*Vicia sativa*), meadow buttercup (*Ranunculus acris*) and common sorrel (*Rumex acetosa*). Damp areas within the grassland also supported cuckoo flower (*Cardamine pratensis*) and soft rush (*Juncus effusus*). A full list of species with their DAFOR can be found in Appendix 2.

3.3.3 Across the western half of the site (TN2) the grassland has established on land cleared of buildings. The sward in this area supports a greater number of coarse grass and forb species, such as false oat grass (*Arrhenatherum*

elatius), common ragwort (*Jacobea vulgaris*), cat's-ear (*Hypochaeris radicata*), creeping thistle (*Cirsium arvense*), and broad leaved dock (*Rumex obtusifolius*).

3.3.4 The grassland at the north of the site that has established on recently disturbed ground is of a similar composition to the grassland across the rest of the site, with some additional species such as common poppy (*Papaver rhoeas*), common fumitory (*Fumaria officinalis*), white campion (*Silene latifolia*), scentless mayweed (*Tripleurospermum inodorum*), weld (*Reseda luteola*) and yarrow (*Achillea millefolium*). Areas of bare ground are still visible through the grassland in this area; however, the habitat has developed past the point at which it would be considered as scattered ephemeral/perennial vegetation.

3.3.5 Lowland meadow/neutral grassland is included as a habitat of principal importance under Section 41 of the NERC Act 2006, and semi-improved grassland is listed on the Barnsley LBAP. The grassland on site is not flower-rich or managed in a traditional meadow regime although areas do support a relatively diverse assemblage of species. Overall the grassland on site is not considered to be of importance beyond the site level.

Tall ruderal

3.3.6 At site margins and on the raised bunds left from demolition of previous buildings the vegetation is more dominated by tall ruderal vegetation; although many of the grassland species are also present in these areas. This habitat was characterised by broad leaved dock, bramble (*Rubus fruiticosus* agg.), common nettle (*Urtica dioica*), cow parsley (*Anthriscus sylvestris*), teasel (*Dipsacus fullonum*), creeping thistle, spear thistle (*Cirsium vulgare*) and greater willowherb (*Epilobium hirsutum*).

3.3.7 Tall ruderal is not a habitat of principal importance under Section 41 of the NERC Act 2006, nor is it listed on the Barnsley LBAP. This habitat is limited in extent, does not contain any notable species and is commonly found in the wider area. As such, the tall ruderal habitat on site is not considered to be of importance to nature conservation beyond the site level.

Hedgerow

3.3.8 A small section (~50 m) of outgrown hedgerow (H1) is present on the eastern boundary of the site. The hedgerow contained hawthorn (*Crataegus monogyna*), elder (*Sambucus nigra*), and sycamore saplings (*Acer psuedoplatanus*). A small group of crack willow (*Salix fragilis*) trees is present at the northern end of the hedgerow.

3.3.9 The hedgerow on site does not comprise the required number of species or features listed within Sub-paragraph 4 to be classed as important under Schedule 1 Part II of the Hedgerow Regulations 1997. However, it does comprise >80% of one or more native species and are therefore classed as a habitat of principal importance under the NERC Act 2006. In addition, hedgerows are listed as a priority habitat on the Barnsley LBAP.

3.3.10 The hedgerow on site is limited in extent, unmanaged and outgrown and has no connectivity to the wider hedgerow network. Consequently the hedgerow habitat on and immediately adjacent to site is not considered to be of importance to nature conservation at greater than a site level.

Scrub

3.3.11 Areas of dense and scattered scrub are present on site. Bramble scrub is present along half of the southern site boundary and several large areas of scrub dominated by tree saplings are present within the western half of the site towards the northern boundary. Species within this habitat include bird cherry (*Prunus padus*), silver birch (*Betula pendula*), elder, goat willow (*Salix caprea*), dogwood (*Cornus sanguinea*), butterfly bush (*Buddleja davidii*), teasel, creeping thistle and bramble.

3.3.12 Scrub is not a habitat of principal importance under Section 41 of the NERC Act 2006, nor is it listed on the Barnsley LBAP. This habitat does not contain any notable species and is frequently occurring in the wider area. As such, the scrub habitat on site is not considered to be of importance to nature conservation beyond the site level.

Introduced shrub

3.3.13 Areas of introduced shrub are present on the eastern, southern and western site boundaries, with other areas present within the western half of the site and along an access road that joins the site to Midland Road. Species recorded within this habitat include pyracantha (*Pyracantha* sp.), berberis (*Berberis* sp.), cotoneaster (*Cotoneaster var. Sternianus*), stag horn sumac (*Rhus typhina syn. R. hirta)*, an ornamental hawthorn (*Crataegus* sp.), and Wilson's honeysuckle (*Lonicera nitida*).

3.3.14 Introduced shrub is not listed as a habitat of principal importance under Section 41 of the NERC Act or on the Barnsley LBAP. This habitat is dominated by non-native species, many of which can have invasive tendencies. This habitat is limited in extent and while offers some foraging opportunities to birds and invertebrates present in the local area it is not considered to be of importance to nature conservation outwith the site level.

Scattered trees

3.3.15 A small number of trees are present on site. Two groups are present on site (one at the north-west corner and the other at the northern end of H1) with a dense scrub understory. One living and one dead tree are also within the western section of grassland (TN2). Species include ash (*Fraxinus excelsior*), lime (*Tilia x europaea*), and sycamore, with elder, hazel (*Corylus avellana*), bird cherry, bramble and dogwood present in the dense understorey.

3.3.16 A row of large mature trees is also present outwith, but immediately adjacent to the site's western boundary. The trees are dominated by ash and lime, with some sycamore also present.

3.3.17 Scattered trees are not listed as habitats of principal importance under Section 41 of the NERC Act 2006 or as priority habitat on the Barnsley LBAP. The trees on site are limited in extent and there is an abundance of scattered trees in the local area, particularly in parkland to the south of Midland Road. Trees on site are therefore considered of importance to nature conservation at a site level only. However, trees outwith the western boundary are mature and form a clear linear feature along the site and are therefore considered to be of importance to nature conservation at up to a local level.

Hardstanding and bare/disturbed ground

3.3.18 A hardstanding playground area is present in the south-eastern corner of the site and a number of hardstanding footpaths are present across the site. Areas of bare/ disturbed ground are present on site having been created during construction of the northern housing development and on-going footpath creation works within the north of the site.

3.3.19 These areas comprise common man-made habitats and whilst the areas of bare/disturbed ground are becoming colonised by grasses and ephemeral species, these areas have little ecological interest, are limited in extent and are recently disturbed and degraded. As such they are considered to be of negligible importance to nature conservation and are not discussed further within this report.

3.4 Species

Amphibians

3.4.1 Barnsley Biological Records Centre (BBRC) returned 1 record of a common toad (*Bufo bufo*) approximately 940 m north of site in 2011. No records of either great crested newt or other common amphibian species were returned for locations within 1 km of the site. Several ephemeral pools were present on site on the day of the survey; formed in tire tracks and areas that have been compacted by machinery. These pools had no aquatic or marginal vegetation and many were formed on bare ground.

3.4.2 There is potential for common amphibians to use habitats on site, if they are present in the local area. However, given the lack of amphibian records or ponds on or near to site, it is considered that amphibians are unlikely to be found on site, but their presence cannot be ruled out entirely. Site habitats are not considered to be of importance to common amphibians at greater than the site level.

Badger

3.4.3 No records of badger were returned by BBRC for locations within 1 km of the site.

3.4.4 No evidence of badgers was recorded during the site survey, such as setts, latrines or snuffle holes. Remains of what appeared to be pigeon were found in two areas likely attributable to fox (*Vulpes vulpes*).

3.4.5 Given the site's location near the centre of Royston and the presence of housing on all boundaries, lack of connectivity with other areas of habitat and limited areas of dense cover on site, badgers are considered to be an unlikely receptor for the proposed development. Site habitats are not considered to be of importance to badger at greater than the site level.

Bats

3.4.6 A total of 28 bat records were returned within 1 km of the site, of which eight were returned by BBRC and 20 by South Yorkshire Bat Group (SYBG). There were seven roost records returned, pertaining to pipistrelle species (*Pipistrellus* sp.) or unidentified bats (Vespertillionidae). The closest record related to an unidentified pipistrelle roost approximately 200 m north of site in 2009. The remaining 21 records related to bats in flight, dead or grounded

bats or were not specified. Species recorded comprising nine common pipistrelle (*Pipistrellus pipistrellus*) records, one whiskered bat record (*Myotis mystacinus*) and 11 unidentified species records.

3.4.7 There are no buildings present on site to provide roosting opportunities. One dead tree on site does however display features with low bat roost potential. All other trees are considered to display negligible potential to support roosting bats.

3.4.8 Site habitats may contribute to a wider foraging resource and/or act as connectivity links for bat species resident within the local area. In particular, the scattered trees outwith, but immediately adjacent to the western site boundary. However, given the dominance of open grassland on site, surrounding housing and lack of connectivity with other features suitable for foraging bats, site habitats are not considered to be of importance to bats beyond the site level.

Birds

3.4.9 In 2015, a re-assessment of Birds of Conservation Concern (BoCC) was published by Eaton *et al*. (2015), which defined rare and threatened bird species on two lists (Red and Amber) describing the level of threat to each species of concern.

3.4.10 "Red" is the highest conservation priority, with species needing urgent action due to either a historical decline in breeding population, severe (>50%) decline in breeding or non-breeding population, or severe decline in breeding range over 50 years or more. "Amber" is the next most critical group, with species qualifying for this status as a result of either recovery from red list criterion, being classed as rare breeders in the UK, moderate (>25%) decline in breeding or non-breeding population or moderate decline in breeding range over 25 years or more. These categories are followed by Green, indicating that the species are relatively unthreatened.

3.4.11 BBRC returned a total of six records of a UK BAP/NERC Act priority bird species within 1 km of the site. These pertained to five house sparrow (*Passer domesticus*) records from a location approximately 800 m south of site in 2009 and yellow hammer (*Emberiza citronella*), recorded approximately 400 m west of site in 2011. Both house sparrow and yellow hammer are Red list species.

3.4.12 Blackbird (*Turdus merula*), house sparrow, woodpigeon (*Columba palumbus*) and song thrush (*Turdus philomelos*) were noted on the day of survey. The majority of activity was associated with the row of scattered trees on the western boundary and areas of scrub. House sparrow and song thrush are Red list species and the other birds recorded are included on the Green list.

3.4.13 The grassland is surrounded by housing and accessed by local children, leading to regular disturbance, limiting its utility for ground nesting birds. The hedgerow, scrub and trees on site have potential to provide structural cover for a variety of nesting birds. However, given the abundance of similar habitat within the wider area, the site is considered to be of importance to nesting and foraging birds at the site level only.

Reptiles

3.4.14 No reptile records were returned by BBRC within 1 km of the site.

3.4.15 The site is located towards the centre of Royston and is surrounded by housing. While the habitats on site offer basking and sheltering opportunities for reptiles there is no connectivity with other areas of suitable habitat. Given the lack of records and location of the site, reptiles are not considered to be a receptor for the proposed development and are not considered further within this report.

Other protected and key species

Hedgehog

3.4.16 No records of hedgehogs (*Erinaceus europaeus*) were provided within 1 km of the site.

3.4.17 However, the grassland and scattered scrub has potential to be used by hedgehogs as part of a wider resource, should they be present within the wider area. Although given the abundance of suitable habitat in the local area, the site is not considered to be of importance to hedgehogs at greater than a site level.

3.5 Invasive species

3.5.1 No Schedule 9 invasive plant species were returned within 1 km of the site by BBRC.

3.5.2 A cotoneaster with characteristics consistent with *Cotoneaster var. Sternianus* was recorded on site. This species is not one of the cotoneasters listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). However, species of this genus can display invasive tendencies. No other invasive species were recorded on site.

4. Ecological Assessment and Mitigation

4.1 Proposals

4.1.1 Proposals for the site include the construction of 80 residential dwellings, associated residential roads, gardens, and an area of public open space. Landtake of the majority of the grassland, scrub, scattered trees, introduced shrub, tall ruderal and hedgerow habitats will be required. The area of public open space will be a minimum of 15 % of the total residential areas and will be dominated by grassland with scattered trees. The following assessment is based on the Appraisal Layout (A645.18) produced Geoff Perry Associates Ltd in October 2015.

4.2 Designated Sites

4.2.1 No designated sites are found within 1 km of the site. No mechanisms by which the proposed development may result in direct or indirect impacts to the integrity of designated sites have been identified and no impacts are envisaged.

4.3 Habitats

Semi-improved grassland

4.3.1 Landtake of the majority grassland on site is assumed to accommodate the proposed development, with approximately 15 % of the total site area retained as grassland at the north of the site, in the public open space. Given the variation of the composition of the sward across the site, the area of grassland that is to be retained is one of the areas with greater species richness that will likely increase over time as the grassland develops. Given the area of retained grassland within the scheme, landtake of the semi-improved grassland would be considered to be of importance to nature conservation at the site level only.

Tall ruderal

4.3.2 Landtake of the entire tall ruderal habitat will be required to accommodate the proposed development. This habitat is limited in extent, and comprised of commonly occurring species that are frequently found both within the local area and nationally. Therefore landtake is not considered to be of importance to nature conservation outwith the site level.

Hedgerow

4.3.3 The single outgrown hedgerow on site will be removed to accommodate the proposed development. While the hedgerow is comprised of more than 80% of one native species and therefore is a habitat of principal importance under the NERC Act, the hedgerow is isolated from a wider hedgerow network, is outgrown, unmanaged and limited in extent. As such, landtake of the hedgerow on site is not considered to be of importance to nature conservation outwith the site level.

4.3.4 Native hedgerow planting would represent a benefit to the biodiversity of the site and inclusion of new sections of species-rich hedgerow comprising five of more species is recommended.

Scrub

4.3.5 Landtake of the entire scrub habitat will be required to accommodate the proposed development. This habitat is relatively limited in extent, and comprised of commonly occurring species that are frequently found both within the local area and nationally. Therefore landtake is not considered to be of importance to nature conservation outwith the site level.

Introduced shrub

4.3.6 Landtake of the entire introduced shrub habitat will be required to accommodate the proposed development. This habitat is dominated by non-native species and is limited in extent, and therefore landtake is not considered to be of importance to nature conservation outwith the site level.

Scattered trees

4.3.7 All scattered trees within the site boundary will be removed to accommodate the proposed development. The trees outwith, but adjacent to the western boundary will be retained. Scattered trees within the site boundary are relatively limited in extent and are not comprised of any notable species and no specimens are of a notable age. Landtake of the scattered trees is therefore not considered to be of importance to nature conservation outwith the site level.

4.3.8 It is recommended that a Tree Protection Plan is produced, in accordance with British Standard 5837 (2012): Trees in relation to design, demolition and construction, to ensure adequate protection is given to trees and their roots during design and construction. Particular attention should be paid to the trees outwith the western boundary.

4.3.9 New tree planting could be incorporated within the landscaping scheme for the proposed development to provide a benefit to nature conservation. Tree species chosen should be native, typical of the local area and of UK provenance. Appropriate tree species may include rowan (*Sorbus aucuparia*), common whitebeam (*Sorbus aria*), hornbeam (*Carpinus betulus*), oak (*Quercus* sp.), wild cherry (*Prunus avium*), beech, bird cherry (*Prunus padus*) and field maple (*Acer campestre*). The use of heavy standards would be beneficial, to reduce establishment time and provide immediate habitat structure and coverage.

4.4 Species

Amphibians

4.4.1 Common frog and common toad are included in Section 9(5) of the Wildlife and Countryside Act 1981 (as amended) which prohibits sale, barter, exchange, transporting for sale and advertising to sell or to buy these species.

4.4.2 Given the lack of ponds on or near to site and presence of alternative habitat in the immediate locality, landtake of on-site grassland is not considered to be of importance to common amphibians outwith the site level. In the unlikely event that any common amphibians are encountered during clearance, they should be moved carefully by gloved hands to an area of shelter away from the footprint of works.

Badger

4.4.3 Badgers and their setts are protected under the Protection of Badgers Act 1992. It is an offence under the act to kill, injure or take a badger. It is also an offence to destroy, damage or obstruct a currently active badger sett, or to disturb animals within the sett.

4.4.4 Alternative foraging habitat is available within the local area, especially in the scrub and farmland located approximately 200 m north of the site, as such, landtake associated with the proposed development is considered to be of importance to badger at no more than the site level.

4.4.5 As badger do have some potential to move across the site from time to time, taking a best practice approach, all deep excavations should be covered overnight during demolition/construction works. Shallow excavations should have a scaffold board or equivalent placed in them overnight to allow any badgers to exit, should they fall in, and all chemicals should be stored securely in accordance with best practice guidelines.

Bats

4.4.6 All species of bat occurring within the UK are included in Schedule 2 of the Conservation of Habitats and Species Regulations 2010 (as amended). Under regulation 41 bats are protected from deliberate capture, injury or killing, from deliberate disturbance and from deliberate damage or destruction of a breeding site or resting place (roost).

4.4.7 All UK bats are also included on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). However, their protection is limited to certain offences. Under the 1981 Act (as amended) it is an offence to intentionally or recklessly disturb bats while they are occupying a structure or place used for shelter or protection, or to obstruct access to any such place.

4.4.8 Barbastelle (*Barbastella barbastellus*), Bechstein's (*Myotis bechsteinii*), brown long-eared, greater horseshoe (*Rhinolophus ferrumequinum*), lesser horseshoe (*Rhinolophus hipposideros*), noctule (*Nyctalus noctula*) and soprano pipistrelle (*Pipistrellus pygmaeus*) bats are included as priority species under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

4.4.9 No further survey is required on Tree 1; however as a precaution it is recommended that the felled tree is left in-situ overnight prior to removal from site. Any cross cutting of the tree should take place away from tree cavities.

4.4.10 Given that no significant linear corridors are being severed or removed, no bat activity survey is recommended and proposed landtake of the grassland on site is not considered to be of importance to foraging bats outwith the site level.

4.4.11 The scattered trees along the western boundary contribute to local green infrastructure within the wider landscape and are considered likely to comprise bat foraging and commuting habitat. The lighting plan for the proposed development should be carefully considered to ensure it avoids or minimises lighting along these and other boundary features to maintain their functionality for commuting and foraging bats. Further information on bats and ecologically sensitive lighting design is included in Appendix 3.

4.4.12 Incorporation of long term bat roosting opportunities on site as part of the development is recommended. Suitable examples of integral roosting provision to be installed at the construction stage include Schwegler 1FR tubes, Wildcare Small Cavity Bat Roosts or Habibat boxes. These provide integral roosting provision that is both discreet and secure, creating a self-contained cavity that does not provide access into the wall cavity. It is recommended that five bat boxes/ tubes are included within the proposed development. Bat tubes/boxes should be placed a minimum of 4 m from ground level on southerly facing aspects and ideally at eaves level. Boxes should be sited away from bright light spill.

Birds

4.4.13 All nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended) against destruction of the nest during the bird nesting season, which falls between March and August, inclusive.

4.4.14 The scrub, hedgerow and trees on site have potential to provide structural cover for a variety of nesting birds. However, given the abundance of similar habitat within the wider area, landtake is not considered to be of significance to nesting and foraging birds above the site level.

4.4.15 The scrub, trees and hedgerows on site have potential to be used by nesting and foraging common bird species during the nesting season. Without mitigation there is potential for active bird nests to be destroyed during vegetation clearance works on site. Therefore as a precautionary measure, it is recommended any tree/shrub/hedgerow removal should be undertaken outside of bird breeding season i.e. undertaken between September to February inclusive. If it is not possible to schedule clearance works for these months, a breeding bird check undertaken by a suitably qualified ecologist will be required no more than two days prior to clearance, to check for the presence of active bird nests. An active nest would require an exclusion zone to be established and adhered to until chicks have fledged (to be monitored and confirmed by an ecologist).

4.4.16 Inclusion of a range of bird nesting provision across the development would be considered a positive enhancement for nature conservation and would comply with the NPPF aims for biodiversity (2012). Suitable provision may include four general bird boxes with 26 mm and 32 mm entrance holes suitable for a range of garden bird species and four sparrow terrace bird boxes, designed to support house sparrows (*Passer domesticus*). The bird boxes should be placed at a minimum height of 3 m in a number of locations facing different aspects to maximise the chances of occupation. However, full south aspects which receive sun all day during the summer months present a risk of overheating and should therefore be avoided.

Other key and notable species

Hedgehog

4.4.17 Hedgehog are included as a species of principal importance under Section 41 of the NERC Act 2006 and whilst not afforded a high level of protection, they are a species in decline and taking a best practice approach, should be taken into consideration during works.

4.4.18 Hedgehogs are highly mobile and inquisitive animals that have potential to

move onto site at any time, therefore as a precautionary measure, it is recommended that any excavations left overnight should be covered or have a suitable escape ramp e.g. a long scaffold board, inserted to allow escape should a hedgehog fall in.

4.4.19 Should a hedgehog be discovered on site at any time, it should be moved carefully with gloved hands to a sheltered area away from the footprint of works e.g. the offsite scrub north of the site or beneath an offsite hedgerow.

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Figure 1. Survey Findings

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Legend

- Boundary
- Target note
- Scattered scrub
- Hedgerow
- Trees
- Fence
- Hardstanding
- Bareground
- SI — Semi-improved grassland
- Tall ruderal
- Introduced shrub
- Dense scrub

0 30 60
Metres

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Midland Road, Royston
Ecological Appraisal

Figure 1
Survey findings

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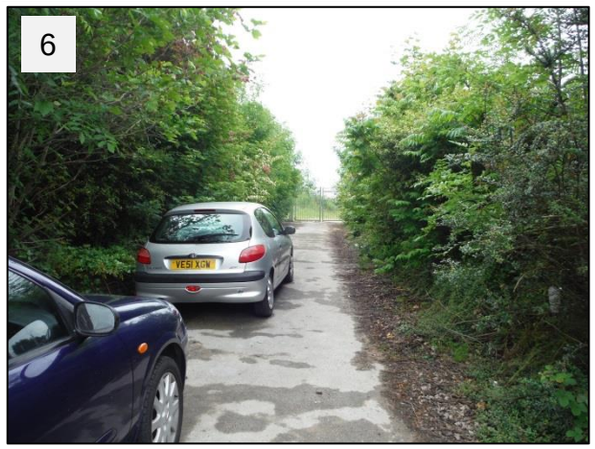
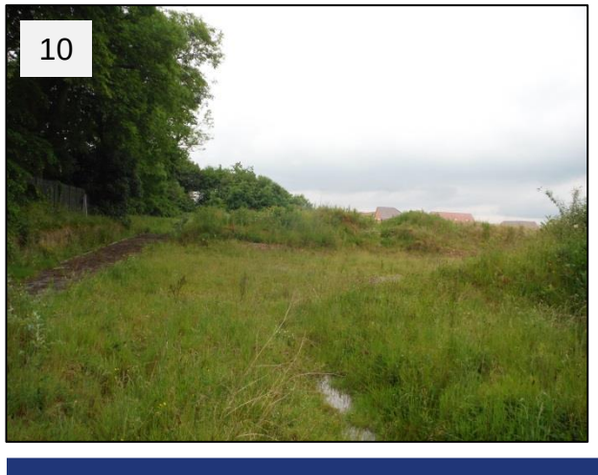
Date: June 2016 | Scale: 1:1,000 @A3 | Drg.Ref: SU/8191/1

Appendix 1. Site Images





1. Semi-improved grassland habitat that dominates the site, with small area of spoil from nearby construction works
2. Hedgerow (H1): outgrown and un-managed
3. Hardstanding playground at south of site
4. One of scattered trees on site with introduced shrub beneath
5. Tall ruderal vegetation on raised bank, with compacted ground and ephemeral pool in foreground
6. Introduced shrub along access road leading to site from Midland Road
7. Bare ground, ephemeral pools and raised banks at north-west of site
8. Semi-improved grassland and raised bund looking to western boundary
9. Ephemeral pool
10. Looking north from south-western corner of the site
11. Scrub on southern boundary
12. Area of disturbed / bare ground

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Appendix 1
Site images

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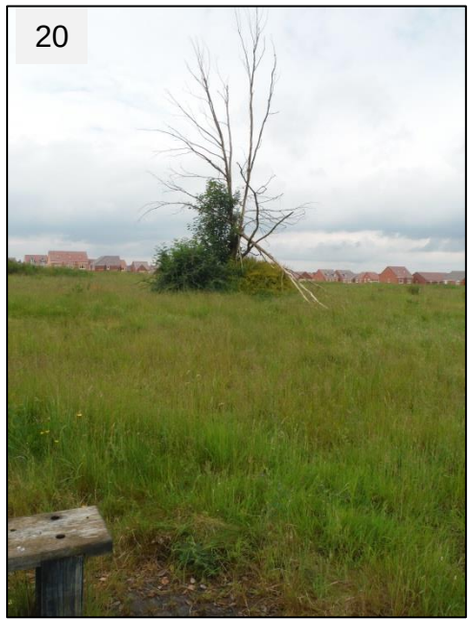

13. Semi-improved grassland habitat looking west from eastern boundary
14. Hardstanding playground
15. Looking north-east from southern boundary
16. Looking east through centre of the site with bunds
17. Establishing semi-improved grassland at the north of the site that will be retained within public open space
18. Newly created footpath at north of the site
19. T1 – low bat roost potential
20. T1 – with underlying introduced shrubs

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Appendix 1
Site images

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Appendix 2. Species List and Target Notes

Table A2.1. Species list for habitats on site

Scientific name	Common name	DAFOR
Semi-improved neutral grassland		
Red fescue	*Festuca rubra*	D
Common vetch	*Vicia sativa*	A
Creeping buttercup	*Ranunculus repens*	A
Lesser stichwort	*Stellaria graminea*	LA
Yarrow	*Achillea millefolium*	LA
White clover	*Trifolium repens*	F
Yorkshire fog	*Holcus lanatus*	F
Broad leaved dock	*Rumex obtusifolius*	O
Bush vetch	*Vicia cracca*	O
Cleavers	*Galium aparine*	O
Common mouse ear	*Cerastium fontanum*	O
Common sorrel	*Rumex acetosa*	O
Creeping thistle	*Cirsium arvense*	O
Dandelion	*Taraxacum officinale agg*	O
False oat grass	*Arrhenatherum elatius*	O
Meadow buttercup	*Ranunculus acris*	O
Meadow foxtail	*Alopecurus pratensis*	O
Red clover	*Trifolium pratense*	O
Ribwort plantain	*Plantago lanceolata*	O
Rough meadow grass	*Poa trivalis*	O
Soft brome	*Bromus hordeaceus*	O
Spear thistle	*Cirsium vulgare*	O
Tare sp.	*Vicia spp.*	O
Timothy	*Phleum pratense*	O
Birds foot trefoil	*Lotus corniculatus*	R
Cat's ear	*Hypochaeris radicata*	R
Cock's-foot	*Dactylis glomerata*	R
Comfrey sp	*Symphytum spp.*	R
Common bent	*Agrostis capillaris*	R
Common daisy	*Bellis perennis*	R
Common fumitory	*Fumaria officinalis*	R
Common poppy	*Papaver rhoeas*	R
Common ragwort	*Jacobea vulgaris*	R
Perennial ryegrass	*Lolium perenne*	R
Scentless mayweed	*Tripleurospermum inodorum*	R
Soft rush	*Juncus effusus*	R
Weld	*Reseda luteola*	R
White campion	*Silene latifolia*	R
Tall ruderal		
Great willowherb	*Epilobium hirsutum*	F
Broad leaved dock	*Rumex obtusifolius*	F
Creeping thistle	*Cirsium arvense*	O
Cow parsley	*Anthriscus sylvestris*	O
Bramble	*Rubus fruticosus agg*	O
Common nettle	*Urtica dioica*	O
Goat willow	*Salix caprea*	O
Butterfly bush	*Buddleja davidii*	O
Spear thistle	*Cirsium vulgare*	O
Colt's foot	*Tussilago farfara*	R
Hedgerow		
Hawthorn	*Crataegus monogyna*	D

Elder	*Sambucus nigra*	O
Sycamore	*Acer pseudoplatanus*	O
Scattered trees		
Lime	*Tilia x europaea*	A
Ash	*Fraxinus excelsior*	A
Hawthorn	*Crataegus monogyna*	O
Bird cherry	*Prunus padus*	O
Elder	*Sambucus nigra*	O
Sycamore	*Acer pseudoplatanus*	O
Scrub		
Bird cherry	*Prunus padus*	A
Bramble	*Rubus fruticosus agg*	A
Dogwood	*Cornus sanguinea*	A
Silver birch	*Betula pendula*	LA
Ash	*Fraxinus excelsior*	O
Butterfly bush	*Buddleja davidii*	O
Creeping thistle	*Cirsium arvense*	O
Ivy	*Hedera helix*	O
Lime	*Tilia x europaea*	O
Sycamore	*Acer pseudoplatanus*	O
Rose sp.	*Rosa spp.*	R
Teasel	*Dipsacus sp.*	R
Introduced shrub		
Wilson's honeysuckle	*Lonicera nitida*	O
Hawthorn sp.	*Crataegus spp.*	O
Berberis sp.	*Berberis spp.*	O
Cotoneaster	*Cotoneaster var. Sternianus*	O
Pyracantha	*Pyracantha spp.*	O
Stag horn sumac	*Rhus typhina syn. R. hirta*	R

Target Notes

TN1 – Grassland to the east of the survey area (TN1) appears to have previously been a playing field which has been left unmanaged for a number of years

TN2 - Grassland that has established/ been sown on land cleared of buildings. The sward in this area supports a greater number of coarse grass and forb species

Appendix 3. Bats and Lighting

Bats and Lighting

Bats and lighting

Artificial lighting is known to affect bat roosting and foraging behaviour with lighting shown to result in a range of impacts including roost desertion (BCT, 2009), delayed emergence of roosting bats (Downs *et al.,* 2003), increased activity of some bat species and decreased activity by others (Stone *et al*., 2012).

An experimental approach using LED units, demonstrated that relatively fast-flying bat species, including common pipistrelle, showed no significant impacts as a result of new artificial lighting, even when lighting was set at relatively high levels close to 50 lux. In contrast slow flying bats, including myotid bats (*Myotis* spp.) showed sharp reductions in presence, even at low light levels of 3.6 lux (Stone *et al.,* 2012). Current recommendations for all bat species specifies that no bat roost should be directly illuminated (BCT 2014).

Mitigation and lighting design

Bat friendly lighting plans should firstly look to avoid lighting where possible and minimise lighting impacts by adopting the following measures:

- **Lighting curfews or use of PIR sensors**. Lighting curfews can be an effective way of avoiding impacts on bats. These curfews may involve either turning off lighting or dimming light units at specific times of the night, dimming units at key times of the year, providing the luminaire allows for this option via a control unit. Lighting to be triggered by PIR sensors can be expected to be illuminated only when required and for a low proportion of the overall time.

- **Consider no lighting solutions where possible**. Options such as white lining, good signage and LED cats eyes, should be considered as preferable, especially within Zones 1 and 2. Reflective fittings may help make use of headlights to provide any necessary illumination in some areas.

- **Use only high pressure sodium or warm white LED lamps where possible**. High pressure sodium and warm white LED lamps emit lower proportions of insect attracting UV light than mercury, metal halide lamps and white LED lighting. Generally lamps should have a lower proportion of white or blue wavelengths, with a colour temperature <4200 kelvin recommended (BCT, 2014).

- **Minimise the spread of light**. Light spread should be kept at or near horizontal in order to ensure that only the task area is lit. Flat cut-off lanterns or accessories should be used to shield or direct light to where it is required. Baffles, hoods, louvres and shields should be used where necessary to reduce light spill.

- **Consider the height of lighting column**. Whilst downward facing bollard lighting is often preferable, it should be noted that a lower mounting height does not automatically reduce impacts to bats as bollard lighting can often be designed to provide uplighting. Where bollard lighting is considered to be the most appropriate system, bollard spacing or unit density should be kept to a minimum and units should be fitted with the appropriate hoods/deflectors to reduce uplightingColumn height should be carefully considered to balance task and mitigation measures.

- **Avoid reflective surfaces below lights.** The polarisation of light by shiny surfaces attracts insects increasing bat activity (BCT, 2012). Consequently

surface materials around lighting require consideration.

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