



Land off St Michaels Avenue, Barnsley – Preliminary Ecological Appraisal

NPS Barnsley Limited

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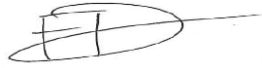
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Summary

Ecus Ltd was commissioned by NPS Barnsley Limited in November 2018 to undertake a Preliminary Ecological Appraisal (PEA) of land off St Michaels Avenue, Barnsley, South Yorkshire (central national grid reference SE36730871), hereafter referred to as the 'Site'. The PEA was undertaken prior to the proposed construction of 34 residential dwellings and associated infrastructure ('Proposed Site Plan' drawing no: NPS-DRA-A-(00)-012 Rev P6 (NPS, 04.02.19)).

Currently the proposed development site comprises 1.19ha of undeveloped land and would lead to the loss of; defunct hedgerow, dense scrub, scattered trees, two structures and semi-improved grassland equalling 1.19 hectares (ha). To compensate for the loss of Site habitats, the proposed development should incorporate areas of replacement vegetation containing native and/or wildlife friendly species'. New grassland should comprise a native mix which maximises species diversity. Other replacement vegetation planting should include species which would maximise flowering, pollen/nectar production and/or berries/fruit production to benefit invertebrates, birds and small mammals.

Adjacent the northern boundary is a mature intact species poor hedgerow. To safeguard the hedgerow during construction it is recommended that Root Protection Areas (RPA's) are calculated and Root Protection Zones (RPZs) implemented in accordance with British Standard 5837 (British Standard, 2012) on any trees and the hedgerow be securely fenced off with secure temporary steel mesh fencing to prevent incidental damage to or encroachment of construction personnel, materials or machinery.

In accordance with comments made by the biodiversity officer "Ideally the hedge here should be incorporated into a retained strip of land with grassland as a community asset. Some sections of the hedgerows along the lane have been laid in the past, reflecting their importance and value – this could be done again by the applicants as a biodiversity enhancement if they have the permission of the landowner to do so." It is recommended that landowner permission is sought to undertake the laying of the hedgerow.

To protect the hedgerow in the long term, a 1m buffer will be provided, set between the hedgerow and the rear of the gardens for the houses along the northern border. The buffer will take the form of closed board fencing and native scrub species planting (e.g. hawthorn and blackthorn). The area and planting will be detailed within an ecologically sensitive landscape plan. This is considered to be an alternative to a retained strip of land with grassland and incorporating the hedgerow as community asset due to lower maintenance requirements and the protection the new planting will offer the existing hedgerow.

Two ponds are located within 500m of Site (See figure 2) and were assessed as having potential to support great crested newts (*Triturus cristatus*). However, due to their distance from Site and in the case of Pond 2, significant barriers between the pond and Site, great crested newts are considered unlikely to be present on site and no further survey for this species is recommended.

Structures 1 and 2 have been assessed as having negligible suitability to support roosting bats, and as a result, no further survey is required. In the unlikely event presence of roosting bats is suspected immediately prior to removal/dismantling of the structures, e.g. due to audible squeaking, the presence of droppings or bats

themselves, works should not proceed further until an ecologist has been contacted for advice.

As an ecological enhancement to the Site, consideration could be given to installing three bat boxes, e.g. Schwegler 1FD bat boxes.

Bat box locations with a southerly facing aspect and located at a minimum of 4m height are optimal to maximise the chances of occupation. Boxes should be placed where bats have a clear flight path to them, i.e. be free of obstructions such as overhanging branches or ivy growth.

It is considered that badgers (*Meles meles*) are not resident on Site but may access Site at any time to forage. 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 badger fall in.

Should a badger sett be discovered on Site at any time, works should be halted in the immediate area and an appropriately trained and qualified Ecologist consulted immediately.

Any removal of woody vegetation, including trees, and scattered scrub etc., should be undertaken between September and February inclusive, i.e. outside of the bird breeding season. Where this is not possible, vegetation should be checked for nesting birds by an experienced ecologist no more than two days prior to works commencing to confirm the absence of nests.

Three nest boxes could be incorporated into the development, where practicable, to provide a positive enhancement for nature conservation. Nest boxes, suitable for starling, such as the Schwegler 3S Starling terrace should be incorporated.

There is potential for reptiles to be present and sheltering within the area of less managed grassland and along the hedgerows. Therefore it is recommended that clearance of the unmanaged semi-improved grassland, scrub and hedgerows/hedge bases should be carried out under supervision of an Ecological Clerk of Works and during the active season for reptiles (March- October) when temperatures are above 10°C, enabling reptiles to easily move away from disturbance.

The Site should be stripped in a systematic manner, ideally in an east to west direction to encourage reptiles away from the footprint of works into adjacent habitat.

The Site has suitability to support hedgehog (*Erinaceus europaeus*) foraging, in the grassland and along the hedgerows. Hedgehogs are highly mobile and inquisitive animals that have suitability to move onto Site at any time. 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.

The creation and maturing of new garden habitats on Site help to compensate the loss of habitat to the grassland currently on Site. To allow for dispersal of hedgehogs and other small mammals between gardens, small gaps beneath or between garden fences will be incorporated across the development, notably where close boarding fencing is to be used.

1. Introduction

1.1 Background

- 1.1.1 Ecus Ltd was commissioned by NPS Barnsley Limited in November 2018 to undertake a Preliminary Ecological Appraisal (PEA) of land off St Michaels Avenue, Barnsley, South Yorkshire S71 2SD (central national grid reference SE 3673 0871).
- 1.1.2 The PEA was required in advance of the proposed construction of 34 residential dwellings and associated infrastructure (*'Proposed Site Plan'* drawing no. NPS-DRA-A-(00)-012 (NPS, Rev 06, 05.10.18)). The land, hereafter referred to as the 'Site', was determined from this plan.
- 1.1.3 The purpose of this appraisal was to review the potential for the Site to contain habitats or be used by species protected or considered to be of importance under UK legislation, namely the Wildlife & Countryside Act 1981 (as amended), the Conservation of Habitats and Species Regulations 2017 and the Natural Environment and Rural Communities (NERC) Act 2006. Any impacts upon these habitats or species likely to result from the proposed development were then assessed.
- 1.1.4 This report details the findings of a desk study, extended Phase 1 habitat survey and subsequent appraisal. It also takes into account the information provided in the Wildscapes report '*Preliminary Ecological Assessment No. 413*', (23/04/2014) produced for the LPA. Methodologies employed are described, including Site surveys and evaluation, and the need for any further survey work and/or mitigation measures or proposed enhancements are included where appropriate.
- 1.1.5 Comments from the biodiversity officer, Trevor Mayne, made in August 2018 supplied via email on 08.02.19 have also been taken into account.

1.2 Site Context

- 1.2.1 The Site area is approximately 1.19 hectares (ha) and is situated off St Michaels Avenue, within the town of Barnsley, South Yorkshire S71 2SD.
- 1.2.2 The Site is surrounded to the south and east sides by residential buildings. To the west is an area of fields and woodland bordering the Carlton industrial estate, which covers a large portion of the surrounding landscape to the north and west.
- 1.2.3 The wider area is mainly urban with residential and industrial buildings, except for the north east and south east where houses give way to open fields and farmland.

2. Methodology

2.1 Data Consultation

- 2.1.1 As part of the PEA process, a data consultation was undertaken by Ecus Ltd in January 2019 with the Barnsley Biological Records Centre (BBRC) to determine whether there were any existing biological records or locally non-statutory designated sites of nature conservation interest within 2km of the Site.
- 2.1.2 In line with the comments from the local biodiversity officer, that stated “In this case external data need not be gained from either South Yorkshire Bat Group or South Yorkshire Badger Group. The site is not in the Nature Improvement Area” no further records from other local bodies/groups have been requested.
- 2.1.3 Natural England’s MAGIC website (www.magic.gov.uk) was consulted in January 2019 for information on statutory designated sites of nature conservation interest within 2km of the Site and details of any European Protected Species (EPS) licences within 2km.
- 2.1.4 Information obtained from BBRC and MAGIC is included within the report where appropriate.

2.2 Extended Phase 1 Habitat Survey

- 2.2.1 The Site was surveyed on 18th December 2018 using the extended Phase 1 habitat survey methodology (JNCC, 2010) by Consultant Ecologist Sarah Rochelle GradCIEEM.
- 2.2.2 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.
- 2.2.3 Plant species recorded were classified according to the subjective method of DAFOR abundance ratings. The standardised terms are as follows:
- D Dominant
 - A Abundant
 - F Frequent
 - O Occasional
 - R Rare
- 2.2.4 Notable, rare or scarce plant species were highlighted if present. Evidence of protected species or species of nature conservation importance were recorded where present at the time of survey. Habitats and species present were recorded on to a field map and are included within the report as appropriate.
- 2.2.5 Habitats present that are listed within Section 41 of the NERC Act 2006 and/or the Local Biodiversity Action Plan (LBAP) for Barnsley were also noted.
- 2.2.6 In line with the following comment from the biodiversity officer “If the application is received before the emerging Local Plan is adopted then the ecology report should comply with our adopted Core Strategy Policies, especially CSP 36 Biodiversity etc, If it is received afterwards then the Local Plan Policy BIO1 biodiversity and geodiversity should be complied with” this report is in line with

CSP 36.

2.2.7 The new Local Plan was adopted at the beginning of January 2019. Therefore this report complies with Policy BIO1 (page 235) (and supporting text).

2.2.8 The value and sensitivity of ecological features present on Site were determined based on the guidance given in '*Guidelines on Ecological Impact Assessment*' (CIEEM, 2018). Individual ecological receptors (habitats and species that could be affected by the development) 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

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

2.2.10 The hedgerows on Site were 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.

2.2.11 For hedgerows of 30m in length or less, the entire hedgerow is surveyed. Hedgerows greater than 30m in length are split in to 100m sections and the central 30m of each 100m 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, namely presence of a bank, wall, or ditch, less than 10 % gaps, at least one standard tree per 50m, 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 15m.

2.2.12 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.

2.2.13 A hedgerow also qualifies as a habitat of principal importance under Section

41 of the NERC Act 2006 if it comprises greater than 80% of one or more native species

2.3 Protected and Key Species

2.3.1 Any evidence of protected species or groups encountered during the survey were 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 A desk based search for ponds within 500m of the Site, which are not separated from the Site by a significant barrier to amphibian dispersal, were searched for using 1:10,000 OS mapping and aerial imaging and where accessible waterbodies were assessed to determine their likely suitability for great crested newt (GCN) using the Habitat Suitability Index (HSI) (Oldham et al. 2000).

2.3.3 The suitability of a given waterbody to support GCN is influenced by the existence of particular features (e.g. fish presence, heavy shading) and/or the absence of others (e.g. suitable terrestrial habitat within 500m). The HSI provides a numerical value (ranging from 0 to 1) that indicates the suitability of a waterbody for GCN. The higher the HSI score, the more suitable (or closer to optimum habitat conditions) the waterbody may be considered for this species. However, it should be noted that the HSI score is no substitute for the judgement of an experienced surveyor.

2.3.4 Habitats within the Site were assessed for their suitability to support amphibians during their terrestrial and aquatic life stages.

Badger

2.3.5 Signs of badger activity were searched for within the Site and for up to 30m from the Site boundary (where accessible) as part of the extended Phase 1 habitat survey.

2.3.6 The badger survey followed standard methodology detailed in 'Surveying Badgers' (Harris et al., 1989). This included searching for badger setts, along with survey of linear features and boundaries for signs of badger activity including dung pits (latrines), foraging marks, feeding signs, hair and pathways.

Bats

2.3.7 As part of the extended Phase 1 habitat survey, structures and trees within the Site were inspected and assessed for their suitability to support roosting bats. The inspection was carried out in accordance with current best practice guidelines (Collins, 2016).

2.3.8 An individual structure/tree may support several features of potential interest to roosting bats. It is not always possible to confirm usage of a feature by bats as often the animals may not be present frequently. Consequently it is customary when undertaking such a survey to assign each feature to a defined category of roosting potential as follows: Negligible, Low, Moderate, High, Confirmed (Collins, 2016).

2.3.9 The Site was also assessed for its suitability for foraging and commuting bats.

Birds

2.3.10 While full bird surveys have not been undertaken, while on Site the opportunity was taken to record any species of birds or evidence of nesting encountered and habitats on Site were assessed for their value to nesting and foraging birds.

Reptiles

2.3.11 The habitats present on Site were assessed for their suitability to support reptiles, with reference to their connectivity with other areas of suitable habitat in the surrounding area.

Riparian Mammals and White-clawed Crayfish

2.3.12 A desk based search was undertaken using 1:10,000 OS mapping to identify any watercourses which occur on or within 2km of the Site, and which are not separated from the Site by a major barrier.

2.3.13 Where accessible, any waterbodies identified were assessed for their suitability to support riparian mammals (e.g. water vole (*Arvicola amphibius*) or otter (*Lutra lutra*)) and white-clawed crayfish (*Austropotamobius pallipes*). Any sightings or incidental evidence of activity by these species was also recorded.

Other Protected and Notable Species

2.3.14 The opportunity was taken whilst on Site to assess habitats for their potential to support any other nationally, locally scarce or notable species, or species protected under national or international nature conservation law not highlighted above.

2.4 Invasive Species

2.4.1 During the Site survey any invasive plant or animal species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), were recorded where present.

2.5 Limitations

2.5.1 The extended Phase 1 habitat survey was undertaken in December which is outside of the optimal season for botanical survey. However, it is considered that sufficient information was obtained to characterise the habitats present without the need for further detailed habitat survey and that a robust evaluation of the importance of Site habitats to nature conservation has been made.

2.5.2 As the survey was undertaken in December an assessment of spring flowers in relation to hedgerows could not be undertaken as referred to by the biodiversity officer in the following comment "Any sections of hedge proposed for removal should be supported by an assessment of their importance against the Hedgerow Regulations 1997 – including spring flowers and heritage aspects"

2.5.3 Whilst it is not the place of this ecological assessment to determine the heritage value of hedgerows, the surveyor is aware of the Archaeological Desk-based Assessment (*Archaeological Research Services Ltd "An Historic Environment*

Desk Based Assessment of Land off St. Michael's Avenue Monk Bretton, South Yorkshire 2019) which states that "all hedgerows on Site qualify as 'historically important'".

- 2.5.4 However, it was possible to determine the number of woody species and associated features at the time of the survey and therefore make an assessment regarding whether the hedgerows are considered ecologically important in accordance with the Hedgerow Regulations, 1997.

3. Findings and Evaluation

3.1 Site Description

- 3.1.1 The Site area comprises approximately 1.19 hectares (ha) and is located off St Michaels Avenue, within the town of Barnsley, South Yorkshire S71 2SD.
- 3.1.2 The Site is surrounded to the south and east sides by residential buildings. To the west is an area of fields and woodland (Spring Wood) bordering the Carlton industrial estate, which covers a large portion of the surrounding landscape to the north and west.
- 3.1.3 The wider area is mainly urban and comprises residential and industrial buildings, except for the north east where houses give way to open fields and farmland.

3.2 Designated Sites

- 3.2.1 Two Local Nature Reserves (LNR) were identified within 2km of the Site using MAGIC. Three Local Wildlife Sites (LWS) were returned by BBRC for locations within 2 km of the Site. Details are provided in Table 1 below.

Table 1. Designated Sites within 2km of the Site

Designated Site	Description from Citation	Approximate Distance and Direction from Site
Statutory		
Carlton Marsh LNR	Old, disused rail embankment dominated by neutral grassland with scattered scrub and tree growth. Also with small and large waterbodies scattered across the site with associated marshy grassland and swamp vegetation.	1.2km north east.
Dearne Valley Park LNR	Acidic oak woodland with a mosaic of wetland habitats.	1.6km south.
Non-Statutory		
Carlton Marsh LWS	Old, disused rail embankment dominated by neutral grassland with scattered scrub and tree growth. Also with small and large waterbodies scattered across the site with associated marshy grassland and swamp vegetation.	1.2km north east.
Barnsley Canal LWS	A former canal with a hedgerow, swamp and neutral grassland. It holds	1.4km north.

Designated Site	Description from Citation	Approximate Distance and Direction from Site
	aquatic life and is managed by the local angling group.	
Cliffe Wood LWS	Located within Dearne Valley Park, the wood is a mix of semi-natural broad-leaved woodland and plantation woodland with areas of open grassland and some swamp habitat.	1.6km south.

3.2.2 The statutory and non-statutory designated sites of nature conservation value are considered to be of importance to nature conservation at between the county and local level respectively.

3.3 Habitats

3.3.1 Habitats recorded on Site are annotated on Figure 1 with features of notable ecological value shown as Target Notes (TN) and listed at Appendix 1. Full species lists are provided at Appendix 2.

Semi improved Grassland

3.3.2 Semi improved grassland, comprising two fields, covers the majority of the Site. The majority of this habitat has been heavily grazed by horses and is of a very short sward. A small section in the eastern corner is not grazed and has been left largely unmanaged.

3.3.3 Comments from the biodiversity officer stated ““My brief site visit of yesterday confirmed much of our attached report’s indicative findings. I did manage to get onto the eastern meadow and can confirm that it is very undulating on the east side – probably as a result of spoil having been dumped in the past, but it did not look like colliery spoil”

3.3.4 A large earth bund recorded on Site is considered likely to be the remains of the spoil referenced in the above comment. See TN1.

3.3.5 Species present in the grassland include; abundant perennial rye (*Lolium perenne*), meadow-grass (*Poa sp.*), frequent ribwort plantain (*Plantago lanceolata*) and rare cocksfoot (*Dactylis glomerata*), creeping buttercup (*Ranunculus repens*), creeping thistle (*Cirsium arvense*), groundsel (*Senecio vulgaris*) and broad leaved dock (*Rumex obtusifolius*).

3.3.6 Semi improved grassland is not listed under Section 41 of the NERC Act 2006, nor on the LBAP. This habitat is common locally and nationally, therefore this habitat on Site is considered of importance to nature conservation at the site level only.

Hedgerows

3.3.7 There are two defunct hedgerows on Site. One borders the Site to south

eastern edge (H1) and the other forms the boundary between the two semi improved grassland fields (H2).

- 3.3.8 H1 consists of dominant blackthorn (*Prunus spinosa*) and hawthorn (*Crataegus monogyna*), reaching around 4m high in places with a width of approximately 1.5m. This hedgerow has large gaps throughout its length and appears to have been left unmanaged.
- 3.3.9 H2 supports a slightly greater diversity of woody species, with frequent hawthorn, blackthorn, occasional apple (*Malus domestica*) and ash (*Fraxinus excelsior*) present. H2 stands at approximately 4m tall and up to 3m wide. This hedgerow has a largely intact central section of approximately 40m, with large gaps either side of this section. It also appears to be unmanaged with the blackthorn in particular extending into the field.
- 3.3.10 Neither hedgerow contains a sufficient number of woody species to be considered ecologically important under the hedgerow regulations but, both hedgerows do comprise more than 80% native species and, therefore, are considered a habitat of principle importance. In addition, hedgerows are listed on the LBAP.
- 3.3.11 Despite this, hedgerow habitats are common locally and nationally, and the examples on Site are of relatively poor value due to having large gaps and limited connections to the surrounding area. Therefore both the hedgerows are considered to be of value to nature conservation at the site level only.

Dense Scrub

- 3.3.12 Patches of dense scrub are present on the Site, comprising dominant bramble and hawthorn, with occasional common mugwort (*Artemisia vulgaris*) and rare gallium species (*gallium sp.*) also present.
- 3.3.13 Dense scrub is not listed under Section 41 of the NERC Act 2006, nor on the LBAP. The scrub on Site is very limited in extent and considered of importance to nature conservation at the site level only.

Scattered trees

- 3.3.14 A very small number of scattered trees are present on Site – these comprise of hawthorn, cherry (*Prunus sp.*) and willow (*Salix sp.*) species.
- 3.3.15 This habitat is not listed under Section 41 of the NERC Act 2006, nor on the LBAP. The trees on Site are all relatively young, very limited in extent and are therefore considered of importance to nature conservation at the site level only.

Habitats Beyond the Site Boundary

- 3.3.16 The northern Site boundary is formed of a post and rail fence beyond which is a mature intact hedgerow (H3), approximately 4m high and 2- 3m wide. The hedge comprises dominant blackthorn and hawthorn and is one of two parallel hedgerows, bordering Old Lamb Lane public footpath. It is taller and denser than the other two hedgerows with no gaps along its length.
- 3.3.17 As this habitat was off Site it has not been subject to a hedgerow assessment.

However it was noted that this habitat is listed on the LBAP and due to its presence of 80% or more of native species, as a priority habitat under Section 41 of the NERC Act 2006. As this hedgerow is more mature and dense than H1 and H2 with no gaps it is considered of importance to nature conservation at up to the local level.

3.4 Species

Amphibians

- 3.4.1 BBRC returned a total of 128 records of amphibians for locations within 2km of Site. No records and no EPS licenses pertaining to great crested newt were identified within 2km of the Site from BBRC/MAGIC.
- 3.4.2 Although records did include 33 common frog (*Rana temporaria*), 44 common toad (*Bufo bufo*), 41 smooth newt (*Lissotriton vulgaris*), three palmate newt (*Lissotriton helveticus*) and two unidentified newt species – listed as *Triturus* sp. As previously all three native newt species were known as *Tritutus*, and no further information is given, it is considered possible that these could be great crested newt. All records are dated between 1977 and 2017, mostly relating to records found within Carlton Marsh LWS.
- 3.4.3 The nearest record to Site pertained to eggs of an unidentified newt species found approximately 300m south west of the Site in 2017. This record refers to a pond not visible on OS mapping but which can be observed on aerial imaging (Pond 1) (Figure 2).
- 3.4.4 OS mapping shows one waterbody within 500m (Pond 2) (Figure 2), to the north west on the other side of Carlton Industrial Estate from Site, just over 460m of the Site. No records of amphibians were supplied for this location.
- 3.4.5 Both ponds were visited during the survey and subject to a HSI assessment. Pond 1 scored 0.63 (average) and Pond 2 scored 0.71 (good) (See Appendix 4) and as a result the presence of great crested newts at either pond cannot be ruled out.

Badger

- 3.4.6 A total of eight field records of badger, dated between 2000 and 2017, were supplied by BBRC for locations within 2km of the Site. The exact location of the records is not provided within this report to safeguard badgers from persecution; however, all records are located outwith 500m from the Site.
- 3.4.7 No setts or other signs of use by badger were recorded inside or within 30m of the Site during the survey.
- 3.4.8 Given the absence of setts it is not considered likely that badgers are resident on Site, though as nearby Spring Wood is highly suitable for badgers and located just north of the Site. As a result it is considered possible that this species may access the Site from time to time as part of a larger foraging range.

Bats

- 3.4.9 BBRC returned a total of 134 bat records for locations within 2km of Site, of which, four records pertained to roosts. Roost records comprise one common pipistrelle (*Pipistrellus pipistrellus*) species, one unknown bat species

(*Chiroptera* sp.) and two Daubenton's bat (*Myotis daubentonii*). There are no records of roosting bats associated with the Site itself, the closest roost to Site pertains to an unidentified bat roost recorded under the fascia board of a house in 2002, approximately 1.1km south east of the Site.

- 3.4.10 The remaining 130 records pertained to field records comprising observations of bats in flight or grounded/injured bats. In addition to species previously listed, BBRC field records included unidentified pipistrelle species (*Pipistrellus* sp.), noctule (*Nyctalus noctula*) and an unidentified nyctalus bat (*Nyctalus* sp.). The closest field record to Site pertained to a Daubenton's bat recorded approximately 800m north of the Site in 1998.
- 3.4.11 A single EPS license relating to bats was identified using MAGIC. The licence (EPSM-2009-532) was located approximately 2km to the north east of the Site and pertained to the destruction of a common pipistrelle resting place in 2010.
- 3.4.12 The Site does not contain any buildings or trees which offer opportunity for roosting bats but does have a two of semi-permanent structures (Structures 1 and 2) in the form of two storage sheds.
- 3.4.13 Structure 1 is of corrugated metal construction with an open front on the south eastern elevation. It has an internal wooden framework. The flat metal roof supports a metal overhang which sits against the corrugated walls leaving a small gap. The gap between the metal roof and walls is considered unsuitable for roosting bats due to the poor thermoregulatory properties of this material. The internal wooden frame work offers some gaps between the timber and the roof and walls but the metal construction and open fronted nature of this structure leaves it highly exposed to the elements. As a result this structure is considered to have **negligible suitability** for roosting bats.
- 3.4.14 Structure 2 is a closed four sided metal container. It is constructed of flat metal sheeting with a flat metal roof. The roof also has a metal overhang, which sits flush against the metal sides. The metal has some areas of rust but no holes or gaps were noted which give access inside the shed. This structure is considered to have **negligible suitability** for roosting bats due to its wholly metal construction the lack of gaps, cracks and no access to the internal space.
- 3.4.15 The fields and hedgerows in the Site offer some foraging and commuting habitat for bats, in addition to providing connectivity into the wider area which supports fields and woodland of higher value. It is considered probable the Site may be used by a small number of bats, such as pipistrelle species, as a commuting route to disperse between potential roosting locations within the urban areas to higher quality foraging habitats in the wider landscape. Given the availability of wooded habitat beyond the Site, the small size and poor quality of hedgerow on the Site, the Site is considered to be of importance to foraging and commuting bats at no more than the site level.

Birds

- 3.4.16 In 2015, a re-assessment of the '*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.

- 3.4.17 “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.
- 3.4.18 BBRC returned a total of 12,067 records comprising 195 bird species for locations within 2km of Site. A total of 36 Schedule 1 bird species, as listed within the Wildlife and Countryside Act 1981 (as amended), are included within the records. Bird records are summarised in Appendix 1 and comprise 40 Red and 66 Amber listed. Records span from 1909 to 2018 and are all located outwith 50m of the Site.
- 3.4.19 The following bird species were recorded on Site; house sparrow (*Passer domesticus*), blue tit (*Cyanistes caeruleus*) and redwing (*Turdus iliacus*). It is also considered possible that other common bird species listed in the BBRC records search such as Collared Dove (*Streptopelia decaocto*), Swallow (*Hirundo rustica*), Robin (*Erithacus rubecula*) and others may use the Site.
- 3.4.20 Species such as Willow Tit (*Poecile montanus*), Ring Ouzel (*Turdus torquatus*) Hen Harrier (*Circus cyaneus*) that were included in the BBRC results as well as other species with highly specific habitat requirements are considered unlikely to be present on Site.
- 3.4.21 Of the 36 schedule 1 species listed, the only species considered likely to be present on Site is barn owl (*Tyto alba*) as all other species either require water, are winter migrants or have very specific breeding and/or foraging requirements. The Site habitats are considered to comprise a poor foraging habitat – Type 3 - as described in Shawyer “Barn Owl Survey Methodology and Techniques for use in Ecological Assessment” (2011) and of low value to barn owl for foraging, and the lack of suitable enclosed shelter for breeding means that this species can be ruled out as a constraint to the development.
- 3.4.22 As habitats of similar value to those in the Site can be found immediately adjacent, within residential gardens, the large mature hedgerow (H3), woodland to the north and the fields to the south west, the Site habitats are considered to be of importance to birds at up to a site level only.

Reptiles

- 3.4.23 BBRC provided a total of 33 records of reptiles for locations within 2km of Site. The records relate to field observations of one slow worm (*Anguis fragilis*) and 32 grass snake (*Natrix helvetica helvetica*). Records were dated between 1991 and 2016 and mostly related to Carlton Marsh LWS. The closest records were a slow worm record approximately 800m west of the Site from 2000 and a grass snake approximately 1.1 km south east of the Site in 2016.
- 3.4.24 The Site has some value for foraging and sheltering reptiles in the form of the rougher ungrazed grassland in the eastern corner and along the hedgerows. The Site is also connected to areas of woodland and open fields in the wider

landscape but areas where the reptiles were recorded are separated from Site by roads. The site has no piles or brush or suitable for hibernation or egg laying.

- 3.4.25 It is therefore considered that the Site has potential to be used by reptiles in small numbers. As a result the Site habitats are considered to be of importance to reptiles at up to a site level.

Riparian Mammals and White-Clawed Crayfish

- 3.4.26 BBRC returned a total of 159 records of water vole for locations within 2km of the Site. All records were dated between 1977 and 2016 with the closest record to Site pertaining to a water vole latrine found approximately 550m north of the Site.
- 3.4.27 No records of otter were provided by BBRC for locations within 2km of the Site and no records were identified in this search area within the public domain.
- 3.4.28 No records of white-clawed crayfish were provided by BBRC for locations within 2km of the Site and no records were identified in this search area within the public domain.
- 3.4.29 Cudworth Dike is located within 2km of the Site, approximately 1.2km north east of the Site. The Dike is separated from Site by several main roads and a large expanse of industrial development with no connectivity via drains or flowing water. As such, the Site has no habitat likely to support riparian mammals or crayfish and these species have been ruled out as constraints to this development and are not discussed further in this report.

Other Protected and Notable Species

Hedgehog

- 3.4.30 A total of 47 records of hedgehog were returned by BBRC. These pertain to hedgehogs observed in residential gardens, including young animals, and observations of road kill. The closest hedgehog record was for a (dead) individual located 280m north of the Site near Fish Dam Lane.
- 3.4.31 The Site provides good foraging habitat for hedgehog in the grassland and along hedgerows. The wider area also offers suitable habitat in the form of residential gardens and the woodland to the north, both of which are directly connected to the Site. As a result the Site habitats are considered to be of importance to hedgehogs at a site level.

Brown Hare

- 3.4.32 A total of 56 records of brown hare (*Lepus europaeus*) were returned by BBRC. Records were dated between 1978 and 2015 and most records have an accuracy of 1km². The most accurate record was found approximately 1.3km east of the Site in 1991.
- 3.4.33 The Site has very limited suitability for brown hare. This species requires rank, unmanaged grassland in which to shelter and this habitat is not present on Site, only heavily grazed grassland which is unlikely to offer much shelter and due the Sites proximity to a residential area. As a result it is considered unlikely this species is present on Site and they have not been considered further within

this report.

Harvest Mouse

- 3.4.34 A total of eight records of harvest mouse (*Micromys minutus*) were returned by BBRC. Most of the records pertain to sightings of a nest and all records are dated between 1978 and 2012. The closest record to Site was recorded approximately 1km south west in 1992.
- 3.4.35 The Site had no suitability for harvest mouse as this species requires either cereal crops or tall grassland in which to shelter and breed. The Site supports only very short sward grassland. As a result this species can reasonably be excluded as a constraint to development and are not discussed further in this report.

3.5 Invasive Species

- 3.5.1 BBRC returned a total of records of 59 invasive plants, including Japanese knotweed (*Fallopia japonica*), Japanese rose (*Rosa rugosa*), Himalayan balsam (*Impatiens glandulifera*), giant hogweed (*Heracleum mantegazzianum*), cherry laurel (*Prunus laurocerasus*), Canadian pondweed (*Elodea canadensis*) and cotoneaster (*Cotoneaster*). All records were dated between 1983 and 2018. The closest record to Site was cotoneaster found approximately 480m north of the Site.
- 3.5.2 No records of invasive plant species were identified for the Site and none were recorded on Site during the survey.

4. Ecological Assessment and Mitigation

4.1 Proposals

- 4.1.1 The site is going forward as draft housing allocation site HS22 (Previously H59) in the emerging Local Plan. Current plans for the Site are for the proposed construction of 34 residential dwellings and associated infrastructure, as identified on 'Proposed Site Plan' drawing no: NPS-DRA-A-(00)-012 (NPS, Rev P6, 04.02.19).
- 4.1.2 The following comprises an appraisal of likely ecological impacts based on the current plans, with recommendations for further survey, mitigation and/or enhancements included where necessary.

4.2 Designated Sites

- 4.2.1 Two statutorily designated sites of importance for nature conservation were identified within 2km of the Site; Carlton Marsh LNR 1.2km north east and Dearne Valley Park LNR 1.9km south of Site. Due to their distance from the Site, lack of connectivity to the Site and the small scale of the works, no impacts either LNR is anticipated.
- 4.2.2 Locally (non-statutory) designated LWSs are also located at least 1.2km from the Site. This is considered to be of a sufficient distance and with no direct habitat connectivity so as to avoid impacts. As such, no impacts from the proposed development are anticipated to LWSs.

4.3 Habitats

Semi improved Grassland

- 4.3.1 Total loss of this habitat will be required to accommodate the proposed development. This habitat is relatively common in the wider area and grassland within the Site is of low ecological value and not considered to be of importance to nature conservation beyond the site level. As a result its removal can be mitigated by new habitat creation in the form of verges and public open spaces.
- 4.3.2 New grassland should comprise a native mix which maximises species diversity. The planting locations, schedule and management regime will be detailed within an ecologically sensitive landscape plan.

Hedgerows

- 4.3.3 Loss of both hedgerows on Site is currently planned. Both hedgerows comprise more than 80% native species and therefore are considered a habitat of principle importance as well as hedgerows being listed on the LBAP.
- 4.3.4 Despite this, these habitats are common locally and nationally, of limited value due to their large gaps and limited connections to the surrounding area. Therefore hedgerows are considered to be of value to nature conservation at the site level only.

Dense Scrub

- 4.3.5 Landtake of this habitat is planned to accommodate the development. This habitat is relatively common in the wider area and where it occurs within the

Site it is small, isolated, of low ecological value and not considered to be of importance to nature conservation beyond the site level.

- 4.3.6 As above, a sensitive landscape plan would comply with the National Planning Policy Framework (NPPF) aim that "opportunities to incorporate biodiversity in and around developments should be encouraged" (NPPF, 2018).
- 4.3.7 Replacement vegetation should ideally comprise native species, and include species which would maximise flowering, pollen/nectar production and/or berries/fruit production to benefit invertebrates, birds and small mammals.

Scattered trees

- 4.3.8 Landtake of this habitat is planned to accommodate the development. This habitat is relatively common in the wider area and where it occurs within the Site it is very small, isolated, of low ecological value and not considered to be of importance to nature conservation beyond the site level.
- 4.3.9 As above, a sensitive landscape plan would comply with the NPPF aim that "opportunities to incorporate biodiversity in and around developments should be encouraged" (NPPF, 2018).
- 4.3.10 Replacement vegetation should ideally comprise native species, and include species which would maximise flowering, pollen/nectar production and/or berries/fruit production to benefit invertebrates, birds and small mammals.

Habitats Beyond the Site Boundary

- 4.3.11 An intact, mature hedgerow (H3) is adjacent the northern boundary, and is a notable habitat listed under Section 41 of the NERC Act 2006 and on the LBAP. The hedgerow has potential to be indirectly impacted by the development.
- 4.3.12 To safeguard the hedgerow during construction it is recommended that the hedgerow be securely fenced off with secure temporary steel mesh fencing to prevent incidental damage to or encroachment of construction personnel, materials or machinery.
- 4.3.13 In accordance with the following comments made by the biodiversity officer "Ideally the hedge here should be incorporated into a retained strip of land with grassland as a community asset. Some sections of the hedgerows along the lane have been laid in the past, reflecting their importance and value – this could be done again by the applicants as a biodiversity enhancement if they have the permission of the landowner to do so." It is recommended that landowner permission is sought to undertake the laying of the hedgerow.
- 4.3.14 To protect the hedgerow in the long term, a 1m buffer will be provided, set between the hedgerow and the rear of the gardens for the houses along the northern border. The buffer will take the form of closed board fencing and native scrub species planting (e.g. hawthorn and blackthorn). The area and planting will be detailed within an ecologically sensitive landscape plan. This is considered to be an alternative to a retained strip of land with grassland and incorporating the hedgerow as community asset due to lower maintenance requirements and the protection the new planting will offer the existing hedgerow.

4.4 Species

Amphibians

- 4.4.1 Great crested newt are included on Schedule 2 of the Conservation of Habitats and Species Regulations 2017. Under the Habitats Regulations great crested newt are protected from deliberate capture, injury or killing, from deliberate disturbance and from deliberate damage or destruction of a breeding Site or resting place.
- 4.4.2 Under the Wildlife and Countryside Act 1981 (as amended) it is also an offence to intentionally or recklessly disturb great crested newt while they are using a structure or place used for shelter or protection, or obstruct access to or damage any such structure or place. The provisions of the Act (1981) also protect great crested newts from activities associated their sale.
- 4.4.3 Ponds 1 and 2 are located 300m and 440m from the Site boundary respectively, both set within an area of woodland habitat which is highly suitable for amphibians during their terrestrial phase.
- 4.4.4 Ponds 1 and 2 have undergone a HSI assessment, with the results indicating they are of average and good suitability for supporting great crested newts respectively. Furthermore there are records for an unidentified newt species in Pond 2.
- 4.4.5 While Pond 1 is not considered to be separated from the Site by a significant barrier, it is still 300m from the Site boundary. Further to this the Site habitats are largely sub optimal for great crested newts, only the hedgerow bases and the area of ungrazed grassland in the far north east corner.
- 4.4.6 Pond 2 is separated from the Site by the Carlton industrial estate, a large area of hardstanding and industrial buildings, which constitutes a significant barrier to great crested newt dispersal.
- 4.4.7 The maximum routine migratory range for great crested newts has been estimated to be approximately 250m from a breeding pond (Oldham and Nicholson, 1986; Jehle, 2000), whilst the terrestrial zone within which 95% of summer refuges are commonly located extends just 63m from the breeding pond (Jehle, 2000). In addition, following the breeding season 64% of newts are commonly recorded within just 20m of the pond edge (Jehle and Arntzen, 2000).
- 4.4.8 Taking into account the above, it is considered unlikely that great crested newts would be present on Site given the distance from the ponds (300m), the limited suitable of on Site habitat and higher quality habitat present in the area immediately adjacent the ponds. Therefore it is not considered further survey in respect of this species is required.

Bats

- 4.4.9 All species of bat occurring within the UK are included in Schedule 2 of the Conservation of Habitats and Species Regulations 2017. 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).

- 4.4.10 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.
- 4.4.11 Barbastelle (*Barbastella barbastellus*), Bechstein's (*Myotis bechsteinii*), brown long-eared, greater horseshoe (*Rhinolophus ferrumequinum*), lesser horseshoe (*Rhinolophus hipposideros*), noctule and soprano pipistrelle (*Pipistrellus pygmaeus*) bats are included as priority species under Section 41 of the NERC Act 2006.
- 4.4.12 As both Structures 1 and 2 have been assessed as having negligible suitability to support roosting bats, no further survey in respect of these is required.
- 4.4.13 In the unlikely event presence of roosting bats is suspected immediately prior to removal/dismantling of the structures, e.g. due to audible squeaking, the presence of droppings or bats themselves, works should not proceed further until an ecologist has been contacted for advice.
- 4.4.14 As an ecological enhancement to the Site, which would comply with the NPPF (2018), consideration could be given to installing three integrated bat boxes, e.g. Schwegler 1FD bat boxes, within new dwellings.
- 4.4.15 Bat box locations with a southerly facing aspect and located at a minimum of 4m height are optimal to maximise the chances of occupation. Boxes should be placed where bats have a clear flight path to them, i.e. be free of obstructions such as overhanging branches or ivy growth.

Badger

- 4.4.16 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.
- 4.4.17 Although no evidence of resident badgers was recorded during the survey, the wider landscape is suitable for badgers and the Site is well connected to areas of suitable habitat, specifically Spring Wood to the north. As a result it is considered that badgers have potential to access Site at any time.
- 4.4.18 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 badger fall in.

Should a badger sett be discovered on Site at any time, works should be halted in the immediate area and an appropriately trained and qualified Ecologist consulted immediately.

Birds

- 4.4.19 All nesting birds are protected under the Wildlife and Countryside Act 1981 (as

amended) against destruction of the nest during the bird breeding season, which falls between March and August, inclusive.

- 4.4.20 Given the abundance of alternative similar habitat for birds in the wider area loss of the habitats on Site are unlikely to be of importance to bird species beyond the site level.
- 4.4.21 Any removal of woody vegetation, including trees, and dense scrub etc., should be undertaken between September and February inclusive, i.e. outside of the bird breeding season. Where this is not possible, vegetation should be checked for nesting birds by an experienced ecologist no more than two days prior to works commencing to confirm the absence of nests.
- 4.4.22 Nest boxes should be incorporated into the development, where practicable, to provide a positive enhancement for nature conservation and comply with the NPPF (2018).
- 4.4.23 As a result of the following comment by the biodiversity officer “Whilst on site I observed many 10’s of starlings roosting in the scattered hawthorn bushes. Mitigation for this species/ loss of habitat should be provided” enhancement for starling will be incorporated into the proposed development
- 4.4.24 Three nest boxes, suitable for starlings (*Sturnus vulgaris*), would be suitable for the Site. Boxes such as the Schwegler 3S starling terrace should be incorporated.

Reptiles

- 4.4.25 Adder (*Vipera berus*), grass snake, common lizard (*Zootoca vivipara*) and slow worm are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) against intentional killing or injuring.
- 4.4.26 Given the potential for reptiles to be present and foraging or sheltering but not hibernating or egg laying, within the area of ungrazed grassland and along the hedgerows, it is recommended that clearance of the unmanaged semi improved grassland, scrub and hedgerows/hedge bases should be carried out under supervision of an Ecological Clerk of Works (ECoW) and during the active season for reptiles (March- October) when temperatures are above 10°C, therefore, enabling reptiles to easily move away from disturbance.
- 4.4.27 The Site should be stripped in a systematic manner, ideally in an east to west direction to encourage reptiles away from the footprint of works into adjacent suitable habitat.

Hedgehog

- 4.4.28 Hedgehog is included as a species of principal importance under Section 41 of the NERC Act 2006. Whilst not afforded a high level of protection, hedgehogs have experienced significant declines in the UK population. Taking a best practice approach, avoiding harm to hedgehogs should be taken into consideration during works.
- 4.4.29 The Site has suitability to support hedgehog foraging, in the grassland and along the hedgerows.

-
- 4.4.30 Hedgehogs are highly mobile and inquisitive animals that have suitability to move onto Site at any time. 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.
- 4.4.31 The creation and maturing of new garden habitats on Site will compensate the loss of habitat to the grassland currently on Site.
- 4.4.32 To allow for dispersal of hedgehogs and other small mammals between gardens, small gaps beneath or between garden fences will be incorporated across the development, notably where close boarding fencing is to be used.
- 4.4.33 Natural gaps should be left under or around fencing where possible at fence junctions to rear gardens particularly ones facing the disused railway corridor, or where this is not feasible, gaps measuring a minimum of 13cm x 13cm will be created to the base of panels/gravel boards to allow the movement of hedgehogs between gardens across the development. Further information and examples of such fencing gaps put into practice can be found at: <http://www.hedgehogstreet.org/pages/link-your-garden.html>. Alternatively, railing and hedgerows provide free passage for hedgehogs.

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







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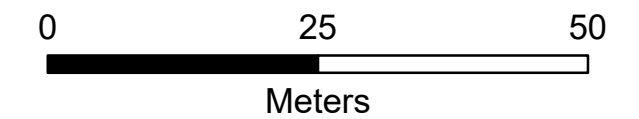
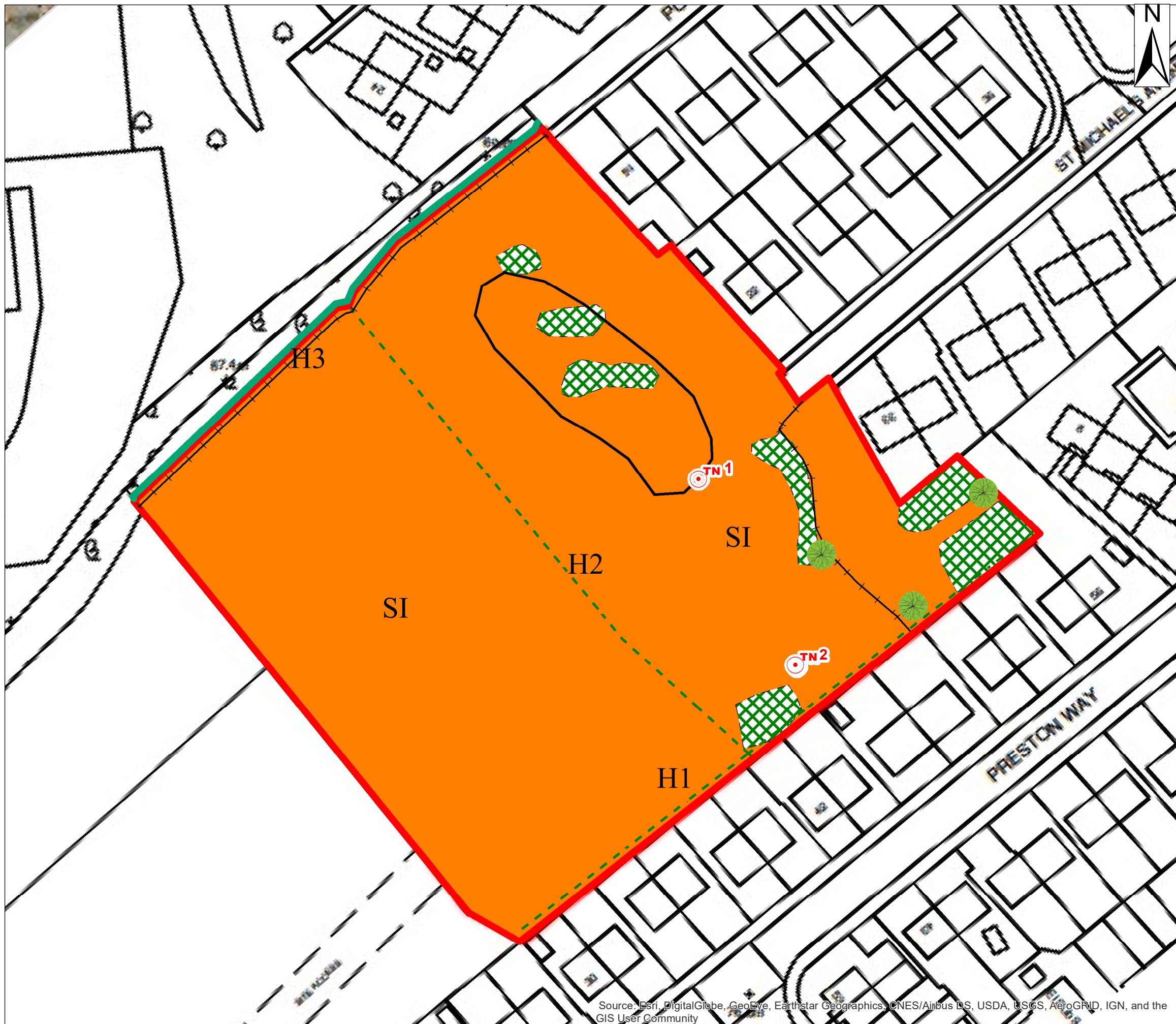
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Figure 1. Survey Findings Plan

Legend

-  Scattered trees
-  Post and rail fence
-  Species Poor Intact hedge (off Site)
-  Site boundary
-  Target notes
-  Species Poor Defunct hedge
-  Dense scrub
-  SI Semi-improved grassland



NPS Barnsley Limited
 Land off St Michaels Avenue, Barnsley
 Preliminary Ecological Appraisal



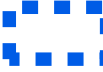
Figure 1
 Extended Phase 1 Survey Findings

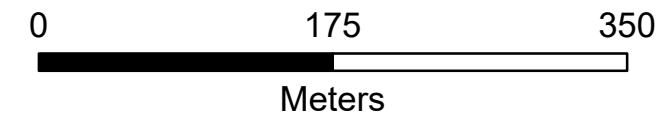
Brook Holt 3 Blackburn Road Sheffield S61 2DW
 T: 0114 2669292 www.ecusltd.co.uk

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 2. Pond Locations Plan

Legend

-  Site boundary
-  Pond locations
-  500m buffer to Site boundary



NPS Barnsley Limited
 Land off St Michaels Avenue, Barnsley
 Preliminary Ecological Appraisal

Figure 2
Pond Locations

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Appendix 1. Target Notes

TN1 Earth bank

TN2 2Structures

Appendix 2. Habitat Species List

Common name	Scientific name	DAFOR
Semi Improved Grassland		
Cocksfoot	<i>Dactylis glomerata</i>	R
Perennial Rye	<i>Lolium perenne,</i>	A
Poa Sp.	<i>Poa sp.</i>	F
Creeping buttercup	<i>Ranunculus repens</i>	R
Dandelion sp.	<i>Taraxacum sp.</i>	R
Ribwort Plantain	<i>Plantago lanceolata</i>	R
Creeping thistle	<i>Cirsium arvense</i>	R
Defunct Hedgerow		
Hawthorn	<i>Crataegus monogyna</i>	F
Apple	<i>Malus domestica</i>	O
Ash	<i>Fraxinus excelsior</i>	O
Blackthorn	<i>Prunus spinosa</i>	O
Dense Scrub		
Bramble	<i>Rubus fruticosus</i>	D

Appendix 3. Bird Records received from BBRC

Common name	Latin name	BoCC status
Black-Tailed Godwit	<i>Limosa limosa</i>	Schedule 1, Red
Common Scoter	<i>Melanitta nigra</i>	Schedule 1, Red
Fieldfare	<i>Turdus pilaris</i>	Schedule 1, Red
Hen Harrier	<i>Circus cyaneus</i>	Schedule 1, Red
Merlin	<i>Falco columbarius</i>	Schedule 1, Red
Redwing	<i>Turdus iliacus</i>	Schedule 1, Red
Ruff	<i>Philomachus pugnax</i>	Schedule 1, Red
Whimbrel	<i>Numenius phaeopus</i>	Schedule 1, Red
Avocet	<i>Recurvirostra avosetta</i>	Schedule 1, Amber
Bewick's Swan	<i>Cygnus columbianus</i>	Schedule 1, Amber
Bittern	<i>Botaurus stellaris</i>	Schedule 1, Amber
Dartford Warbler	<i>Sylvia undata</i>	Schedule 1, Amber
Garganey	<i>Anas querquedula</i>	Schedule 1, Amber
Goldeneye	<i>Bucephala clangula</i>	Schedule 1, Amber
Green Sandpiper	<i>Tringa ochropus</i>	Schedule 1, Amber
Greenshank	<i>Tringa nebularia</i>	Schedule 1, Amber
Greylag Goose	<i>Anser anser</i>	Schedule 1, Amber
Kingfisher	<i>Alcedo atthis</i>	Schedule 1, Amber
Little Tern	<i>Sterna albifrons</i>	Schedule 1, Amber
Marsh Harrier	<i>Circus aeruginosus</i>	Schedule 1, Amber
Mediterranean Gull	<i>Larus melanocephalus</i>	Schedule 1, Amber
Osprey	<i>Pandion haliaetus</i>	Schedule 1, Amber
Pintail	<i>Anas acuta</i>	Schedule 1, Amber
Quail	<i>Coturnix coturnix</i>	Schedule 1, Amber
Whooper Swan	<i>Cygnus cygnus</i>	Schedule 1, Amber
Wood Sandpiper	<i>Tringa glareola</i>	Schedule 1, Amber
Barn Owl	<i>Tyto alba</i>	Schedule 1, Green
Bearded Tit	<i>Panurus biarmicus</i>	Schedule 1, Green
Brambling	<i>Fringilla montifringilla</i>	Schedule 1, Green
Firecrest	<i>Regulus ignicapillus</i>	Schedule 1, Green
Goshawk	<i>Accipiter gentilis</i>	Schedule 1, Green
Hobby	<i>Falco subbuteo</i>	Schedule 1, Green
Little Ringed Plover	<i>Charadrius dubius</i>	Schedule 1, Green
Peregrine falcon	<i>Falco peregrinus</i>	Schedule 1, Green
Red Kite	<i>Milvus milvus</i>	Schedule 1, Green
Spotted Crake	<i>Porzana porzana</i>	Schedule 1, Green
Arctic Skua	<i>Stercorarius parasiticus</i>	Red
Corn Bunting	<i>Emberiza calandra</i>	Red
Cuckoo	<i>Cuculus canorus</i>	Red
Curlew	<i>Numenius arquata</i>	Red
Grasshopper Warbler	<i>Locustella naevia</i>	Red
Grey Partridge	<i>Perdix perdix</i>	Red

Grey Wagtail	<i>Motacilla cinerea</i>	Red
Hawfinch	<i>Coccothraustes coccothraustes</i>	Red
Herring Gull	<i>Larus argentatus</i>	Red
House Sparrow	<i>Passer domesticus</i>	Red
Kittiwake	<i>Rissa tridactyla</i>	Red
Lapwing	<i>Vanellus vanellus</i>	Red
Lesser Redpoll	<i>Carduelis cabaret</i>	Red
Linnet	<i>Carduelis cannabina</i>	Red
Mistle Thrush	<i>Turdus viscivorus</i>	Red
Pied Flycatcher	<i>Ficedula hypoleuca</i>	Red
Pochard	<i>Aythya ferina</i>	Red
Ring Ouzel	<i>Turdus torquatus</i>	Red
Ringed Plover	<i>Charadrius hiaticula</i>	Red
Skylark	<i>Alauda arvensis</i>	Red
Song Thrush	<i>Turdus philomelos</i>	Red
Spotted Flycatcher	<i>Muscicapa striata</i>	Red
Starling	<i>Sturnus vulgaris</i>	Red
Tree Pipit	<i>Anthus trivialis</i>	Red
Tree Sparrow	<i>Passer montanus</i>	Red
Turtle Dove	<i>Streptopelia turtur</i>	Red
Whinchat	<i>Saxicola rubetra</i>	Red
Willow Tit	<i>Poecile montanus</i>	Red
Wood Warbler	<i>Phylloscopus sibilatrix</i>	Red
Woodcock	<i>Scolopax rusticola</i>	Red
Yellow Wagtail	<i>Motacilla flava</i>	Red
Yellowhammer	<i>Emberiza citrinella</i>	Red
Arctic Tern	<i>Sterna paradisaea</i>	Amber
Barnacle Goose	<i>Branta leucopsis</i>	Amber
Bar-tailed Godwit	<i>Limosa lapponica</i>	Amber
Black-Headed Gull	<i>Chroicocephalus ridibundus</i>	Amber
Brent Goose	<i>Branta bernicla</i>	Amber
Bullfinch	<i>Pyrrhula pyrrhula</i>	Amber
Common Gull	<i>Larus canus</i>	Amber
Common Redstart	<i>Phoenicurus phoenicurus</i>	Amber
Common Sandpiper	<i>Actitis hypoleucos</i>	Amber
Common Tern	<i>Sterna hirundo</i>	Amber
Crane	<i>Grus grus</i>	Amber
Dunlin	<i>Calidris alpina</i>	Amber
Dunnock	<i>Prunella modularis</i>	Amber
European Storm Petrel	<i>Hydrobates pelagicus</i>	Amber
Gadwall	<i>Anas strepera</i>	Amber
Glaucous Gull	<i>Larus hyperboreus</i>	Amber
Great Black-Backed Gull	<i>Larus marinus</i>	Amber
Grey Plover	<i>Pluvialis squatarola</i>	Amber

House Martin	<i>Delichon urbica</i>	Amber
Iceland Gull	<i>Larus glaucooides</i>	Amber
Kestrel	<i>Falco tinnunculus</i>	Amber
Lesser Black-backed Gull	<i>Larus fuscus subsp. graellsii</i>	Amber
Lesser Black-Backed Gull	<i>Larus fuscus subsp. graellsii</i>	Amber
Mallard	<i>Anas platyrhynchos</i>	Amber
Manx Shearwater	<i>Puffinus puffinus</i>	Amber
Meadow Pipit	<i>Anthus pratensis</i>	Amber
Mealy Redpoll	<i>Carduelis flammea</i>	Amber
Mute Swan	<i>Cygnus olor</i>	Amber
Oystercatcher	<i>Haematopus ostralegus</i>	Amber
Pink-Footed Goose	<i>Anser brachyrhynchus</i>	Amber
Redshank	<i>Tringa totanus</i>	Amber
Reed Bunting	<i>Emberiza schoeniclus</i>	Amber
Sandwich Tern	<i>Sterna sandvicensis</i>	Amber
Shelduck	<i>Tadorna tadorna</i>	Amber
Short-eared Owl	<i>Asio flammeus</i>	Amber
Shoveler	<i>Anas clypeata</i>	Amber
Snipe	<i>Gallinago gallinago</i>	Amber
Spotted Redshank	<i>Tringa erythropus</i>	Amber
Stock Dove	<i>Columba oenas</i>	Amber
Swift	<i>Apus apus</i>	Amber
Tawny Owl	<i>Strix aluco</i>	Amber
Teal	<i>Anas crecca</i>	Amber
Water Pipit	<i>Anthus spinoletta</i>	Amber
Wigeon	<i>Anas penelope</i>	Amber
Willow Warbler	<i>Phylloscopus trochilus</i>	Amber
Yellow-legged Gull	<i>Larus michahellis</i>	Amber
Blackbird	<i>Turdus merula</i>	Green
Blackcap	<i>Sylvia atricapilla</i>	Green
Blue Tit	<i>Cyanistes caeruleus</i>	Green
Buzzard	<i>Buteo buteo</i>	Green
Carrion Crow	<i>Corvus corone</i>	Green
Chaffinch	<i>Fringilla coelebs</i>	Green
Chiffchaff	<i>Phylloscopus collybita</i>	Green
Coal Tit	<i>Parus ater</i>	Green
Collared Dove	<i>Streptopelia decaocto</i>	Green
Coot	<i>Fulica atra</i>	Green
Cormorant	<i>Phalacrocorax carbo</i>	Green
Crossbill	<i>Loxia curvirostra</i>	Green
Feral Pigeon	<i>Columba livia feral</i>	Green
Garden Warbler	<i>Sylvia borin</i>	Green
Goldcrest	<i>Regulus regulus</i>	Green
Golden Plover	<i>Pluvialis apricaria</i>	Green

Goldfinch	<i>Carduelis carduelis</i>	Green
Goosander	<i>Mergus merganser</i>	Green
Great Crested Grebe	<i>Podiceps cristatus</i>	Green
Great Spotted Woodpecker	<i>Dendrocopos major</i>	Green
Great Tit	<i>Parus major</i>	Green
Green Woodpecker	<i>Picus viridis</i>	Green
Greenfinch	<i>Carduelis chloris</i>	Green
Greenfinch	<i>Carduelis chloris</i>	Green
Grey Heron	<i>Ardea cinerea</i>	Green
Jack Snipe	<i>Lymnocyptes minimus</i>	Green
Jackdaw	<i>Corvus monedula</i>	Green
Jay	<i>Garrulus glandarius</i>	Green
Lesser Whitethroat	<i>Sylvia curruca</i>	Green
Little Egret	<i>Egretta garzetta</i>	Green
Little Grebe	<i>Tachybaptus ruficollis</i>	Green
Little Stint	<i>Calidris minuta</i>	Green
Long-Eared Owl	<i>Asio otus</i>	Green
Long-Tailed Tit	<i>Aegithalos caudatus</i>	Green
Magpie	<i>Pica pica</i>	Green
Moorhen	<i>Gallinula chloropus</i>	Green
Nuthatch	<i>Sitta europaea</i>	Green
Pheasant	<i>Phasianus colchicus</i>	Green
Pied Wagtail	<i>Motacilla alba</i>	Green
Pomarine Skua	<i>Stercorarius pomarinus</i>	Green
Reed Warbler	<i>Acrocephalus scirpaceus</i>	Green
Robin	<i>Erithacus rubecula</i>	Green
Rock Dove	<i>Columba livia</i>	Green
Rock Pipit	<i>Anthus petrosus</i>	Green
Rook	<i>Corvus frugilegus</i>	Green
Sand Martin	<i>Riparia riparia</i>	Green
Sedge Warbler	<i>Acrocephalus schoenobaenus</i>	Green
Siskin	<i>Carduelis spinus</i>	Green
Siskin	<i>Carduelis spinus</i>	Green
Sparrowhawk	<i>Accipiter nisus</i>	Green
Stonechat	<i>Saxicola torquata</i>	Green
Swallow	<i>Hirundo rustica</i>	Green
Treecreeper	<i>Certhia familiaris</i>	Green
Tufted Duck	<i>Aythya fuligula</i>	Green
Water Rail	<i>Rallus aquaticus</i>	Green
Waxwing	<i>Bombycilla garrulus</i>	Green
Wheatear	<i>Oenanthe oenanthe</i>	Green
Whitethroat	<i>Sylvia communis</i>	Green
Wood pigeon	<i>Columba palumbus</i>	Green
Wren	<i>Troglodytes troglodytes</i>	Green

Bar-Headed Goose	<i>Anser indicus</i>	No Status
Blue-headed Wagtail	<i>Motacilla flava subsp. flava</i>	No Status
Budgerigar	<i>Melopsittacus undulatus</i>	No Status
Cockatiel	<i>Nymphicus hollandicus</i>	No Status
Corvid Species	<i>Corvus</i>	No Status
Ferruginous Duck	<i>Aythya nyroca</i>	No Status
Goose species	<i>Anser</i>	No Status
Great Grey Shrike	<i>Lanius excubitor</i>	No Status
Great White Egret	<i>Ardea alba</i>	No Status
Little Owl	<i>Athene noctua</i>	No Status
Red Legged Partridge	<i>Alectoris rufa</i>	No Status
Thrush Species	<i>Turdus</i>	No Status
Wheatear species	<i>Oenanthe</i>	No Status
Canada Goose	<i>Branta canadensis</i>	Schedule 9
Golden Pheasant	<i>Chrysolophus pictus</i>	Schedule 9
Ring-Necked Parakeet	<i>Psittacula krameri</i>	Schedule 9
Ruddy Duck	<i>Oxyura jamaicensis</i>	Schedule 9

Appendix 4. Pond HSI Data

Pond Ref	Location	Pond Area	Pond Drying	Water Quality	Shade	Fowl	Fish	Ponds	Terrestrial Habitat	Macrophytes	HSI	Suitability
Pond 1	Zone A	0.2	Sometimes	Moderate	0-60%	Absent	Possible	1	Moderate	70	0.63	Average
Pond 2	Zone A	1	Sometimes	Moderate	0-60%	Absent	Possible	1	Moderate	90	0.71	Good

Appendix 5. Site Photos



Legend

- 1. View of the Site, facing south west.
- 2. View of the hedgerow along the eastern boundary, facing east.
- 3. View of the hedgerow dividing the two fields– facing west
- 4. View of the scrub in the north eastern corner. Facing north east.
- 5. View of the structure 1 with wooden frame.
- 6. View showing structure 2,



NPs Barnsley Limited Land Off St Michaels Ave
Preliminary Ecological Appraisal

Appendix 5. Site Images

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