Appendix 1 – HEGS Survey Sheet

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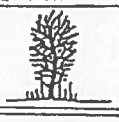
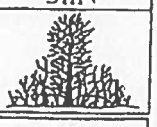
Deepcar 2.7.18

HEDGE RECORD AND EVALUATION SHEET

HEDGE NO.: 1

1 Recently laid or coppiced [YES] [NO] (if yes, score 7 and ignore criteria 2 to 4 below)

	SCORE ->	1	2	3	4
2	Height (exclude bank)	0–1m	1–2m	2–4m	4m+
3	Width	0–1m	1–2m	2–3m	3m+
4	Average Cross-Section				

5 STANDARD TREES
Species present:

No. of mature trees/pollards: 0
No. of young trees: 0

6 Length: 50 m

		≤1	1≤3	3≤5	>5
7	Mature Standards/100m	nil			
8	Young Standards/100m	nil			

STRUCTURAL SCORE 6

		30%+	30–10%	10–0%	no gaps
9	Percentage Gaps				
10	No. of End Connections	nil	2	3	4+

CONNECTIVITY SCORE 3

11 HEDGE CANOPY SPECIES
Species present:
Hawthorn
Sycamore
Alder

Combined total of tree and shrub species: 3

12 Native Species Dominant [nil] [1–2 spp] [mixed]
Exotic spp dominant – score nil

13 Total No. of Tree & Shrub Spp. [1–4] [5–7] [8–9] [10+]

DIVERSITY SCORE 3

		0–½m	½–1m	1m+
14	Hedgebank/Lynchet	nil		
15	Ditch	nil		
16	Grass Verge (2m+ wide)	nil		

ASSOCIATED FEATURES SCORE 0

17 NOTES
Ground flora & Climbers:
Ivy

18 Notable Species present

Pop nig	Til cor	Pyr cor
Sor tor	Til pla	other

→ Yes (NS) GRA 4
No

new hedge | old laid | unmanaged | cut/trimmed
track/roadside | fence/wall | parish boundary | garden boundary

Site: Deepcar Date: 2-7-18 Surveyor: MJH

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Appendix 2 – White Clawed Crayfish, Otter & Watervole Report

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Hallam Land Management

Land off Carr Road, Deepcar

WATER VOLE, OTTER & WHITE CLAWED CRAYFISH REPORT

June 2018

FPCR Environment and Design Ltd
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Rev	Issue Status	Prepared / Date	Approved/Date
-	Draft 1	MJH / 01.05.18	JSE / 04.05.18
	Final	KG / 08.05.2018	KG / 08.05.2018 ; JSE / 29.06.18

CONTENTS

FIGURES

PLATES

1.0 INTRODUCTION

1.1 This document has been prepared by FPCR Environment and Design Limited on behalf of Hallam Land Management. The report provides details of a survey for water voles *Arvicola amphibious,* otters *Lutra lutra* and white-clawed crayfish *Austropotamobius pallipes* at a site located off Carr Road, Deepcar.

1.2 The surveys were undertaken in response to a request by Sheffield City Council and are submitted to inform a proposed planning application (Planning Reference 17/04673/OUT) for a residential development of the above site.

1.3 The site is located in the southwest of the village of Deepcar to the northwest of Sheffield. Hollin Busk Lane and Carr Road border the site to the southwest and southeast. The northern boundary is bordered by Fox Glen Wood Local Wildlife Site (LWS) and grassland fields. The wider countryside is agricultural with numerous woodland blocks and the Peak District National Park extending away to the west.

1.4 The surveys were undertaken in a watercourse known as Clough Dyke within Fox Glen (Central Grid Reference SK 278 976). Figure 1 shows the location of the proposed development in relation to Fox Glen.

1.5 All surveys were undertaken on 24th April 2018.

2.0 RELEVANT LEGISLATION

Water Voles

2.1 Water voles are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (*as amended*). This makes it an offence to:-

- Intentionally kill, injure or take (capture) water voles;
- Possess or control live or dead water voles or derivatives;
- Intentionally or recklessly damage, destroy and obstruct access to any structure or place used by water voles for shelter or protection;
- Intentionally or recklessly disturb water voles whilst they are using such a place;
- Sell water voles or offer to expose for sale or transport for sale;
- Publish or cause to publish any advertisement which conveys the buying or selling of water voles.

2.2 Water voles are listed as a Species of Principal Importance under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

Otters

2.3 Otters are fully protected under Schedule 5 of the Wildlife & Countryside Act 1981 (*as amended*) due to the protection afforded to their places of shelter and protection. They are afforded protection under Section 9 parts 4(a) and 4(b). This makes it an offence to:

- Intentionally or recklessly kill, injure or take these species;
- Possess or control live or dead these species or derivatives;
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection;
- Intentionally or recklessly disturb these species whilst occupying a structure or place used for that purpose;
- Sell these species or offer or expose for sale or transport for sale; and
- Publish or cause to be published any advertisement which conveys the buying or selling of these species.

2.4 Otter is also protected by the Conservation of Habitats and Species Regulations 2017. In effect this legal protection makes it an offence to deliberately:

- Kill, take or injure and otter;
- Damage or destroy an otters place of shelter; and
- Disturb an otter whilst using such a place.

2.1 If impacts to otters or their places of rest or shelter cannot be avoided a European Protected Species Licence (EPSL) from Natural England is required (licenses cannot be obtained to provide protection against offences under the Wildlife & Countryside Act 1981 (*as amended*).

2.2 Otter is also listed as a Species of Principal Importance under Section 41 of the Natural Environment and rural Communities (NERC) Act 2006.

White-clawed crayfish

2.3 This species is protected under Schedule 5 of the Wildlife and Countryside Act 1981 (*as amended*) from taking and sale. Where any action is required that may lead to the removal of crayfish from their habitat ("taking"), such as bank excavation or direct crayfish removal from any area of works, a licence may be required under Section 16(3) of the Act.

2.4 The white-clawed crayfish is also listed on the IUCN Red Data List, Appendix III of the Bern Convention and Annexes II and V of the Habitats Directive. This species is also listed as a Species of Principal Importance under Section 41 of the Natural Environment and rural Communities (NERC) Act.

3.0 METHODOLOGY

3.1 The surveys were undertaken on 24th April 2018. The survey was conducted during suitable weather conditions comprising little / no wind or rain.

3.2 The survey considered the entire length of Clough Dyke within Fox Glen.

3.3 The source of the Clough Dyke is at the south-western extreme of Fox Glen and is culverted under Wood Royd Road to the north-east of the Glen. The total survey area was approximately 525m.

Field Survey

Water Vole

3.4 Standard methodology outlined within Strachen *et al* (2011)[1] was used which involved searching the banks/margins of the drains and ditches for evidence of:

- *Latrines* - distinct piles of water vole droppings found near nest sites, at the ranges of territorial boundaries and where the animals enter and leave the water;
- *Burrows* - burrow entrances are typically wider than high with a diameter between 4-8cm. Generally these burrow entrances are located at the water's edge;
- *Feeding Stations* - areas with distinct neat piles of chewed lengths of vegetation cut at 45 degrees along pathways or haul out platforms along the water's edge;
- *Footprints* - identifiable prints in soft margins of the watercourse;
- *Runways* - low tunnels that are pushed through the vegetation and often leading to burrows or feeding stations.

3.5 Descriptions of the watercourse were also made to aid any enhancement or mitigation recommendations required.

Otter

3.6 Survey methodology attempted to determine the status of otters. The methodology followed that of the full survey detailed in the New Rivers and Wildlife Handbook (RSPB/NRA, 1995).

3.7 Due to the unlikely event of actual observation, the survey concentrated on locating field signs indicating otter presence or use. Such field signs include:

- *Spraints* – characteristic sweet-smelling, black tar-like (where fresh/relatively recent i.e. within a few weeks) or grey crumbly (when old) faecal deposits usually containing fish scales, bones and occasionally invertebrate exoskeleton and bird feathers.
- *Footprints* – In good substrate typically asymmetrical and showing five toes arched around a large pad and, depending on substrate, webbing and claw marks. Poorer, generally coarser substrates do not often enable the identification of otter footprints.

3.8 Additional signs of otter presence may occur, although without additional evidence are usually not conclusive proof of current otter presence:

- *Feeding remains* – Remains of fish
- *Slides/haul-outs* – Routes into and out of the water, which are usually associated with terrestrial routes such as short cuts around meanders or along traditionally, used otter paths/routes.
- *Couches/hovers* – above ground resting place. Usually associated with cover such as dense scrub, rushes or reed, flood debris or fallen trees. Many couches are rarely used whilst others more so. Difficult to prove use without radio tracking.

[1] Strachen, R, Moorhouse, T and Gelling, M (2011) Water Vole Conservation Handbook. Third edition

- *Holts* – below ground resting site usually associated with sprainting. Sometimes used with greater frequency than couches and can be important for breeding (natal holts) where other signs are usually absent. Notoriously difficult to find or prove without radio tracking.

3.9 Descriptions of the watercourse were also made to aid any enhancement or mitigation recommendations required.

White-clawed crayfish

3.10 The survey was carried out by a licensed ecologist (Natural England Licence No. 2016-22651-CLS-CLS) using the methodology outlined in *Guidance of works affecting white clawed crayfish, Peay, S 2000)*[2]. Survey methods comprised of:

- Manually searching under all suitably large cobbles, boulders, woody debris and any other suitable refuge material on the stream bed; and
- Sweep netting under overhanging banks and in submerged vegetation.

3.11 Smith *et al*. (1996)[3] identified the key bankside habitat features that determine success of white-clawed crayfish populations (aside from water chemistry) as being:

- Presence of vertical banks;
- Canopy overhanging the channel over 0.5m from the water surface; and
- Tree roots projecting into the water.

4.0 RESULTS

Field Survey

Habitat Assessment

4.1 The source of Clough Dyke is at the south-westerly extreme of Fox Glen Wood and at the north-eastern extreme of the Glen the watercourse is culverted. The entire length of the watercourse, approximately 500m, was surveyed (Figure 2, Habitats Plan).

4.2 The watercourse was seen to have four main habitats (Figure 2, Habitats Plan); all habitat types are described below: .

- Habitat 1: 75m from the culvert upstream of the brook. The water course was approximately 5cm deep and 2m wide. Water flow would be described as medium with substrate mainly mud and was heavy with silt. The banks comprised of bare ground with little vegetation. There was approximately 75% shading over the water column. Small number of holes were present within the bank of this habitat.

[2] Peay S. (2000) Guidance of works affecting white-clawed crayfish. English Nature FIN/CON/139

[3] Smith GRT, Learner MA, Slater FM & Foster J (1996) Habitat features important for the conservation of the native crayfish *Austropotamobius pallipes* in Britain. Biological Conservation 75, pp 239-246.

Plate 1: Habitat 1.

- Habitat 2: Approximately 250m of the remaining watercourse. The watercourse depth varied between 5-30cm, with a majority between 5-10cm. The watercourse was approximately 0.5-1m wide. A few deep pools, with slow-flow were present but overall the water flow was medium-fast. The substrate was gravel with medium size boulders and cobbles. The banks were steep and comprised of rocks, ivy, bramble and moss. There was approximately 75% shading over the water column. There were a small number of undercut banks, but in general the sides were almost vertical.

Plate 2: Habitat 2.

- Habitat 3: Approximately 30m from the source to downstream and within the central area of the water course. The watercourse was approximately 5cm deep and 0.5-1m wide. Water flow would be described as glide with substrate of bedrock, with very few boulders. The banks were steep and comprised of rocks, ivy, bramble and moss. There was approximately 75% shading over the water column. There were a few undercut banks.

Plate 3: Habitat 3.

- Habitat 4: Towards the west of the water course a dammed area that was heavily vegetated. Water flow was slow and approximately 30cm deep. Sides were stone and vertical. There was approximately 75% shading over the water column. There were no undercut banks.

Plate 4: Habitat 4.

Water Vole

4.3 No evidence confirming the presence of water vole was recorded within the survey area.

4.4 A few small bankside holes were present throughout the survey area (mainly within habitat 1) but these are not thought to be made by water vole due to their small size and no other evidence of occupation by water vole was identified along the watercourse.

Otter

4.5 No otter spraints and footprints were recorded during the survey.

4.6 No signs of otter holts or couches were present within the survey area.

White-clawed crayfish

4.7 No evidence of white-clawed crayfish was recorded in any of the 4 habitat sites surveyed, although suitable refugia in the form of boulders, pebbles, woody debris, tree roots and undercut banks were present.

Survey Effort / Timing

4.8 Table 1, below, provides full details of survey effort expended in relation to the white-clawed crayfish presence / likely absence surveys. The survey effort is broadly based on *Guidance of works affecting white clawed crayfish, Peay, S 2000)*[4] which recommends that:

"Selective searching for 45 minutes or more will be needed to detect a population at low density, even where conditions are suitable for manual searching."

4.9 The survey team comprised two experienced surveyors (including one licensed) working from downstream to upstream, undertaking manual searches simultaneously. Total survey time was 180 minutes for each surveyor and survey time in any given habitat was proportionate to the number of potential refuges available / searchable. Rather than selective searching (as described in the above guidance), all potential refuges within the channel which could be lifted, were searched for crayfish presence.

In-Stream Habitat Type Reference (see Figure 2)	Number of Constituent Habitat Patches Within Habitat Type	Total Length of Habitat Patch (m)	Main Potential Refuge Features	Total Habitat Survey Time Per Surveyor (minutes)
1	1	75m	Bank holes	15
2	3	250m: 115m+105m+30m	In stream: numerous cobbles / boulders. Banks: Boulders.	120
3	2	150m: 90m+60m	In-stream: occasional boulders. Banks: occasional boulders.	30

[4] Peay S. (2000) Guidance of works affecting white-clawed crayfish. English Nature FIN/CON/139

In-Stream Habitat Type Reference (see Figure 2)	Number of Constituent Habitat Patches Within Habitat Type	Total Length of Habitat Patch (m)	Main Potential Refuge Features	Total Habitat Survey Time Per Surveyor (minutes)
4	1	25m	In-stream: very occasional cobbles / boulders. Banks: very occasional cobbles / boulders.	15

4.10 Given the above information, and as the survey time is effectively doubled due to the presence of two surveyors, it is considered that the survey effort undertaken, by far, exceeds that recommended in the above guidance to enable the detection of this species, even where it occurs at low density.

5.0 DISCUSSION

5.1 No evidence confirming the presence of water vole, otter and white-clawed crayfish was recorded in the Clough Dyke during the course of the surveys.

Water Vole

5.2 The habitat along the length of the survey area was considered to provide some suitability for water vole given its nature, however the connectivity to water bodies in the local area is poor as the Dyke's source is within the west of the Glen and the Dyke is culverted to the east of the Glen. It is therefore very unlikely that the nature of the habitat is suitable to sustain a population of the species.

5.3 Fox Glen has been designated a LWS and water voles were presented within the designation, however consultation records from Sheffield Biological Records Centre do not show any records of water vole within the Dyke, and no signs were identified over the survey.

Otter

5.4 Otters have large ranges which they regularly travel in search of food. However, there was no evidence of otter in the Dyke during the survey. Therefore, the presence of otter has not been identified as a statutory ecological constraint.

White-clawed Crayfish

5.5 No white-clawed crayfish were observed at the time of the survey. Habitat sections 2-4 provided potential refuge habitat with boulders, cobbles, woody debris and small areas of emergent vegetation throughout the survey area but no evidence of white clawed crayfish were identified

over the survey. Habitat 1 was not suitable for the species with the exception of small holes in the bank. However, should this species be present within the watercourse, evidence of occupation would have been confirmed during the manual search. From these results white clawed crayfish has not been identified as a statutory ecological constraint.

Figures

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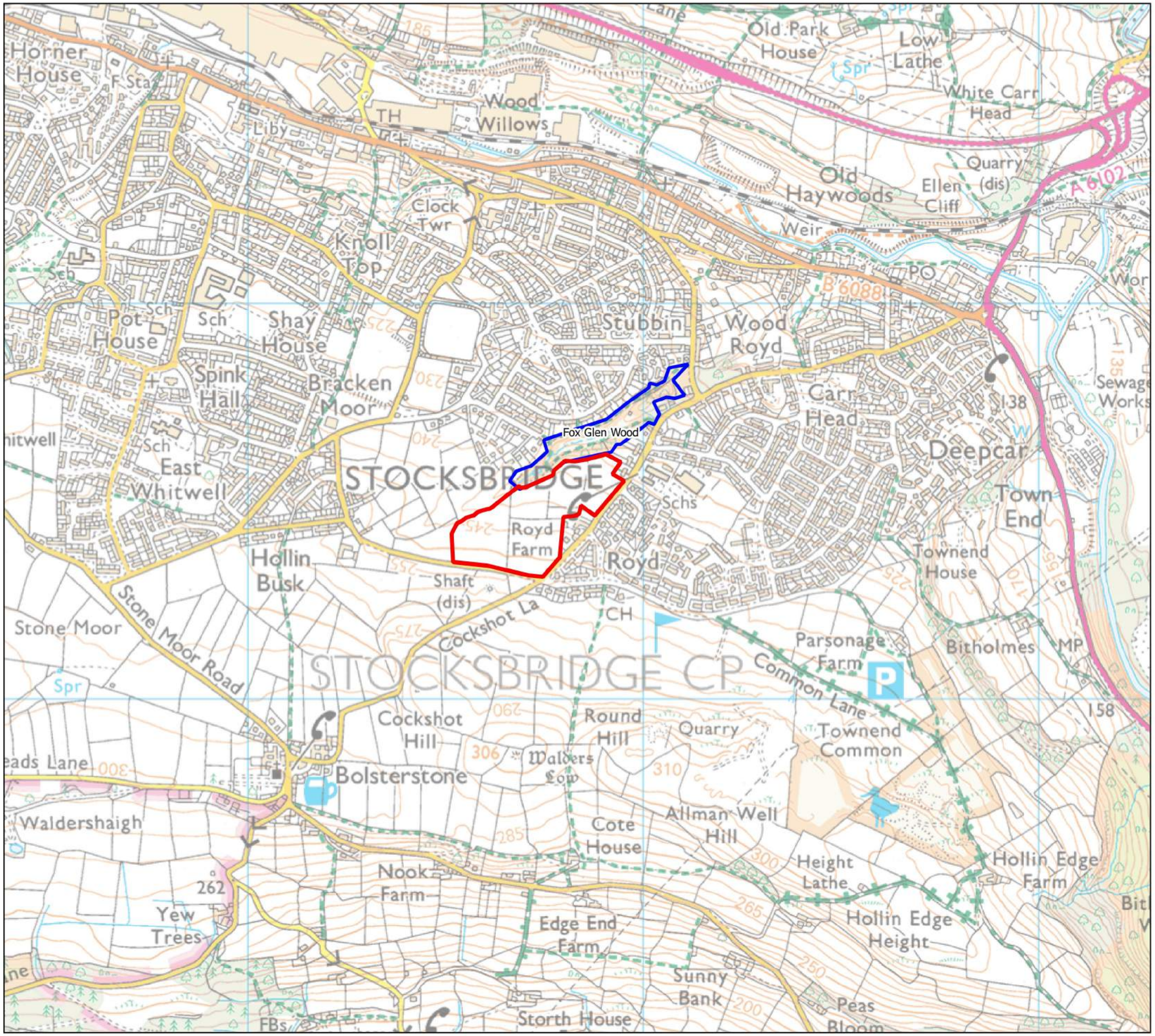
Key

Site Boundary

Fox Glen Wood



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masterplanning ▪ environmental assessment ▪ landscape design ▪ ecology ▪ architecture ▪ arboriculture ▪

0 250 500 750 1000 m

N

client
Hallam Land Management

project
Land off Carr Road, Deepcar

SITE LOCATION AND SURVEY AREA WITHIN FOX GLEN WOOD

scale of A3 1:10,000 | drawn MRD | issue 1/5/2018

drawing / figure number
Figure 1 **7301 - E - 01**

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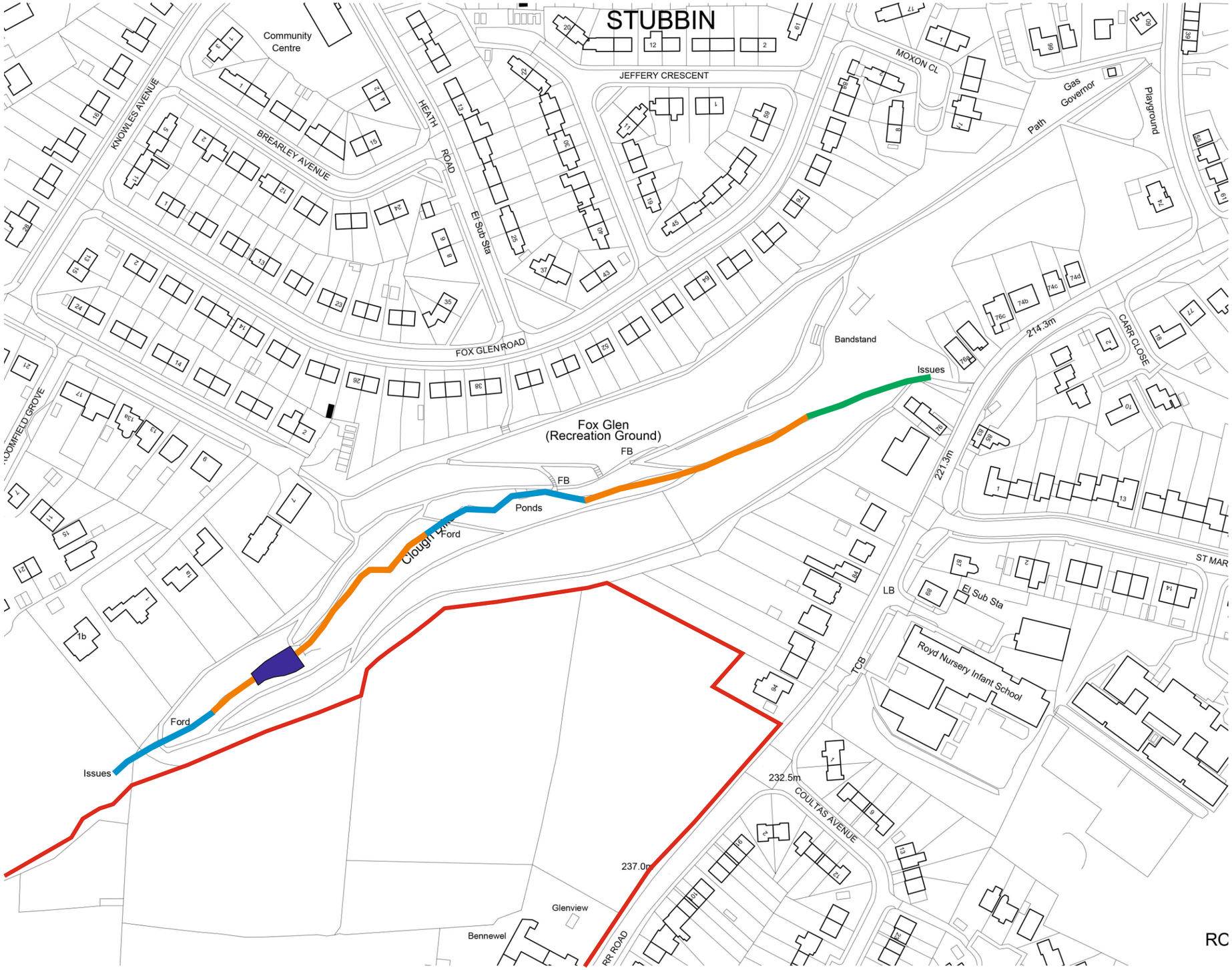

Habitat 1

Habitat 2

Habitat 3

Habitat 4

RC

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HABITATS PLAN

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Figure 2

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Appendix 3 – Static Bat Detector Survey Results

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Unit 27 – May 2016: Static Survey Information

Day	Ppi	Ppy	Psp	Myotis	Nyctalus	Nn
19/05/2016 - 20/05/2016	694	0	7	3	1	2
20/05/2016 - 21/05/2016	138	0	0	2	0	0
21/05/2016 - 22/05/2016	480	0	2	0	0	0
22/05/2016 - 23/05/2016	793	0	11	1	0	0
23/05/2016 - 24/05/2016	215	0	13	1	0	0
Total	**2320**	**0**	**33**	**7**	**1**	**2**
Max	**793**	**0**	**13**	**3**	**1**	**2**

Species	21:00-22:00	22:01-23:00	23:01-00:00	00:01-01:00	01:01-02:00	02:01-03:00	03:01-04:00	04:01-05:00
Common Pipistrelle	442	402	361	367	220	84	162	284
Pipistrelle Species	17	4	5			1	4	2
Myotis Species	1	2	1	1		1	1	
Noctule				2				
Nyctalus Species		1						

Unit 10 – July 2016: Static Survey Information

Day	Ppi	Ppy	Psp	Myotis
30/06/2016 - 01/07/2016	9	0	0	1
01/07/2016 - 02/07/2016	4	0	0	1
02/07/2016 - 03/07/2016	15	0	0	0
03/07/2016 - 04/07/2016	28	0	0	0
04/07/2016 - 05/07/2016	42	0	0	0
Total	**98**	**0**	**0**	**2**
Max	**42**	**0**	**0**	**1**

Species	21:00-22:00	22:01-23:00	23:01-00:00	00:01-01:00	01:01-02:00	02:01-03:00	03:01-04:00	04:01-05:00
Common Pipistrelle	1	67	7	5	2	4	8	4
Myotis Species			1				1	

Unit 13 – September 2016: Static Survey Information

Day	Ppi	Ppy	Psp	Myotis	Nyctalus	Nn	Unknown	Ppi-Ppy
23/09/2016 - 24/09/2016	14	0	0	1	2	2	1	0
24/09/2016 - 25/09/2016	19	0	0	1	2	1	0	0
25/09/2016 - 26/09/2016	11	0	0	0	1	0	0	0
26/09/2016 - 27/09/2016	3	0	0	0	1	0	0	1
27/09/2016 - 28/09/2016	9	0	0	1	4	2	0	0
Total	**56**	**0**	**0**	**3**	**10**	**5**	**1**	**1**
Max	**19**	**0**	**0**	**1**	**4**	**2**	**1**	**1**

Species	19:00-20:00	20:01-21:00	21:01-22:00	22:01-23:00	23:01-00:00	00:01-01:00	01:01-02:00	02:01-03:00	03:01-04:00	04:01-05:00	05:01-06:00	06:01-07:00
Common Pipistrelle	13	12	3	4	4	1		2			2	15
Nyctalus Species	7			1			1				1	
Noctule	5											
Myotis Species				1	2							
Common / Soprano Pipistrelle												1
Unknown Species								1				

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