Goldthorpe ES10 – Bird Survey and Defra Metric Briefing Note v3

Introduction

This briefing note is intended to serve as a partial update to the Goldthorpe ES10 Preliminary Ecological Appraisal (PEA) report (MBE, 2020). Bird survey works undertaken since the PEA are detailed together with mitigation recommendations arising from survey findings. This document also provides preliminary guidance on the extent of habitat enhancement measures likely to be required to enable 10% Biodiversity Net Gain (BNG) on the site.

Methods

A four-visit breeding bird survey of the site was undertaken by Peter Middleton between 23rd April and 8th June 2020, as detailed in the PEA. The breeding bird surveys highlighted use of the site by marsh harrier *Circus aeruginosus* with targeted marsh harrier survey work subsequently undertaken.

Seven three-hour vantage point surveys were completed between 31st July and 18th August 2020 from a location on the southern boundary of the site (SE 44036 03129). This period was chosen as it coincides with the fledging of young birds of this species (two of the juveniles at Old Moor had fledged by the 28th August). Recorded marsh harriers were sexed and aged where possible and their flight lines were numbered and drawn onto a suitable map of the area. Not all of the site could be viewed from the vantage point as some areas were obscured by the trees along Carr Dike, also some areas off site to the west of the application site were also obscured as a consequence of the topography (see Appendix 2). The surveys were undertaken at different times of the day and in different weather conditions. All flight lines have been digitised and a heat map has been produced to highlight where most foraging activity took place during the surveys.

The Biodiversity Metric 2.0 (Crosher *et al*., 2019) is used to calculate the biodiversity impact of this scheme. This metric uses habitat as a proxy for wider biodiversity with different habitat types scored according to their relative biodiversity value. This value is then adjusted depending on the condition and location of the habitat, to calculate 'biodiversity units'. Calculations are undertaken in a purpose designed spreadsheet, which provides the main output of the process. Given that no finalised landscaping plans currently exist for this scheme, the site's existing value only has been quantified using the Biodiversity Metric 2.0. Calculations undertaken to date has looked only at area habitats. The calculations have not yet been undertaken for hedgerows or rivers. It should be noted that the Biodiversity Metric 2.0 only considers habitats and not species and therefore the LPA has to ensure a minimum 10% biodiversity net gain (Masterplan Framework generic policy) and mitigate for species impacts.

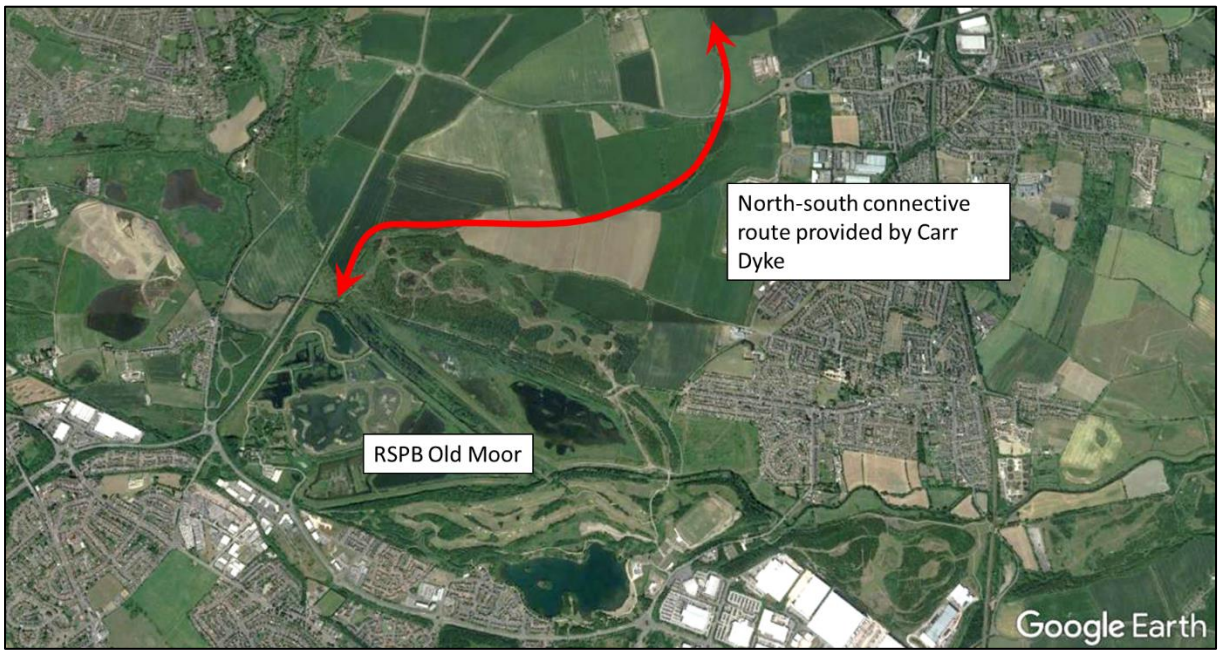
RSPB Old Moor and Other Dearne Valley Wetland Reserves

The Dearne Valley supports nationally important assemblages of breeding birds of lowland damp grassland, lowland open water and their margins and scrub, plus nationally important numbers of some individual species of breeding water birds. Although individual sites within the Dearne Valley are currently designated at a local level only, a network of wetland reserves including RSPB Old Moor is under consideration for designation at a national level as a Site of Special Scientific Interest (SSSI).

At present, in addition to east-west landscape connectivity provided by the River Dearne, Old Moor benefits from some level of north-south landscape connectivity provided by the proposed development site, notably including Carr Dike (Figure 1) but also including arable land in this area.

The proposed development site is likely to be used as a wider dispersal and foraging area by birds using RSPB Old Moor and the other Dearne Valley wetlands. It is assessed that development of Goldthorpe ES10 may negatively impact the integrity of the Old Moor and Bolton Ings sites by restricting foraging and dispersal opportunities for several bird species including marsh harrier.

Figure 1. Carr Dike as a connective landscape link to RSPB Old Moor



Breeding birds

The site is most important for its assemblage and abundance of farmland/open habitat species of birds including lapwing *Vanellus vanellus*, yellowhammer *Emberiza citrinella*, skylark *Alauda arvensis*, yellow wagtail *Motacilla flava* and linnet *Linaria cannabina* together with a single pair of grey partridge *Perdix perdix*. The findings of the breeding bird survey are shown in Appendix 1. The site is considered to generally be of importance to farmland birds at a local level, however, it is considered to be of importance to two individual species notably including yellow wagtail, at a district level. Table 1 shows the importance of the site to each species assessed by comparing data from The Atlas of Breeding Birds in the Barnsley Area 2006 – 2011 (Pearce & Middleton, 2018).

Table 1. Breeding pairs of key red listed farmland bird species on site

Species	Breeding pairs on site (1km^2)	Highest count per 1km^2 in Barnsley area 2006 - 2011	Estimated Barnsley Breeding Population 2006 - 2011	Red or Amber Listed	Site importance
Lapwing	2	20	>600 (608)	Red	Local
Grey partridge	1	3[1]	<200 (170)[1]	Red	Local/District
Yellow wagtail	3	4	<35 (33)	Red	District
Skylark	14	19	<1,100 (1060)	Red	Local

[1] The grey partridge population in the Barnsley area has crashed since 2011 (Middleton, pers. comm.)

Species	Breeding pairs on site (1km^2)	Highest count per 1km^2 in Barnsley area 2006 - 2011	Estimated Barnsley Breeding Population 2006 - 2011	Red or Amber Listed	Site importance
Linnet	4	18	<700 (659)	Red	Local
Yellowhammer	11	11	>800 (838)	Red	Local

Marsh harrier

Marsh Harrier comprise a bird species included on Schedule 1 of the Wildlife and Countryside Act (1981) as amended. Its UK population in 2017 was estimated at 350-392 breeding females/pairs (Holling *et al.*, 2019) with a strong increase (+322%) over a 25-year trend. In 2020 marsh harrier successfully bred at RSPB Old Moor with three chicks fledging. This comprises the first breeding attempt by this bird at a site within Barnsley in recorded history. Although marsh harrier has successfully bred at Potteric Carr in Doncaster recently, we are not currently aware of any proven successful breeding attempt at any other site in South Yorkshire. Given the lack of breeding records for marsh harrier in South Yorkshire it can reasonably be suggested that RSPB Old Moor is of importance to this species at a regional level.

A total of seven marsh harriers have been recorded on site on six of the seven visits: three adult females, three juveniles and one adult male. An additional adult female in moult was also recorded at Old Moor during this time (Waddington, pers. com.) but was not seen in the survey area during vantage point surveys. One hundred and eight (108) flight lines mainly along Carr Dike have been recorded during the six survey visits undertaken. These observations were centred on Carr Dike (Appendix 2) with wet areas of arable where the crop had failed adjacent to the southern edge of the dike also used extensively.

On the first survey two juveniles and an adult female were recorded with the juveniles largely loafing (sat in fields) to the west of the application site. On the second visit the third juvenile had fledged and was recorded on site with its siblings. Juveniles were seen to gain height and leave north on several occasions and by the 9th August they were assumed to have dispersed as they were not seen on subsequent visits.

It is clear that juvenile and adult marsh harrier use the proposed development site both during and following the nesting period. During 2020, the site was extensively used by dispersing juvenile birds which foraged regularly on site, particularly in rough grassland alongside Carr Dike. Furthermore, observed behaviour suggests that this area is an important staging post prior to final dispersal. At present, given the level of marsh harrier use recorded during the 2020 surveys and the likely importance of this site to the birds, it is considered that Goldthorpe ES10 may be of up to county level importance to marsh harrier.

The development could potentially result in the complete loss of site habitats to marsh harrier, either as a result of direct land-take or more likely through indirect disturbance resulting from the close proximity of built structures to the dike. Were site habitats to be lost to this bird species, without mitigation, then it is unknown what impact it could have on the viability of RSPB Old Moor as a future breeding site for marsh harrier. It is possible that loss of Goldthorpe ES10 habitats to marsh harrier may result in either a reduction in the summer carrying capacity of Old Moor or a related reduction in fledging success. It has also been suggested that loss of the Goldthorpe ES10 site to foraging marsh harrier may increase the reliance of foraging birds on RSPB Old Moor, potentially increasing predation upon other bird species that it supports. Unfortunately, it is probably not possible to accurately predict the likelihood of these potential impacts occurring.

Wintering bird surveys

Bird surveys undertaken in December, January and February have revealed that the site is not considered important for wintering farmland birds with only very low numbers of skylark and yellowhammer recorded in January and February, with none in December. All the site is sown with autumn sown cereals or rape and therefore its value to wintering birds is limited to Carr Dike and hedgerows on field boundaries. However, evidence gathered during the vantage point surveys in August (August is autumn in the bird calendar) suggests the site is used by wildflowl and waders (lapwing), as geese and lapwing have been recorded on site in relatively large numbers prior to the sowing of crops.

Mitigation for marsh harrier

The Ecological Constraints and Opportunities Plan (ECOP) provided in the PEA report (see Appendix 3 of this document) recommends the maintenance of the widest possible buffer along Carr Dike with a minimum buffer of 10m advised. A narrower buffer is considered acceptable alongside tributary ditches and retained hedgerows. This buffer is considered acceptable to maintain the ditch's functional importance as a green corridor to most generalist faunal species (not including farmland birds).

The targeted marsh harrier survey results do however appear to demonstrate a reluctance of marsh harrier to feed close to the industrial development, which borders the east of the site. For this reason and given the tendency of this species to avoid disturbance and closed habitats, it is considered that a 10m buffer from Carr Dike would not be sufficient to allow marsh harrier to continue to use the site habitats.

We would consider there are two options appropriate to mitigate marsh harrier impacts likely to arise from the scheme. These options are shown on the plans in Appendix 4. The first option would be to maintain a 35m buffer from each bank of Carr Dike as it passes through the site. Within this buffer, new habitats away from the existing woodland, should comprise either rough grassland, or an alternative suitable open habitat, such as reedbed. It is considered this wide buffer from development would maximise the chance of marsh harrier continuing to use the ES10 site post-development.

An alternative marsh harrier mitigation approach would be to maintain a narrower buffer on Carr Dike within the red-line boundary, accepting this would make continued use of the site by marsh harrier unlikely. To mitigate for this loss of foraging space, existing rough grassland banks along the length of Carr Dike, to the west of the red-line boundary and the north of Bolton Tip, would be widened to provide a 35m wide corridor within this area. This corridor would be further supplemented by a 35m wide corridor connecting to the dike's north bank and continuing north to the A635. The marsh harrier survey works have shown the grass banks of Carr Dike to the west of the site were used most intensively by this bird species during the 2020 survey works. We have located this northern extension c.300m west of the site boundary to minimise potential disturbance to this corridor from the proposed ES10 development. Habitats within this inverse T-shaped corridor would comprise either rough grassland, or an alternative suitable habitat such as reedbed. It should however be noted that this inverse T-shaped off-site corridor is only considered a suitable mitigation option whilst the surrounding land to the west of ES10 is managed as either arable or an alternative open and undisturbed habitat. Were this area to be developed in the future, it is considered unlikely that this second marsh harrier mitigation option would remain viable.

Adoption of the second (off-site) marsh harrier mitigation plan would have the additional benefit that it would reduce the scheme's impact on farmland birds, to some degree.

Biodiversity net gain

As stated by Trevor Mayne in his recent correspondence, the development will be required to achieve 10% biodiversity net gain. Baseline calculations undertaken in The Biodiversity Metric 2.0 show the existing site has a value of 195 Habitat Units with the arable land contributing 158 Units of the total figure. This figure notes that all land falls within an area 'formally identified in local strategy' as it falls within the NIA. Preliminary calculations of the post development site show that even if the ECOP (Appendix 3) were enacted fully, the development would still result in a large reduction in the site's ecological value, as measured by the metric. The reason for this is that whilst the metric shows arable land as having a low distinctiveness value, it is still much greater than hardstanding or buildings, which are considered to have no value at all. For this reason, it is considered that achieving net gain within the red-line boundary, even if a 35m buffer were maintained along Carr Dike (see Marsh Harrier Mitigation Option 1 – Appendix 4), would not be possible. As a result, in addition to seeking to include measures detailed in the ECOP within the proposed scheme, and enacting one of the two marsh harrier mitigation options (or an adaption thereof) it is expected that further off-site land will need to be used to deliver biodiversity net gain. When selecting off-site land upon which to achieve net gain in relation to the ES10 scheme, it is important that land falling closer to the ES10 scheme is given preference and that habitat creation considers the impacts of the ES10 scheme and the habitats being lost.

If you have any queries in the meantime, please do not hesitate to get in contact.

Yours sincerely,

Robert Bell MCIEEM
Principal Ecologist

References

Bond M (2003) Principles of Wildlife Corridor Design. Centre for Biological Diversity.

Crosher I, Gold S, Heaver M, Heydon M, Moore L, Panks S, Scott S, Stone D & White N (2019) The Biodiversity Metric 2.0: Auditing and accounting for biodiversity value: technical supplement (Beta version, July 2019). Natural England.

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Wenger SJ (1999) A review of the scientific literature on riparian buffer width, extent and vegetation. Athens: Institute of Ecology Office for Public Service and Outreach, University of Georgia.

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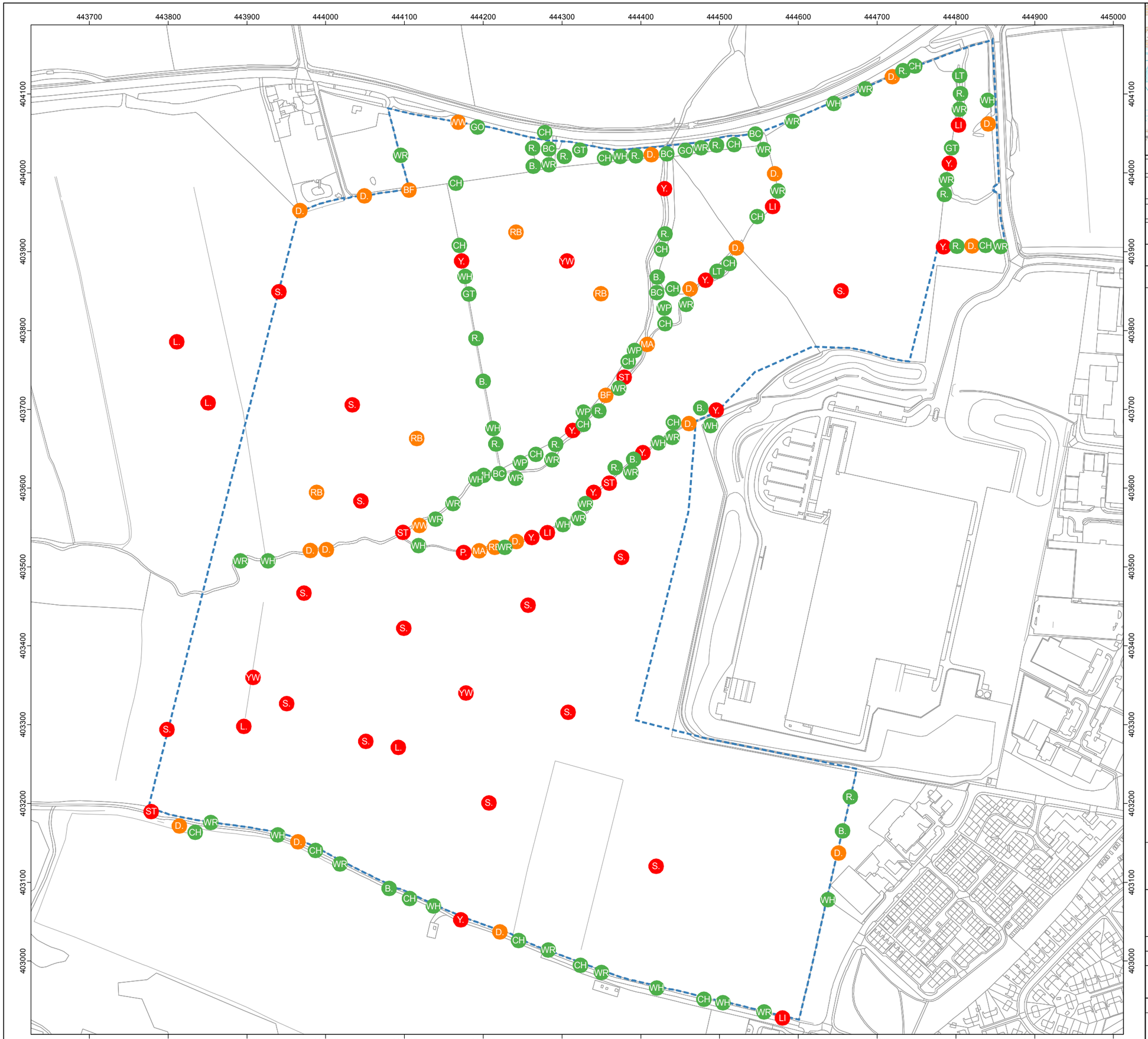
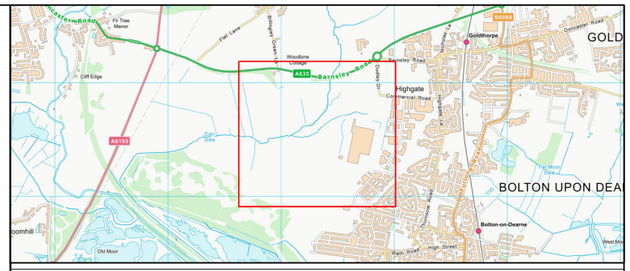
Appendix 1. Breeding Bird Survey Results





Survey Information

Site boundary

Breeding Bird Survey Territories (incl. Status)

- BoCC - red listed species
- BoCC - amber listed species
- BoCC - green listed species

BTO Species Codes, BoCC Classification and Territory Count:

BoCC Red Listed
- L. - Lapwing (4)
- LI - Linnet (4)
- P. - Grey Partridge (1)
- S. - Skylark (14)
- ST - Song Thrush (4)
- Y. - Yellowhammer (11)
- YW - Yellow Wagtail (3)

BoCC Amber Listed
- BF - Bullfinch (2)
- D. - Dunnock (17)
- MA - Mallard (2)
- RB - Reed Bunting (5)
- WW - Willow Warbler (2)

BoCC Green Listed
- B. - Blackbird (7)
- BC - Blackcap (5)
- CH - Chaffinch (22)
- GO - Goldfinch (2)
- GT - Great Tit (3)
- LT - Long-tailed Tit (2)
- MH - Moorhen (1)
- R. - Robin (15)
- WH - Whitethroat (16)
- WP - Wood Pigeon (4)
- WR - Wren (27)

N 0 25 50 100 150 200 Metres

PROJECT TITLE

SCR PRIORITY CLUSTERS, BARNSLEY : GOLDTHROPE

DRAWING TITLE

Figure X. Breeding Bird Survey - Territories

VER	DATE	REMARKS	Drawn	Checked
1.1	28/06/20	BBS - Territories	MP	RB

DRAWING NUMBER: MIDDLETONBELLECOLOGY/Goldthrope/BBS

SCALE	PLOT SIZE	DATUM	PROJECTION
1:4,600	A3	OSGB	BNG

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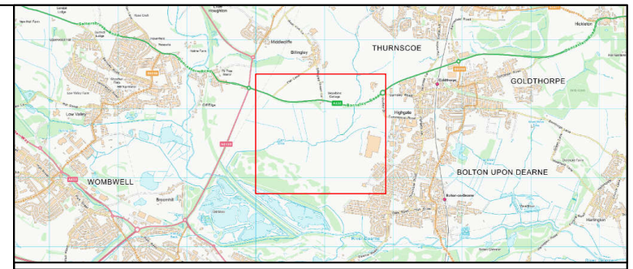
Appendix 2. Marsh Harrier Density Plot



Survey Information	
	Site boundary
VP	Vantage point location
Marsh Harrier Density	
	2 - 3 flightlines
	4 - 5 flightlines
	6 - 10 flightlines
	11 - 16 flightlines

N

0 25 50 100 150 200
Metres

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DRAWING TITLE

Figure 7. Marsh Harrier Vantage Point Survey, Density

VER	DATE	REMARKS	Drawn	Checked
1.0	25/08/20	Density	MP	RB

DRAWING NUMBER:

MIDDLETONBELLECOLOGY/Goldthrope/VPDensity

SCALE	PLOT SIZE	DATUM	PROJECTION
1:6,250	A3	OSGB	BNG

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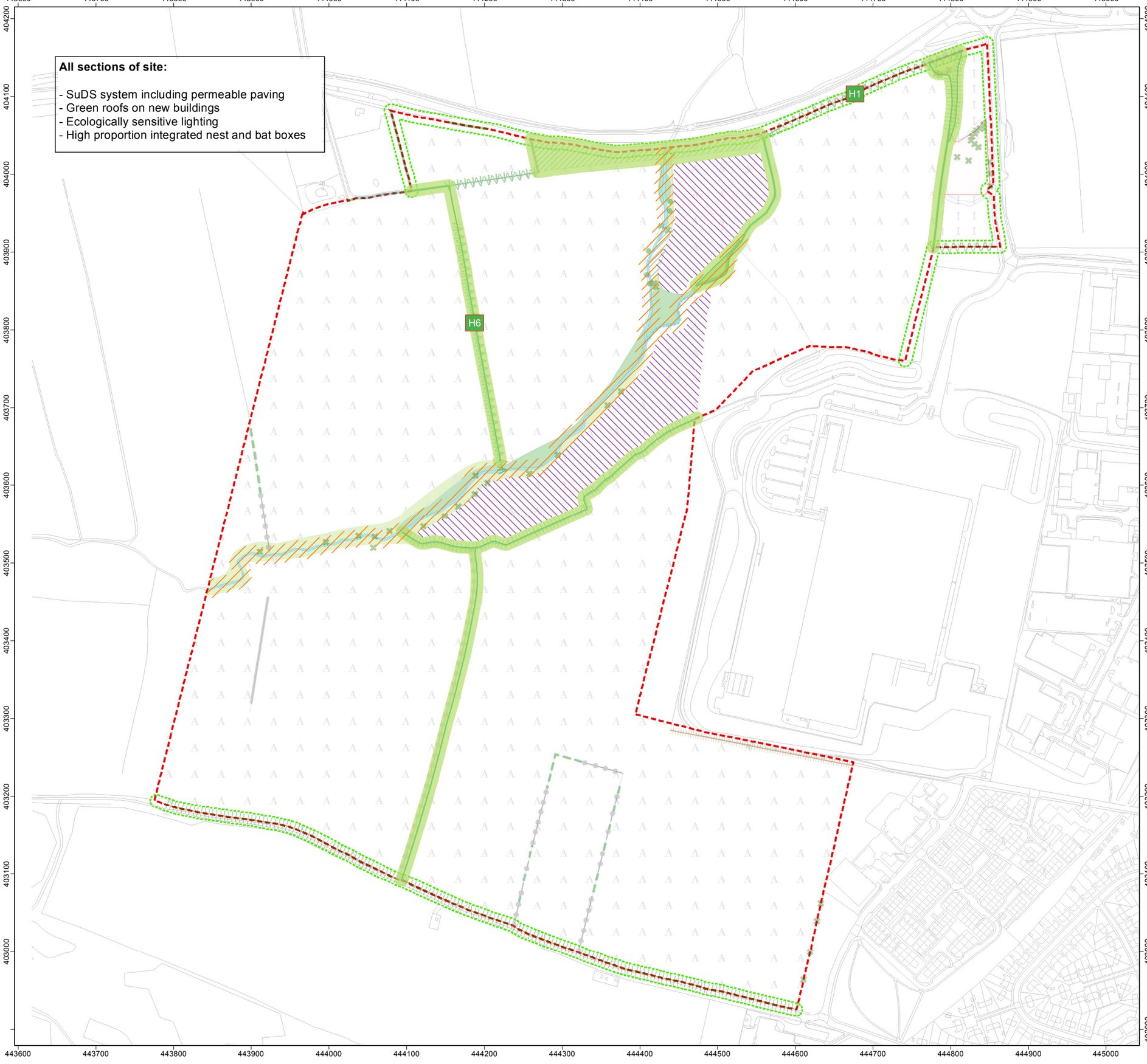
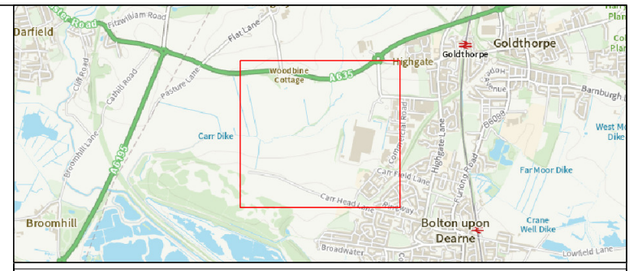
Appendix 3. Ecological Constraints and Opportunities Plan





Survey Information	
	Site boundary (732,947m^2)
Ecological Constraints and Opportunities	
	Largest possible buffer of retained and newly created semi-natural habitat. Recommend at least 10m buffer from each bank
	Look to maintain 8m buffer of retained and newly created semi-natural habitats
	Look to develop blocks of semi-natural habitat (i.e. woodland/ reedbed) on awkward shaped plots of land between ditches
	Gap plant retained hedgerow and plant new hedgerow, retain boundary woodland
Phase 1 Habitat Survey	
	Broadleaved woodland (7,177m^2)
	Plantation woodland (6,325m^2)
S S	Poor semi-improved grassland (13,432m^2)
	Improved grassland (10,162m^2)
	Bracken (165m^2)
	Running water (3,864m^2)
A	Arable (687,360m^2)
	Other habitat (4,462m^2)
	Intact hedge - native species-rich
	Intact hedge - species-poor
	Defunct hedgerow - species-poor
	Hedge with trees - native species-rich
	Hedge with trees - species-poor
	Dry ditch
	Fence
	Remnant stone wall
	Earth bank
	Scattered broadleaved tree
	Scattered scrub

N 0 25 50 100 150 200 Metres

PROJECT TITLE

SCR PRIORITY CLUSTERS, BARNSLEY : GOLDTHROPE

DRAWING TITLE

Appendix 4. Ecological Constraints and Opportunities Plan

VER	DATE	REMARKS	Drawn	Checked
1.2	19/01/21	ECOP	MP	PM

DRAWING NUMBER:

MIDDLETONBELLECOLOGY/Goldthrope/ECOP

SCALE	1:4,800	PLOT SIZE	A3	DATUM	OSGB	PROJECTION	BNG

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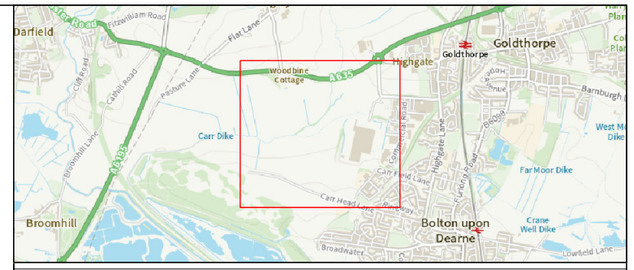
Appendix 4. Marsh Harrier Mitigation Options Plans



Survey Information	
	Site boundary (732,947m^2)

Mitigation Option	
	A 35m buffer of semi-natural vegetation from each bank of Carr Dike (c. 70m total width). New habitats away from existing woodland to comprise either rough grassland or other suitable habitat (i.e. reedbed)

N

0 25 50 100 150 200
Metres

PROJECT TITLE

SCR PRIORITY CLUSTERS, BARNSLEY : GOLDTHROPE

DRAWING TITLE

Appendix x. Marsh Harrier – Mitigation Options Plan 1

VER	DATE	REMARKS	Drawn	Checked
1.0	19/01/21	MH1	MP	PM

DRAWING NUMBER:

MIDDLETONBELLECOLOGY/Goldthrope/MH1

SCALE	1:4,800	PLOT SIZE	A3	DATUM	OSGB	PROJECTION	BNG

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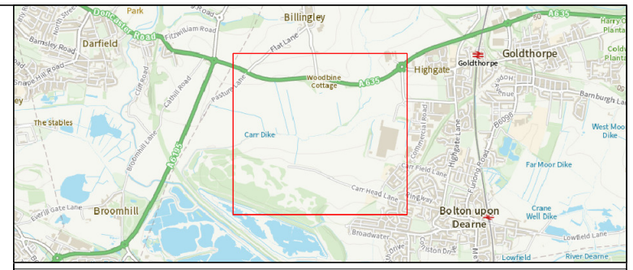

Survey Information	
	Site boundary (732,947m^2)

Mitigation Option	
	An inverse T-shaped corridor with a total width of 35m. The southern section is centred on Carr Dike with the northern section connecting to the A635. This area is to include habitats with appeal for foraging and dispersing marsh harrier,comprising either rough grassland or other suitable habitat (i.e. reedbed)
	Minimum 10m buffer from each bank of Carr Dike as it passes through red-line boundary. Recognised that this buffer is likely to be too narrow to allow continued use of the area by marsh harrier

N

0 25 50 100 150 200
Metres

PROJECT TITLE

SCR PRIORITY CLUSTERS, BARNSLEY : GOLDTHROPE

DRAWING TITLE

Appendix x. Marsh Harrier – Mitigation Options Plan 2

VER	DATE	REMARKS	Drawn	Checked
1.1	25/01/21	MH2	MP	PM

DRAWING NUMBER:

MIDDLETONBELLECOLOGY/Goldthrope/MH2

SCALE	1:6,000	PLOT SIZE	A3	DATUM	OSGB	PROJECTION	BNG

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