

9 BIODIVERSITY

Introduction

- 9.1 This chapter of the ES assesses the likely significant effects of the Development on the environment in respect of biodiversity.
- 9.2 This chapter has been prepared by Paul Andrews of FPCR Environment and Design Ltd (see Appendix 1.2 Statement of Expertise).
- 9.3 This chapter should be read in conjunction with the following appendices and figures, which have been used to inform the assessment:
- Appendix 9.1 Ecological Appraisal;
 - Appendix 9.2 Breeding Bird Survey Report;
 - Appendix 9.3 Wintering Bird Survey Report;
 - Appendix 9.4 Marsh Harrier Technical Note;
 - Appendix 9.5 Bat Assessment Report;
 - Appendix 9.6 Gypsy Marsh Ecology: Air Quality Review
 - Appendix 9.7 BMBC Ecological Survey of Local Plan Site D1A (2013)
 - Appendix 9.8 Wildscapes Preliminary Ecological Appraisal Goldthorpe Unit D (2019)
 - Appendix 9.9 Middleton Bell Ecology. Goldthorpe ES10 Preliminary Ecological Appraisal
 - Appendix 9.10 Middleton Bell, Bird Survey and DEFRA Metric Briefing Note v3 (February 2021)
 - Figure 9.1 Study Area

Policy Context

National Planning Policy Framework (NPPF)

- 9.4 Guidance on nature conservation planning policy is provided in the '*Conserving and enhancing the natural environment*' section of the NPPF¹.
- 9.5 Paragraph 174 sections a, b and d are relevant to biodiversity and state '*Planning policies and decisions should contribute to and enhance the natural and local environment by:*
- a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);*
 - b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland:...*
 - d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;...*

9.6 Paragraph 175 states *'Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.'*

9.7 Paragraph 180 states *'When determining planning applications, local planning authorities should apply the following principles:*

a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;...'

Planning Practice Guidance (PPG)

9.8 Guidance on the application of the NPPF is provided in the *'Natural Environment'* section of the PPGⁱⁱ. The PPG has a section providing guidance on green infrastructure, and a section providing guidance on biodiversity, geodiversity, ecosystems (which includes Biodiversity Net Gain (BNG)).

ODPM

9.9 Office of the Deputy Prime Minister Government Circular 06/2005: *'Biodiversity and geological conservation'*ⁱⁱⁱ provides administrative guidance on the application of the law relating to planning and nature conservation as it applies in England. It complements the policy in the NPPF and the PPG.

Local Planning Policy

Barnsley Metropolitan Borough Council (BMBC) Local Plan

9.10 The BMBC Local Plan^{iv} was adopted in January 2019. Policies within the BMBC Local Plan that are relevant to this chapter comprise:

- Policy E6 Rural Economy;
- Policy D1 High Quality Design and Place Making;
- Policy GI1 Green Infrastructure;
- Policy GS1 Green Space; and
- Policy BIO1 Biodiversity and Geodiversity.

9.11 Section 8.14 of the BMBC Local Plan provides a list of proposed employment land allocations that includes the Site under *'ES10 Land South of Dearne Valley Parkway'*. Specific policy relating to the ES10 area and relevant to biodiversity states:

"The development will be subject to the production of a phased Masterplan Framework and will be expected to:

Protect and enhance biodiversity value including possible impacts on the Golden Plover population and on the nearby Old Moor RSPB reserve and ensure that the development avoids impacts or incorporates effective mitigation measures. Any impact on the golden plover habitat will be expected to be mitigated by either;

- a. On-site creation of optimal agricultural conditions for fields to be retained; or*
- b. Creating suitable compensation habitat for the species off-site but nearby.*

Provide a contribution towards improvements to biodiversity within the Dearne Valley Green Heart Nature Improvement Area;

Include the creation of a habitat corridor (at least 8m in width) along Carr Dike and a sustainable drainage scheme to ensure that rainwater falling on the site is still able to drain into the Dike aiming to improve water quality;...

Retain the existing woodland and hedgerows on the site periphery;

Retain the section of hedgerow remaining in the north-west corner of the site;... and

Give consideration to Carr Dike and the connecting unnamed ordinary watercourse which runs through the site."

Barnsley Biodiversity Action Plan

9.12 Local Biodiversity Action Plans (BAPs) provide detail on habitats and species of local importance. Barnsley BAP^v was first published in 2002 and updated in 2010. It is currently in revision with updated sections available for public comment. The following species and habitats are included within the Barnsley BAP:

- Bats;
- Kestrel;
- Northern Lapwing;
- Skylark;
- Hedgerows;
- Arable Field Margins; and
- Rivers.

Dearne Valley Green Heart Nature Improvement Area (NIA)

9.13 According to Natural England^{vi}, *'Nature Improvement Areas (NIA) were established to create joined up and resilient ecological networks at a landscape scale. They are run by partnerships of local authorities, local communities and landowners, the private sector and conservation organisations with funding provided by the Department for the Environment, Food and Rural Affairs (Defra) and Natural England'*.

9.14 The Dearne Valley Green Heart NIA was one of the first 12 NIAs established by the UK Government in 2012. The NIA is managed by a partnership including Natural England, the Environment Agency, the RSPB, wildlife conservation organisations, local authorities and communities. Funding for the NIA ended in 2015.

Legislative Context

6.1 The following legislation and European Directives afford protection to wildlife and have been used to inform this assessment:

- The Environment Act 2021^{vii};
- Natural Environment and Rural Communities (NERC) Act 2006^{viii};
- The EC Birds Directive (Directive 79/409/EEC)^{ix}, as translated into UK law by The Conservation of Habitat and Species Regulations 2010 (as amended)^x;

- The EC Habitats Directive (Directive 92/43/EEC)^{xi} as translated into UK law by The Conservation of Habitat and Species Regulations 2010 (as amended);
- Wildlife and Countryside Act (WCA) 1981 (as amended)^{xii};
- The Countryside and Rights of Way (CRoW) Act 2000^{xiii};
- The Hedgerow Regulations 1997^{xiv}; and
- The Protection of Badgers Act 1992^{xv}.

Assessment Methodology

Overview

- 9.15 The collection of baseline information, review of data, identification and evaluation of important ecological features, and the assessment of potential impacts has been carried out in accordance with guidance provided by the Chartered Institute of Ecology and Environmental Management (CIEEM) and includes:
- Guidelines for accessing, using and sharing biodiversity data in the UK (2020)^{xvi};
 - Guidelines for ecological report writing, Second Edition (2017)^{xvii};
 - Guidelines for Preliminary Ecological Appraisal, Second Edition (2017)^{xviii}; and
 - Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Version 1.2 (2022)^{xix}.

EIA Scoping

- 9.16 An EIA Scoping Report (Appendix 2.1) was submitted to BMBC on 10th October 2022 in support of a formal request for an EIA Scoping Opinion. BMBC adopted their EIA Scoping Opinion on the 25th November 2022 and confirmed that the likely significant effects of the Development on biodiversity are required to be assessed in the ES. A consultation response was provided from BMBC's Planning Ecologist.
- 9.17 The comments received from BMBC and corresponding responses are provided in Table 9.1 below and have been addressed within this chapter.

Table 9.1 Summary of Consultee Comments

Consultee Comment	Response
<i>"The proposal site is located within 100m of the Dearne Valley Wetlands Site of Special Scientific Interest (SSSI) and within the Impact Risk Zone (IRZ) for the SSSI. The development types (as set by Natural England) which may have a potential impact upon statutory designated sites includes the proposed plans. Therefore, due to the proximity of the site to the SSSI there is potential for adverse impacts on the SSSI, in the absence of mitigation."</i>	<p>The ecological desk study and field surveys conducted are provided as appendices to this chapter (Appendixes 9.1 - 9.10) and provide the evidence base for determining the potential effects of the Development upon designated sites of conservation importance.</p> <p>The potential for likely significant effects on the Dearne Valley Wetlands SSSI as a result of the Development is assessed within this chapter.</p>
<i>"The closest Local Wildlife Site (LWS - non-statutory protected site) within proximity of the proposed site is Bolton upon Dearne Wetlands LWS, located approximately 1 km west. Direct impacts to this LWS"</i>	<p>The closest LWS is Old Moor and Wath Ings LWS which is within the Dearne Valley Wetlands SSSI and is assessed further in this chapter.</p>

Consultee Comment	Response
<p><i>are considered highly unlikely due to its distance from the site. However, due to the proximity of the proposal to the Dearne Valley Wetlands SSSI, development of the site may result in hydrological impacts which may also indirectly affect Bolton upon Dearne Wetlands LWS. As such, further investigations into the hydrological effects and their impact on biodiversity would be required."</i></p>	<p>Bolton Upon Dearne Wetlands LWS is located approximately 1 km east of the Site.</p> <p>The Dearne Valley Wetlands SSSI comprises a cluster of sites following the floodplain valley of the River Dearne and is located approximately 100m south-west of the Site.</p> <p>Bolton Upon Dearne Wetlands LWS is located upstream of the River Dearne, connected to Adwick Washlands Nature Reserve via Crane Well Dike. Adwick Washlands is part of the Dearne Valley Wetlands SSSI cluster and is also an RSPB nature reserve.</p> <p>The Dearne Valley Wetlands SSSI area that is closest to the Site is upstream of both the River Dearne and Adwick Washlands but not upstream of Bolton Upon Dearne Wetlands.</p> <p>Between the Site and Bolton Upon Dearne Wetlands LWS is an area of residential and industrial/commercial development with no obvious hydrological or hydrogeological connectivity to the Site.</p> <p>It is considered highly unlikely that the Site is in hydrological or hydrogeological connectivity with Bolton Upon Dearne Wetlands LWS given the geographical location of these sites.</p>
<p><i>"Marsh harrier Circus aeruginosus, a Schedule 1 bird of the Wildlife and Countryside Act 1981, have, in recent years successfully bred at Old Moor. The species have been recorded foraging over the proposal site (2020/2021), therefore it is highly likely that Carr Dike and adjacent habitats provide a valuable foraging/dispersal feature for the species and others which are key features of the SSSI. As such, development of the site may negatively impact species associated with the Dearne Valley Wetlands SSSI and other notable species, including marsh harrier."</i></p>	<p>A Marsh Harrier report is provided in Appendix 9.4 and provides the evidence base to assess the potential effects of the Development upon this species.</p> <p>The potential for likely significant effects on Marsh Harriers as a result of the Development is assessed within this chapter.</p>
<p><i>"From consulting aerial photographs the site appears to largely comprise arable fields of limited biodiversity value. However Carr Dike and the hedgerow/ditch/tree network along field boundaries are likely to provide habitat for a variety of species including bats, birds and small mammals. Furthermore, the hedgerows may comprise the required number of features for them to be considered priority habitats (section 41 of the Natural Environment and Rural Communities (NERC) Act 2006). The ecology report for the site indicates that Hedgerow 9 classifies as Important under Hedgerow Regulations (1997) criteria. The screening opinion does not provide any detail on how/which key ecological features would be retained. Therefore, to avoid adverse ecological impacts it is advised, as per the ecology report that Carr Dike and key hedgerows/ditches are retained, alongside large development buffers. Where</i></p>	<p>A Preliminary Ecological Appraisal (PEA) conducted by Middleton Bell Ecology in 2020 for the ES10 masterplan and was reviewed for this assessment (Previous reports reviewed for the purposes of this assessment are listed in section 9.23 below). The Middleton Bell (2020) report determined one hedgerow in the northern central area of the Site to meet the classification of "Important" under the Hedgerow Regulations ^{xiv}. However, the 2022 survey conducted by FPCR and reported in the Ecological Appraisal (Appendix 9.1, Hedgerow H1) did not agree with this classification. This hedgerow (H1) scored -2 (moderately high to high) value using the Hedgerow Evaluation and Grading System (HEGS).</p>

Consultee Comment	Response
<p><i>hedgerows cannot be retained, additional planting/infilling of gaps in existing hedgerows should be undertaken.”</i></p>	<p>Field surveys conducted in 2022 (reported within Appendix 9.1), provide further details of all hedgerows within the Site.</p> <p>The BMBC survey of the area (Site D1A/ES10) undertaken in 2013 described hedgerows at the Site to be species poor and did not make any determination of whether any hedgerows classified as “Important”.</p> <p>All hedgerows over 20m in length with at least one native woody species would be considered to be Habitats of Principal Importance under the NERC Act 2006 and are considered for the assessment of potential significant effects within this chapter.</p> <p>Where hedgerows cannot be retained, enhancement of retained hedgerows and hedgerow creation will be undertaken within areas of structural landscaping and strategic landscape screening.</p>
<p><i>“The ecology report for ES10 is detailed and a suite of protected and notable species surveys have been undertaken. However, the majority of the surveys were completed in 2019 and 2020. As such, prior to the submission, updated surveys bird surveys would be required to support the application. I would also request that willow tit and wintering bird surveys are completed in addition to the existing bird surveys, due to the proximity of the site to the Dearne Valley Wetlands SSSI.”</i></p>	<p>The previous surveys carried out for the ES10 masterplan were reviewed and are considered within the assessment of the Site and Development. See section 9.23 below for a list of reports made available for review.</p> <p>Breeding bird surveys and wintering bird surveys have been undertaken to support this assessment. (see Appendix 9.3).</p> <p>Willow tits were given specific consideration within the survey undertaken in February 2023 however no records of this species were made during the survey and as such will not be considered further within this assessment.</p>
<p><i>“The scoping report indicates that Biodiversity Net Gain will be used to inform habitat creation and enhancement proposals for the scheme and to guide decisions around additional habitat provision. The entire site lies within the Dearne Valley Green Heart, a Nature Improvement Area. This needs to be taken into account within the metric in that the site is located within an area of strategic significance. The LPA’s policy at present for this part of the borough is for ‘no net loss’ of biodiversity, however, as the proposal site is a masterplan framework site a minimum 10% Biodiversity Net Gain is required.”</i></p>	<p>It is acknowledged that the Site is located within the ES10 BMBC masterplan area and that 10% biodiversity net gain will be required. A Biodiversity Net Gain calculation and report will be submitted to support the planning application for the Development which will show 10% gain will be provided. Impacts relating to the loss or creation of biodiversity are also addressed within this chapter.</p>
<p><i>“The site is located within a masterplan framework site, ES10, Land South of Dearne Valley Parkway. The sites policy stipulates the following in relation to biodiversity;</i></p> <ul style="list-style-type: none"> <i>• Protect and enhance the biodiversity value of the site including possible impacts on the Golden Plover population and on the nearby Old Moor RSPB reserve and ensure that the development avoids impacts or incorporates effective mitigation measures.</i> 	<p>Breeding bird and wintering bird surveys have been carried out at the Site (see Appendices 9.2 and 9.3). These surveys did not identify golden plovers as using the Site, therefore, no significant effects are expected to this species from the Development and will not be considered further within this assessment.</p> <p>RSPB Old Moor (a LWS and part of the Dearne Valley Wetlands SSSI) is located over 900m south-west of the Site. Given the distance from the Site no</p>

Consultee Comment	Response
<ul style="list-style-type: none"> • <i>Any impact on golden plover habitat will be expected to be mitigated by either;</i> <ul style="list-style-type: none"> a. <i>On-site creation of optimal agricultural conditions for fields to be retained; or</i> b. <i>Creating suitable compensation habitat for the species off-site but nearby.</i> • <i>Provide a contribution towards improvements to biodiversity within the Dearne Valley Green Heart Nature Improvement Area;</i> • <i>Include the creation of a habitat corridor (at least 8m in width) along Carr Dike and a sustainable drainage scheme to ensure that rainwater falling on the site is still able to drain into the Dike aiming to improve water quality;</i> • <i>Retain the existing woodland and hedgerows on the site periphery;</i> • <i>Retain the section of hedgerow remaining in the north-west corner of the site; and</i> • <i>Give consideration to Carr Dike and the connecting unnamed ordinary watercourse which runs through the site.”</i> 	<p>significant ecological effects to this site are expected from the Development though effects to the Dearne Valley Wetlands SSSI are assessed within this chapter.</p> <p>The Development will include habitat creation that will compensate for habitats lost to the Development and overall will provide a net gain in biodiversity. This would be considered to be an improvement to biodiversity within the Dearne Valley Green Heart NIA.</p> <p>The Development will maintain a corridor along Carr Dike of at least 8m in width. Carr Dike is considered within this assessment as an important ecological feature.</p> <p>Where possible the Development will retain existing hedgerows and woodlands within the Site. Where this is not possible additional enhancements to retained habitats and creation of new woodland and hedgerow will take place to mitigate and compensate for any loss. The effects of habitat loss due to the Development is assessed within this chapter.</p> <p>It is not clear which hedgerow is referred to as being in the north-west corner. All hedgerows to be impacted will be mitigated or compensated through enhancement of retained hedgerows and creation of new hedgerows within the landscaping of the Site as shown within parameter plans and landscaping plans.</p> <p>The connecting unnamed watercourse has been determined to be a drainage ditch. A search of publicly accessible historical mapping shows that the watercourse was not present in mapping before 1929 and follows the established field boundaries. As such, it is considered that this watercourse was created as a drainage ditch in the early 20th Century. This watercourse has been considered within this assessment.</p>

Zone of Influence and Study Area

- 9.18 According to CIEEM guidelines, the ‘zone of influence’ for a development is the area over which ecological features may be affected by biophysical changes as a result of a proposed development and associated activities.
- 9.19 The zones of influence for impacts to habitats and species from the Development vary and are defined by the ecological sensitivity, vulnerability and ecological requirements of the feature rather than specific geographical areas or zones.
- 9.20 The Study Area focusses upon the Site, as well as the anticipated zone of influence from the Development in regard to ecological features within the vicinity of the Site. The Study Area includes;
- International sites designated for nature conservation within 5km and 15km of the Site;
 - National/Regional sites designated for nature conservation within 2km of the Site;

- County sites designated for nature conservation within 1km of the Site; and
- Protected and notable species recorded within 1km of the Site.

Desk Study

9.21 A desk study was undertaken in January 2023 with biological records information obtained in March 2022 and included a review of the following data sources:

- Multi Agency Geographic Information for the Countryside (MAGIC);
- Barnsley Biological Records Centre (BBRC); and
- Publicly available maps and aerial imagery.

9.22 As part of the Ecological Appraisal (Appendix 9.1) additional information was sourced from a review of previous ecological surveys relating to the Site undertaken between 2013 and 2021 which provide additional ecological context.;

Ecological Surveys

9.23 Ecological surveys have been undertaken at the Site to define the baseline conditions and support the assessment of the likely significant effects of the Development. The surveys comprise:

- Phase 1 Habitat Survey following JNNC methodology, JNCC Handbook for Phase 1 Habitat Survey (2010^{xx}) (reported within Appendix 9.1);
- Hedgerow survey following guidance within the DEFRA Hedgerow Survey Handbook (2007^{xxi}) and the Hedgerow Evaluation and Grading System (HEGS, 1992^{xxii}) (reported within Appendix 9.1);
- Badger survey, conducted following Mammal Society guidance Surveying Badgers (1989^{xxiii}) (reported within Appendix 9.1);
- Great crested newt (GCN) habitat suitability index assessments for ponds, carried out following the methodology within the Amphibian and Reptile Groups of the UK Advice Note 5 Great Crested Newt Habitat Suitability Index (2010^{xxiv}) (reported within Appendix 9.1);
- Bat roost potential for trees, bat roost inspections, and bat activity surveys, conducted following guidance within the Bat Conservation Trust, Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd ed. 2016^{xxv}) (reported within Appendix 9.5); and
- Breeding Bird and Wintering Bird surveys were broadly based on the methodology of territory mapping used for the British Trust for Ornithology (BTO) Common Bird Census (CBC) methodology (reported within Appendixes 9.2 and 9.3).

Identification and Assessment of Important Ecological Features

9.24 Based upon the findings of the ecological surveys and in line with the EIA Scoping Opinion, only those ecological features with significant ecological value have been included within this assessment and are identified as Important Ecological Features. Sites, habitats, or floral/faunal species/groups of 'negligible' ecological value, which may be widespread and/or unthreatened by the Development, or those that would remain viable and sustainable and are unlikely to be significantly adversely affected as a result of the Development, have not been considered further.

9.25 The CIEEM Guidelines for Ecological Impact Assessment^{xx} (Section 4, paragraphs 4.5 and 4.6) recognise that evaluation is a complex process and that a range of factors need to be considered in attributing value to ecological features. The following characteristics can be used to identify features that are likely to be important in terms of biodiversity:

- Naturalness;
- Animal or plant species that are rare or uncommon, either internationally, nationally or more locally;
- Ecosystems and their component parts which provide the habitats required by the above species, populations and/or assemblages;
- Endemic species or locally distinct sub-populations of a species;
- Habitat diversity, connectivity and/or synergistic associations (e.g. Networks of hedgerows and areas of species-rich pasture that provide important feeding habitat for a rare species, such as greater horseshoe bat);
- Plant communities (and their associated animals) that are considered to be typical valued natural/semi-natural vegetation types – these will include examples of naturally species poor communities;
- Species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change;
- Species rich assemblages of plants and animals; and
- Typical faunal assemblages that are characteristic of homogenous habitats.

9.26 According to the CIEEM Guidelines for *EclA* (Section 4 paragraph 4.4) ‘Ecologists may identify ecological features that are not included in lists of important sites or features, but considered important on the basis of expert judgment e.g. because of their local rarity or because they enable effective conservation of other important features.’

9.27 For the purpose of this assessment, important ecological features are defined as those features with significant ecological value, that are located within the zone of influence of, and may be affected by, the Development, comprising:

- Statutory and non-statutory designated sites of nature conservation;
- Habitats;
- Floral species/groups; and
- Faunal species/groups.

9.28 Important ecological features have been evaluated within a geographical framework, based upon the ecological value/status of the features but also reflective of CIEEM and other guidance and legislation (as outlined in Section 9.5 to 9.16 above). Table 9.2 below provides an overview of the levels of ecological value.

Table 9.2: Geographical Level of Value

Level of Value	Examples
International and European	An internationally or European designated site or candidate site (Special Protection Area SPA, proposed Special Protection Area pSPA, Special Area of Conservation SAC, candidate Special Area of Conservation cSAC, proposed Special Area of Conservation pSAC, Ramsar site, Biogenetic Reserve) or an area which meets the published selection criteria for such designation, irrespective of whether or not it has yet been notified.

Level of Value	Examples
	<p>A viable area of a habitat type listed in Annex I of the Habitats Directive or smaller areas of such habitat which are essential to maintain the viability of a larger whole.</p> <p>Any regularly occurring population of an internationally important species, which is threatened or rare in the UK (i.e. it is a UK Red Data Book species or listed as occurring in 15 or fewer 10km Ordnance Survey grid squares in the UK) or of uncertain conservation status or of global conservation concern.</p> <p>A regularly occurring, nationally significant population/number of any internationally important species.</p>
National	<p>A nationally designated site (SSSI, National Nature Reserve (NNR), Marine Nature Reserve) or a discrete area, which meets the published selection criteria for national designation (e.g. SSSI selection guidelines) irrespective of whether or not it has yet been notified.</p> <p>A viable area of a priority habitat identified as a habitat of Principal Importance or smaller areas of such habitat which are essential to maintain the viability of a larger whole.</p> <p>Any regularly occurring population of a nationally important species which is threatened or rare in the region or county (local BAP).</p> <p>A regularly occurring, regionally or county significant population/number of any nationally important species.</p>
Regional (Yorkshire)	<p>Viable areas of key habitat identified in the Regional BAP or smaller areas of such habitat which are essential to maintain the viability of a larger whole.</p> <p>Viable areas of key habitat identified as being of Regional value in the appropriate Natural Area profile.</p> <p>Any regularly occurring, locally significant population of a species listed as being nationally scarce which occurs in 16-100 10km Ordnance Survey Grid squares in the UK, or in a Regional BAP or relevant Natural Area on account of its regional rarity or localisation.</p> <p>A regularly occurring, locally significant number of a regionally important species.</p> <p>Sites which exceed the County-level designations but fall short of SSSI selection guidelines, where these occur.</p>
County (Barnsley Metropolitan Borough)	<p>County/Metropolitan sites and other sites which the designating authority has determined meet the published ecological selection criteria for designation, including Local Nature Reserves (LNR) selected on County/Metropolitan ecological criteria (County/Metropolitan sites will often have been identified in local plans).</p> <p>A viable area of habitat identified in the County/Metropolitan BAP.</p> <p>Any regularly occurring, locally significant population of a species which is listed in a County/Metropolitan "red data book" or BAP on account of its regional rarity or localisation.</p> <p>A regularly occurring, locally significant number of a County/Metropolitan important species.</p>
District/Borough (Goldthorpe)	<p>District/Borough sites and other sites which the designating authority has determined meet the published ecological selection criteria for designation, including Local Wildlife Sites (LWS).</p> <p>A viable area of habitat considered to appreciably enrich the habitat resource within the context of the District/Borough.</p> <p>LNRs or LWSs selected on District/Borough ecological criteria.</p>
Local	<p>Areas of habitat considered to appreciably enrich the habitat resource within the context of the local, parish, or neighbourhood (e.g. species-rich hedgerows).</p>

Level of Value	Examples
	<p>Species which may be widespread and abundant in a wider geographical context but which may be important to and enrich the ecosystems of the local area or species, sufficient numbers of a species within the Site to influence the wider local population viability, or species which may be important due to being locally scarce.</p> <p>LNRs or LWSs selected on local, parish, or neighbourhood ecological criteria.</p>
Site	<p>Below local value. Habitats may present opportunities to support wildlife but likely to be limited in extent, connectivity, and quality therefore providing benefits at the level of the Site only.</p> <p>Species which may be present at the Site but are sufficiently widespread and/or abundant at a wider geographic context such that they do not provide any significant ecological value outside of the Site. Sufficiently low numbers of a species, usually which is widespread or abundant, that would not be significant to the continued viability of the local or wider populations.</p>

Assessment Criteria

- 9.29 To determine whether any effects to important ecological features are significant it is necessary to determine whether there will be an impact upon the integrity or conservation status of the feature (designated site, habitat, or species). Integrity is taken to be the coherence of ecological structure and function across a site that enables it to sustain the habitats and/or the levels of populations of species present. Changes to the nature, extent, structure, and function of habitats impact upon integrity. The conservation status is a measure of the health of the population of a species, favourable conservation status describes the minimum threshold at which a species is able to thrive sustainably throughout its natural range and its ability to continue to do so into the future. Changes to population size and viability of habitats to support species impact upon conservation status.
- 9.30 Significance is determined by the sensitivity of an important ecological feature to change, and the magnitude of the change, where the resulting change produces an effect, that effect could be either adverse or beneficial.

Sensitivity

- 9.31 The sensitivity of an important ecological feature is determined based upon the extent, diversity, and rarity within the Site and the surrounds, or within the Zone of influence of the Development. A feature with a relatively high geographic value may, in the context of the potential effects of the Development, have a lower level of sensitivity. Examples of sensitivity are provided in Table 9.3.

Table 9.3: Sensitivity of Important Ecological Features

Sensitivity	Examples of Ecological Features
High	The important ecological feature has little ability to absorb change without fundamentally altering its present character, or its international or national importance
Moderate	The important ecological feature has a moderate capacity to absorb change without significantly altering its present character, or is of high importance
Low	The important ecological feature is tolerant of change without detriment to its character, is of low or local importance.

Magnitude

- 9.32 The magnitude of impact to an important ecological feature is determined by the size, extent, and duration of the impact. The criteria for determining the magnitude of impact are provided in Table 9.4.

Table 9.4: Magnitude of Impact

Magnitude	Examples of Impact
Major	Major impacts may include those that result in extensive, permanent changes to the baseline conditions of an ecological receptor and are likely to change its ecological integrity. These impacts are therefore likely to result in fundamental change to the conservation status of a species population or habitat type at the location(s) under consideration.
Moderate	Moderate impacts include moderate-scale permanent changes to an important ecological feature for example the loss or alteration to one or more key elements/features of the baseline conditions such that there would be material change to the baseline conditions post development. Moderate impacts also include larger-scale temporary changes in the conservation status of a population or habitat type at the location(s) under consideration, where the integrity of the feature is not affected in the long-term
Minor	A minor and discernible/detectable shift away from baseline conditions that is not material. Minor impacts may include those that are small in magnitude, have small scale temporary changes, and where integrity is not affected. These effects are unlikely to result in overall changes in the conservation status of a species population or habitat type at the location(s) under consideration, but do not exclude the possibility that mitigation or compensation would be required.
Negligible	Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation.

Significance of Effects

- 9.33 Significant effects may be either adverse or beneficial. The assessment of significant effects identifies the need for mitigation and identifies residual effects. The interaction of sensitivity and magnitude determines the level of significance of the effect. Moderate and above effects would be considered to be significant, whilst minor or negligible effects will not be considered to be significant for the purposes of this assessment.
- 9.34 An ecologically significant effect is an effect that causes a change in the integrity or conservation status of an important ecological feature. Where an effect would cause a change in integrity or conservation status more than a negligible level it will be considered further within the assessment of effects.
- 9.35 The CIEEM Guidelines for Ecological Impact Assessment discourage the use of a matrix approach to determining the significance of effects. As such, Table 9.5 below provides a guide for determining the level of significance, but the final level of significance determined will be based upon the specific details relating to the likely effect on the current status and conservation objectives of the ecological feature. Where subjective or qualitative evaluations of significance are used these will be clearly described within the assessment.

Table 9.5: Significance of Effect

Magnitude	Sensitivity		
	High	Moderate	Low
Major	Major Adverse/Beneficial	Major - Moderate Adverse/Beneficial	Moderate - Minor Adverse/Beneficial
Moderate	Major - Moderate Adverse/Beneficial	Moderate - Minor Adverse/Beneficial	Minor Adverse/Beneficial
Minor	Moderate – Minor Adverse/Beneficial	Minor Adverse/Beneficial	Minor Adverse/Beneficial - Negligible
Negligible	Negligible	Negligible	Negligible

Mitigation, Compensation and Enhancement

9.36 The Significance of effects are assessed in the first instance without mitigation (with the exception of mitigation embedded inherently within the detailed design of the Development). Additional mitigation is then proposed and detailed for any significant effects on important ecological features.

9.37 CIEEM Guidelines for *EcIA* (Section 1 paragraph 1.19) looks for a proposed development to apply the mitigation hierarchy:

“Avoidance - Seek options that avoid effects to ecological features;

Mitigation - Adverse effects that cannot be avoided are minimised; and

Compensation – Where there are significant adverse residual effects (after mitigation) these should be addressed using appropriate compensatory measures.

Enhancement – Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation or compensation”.

9.38 Priority is given to avoidance of significant adverse effects, where possible, through primary mitigation measures i.e. masterplanning and project design and/or regulation of the project through aspects such as timing, storage of materials etc. Where this is not possible, opportunities are sought to reduce adverse effects as much as is feasible. If significant effects cannot be avoided through mitigation, then compensation that is considered appropriate to offset the adverse effects of the project is outlined within this assessment.

Limitations and Assumptions

9.39 Ecological surveys have been carried out according to relevant methodologies and guidance, as set out above. The surveys are considered to be sufficiently recent to provide information relevant to the current Site conditions. Surveys were carried out to a level appropriate to determine major habitat classes, and the likely presence and absence of protected and notable species. However, species lists should not be considered to be exhaustive and the absence of evidence of a species does not necessarily mean that the species is absent from the Site.

Baseline Conditions

9.40 Appendix 9.1 (Ecological Appraisal) provides an appraisal of the baseline ecological receptors within, and in the vicinity of the Site, and includes a plan showing records of designated sites returned by BBRC in 2022 within the Study area (Appendix 9.1. Figure 1).

Statutory Designated Sites

9.41 There are no statutory designated sites within the Site boundary and no sites of international nature conservation importance within 15km of the Site.

9.42 Dearne Valley Wetlands SSSI is located approximately 100m south-west of the Site at its nearest point. The Dearne Valley Wetlands is a cluster of 22 wetland, scrub and woodland areas along the valley of the River Dearne and includes privately owned nature reserves, RSPB reserves and parkland. The SSSI is designated for:

- Breeding gadwall *Mareca strepera*, shoveler *Spatula clypeata*, garganey *Spatula querquedula*, pochard *Aythya ferina*, bittern *Botaurus stellaris*, black-headed gull *Chroicocephalus ridibundus* and willow tit *Poecile montanus klienschmidtii*.
- Non-breeding gadwall *Mareca strepera* and shoveler *Spatula clypeata*.
- Diverse assemblages of breeding birds of Lowland damp grasslands, Lowland scrub, a mixed assemblage of Lowland open waters and their margins, and Lowland fen.

Non-Statutory Designated Sites

- 9.43 There is one designation for a non-statutory site within 1km of the Site. Old Moor and Wath Ings Local Wildlife Site (LWS) is 930m south-west of the Site and located within the Dearne Valley Wetlands SSSI. The LWS is considered to be important for a range of habitats and species of flora and fauna, and particularly important for birds. Within 2km of the Site, there are an additional two LWS; Bolton Upon Dearne Wetlands LWS 1.02km east of the Site, and Broomhill Flash and Wombwell Ings LWS 1.73km west of the Site.

Records of Protected and Notable Species

- 9.44 Appendix 9.1 (Ecological Appraisal) provides a plan (Appendix 9.1 Figure 2) showing records of protected and notable species returned by BBRC in 2022 for the Site and within 1km of the Site. Below is a summary of species recorded within the Site.
- 9.45 Within the Site records for bat species included, common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, noctule bat *Nyctalus noctule*, an unidentified species of *Myotis* bat, and an unidentified species of bat. The records did not provide detail on roosts or type of activity, only presence.
- 9.46 Bird records within the study area included 169 records of different bird species, with those specifically recorded within the Site including, dunnock *Prunella modularis*, green sandpiper *Tringa ochropus*, greenfinch *Chloris chloris*, grey partridge *Perdix perdix*, house martin *Delichon urbicum*, house sparrow *Passer domesticus*, kestrel *Falco tinnunculus*, linnet *Linaria cannabina*, meadow pipit *Anthus pratensis*, moorhen *Gallinula chloropus*, song thrush *Turdus philomelos*, sparrowhawk *Accipiter nisus*, swift *Apus apus*, woodpigeon *Columba palumbus*, wren *Troglodytes troglodytes*, whitethroat *Sylvia communis*, yellow wagtail *Motacilla flava* and yellowhammer *Emberiza citrinella*.

Summary of Field Survey Findings

Habitats

- 9.47 The habitats present at the Site at the time of the most recent field survey (Appendix 9.1) comprise predominately agricultural land in arable cultivation divided into a number of discrete fields. Carr Dike, a small stream, flows in a general south-westerly direction through the Site from the north to the south-west. A drainage ditch is present which meets Carr Dike in the centre of the Site (flowing from the east of the Site towards the west). Plantation woodland is present in small stands on the northern bank of Carr Dike and at the northern Site boundary. Field margins are sparse but in places there are intact hedgerows and scattered scrub.
- 9.48 The survey undertaken in 2013 (Appendix 9.7) identified two ancient woodland indicator species in the woodland adjacent to Carr Dike, Yellow Archangel *Lamiastrum galeobdolon* and Greater Stitchwort *Stellaria holostea*. The most recent survey from 2022 (detailed in Appendix 9.1) was undertaken at an appropriate time of year to identify these species (April) but they were not observed, which may indicate a decline in the quality of the woodland habitats since 2013.
- 9.49 One hedgerow was noted to be more diverse (labelled as H1 in Appendix 9.1 Figure 3) and was previously identified as being 'Important' under the Hedgerow Regulations 1997^{xiv} (Appendix 9.9). Appendix 9.9 does not provide survey results/observations to justify the classification as important. However, the most recent survey (undertaken in 2022 and detailed within Appendix 9.1) disagrees with this assessment as the hedgerow does not meet the qualifying number of woody species within a 30m section or the qualifying number of additional features to be considered to be important.
- 9.50 Habitats within the Site identified as Habitats of Principal Importance (HPIs) under the NERC Act 2006^{vii}, or habitats identified as priority habitats in the Barnsley BAP included hedgerows, rivers (running water), scrub, and arable field margins. The woodland within the Site is not present on the priority habitats inventory^{xxvi} and does not adequately meet the description for priority woodland in the Barnsley BAP.

Mammals

- 9.51 Bat surveys (detailed within Appendix 9.5) did not identify any Annex II species at the Site. Static detectors only detected a relatively low number of bat passes with the vast majority being common pipistrelle. Bats were identified as most active foraging around Carr Dike in the centre of the Site and along the hedgerow adjacent to Carr Head Lane bounding the south of the Site. Bats were identified to be commuting along the hedgerow bounding the east of the Site, adjacent to the Aldi Regional Distribution Centre (RDC). The habitats within the Site are likely to provide a Site level of importance for foraging and commuting bats with more extensive and better-quality habitats present in the wider area.
- 9.52 Four trees with moderate bat roosting potential were identified within the Site. Aerial assessment of the trees allowed for one tree to be downgraded to negligible potential and one tree to be downgraded to low bat roosting potential, both of these trees will be retained according to the parameters plan. The remaining two trees will be lost to the development but further nocturnal survey (emergence/re-entry) determined that bat roosts are likely absent.
- 9.53 Surveys from 2013 up to the most recent survey in 2022 (see Appendixes 9.1, 9.7, 9.8, 9.9 and 9.10 for additional detail) did not identify any signs of badgers *Meles meles*. As such, badgers are considered to be absent from the Site and will not be considered further in this assessment.
- 9.54 The most recent Site survey (detailed within Appendix 9.1) identified that the Site has the potential to support terrestrial mammals including, otter *Lutra lutra* (a European protected species), brown hare *Lepus europaeus* and hedgehog *Erinaceus europaeus* (both Species of Principal Importance (SPIs) under the NERC Act 2006^{viii}). No field signs or observations of these species were made at the Site. Habitats at the Site are not considered to be optimal or extensive for these species and would not be expected to support any significant numbers of local populations (though Carr Dike could offer a potential commuting route for otter). As such, these species are not considered to be a constraint to the development and will not be considered further.
- 9.55 Surveys for water voles (Appendixes 9.8 and 9.9) *Arvicola terrestris* in 2019 and 2020 did not find any evidence of presence of the species on Carr Dike or the Site but did find evidence of American mink *Neovison vison* which predate on water voles. Therefore, it is considered unlikely that water vole are present within the Site and will not be considered further in this assessment

Birds

- 9.56 Appendix 9.10 provides details of breeding bird surveys and wintering bird surveys over the period of 2020 to 2021. The breeding bird surveys identified six red listed species breeding at the Site. The report concluded that overall, the Site was generally of local level importance for breeding farmland birds but a district level importance for yellow wagtail as 3 breeding pairs were identified, and this was estimated to be around 10% of the Barnsley breeding population (based on figures from 2006-2011). The breeding bird survey conducted in 2022 (Appendix 9.2) did not identify yellow wagtail at the Site, though a number of red listed species were noted. Overall, the habitats and species present at the Site were considered to be of Local importance, however one species, corn bunting *Emberiza calandra* was considered to have District level importance as it may have been breeding outside of its normal range within the district.
- 9.57 The wintering bird survey from 2020-2021 (Appendix 9.10) concluded that the Site is not important for wintering farmland birds but that the vegetated areas adjacent to Carr Dike and the hedgerows offer some habitat that might support birds. In addition it was noted that relatively large numbers of wildfowl were present in the agricultural areas prior to sowing. Further wintering bird survey conducted in 2022 - 2023 (Appendix 9.3) generally confirmed that the area was not particularly important for farmland birds but did record large numbers of transitory skylark and linnet which used the Site only temporarily. Overall, assemblages of wintering birds were considered to be of local level ecological value.
- 9.58 Appendix 9.10 reports that Marsh harriers were breeding on the nearby Old Moor RSPB reserve (part of the Dearne Valley Wetlands SSSI) in 2020. Marsh harriers are protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and are an amber listed species. During 2020 seven marsh harriers were reported to have used the Site, including three juveniles. The marsh harriers were noted to predominately use habitats directly adjacent to Carr Dike particularly the western reach of the watercourse within the Site boundary. No survey information or records were identified that confirm

marsh harriers have bred within the study area since 2020. The breeding bird surveys detailed in Appendix 9.2 (undertaken in 2022) did not record marsh harriers at the Site.

- 9.59 Appendix 9.10 stated that the Site may act as an important foraging and dispersal area for marsh harriers, and that (in 2020), the area around Carr Dike appeared to be significant to this species. There are similar habitats to those present along Carr Dike, present along the Dearne Valley including within the SSSI and RSPB reserves which could equally be used by marsh harriers for foraging and dispersal. Appendix 9.10 concluded that it would not be possible to accurately predict the likelihood of impacts both direct and indirect on marsh harrier as a result of development at the Site. The Marsh Harrier Assessment Report (Appendix 9.4) takes a precautionary approach and considers that the Site is of County level importance for this species.

Herpetofauna

- 9.60 Appendix 9.1 concluded that the habitats at the Site are generally unsuitable for reptiles, though Carr Dike and the broadleaved plantation woodland areas provide some limited suitability. Previous reptile surveys (as reported in Appendix 9.9) did not identify any reptiles at the Site. It is considered unlikely that reptiles are present on the Site or are only present at a very low density. As such, reptiles will not be considered further in this assessment.
- 9.61 Appendix 9.1 identifies that there is one small pond present in the north of the Site (identified as Pond P2). No records of GCN were identified in the vicinity of the Site within the desk study (detailed in Appendix 9.1). Appendix 9.8 and 9.9 provide details of three ponds (including Pond P2, within the Site) that were surveyed for GCN eDNA and tested negative. GCN are therefore considered to be absent and will not be considered further in this assessment. The pond on-Site and terrestrial habitats at the Site have the potential to support common and widespread amphibians however no biological records were identified in the desk study (Appendix 9.1) for amphibians within the Site. It is considered unlikely that common and widespread amphibians would be present at the Site in significant numbers and as such will not be considered further in this assessment.

Summary of Important Ecological Features

- 9.62 Table 9.5 provides a summary of the important ecological features that will be taken forward for further assessment, identified through the review of previous survey reports, desk study and field study.

Table 9.5 Summary of Important Ecological Features to be Assessed Further

Important Ecological Feature	Summary Description	Nature Value	Conservation
Designated Sites			
Dearne Valley Wetlands SSSI (including Old Moor and Wath Ings LWS)	A cluster of SSSI sites which follow the valley of the River Dearne designated for supporting significant numbers of breeding and non-breeding bird species across a variety of habitats. As a SSSI these sites are of National importance.	National	
Habitats			
Hedgerows	Hedgerows within the Site are HPIs. One hedgerow in the north-west of the Site has slightly greater diversity. None of the hedgerows at the Site are considered to meet the criteria of an Important hedgerow under the Hedgerow Regulations 1997. Hedgerows provide habitat for wildlife including breeding birds.	Site	
Broadleaved Plantation woodland	Woodland plantation areas are located mainly on the Site periphery and the banks of Carr Dike. These are considered to be HPIs though they are of limited structure and diversity.	Site	

	<p>The woodlands provide some importance to birds for foraging and nesting and to other wildlife for areas of refuge and connectivity.</p> <p>Not included on woodland inventory or inventory of HPis, would not meet the criteria for priority habitat within the Barnsley BAP.</p>	
Arable field margins	Limited areas of arable margins grassland with relatively poor diversity. These habitats are HPis and a priority habitat within the Barnsley BAP and may provide some potential to support wildlife	Site
Watercourse (Carr Dike)	<p>Steep sided watercourse which flows in a general south-westerly direction through the Site.</p> <p>Although the dike supports little vegetation the watercourse provides a corridor of bankside habitat which is used by wildlife for foraging, commuting and potentially for breeding.</p>	Local
Fauna		
Bats - Foraging/Commuting	Relatively low bat activity at the Site confined to areas of woodland and hedgerows. The habitats within the Site are likely to provide a local level of importance for foraging and commuting bats.	Local
Bats - Roosting	Two trees within the Site have been assessed to have moderate bat roosting potential and further survey is required to determine whether roosts are present.	Local
Breeding Birds	<p>Overall the habitats present are considered to be of relatively low value to breeding birds and assemblages present are mainly of common and widespread species, or in numbers not sufficient to be significant at more than Local ecological importance.</p> <p>Yellow wagtail were considered to be of District level importance in 2020 due to 3 breeding pairs being present representing around 10% of the estimated district population.</p> <p>Corn bunting was assumed to be breeding at the Site in 2022 and this was considered to be of District level importance due to being outside the normal breeding range of the species within the district.</p>	<p>Local</p> <p>District (Individual Species – yellow wagtail and corn bunting)</p>
Wintering Birds	Wintering bird assemblages are mainly of common and widespread species, or in numbers not sufficient to be significant at more than Local ecological importance	Local
Marsh Harriers	Marsh harriers breed at nearby RSPB Old Moor Reserve in 2020 and are not known to breed at any other site in the county though over 590 pairs are reported to breed in the UK ^{xxvii} . Marsh harriers have used the Site for foraging and dispersal. Effects on marsh harrier could have indirect impacts upon other species in the locality.	County

Future Baseline

- 9.63 In the absence of the Development, the Site would be expected to remain in predominately agricultural usage, with ongoing management of the existing hedgerows and management of the plantation woodland areas expected to be minimal. The ecological value and sensitivity of the Site and the features and habitats within the Site would be expected to remain relatively unchanged. The woodland areas would increase in diversity and structure as the trees and understorey mature, this could lead to a slight increase in value in the longer term, but not likely to exceed the Local level.

Likely Significant Effects

Construction Phase

Designated Sites

- 9.64 Construction activities have the potential to lead to environmental releases (dust, oils/fuels, sediment, other chemicals) to the ground or water, any such release would be expected to be relatively modest in magnitude.
- 9.65 Given the relative distance between the Site and the nearest designated Site (Dearne Valley Wetlands SSSI) it is considered unlikely that any dust would have any impact and as such would be of **negligible** effect.
- 9.66 Given the relative distance between the Site and the nearest designated Site (Dearne Valley Wetlands SSSI) it is considered unlikely that environmental release to ground would have any impact and as such would be of **negligible** effect.
- 9.67 A release to water, into Carr Dike, could potentially be transported downstream to the SSSI. Carr Dike flows through Dearne Valley Wetlands SSSI approximately 1.3km downstream of the Site and passes through SSSI Unit 14 (The Mullins) and SSSI Unit 15 (Bolton Ings) for approximately 1.5km before discharging into the River Dearne. Carr Dike does not appear to have any direct hydrological connectivity with the wetlands within the SSSI and is situated within only two of the twenty-two (22) SSSI units. Any release to water would be expected to disperse and dilute over distance and would not be expected to reach the wetland areas of the SSSI, any impact to the watercourse within the SSSI would represent only a very small area of the whole SSSI. There is a small risk that a release could directly impact upon individual waterfowl species which may use Carr Dike and are listed within the citation for the SSSI, this would depend upon the species being present in those areas where a release occurs including during the event. Waterfowl are mobile and may be able to avoid contact with any release into a watercourse. It would be expected that dispersal and dilution due to the downstream distance to the SSSI would in part mitigate the magnitude of any such impact to individual species. Overall, the effect from an environmental release on the SSSI would be considered to be **minor adverse** (without mitigation), although the SSSI is of national importance the effect would be unlikely to cause impact at the National level for any species listed in the citation and, as such, would be considered to be of County Level and would be temporary in nature. Given the above, the effect would not be considered to be significant.
- 9.68 Construction would lead to an increase in the number of vehicles using the nearby road network which in turn would lead to an increase in airborne pollution. These impacts have been further assessed in Chapter 14 (Air Quality) and in Appendix 9.6 and include scenarios for the construction phase of development with and without the addition of cumulative developments and the potential impacts to Gypsy Marsh, which is only one of the 22 SSSI Units of the Dearne Valley Wetlands SSSI spread throughout the Dearne Valley.
- 9.69 For Nitrogen Oxides (NO_x) the modelled values for construction (without cumulative inputs) exceeded the annual critical level increase threshold of 1% for points up to 40m into the swamp habitat and only relatively small exceedances (up to 3.3% of annual critical level) were modelled. No exceedance was modelled for the 24-hour mean NO_x critical level or 10% increase threshold for process contribution. Ammonia (NH₃) did not exceed the modelled critical level and the 1% threshold was also not exceeded. For Nitrogen deposition the annual critical load would not be exceeded although the critical load threshold of 1% from process contribution would be exceeded up to 20m into the habitat. Overall the

conclusions within Appendix 9.6 state that impacts during the construction phase (without cumulative effects) would be confined to small areas of the periphery of the individual SSSI Unit (Gypsy Marsh), would be unlikely to impact upon the structure or function of the habitat, and would not impact upon the bird assemblages for which the SSSI is designated. In most instances there are only slight exceedances of the 1% threshold which triggers the requires further assessment, and the total critical level/load is not exceeded. As such, overall the effect at the construction stage (without cumulative inputs) is considered to be **negligible** and would not be considered to be significant.

Effects of Construction on Habitats

- 9.70 Construction will lead to the permanent and direct loss of terrestrial habitats, only those habitats considered to be Important Ecological Features have been considered. This includes the loss of 0.25ha of mixed woodland, 1.44ha of other neutral grassland (arable field margins) and seven individual trees. The loss of these habitats is small in scale and the habitats present are not considered to be particularly diverse or unique in the landscape. As such, the effect of this loss is considered to be only **minor adverse** at the Site/local level.
- 9.71 Construction will also lead to the permanent loss of 1.66km of hedgerows. None of the hedgerows to be lost are considered to be 'Important' under the Hedgerows Regulations, though one hedgerow (identified as H1 in Appendix 9.1) is considered to be more diverse and provides some connectivity from Carr Dike in the centre of the Site through the central northern area of the Site. The loss of these hedgerows would be considered to be **minor adverse** (without mitigation) at the Site level.
- 9.72 Construction activities may lead to the direct damage of retained habitats, particularly to woodland and hedgerows. Damage may be from direct contact with construction machinery or vehicles, compaction of root zones, or contact with dust or other environmental releases (oils/fuels etc.). These effects would be expected to be temporary and to impact only localised areas of habitat. As such the overall effect would be considered to be **minor adverse** (without mitigation) at the Site level only.
- 9.73 Approximately 15m of habitat associated with Carr Dike and 16m of habitat relating to the ditch/tributary of Carr Dike (referenced as D1 in Appendix 9.1) will be converted to culvert and as such will be lost due to the construction of access roads within the Site. Given the low biodiversity of the water courses and their margins (as reported in Appendix 9.1) and the relatively small amount of habitat to be lost, the effect is considered to be **negligible** at the Site level.
- 9.74 Construction activities have the potential to lead to environmental releases (dust, oils/fuels, sediment, other chemicals) that could enter the soils and impact upon terrestrial habitats at the Site. Any such release would be expected to be relatively modest in magnitude and effects would be expected to be temporary. An environmental release would not be expected to have more than a **minor adverse** effect (without mitigation) at the Site level.
- 9.75 Construction activities have the potential to lead to environmental releases (dust, oils/fuels, sediment, other chemicals) that could enter Carr Dike, any such release would be expected to be relatively modest in magnitude and effects would be expected to be temporary. Carr Dike is limited in biodiversity and as such any environmental release would not be expected to have more than a **moderate adverse** effect (without mitigation) at the Site level.

Effects of Construction on Fauna

Bats

- 9.76 Construction activities would lead to the reduction of habitat used by foraging and commuting bats. Although the majority of habitats at the Site will be cleared, bats were reported to mainly use the corridor of Carr Dike which will be retained, and the peripheral areas of the Site where the majority of hedgerows and habitats will be retained (Appendix 9.5). As such, the extent of habitats used by bats, and which will be lost to construction would be considered to be limited. The loss of these habitat would represent a **minor adverse** effect to bats (without mitigation) at the local level during construction.
- 9.77 There is the potential for construction activities to create increased noise and light which could disturb bats and disrupt commuting and foraging flight paths. Given the relatively low numbers of bats using the

Site, and concentrated areas of use, in the absence of mitigation the effect to bats from construction activities would be considered to be **minor adverse** (without mitigation) at the local level and only temporary.

Birds

- 9.78 Construction activities would lead to the loss of 79.43ha of arable agricultural habitat and 1.44ha of arable field margins which would relate to a loss of breeding and foraging habitat for farmland birds that may make use of arable habitats. This loss could also represent a complete loss of breeding habitat for skylark and corn bunting, though only a single corn bunting and only low numbers of skylark were encountered during survey (Appendix 9.2). In the absence of mitigation this would be expected to be a **minor adverse** (without mitigation) effect at the Local level to farmland birds.
- 9.79 The loss of arable habitats would also result in the permanent loss of foraging habitat for the assemblage of wintering birds that make use of the Site, including loss of habitat for skylark, although alternative resource would still be available in the wider area. In the absence of mitigation this effect would be considered to be **minor adverse** (without mitigation) at the local level.
- 9.80 Construction activities would lead to the loss of 1.66km of hedgerows and 0.24 ha of woodland, located mainly in the north and central areas of the Site. This would result in a modest loss of potential breeding bird habitat, however similar habitats (woodland and hedgerows) of greater extent will be retained along the corridor of Carr Dike and the peripheral areas of the Site and similar alternative habitats would remain available in the immediate vicinity of the Site. As such, and in the absence of mitigation, the effect would be expected to be only **minor adverse** (without mitigation) at the Local level due to the loss of a limited extent of breeding habitat.
- 9.81 Construction activities have the potential to disturb or directly impact/harm nesting birds within suitable habitats which are to be cleared should clearance take place during the nesting bird season. In the absence of mitigation construction activities may lead to breeding birds abandoning nests or being directly injured or killed. This would be considered to be a **moderate adverse** effect (without mitigation) at the local level.
- 9.82 Construction activities have the potential to disturb marsh harriers (if using the Site) and habitat loss would potentially reduce the availability of habitat used by marsh harriers for foraging and dispersal. Appendices 9.4 and 9.10 provide further detail of the areas previously used by marsh harriers, which was predominately in the south-western area of the Site adjacent to Carr Dike. Habitats along the corridor of Carr Dike will be retained, thereby limiting the loss of habitats used by marsh harriers. Additionally, marsh harriers were not observed to be using the Site during the most recent bird surveys (detailed in Appendix 9.2) and there are similar habitats available within the wider environment. Overall, impacts from construction on marsh harriers would be expected to have a **minor adverse** effect (without mitigation) at the County level.

Operational Phase

Designated Sites

- 9.83 There is the potential for environmental releases to occur during the operational phase which may impact to water (Carr Dike). Sustainable Urban Drainage Systems (SUDS) features embedded within the design of the Development (as shown on Landscape Parameter Plan Figure 3.2) would minimise potential for pollution events and reduce silt input from reaching Carr Dike. Any release that might enter Carr Dike would have to travel approximately 1.3km downstream, and then would only affect localised areas of Carr Dike within Dearne Valley Wetlands SSSI. The effect would be expected to be limited magnitude and unlikely to impact upon designated features of the SSSI, as such the overall effect would be considered to be **negligible** at the national level and only temporary in nature. The effect would not be considered to be significant.
- 9.84 During the operational phase traffic increases as a result of the Development have been modelled to be above the thresholds requiring further assessment as set out by the Design Manual for Roads and Bridges (DMRB) and Natural England. Appendix 9.6 details the potential impacts of increased air borne

pollutants from traffic during the operational phase on sensitive habitats within the Gypsy March SSSI unit of the wider Dearne Valley Wetlands SSSI.

- 9.85 At the operational phase inputs of NO_x exceed the further assessment threshold of 1% of annual critical level at all points on the transects though the most significant exceedances are at the periphery of the habitat. The modelled annual critical level for NO_x was exceeded within 30m from the edge of the habitat. The 24-hour critical level for NO_x would not be exceeded. For ammonia (NH₃) relatively slight exceedances of the 1% threshold were modelled at points across the majority of the habitat, however the critical level used in modelling was considered to be precautionary and a more realistic level would limit exceedances with within 20m of the edge of the habitat. For nitrogen deposition the 1% of critical load was modelled as exceeding at all points, though the critical load level used in modelling was considered to be precautionary and a more realistic value would result in no exceedance of the total annual critical load and exceedances of the 1% threshold only up to 30m within the habitat.
- 9.86 Overall the conclusions within Appendix 9.6 state that impacts during the operational phase (without cumulative effects) would be confined to small areas of the periphery of the individual SSSI Unit (Gypsy Marsh), would be unlikely to impact upon the structure or function of the habitat, and would not impact upon the bird assemblages for which the SSSI is designated. In most instances there are only slight exceedances of the 1% threshold which triggers the requires further assessment, and the total critical level/load is not exceeded. As such, overall the effect at the operational phase (without cumulative inputs) is considered to be **minor adverse** and would not be considered to be significant.

Effects of Operational Phase on Habitats

- 9.87 The Development will retain 2.27ha of woodland, 22 individual trees and 0.89km of hedgerow. Habitat creation embedded within the design of the Development will include the creation of 0.24ha of modified grassland, 19.85ha of other neutral grassland, 3.0ha of mixed scrub, 8.68ha of broadleaved woodland, 3.67ha of wet woodland, 2.97ha of ponds (used within SUDS but which permanently hold water), and 0.27ha of other SUDS features, 70 medium sized individual trees and 6.62km of hedgerow (as shown on Landscape Parameter Plan Figure 3.2).

Woodland and Scrub

- 9.88 The proposed habitat creation will expand the area of woodland within the Site from 3.16ha pre-development to 17.21ha in the operational phase, extending the corridor of habitat along Carr Dike and introducing additional diversity through the inclusion of mixed woodland and wet woodland creation. In addition, 3.0ha of mixed scrub habitat will be created, predominately at woodland edges or extending from the woodland areas. These habitats would require 10-30 years to establish but once mature and managed appropriately would be a permanent significant increase in woodland habitat considered to be medium or potentially high ecological distinctiveness. The creation of mixed scrub and woodland would, once established, provide an increase in priority habitats within the Site and local area. The increase in woodland and scrub habitat would be considered to be a permanent **moderate beneficial** effect at the local level due to the increase in continuous woodland which is relatively limited in the local area.

Grassland

- 9.89 There will be a reduction in the amount of modified grassland/poor semi-improved grassland (low ecological value) from 1.26ha pre-development to 0.24ha in the operational phase. However there will be creation of areas of more valuable semi-improved/other neutral grassland which would increase from 1.44ha associated with arable field margins pre-development to 19.86ha during the operational phase. The grassland areas will be provided in the west and north of the Site and as well as providing ecological value will also provide ecosystem service value for flood alleviation. The increase in the area of grassland habitat is significant and would be considered to be a permanent **moderate beneficial** effect at the Site level.

Waterbodies

- 9.90 Pond habitat would increase from only 47m² pre-development to 2.97ha during operation, although these ponds would be non-priority habitats and associated with Site drainage, they would still provide

an increase in the ecological value of the Site. The increase in waterbody habitats would be considered to be **moderate beneficial** effect at the Site level.

Hedgerows

- 9.91 Hedgerows would increase from 2.25km pre-development to 7.51km post development. This would be a moderate increase in priority habitat providing a **moderate beneficial** effect at the local level.

Watercourses

- 9.92 During operation of the Development there is the potential for environmental releases to occur during the operational phase which may impact to water (Carr Dike or the tributary ditch on-site). SUDS features embedded within the design of the Development (as shown on Landscape Parameter Plan Figure 3.2) would minimise potential for pollution events and reduce silt input from reaching Carr Dike. Any release that might reach Carr Dike would be expected to be of limited/minor magnitude, resulting in a temporary **minor adverse** effect to the watercourse habitat at the Site/local level and would not be considered to be a significant effect.
- 9.93 It is expected that during the operational phase there would be a reduction in environmental based nutrient sources entering Carr Dike and the tributary ditch (from diffuse sources of agricultural fertilisers and other chemicals) as a result in the change of land use away from agriculture in the immediate vicinity. Although nutrients would be likely to continue to enter the watercourse from upstream and downstream agricultural land use. The SUDS features within the design of the Development would also reduce the input of sediment and nutrients into the watercourses. A reduction in nutrient and sediment input would be expected to result in reduction of algal growth and increase dissolved oxygen within the watercourse leading to minor increase in water quality of the ecological habitat. This would be considered to be a **minor beneficial** effect at the Site level and would not be significant.

Effects of Operational Phase on Fauna

Bats

- 9.94 The increase in woodland planting along the Carr Dike corridor and on the western edge of the Development would provide greater connectivity for commuting bats in a north-south and north-east/south-west direction. The habitat creation within the design of the Development would provide additional resources for foraging bats with the large increases in grassland, woodland, hedgerows, and ponds expected to permanently increase the availability of invertebrate prey sources once established. This would be expected to be a **moderate beneficial** effect to bats at the local level.
- 9.95 Commuting and foraging bats have the potential to be disrupted or deterred from using the Site by additional noise from operational activities, and lighting on buildings or along roadways. Given the relatively low numbers of bats using the Site and that bats concentrated along the peripheral hedgerows and the Carr Dike corridor (Appendix 9.5) the magnitude of this impact would be considered to be minor. It would be expected that commuting and foraging bats would make use of newly created habitat areas in the west of the Site and that habitats embedded within the design of the Development (wooded embankments and additional woodland planting) would limit the effects of noise and/or light on bats. In the absence of additional mitigation the effect of operational activities disturbing bats would be considered to be **minor adverse** (without mitigation) at the local level and would be expected to be sporadic/temporary in nature.
- 9.96 Buildings within the Development would be considered to be unsuitable for roosting bats. The woodland habitat creation could provide opportunities for roosting bats once trees have reached mature/veteran status however this could take over 50 years. As such, the effect on roosting bats would be considered to be **minor beneficial** at the local level but only in the long term.

Birds

- 9.97 Habitat creation within the Development would provide a large increase in scrub, woodland and hedgerows which could be used by a wide range of bird species for cover, foraging and nesting and for use in winter. In addition, habitat creation within the western and northern areas will include grassland

which would have potential for nesting for some ground nesting birds as well as foraging opportunities throughout the year, it is possible that skylark and corn bunting could also use this habitat though it would not be optimal for these farmland species. Habitat creation of ponds and SUDS features would provide opportunities for some waterfowl for foraging and nesting. Although the construction of the Development will result in a reduction of agricultural habitat favoured by farmland specialist birds there will be an increase in breeding/nesting habitat for a wide range of bird species. Overall, the effect to breeding birds would be considered to be **minor beneficial** at the local level.

- 9.98 The habitat creation embedded within the design of the Development, particularly within the western flood alleviation area of the Site would be expected to compensate only partially for the loss of a large amount of arable agricultural land use (79.43ha) which is utilised by farmland birds during the winter. As such, habitat creation during the operational phase would be considered to have a **negligible** effect at the local level.
- 9.99 The habitat creation embedded within the design of the Development, particularly within the western flood alleviation area of the Site, is expected to provide potential foraging and dispersal opportunities for marsh harriers. The habitats created include ponds, grassland and hedgerows which would increase the potential for prey species (waterfowl and small mammals) to use the Site. The habitats (wooded embankments, hedgerows and woodland planting), once established, would limit disturbance from operational activities on the western area of the Site where marsh harriers were previously observed (Appendix 9.10). The western area would be subject to less disturbance from management in comparison to the pre-development agricultural use. Overall, the increase in more optimal habitats and reduction in disturbance in the western area would be considered to be a **minor beneficial** effect for marsh harriers at the County level.

Mitigation Measures

Construction Phase

Construction Environmental Management Plan (CEMP) Framework

- 9.100 A Construction Environmental Management Plan (CEMP) Framework has been produced for the Development^{xxviii} to inform construction and will be implemented by the main contractor during construction. The CEMP Framework provides instruction on methods of environmental and ecological protection during construction including:
- Designate Ecological Protection Zones (EPZs) around retained habitats and implement the demarcation and fencing of areas to prevent direct impacts from construction activities and vehicle movements. Retained trees will be protected in accordance with BS 5837:2012^{xxix}. Suitable signs will be installed clearly highlighting retained and sensitive habitats and all Site personnel will be briefed as to their responsibilities;
 - Control of potential sources of dust;
 - Implementing best practice guidance on the storage of environmentally hazardous materials;
 - Implementing measures to control noise and vibration;
 - Measures to reduce the impact of temporary lighting onto retained and key habitats; and
 - Measures to avoid disturbance to nesting birds.

Operational Phase

Habitat Management

- 9.101 A conservation-led Landscape Ecological Management Plan (LEMP) will be produced for the Development. This will provide the over-arching aims and objectives for on-Site habitat creation and management aimed at benefiting biodiversity over the long-term, including details of management responsibilities and mechanisms to secure the long-term management and setting out the framework for ongoing management and monitoring. It will set out the targeted objectives and detailed management prescriptions for each habitat type or feature, the monitoring requirements and a rolling five-year work programme (for a 30-year period as one of the principles of 'Biodiversity Net Gain'). These measures will seek to benefit local fauna which use or could use the Site. The plan would be a 'living document', with a programme of monitoring and feedback, to ensure that the on-going management is flexible and responds to change. Regular reviews and updates will be submitted and agreed with the LPA, and any other parties as agreed, and will be as set out within the approved LEMP.

Bats

- 9.102 A lighting impact assessment was undertaken and a lighting strategy for the Development has been developed^{xxx} which includes measures to reduce impacts to ecological receptors. The assessment makes reference to the Bat Conservation Trust & Institute of Lighting Engineers guidelines^{xxxi} and the measures proposed broadly align with those recommended within the guidelines.
- 9.103 A variety of bat boxes will be installed on retained trees (where appropriate) adjacent to retained and created habitats to increase and provide availability of roosting sites. It is recommended that 15 bat boxes are erected at five locations across the Site.

Birds

- 9.104 A variety of bird boxes will be installed on retained trees and on new buildings (where appropriate) adjacent to retained and created habitats to increase availability of nesting sites.
- 9.105 Willow Tit *Poecile montanus* is a red listed species listed in the designation of the nearby Dearne Valley Wetlands. This species breeds within wet woodlands with standing deadwood. Deadwood nest features will be introduced into the area of wet woodland within the Site design to encourage the use of the Site by willow tit.

Residual Effects

- 9.106 There are no significant residual effects resulting from the Development after effective implementation of the additional mitigation measures proposed above and mitigation embedded within the Site design. Please refer to Table 9.7 below for a summary of effects.

Construction Phase

Designated Sites

- 9.107 Temporary construction impacts such as environmental releases of to air (dust), ground, and water which have the potential to migrate to nearby designated sites (Dearne Valley Wetlands SSSI) would be mitigated by implementation of the CEMP Framework, the residual effects after mitigation are considered to be **negligible**.
- 9.108 Air pollution to designated Sites (Dearne Valley Wetlands SSSI – Gypsy Marsh) due to increases in traffic as a result of the construction of the Development were assessed to be negligible and no mitigation proposed. Residual effects are considered to be **negligible**.

Habitats

- 9.109 Permanent loss of terrestrial habitats within the Site during construction were assessed to be minor adverse, no mitigation is proposed at the construction stage therefore residual effects are considered to be **minor adverse**.
- 9.110 Permanent loss of hedgerows within the Site during construction were assessed to be minor adverse, no mitigation is proposed at the construction stage therefore residual effects are considered to be **minor adverse**.
- 9.111 Damage to retained habitats as a result of construction activities is considered to be a temporary effect that would be mitigated through the implementation of the CEMP Framework. After mitigation the residual effect is considered to be **negligible**.
- 9.112 Permanent loss of watercourses habitats includes two small areas to be culverted to allow for access road construction and is considered to be negligible. No mitigation is proposed, and the residual effect is considered to be **negligible**.
- 9.113 Potential environmental releases to terrestrial habitats during construction are considered to be temporary and would be minor adverse, which would be mitigated through the implementation of the CEMP Framework. Residual effects after mitigation are considered to be **negligible**.
- 9.114 Potential environmental releases to watercourses during construction are considered to be temporary and would be moderate adverse, which would be mitigated through the implementation of the CEMP Framework. Residual effects after mitigation are considered to be **negligible**.

Bats

- 9.115 Loss of habitat used by commuting and foraging bats during construction would be temporary and is assessed as being minor adverse. No mitigation measures are proposed during construction and as such residual effects would be considered to be **minor adverse** (although this is addressed further at the operational phase).
- 9.116 Direct disturbance to commuting and foraging bats from construction activities is considered to be temporary and a minor adverse effect. The implementation of the CEMP Framework which prescribes best practice lighting design that would mitigate the effect to some extent. However, it is considered that the residual effect would remain as temporary and **minor adverse**.

Birds

- 9.117 The loss of arable habitats potentially used by breeding farmland birds is considered to be minor adverse at the construction stage, with no mitigation proposed. The residual effect would be considered to be **minor adverse** at the construction stage (although this is addressed further at the operational phase).
- 9.118 The loss of arable habitats potentially used by wintering birds is considered to be minor adverse at the construction stage, with no mitigation proposed. The residual effect would be considered to be **minor adverse** at the construction stage (although this is addressed further at the operational phase).
- 9.119 The loss of terrestrial habitats (hedgerows and woodlands) potentially used by breeding birds is considered to be minor adverse at the construction stage, with no mitigation proposed. The residual effect would be considered to be **minor adverse** at the construction stage (although this is addressed further at the operational phase).
- 9.120 Disturbance and direct impacts of construction on breeding birds is considered to have a moderate adverse effect but will be mitigated through measures implemented by the CEMP Framework. The residual effect is considered to be **negligible**.
- 9.121 Disturbance during construction to marsh harriers potentially using parts of the Site is considered to be temporary minor adverse. No mitigation is proposed at the construction stage and therefore the residual effect is considered to be temporary **minor adverse**.

*Operational Phase**Designated Sites*

- 9.122 Environmental releases to water resulting from operations at the Site have the potential to migrate to the Dearne Valley Wetlands SSSI, however due to the distance to the SSSI the potential temporary effect is considered to be negligible. Sustainable Urban Drainage Systems (SUDS) embedded within the design of the Development would mitigate potential environmental releases to water. Residual effects are considered to be **negligible**.
- 9.123 Air pollution resulting from increases in traffic at the operational phase of the Development is considered to have a minor adverse effect on the nearby SSSI (Dearne valley Wetlands – Gypsy Marsh). No mitigation is proposed and the residual effect is considered to be **minor adverse**.

Habitats

- 9.124 The creation of terrestrial woodland habitat is considered to have a moderate beneficial effect at the operational phase. Habitat creation is embedded within the Site design, however the implementation of a LEMP will ensure that habitats are managed and maintained in the long term to provide biodiversity value. The residual effect is considered to be **moderate beneficial**.
- 9.125 The creation of terrestrial grassland habitat is considered to have a moderate beneficial effect at the operational phase. Habitat creation is embedded within the Site design, however the implementation of a LEMP will ensure that habitats are managed and maintained in the long term to provide biodiversity value. The residual effect is considered to be **moderate beneficial**.
- 9.126 The creation of waterbodies/pond habitats (as part of SUDS) are considered to have a moderate beneficial effect at the operational phase. Habitat creation is embedded within the Site design, however the implementation of a LEMP will ensure that habitats are managed and maintained in the long term to provide biodiversity value. The residual effect is considered to be **moderate beneficial**.
- 9.127 The creation of hedgerow habitats are considered to have a moderate beneficial effect at the operational phase. Habitat creation is embedded within the Site design, however the implementation of a LEMP will ensure that habitats are managed and maintained in the long term to provide biodiversity value. The residual effect is considered to be **moderate beneficial**.
- 9.128 Potential environmental releases during the operational phase have the potential to directly impact watercourse habitats at the Site. The effect of this is considered to be minor adverse and temporary. The inclusion of ponds and other SUDS features embedded within the Development design would be expected to reduce potential impacts to watercourses from environmental releases through limiting the amount of pollutant available to reach the watercourses. As such, the residual effect would be considered to be **minor adverse**.
- 9.129 As a result of land use change (from arable agricultural) to commercial use with habitat creation, there would be expected to be a reduction in the nutrient input to watercourses at the Site due to a reduction in agricultural nutrient inputs. This would be expected to have a minor beneficial effect on watercourses at the Site. No further mitigation is proposed, and the residual effect is considered to be minor beneficial.

Bats

- 9.130 The creation of significant areas of more suitable terrestrial habitats is expected to have a moderate beneficial effect on commuting and foraging bats at the operational phase. Habitat creation is embedded within the Development design and the residual effect is considered to be **moderate beneficial**.
- 9.131 Operational activities (vehicle movements, noise, lighting) would be expected to have a minor adverse impact upon bats that may use the Site (likely only common and widespread species). Habitat creation embedded within the Development design would provide areas less impacted by operational activities

and the implementation of the lighting strategy would mitigate for some of the impacts. The residual effect is considered to be **minor adverse**.

- 9.132 No roosting bats are considered to be present at the Site but habitat creation in the longer term at the operational phase may provide opportunities for bat roosting and as such, there is considered to be a minor beneficial effect. Habitat creation is embedded in the Development design however, implementation of a scheme of bat box installation would provide additional roosting habitats. The residual effect to the local bat population is considered to be **minor beneficial**.

Birds

- 9.133 Habitat creation (woodland, scrub, grasslands, ponds, hedgerows) would provide additional diversity of habitats and opportunities for a range of breeding birds at the operational phase. Habitat creation is embedded within the Development design however, implementation of a scheme of bird box installation would provide additional roosting habitats. The residual effect to the local bird assemblage is considered to be **minor beneficial**.
- 9.134 Some of the habitats created would be suitable, though not optimal, for breeding and foraging farmland birds (e.g. grassland areas in the west of the Site). This habitat creation would be considered to have a negligible effect on the local farmland bird assemblage. Habitat creation is embedded in the Development design, no further measures are proposed in relation to farmland birds at the operational phase. The residual effect to farmland birds at the operational phase is considered to be **negligible**.

Habitats created within the Site, particularly in the west and north, would be suitable to support marsh harriers (for commuting, hunting and potentially breeding). This habitat creation would be considered to be minor beneficial to marsh harriers during the operational phase. The habitat creation is embedded within the Development design and no further measures are proposed. The residual effect to marsh harriers during the operational phase is considered to be **minor beneficial**.

Cumulative Effects

- 9.135 The following section provides an overview of the potential cumulative effects from development applications in combination with the proposed scheme. Table 9.6 provides a summary of these applications and the ecological constraints and impacts associated with each application in isolation.

Table 9.6: Schemes considered within the cumulative effects assessment

	Scheme	Application	Ecological Summary	Impacts of development (in isolation)
1	Fields End Business Park, Portwest, Colliery Lane, Thurnscoe, Rotherham, S63 0JF (2021/0012)	Erection of extension to existing storage and distribution warehouse (Approved in February 2022 subject to legal agreement)	Site was previously occupied by a mix of grassland, scrub and fen/swamp. Recent publicly available aerial imagery (Google earth) shows the site to have been developed. Ecological receptors considered to be of only local value. Loss of habitat to be compensated for off-site	No overriding ecological constraints
2	Former Goldthorpe Primary School, High Street, Goldthorpe, S63 9NQ	Erection of a 1,979 sq.m (gross) retail unit (Use Class E) with vehicular and pedestrian accesses; parking; hard and soft landscaping; boundary treatments; trolley bay;	Site of former school now demolished. Hardstanding across a large portion of the site, habitats include ephemeral vegetation, improved grassland, scrub and species poor hedgerow.	No overriding ecological constraints

	Scheme	Application	Ecological Summary	Impacts of development (in isolation)
	(2022/0056)	electricity substation and associated works (Approved in July 2022 subject to legal agreement)	No overriding ecological constraints	
3	Land off Barnburgh Lane, Goldthorpe, Rotherham, S63 9NT (2015/1198)	Erection of 61 dwellings with garages and/or parking spaces together with the provision of open space and associated roads and sewers. (Approved June 2016, under construction)	From aerial imagery this site has now been developed with housing. Previously the site was predominately grassland, semi-improved and marshy grasslands with boundary hedgerows. GCN surveys for eDNA in nearby ponds were negative. No overriding ecological constraints	No overriding ecological constraints
4	Land at Kingsmark Way, Goldthorpe, Rotherham (2019/1274)	Residential development of 116 dwellings and associated works (Reserved Matters for approval of details relating to layout, scale, design, external appearance and landscaping in relation to application 2018/0103). (Amended Plan) (Approved in January 2021 subject to legal agreement)	No ecological report available for review within planning documents. Aerial imagery shows site partially developed. Arboricultural assessment identified trees to be retained on the site boundaries. Historical aerial imagery shows the site to comprise grassland and mixed scrub with trees/hedgerows to the boundaries. No ecological conditions within planning decision. No overriding ecological constraints identified	No overriding ecological constraints
5	Land BMBC Asset ID E00546, Land off Willow Road, Thurnscoe, Rotherham, S63 0PG (2017/1051)	Erection of 129 dwellings (Phase 2), associated infrastructure and public open space (Full Consent). Residential Development (Phase 3) and associated infrastructure (Outline) - Hybrid Application. (Approved in 2017, under construction)	Site is now partially developed. Previously semi-improved grassland, scattered trees, scrub and hedgerow. A single tree with bat roost potential was to be retained, no other significant protected/notable species constraints identified.	No overriding ecological constraints
6	Land at Everill Gate Lane, Wombwell, Barnsley (2018/1353)	Development of the site for employment uses within use classes B1 (Business), B2 (General Industrial) and B8 (Storage and Distribution) and associated access, parking and circulation areas, and infrastructure. (Approved in April 2019 with conditions)	Site is now developed and predominately hardstanding. Previously species poor semi-improved grassland, tall ruderal vegetation, and scattered scrub. Further survey for reptiles was recommended but no evidence was carried out. Amphibians were not identified to be a constraint; however the decision notice included a condition for amphibian surveys to be carried out (no ponds or water courses present in the site). Separated from the Development by distance with severed connectivity,	No adverse impacts after mitigation

	Scheme	Application	Ecological Summary	Impacts of development (in isolation)
			major roads considered to be a barrier to reptiles and amphibians.	
7	58 Lundhill Road, Wombwell, Barnsley, S73 0RJ (2019/0089)	Demolition of existing bungalow and the development of 235 no. dwellings with formation of new access, car parking, landscaping and public open space (Amended plans and description). (S73 application approved in April 2020)	Site is currently under construction. Formerly semi-improved grassland and scattered trees/scrub with amenity grassland (former sports pitches). Additional bat activity surveys were undertaken, and common and widespread species noted to use the site. Recommendations for mitigation and enhancement included sympathetic lighting scheme for bats, bat box installations and landscape planting to encourage bat foraging.	No adverse impacts after mitigation
8	The Symphony Group, Park Spring Road, Grimethorpe, Barnsley, S72 7EZ (2020/1032)	Erection of a new factory/warehouse (Use Class B2 General Industrial & Use Class B8 Storage & Distribution) with installation of up to a 1 MW biomass boiler, associated parking and circulation space (Approved in January 2021 subject to legal agreement)	Site has been partially developed. Previously an area of mineral extraction with poor semi-improved grassland, marshy grassland, bare ground, linear stands of broadleaved plantation and an area of standing water. Some areas were also classified as open mosaic habitat. A small population of GCN was identified in the vicinity to this site. Brown hare, common toad and breeding birds were also identified as ecological constraints. New Zealand pygmy weed (an Invasive Non-Native Species) was identified at the site. Habitat loss to be compensated for in an off-site nature reserve. This site is separated from the Development by distance, fragmented habitat connectivity and barriers to dispersal.	No adverse impacts after mitigation
9	Lockwood Road, Goldthorpe, Rotherham, S63 9JY (2021/1171)	Erection of 137 2, 3 and 4 bed dwellings with associated access and landscaping (Approved in October 2023 subject to legal conditions)	This site is predominately modified grassland and scrub of low ecological value/distinctiveness and is located approximately 1.7km north-east of the Development. This site is separated from the Development by intervening land-use including commercial/industrial, railway line, and residential properties. No significant habitat connectivity with the Development.	No overriding ecological constraints and no adverse impacts after mitigation

	Scheme	Application	Ecological Summary	Impacts of development (in isolation)
			An EclA report did not identify any significant impacts from this development.	
10	Land Bmhc Asset Id E00061, Barnburgh Lane, Goldthorpe, Rotherham, S63 9FL (2020/1439)	Erection of 68no. 2,3, and 4 bed dwellings with associated access and landscaping (Amended Plans and Description) (Approved in March 2023 subject to legal conditions)	This site includes areas of grassland, marshy grassland, bramble scrub, and tall herb communities and is located approximately 1.75km east of the Development. This site is separated from the Development by intervening land-use including commercial/industrial, railway line, and residential properties. No significant habitat connectivity with the Development. EclA report not identify any significant impacts from this development.	No overriding ecological constraints and no adverse impacts after mitigation
11	Land at Houghton Main, Park Spring Road, Little Houghton, Barnsley, S72 0HR (2021/1282)	Outline planning permission for the erection of c. 19,147m2 (206,100 sq ft) flexible employment space (Class E, B2 and B8) including ancillary car parking and landscaping. All matters reserved with the exception of access. (Approved in July 2023 subject to legal conditions)	This site includes a mosaic of generally species poor grassland and young woodland habitats, with some scattered scrub and a damp ditch and is located approximately 2.1km north-west of the Development. This site is separated from the Development by intervening land-use including the A635 main road, agricultural land, residential areas, and woodland. No overriding ecological constraints identified.	No overriding ecological constraints

Designated Sites

- 9.136 Impacts from increased traffic pollution to Dearne Valley Wetlands SSSI Unit 12 Gypsy Marsh have been assessed in Chapter 14 of this ES and Appendix 9.6 and includes an assessment of cumulative effects from the identified applications in Table 9.6.
- 9.137 Cumulative effects during construction are considered to be **minor adverse** to a national level IEF (Dearne Valley Wetlands SSSI). The extent of the effect is considered to be limited and is unlikely to impact upon designated features of the SSSI. As such the overall effect is not considered to be significant.

Habitats

- 9.138 Habitats within the identified applications were considered to be in general of low ecological value with priority habitats limited to relatively small areas of hedgerows and in one case (Application 8 Table 9.6) open mosaic habitat. The identified applications either did not consider habitat loss to be of minor effect or provided mitigation and compensation.
- 9.139 Including the significant embedded habitat creation within the Development, and proposed habitat creation within the identified developments (both on-site and off-site), the cumulative effect of changes to habitats is considered to be **minor beneficial** at the local level.

Protected and Notable Species

Bats

- 9.140 No impacts to bat roosts were noted from a review of the identified applications. Only one application (Application 7 within Table 9.6) identified bat commuting and foraging as a specific ecological constraint and provided recommendations for mitigation and enhancement.
- 9.141 The embedded habitat creation within the Development, and habitats created within the cumulative developments would be considered to provide a **minor beneficial** effect for roosting bats in the local population in the long term.
- 9.142 Habitat creation within the Development and in the cumulative developments would have a **moderate beneficial** effect for foraging and commuting bats (due mainly to the extensive creation of connective woodland within the Development). However, operational activities at the Development and in combination with the cumulative developments would be expected to have a **minor adverse** effect on commuting and foraging bats due to lighting and potential impacts of vehicles using those sites at night. Overall, the cumulative impact to foraging and commuting bats including the effects of habitat creation (beneficial) and operational activities (adverse) is considered to be **minor beneficial** at the local level.

Birds

- 9.143 Habitats at the identified application sites were generally semi-improved grasslands with scrub and hedgerows, in comparison with the subject Site which has a large area of arable agricultural land. Therefore, cumulative effects to farmland bird species would be considered to be of negligible magnitude with negligible additional effect. Overall the cumulative effect of the Development and identified applications would be considered to be **minor adverse** at the local level to farmland bird species and not considered to be significant.
- 9.144 Including mitigation, the cumulative effect to other bird assemblages from the identified applications and the Development is considered to be **minor beneficial** at the local level, as a result of additional habitat creation and mitigation within the Development and the identified applications.
- 9.145 No habitats were noted to be particularly suitable for marsh harriers within the identified applications and none of the applications identified marsh harriers as a potential ecological constraint. As such, no additional cumulative impacts to marsh harrier would be expected and the cumulative effect would remain **minor beneficial** effect for marsh harriers at the County level due to the habitat creation and increased connectivity within the Development.

Other Protected and Notable Species

- 9.146 Other protected and notable species (not identified as IEFs within the Development) were noted to have been identified within two of the identified applications (Application 6 and 8 within Table 9.6). Given the distance between the application site and the Development as well as broken connectivity and barriers to wildlife dispersal, no cumulative impact would be expected on the species present at the application site.

Summary

- 9.147 This chapter assesses the likely significant effects of the Development in terms of ecology and nature conservation. The assessment is based on existing information regarding the Site collated through a desk study, review of previous reports and surveys from 2013 to 2021 and habitat and species surveys undertaken by FPCR in 2022 and 2023. The broad nature of the habitats, species assemblages, and populations recorded has remained broadly consistent from 2013 to 2023.
- 9.148 Dearne Valley Wetlands SSSI was identified as the nearest designated site for nature conservation, located approximately 100m south-west of the Site.

- 9.149 The study established that the Site supports predominately arable agricultural land use with hedgerows and small stands of woodland on the periphery, Carr Dike (a small watercourse) bisecting the Site from north-east to south-west, with small stands of woodland along the course, a ditch acting as a tributary to Carr Dike in the central and eastern area of the Site, a small pond in the north of the Site and limited semi-improved grassland as arable field margins. Habitats identified for further consideration included the hedgerows, woodlands, arable field margins and Carr Dike.
- 9.150 Species identified from the study included:
- relatively low numbers of commuting and foraging bats, predominately pipistrelle species;
 - low numbers of breeding or potentially breeding farmland birds;
 - an assemblage of breeding birds including small numbers of notable species;
 - use of the site by marsh harriers for foraging and dispersal;
 - small numbers of winter birds using the Site for foraging, with occasional larger numbers of some species using the Site in a transitory capacity.
- 9.151 Following review of the ecological baseline, the potential impacts which may arise through the loss of habitats were identified and reviewed, with the aim of, where possible, avoiding potential impacts through alterations to design, layout or working methods and incorporated into the project design.
- 9.152 The majority of the development is to be located on areas of arable land and species-poor grassland which habitats of low or negligible ecological value. Some minor loss of habitats of increased value such as sections of hedgerow and woodland will occur. A small amount of the watercourses will be lost via culverts.
- 9.153 Embedded habitat creation will create a large amount of grassland, woodland, ponds, and hedgerows that will increasing the amount of more ecologically valuable habitats within the Site and increasing the connectivity of habitats.
- 9.154 Mitigation will include the implementation of the CEMP Framework which will reduce the likelihood of environmental releases and impacts to ecological features during construction.
- 9.155 A LEMP will be produced to ensure the long-term management of the habitats created at the Site and maximise the ecological value of those habitats through appropriate management methods.
- 9.156 Further mitigation will include the installation of bat and bird boxes throughout the Development and the inclusion of deadwood features to encourage willow tit to nest within the created wet woodland areas.
- 9.157 The potential loss of two trees during construction with bat roost potential has a risk of incurring a Moderate Adverse effect to the local bat population in the short term (further surveys will be undertaken to determine whether bat roosts are present). Mitigation through the provision of woodland habitat creation and installation of additional bat boxes would be adequate to compensate for the loss of up to two roosts (if present) and would be expected to provide a minor beneficial effect in the long term.
- 9.158 Habitat losses would be only expected to have minor adverse effects in the short term to habitat diversity, and for other wildlife including bats and birds. In the longer term the habitat creation embedded within the Site design would be considered to provide mostly minor beneficial effects, but the creation of additional woodland, grassland, ponds, and hedgerows with long-term management would be at a sufficient scale to be Moderate beneficial and would be considered to be significant at the local level.
- 9.159 In conclusion, on the basis of the current evidence, there are no overriding ecological reasons why the Development could not proceed. All likely significant adverse effects on habitats and species of ecological interest are avoided or mitigated through the design of the Development, which also includes ecological enhancements.

9.160 Table 9.7 contains a summary of the likely significant effects of the Development.

Table 9.7: Table of Significance – Biodiversity

Potential Effect	Nature of Effect (Permanent/ Temporary)	Significance (Major/Moderate/Minor) (Beneficial/Adverse/ Negligible)	Mitigation / Enhancement Measures	Geographical Importance*							Residual Effects (Major/Moderate/Minor) (Beneficial/Adverse/ Negligible)
				I	N	R	C	D	L	S	
Construction											
Environmental releases of dust impacting upon SSSI	Temporary	Negligible	CEMP – Measures to damp down dust		X						Negligible
Environmental release to ground impacting upon SSSI	Temporary	Negligible	CEMP – good practice for storage of hazardous materials		X						Negligible
Environmental release to water impacting upon SSSI	Temporary	Minor Adverse	CEMP – good practice for storage of hazardous materials				X				Negligible
Increase in traffic pollutants impacting on SSSI	Permanent	Negligible	None proposed		X						Negligible
Loss of terrestrial habitats within the Site	Permanent	Minor Adverse	None proposed at construction stage						X		Minor Adverse
Loss of hedgerows within Site	Permanent	Minor Adverse	None proposed at construction stage							X	Minor Adverse
Damage to retained habitats from construction activities	Temporary	Minor Adverse	CEMP – identify and fence off EPZ and provide awareness to contractors							X	Negligible

Loss of habitat to watercourses	Permanent	Negligible	None proposed at construction stage							X	Negligible
Environmental release impacting terrestrial habitats at the Site	Temporary	Minor Adverse	CEMP – good practice for storage of hazardous materials							X	Negligible
Environmental release impacting watercourses at the Site	Temporary	Moderate Adverse	CEMP – good practice for storage of hazardous materials							X	Negligible
Loss of habitat used by commuting and foraging bats	Permanent	Minor Adverse	None proposed at construction stage							X	Minor Adverse (Addressed further during operational phase through habitat creation)
Disturbance to commuting and foraging bats	Temporary	Minor Adverse	CEMP – sensitive use of lighting							X	Minor Adverse
Loss of two trees with potential bat roosts (if present)	Permanent	Moderate Adverse	None proposed at construction stage							X	Moderate Adverse (Addressed further during operational phase through installation of bat boxes)
Loss of arable habitats used by breeding farmland birds	Permanent	Minor Adverse	None proposed at construction stage							X	Minor Adverse (Addressed further during operational phase through habitat creation)
Loss of arable foraging habitat for wintering birds	Permanent	Minor Adverse	None proposed at construction stage							X	Minor Adverse (Addressed further during operational phase through habitat creation)

Loss of terrestrial habitat (hedgerow and woodland) for breeding birds	Permanent	Minor Adverse	None proposed at construction stage						X	Minor Adverse (Addressed further during operational phase through habitat creation)
Disturbance or direct impact (injury/death) of breeding birds from construction activities	Permanent	Moderate Adverse	CEMP – avoid breeding bird season or employ measures to identify and protect nesting birds during construction						X	Negligible
Disturbance to marsh harriers using the Site due to habitat loss and construction activities	Temporary	Minor Adverse	None proposed				X			Minor Adverse
Completed Development										
Environmental releases to water from Site operation impacting upon SSSI	Temporary	Negligible	None proposed. SUDs features embedded within Site design will limit the extent of any potential release		X					Negligible
Increase in traffic pollutants impacting on SSSI	Permanent	Minor Adverse	None Proposed		X					Minor Adverse
Creation of terrestrial woodland habitat	Permanent	Moderate Beneficial	Habitat creation embedded within Site design LEMP – to ensure habitats provide biodiversity/ecological value						X	Moderate Beneficial

Creation of terrestrial grassland habitat	Permanent	Moderate Beneficial	Habitat creation embedded within Site design LEMP – to ensure habitats provide biodiversity/ecological value							X	Moderate Beneficial
Creation of waterbodies/pond habitats	Permanent	Moderate Beneficial	Habitat creation embedded within Site design LEMP – to ensure habitats provide biodiversity/ecological value							X	Moderate Beneficial
Creation of hedgerows	Permanent	Moderate Beneficial	Habitat creation embedded within Site design LEMP – to ensure habitats provide biodiversity/ecological value							X	Moderate Beneficial
Environmental releases to watercourses	Temporary	Minor Adverse	Ponds and SUDS creation embedded within Site design would reduce impacts							X	Minor Adverse
Land use change reducing diffuse nutrient inputs to watercourses	Permanent	Minor Beneficial	None proposed							X	Minor Beneficial
Habitat creation impacts on foraging/commuting bats	Permanent	Moderate Beneficial	Habitat creation embedded within Site design							X	Moderate Beneficial

Operational activities impact on bats	Temporary	Minor Adverse	Habitat creation embedded within Site design Lighting Strategy							X		Minor Adverse
Habitat creation impacts on roosting bats	Permanent	Minor Beneficial	Habitat creation embedded within Site design Bat boxes installed on-site							X		Minor Beneficial
Habitat creation for breeding birds	Permanent	Minor Beneficial	Habitat creation embedded within Site design Bird boxes installed on-site							X		Minor Beneficial
Habitat creation for breeding/foraging farmland birds	Permanent	Negligible	Habitat creation embedded within Site design							X		Negligible
Habitat creation for marsh harriers	Permanent	Minor Beneficial	Habitat creation embedded within Site design				X					Minor Beneficial
Cumulative Effects												
<i>Construction</i>												
Increased traffic pollution impact to SSSI	Permanent	Minor Adverse	None Proposed		X							Minor Adverse
<i>Completed Development</i>												
Increased traffic pollution impact to SSSI	Permanent	Minor Adverse	None Proposed		X							Minor Adverse

Habitat Creation	Permanent	Minor Beneficial	Habitat creation embedded within Site design and design of other schemes, including off-site compensation within the local area						X	Minor Beneficial
Impacts of local bat population	Permanent	Negligible	No bat roosts impacted Limited suitable habitats impacted Habitat creation embedded within Site design and design of other schemes						X	Negligible
Impacts to farmland bird breeding/foraging	Permanent	Minor Adverse	Habitat creation embedded within Site design and design of other schemes						X	Minor Adverse
Impacts to breeding/foraging birds	Permanent	Minor Beneficial	Habitat creation embedded within Site design and design of other schemes Installation of bird boxes						X	Minor Beneficial
Impacts to marsh harriers	Permanent	Minor Beneficial	Habitat creation embedded within Site design				X			Minor Beneficial

* Geographical Level of Importance

I = International; N = National; R = Regional; C = County; D = District; L = Local; S = Site

REFERENCES

- ⁱ Ministry of Housing, Communities & Local Government (2023) National Planning Policy Framework (Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1182995/NPPF_Sept_23.pdf)
- ⁱⁱ Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government (2016, revised 2019) Planning Practice Guidance: Natural Environment (Available at: <https://www.gov.uk/guidance/natural-environment>)
- ⁱⁱⁱ Ministry of Housing, Communities & Local Government (2005). Office of the Deputy Prime Minister. Biodiversity and geological conservation: circular 06/2005 (Available at: <https://www.gov.uk/government/publications/biodiversity-and-geological-conservation-circular-06-2005>)
- ^{iv} Barnsley Metropolitan Borough Council (Adopted 2019) Barnsley Local Plan (Available at: <https://www.barnsley.gov.uk/media/17249/local-plan-adopted.pdf>)
- ^v Barnsley Biodiversity Trust (2002, revised 2010) Barnsley Biodiversity Action Plan (Available at: <http://www.barnsleybiodiversity.org.uk/biodiversityplan.html>)
- ^{vi} Natural England (2016) Nature Improvement Areas: About the programme (Available at: <https://www.gov.uk/government/publications/nature-improvement-areas-improved-ecological-networks/nature-improvement-areas-about-the-programme>)
- ^{vii} The Environment Act (2021) (Available at: <https://www.legislation.gov.uk/ukpga/2021/30/>)
- ^{viii} Natural Environment and Rural Communities Act (2006) (Available at: <https://www.legislation.gov.uk/ukpga/2006/16>)
- ^{ix} Council of the European Union (1979) Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds (Available at: <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex:31979L0409>)
- ^x The Conservation of Habitats and Species Regulations (2010) (Available at: <https://www.legislation.gov.uk/uksi/2010/490>)
- ^{xi} Council of the European Union (1992) Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. (Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31992L0043>)
- ^{xii} Wildlife and Countryside Act (1981 as amended) (Available at: <https://www.legislation.gov.uk/ukpga/1981/69>)
- ^{xiii} Countryside and Rights of Way Act (2000) (Available at: <https://www.legislation.gov.uk/ukpga/2000/37/>)
- ^{xiv} The Hedgerows Regulations (1997) (Available at: <https://www.legislation.gov.uk/uksi/1997/1160/>)
- ^{xv} Protection of Badgers Act (1992) (Available at: <https://www.legislation.gov.uk/ukpga/1992/51/>)
- ^{xvi} CIEEM (2020) Guidelines for Accessing, Using and Sharing Biodiversity Data in the UK. 2nd Edition. Chartered Institute of Ecology and Environmental Management. Winchester, UK. (Available at: <https://cieem.net/wp-content/uploads/2016/03/Guidelines-for-Accessing-and-Using-Biodiversity-Data-March-2020.pdf>)
- ^{xvii} CIEEM (2017) Guidelines on Ecological Report Writing. Chartered Institute of Ecology and Environmental Management, Winchester. (Available at: <https://cieem.net/wp-content/uploads/2019/02/Ecological-Report-Writing-Dec2017.pdf>)
- ^{xviii} CIEEM (2017) Guidelines for Preliminary Ecological Appraisal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester. (Available at: <https://cieem.net/wp-content/uploads/2018/01/Guidelines-for-Preliminary-Ecological-Appraisal-Jan2018-typo-edit.pdf>)
- ^{xix} CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.2. Chartered Institute of Ecology and Environmental Management, Winchester (Available at: <https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.2-April-22-Compressed.pdf>)
- ^{xx} JNCC. (2010) Handbook for Phase 1 Habitat Survey – a Technique for Environmental Audit. Joint Nature Conservation Committee, Peterborough. Reprinted 2016 (Available at: <https://data.jncc.gov.uk/data/9578d07b-e018-4c66-9c1b-47110f14df2a/Handbook-Phase1-HabitatSurvey-Revised-2016.pdf>)
- ^{xxi} Defra (2007) Hedgerow Survey Handbook. A standard procedure for local surveys in the UK. Defra, London
- ^{xxii} Clements, D.K. and Tofts, R.J. (1992) Hedgerow Evaluation and Grading System (HEGS): A Methodology for the Ecological Survey, Evaluation and Grading of Hedgerows. Countryside Planning and Management
- ^{xxiii} Harris, S., Cresswell, P., and Jefferies, D. (1989) Surveying Badgers: An Occasional Publication of the Mammal Society No.9. The Mammal Society. London. (Available at: https://www.mammal.org.uk/wp-content/uploads/2016/04/Surveying_Badgers_Mammal_Society.compressed.pdf)

^{xxiv} Amphibian And Reptile Groups of the United Kingdom (2010) ARG UK Advice Note 5. Great Crested Newt Habitat Suitability Index. ARG. (Available at: <https://www.arguk.org/info-advice/advice-notes/9-great-crested-newt-habitat-suitability-index-arg-advice-note-5/file>)

^{xxv} Collins, J (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London. (Available at: https://cdn.bats.org.uk/uploads/pdf/Resources/Bat_Survey_Guidelines_2016_NON_PRINTABLE.pdf?v=1542281971)

^{xxvi} Natural England (2023) Priority Habitats Inventory (England) Available at: <https://www.data.gov.uk/dataset/4b6ddab7-6c0f-4407-946e-d6499f19fcde/priority-habitats-inventory-england> and accessible through <https://magic.defra.gov.uk/>

^{xxvii} According to RSPB Website <https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/marsh-harrier/>

^{xxviii} Newlands Developments. November 2023. Infrastructure: Construction Environmental Management Plan Framework. Land to the South of Dearne Valley Parkway, Goldthorpe.

^{xxix} The British Standards Institution (2012) BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations

^{xxx} Designs for Lighting Ltd. December 2023. Lighting Impact Assessment. Land South of Dearne Valley Parkway, Goldthorpe. (Ref: 2368-DFL-ELG-XX-RP-EO-13001).

^{xxxi} Bat Conservation Trust and Institute of Lighting Professionals (2018) Guidance Note 08/18 Bats and artificial Lighting: Bats and the Built Environment Series Available at: <https://cdn.bats.org.uk/uploads/pdf/Resources/ilp-guidance-note-8-bats-and-artificial-lighting-compressed.pdf?v=1542109349>