

CONTENTS

INTRODUCTION	7-1
The Site	7-1
Summary of the Proposed Development.....	7-2
METHODOLOGY	7-2
Scope and consultation	7-2
Purpose of this Assessment	7-3
Approach	7-3
Assumptions and Limitations.....	7-7
Assessment Methods.....	7-8
Evidence of Technical Competence and Experience.....	7-11
BASELINE CONDITIONS	7-11
Statutory Designated Sites.....	7-11
Non-Statutory Sites.....	7-12
Existing Records of Protected and Notable Species.....	7-14
Future Baseline	7-25
ASSESSMENT OF EFFECTS.....	7-25
Embedded Mitigation	7-25
Construction Effects	7-26
SUMMARY OF PREDICTED EFFECTS	7-32
CONCLUSIONS	7-36

INTRODUCTION

- 7.1 This chapter provides an Ecological Impact Assessment (EclA) which contains information about the potential effects on important ecological receptors, and their likely significance, associated with the proposed extension of quarrying activities and the amendment of the previously approved restoration scheme at Carlton Main Brickworks. This chapter describes the baseline ecological conditions, the development activities which are proposed and the avoidance, mitigation and / or compensation measures that would be implemented and then assesses. The chapter then considers any residual effects on important ecological features. Ecological enhancement measures are also considered.
- 7.2 This Chapter is supported by a number of Appendices, as listed below:
- Appendix 7/1: Great Crested Newt (GCN) eDNA Survey Report 2020 (survey updated with eDNA sampling in 2022);
 - Appendix 7/2: Reptile Presence / Absence Survey Report 2020 (desk study elements updated 2022);
 - Appendix 7/3: Breeding Bird Survey Report 2020 (desk study elements updated 2022);
 - Appendix 7/4: Desk Study Data 2020 (updated 2022);
 - Appendix 7/5: Detailed Botanical Target Notes 2020; and
 - Appendix 7/6: Botanical Species List and Frequency Values 2020.

The Site

- 7.3 **Figure 7-1** shows both the quarry site and application site along with thier context in respect of ecologically designated sites. **Figure 7-2** shows the habitats within the site and the adjoining quarry.
- 7.4 The Quarry, hereafter referred to as the 'Site', extends to around 30.4 hectares (ha), of which c.3.5 ha comprises a proposed Southern Extension (referred to hereafter as the 'extension area'). The term site should not therefore be confused with the definition of the 'application site' in other chapters in this ES.
- 7.5 Despite being in separate ownership the extension area currently forms part of the New Park Springs Country Park which in total extends for 56 ha. It occupies a former colliery site which since 2010 has been remediated and then restored to a mixture of woodland and grassland habitats. The Country Park is managed by the Land Trust as part of a portfolio of other sites in the local area which also includes the nearby Cudworth Common.
- 7.6 The majority of the Site comprises of an existing quarry void with bare ground, pioneer vegetation, some linear operational waterbodies and perimeter (screening) woodland mainly along the northern and north-eastern boundaries.
- 7.7 As noted in Chapter 2, the wider area contains the town of Grimethorpe to the north, the A6195 to the south-west, a cemetery to the east and some large blocks of woodland (e.g. Lady Wood, West Haigh Wood and Rakes Wood, which are collectively known as White City Woods).

Summary of the Proposed Development

- 7.8 The proposed development has been described in full in Chapter 3 above. It comprises the working of a 3.4ha southern extension to the existing quarry which would then be restored in accordance with a revised restoration scheme of the entire Site.
- 7.9 The proposed mix of habitats to be delivered by restoration include open water and reedbed, open mosaic habitats, inland cliffs, lowland acidic grassland and deciduous woodland.

METHODOLOGY

Scope and consultation

Consultation and Scoping Responses

- 7.10 A scoping report (SLR Consulting Limited 2019) was submitted to Barnsley Metropolitan Borough Council (BMBC) in October 2019. Scoping responses containing ecological comments were received in January 2020 from BMBC's Biodiversity Officer and also from Natural England.
- 7.11 A summary of the key points from the relevant scoping responses, and details of how the comments have been addressed in the EcIA or wider EIA Report are provided in Table 7-1.

Table 7-1
Key Issues

Consultee	Summary of Key Issues	Response
BMBC Biodiversity Officer	A request has been made to include a description and evaluation of the Dearne Valley 'Nature Improvement Area' and West Haigh Wood Local Nature Reserve (LNR).	A description of the relevant parts of both the NIA and the LNR is provided as is an evaluation of potential impacts.
	A request to include information and an evaluation of Ancient Woodlands and Local Sites.	Descriptions and an evaluation of potential impacts are provided.
	The creation of additional wildflower grassland is requested instead of woodland plantation, due to the higher biodiversity value of the grassland habitats currently present on the nature reserve/ country park, for example for ground-nesting birds such as skylark (<i>Alauda arvensis</i>).	To meet Biodiversity Net Gain +10% the proposed restoration would provide significant areas of open mosaic habitat and lowland acidic grassland, the composition of both would be species-rich.
	BMBC's Biodiversity Officer welcomes the inclusion of a wetland feature, and requests that it is designed to allow the translocation of white-clawed crayfish (<i>Austropotamobius pallipes</i>) (which would be undertaken by himself) to act as an 'ark site' as this is a Barnsley Biodiversity Action Plan species which is under threat of extinction in the Borough. Minerals restoration schemes offer the best chance to conserve the species locally.	A wetland feature is proposed which comprises open water (0.8ha) and reedbed (0.2ha). This would be suitable as an 'ark site'.

Consultee	Summary of Key Issues	Response
	A request has been made to undertake ground-nesting bird, amphibian and reptile surveys.	Surveys for all three of these groups have been undertaken and are detailed in the relevant Technical Appendices.
Natural England	Natural England have requested that an assessment of the potential impacts upon Carlton Main Brickworks Site of Special Scientific Interest (SSSI) is included.	An assessment of Carlton Main Brickworks SSSI is provided in a separate geological report.
	Natural England advise that the developer must provide information supporting the application sufficient for the local planning authority to assess whether protected species are likely to be affected, and, if they are, whether sufficient mitigation, avoidance or compensation measures would be put in place.	This EIA Chapter and associated Technical Appendices provide baseline information on protected species, an assessment of potential impacts and the avoidance, mitigation and compensation measures that are required.

Purpose of this Assessment

7.12 The purpose of this EcIA is to:

- describe the baseline data collection and assessment methods used;
- summarise the baseline ecological conditions;
- identify and describe all potentially significant ecological effects associated with the proposed development;
- set out the design, mitigation and compensation measures required to ensure compliance with nature conservation legislation and to address any potentially significant ecological effects;
- identify how mitigation and compensation measures will/could be delivered;
- provide an assessment of the significance of any residual effects in relation to the effects on biodiversity and the legal and policy implications; and
- identify appropriate enhancement measures and how these will/could be delivered.

Approach

7.13 This chapter takes an appropriate and topic-specific approach to assessment of the proposed development within the parameters identified in Chapter 3.

7.14 This chapter provides a worst-case assessment for ecology and presents sufficient information for consultees and the decision makers to comment on and determine the applications within the parameters of the proposed development.

Study Area

7.15 The study area used for the EcIA varies according to the ecological feature in question, based on relevant good practice guidance.

- 7.16 The study area/mapping boundary used to establish the baseline in respect of site habitats is shown in **Figure 7-2** and includes the full application boundary areas for the two planning applications assessed by this EclA.
- 7.17 The study areas for relevant faunal species are summarised in the 'Field Survey Methodology' subsection below and are described in more detail within **Technical Appendices 7/1 – 7/3**.
- 7.18 For most faunal species the study area represents suitable habitat within the application boundary area, however, this is extended to the relevant off-site ponds within 250m for great crested newt (*Triturus cristatus*) (GCN); habitat within 30m for badger (*Meles meles*); and immediately surrounding habitat for breeding birds.

Information and Data Sources

- 7.19 An ecological desk study has been completed utilising the following sources:
- Barnsley Biological Records Centre (BBRC) was commissioned in May 2020 and June 2022 to provide records of protected and notable species, and information on non-statutory designated sites for nature conservation within the site and a 2km radius of its boundary;
 - The Land Trust, who manage New Park Springs Country Park, were contacted in June 2020 for any additional ecological records which are not already held by BBRC;
 - The Royal Society for the Protection of Birds (RSPB) were contacted in June 2020 for any additional ecological records at their Edderthorpe Ings Reserve which are not already held by BBRC;
 - The Multi-Agency Geographic Information for the Countryside (MAGIC) website (<https://magic.defra.gov.uk/>) was searched for information on internationally designated sites (such as Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites) within 10km of the site, nationally designated sites (such as SSSIs) within 5km of the Site, locally designated sites (such as Local Nature Reserves) within 2km of the Site, Ancient Woodland on the Ancient Woodland (England) inventory and priority habitats listed on the Priority Habitats Inventory (England) within 1km, and European Protected Species Licences (EPSLs) granted within a 1km radius of the Site;
 - Aerial imagery (Google Earth Pro) for the Site and surrounding area were reviewed in May 2020, to provide an indication of the broad habitat types within the Site and surrounding area, for context;
 - Ordnance Survey (OS) 1:10,00 mapping was reviewed for information on waterbodies within 250m of the Site;
 - The local planning portal (<https://www.barnsley.gov.uk/services/planning-and-buildings/using-planning-explorer/>) was searched for recent planning applications within 1km of the Site, so that any relevant ecological information submitted as part of those applications could be reviewed; and
 - Available information from the most recent 2003 (planning ref: B/02/1669/HR) and 2008 (planning ref: 2007/1784) planning applications were reviewed for relevant ecological and restoration information.

- 7.20 A summary of the information collated from these data sources is included within this EclA, with the locations of the relevant designated sites shown in **Figure 7-1**, and the data supplied by BBRC provided in **Appendix 7/4**.

Field Survey

Habitat Survey

- 7.21 A habitat survey and initial protected species appraisal was first undertaken on 22nd May 2020, with an additional visit undertaken on the 1st July 2020 to collect supplementary botanical information.
- 7.22 An updated visit, to check for any changes to the baseline conditions in respect of habitats and flora within the Site, was undertaken on 4th May 2022.
- 7.23 On all of the above occasions the habitats within the Site were categorised and mapped following the UK Habitat Classification (UKHab-Professional edition, version 1.1) methodology (<https://ukhab.org/>).
- 7.24 UKHab is a unified and comprehensive approach to classifying habitats, developed by a steering group of professional ecologists, suitable for habitat metrics and impact assessment. Habitats were classified to Level 5 of the Primary Hierarchy where possible, and all mandatory secondary codes were used, along with optional secondary codes where relevant. A Minimum Mapping Unit (MMU) of 25m² was used. Detailed habitat descriptions have been taken in the form of Target Notes. The condition of habitats was also recorded, using the criteria within DEFRA Metric v3.0.
- 7.25 Searches were made for invasive non-native plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) such as Japanese knotweed (*Fallopia japonica*) and Himalayan balsam (*Impatiens glandulifera*).
- 7.26 In addition to habitat mapping and classification, a botanical species list was collected for each main habitat type, with the abundance of each species being estimated using standard 'DAFOR' codes: **D**ominant, **A**bundant, **F**requent, **O**ccasional, **R**are (Locally being used as a prefix where appropriate).

Flora and Fauna Surveys

- 7.27 The scope of the habitat surveys undertaken in 2020 and 2022 were extended to include an assessment of the potential of the Site to support legally protected or notable species.
- 7.28 The extension area does not contain any buildings and the wider Site does not contain any buildings which are not being retained.
- 7.29 A search for suitable habitats and / or actual field signs of such species was undertaken as follows:
- the Site and a 30m radius (where accessible) was searched for badger setts and field signs;
 - trees within the Site were subject to a ground-level assessment to search for features that could provide opportunities for bats to use for roosting (known as Potential Roosting Features (PRFs)). The relevant trees were then graded for their potential to support roosting

bats, using criteria contained within the Bat Conservation Trust (BCT) guidelines (Collins, 2016), see Table 7-2;

- in respect of the block of mature woodland on the north-eastern margin of the quarry (Target Note (TN) 13)), this was graded as a single entity for its bat roosting potential, rather than individual trees, as this woodland would not be affected by the development proposals;
- evident and accessible ponds within a 250m radius of the Site, which were not separated by a major barrier to dispersal, were subject to a Habitat Suitability Index (HSI) assessment to gauge whether they could provide suitable aquatic / breeding habitat for GCN using the standard methodology (Oldham et al., 2000). Where a given pond was considered to be suitable it was subject to Environmental DNA (eDNA) testing. Further details are provided in Appendix 7/1;
- the Site was assessed for its potential to support other protected or notable species including reptiles, foraging / commuting bats, an invertebrate assemblage of conservation significance, or a breeding bird assemblage of conservation significance (and/or a high value for a given species); and
- during all ecological surveys, incidental sightings of other notable fauna were also recorded.

Table 7-2
Guidelines for Assessing Bat Roosting Potential

Potential	Description - Roosting habitats
Negligible	Building or tree without features of obvious potential for roosting bats.
Low	A structure with one or more Potential Roost Features (PRFs) that could be used by individual bats, perhaps opportunistically or intermittently. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/ or suitable surrounding habitat to be used in a regular basis by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain PRFs but with none seen from the ground or feature seen with only very limited roosting potential.
Moderate	A structure or tree with one or more PRFs that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type).
High	A structure or tree with one or more PRFs that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

Great Crested Newt (GCN) Survey

- 7.30 On the 4th June 2020, an Environmental DNA (eDNA) survey was undertaken of all of the identified waterbodies and ponds containing water which were present within the Site and a 250m radius, where not separated from the Site by a major barrier to dispersal. The survey followed the Natural England approved methodology (Biggs *et al.*, 2014).
- 7.31 Two ponds/lagoons were surveyed within the Site (referenced as P2 and P3), one immediately to the west (P1) and one c. 250m south of the Site (P4).
- 7.32 The remainder of the ponds and ditches were scoped out from survey, because either they were dry or they were separated by major barriers to dispersal.

- 7.33 The three ponds within or near to the quarry (P1-3) were re-sampled on 25th June 2020, using a filter to filter out contaminants which had inhibited the DNA extraction process in the initial samples.
- 7.34 The results were updated with an additional eDNA survey, using a filter, undertaken on 4th May 2022.
- 7.35 The eDNA sampling of pond 4 was not repeated in late June 2020 or in May 2022.
- 7.36 Further details are provided in **Appendix 7/1**.

Reptile Survey

- 7.37 A reptile presence/ absence survey was undertaken of all suitable reptile habitat within the Site in June and July 2020, in accordance with good practice guidelines (HGBI, 1998; Froglife, 1999; Gent and Gibson, 2003).
- 7.38 A total of 120 reptile refuges were deployed, and were subsequently checked on seven occasions for reptiles (as well as amphibians) before being removed. The refuge inspection was combined with passive survey.
- 7.39 Further details are provided in **Appendix 7/2**.

Breeding Bird Survey

- 7.40 A breeding bird survey (including ground-nesting species) was undertaken over three visits in June 2020 following an adapted form of the British Trust for Ornithology (BTO) Common Bird Census (CBC) methodology described in Marchant (1983).
- 7.41 A territory mapping approach was used to estimate the number and positions of territories of species during the breeding season.
- 7.42 Further details are provided in **Appendix 7/3**.

Assumptions and Limitations

- 7.43 Presented here is a summary of limitations detected during the surveys, further details are presented in **Appendices 7/1 – 7/3**.
- 7.44 The earliest part of the breeding bird season was missed, as the breeding bird surveys were undertaken throughout June 2020. However, it is considered that the timings of the survey visits were suitable for the detection of breeding behaviour and given the level of survey effort employed it is likely that bird species present would have been recorded. While species such as lapwing (*Vanellus vanellus*) breed earlier in the season (March – May inclusive), the birds would still remain on territory through the latter portion of the season, until the young are able to fly (Joys *et al.*, 2004).
- 7.45 The second water samples taken of three of the waterbodies for the GCN eDNA survey were analysed in a way which deviates from the Natural England approved methodology (Biggs *et al.*,

2014), due to it not being possible to add a degradation control test with the filter method. However, ADAS confirmed that the filter methodology is a frequently used practice within analytical laboratories, and degradation in the sample is very unlikely, for example the study on the efficacy of eDNA testing on which the Natural England approved method is derived from (Biggs *et al.*, 2014) did not have any instances of the eDNA within the samples degrading. It is considered that the re-sampling provides a valid result on the presence or absence of GCN eDNA within the relevant ponds.

- 7.46 Several of the artificial refuges were moved from the extension area presumably by members of the public, however, once this was detected they were immediately re-deployed and this is therefore not considered to be a significant constraint on the findings of the reptile survey.
- 7.47 An ecological survey provides only a “snapshot” of the conditions prevailing at the time of survey. Whilst it is considered unlikely that any significant evidence of protected or otherwise notable mammal species was overlooked during survey work, due to the nature of the subjects of ecological surveys, it is feasible that species that use the Site may not have been recorded by virtue of their seasonality, cryptic behaviour, habit or random chance. This is a standard limitation that is common to all ecological survey work. It is considered unlikely, however, that additional surveys of the Site would materially alter the conclusions of the baseline survey work.

Assessment Methods

- 7.48 The CIEEM Guidelines for *Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (CIEEM, 2018) (henceforth referred to as the CIEEM guidelines) form the basis of the impact assessment presented in this Chapter.

Sensitivity of Receptor

- 7.49 In accordance with the CIEEM guidelines only ecological receptors (habitats, species, ecosystems and their /processes), which are considered to be important and are potentially affected by the proposed development should be subject to detailed assessment. It is not necessary to carry out detailed assessment of receptors that are sufficiently widespread, unthreatened and resilient to impacts from the proposed development and would remain viable and sustainable.
- 7.50 Ecological should be considered within a defined geographical context. For this assessment the following geographic frame of reference has been used:
- International;
 - National (i.e. UK);
 - Regional (i.e. Yorkshire/North-East England);
 - County (i.e. South Yorkshire);
 - Local (i.e. within circa (c.) 5km); and
 - Less than local.
- 7.51 For designated sites, importance should reflect the geographical context of the designation. For example, a SSSI would normally be considered nationally important.
- 7.52 In accordance with CIEEM guidelines, the value of habitats has been measured against published selection and other relevant data where available. Examples of relevant criteria include Annex 1

of the Habitats Directive; descriptions of habitats of principal importance for biodiversity under Section 41 of Natural Environment and Rural Communities (NERC) Act 2006; Local Wildlife Site Selection Criteria; and Habitat Action Plans (HAPs) contained within Barnsley Biodiversity Action Plan (Barnsley Biodiversity Trust, 2009). In assigning a level of value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records. Reference has therefore been made to published lists and criteria where available. Examples of relevant lists and criteria include: species of European conservation importance (as listed on Annexes II, IV and V of the Habitats Directive or Annex 1 of the Birds Directive); species of principal importance for biodiversity under Section 41 of the NERC Act 2006 and Birds of Conservation (Eaton *et al.*, 2015).

- 7.53 For the of this chapter ecological receptors of Local importance or greater and/or subject to legal protection have been subject to detailed assessment. Effects on ecological receptors of less than local importance and/or not subject to specific legal protection are considered unlikely to be significant in legal or policy terms.

Impact Assessment

- 7.54 The impact assessment process involves the following steps:
- identifying and characterising impacts;
 - incorporating measures to avoid and mitigate (reduce) these impacts;
 - assessing the significance of any residual effects after mitigation;
 - identifying appropriate compensation measures to offset significant residual effects (if required); and
 - identifying opportunities for ecological enhancement.
- 7.55 When ecological impacts, reference has been made to the following characteristics, as appropriate:
- positive or negative;
 - extent;
 - magnitude;
 - duration;
 - timing;
 - frequency; and
 - reversibility.
- 7.56 Both direct and indirect impacts are considered. Direct ecological impacts are changes that are directly to a defined action, e.g. the physical loss of habitat during the construction process. Indirect ecological impacts are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process or receptor, e.g. the creation of access tracks which cause hydrological changes, which, in the absence of mitigation, could lead to the drying out of adjacent peatland habitats.
- 7.57 For the purposes of this assessment, in accordance with CIEEM guidelines, a 'significant effect' is defined as an effect that either supports or undermines biodiversity conservation objectives for 'important receptors' or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy). Effects can be

considered significant at a wide range of scales from international to local. For example, a significant effect on a SSSI is likely to be of national significance whilst a significant effect on a regionally important population of a species is likely to be of regional significance.

7.58 Consideration of conservation status is important for evaluating the effects of impacts on individual habitats and species and assessing their significance:

- Habitat – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area; and
- Species - conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

Avoidance, Mitigation, Compensation and Enhancement

7.59 The purpose of avoidance, impact minimisation and compensation measures are to reduce the extent or magnitude of project impacts. The aim of these measures is to reduce the project's adverse impacts such that there is no overall loss of biodiversity as a result of the project.

7.60 Following CIEEM , the following terminology has been defined as below:

- Avoidance: where an impact has been eradicated through, e.g. changes in project design;
- Mitigation: measures used to reduce or remedy a specific negative impact in-situ;
- Compensation: when mitigation in situ is impossible, then compensation is used to offset residual effects; and
- Enhancement: provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures.

7.61 When seeking mitigation or compensation solutions, the CIEEM guidelines state that efforts should be consistent the geographical scale at which an effect is significant. For example, mitigation and compensation for effects on a species population significant at a county scale should ensure no net loss of abundance or distribution of the population at a county scale. The relative geographical scale at which the effect is significant would have a bearing on the required outcome which must be achieved.

7.62 Where potentially significant effects have been identified, the mitigation hierarchy has been applied, as in the CIEEM guidelines. The mitigation hierarchy sets out a sequential approach beginning with the avoidance of impacts where possible, the application of mitigation measures to minimise unavoidable impacts and then compensation for any remaining impacts. Once avoidance and mitigation measures have been applied residual effects are then identified along with any necessary compensation measures, and incorporation of opportunities for enhancement.

Residual Impacts

7.63 After assessing the impacts of the proposed development, all attempts should be made to avoid and mitigate impacts as described above. Once measures to avoid and mitigate ecological impacts have been finalised, assessment of the residual impacts should be undertaken to determine the significance of their effects on ecological features.

- 7.64 As outlined in CIEEM guidelines, any residual impacts that would result in effects that are significant, alongside the proposed compensatory measures, would be the factors considered against ecological objectives (legislation and policy) in determining the outcome of the application.

Cumulative Effects

- 7.65 Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a particular location. Cumulative effects can occur where a proposed development results in individually insignificant impacts that, when considered in combination with impacts of other proposed or permitted plans and projects, can result in significant effects.

Evidence of Technical Competence and Experience

- 7.66 The updated site survey and subsequent reporting has been undertaken by SLR Project Ecologist Julia Kozłowska. The report has been reviewed by SLR Senior Field Ecologist Ellen Miller MA *Cantab.*, who has experience preparing EclAs for numerous projects as well as undertaking habitat and protected species surveys.
- 7.67 This assessment has been prepared by SLR Associate Ecologist Hazel Douglas MBiolSci. Hazel also undertook the botanical survey work and a proportion of the protected species survey work in 2020. Hazel has over seven years' professional experience within ecological consultancy, with extensive experience in EclA, habitat and protected species surveys.
- 7.68 The assessment has been reviewed by Mr Andrew Law, CEcol MCIEEM, a Principal Ecologist with SLR. Andy has more than 30 years experience of ecological assessment including many mineral schemes.
- 7.69 Details of the survey team are provided within **Appendices 7/1 – 7/3**. All work was undertaken by appropriately experienced, and where relevant licensed, ecologists.

BASELINE CONDITIONS

Desk Study

Statutory Designated Sites

- 7.70 The locations of designated sites are shown in **Figure 7-1**, and citations are provided in **Appendix 7/4**.
- 7.71 There are no internationally designated sites within a 10km radius of the Site; the closest is over 15km away.
- 7.72 There are three SSSIs within a 5km radius of the Site. Two of these are designated for geological rather than ecological reasons and one (Dearne Valley Wetlands SSSI) is an ecological site.
- 7.73 Carlton Main Brickwork SSSI is situated within the Site and is of geological interest being one of the best exposures of the Top Marine Band in the Pennine coalfields.

- 7.74 Stairfoot Brickworks SSSI is c. 4.2km to the south-west of the Site and is of geological interest for the exposures of the Aegiranum Marine Band which mark the Duckmantian-Bolsoviae stage boundary of the Westphalian Series.
- 7.75 Dearne Valley Wetlands SSSI is a large (649 ha) a diverse site which is of special ecological interest for birds (breeding gadwall, shoveler, garganey, pochard, bittern, black-headed gull, willow tit; non-breeding gadwall and shoveler; and diverse breeding bird assemblages associated with open water, damp grassland, fen and scrub).
- 7.76 There is one Local Nature Reserve (LNR) within a 2km radius of the Site at West Haigh Wood, which is located c. 450m to the east of the Site at its closest part. West Haigh Wood LNR is a mixed deciduous woodland dominated by oak and has archaeological features which include abandoned Victorian-age ponds. West Haigh Wood LNR is adjacent to Ladywood and Houghton Common and collectively they form an area known as White City Woods.

Strategic Initiatives

- 7.77 The Site lies within the Dearne Valley Green Heart Nature Improvement Area (NIA), which encompasses an area spanning from Barnsley to the west, Conisbrough to the east, and Brierley to the north. Twelve NIAs across the country were designated by the UK Government in 2012 and were provided with funding for a landscape-scale approach to nature conservation.
- 7.78 The aim of the Dearne Valley Green Heart NIA is to help restore and enhance the ecological networks of the River Dearne, its floodplain, and its links to habitats on surrounding slopes and hills.
- 7.79 More specifically, the Dearne Valley Green Heart NIA has four main objectives to:
- create and restore floodplain habitat at Houghton Washlands, Wombwell Ings and Carlton Marsh through direct management;
 - restore woodland and farmland habitats in low ecologically functioning areas through targeted advisory work and uptake of environmental stewardship, management advice and training;
 - embed NIA principles in local planning policy and create opportunities for biodiversity offsetting by working with local planning authorities; and
 - build popular support and understanding in the community through community wardens and a programme of events.

Non-Statutory Sites

- 7.80 The locations of non-statutory designated sites are shown on **Figure 7-1** and their citations are provided in **Appendix 7/4**.
- 7.81 No non-statutory designated sites for nature conservation are present within the Site.
- 7.82 Three Local Wildlife Sites (LWSs) have been identified within a 2km radius, as detailed below in Table 7-3.

Table 7-3

Local Wildlife Sites within 2km

Site Name	Description	Approximate Distance and Direction from Site
West Haigh Woodland LWS	A mixed age oak (<i>Quercus</i> sp.) / birch (<i>Betula</i> sp.) woodland with a variety of other woody species of plant including beech (<i>Fagus sylvatica</i>), sycamore (<i>Acer pseudoplatanus</i>) and rhododendron (<i>Rhododendron ponticum</i>). The ground flora is generally of creeping soft-grass (<i>Holcus mollis</i>), bluebell (<i>Hyacinthoides non-scripta</i>), honeysuckle (<i>Lonicera periclymenum</i>) and bracken (<i>Pteridium aquilinum</i>). There are a few areas that are more species-rich including ancient woodland indicators. In the main body of the woodland some of the sycamores are up to around 120 years old, and there is an ancient sweet chestnut (<i>Castanea sativa</i>) coppice stool which is perhaps 200 years old. Additional habitats of lowland heath and willow carr add diversity to the Site. There is also a wealth of woodland archaeological features such as hollow-ways, lynchets, complex boundary earthworks, terraced tracks, charcoal hearths, regrown coppice and an abandoned Victorian pond. The Site supports priority species such as dunnoek (<i>Prunella modularis</i>), bullfinch (<i>Pyrrhula pyrrhula</i>), song thrush (<i>Sturnus philomelos</i>) and common lizard (<i>Zootoca vivipara</i>).	c. 70m east
Edderthorpe Ings LWS	A flooded area due to subsidence from adjacent Grimethorpe Colliery. The majority of the Site is known as Cudworth Washland, with open water and marginal vegetation, along with taller swamp, marshy grassland and neutral grassland, adjacent to the River Dearne and disused railway lines. The Site also contains woodland. The Site is important for a range of bird species but particularly avocet (<i>Recurvirostra avosetta</i>) and little ringed plover (<i>Charadrius dubius</i>). The Site also supports priority species such as skylark, cuckoo (<i>Cuculus canorus</i>), yellowhammer (<i>Emberiza citrinella</i>), reed bunting (<i>Emberiza schoeniclus</i>), grasshopper warbler (<i>Locustella naevia</i>), yellow wagtail (<i>Motacilla flava</i>) and willow tit (<i>Poecile montanus</i>). This Site also forms part of the Dearne Valley RSPB reserve.	c. 500m south-west
Sunny Bank, Horse Carr and Storrs Woodland LWS	Comprises five separate areas of broad-leaved semi-natural woodland, which are on the Ancient Woodland Register. Important species include ancient woodland indicator species such as bluebell, as well as kingfisher (<i>Alcedo atthis</i>), otter (<i>Lutra lutra</i>), dunnoek, bullfinch and song thrush.	c. 1.2km south-west

Country Parks

- 7.83 The proposed extension and the land to the south of the quarry forms part of New Park Springs Country Park, a developing public space managed by the Land Trust in partnership with The Conservation Volunteers (TCV). New Park Springs comprises part of the former Grimethorpe Colliery which was remediated in the early 2000s, and which now supports grassland, wetlands and developing woodland habitats.

Ancient Woodland

- 7.84 There is one area of Ancient Woodland shown on the Ancient Woodland Inventory within 1km of the Site. This is located c. 380m east at its closest part; a large part of the wood is designated as West Haigh Wood LWS / LNR.

Priority Habitat Inventory (PHI) – Mapped

- 7.85 An area of woodland shown/listed as deciduous woodland on the Priority Habitat Inventory (PHI) is shown as being present within the Site in the active quarry area and was mapped in 2020. This block of woodland has since been removed as part of the consented quarry workings and the relevant habitat mapping revised (2022). The woodland immediately east of the extension area is also listed as deciduous woodland on the PHI, which extends out to West Haigh Wood.
- 7.86 New Park Springs, including the extension area, are mapped as ‘Open Mosaic Habitat (Draft)’, which presumably relates to its status prior to its restoration. There is also an area c. 70m east of the extension area which is categorised as ‘priority habitat inventory – no main habitat, but additional habitats exist.’

Existing Records of Protected and Notable Species

- 7.87 Table 7-4 provides a summary of the results of the protected and notable species search within a 2km radius of the Site. Further details are provided in **Appendices 7/1 to 7/4**.

Table 7-4
Existing records of protected and notable species¹

Species	Status*	Notes
Invertebrates		
Three butterfly and six moth species	LBAP (dingy skipper (<i>Erynnis tages</i>)), S41	Butterflies: small heath (<i>Coenonympha pamphilus</i>), dingy skipper (<i>Erynnis tages</i>) and wall (<i>Lasiommata megera</i>). Moths: cinnabar (<i>Tyria jacobaeae</i>), dusky brocade (<i>Apamea remissa</i>) and mottled rustic (<i>Caradrina morpheus</i>), some of which are recorded at New Park Springs.
Amphibians		
Great crested newt (<i>Triturus cristatus</i>)	HR Sch2, WCA Sch5, S41, LBAP	Record of c.100 GCN in four years between 2000 and 2010, in pitfall traps during open casting at Cudworth, located c. 1.2km to the west of the Site.
Common toad (<i>Rana temporaria</i>)	WCA Sch5 (Section 9(5) only), S41	Twelve records within 2km, the closest c. 200m west of the Site.

¹ Including species protected under Schedule 1 or Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), Schedule 2 of the Habitats Regulations, listed under Section 41 of the NERC Act 2006 as a species of principal importance, or included in Barnsley Biodiversity Action Plan (Barnsley Biodiversity Trust, 2009).

Species	Status*	Notes
Smooth newt (<i>Lissotriton vulgaris</i>)	WCA Sch5 (Section 9(5) only)	Eleven records within 2km, dating 2001-2017, including at New Park Springs in 2003.
Common frog (<i>Rana temporaria</i>)	WCA Sch5 (Section 9(5) only)	Eleven records within 2km, including at New Park Springs.
Reptiles		
Common lizard (<i>Zootoca vivipara</i>).	WCA Sch5 (Section 9(1) and 9(5) only), S41	Nineteen records dating between 2001 and 2019. One record is from the north-eastern edge of the proposed southern extension area dating from 2019, described as basking on a pulled-up fence post. The remainder are from Edderthorpe Ings, Houghton Main colliery, Cudworth Common, and a layby verge between Cudworth Common and New Park Springs, all to the south or south-west of the Site.
Grass snake (<i>Natrix helvetica</i>)	WCA Sch5 (Section 9(1) and 9(5) only), S41	Thirty two records dating 2016-2017, mostly from Edderthorpe Ings located c. 0.7km to the south-west, as well as at Houghton Main colliery c. 1.4km to the south. The closest record is located c. 0.2km to the west on the far side of the A6195, dating from 2016.
Birds		
93 species	WCA (nests, eggs), WCA Sch1 (some species), S41 (some species), LBAP (some species)	Records are mostly from Edderthorpe Ings, comprising a wide range of wetland and farmland species. There are also a large number of records of mostly farmland/ grassland species from New Park Springs, including species such as skylark (<i>Alauda arvensis</i>), yellowhammer, tree pipit (<i>Anthus trivialis</i>), grey partridge (<i>Perdix perdix</i>), lapwing (<i>Vanellus vanellus</i>), linnet (<i>Linaria cannabina</i>), willow tit, starling (<i>Sturnus vulgaris</i>), lesser redpoll (<i>Acanthis cabaret</i>), redwing (<i>Turdus iliacus</i>), mistle thrush (<i>Turdus viscivorus</i>), little ringed plover, meadow pipit (<i>Anthus pratensis</i>), bullfinch and dunnoek.
Mammal		
Water vole (<i>Arvicola amphibius</i>)	WCA Sch5, S41, LBAP	A total of 51 records, dating from 2001 – 2012. Reasonably widespread in the local area, with the closest records c. 270m to the south and 350m to the south-west of the extension area, and c. 300m west of the quarry, with burrows recorded in 2012.
Badger	PBA	Two records: a badger sett located c. 1.5km to the east of Site (recorded in 2019), and hair and prints at Little Houghton Ings c. 2.7km south of the Site (in 2014).
Common pipistrelle (<i>Pipistrellus pipistrellus</i>)	HR Sch2, WCA Sch5, LBAP	Nineteen records, dating from 1989-2011, four are specified as roosts. The largest roost is a count of 45 in 2007, c. 1.9km to the west.
Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	HR Sch2, WCA Sch5, S41, LBAP	Two foraging records in West Haigh Wood.
Noctule (<i>Nyctalus noctula</i>)	HR Sch2, WCA Sch5, S41, LBAP	Two foraging records from West Haigh Wood and Ferry Moor pond, c. 0.7km to the north-west.
<i>Myotis</i> sp. bat	HR Sch2, WCA Sch5, LBAP	Two foraging records in West Haigh Wood.

Species	Status*	Notes
Chiroptera sp.	HR Sch2, WCA Sch5, S41 (some species), LBAP	Four records of un-specified Chiroptera bat species, the closest is c. 2km to the south.
Brown hare (<i>Lepus europaeus</i>)	S41	Recorded within 2km.
Hedgehog (<i>Erinaceus europaeus</i>)	S41, LBAP	Recorded within 2km.
Harvest mouse (<i>Micromys minutus</i>)	S41	Recorded within 2km.

*Table Key: Status

HR Sch2 = Included on Schedule 2 of the Conservation (Natural Habitats &c) Regulations 1994 (as amended)

WCA Sch1/ Sch5 = Listed on Schedule 1 or Schedule 5 of the Wildlife and Countryside Act 1981 (as amended)

PBA = Protected under the Protection of Badgers Act 1992

S41 = NERC Act 2006 Section 41 Species of Principal Importance

LBAP = Local (Barnsley) Biodiversity Action Plan Priority Species (Barnsley Biodiversity Trust, 2009)

7.88 No granted European Protected Species licences have been identified within a 1km radius of the Site.

Habitats and Flora

7.89 Habitat types within the Site have been mapped and are shown in **Figure 7-2** and summarised in Table 7-5. Table 7-5 also summarises the conservation status for each habitat and evaluates their importance.

7.90 Detailed botanical notes, photographs and condition assessments are provided in the form of Target Notes (TN) in **Appendix 7/5**, and a botanical species list with frequency values is provided in **Appendix 7/6**.

7.91 Bluebell, which is listed on Schedule 8 of the Wildlife and Countryside Act 1981 (sale only) was recorded, this was present on an occasional basis within the mature woodland on the eastern boundary of the Site, beyond the quarry working (TN 10). It is considered unlikely that any other Schedule 8 plant species are present within the site, and no particularly rare plant species were recorded.

7.92 One invasive non-native species listed on Schedule 9 of the Wildlife and Countryside Act 1981 was recorded, specifically, two small stands of Japanese knotweed are present on the southern margin of the quarry between the quarry and the extension area (see **Figure 7-2**).

Table 7-5
Description and Evaluation of Habitats Within the Site

Habitat Type	Description	Reason for Evaluation	Evaluation
Extension Area			
Other neutral grassland with calcicoles (g3c 123)	The extension area comprises several areas of grassland (TN1) which were created during the restoration of the former landfill as part of the	The grassland has been created within the last c. 20 years, and there is an abundance of similar	Local

Habitat Type	Description	Reason for Evaluation	Evaluation
	development of the New Park Springs Country Park approximately 20 years ago. The grassland supports a sward indicative of predominantly neutral conditions. Red fescue (<i>Festuca rubra</i>) is the most frequent grass species, which is abundant in places; tufted hair-grass (<i>Deschampsia cespitosa</i>) and Yorkshire fog (<i>Holcus lanatus</i>) is frequent, and occasional cock's-foot (<i>Dactylis glomerata</i>), perennial ryegrass (<i>Lolium perenne</i>), rough-stalked meadow-grass (<i>Poa trivialis</i>), soft brome (<i>Bromus hordeaceus</i>) and sweet vernal grass (<i>Anthroxanthum odoratum</i>) were also recorded. The sward is locally flower-rich and includes species such as the locally abundant common knapweed (<i>Centaurea nigra</i>), frequent or occasional black medick (<i>Medicago lupulina</i>), common vetch (<i>Vicia sativa</i>), hairy tare (<i>Vicia hirsuta</i>), smooth tare (<i>Vicia tetrasperma</i>), ox-eye daisy (<i>Leucanthemum vulgare</i>), perforate St. John's wort (<i>Hypericum perforatum</i>), ribbed melilot (<i>Melilotus officinalis</i>), alsike clover (<i>Trifolium hybridum</i>) and hedge bedstraw (<i>Galium mollugo</i>). There are also occasional calcareous and calcifugous indicators such as wild carrot (<i>Daucus carota</i>) and more rarely betony (<i>Betonica officinalis</i>). This mix of species is likely to have occurred due to the restoration substrate materials and seed mix used in the restoration.	grassland in the surrounding area within the remainder of New Park Springs Country Park. The grassland has been evaluated as being of local ecological importance due to its flower-rich status, and likely value to species groups such as invertebrates and reptiles. Using the criteria in Natural England TIN110 (Natural England, 2012), the restored grassland narrowly misses the criterion for lowland meadow NERC Act 2006 habitat of principal importance, although it does support five indicator species and is close to meeting the abundance thresholds for these species.	
Other woodland; broadleaved – plantation (w1g 36)	Broad-leaved woodland within the extension area, which comprises a young and even-aged stand. The main sections (TN2) were planted c. 11-12 years ago, whereas the woodland on the southern margin (TN3) was planted c. 20-30 years ago. The planted woodland supports frequent bird cherry (<i>Prunus avium</i>), alder (<i>Alnus glutinosa</i>), hawthorn (<i>Crataegus monogyna</i>), field maple (<i>Acer campestre</i>), goat willow (<i>Salix caprea</i>), hazel (<i>Coryllus avellana</i>) and silver birch (<i>Betula pendula</i>), with occasional pedunculate oak (<i>Quercus robur</i>), sessile oak (<i>Quercus petraea</i>) and rowan (<i>Sorbus aucuparia</i>). Woodland ground flora has not yet developed due to its young age, and a grassland sward is present with abundant red fescue.	Although it does support a range of native species, the planted woodland is currently young and even-aged, and lacks age/structural diversity and deadwood, or a diverse ground flora, and is therefore assessed as being of less than local importance in its current form. However, it does provide habitat for a range of species groups and would increase in value over time as it matures.	Less than Local (but Local in future)
Other neutral grassland –	There are two patches of tall ruderal vegetation within the extension area (TN4) which support common nettle (<i>Urtica dioica</i>), creeping thistle	The habitat is species-poor and widespread within the local landscape.	Less than Local

Habitat Type	Description	Reason for Evaluation	Evaluation
tall herb (g3c 16)	(<i>Cirsium vulgare</i>) and rosebay willowherb (<i>Chamerion angustifolium</i>).		
Existing Quarry and Boundary Habitats			
Other inland rock and scree (s1d)	Active clay quarry area (TN5) with exposed substrate/mud/rock, set across various levels/benches. This area of the quarry is being actively worked and therefore lacks vegetation.	Un-vegetated with negligible ecological value.	Less than Local
Other eutrophic standing waters – freshwater, man-made (r1a6 39)	Man-made settlement lagoons within the quarry working area (TN6), with low water quality and very little or absent aquatic or marginal vegetation, or bankside vegetation. The settlement lagoons are drained and dredged from time to time.	Low water quality with little or no vegetation.	Less than Local
Open mosaic habitats on previously developed land (u1a)	Sparse ephemeral/short perennial vegetation with bare ground at various stages of succession which is developing into flower-rich grassland, with some scattered scrub, and several damp depressions with rushes. Predominantly located on ledges at the edge of the quarry (TN7) or on slopes or spoil which are not being actively worked (TN8). One area on the quarry margin supports sparse vegetation on disturbed ground which is developing into grassland and scrub, where woodland was clear-felled several years ago (TN9).	Supports all key components of open mosaic habitat on previously developed land, with areas at different successional stages. This is a NERC Act 2006 habitat of Principal Importance, and one which provides habitat for a range of species groups including invertebrates and reptiles.	Local
Other neutral grassland with calcicoles (g3c 123)	Some areas around the quarry margins (e.g. in the north-west corner of the quarry (TN10)) have developed into a flower-rich grassland. The species assemblage is reasonably similar to the grassland within the extension area and contains mainly neutral indicator species, along with occasional calcareous and several acidic indicator species. Along with the species recorded in the extension area, these areas also support additional species such as frequent or occasional mouse-ear hawkweed (<i>Hieracium pilosella</i>), foxglove (<i>Digitalis purpurea</i>), common restharrow (<i>Ononis repens</i>), common bird's-foot trefoil (<i>Lotus corniculatus</i>), hare's-foot clover (<i>Trifolium arvense</i>), and more rarely common spotted orchid (<i>Dactylorhiza fuchsii</i>), viper's bugloss (<i>Echium vulgare</i>) and wild marjoram (<i>Origanum vulgare</i>).	The grassland is flower-rich in some areas, with value for invertebrates and a range of other faunal groups. Using the criteria in Natural England TIN110 (Natural England, 2012), the restored grassland narrowly meets the criterion for lowland meadow NERC Act 2006 habitat of principal importance, but also contains a number of indicator species of calcareous and acidic grassland.	Local
Modified grassland (g4)	Species-poor improved grassland and tall ruderal vegetation on topsoil mound (TN11).	Common habitat with low species diversity due to nutrient content of topsoil substrate.	Less than local
Grassland – tall herb (g4 16)	Topsoil/subsoil mound with tall ruderal vegetation such as rosebay willowherb, creeping thistle, hedge bindweed (<i>Calystegia sepium</i>), common	Reasonably species-poor with lack of notable plant species.	Less than local

Habitat Type	Description	Reason for Evaluation	Evaluation
	nettle, common ragwort (<i>Jacobaea vulgaris</i>), mugwort (<i>Artemisia vulgaris</i>) and false oat-grass (TN12).		
Other lowland mixed deciduous woodland (w1f7)	Mature broad-leaved semi-natural woodland (TN13) with a varied age structure, deadwood present and natural regeneration evident. The main canopy species are sweet chestnut (<i>Castanea sativa</i>), silver birch and sessile oak.	NERC Act 2006 habitat of principal importance. Mature woodland in moderate to good condition with mature tree specimens.	Local
Other woodland – broad-leaved, plantation (w1g 36)	Scrubby broad-leaved woodland on the northern margin of the active quarry (TN14), which was planted c. 20-30 years ago as part of quarry screening/restoration work. The trees are young and even-aged with a lack of deadwood, and a lack of a diverse woodland ground flora. The tree species mix is very similar to the new woodland planting in the southern extension area.	Although it does support a range of native species, the planted woodland is currently young and even-aged, and lacks age/structural diversity and deadwood, or a diverse ground flora, and is therefore assessed as having less than local value in its current form. However, it does provide habitat for a range of species groups and would increase in value over time as it matures.	Less than local (but local in future)
Mixed scrub (h3h)	Small areas of mixed scrub with species such as hawthorn, gorse (<i>Ulex europaeus</i>), dogwood (<i>Cornus sanguinea</i>), hazel and dog rose (<i>Rosa canina</i>) (TN15).	Scrub in moderate condition which supports a number of native species.	Local
Bracken (g1c)	Stands of bracken (<i>Pteridium aquilinum</i>) to the east of the active quarry area (TN16).	Small habitat patches with limited ecological value.	Less than local
Built linear features (u1e)	Gravel track around quarry margins.	Negligible ecological value.	Less than local

- 7.93 To conclude, the Site including the extension area is assessed as being of ecological importance at a local level in habitat terms.
- 7.94 Although the remainder of the New Park Springs Country Park was not subject to detailed habitat mapping, the habitats present there are similar to those found in the extension area and originate from the same restoration/landscaping exercise of the former colliery site. As such, the Country Park is also assessed as being of as being of ecological importance at a local level in habitat terms.

Protected and Notable Species/Groups

Invertebrates

- 7.95 The majority of the Site is un-vegetated and is regularly disturbed through quarrying and other activities. It is therefore unlikely to be of importance to invertebrates.
- 7.96 The landscaped bunds and margins around the edges of the active quarry comprise open mosaic habitat of varying ages, with various micro-habitats at different stages of succession, including ephemeral/short perennial vegetation with areas of bare ground, developing grassland (which is

flower-rich in places), patches of seasonally damp ground and scattered scrub. These areas provide better quality habitat for a range of invertebrate species.

- 7.97 The habitats within the proposed extension area also provide habitats for invertebrates and in localised areas the quality is good, in particular those areas of grassland which are flower-rich, as these provide a source of nectar for pollinating insects. There are desk study records of several priority butterfly and moth species within New Park Springs, such as dingy skipper butterfly, and these species may also occur within the extension area and quarry margins (although birds foot trefoil – the foodplant of the dingy skipper is only locally abundant).
- 7.98 The younger woodland areas are unlikely to support a notable assemblage in their current form, due to their age and the lack of deadwood and general habitat diversity.
- 7.99 No follow-on surveys have been undertaken in respect of invertebrates as the interest is likely to be localised when considering the Site as a whole. Furthermore, the habitats present which are of value for this group such as Open Mosaic Habitat are to be recreated and even improved upon by the proposed restoration to directly benefit this group.
- 7.100 No further consideration is given to this group in this EclA.

Fish

- 7.101 The Site is unlikely to support fish. The lagoons within the active quarry area are periodically drained and dredged, and fish have not been reported by quarry staff. Fish are therefore scoped out from further assessment in this EclA.

Amphibians including Great Crested Newt (GCN)

- 7.102 The result of the GCN survey are provided in **Appendix 7/1**.
- 7.103 The lagoons present within the operational site were assessed as having below average suitability to provide an aquatic/breeding habitat for GCN. The off-site ponds were assessed as having below average to average suitability.
- 7.104 The ponds / lagoons surveyed within the Site and a 250m radius all tested negative for GCN Environmental DNA (eDNA).
- 7.105 A dead smooth newt was observed incidentally during water sampling within the lagoon on the western edge of the quarry. No amphibians were recorded under artificial refuges during the reptile survey.
- 7.106 The large population of GCN located at Cudworth, reported in the desk study, is separated from the Site by a distance of c. 1.2km and there are also several barriers likely to prevent dispersal from this site, such as the A6195 road. The likelihood of individuals from this population dispersing to the Site is therefore considered to be very low.
- 7.107 Two ponds within a 250m radius of the Site were found to be dry, although these are likely to periodically contain water. However, the fact that the ponds were found to be dry as early in the

year as May indicates that they are unlikely to be capable of supporting a breeding population of GCN, which require ponds to retain water until August for eft survival.

- 7.108 Given the lack of suitable ponds testing positive for GCN eDNA within the site and 250m radius, it is highly unlikely that GCN occur within the Site or nearby. The Site is unlikely to be important or critical to other amphibian species, due to the low quality or dried up nature of the ponds.
- 7.109 A new waterbody/pond and reedbed are proposed as part of the restoration and this would provide a valuable new habitat for this group.
- 7.110 For the above reasons, amphibians are therefore assessed to be of less than local importance and are scoped out from further assessment in this EclA.

Reptiles

- 7.111 The results of the reptile survey are provided in **Appendix 7/2**.
- 7.112 Suitable reptile habitat is present within the Site in the form of grassland and woodland edge habitat in the proposed extension area, and also the vegetated bunds and grassland around the quarry margins. There is also extensive suitable reptile habitat in the surrounding landscape, including within New Park Springs Country Park, although as previously stated this has had a recent industrial past.
- 7.113 A peak count of five common lizard was recorded in 2020 which were distributed within grassland habitat in the extension area, and also the grassland bunds in the east and south-east margins of the existing quarry. This equates to a 'Low' population size using the definition by HGBI (1998) (which accounts for the size of the area surveyed), and a 'Good' population as defined by Froglife (1999) (albeit it is at the lowest end of the Good population size class, and this definition does not account for the size of the area surveyed).
- 7.114 A single shed skin of a juvenile grass snake was recorded on the south-east margin of the quarry, which equates to a 'Low' population of grass snake using both the HGBI (1998) and Froglife (1999) definitions.
- 7.115 Due to the confirmed presence of reptiles this group is carried forward for further consideration in this EclA.

Birds

- 7.116 The results of the breeding season bird surveys are provided in **Appendix 7/3**.
- 7.117 A total of 28 bird species were recorded during the breeding bird survey, 13 of which are species of conservation concern².

² Including Red and Amber Listed Birds of Conservation Concern Species (Eaton *et al.*, 2015), Wildlife and Countryside Act 1981 (as amended) Schedule 1 Species, NERC Act 2006 Section 41 Species and Local Biodiversity Action Plan Priority Species.

- 7.118 Of the total number of bird species, 18 were confirmed, or considered likely, to have bred/held territories, eight of which are species of conservation concern², namely dunnoek, linnet, meadow pipit, reed bunting, skylark, song thrush, willow warbler and yellowhammer.
- 7.119 Territories of two species of ground-nesting bird were recorded, skylark and meadow pipit; however, they were located beyond the southern boundary of the Site, within New Park Springs Country Park. One meadow pipit territory was located on the western margin of the extension area.
- 7.120 A single yellowhammer territory was recorded within the extension area, although it is considered likely that this individual was breeding within more mature habitat off-site, rather than within the extension area, as this species favour dense / mature hedgerows.
- 7.121 Grey partridge was recorded moving across the southern part of the Site, and this species was also recorded in New Park Springs.
- 7.122 Two willow warbler territories were confirmed within the extension area, in addition to a probable song thrush territory.
- 7.123 A barn owl (*Tyto alba*) was recorded hunting over the extension area on one occasion, although no suitable nesting opportunities (e.g. buildings or mature trees with cavities) for this species exist within the Site.
- 7.124 A little ringed plover was heard calling from within the quarry on a single occasion; however, this species was not recorded on subsequent visits, and is therefore unlikely to have bred on the Site.
- 7.125 The bird species recorded represent a typical assemblage for farmland / grassland, scrub and woodland habitats within South Yorkshire. The highest densities of territories were recorded within the woodland and scrub in the quarry margins and the proposed extension area, and within the grasslands of New Park Springs beyond the Site boundary.
- 7.126 Given the legislative protection that is afforded to nesting birds and the presence of an assemblage of breeding birds which include species of conservation concern, it is appropriate to give further consideration to this group in this EcIA.

Otter

- 7.127 The site does not support suitable habitat for otter (*Lutra lutra*), and there are no records of this species in the surrounding area.
- 7.128 Otter is therefore unlikely to occur on the Site and is scoped out from further assessment in this EcIA.

Water Vole

- 7.129 The habitats on the Site are largely unsuitable for water vole. There is a small ditch running through the proposed extension area. However, this is completely dry and therefore unsuitable.

- 7.130 The settlement lagoons within the quarry have low water quality, and unvegetated shallow margins which are unsuitable for water vole burrowing or cover. They are also regularly drained and dredged. These features were inspected on 22nd May 2020 during the habitat survey, and no burrows or other water vole field signs were recorded.
- 7.131 Water vole are therefore concluded to be absent from the Site and is scoped out from further assessment in this EclA.

Badger

- 7.132 Desk study records for this species are located 1.5km or further from the Site.
- 7.133 The Site does have suitable foraging and sett building habitat for this species, in the form of woodland, grassland and spoil mounds around the margins of the quarry and the extension area. The surrounding landscape also has extensive suitable habitat for this species.
- 7.134 No setts or other badger field evidence was recorded on the Site during the survey work.
- 7.135 Given the lack of field evidence, the Site is unlikely to be important to any local badger social group(s) and is therefore assessed as being of less than local importance for badger. However, given its protected status, and the fact that it is possible that badger could excavate setts on the site in the future, badger is taken forward for further consideration in this EclA.

Bats (Roosting)

- 7.136 A mature block of woodland is present beyond the quarry working area on the eastern boundary (TN 13). The woodland contains mature trees which collectively have been assessed as having moderate to high bat roosting potential. The woodland here is beyond the working area and would not be affected by the development proposals.
- 7.137 The remainder of the trees within the Site boundary are young and have not yet developed any features which could provide roosting opportunities for bats, and they are therefore assessed as having negligible bat roost potential. As no potential bat roosts would be affected by the proposals they are scoped out from further assessment in this EclA.

Bats (Foraging)

- 7.138 The quarry margins and the proposed extension area support woodland, scrub and grassland habitats that is likely to be used by commuting / foraging bats. The active part of the quarry is unlikely to be of any value to foraging / commuting bats as it is largely unvegetated.
- 7.139 The majority of the woodland on the Site has been planted in the last 10-30 years and is therefore not yet mature. Although it is likely to have some value to foraging / commuting bats it would be lower than the extensive areas of mature / ancient woodland present within the surrounding area, particularly to the east (such as West Haigh Wood).
- 7.140 The areas of existing mature woodland within the quarry site which have been established for screening purposes are to be retained.

- 7.141 The Site is therefore unlikely to be of high value to foraging bats in the context of the surrounding areas. For this reason, it was not considered necessary to undertake further surveys. As no likely high value foraging habitats for bats would be affected by the proposals and given the predicted habitat gains which would be delivered by restoration they are scoped out from further assessment in this EclA.

Other Mammal Species

- 7.142 The grassland within the Site, as well as the extensive surrounding grassland in New Park Springs, has suitability for harvest mouse. Due to the presence of dogs and humans in the Country Park, the presence of brown hare is considered to be unlikely.
- 7.143 The grassland, scrub and woodland habitat within the Site and surrounding area also has suitability for hedgehog.

Evaluation of Faunal Receptors

- 7.144 An evaluation of the faunal ecological receptors, which are either known to be present or considered likely to be present within the site, is provided in Table 7-6.

Table 7-6
Evaluation of Faunal Receptors Within the Site

Receptor	Legal/Conservation Status	Reason for Evaluation	Evaluation
Invertebrate assemblage	S41 (some species), LBAP (dingy skipper)	The mosaic of habitats along the quarry margins (particularly open mosaic habitat) and the habitat within the extension area (particularly the flower-rich grassland) is likely to support a range of priority invertebrate species.	Local value
Reptiles (grass snake and common lizard)	WCA Sch5 (Section 9(1) and 9(5) only), S41	The quarry margins, along with the grassland habitat in the extension area, support common lizard (peak count of five) and grass snake (peak count of one). The wider area also supports extensive suitable habitat for these species.	Local value
Breeding bird assemblage	WCA (nests, eggs), WCA Sch1 (some species), S41 (some species), LBAP (some species)	The site supports a reasonably typical breeding bird assemblage for farmland / grassland, scrub and woodland habitats within South Yorkshire. The site and surrounding area supports a number of bird species of conservation concern.	Local value
Badger	Protection of Badgers Act 1992.	No field evidence of badger has been recorded, however this species has been brought forward for further assessment due to the presence of nearby records and suitable habitat, their protected status, and because badgers can dig new setts at any time.	Less than Local value
Bats (commuting/ foraging)	HR Sch2, WCA Sch5, S41 (some species), LBAP	The unvegetated active quarry area has negligible value for foraging / commuting bats. The quarry margin and quarry extension areas on the site are likely to have some value to foraging and commuting bats, although higher quality habitat is abundant off-site within the local landscape, such as the mature woodland areas to the east.	Local value

Receptor	Legal/Conservation Status	Reason for Evaluation	Evaluation
Other mammals (hedgehog and harvest mouse)	S41, LBAP (hedgehog)	The quarry margins and extension area have suitable habitat for hedgehog and harvest mouse, although more extensive areas of suitable habitat lie off-site such as within the surrounding New Park Springs.	Up to local value (if present)

**Table Key: Status*

HR Sch2 = Included on Schedule 2 of the Conservation (Natural Habitats &c) Regulations 1994 (as amended)

WCA Sch1/ Sch5 = Listed on Schedule 1 or Schedule 5 of the Wildlife and Countryside Act 1981 (as amended)

PBA = Protected under the Protection of Badgers Act 1992

S41 = NERC Act 2006 Section 41 Species of Principal Importance

LBAP = Local (Barnsley) Biodiversity Action Plan Priority Species (Barnsley Biodiversity Trust, 2009)

Future Baseline

- 7.145 In the absence of the development proposals, the plantation woodland within the proposed extension area would mature and increase in ecological value over time if managed to optimise biodiversity.
- 7.146 The existing habitats within the quarry area would be lost upon completion of mineral extraction and the quarry area would be restored as per the existing approved restoration plan under the existing planning permission for the Site.
- 7.147 The existing restoration plan involves the in-filling of the quarry with non-hazardous waste, and the creation of acid grassland and woodland habitats and an extensive area of amenity grassland of low ecological value. The existing restoration plan would also result in the loss of inland cliffs.

ASSESSMENT OF EFFECTS

- 7.148 The assessment of effects is based on the information outlined in Chapter 3.

Embedded Mitigation

- 7.149 The following design principles and “designed-in” mitigation have informed the assessment of impacts.
- Within the design of the proposal good practice environmental and pollution control measures are employed with regard to current best practice guidance such as, but not limited to, the following:
 - CIRIA C532, ‘Control of water pollution from construction sites: guidance for consultants and contractors’ (2001).
 - CIRIA C741, ‘Environmental good practice on site guide’ (2015 4th Ed.).
 - Landscaping measures are proposed within the design of the development within or outside of the application boundary to minimise loss of biodiversity on-site.

- 7.150 Good practice measures in relation to pollution risk and sediment management to be adopted during the construction / operation / restoration phases are set out in Chapter 8.
- 7.151 Taking the above into account, the principal potential impacts of the proposed development are outlined in the following sections.

Pre-Construction Surveys

- 7.152 Pre-construction surveys for protected and notable species may be required depending on the interval of time which had elapsed since the last surveys and the individual species/group concerned.

Construction Effects

Potential Effects

- 7.153 Construction effects refer to the mineral extraction phase and any preparatory works.
- 7.154 Effects have been assessed only for important ecological receptors (i.e. those with a value of Local level or above and / or legally protected species) which have the potential to be affected by the proposals.
- 7.155 As the activities within the main void are already consented the assessment of construction effects focuses on important ecological features present in the proposed extension.

Designated Ecological Sites

Direct Habitat Loss of Designated Ecological Sites

- 7.156 The Site is not formally designated for ecological reasons, either as a statutory or non-statutory site, and as such the development proposals would not result in the direct loss of any habitats forming part of a designated ecological site.

Direct Habitat Loss of Designated Ecological Sites – Proposed Avoidance, Mitigation and Monitoring

- 7.157 As no direct habitat losses are predicted to occur to designated ecological sites, no avoidance, mitigation or monitoring measures are required.

Direct Habitat Loss of Designated Ecological Sites – Residual Effects

- 7.158 Not predicted/applicable.

In-Direct Effects on Designated Ecological Sites

- 7.159 West Haigh Wood LNR/LWS is the closest designated site in the wider area. The LWS designated parts of this site are present at their closest point within 70m of the eastern boundary of the Site. At this distance, the potential exists for dust generated during soil stripping and the initial stages of mineral extraction to be deposited within the LWS woodland. At excessive levels this could result

in the smothering of vegetation and or deleterious changes in species composition brought about by chemical reactions with plants and the soil.

- 7.160 However, the proposed extension would be worked on a campaign/demand basis and as such working would be likely to be intermittent and incremental in nature. This would reduce the potential for dust to be generated when compared to a single-phase extraction.
- 7.161 The Dearne Valley Wetlands SSSI is situated around 700m to the west of the proposed extension area and is separated by Park Spring Road and the Country Park. At this distance it is considered that there is no potential for in-direct effects on the SSSI.
- 7.162 No other in-direct effects in respect of this or any other designated ecological sites have been predicted.

In-Direct Effects on Designated Sites - Proposed Avoidance, Mitigation and Monitoring

- 7.163 The intervening land between the proposed extension area and West Haigh Wood comprises of un-designated retained woodland within the Country Park (see **Figure 7-1**). It is considered that this would be sufficient, together with the operational measures set out below to provide effective buffering from dust effects for the LWS.
- 7.164 As an operational site, avoiding the generation and deposition of dust is an important activity as it has wider implications such as safe working for employees, the prevention of plant breakdowns and avoiding the transfer of dust into adjacent residential properties and transport networks.
- 7.165 The quarry has long standing mechanisms in place to prevent dust being generated within and along the boundaries of the Site. These working practices would be amended to reflect the working of the proposed extension.
- 7.166 The avoidance of windy conditions during the initial soil strip and the damping down of land are both measures which would be taken to avoid dust being generated.

In-Direct Effects on Designated Ecological Sites – Residual Effects

- 7.167 No adverse residual effects are predicted after the application of the above proposed avoidance, mitigation and monitoring measures in respect of dust.

Direct Loss of Site Habitats – Site excluding the extension

- 7.168 The development proposals would retain 5.1ha of land, comprising of industrial buildings (2.4ha), modified grassland (1.7ha) and broad-leaved woodland (1ha) within the existing quarry site. Additional areas of woodland to the north and east are also present which fall outside of the Site but are within the applicants ownership and would be retained.
- 7.169 The loss of habitats within the existing quarry boundary has been permitted by previous planning permissions and a restoration concept, based on the importation of non-hazardous waste, has also been approved.

- 7.170 A revised restoration is proposed which would not include the importation of non-hazardous waste and which as a consequence, would be lower-level scheme using imported inert and quarry (mineral) wastes. It has been designed to retain inland cliffs and to create a range of habitat types reflective of the area and ones which would deliver Biodiversity Net Gain (BNG) of at least 10%, contribute towards the aims and objectives of the Dearne Valley NIA and provide some additional wetland habitats for the bird species associated with the Dearne Valley Wetlands SSSI.

Direct Loss of Site Habitats – Proposed Extension Only.

- 7.171 The working of the proposed extension would result in the loss of the following habitats, assessed as being of ecological importance at a local geographical level, as shown in Table 7-7.

Table 7-7
Habitat Loss within the Extension Area

UK Habitat Classification Code	Habitat Type	Area (ha)
g3c	Other Neutral Grassland	1.22
u1a	Open Mosaic Habitats	0.01
u1e	Built Linear Features	0.03
w1g	Other Woodland, Broad-leaved	2.05
	Total	3.31ha

- 7.172 The habitats present in the proposed extension area have been created over relatively recent timescales (c.20 years) from a former colliery site and they are considered to be of ecological value at a local level only; furthermore, those present are replicated within the remainder of the Country Park (i.e. are not unique) and no irreplaceable habitats occur.
- 7.173 Open Mosaic on Previously Developed Land and Lowland Deciduous Woodland habitats are UK Priority Habitat Types.
- 7.174 Nevertheless, as maturing habitats with localised areas of ecological interest, such as patches of species-rich grassland, it is appropriate to ensure that there is no net loss.

Direct Loss of Site Habitats – Proposed Avoidance, Mitigation and Monitoring.

- 7.175 The revised restoration scheme for the Site would result in the retention of habitats in certain areas and the creation of habitats in other parts of the Site following the completion of mineral working, as shown in Table 7-8. The proposed mix of habitats would deliver a BNG of + 10.84%. In contrast, the approved restoration scheme for the existing site (assuming the proposed extension is included but remains unworked) would deliver BNG minus 10.15%.

- 7.176 The extension area itself would be restored to a mix of broad-leaved woodland, open-mosaic habitat, inland cliffs and would form part of a large waterbody and reedbed as shown on the Restoration Plan.

Table 7-8
Habitats Retained or Created within the Site and Extension Area

Habitat Type	Site including Extension Area (ha)
Other Acidic Species Rich Grassland	2.74
Open Mosaic Habitats	9.15
Inland Rock / Scree	4.70
Other Woodland, Broad-leaved	7.70
Ponds	0.80
Reedbed	0.20
Sub total	25.29
Retained habitats (Woodland 1 ha, Grassland 1.7 ha) and buildings (2.4ha)	5.10
Total	30.39

Direct Loss of Site Habitats – Residual Effects.

- 7.177 As a BNG of more than 10% has been achieved by the revised restoration scheme there would be no residual loss of site habitats.

Notable or Invasive Flora - Japanese Knotweed (Schedule 9 Invasive Plant Species) – Potential spread.

- 7.178 The presence of Japanese knotweed, a controlled plant species due to its invasive nature, was noted within the quarry void in the locations shown on **Figure 7-2**. Earthworks in this area to facilitate an extension to the workings could result in this species being moved and therefore spread to other areas which would constitute an offence under the Wildlife and Countryside Act 1981 (as amended).

Japanese Knotweed (Schedule 9 Invasive Plant Species) – Proposed Avoidance, Mitigation and Monitoring.

- 7.179 It is proposed that an eradication scheme is implemented prior to any disturbance taking place to the locations where this plant species occurs.
- 7.180 The site would remain vigilant to the potential future presence of this species and take appropriate action as required.

Japanese Knotweed (Schedule 9 Invasive Plant Species) – Residual Effects.

- 7.181 Based on the assumption that this species can either be eradicated *in-situ* or the clumps (plus the associated contaminated rooting environment – both horizontally and vertically down to 7 metres)

can be removed and either buried at depth or transferred to an appropriately licensed waste handling facility then no residual effects are predicted.

Reptiles – Habitat Loss, Killing and or Injury

- 7.182 The development proposals would result in the loss of habitats supporting small numbers of common lizard and grass snake.
- 7.183 A 'low' population size of common lizards was recorded using the definition by HGBI (1998) (which accounts for the size of the area surveyed).
- 7.184 A single shed skin of a juvenile grass snake was recorded on the south-east margin of the quarry, which equates to a 'Low' population of grass snake using both the HGBI (1998) and Froglife (1999) definitions.

Reptiles – Proposed Avoidance, Mitigation and Monitoring.

- 7.185 The UK legislation (Wildlife and Countryside Act 1981) makes it an offence to kill and or injure reptiles.
- 7.186 The mitigation measures which are proposed are intended to ensure that this does not occur by removing animals from potential harm or reducing the likelihood of their presence by modifying habitats to make them less suitable.
- 7.187 A Reptile Mitigation Scheme (RMS) would be prepared and implemented. Given the low numbers of reptiles likely to be present the approach taken would be one of habitat manipulation and targeted hand searches rather than a fenced translocation. Any animals found would be relocated to retained habitats.
- 7.188 The proposed enhanced mix of habitats to be delivered through restoration would directly benefit this group.

Reptiles – Residual Effects.

- 7.189 None are predicted provided that the above RMS and revised restoration scheme are implemented.

Breeding Birds – Loss of Nesting Habitat and Foraging / Cover

- 7.190 A survey of the extension area found that it supports a reasonably typical breeding bird assemblage for farmland / grassland, scrub and woodland habitats within South Yorkshire including a number of Bird Species of Conservation Concern.
- 7.191 The list of bird species considered to have bred or probably/likely bred and the number of territories which were held was considered to be of local value.
- 7.192 The proposed extension would remove habitats used by birds for nesting and foraging/cover.

Breeding Birds – Proposed Avoidance, Mitigation and Monitoring

- 7.193 The loss of nesting and / or foraging opportunities would be a temporary effect over the medium term until the Site is restored. Alternative and similar habitats are present in the adjacent Country Park.
- 7.194 The proposed mix of habitats both within the Site and extension area would replace those habitats lost to development and increase their diversity (e.g. by creating open water and reedbed).
- 7.195 The removal of vegetation including grassland habitats would take place outside of the bird nesting season (March to August inclusive).
- 7.196 A watching brief would be maintained in respect of the potential presence of Schedule 1 species such as little ringed plover within the existing operational areas of the Site when planning the timing of when habitats would be removed.

Breeding Birds – Residual Effects

- 7.197 No residual effects on breeding birds are predicted

Bats – Loss of Roosts

- 7.198 No bat roosts in buildings or trees would be lost.

Bats – Proposed Avoidance, Mitigation and Monitoring

- 7.199 Not required.

Bats – Residual Effects

- 7.200 No residual effects on bat roosts are predicted.

Badger – Loss of Setts and Foraging/Commuting Habitat

- 7.201 No setts or other badger field evidence was recorded within the Site during the survey work. The proposed extension is therefore unlikely to affect habitats which are of high value to badger.
- 7.202 Given the lack of field evidence, the Site is unlikely to be important to any local badger social groups, and is assessed as being of less than local important for badger.

Badger – Proposed Avoidance, Mitigation and Monitoring

- 7.203 A pre-commencement survey for badgers would be undertaken no more than 3 months prior to any enabling works (e.g. vegetation removal, site fencing etc) taking place.
- 7.204 If badgers have established setts or significant other field evidence is found during the survey then an appropriate mitigation scheme would be developed and implemented under licence to ensure compliance with the relevant legislation.

Badger – Residual Effects

- 7.205 No residual effects on badgers are predicted.

SUMMARY OF PREDICTED EFFECTS

7.206 Table 7-7 provides a summary of predicted effects, the proposed mitigation measures and any residual effects.

Table 0-1:
Summary of Potential Impacts, Proposed Mitigation and Residual Effects

Ecological Feature	Potential Impacts	Characterisation	Proposed Mitigation	Means of Delivering Mitigation	Residual Effects												
Designated Ecological Sites																	
West Haigh Wood LNR/LWS	Dust deposition from adjacent mineral extraction within 100m.	- Negative; - Extent (see left); - Magnitude – Low – a minor loss of Priority Habitats, other Priority Habitats or on other habitats valued above a local level; - Temporary – initial stages; and - Reversible.	The presence of intervening un-designated land would provide an effective buffer. During the initial soil strip stage windy days and excessively dry periods would be avoided and damping down employed if necessary. Working the site on a campaign basis would reduce the potential for significant quantities of dust to be generated at one point in time. The existing dust avoidance practices would be extended to cover this interface with remedial measures undertaken if dust mobilisation is occurring.	Quarry Management EMS	Not predicted.												
Site Habitats	3.4ha loss of the following in the proposed southern extension area:- Other Neutral Grassland – 1.22 ha; Open Mosaic Habitats – 0.009 Built Linear Features – 0.03 Other Woodland, Broadleaved - 2.05 All of the above are valued as being of ecological importance at a local level.	- Negative; - Extent (see left); - Magnitude – Low – a minor loss of Priority Habitats, other Priority Habitats or on other habitats valued above a local level; - One-off; and	<table><tr><td colspan="2">Restoration would replace and create new habitats of higher value across the whole site as follows:</td></tr><tr><td>Habitat Type</td><td>Site including Extension Area (ha)</td></tr><tr><td>Other Acidic Grassland</td><td>2.74</td></tr><tr><td>Open Mosaic Habitats</td><td>9.15</td></tr><tr><td>Inland Rock / Scree</td><td>4.7</td></tr><tr><td>Other Woodland, Broad-leaved</td><td>7.7</td></tr></table>	Restoration would replace and create new habitats of higher value across the whole site as follows:		Habitat Type	Site including Extension Area (ha)	Other Acidic Grassland	2.74	Open Mosaic Habitats	9.15	Inland Rock / Scree	4.7	Other Woodland, Broad-leaved	7.7	Restoration, and aftercare	Not predicted.
Restoration would replace and create new habitats of higher value across the whole site as follows:																	
Habitat Type	Site including Extension Area (ha)																
Other Acidic Grassland	2.74																
Open Mosaic Habitats	9.15																
Inland Rock / Scree	4.7																
Other Woodland, Broad-leaved	7.7																

Ecological Feature	Potential Impacts	Characterisation	Proposed Mitigation		Means of Delivering Mitigation	Residual Effects												
		Habitats have been created through colliery restoration and are therefore re-creatable. Therefore effects are reversible over time.	<table><tr><td></td><td></td></tr><tr><td>Ponds</td><td>0.8</td></tr><tr><td>Reedbed</td><td>0.2</td></tr><tr><td>Sub total</td><td>25.29</td></tr><tr><td>Retained habitats and buildings</td><td>5.1</td></tr><tr><td>Total</td><td>30.39</td></tr></table>				Ponds	0.8	Reedbed	0.2	Sub total	25.29	Retained habitats and buildings	5.1	Total	30.39		
Ponds	0.8																	
Reedbed	0.2																	
Sub total	25.29																	
Retained habitats and buildings	5.1																	
Total	30.39																	
Reptiles	Potential for killing and / or injury of common lizard and grass snake. Habitat loss for reptile populations of local importance (small/low conservation significance).	- Negative; - Extent – approximately 1.23ha of suitable habitat in proposed extension area (Other Neutral Grassland and OMH); - Magnitude – impact on small number/low population sizes of common lizard and grass snake of local conservation significance; - Duration – medium term until replacement habitats develop; - Timing – initial stages of vegetation removal; - Frequency - one-off; and - Reversibility – yes via restoration.	- Development of a Reptile Mitigation Strategy (RMS); - Prior manipulation of habitats to reduce risk of killing/injury; and - Restoration would replace and create new habitats of higher value to this group.															
Breeding Birds	Destruction of nests if works undertaken to remove vegetation during the nesting season between March and August inclusive. Loss of nesting and feeding habitat.	- Negative; - Extent: (see Site Habitats); - Magnitude – high for individual nests but only in a Site context; - Duration – medium term until replacement habitats develop;	- Vegetation removal would avoid the nesting season (the season is March to August inclusive); and - Habitat creation through restoration would provide high quality nesting habitats for birds e.g. 7.7ha of broad-leaved woodland.															

Ecological Feature	Potential Impacts	Characterisation	Proposed Mitigation	Means of Delivering Mitigation	Residual Effects
		- Timing – initial stages of vegetation removal; - Frequency - one-off; and - Reversibility – yes via restoration.			
Badger	No field evidence of badger.	- Negative – if setts become established in the intervening period; - Positive – habitat creation; - Magnitude: Low (at a site level); - Certain; - Permanent; and - Reversible through restoration	- Pre-commencement walkover of the site to update information relating to badger and ascertain if new setts had been dug; - Implementation of an appropriate scheme of mitigation under licence if setts are lost or disturbed; - Habitat creation through restoration would provide high quality habitats for foraging and sett building e.g. 7.7ha of broad-leaved woodland.		

CONCLUSIONS

- 7.207 The ecological impact assessment has found that there would be mainly temporary impacts on habitats and species, which would be avoided or minimised through the mitigation and compensation measures which are proposed in this assessment. However, no significant adverse residual effect on important ecological features has been predicted.
- 7.208 The proposed landscaping and habitat creation scheme is considered to represent an overall long-term residual gain for biodiversity as more extensive and better-quality habitats would be delivered when compared to the existing local value of the habitats currently present in the site.
- 7.209 The composition and management of the new habitats would be tailored to the needs of specific fauna where necessary and they would be appropriately managed for the lifetime of quarry.

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<https://magic.defra.gov.uk/> [Last accessed September 2020]
- 7.44 UK Habitat Classification Methodology <http://ecountability.co.uk/ukhabworkinggroup-ukhab> [Last accessed February 2021]

FIGURES

Figure 7-1: Sites designated for nature conservation

Figure 7-2: UKHab Habitat Plan

APPENDIX 7-1

Great Crested Newt eDNA Survey Report

APPENDIX 7-2

Reptile Presence / Absence Survey Report

APPENDIX 7-3

Breeding Bird Survey Report

APPENDIX 7-4

Desk Study Data

APPENDIX 7-5

Detailed Botanical Target Notes

TN (Fig. 7-2)	Description	Photograph & Condition Assessment
1	Other neutral grassland with calcicoles (g3c 123), created c. 20 years ago as part of a restoration scheme. The main components of the sward are indicative of predominantly neutral conditions. Red fescue is the most frequent grass species, which is abundant in places; tufted hair grass and Yorkshire fog is frequent, and cock's-foot, perennial ryegrass, rough-stalked meadow-grass, and sweet vernal grass was also recorded occasionally. The sward is mostly tussocky in character and has some very flower-rich patches which support up to 50% wildflower cover, although elsewhere flower cover is sparse. Common knapweed is locally abundant, and black medick, common vetch, hairy tare, smooth tare, red clover (<i>Trifolium pratense</i>), oxeye daisy and ribwort plantain (<i>Plantago lanceolata</i>) occur frequently. Other herbs which occur occasionally include alsike clover, colt's-foot (<i>Tussilago farfara</i>), common cat's-ear (<i>Hypochaeris radicata</i>) and perforate St John's wort, and herbs occurring rarely include common centaury (<i>Centaureum erythraea</i>), betony (<i>Betonica officinalis</i>), hop trefoil (<i>Trifolium campestre</i>), musk mallow (<i>Malva moschata</i>), pignut (<i>Conopodium majus</i>), great lettuce (<i>Lactuca virosa</i>) and zigzag clover (<i>Trifolium medium</i>). There are also occasional calcareous indicators, specifically several specimens of wild carrot (<i>Daucus carota</i>) were recorded, which is a species typically associated with calcareous soils, and may be present due to the introduced seed mix and types of substrates used in the restoration, for example containing concrete.	 Moderate to good condition.
2	Broad-leaved woodland within the southern extension area, which comprises a young and even-aged stand which was planted c. 11-12 years ago. The planted woodland supports frequent cherry, alder, hawthorn, field maple, goat willow, hazel and silver birch, with occasional pedunculate oak, sessile oak and rowan. Woodland ground flora has not yet developed due to its young age, and a grassland sward is present with abundant red fescue, frequent or occasional hogweed (<i>Heracleum sphondylium</i>), cock's-foot, bramble	 Poor to moderate condition

TN (Fig. 7-2)	Description	Photograph & Condition Assessment
	(<i>Rubus fruticosus</i> agg.), creeping thistle, curled dock (<i>Rumex crispus</i>), mugwort, ribwort plantain (<i>Plantago lanceolata</i>), rough-stalked meadow-grass, common nettle and spear thistle (<i>Cirsium vulgare</i>).	
3	Broad-leaved woodland at the very southern end of the southern extension area, which comprises a reasonably young and even-aged stand which was planted c. 20-30 years ago. The species mix mirrors that of the younger woodland in the extension area (TN2) but the woodland has more of a closed canopy due to the slightly older trees.	 Moderate condition
4	Species-poor patches of tall ruderal vegetation within the extension area which support common nettle, creeping thistle and rosebay willowherb.	 Poor condition
5	Active clay quarry area with exposed substrate/mud/rock, set across various levels/benches. This area of the quarry is being actively worked and therefore lacks vegetation.	 Condition assessment – N/A
6	Man-made settlement lagoons within the quarry working area, with low water quality and very little or absent aquatic or marginal vegetation, or bankside vegetation. The settlement lagoons are drained and dredged from time to time.	

TN (Fig. 7-2)	Description	Photograph & Condition Assessment
		Poor condition
7	The ledges and slopes on the quarry margin, mostly located on the northern edge of the quarry, support sparse ephemeral/short perennial vegetation at different stages of succession grading into flower-rich grassland with scattered scrub. The species are mainly neutral in character with some calcicoles and acidic indicators. The main grass species present within these areas are red fescue, Yorkshire fog, cock's-foot, tufted hair-grass, common bent (<i>Agrostis capillaris</i>) and false oat-grass. Species-diversity is reasonably high, and herbs within the sward include pioneer species of disturbed ground. Herbs recorded include common centaury, colt's-foot (<i>Tussilago farfara</i>), foxglove, mouse-ear hawkweed, common restharrow, oxeye daisy, purple toadflax (<i>Linaria purpurea</i>), selfheal (<i>Prunella vulgaris</i>), black medick and hare's-foot clover.	 Good condition
8	Subsoil spoil heaps and other areas around the margins of the quarry which are not being actively worked, and have developed open mosaic habitat on previously developed land. Similar to TN7, these areas support sparse ephemeral/short perennial vegetation, as well as areas developing into species-rich grassland at varying stages of succession, along with damp depressions supporting soft rush (<i>Juncus effusus</i>). The species recorded are similar to that at TN7, along with some additional species such as charlock (<i>Sinapis arvensis</i>), great lettuce (<i>Lactuca virosa</i>), procumbent pearlwort (<i>Sagina procumbens</i>), scented mayweed (<i>Matricaria chamomilla</i>), weld (<i>Reseda luteola</i>) and bristly ox-tongue (<i>Helminthotheca echioides</i>).	 Good condition
9	A further area of open mosaic habitat on previously developed land in the south-east corner of the quarry, which is developing on land which was cleared of woodland several years ago. The sward contains some remnant species of the previous wooded habitat such as wood sage (<i>Teucrium scorodonia</i>), bramble, foxglove and bracken, and also has a range of grasses and wildflowers, including those indicative of recent disturbance. Species recorded include common ragwort, common bent, Yorkshire fog, spear thistle, great lettuce and hedge bindweed (<i>Calystegia sepium</i>). Species diversity is slightly lower than in other surrounding areas of the quarry margin.	 Moderate condition

TN (Fig. 7-2)	Description	Photograph & Condition Assessment
10	Some areas around the quarry margins have developed into a flower-rich grassland, with some particularly flower-rich areas such as in the north-west corner of the quarry. The species assemblage is reasonably similar to the grassland within the extension area, and contains mainly neutral indicator species, along with occasional calcareous and several acidic indicator species. Species recorded include abundant mouse-ear hawkweed, cock's-foot and soft brome, along with frequent or occasional oxeye daisy, black medick, common bent, common centaury, common knapweed, common vetch, creeping bent, foxglove, smooth and hairy tare, common restharrow, common bird's-foot trefoil and hare's-foot clover, along with rare common spotted orchid, southern marsh orchid (<i>Dactylorhiza praetermissa</i>), viper's bugloss, evening primrose (<i>Oenothera biennis</i>) and wild marjoram.	 Moderate to good condition
11	Species-poor improved grassland and tall ruderal vegetation on topsoil mound, with low species diversity due to the nutrient content of the topsoil. Species recorded include cock's-foot, false oat-grass, creeping thistle, common nettle and rosebay willowherb.	 Poor condition
12	Tall ruderal vegetation which has developed on a spoil heap with both topsoil and subsoil, supporting rosebay willowherb, creeping thistle, hedge bindweed, common nettle, common ragwort, mugwort and false oat-grass.	 Poor condition
13	Mature broad-leaved semi-natural woodland with a varied age structure, deadwood present and natural regeneration evident. The main canopy species are sweet chestnut (including some very mature specimens), silver birch and sessile oak. Ground flora species recorded includes frequent wood meadow-grass (<i>Poa nemoralis</i>) and creeping soft-grass, with occasional bluebell and bracken.	

TN (Fig. 7-2)	Description	Photograph & Condition Assessment
		 Moderate to good condition
14	Scrubby broad-leaved woodland on the northern margin of the active quarry, which was planted c. 20-30 years ago as part of quarry screening/restoration work. The trees are young and even-aged with a lack of deadwood, and a lack of a diverse woodland ground flora. The tree species mix contains frequent blackthorn (<i>Prunus spinosa</i>), alder, hawthorn, dog rose, grey alder (<i>Alnus incana</i>), silver birch and sessile oak, with occasional cherry, field maple, goat willow, grey willow (<i>Salix cinerea</i>), guelder rose (<i>Viburnum opulus</i>), hazel, holly and rowan. The ground flora is not particularly diverse, with species such as common nettle, cock's-foot, cleavers, bramble and broad-leaved willowherb (<i>Epilobium montanum</i>) recorded.	 Moderate condition
15	Small areas of mixed scrub with species such as hawthorn, gorse, dogwood, hazel and dog rose.	 Moderate condition

TN (Fig. 7-2)	Description	Photograph & Condition Assessment
16	Stands of bracken to the east of the active quarry area.	 Poor condition

APPENDIX 7-6

Botanical Species List and Frequency Values

Species Common Name	Species Latin Name	Frequency Value (DAFOR)*
Southern Extension Area		
Grassland		
Alsike clover	<i>Trifolium hybridum</i>	O
Betony	<i>Betonica officinalis</i>	R
Black medick	<i>Medicago lupulina</i>	F
Bristly ox-tongue	<i>Helminthotheca echinoides</i>	O
Broad-leaved dock	<i>Rumex obtusifolius</i>	O
Broadleaf plantain	<i>Plantago major</i>	O
Cleavers	<i>Galium aparine</i>	O
Cock's-foot	<i>Dactylis glomerata</i>	O
Colt's-foot	<i>Tussilago farfara</i>	O
Common cat's-ear	<i>Hypochaeris radicata</i>	O
Common centaury	<i>Centaurium erythraea</i>	R
Common hogweed	<i>Heracleum sphondylium</i>	O
Common knapweed	<i>Centaurea nigra</i>	LA
Common nettle	<i>Urtica dioica</i>	O
Common ragwort	<i>Senecio jacobaea</i>	O
Common vetch	<i>Vicia sativa</i>	F
Couch-grass	<i>Elymus repens</i>	R
Creeping buttercup	<i>Ranunculus repens</i>	O
Creeping thistle	<i>Cirsium arvense</i>	F
Curled dock	<i>Rumex crispus</i>	O
Dandelion	<i>Taraxacum officinalis agg.</i>	O
Dove's-foot cranesbill	<i>Geranium mole</i>	R
Hare's-foot clover	<i>Trifolium arvense</i>	R
Hedge bedstraw	<i>Galium mollugo</i>	O
Hop trefoil	<i>Trifolium campestre</i>	R
Goat's beard	<i>Tragopogon pratensis</i>	R
Goat's rue	<i>Galega officinalis</i>	O
Great lettuce	<i>Latuca virosa</i>	R
Great willowherb	<i>Epilobium hirsutum</i>	LF
Hairy tare	<i>Vicia hirsute</i>	F
Hedge bindweed	<i>Calystegia sepium</i>	O
Mugwort	<i>Artemisia vulgaris</i>	O
Musk mallow	<i>Malva moschata</i>	R
Oxeye daisy	<i>Leucanthemum vulgare</i>	F
Perennial ryegrass	<i>Lolium perenne</i>	O
Perforate St. John's-wort	<i>Hypericum perforatum</i>	O
Pignut	<i>Conopodium majus</i>	R

Species Common Name	Species Latin Name	Frequency Value (DAFOR)*
Red clover	<i>Trifolium pratense</i>	F
Red fescue	<i>Festuca rubra</i>	LA
Ribbed melilot	<i>Melilotus officinalis</i>	O
Ribwort plantain	<i>Plantago lanceolata</i>	F
Rough-stalked meadow-grass	<i>Poa trivialis</i>	O
Rosebay willowherb	<i>Chamerion angustifolium</i>	O
Selfheal	<i>Prunella vulgaris</i>	O
Smooth tare	<i>Vicia tetrasperma</i>	F
Soft brome	<i>Bromus hordeaceus</i>	O
Spear thistle	<i>Cirsium vulgare</i>	F
Sweet vernal grass	<i>Anthroxanthum odoratum</i>	O
Tufted hair-grass	<i>Deschampsia cespitosa</i>	F
Wild carrot	<i>Daucus carota</i>	O
White clover	<i>Trifolium repens</i>	O
Yorkshire fog	<i>Holcus lanatus</i>	F
Zigzag clover	<i>Trifolium medium</i>	R
Woodland		
Ash	<i>Fraxinus excelsior</i>	R
Aspen	<i>Populus tremula</i>	R
Bramble	<i>Rubus fruticosus agg.</i>	O
Cherry	<i>Prunus avium</i>	F
Cock's-foot	<i>Dactylis glomerata</i>	O
Common alder	<i>Alnus glutinosa</i>	F
Common hawthorn	<i>Crataegus monogyna</i>	F
Common hogweed	<i>Heracleum sphondylium</i>	F
Common knapweed	<i>Centaurea nigra</i>	F
Common nettle	<i>Urtica dioica</i>	F
Cow parsley	<i>Anthriscus sylvestris</i>	O
Cleavers	<i>Galium aparine</i>	F
Creeping thistle	<i>Cirsium arvense</i>	F
Curled dock	<i>Rumex crispus</i>	O
Dandelion	<i>Taraxacum officinalis agg.</i>	O
Field maple	<i>Acer campestre</i>	F
Goat willow	<i>Salix caprea</i>	F
Great willowherb	<i>Epilobium hirsutum</i>	F
Hazel	<i>Corylus avellana</i>	F
Mugwort	<i>Artemisia vulgaris</i>	F
Norway maple	<i>Acer platanooides</i>	R
Pedunculate oak	<i>Quercus robur</i>	O
Red fescue	<i>Festuca rubra</i>	A
Ribwort plantain	<i>Plantago lanceolata</i>	O
Rough-stalked meadow-grass	<i>Poa trivialis</i>	O
Rowan	<i>Sorbus aucuparia</i>	O

Species Common Name	Species Latin Name	Frequency Value (DAFOR)*
Sessile oak	<i>Quercus patraea</i>	O
Silver birch	<i>Betula pendula</i>	F
Spear thistle	<i>Cirsium vulgare</i>	O
Existing Quarry and Margins		
Grassland		
Alsike clover	<i>Trifolium hybridum</i>	O
Barren brome	<i>Bromus sterilis</i>	O
Beaked hawk's-beard	<i>Crepis vesicaria</i>	R
Black medick	<i>Medicago lupulina</i>	F
Bracken	<i>Pteridium aquilinum</i>	O
Bristly ox-tongue	<i>Helminthotheca echioides</i>	O
Broad-leaved dock	<i>Rumex obtusifolius</i>	O
Broad-leaved willowherb	<i>Epilobium montanum</i>	O
Broadleaf plantain	<i>Plantago major</i>	O
Cock's-foot	<i>Dactylis glomerata</i>	LA
Colt's-foot	<i>Tussilago farfara</i>	O
Common bent	<i>Agrostis capillaris</i>	F
Common bird's-foot trefoil	<i>Lotus corniculatus</i>	O
Common cat's-ear	<i>Hypochaeris radicata</i>	O
Common centaury	<i>Centaurea erythraea</i>	LF
Common chickweed	<i>Stellaria media</i>	O
Common knapweed	<i>Centaurea nigra</i>	LF
Common ragwort	<i>Senecio jacobaea</i>	F
Common restharrow	<i>Ononis repens</i>	O
Common spotted orchid	<i>Dactylorhiza fuchsia</i>	R
Common vetch	<i>Vicia sativa</i>	O
Cow parsley	<i>Anthriscus sylvestris</i>	O
Creeping bent	<i>Agrostis stolonifera</i>	O
Creeping cinquefoil	<i>Potentilla reptans</i>	O
Curled dock	<i>Rumex crispus</i>	O
Cut-leaved crane's-bill	<i>Geranium dissectum</i>	O
Daisy	<i>Bellis perennis</i>	O
Dandelion	<i>Taraxacum officinalis agg.</i>	O
Evening primrose	<i>Oenothera biennis</i>	R
False oat-grass	<i>Arrhenatherum elatius</i>	F
Fennel	<i>Foeniculum vulgare</i>	R
Foxglove	<i>Digitalis purpurea</i>	LF
Goat's-beard	<i>Tragopogon pratensis</i>	R
Groundsel	<i>Senecio vulgaris</i>	O
Hairy tare	<i>Vicia hirsute</i>	O
Hare's-foot clover	<i>Trifolium arvense</i>	LF
Hawkweed	<i>Hieracium sp.</i>	O
Heather	<i>Calluna vulgaris</i>	R

Species Common Name	Species Latin Name	Frequency Value (DAFOR)*
Hedge bedstraw	<i>Galium mollugo</i>	R
Hedge bindweed	<i>Calystegia sepium</i>	R
Hedge woundwort	<i>Stachys sylvatica</i>	R
Lady's bedstraw	<i>Galium verum</i>	O
Meadow buttercup	<i>Ranunculus acris</i>	R
Meadow vetchling	<i>Lathyrus pratensis</i>	O
Mosses	-	LF
Mugwort	<i>Artemisia vulgaris</i>	O
Mouse-ear hawkweed	<i>Pilosella officinarum</i>	A
Oxeye daisy	<i>Leucanthemum vulgare</i>	LF
Perforate St. John's-wort	<i>Hypericum perforatum</i>	O
Prickly sow-thistle	<i>Sonchus asper</i>	O
Red clover	<i>Trifolium pratense</i>	LF
Red fescue	<i>Festuca rubra</i>	F
Ribbed melilot	<i>Melilotus officinalis</i>	O
Ribwort plantain	<i>Plantago lanceolata</i>	F
Rosebay willowherb	<i>Chamerion angustifolium</i>	O
Scented mayweed	<i>Matricaria chamomilla</i>	O
Selfheal	<i>Prunella vulgaris</i>	O
Smooth hawk's-beard	<i>Crepis capillaris</i>	O
Smooth tare	<i>Vicia tetrasperma</i>	O
Soft brome	<i>Bromus hordeaceus</i>	A
Soft rush	<i>Juncus effusus</i>	LF
Southern marsh orchid	<i>Dactylorhiza praetermissa</i>	R
Spear thistle	<i>Cirsium vulgare</i>	O
Tufted hairgrass	<i>Deschampsia cespitosa</i>	LF
Tufted vetch	<i>Vicia cracca</i>	O
Viper's bugloss	<i>Echium vulgare</i>	R
Weld	<i>Reseda luteola</i>	R
White clover	<i>Trifolium repens</i>	O
Wild marjoram	<i>Origanum vulgare</i>	R
Yarrow	<i>Achillea millefolium</i>	O
Yellow loosestrife	<i>Lysimachia vulgaris</i>	R
Yellow oat-grass	<i>Trisetum flavescens</i>	R
Yorkshire fog	<i>Holcus lanatus</i>	F
Open Mosaic Habitat on Previously Developed Land		
Bracken	<i>Pteridium aquilinum</i>	F
Bramble	<i>Rubus fruticosus agg.</i>	O
Bristly ox-tongue	<i>Helminthotheca echioides</i>	R
Broad-leaved willowherb	<i>Epilobium montanum</i>	F
Charlock	<i>Sinapis arvensis</i>	LF
Common bent	<i>Agrostis capillaris</i>	O
Colt's-foot	<i>Tussilago farfara</i>	O

Species Common Name	Species Latin Name	Frequency Value (DAFOR)*
Cock's-foot	<i>Dactylis glomerata</i>	O
Common cat's-ear	<i>Hypochaeris radicata</i>	O
Common centaury	<i>Centaurium erythraea</i>	F
Common ragwort	<i>Senecio jacobaea</i>	F
Creeping bent	<i>Agrostis stolonifera</i>	F
Creeping buttercup	<i>Ranunculus repens</i>	O
Dandelion	<i>Taraxacum officinalis agg.</i>	O
False oat-grass	<i>Arrhenatherum elatius</i>	F
Foxglove	<i>Digitis purpurea</i>	F
Great lettuce	<i>Latua virosa</i>	O
Groundsel	<i>Senecio vulgaris</i>	O
Hedge bindweed	<i>Calystegia sepium</i>	O
Mugwort	<i>Artemisia vulgaris</i>	O
Mouse-ear hawkweed	<i>Pilosella officinarum</i>	F
Oxeye daisy	<i>Leucanthemum vulgare</i>	O
Procumbent pearlwort	<i>Sagina procumbens</i>	O
Purple toadflax	<i>Linaria purpurea</i>	R
Red fescue	<i>Festuca rubra</i>	F
Ribbed melilot	<i>Melilotus officinalis</i>	O
Ribwort plantain	<i>Plantago lanceolata</i>	F
Rosebay willowherb	<i>Chamerion agustifolium</i>	F
Selfheal	<i>Prunella vulgaris</i>	O
Scented mayweed	<i>Matricaria chamomilla</i>	F
Soft rush	<i>Juncus effusus</i>	LF
Spear thistle	<i>Cirsium vulgare</i>	F
Tufted hair-grass	<i>Deschampsia cespitosa</i>	O
Weld	<i>Reseda luteola</i>	O
Wood sage	<i>Teucrium scorodonia</i>	O
Yorkshire fog	<i>Holcus lanatus</i>	F
Scrub		
Blackthorn	<i>Prunus spinosa</i>	O
Bramble	<i>Rubus fruticosus agg.</i>	O
Broom	<i>Cytisus scorparia</i>	O
Dogwood	<i>Cornus sanguinea</i>	O
Dog rose	<i>Rosa canina</i>	O
Elder	<i>Sambucus nigra</i>	O
Goat willow	<i>Salix caprea</i>	F
Gorse	<i>Ulex europaeus</i>	O
Hawthorn	<i>Crataegus monogyna</i>	A
Hazel	<i>Corylus avellana</i>	O
Italian alder	<i>Alnus cordata</i>	R
Silver birch	<i>Betula pendula</i>	LF
Tall ruderal		

Species Common Name	Species Latin Name	Frequency Value (DAFOR)*
Cleavers	<i>Galium aparine</i>	LF
Common hogweed	<i>Heracleum sphondylium</i>	LF
Common nettle	<i>Urtica dioica</i>	LA
Cow parsley	<i>Anthriscus sylvestris</i>	O
Creeping thistle	<i>Cirsium arvense</i>	LF
Great willowherb	<i>Epilobium hirsutum</i>	LF
Mugwort	<i>Artemisia vulgaris</i>	O
Spear thistle	<i>Cirsium vulgare</i>	O
Teasel	<i>Dipsacus fullonum</i>	O
Rosebay willowherb	<i>Chamerion angustifolium</i>	LF
Woodland		
Blackthorn	<i>Prunus spinosa</i>	LF
Bluebell	<i>Hyacinthoides non-scripta</i>	O
Bracken	<i>Pteridium aquilinum</i>	F
Bramble	<i>Rubus fruticosus agg.</i>	F
Broad-leaved willowherb	<i>Epilobium montanum</i>	O
Cherry	<i>Prunus avium</i>	O
Cleavers	<i>Galium aparine</i>	F
Cock's-foot	<i>Dactylis glomerata</i>	O
Colt's-foot	<i>Tussilago farfara</i>	F
Common alder	<i>Alnus glutinosa</i>	LF
Common hawthorn	<i>Crataegus monogyna</i>	LF
Common nettle	<i>Urtica dioica</i>	F
Common ragwort	<i>Senecio jacobaea</i>	O
Creeping soft-grass	<i>Holcus mollis</i>	LF
Dandelion	<i>Taraxacum officinalis agg.</i>	O
Dog rose	<i>Rosa canina</i>	LF
Field maple	<i>Acer campestre</i>	O
Field rose	<i>Rosa arvensis</i>	R
Foxglove	<i>Digitalis purpurea</i>	R
Goat willow	<i>Salix caprea</i>	O
Grey alder	<i>Alnus incana</i>	LF
Grey willow	<i>Salix cinerea</i>	O
Gelder rose	<i>Viburnum opulus</i>	O
Hazel	<i>Corylus avellana</i>	O
Hedge bindweed	<i>Calystegia sepium</i>	R
Holly	<i>Ilex aquifolium</i>	R
Pedunculate oak	<i>Quercus robur</i>	O
Rough-stalked meadow-grass	<i>Poa trivialis</i>	F
Rowan	<i>Sorbus aucuparia</i>	O
Sessile oak	<i>Quercus petraea</i>	F
Silver birch	<i>Betula pendula</i>	F-LA
Sycamore	<i>Acer pseudoplatanus</i>	O

Species Common Name	Species Latin Name	Frequency Value (DAFOR)*
Sweet chestnut	<i>Castanea sativa</i>	LF
Tutsan	<i>Hypericum androsaemum</i>	R
Wood meadow-grass	<i>Poa nemoralis</i>	F

*Frequency Code Values:

D = Dominant

A = Abundant

F = Frequent

O = Occasional

R = Rare

(L = Locally)