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Gayles Quarry

Ecological Impact Assessment

Prepared for Stainton Quarry Limited

February 2022

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Notes:	This report may contain sensitive information concerning protected species and caution should be exercised when copying and distributing to third parties.	

Report Status	Authorised for Release	Date	Position
FINAL DRAFT	Rob Frith 	20 December 2021	Principal Ecologist
FINAL	Rob Frith 	16 February 2022	Principal Ecologist

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EXECUTIVE SUMMARY

Stainton Quarry Ltd is seeking planning permission for reopening Gayles Quarry, Richmond, North Yorkshire.

RDF Ecology were appointed to undertake a desktop study, extended phase I habitat and protected species walkover survey and report on the findings.

The site comprises former quarry areas with some open mosaic habitats along with areas of neutral and acid grassland and bracken dominated vegetation.

Assessment Summary

Survey Item	Conclusions
Designated Sites	No impacts upon designated sites are predicted and no further survey and assessment work are recommended.
Habitats	The majority of the habitats within the site have no intrinsic botanical value and their loss of would have negligible ecological effects. However the site supports lowland acid grassland listed as habitat of Principal Importance in Section 41 of the NERC Act 2006. Further assessment of the development impacts on acid grassland concluded that the residual impacts would lead to an overall increase in acid grassland once the site has been fully restored.
Bats—Buildings and Structures	There is an old archway with the site boundary which was assessed to have low potential for roosting bats. A single emergence survey did not record any bats emerging from the structure. No impacts upon roosting bats in buildings are predicted and no further survey or assessment work is recommended.
Bats—Trees and Habitats	There are no large trees with potential roost features to be removed or directly affected by the proposed development and no commuting routes would be disrupted. No significant impacts upon commuting or feeding bats or upon bats roosting in trees are predicted and no further survey and assessment work is recommended
Badger	No evidence of badger activity was recorded and no impacts upon badgers are predicted and no further survey or assessment work is recommended.
Otter	The site does not contain any habitats of potential value to otters, no evidence of otter activity was recorded during the field survey. No impacts upon otters are predicted and no further survey or assessment work for otters is recommended
Water Vole	The site does not contain any habitats of potential value to water vole, no evidence of water vole activity was recorded during the field survey. No impacts upon water vole are predicted and no further survey or assessment work for water vole is recommended
Breeding Birds	No significant impacts upon nesting birds are predicted and no further ornithological survey work is recommended
Amphibians	No impacts upon amphibians are predicted and no further survey work is recommended
Reptiles	No significant impacts upon reptiles are predicted and no further survey work is recommended
Recommendations	
Breeding Birds	That removal of trees, shrubs and surface vegetation should be completed outside of the bird breeding season (March to September inclusive). Where this is not possible a suitably qualified and experienced ecologist should complete a survey of the site immediately prior to completion of the proposed works to search for nesting birds and to advise on exclusion zones or timing of works if nesting birds are recorded

1. INTRODUCTION

1.1. Project Background

1.1.1. Stainton Quarry Ltd is seeking planning permission for reopening Gayles Quarry, Richmond, North Yorkshire, (hereafter referred to as 'the site') whose location and extent is shown in Figure 1.

1.2. Ecological Background

1.2.1. A preliminary Ecological Appraisal was prepared for the site by David Ryder–Consultant Ecologist in 2019.

1.2.2. The report identified a number of habitat types within the site including scrub, bracken dominated vegetation and semi-improved grasslands whilst the protected species walkover survey did not identify any protected species constraints.

1.3. Project Brief and Objectives

1.3.1. ***RDF*** Ecology has been appointed to undertake a desktop study, extended phase I habitat and protected species walkover survey and report on the findings.

1.3.2. The objectives of the commission were to:

- To complete a desk-top study to review any existing information regarding protected or notable species and designated sites within a 2 kilometre (km) radius of the site, extended to 10 km for International and European conservation sites including Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites;
- To undertake an extended phase 1 habitat and protected species walkover survey to describe and map the habitats on the site and to identify the presence or potential presence of any protected or notable species;
- To identify and assess potential ecological constraints to the proposed development;
- To prepare an Ecological Impact Assessment (EcIA)
- To provide recommendations for further ecological surveys where necessary; and,
- Recommend appropriate mitigation measures to enable compliance with wildlife legislation, offset potential negative ecological effects and enhance biodiversity where possible.

1.3.3. This report describes the findings of the desktop study and field survey work, considers the potential impacts arising from the proposed development and proposes appropriate mitigation measures.

2. THE DEVELOPMENT PROPOSALS

2.1. The proposals considered by this report are for the quarrying of sandstone and quarry restoration to nature conservation after use with potentially some light conservation cattle grazing.

2.2. The proposed mineral extraction and restoration scheme would consist of:

- Initial site establishment, including construction of a vehicular access into the existing quarry 'bowl' and construction of screening bunds.
- Phased extraction and construction of further screening bunds.
- Sequential restoration during the phased extraction.
- Final restoration upon completion of extraction.
- Incorporation of ecological features to ensure 'no nett loss' of habitat;

2.1. Site Establishment

2.1.1. The initial phase of works would consist of constructing the vehicular access from the existing track that adjoins the south-east corner of the site. A stock proof fence would be erected around the site boundary. Within the existing Gayles Quarry 'bowl', vegetation removal would take place together with construction of a stockpile platform. A screening bund at the junction of the vehicular access into the site and existing track would be created utilising material removed from the cutting to accommodate the site access. Both the screening bund and cutting slopes would be seeded. The area of existing rough pasture located between the new site access and existing track, to the east of the quarry void, would be planted with trees to create a longer-term woodland area.

2.1.2. The existing Public Right of Way that fringes the present quarry 'bowl' would be temporarily re-located, for safety reasons, further north i.e. along the existing, north facing slope at a further distance from the works; the footpath would be returned to its original route during the final restoration phase.

2.1.3. It is anticipated that the site establishment phase would be undertaken over a period of six months.

2.2. Phase A

2.2.1. Soil stripping and substrate removal would take place, soils would be stockpiled. Overburden within the Phase A area would be removed and, initially, used to supplement the existing spoil mounds to the northern fringe of the quarry in order to create screening. The bunds would be soiled, from on-site stores, and seeded.

2.2.2. The southern edge of the quarry void would be re-profiled, to remove the 90O slope thus creating a shallower face angle, then soiled and seeded.

2.2.3. Extraction would commence, including removal of usable stone from the overburden, down to a depth of approximately 243 metres AOD. Phase A extraction would commence at the north-west corner, working east then south.

2.2.4. Overburden removal in Phase A is estimated to take place over a period of 3 months, with extraction over a period of 3.5 to 4 years.

2.3. Phase B

2.3.1. Upon completion of extraction within Phase A, Phase B would commence. Soil stripping and substrate removal would take place within Phase B, with both stored on site for the restoration of Phase A. Overburden would then be removed, initially utilised to create additional screen bunds to the northern edge of Phases B and C. Soils would be taken from onsite stores to cover the new screen bunds which would then be seeded.

2.3.2. Extraction would then commence, including removal of usable stone from the overburden, also down to a depth of approximately 243 metres AOD. Phase B extraction would take place from east to west.

2.3.3. During Phase B, overburden and soils from site would be used to restore Phase A.

2.3.4. The duration of Phase B is estimated to be some 5 to 6 years.

2.4. Phase C

2.4.1. Completion of Phase B would enable extraction to commence in Phase C. Again, soil stripping and substrate removal would be the initial element of working. Both materials would be stored on site for the restoration of Phases B and C, overburden would then be removed. When a depth of 3 metres below present ground level has been achieved, the northern slope would be re-profiled, soiled and seeded.

2.4.2. Extraction would then commence, including removal of usable stone from the overburden, also down to a depth of approximately 243 metres AOD. Phase C extraction would also take place from east to west.

2.4.3. The duration of Phase C is estimated to be some 4 to 5 years.

2.5. Final Restoration

2.5.1. Restoration of Phases B and C would take place working north to south upon completion of extraction. The screening bunds to the north would be retained; the intention being to establish heathland/grassland of ecological

interest on the bund slopes. Phases B and C would achieve restoration contours and the Public Right of Way be returned to its original route.

2.5.2. The site access and screen bund to the south-east corner of the site would also be removed and restoration to grassland undertaken, in particular infilling of the cutting.

2.5.3. The restoration scheme would be subject to a management regime to ensure establishment and future development of completed landscape. Existing soils would be retained for use on site as part of the restoration scheme. Any new planting areas would consist of plant material that is of local provenance, where possible, to enhance sustainability.

2.5.4. For the purposes of this appraisal, the proposed development is considered to be temporary i.e. the period of extraction activity will not constitute a permanent feature and the site will be subsequently restored. It should be noted that an area of existing quarry void would be retained, however this is considered comparable to the present quarry 'bowl' which has formed a longstanding feature within the landscape.

2.5.5. The final restoration phase is estimated to take place between some 6 to 12 months.

3. PLANNING POLICY CONTEXT

3.1. National Planning Policy

3.1.1. National Planning Policy Framework 2019

3.1.1.1. The National Planning Policy Framework (NPPF 2019) sets out the Government's planning policies for England and how these are expected to be applied. The NPPF sets out the Government's national principles and policies for England on the protection of biodiversity and geological conservation through the planning system.

3.1.1.2. At the heart of the NPPF is a clear *"**presumption in favour of sustainable development**, which should be seen as a golden thread running through both plan-making and decision-making"* (Para 11).

3.1.1.3. The UK's Sustainable Development Strategy "Securing the Future" sets out 5 guiding principles of sustainable development:

- living within the planet's environmental limits;
- ensuring a strong, healthy and just society;
- achieving a sustainable economy;
- promoting good governance; and
- using sound science responsibly.

3.1.1.4. Section 15 of the NPPF sets out how the planning system should contribute to sustainable development by conserving and enhancing the natural environment through:

- protecting and enhancing valued landscapes, geological conservation interests and soils;
- recognising the intrinsic character and beauty of the countryside and the wider benefits from natural capital and ecosystem services;
- maintaining the character of the undeveloped coast:
- minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;
- preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability; and

- remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

3.1.1.5. To protect and enhance biodiversity and geodiversity, plans should:

- Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and
- Promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

3.1.1.6. Paragraph 175 states that when determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:

- if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of Sites of Special Scientific Interest;
- development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;
- opportunities to incorporate biodiversity in and around developments should be encouraged;
- planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient

woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss; and

- the following wildlife sites should be given the same protection as European sites:
  - » potential Special Protection Areas and possible Special Areas of Conservation;
  - » listed or proposed Ramsar sites; and
  - » sites identified, or required, as compensatory measures for adverse effects on European sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites

3.1.1.7. Additionally paragraph 177 notes that the "*presumption in favour of sustainable development does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined"*.

3.1.1.8. Annex 1 of the NPPF sets out the detail of implementation.

3.1.1.9. *ODPM Circular 06/2005* (Government Circular: Biodiversity and Geological Conservation—Statutory Obligations and their Impact within the Planning System) continues to provide administrative guidance on the application of the law relating to planning and nature conservation as it applies in England. It complements and supports the expression of national planning guidance set out in NPPF.

3.2. North Yorkshire County Planning Policies

3.2.1. Of relevance here are the saved polices from the North Yorkshire Minerals Local Plan 1997 and the following are considered by this EcIA

Policy 4/6 Nature Conservation and Habitat Protection - National/International

"Proposals for mining operations and the associated depositing of mineral waste which affect declared or potential Ramsar Sites, Special Protection Areas, Special Areas of Conservation, National Nature Reserves, and Sites of Special Scientific Interest will be subject to the most rigorous examination, and planning permission will only be granted where there would not be an unacceptable effect on the nature conservation interest."

Policy 4/6A Nature Conservation and Habitat Protection - Local

"In making decisions on planning applications, the Mineral Planning Authority will protect the nature conservation or geological interest of Local Nature Reserves and of other sites having a nature conservation interest or importance and will have regard to other wildlife habitats."

4. SURVEY METHODS

4.1. Desktop Study

4.1.1. A desk study was carried out in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) 'Guidelines for Preliminary Ecological Appraisal' (2017). Records of any protected or notable species, habitats and designated nature conservation sites within a 2 km radius of the site were obtained and reviewed. This radius was extended to 10km for International and European conservation sites including Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites.

4.1.2. The following organisations were contacted for protected sites and species data:

- North and East Yorkshire Ecological Data Centre (NEYEDC)

4.1.3. Additional information on sites and species of nature conservation interest was obtained from:

- Multi Agency Geographic Information for the Countryside (MAGIC) website;
- Natural England web site and online SSSI database;

4.2. Extended Phase I Habitat Survey

4.2.1. An extended phase 1 habitat survey of the site was completed by Robert Frith MRSB on 6 March 2020 and 15 June 2021. All habitats within the site were surveyed.

4.2.2. Habitats present on the site were classified and mapped according to the Joint Nature Conservation Committee (JNCC) Phase 1 Habitat survey method (JNCC, 2010).

4.2.3. A phase 1 habitat survey provides sufficient information on the composition of the vegetation present to enable it to be characterised and assessed.

4.2.4. Fauna and flora present at the time of survey were recorded and the site was assessed for its potential to support notable and/or protected species that could be impacted by development following CIEEM guidance (CIEEM, 2017 and 2018).

4.2.5. Target notes were prepared for any features of ecological interest and their locations noted in Figure 3. Plant species were recorded following the nomenclature in Stace (1997) and lists of species are included in Appendix 1.

4.3. Badger Survey

4.3.1. Areas of suitable habitat on site and within 50m of the site boundary (where accessible) were searched for evidence of badger with reference to the methods defined in Harris et al. (1991). The following field signs were recorded, if encountered, during the protected species walkover survey:

- Setts;
- Latrines;
- Prints and paths or trackways;
- Hairs caught on rough wood or fencing; and
- Other evidence including snuffle holes, feeding remains and scratching posts.

4.3.2. Where setts were recorded, their status and level of activity was noted. Sett status is broadly categorised as follows:

- Main: generally the largest sett within a badger clan's territory, with a relatively large number of sett entrances with well-worn pathways between them, and conspicuous spoil mounds. This type of sett will be occupied throughout the year and used for breeding;
- Annexe: normally found within 150m of the main sett comprising many entrances, this type of sett may not be occupied throughout the year, and can be used for breeding if there is more than one breeding sow within the clan;
- Subsidiary: similar to an annexe sett, but typically located further from the main sett. This type of sett will not be occupied throughout the year and lacks the well-worn paths associated with main and annexe setts; and
- Outlier: consisting of one or two entrances, this type of sett will be found furthest from the main sett and will only be used sporadically throughout the year.

4.3.3. The suitability of the existing habitats on site, as badger breeding and foraging habitat, was assessed.

4.4. Otter Survey

4.4.1. Areas of suitable habitat on site and within 50m of the site boundary (where accessible) were searched for evidence of otter (*Lutra lutra)*. The following field signs were recorded, if encountered, during the protected species walkover survey:

- Sightings of Otters
- Otter Holts
- Otter footprints
- Otter spraints
- Otter slides

4.4.2. The suitability of the existing habitats on site, as otter breeding and foraging habitat, was assessed.

4.5. Water Vole Survey

4.5.1. Areas of suitable habitat on site and within 50m of the site boundary (where accessible) were searched for evidence of water vole *(Arvicola amphibius)*. The following field signs were recorded, if encountered, during the protected species walkover survey:

- Sightings of Water Voles
- Water Vole tunnel entrances
- Water Vole "lawns"
- Water Vole feeding stations
- Water Vole latrines
- Waterside paths
- Runs in vegetation
- Water Vole footprints
- Sounds of Water Voles 'plopping' into the water

4.5.2. The suitability of the existing habitats on site, as water vole breeding and foraging habitat, was assessed.

4.6. Bat Survey

4.6.1. Whilst completing the extended phase I habitat survey a preliminary bat roost assessment was undertaken in accordance with best practice guidelines (Collins 2016 and Hundt, 2012).

4.6.1. Tree Assessment Survey

4.6.1.1. Trees within or immediately adjacent to the site were assessed for their potential to support roosting bats in accordance with best practice guidelines (Collins 2016 and Hundt, 2012). The trees were examined from the ground using binoculars and a high-powered torch where appropriate to look for any potential roost features (PRF's) such as natural holes, woodpecker holes, cracks/splits in major limbs, loose bark, thick stemmed ivy growth, hollows/cavities and within dense epicormic growths. The trees were classified according to the criteria detailed in Table 1 below, based upon the visible PRF's identified during the ground levels survey. For extensive areas of woodland, where all trees could not be fully checked the woodland as a whole, was assessed for its potential for roosting bats based upon the overall age and character of the trees present.

Table 1—Criteria for bat roost potential assessment of trees (based on Collins 2016 and Hundt, 2012)

Tree Category	Description
Confirmed	Tree with features confirmed to be used by roosting bats either by historic records (verified appropriately), or evidence recorded during survey.
High	Tree with many suitable PRF's capable of supporting larger roosts. The tree is located within habitat that is connected to wider landscape by strong linear features that may be used by commuting bats e.g. river valley, streams and hedgerows.
Moderate	Tree with definite bat roost potential but with fewer larger PRF's or several PRF's with the potential to be used by individual/small numbers of bats. Surrounding area includes good quality foraging habitat for bats e.g. broadleaved woodland, tree-lined watercourses and grazed parkland; or tree with highly suitable features though its context is less optimal.
Low	Tree with less PRF's capable of supporting only individual/small numbers of bats within a suboptimal location; tree in suitable habitat and of a size and age that elevated surveys are considered likely to result in cracks or crevices being found; or tree with definite bat roost potential which is isolated and within low quality foraging habitat meaning that the presence of a roost is considered less likely.
Negligible	Tree with no visible PRF's, or very few or minor features in an isolated/unsuitable location such that the presence of a roost is considered highly improbable e.g. isolated from suitable foraging or commuting habitats.

4.6.2. Buildings Assessment Survey

4.6.2.1. Buildings within the site were visually assessed from ground level for potential roost features (PRF's) and evidence of bat activity using binoculars to view upper floor areas and roofs along with a one million candlepower torch to aid visibility.

4.6.2.2. The external ground level survey sought to identify features that could be used by roosting bats such as small gaps in the pointing and brickwork, gaps around barge/soffit/fascia boards, raised or missing ridge tiles and gaps at gable ends, all of which provide potential access points for roosting bats. Evidence of use by bats included the presence of a live or dead bat, accumulations of bat droppings, feeding remains or urine staining. The presence of cobwebs, bird nests and general detritus within PRF's was taken as an indication that they were unlikely to be used by bats.

4.6.2.3. Where safe internal access was possible, buildings were thoroughly examined for any evidence of bat activity including looking for live or dead bats, droppings, feeding remains or staining. Specifically, the visual survey involved looking for the following evidence:

- Bat droppings on walls, windowsills and in roof spaces
- Scratch marks and staining on beams, other internal structures and potential entrance and exit holes
- Wing fragments of butterfly and moth species underneath beams and other internal structures

- The presence of dense spider webs at a potential roost can often indicate absence of bats
- Examination of crevices and cracks in the buildings to assess their importance for roosting bats

4.6.2.4. Buildings are classified as having high, medium, low or negligible risk for containing bat roosts based upon the type and construction of the building, the number and quality of potential roost features present, and the building position in relation to the surrounding environment. Table 2 below summarises the criteria used for bat roost potential assessment of buildings.

4.6.2.5. A high risk building would typically be an older building with a several potential roost features and perhaps limited evidence of bat activity such as feeding remains or small amounts of droppings and will be situated close to high quality bat foraging habitats such as woodland.

4.6.2.6. Negligible risk buildings will typically be of modern, well-sealed construction with no or very few potential roost features often located within an area of poor quality habitat such as urban environments.

Table 2—Criteria for bat roost potential assessment of buildings (based on interpretation of Collins 2016 and Hundt, 2012)

Low Risk	Medium Risk	High Risk
Modern well maintained buildings or structures with few PRF's	Poorly maintained modern or older buildings with a small number of PRF's visible during ground level surveys	Older buildings with several PRF's visible during ground levels surveys.
No easily identifiable PRF's such as gaps within stonework or between tiles.	Some PRF's visible. May be obscured by cobwebs or detritus.	Several PRF's visible.
No roof void	Small or cluttered roof void	Large roof void with unobstructed flying spaces
No external cavities such as crevices within wall or behind fascia boards	Few external cavities with those present of low suitability	A variety of external features offering a range of roosting locations
Located within areas of poor quality habitat, away from bat foraging or commuting routes	Area offering some habitat features likely to be used by bats	Good connectivity to high quality habitats
Not part of a group of buildings	Part of a group of buildings, all offering similar roosting opportunities	Part of a group of buildings offering a range of different conditions and potential roost locations
Heavily disturbed	Potential roosting locations suffering little disturbance	Building disused or little used, largely undisturbed

4.6.3. Habitat Assessment Survey

4.6.3.1. Habitat within and adjacent to the site boundary was assessed for its suitability for commuting and feeding bats in accordance with current guidance (Table 4.1 in Collins, 2016) with habitats categorised as having negligible, low, moderate or high suitability for commuting and feeding bats and are summarised in Table 3 below:

Table 3— Criteria for habitat suitability assessments (based on interpretation of Collins 2016 and Hundt, 2012)

Habitat Suitability	Description
High	Continuous high quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, stream, hedgerows, lines of trees and woodland edge. High quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree lined watercourses and grazed parkland Site is close to and connected to known roosts.
Moderate	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
Low	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream but isolated i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland setting) or a patch of scrub.
Negligible	Negligible habitat features on site likely to be used by commuting or foraging bats.

4.6.4. Roost presence/Likely Absence Survey

Emergence Survey Method

4.6.4.1. Emergence surveys are used to determine bat presence or likely absence in a tree or building and can also give a good estimate of the numbers present.

4.6.4.2. Survey times are selected to ensure that bats can be observed emerging from roosts' given that Common Pipistrelle *(Pipistrellus pipistrellus)* bats can emerge up to 30 minutes before sunset and Brown Long-eared *(Plecotus auritus)* may emerge up to an hour after sunset. These surveys will also record any foraging and commuting activity.

4.6.4.3. To ensure that all potential access points identified in the daytime visual inspection could be observed, experienced surveyors were positioned around the site each night.

4.6.4.4. Bat activity and species were identified by using some or all of the following:

- Bat box duet heterodyne/frequency division bat detector and Roland Edirol R-05 Digital Recorder
- Anabat SD1/SD2 frequency division bat detectors/recorder
- Echometer Touch Bat detector and recorder

4.6.4.5. To ensure that all PRF's identified in the daytime visual inspection could be observed, surveyors were carefully positioned around the site. Their locations are shown in Figure 3.

4.7. Wild Birds

4.7.1. Habitat within and adjacent to the site boundary was assessed for its suitability for nesting birds. Bird species seen or heard during the survey were recorded.

4.8. Amphibians

4.8.1. Habitat Suitability Index Assessment

4.8.1.1. All accessible water bodies within 500m of the site, which are not separated from the site by significant barriers to amphibian movement, were assessed for their suitability as aquatic habitat for Great Crested Newts (*Triturus cristatus*) (GCN) using the criteria in the HSI assessment method developed by Oldham et al (2000) and modified further by the Amphibian and Reptile Groups of the United Kingdom (ARG 2010).

4.8.1.2. An index score was calculated and compared to the scale shown in Table 4 below as a categorisation of pond suitability. The final column in the table shows field results of pond occupancy for the different suitability categories.

Table 4—Categorisation of HSI scores

HSI Score	Suitability	Proportion of ponds occupied
<5	Poor	0.03
0.5 – 0.59	Below Average	0.20
0.6 – 0.69	Average	0.55
0.7 – 0.79	Good	0.79
>0.8	Excellent	0.93

4.9. Reptiles

4.9.1. Any casual observations of reptiles within the site were recorded and the habitats within the site were assessed for their potential value for reptiles.

4.10. Limitation of Field Survey

4.10.1. The extended phase 1 habitat survey was undertaken on 6 March 2020 and 15 June 2021 with the latter visit within the period generally considered to be the optimal vegetation survey period (i.e. April to September). Given the timings of the survey and the nature of the habitats recorded on site it is considered that no limitations are present in the assessment of the site for protected/notable species and habitats. However, an extended phase 1 habitat survey does not comprise a full botanical assessment of all species present within a site; therefore species lists are indicative only.

4.10.2. The baseline conditions described in this report are accurate at the time at which the survey was undertaken. Should a considerable time pass (e.g. more than 2 years) and/or conditions/land-use on the site change prior to the commencement of works, it is recommended that an up-date survey is undertaken.

5. DESKTOP STUDY RESULTS

5.1. Introduction

5.1.1. The desk study results are summarised below and include a review of data provided by North and East Yorkshire Ecological Data Centre (NEYEDC).

5.1.2. Data older than 10 years is considered to be less important than more recent data due to the length of time that has elapsed since being collected (and the chance that they are no longer valid for a current assessment) and these have therefore been excluded from the protected species summary unless the historical records are the sole record for that particular species.

5.2. Designated Sites

5.2.1. Nature Conservation designations within 2km and 10km of the site are shown in Figure 2.

5.2.1. Statutory Designated Sites

5.2.1.1. The site is not covered by any statutory nature conservation designations and there are no sites covered by statutory nature conservation designations within 2km of the site boundary.

5.2.1.2. Within 10km of the site boundary are small areas of the North Pennine Dales Meadows Special Area of Conservation (SAC) whose underlying Site of Special Scientific Interest (SSSI) sites are Gingerfields SSSI and Richmond Meadows SSSI.

5.2.2. Non-Statutory Designated Sites

5.2.2.1. The site is not covered by any non-statutory nature conservation designations. However the desktop study data indicates notes that there are 9 Sites of Importance for Nature Conservation (SINC's) within 2km of the site boundary and these are summarised in Table 5 below.

Table 5—Non-Statutory Designations within 2km of the site

Site Name	Designation	Distance from Site at nearest point
Priest Gill	Deleted SINC	Adjacent to eastern boundary
Ravensworth Park – Castle Fetch	SINC	1.2km NE
Copper Mill Bridge Wood	SINC	1.3km SE
Copper Mill Bridge Verge	Deleted SINC	1.8km SE
Grassland at Kirby Hill & Wilfs Wood	SINC	450m SE
Swinery Wood	SINC	1.3km NW
Mill Beck/Throstle Gill Extension	SINC	1.8km NW
Park Wood	SINC	110m W
Sturdy House Lane Wood	SINC	1.7km SE

5.2.2.2. Site of Importance for Nature Conservation (SINC) is the term given to a non-statutory site in North Yorkshire. A SINC is designated on the basis of its ecological interest. SINC designation aims to identify and protect the most important nature conservation sites and features. SINC survey and designation also provides opportunities to contact SINC owners to offer help, advice and practical assistance with the management of these valuable sites.

5.2.2.3. North Yorkshire SINCs that have been deleted by the North Yorkshire and York SINC Panel have been surveyed and assessed against the SINC selection guidelines and found not to qualify. These sites are still listed in this report. In many cases just because a site has not met the high criteria for designation as a SINC it does not mean that it has no added value for wildlife. The SINC assessment is usually based on a botanical survey of the habitat and does rarely includes surveys for other taxa, including protected species, which the site may support. It may also be important for connectivity or as part of a wider habitat network. It may be possible to enhance the value of the site for wildlife with certain types of management, which could bring the site up to the standard required for designation as a SINC.

5.2.2.4. Park Wood SINC lies approximately 110m west of the site boundary and comprises areas of ancient, largely semi-natural woodland, parkland and scattered broad-leaved trees, semi-improved neutral grassland and running water extending to approximately 8.6ha. The canopy is often quite open and dominated by sessile oak *(Quercus petraea)* with areas of downy birch *(Betula pubescens)* and scattered rowan *(Sorbus aucuparia)*. The most open areas, in the extreme north western and eastern parts, have frequent sycamore *(Acer pseudoplatanus)*. As a result of long-term grazing, there is no appreciable understorey. The field layer consists mainly of large patches of great wood rush *(Luzula sylvatica)*, bluebell *(Hyacinthoides non-scripta)* or wavy hair grass *(Deschampsia flexuosa)*, with wood sorrel *(Oxalis acetosella)*. Some areas are quite rocky and mosses are abundant. Runnels, streams and flushes have a flora dominated by soft rush *(Juncus effusus)*, creeping buttercup *(Ranunculus repens)*, meadowsweet *(Filipendula ulmaria)*, stinging nettle *(Urtica dioica)* and opposite leaved golden saxifrage *(Chrysosplenium oppositifolium)*. Neutral grassland has frequent sorrel *(Rumex acetosa)*, lesser celandine *(Ranunculus ficaria)* and cleavers *(Galium aparine)*.

5.2.2.5. Notes from the North Yorkshire SINC Panel meeting in February 2006 Priest Gill deleted SINC 2006 simply say that the site has been deleted because it does not meet the guidelines. From the information available to NEYEDC, it appears that it is the hedgerows that have been identified as being of interest, but when they were surveyed, they did not meet the guidelines and this may provide an opportunity to add to their value by additional planting and improved management.

5.3. Protected Species

5.3.1. Bats

5.3.1.1. The desktop study did not identify any records of bats within 2km of the site boundary

5.3.2. Badgers

5.3.2.1. The desktop study did not identify any records of badgers *(Meles meles)* within 2km of the site boundary

5.3.3. Otters

5.3.3.1. The desktop study did not identify any records of otter *(Lutra lutra)* within 2km of the site boundary

5.3.4. Water Vole

5.3.4.1. The desktop study did not identify any records of water vole *(Arvicola amphibius)* within 2km of the site boundary

5.3.5. Wild Birds

5.3.5.1. The data provided by NEYEDC included 83 records for 41 species of bird with the majority of records (64-78%) being more than 10 years old.

5.3.5.2. None of the records related to the site.

5.3.5.3. The more recent records were from the villages of Gayles (3 records), Kirkby Hill (3 records) and Ravensworth (13 records). Notable records were of curlew *(Numenius arquata)* and oystercatcher *(Haematopus ostralegus)* from 1km grid square NZ1307 located north east of the site boundary.

5.3.6. Amphibians

5.3.6.1. The desktop study did not identify any records of amphibians within 2km of the site boundary.

5.3.7. Reptiles

5.3.7.1. The desktop study did not identify any records of reptiles within 2km of the site boundary.

5.3.8. Non-native Invasive Species

5.3.8.1. The data provided by NEYEDC identified a single record of Indian balsam *(Impatiens glandulifera)* for Dalton village approximately 2.12km north west of the site boundary.

6. SURVEY RESULTS

6.1. Introduction

6.1.1. The results of the extended phase 1 habitat and protected species survey are presented below. An extended phase 1 habitat survey map is shown within Figure 2 and illustrates the location and extent of all habitat types recorded on Site, with notable features or features too small to map highlighted using Target Notes (TN). A list of species recorded on the Site is included in Appendix 1.

6.2. Habitat Descriptions

6.2.1. The following Phase 1 habitat types (JNCC codes in parenthesis) were recorded on site during the field survey:

- Dense Scrub (A2.1);
- Scattered trees (A3);
- Unimproved Neutral Grassland (B2.1);
- Semi-improved Grassland (B2.2);
- Semi-improved Acid Grassland (B1.2);
- Continuous Dense Bracken (C1.1);
- Tall Ruderal Vegetation (C3.1);
- Acid Dry Dwarf Shrub Heath (D1.1);
- Running Water (G2);
- Quarry Edge (I1.1);
- Hedgerows (J2); and,
- Bare Ground (J4)

6.2.1. Dense Scrub (A2.1)

6.2.1.1. Lage parts of the site are covered with dense gorse *(Ulex europaeus)* scrub, especially on well drained sloping ground to the north and around the former quarry tops **(TN3 and TN4)**. The cover of gorse is variable with dense patches supporting little ground vegetation to more open patches with neutral grassland ground cover. Other scrub species present included occasional hawthorn *(Crataegus monogyna)*, silver birch *(Betula pendula)* and broom *(Cytisus scoparius)* with some bramble *(Rubus fruticosus agg.)* underscrub constant throughout. Species associated with these areas included common bent *(Agrostis capillaris)*, sweet vernal-grass *(Anthoxanthum odoratum)*, false oat-grass *(Arrhenatherum elatius)*, Yorkshire fog *(Holcus lanatus)*, dandelion *(Taraxacum officinale agg.)*, white clover *(Trifolium repens)* and locally abundant common nettle *(Urtica*

dioica). Around the margins the adjacent bracken *(Pteridium aquilinum)* was present.

Photograph 1—Gorse and hawthorn scrub on quarry slopes

6.2.1.2. Around the old quarry margins the scrub contained more hawthorn and her in shady conditions some woodland ground flora species were present at typically low abundance including herb Robert *(Geranium robertianum)*, red campion *(Silene dioica)*, wood sorrel *(Oxalis acetosella)*, broad-buckler fern *(Dryopteris dilitata)*, male fern *(Dryopteris filix-mas)*, lesser celandine *(Ficaria verna)* and bluebell *(Hyacinthoides non-scripta)*.

Photograph 2—Shaded quarry slopes with hawthorn scrub

6.2.2. Scattered trees (A3)

6.2.2.1. Within the site are number of scattered trees including, including a large sycamore *(Acer pseudoplatanus)* **(T3)** within the base of the quarry and another large sycamore to the north **(T2)**.

Photograph 3 and 4 —Trees T2 (left) and T3 (right)

6.2.2.2. The remaining trees were all smaller in size and comprised sycamore, ash, holly, goat willow *(Salix caprea)*, rowan *(Sorbus aucuparia)*, mature hawthorn and elder.

6.2.3. Unimproved Neutral Grassland (B2.1)

6.2.3.1. A small area of unimproved neutral grassland is found in the north east portion of the site just outside of the proposed development boundary **(TN1)**. Here the vegetation comprises a range of grasses including common bent, sweet vernal-grass, red fescue *(Festuca rubra)*, Yorkshire fog, cock's-foot *(Dactylis glomerata)* and perennial rye-grass *(Lolium perenne)* with some false oat-grass around the margins. Other species here included invading bracken and an area of dense soft rush *(Juncus effusus)* along a damp seepage line with occasional marsh thistle *(Cirsium palustre)* and tufted hair-grass *(Deschampsia cespitosa)*.

6.2.3.2. Other species included common mouse-ear *(Cerastium fontanum)*, cat's-ear *(Hypochaeris radicata)*, common bird's-foot-trefoil *(Lotus corniculatus)*, ribwort plantain *(Plantago lanceolata)*, pignut *(Conopodium majus)*, tormentil *(Potentilla erecta)*, creeping cinquefoil *(Potentilla reptans)*, creeping buttercup *(Ranunculus repens)*, common sorrel *(Rumex acetosa)*, Dandelion, red clover *(Trifolium pratense)*, white clover and germander speedwell *(Veronica chamaedrys)* with less frequent smooth hawk's-beard *(Crepis capillaris)*, wild strawberry *(Fragaria vesca)*, hogweed *(Heracleum sphondylium)*, ox-eye daisy *(Leucanthemum vulgare)* and selfheal *(Prunella vulgaris)*.

Photograph 5—Slope towards TN2 with soft rush dominated seepage line visible

6.2.3.3. Bracken is beginning to invade the grassland from the south and west and at the base of the slope is frequent gorse and hawthorn scrub and several old holly *(Ilex aquifolium)* trees.

6.2.4. Semi-improved Grassland (B2.2)

6.2.4.1. Much of the grassland surrounding the former quarry to the south is cattle grazed at low intensity and comprises areas of generally species poor semi-improved agricultural grassland **(TN7 and TN8)** with several seepage lines supporting stands of soft rush, with more extensive stands on damper ground to the south of the site boundary **(TN8)**.

6.2.4.2. Species here included abundant perennial rye-grass, crested dog's-tail *(Cynosurus cristatus)*, sweet vernal-grass, common bent and red fescue with localised stands of Yorkshire fog, cock's-foot and false oat grass. Broad-leaved species were typically at low abundance and included creeping buttercup, white clover, cat's-ear, ribwort plantain, selfheal, common sorrel and localised patches of greater plantain *(Plantago major)* around heavily trafficked areas such as at gate enhances.

6.2.4.3. Along the eastern site boundary **(TN9)** is a small area of wetter grazed grassland and here hairy sedge *(Carex hirta)*, glaucous sedge *(Carex flacca)* was locally frequent and the ward included small populations of pignut, yellow sedge *(Carex flava agg.)* and cuckooflower *(Cardamine pratensis)*.

Photograph 6—Semi-improved grassland with soft rush in damper areas

6.2.5. Semi-improved Acid Grassland (B1.2)

6.2.5.1. Small patches of semi-improved acid grassland are found in the base of the quarry **(TN10)** with a much larger area of grazed acid grassland extending outside of the site boundary to the north west **(TN6)**.

6.2.5.2. The area in the base of the quarry **(TN10)** comprised sparse grassland with areas of bare ground and revegetating bare ground. Species here included common bent, red fescue, sheep's fescue *(Festuca ovina)*, sweet vernal-grass and some Yorkshire fog, with less frequent Velvet bent *(Agrostis canina)*, wavy hair-grass *(Deschampsia flexuosa)* and crested dog's-tail. Associated species included thyme-leaved sandwort *(Arenaria serpyllifolia)*, heath bedstraw *(Galium saxatile)*, cat's-ear, field woodrush *(Luzula campestris)*, locally frequent mouse-eared hawkweed *(Pilosella officinarum)* and sheep's sorrel *(Rumex acetosella)*, tormentil, procumbent pearlwort *(Sagina procumbens)*, dandelion, red clover, white clover and thyme-leaved speedwell *(Veronica serpyllifolia)*.

6.2.5.3. The grassland in the north west of the site **(TN6)** was grassed by cattle and supported a less diverse sward with grasses such as common bent, red fescue, sheep's fescue, sweet vernal-grass dominating with Yorkshire fog, perennial rye-grass and crested dog's-tail present and less wavy hair-grass. Broad-leaved species were less abundant and less diverse with tormentil, heath bedstraw as much lower abundance and thyme-leaved sandwort absent.

Photograph 7—Acid grassland in base of quarry (TN10)

6.2.5.4. Other species were more frequently encountered and included common mouse-ear, yarrow *(Achillea millefolium)*, creeping thistle *(Cirsium arvense)* and ribwort plantain.

6.2.6. Continuous Dense Bracken (C1.1)

6.2.6.1. Large parts of the site that have been previous disturbed through quarrying operations supported dense stands of bracken where this species was total dominant and all other species were sub-ordinate and included common bent, sweet vernal-grass, Yorkshire fog, heath bedstraw, tormentil, sheep's sorrel, creeping thistle, cat's-ear, bramble, common nettle and gorse.

Photograph 8—bracken dominated vegetation on northern slopes

6.2.6.2. In some areas ruderal species such as common nettle and creeping thistle are co-dominant with the bracken and occasional plants of broad buckler fern are also present. Bramble too is often co-dominant with the bracken vegetation and her coarse grasses including false oat grass and cock's-foot are also recorded.

6.2.7. Tall Ruderal Vegetation (C3.1)

6.2.7.1. Ruderal vegetation was encountered on disturbed soils around the site **(TN2 and TN12)** and typically comprised open stands of common nettle and creeping thistle with a range of coarse grasses including Yorkshire fog, cock's-foot and common couch *(Elytrigia repens)* along with some common bent, red fescue and sweet vernal-grass. Other species included robust perennials such as broad-leaved dock *(Rumex obtusifolius)*, rosebay willowherb *(Chamerion angustifolium)*, hogweed and ragwort *(Senecio jacobaea)*, along with occasional mugwort *(Artemisia vulgaris)*, spear thistle *(Cirsium vulgare)*, black medick *(Medicago lupulina)*, colt's-foot *(Tussilago farfara)*.

6.2.8. Acid Dry Dwarf Shrub Heath (D1.1)

6.2.8.1. A small area of developing heathland was recorded on the steeply sloping north facing bank of a farm access track **(TN5)**.

Photograph 9—Developing heathland at TN5

6.2.8.2. Species here were those found in the adjacent acid grassland and included common bent, velvet bent, fed fescue, sweet vernal-grass and sheep's fescue but with an increased abundance of wavy hair grass and occasional mat grass *(Nardus stricta)*. Within this sward were frequent young

developing plants of heather *(Calluna vulgaris)* and bilberry *(Vaccinium myrtillus)*. Other species present included tormentil, heath bedstraw, and occasional plants of hard fern *(Blechnum spicant)*.

6.2.9. Running Water (G2)

6.2.9.1. A small stream runs just outside of the norther eastern site boundary (TN1) and supported a small population of monkey flower *(Mimulus guttatus)* along the banks with brooklime *(Veronica beccabunga)*, soft rush, hard rush *(Juncus inflexus)*, creeping bent *(Agrostis stolonifera)*, creeping buttercup, and some invading bracken.

6.2.10. Quarry Edge (I1.1)

6.2.10.1. A small section of exposed sandstone quarry face is present to the north of TN10. The cliff is vertical and contains broad buckler fern, foxglove, ragwort *(Senecio jacobaea)*, common bent and common nettle along with young saplings of sycamore, hawthorn and rowan with bramble scrambling down from above and a small number of plants of hard fern and male fern.

Photograph 10—Sandstone Quarry Face

6.2.11. Hedgerows (J2)

6.2.11.1. A mature unmanaged gappy hedgerow **(H1)** runs along the easter site boundary and lies with the now deleted Priest Gill SINC.

6.2.11.2. The hedgerow is predominantly hawthorn and contains a number of larger trees including pedunculate oak *(Quercus robur)*, ash *(Fraxinus excelsior)*, sycamore *(Acer pseudoplatanus)*, goat willow *(Salix caprea)*, and rowan *(Sorbus aucuparia)* with frequent dog rose *(Rosa canina agg.)* and

occasional elder *(Sambucus nigra)* with honeysuckle *(Lonicera periclymenum)* straggling through the canopy along with ivy *(Hedera helix)*.

6.2.11.3. The ground vegetation on the roadside verge was moderately species rich and included false oat-grass, dock's-foot, Yorkshire fog, red fescue, common bent and crested dog's-tail. Broadleaved species were frequent, at moderately high abundance and included red campion, hedger woundwort *(Stachys sylvatica)*, crosswort *(Cruciata laevipes)*, creeping buttercup, common bird's-foot-trefoil, common knapweed *(Centaurea nigra)*, ox-eye daisy, wood avens *(Geum urbanum)*, water avens *(Geum rivale)*, hedge bedstraw *(Gallium mollugo)*, greater stitchwort *(Stellaria holostea)*, broad-buckler fern, cow parsley *(Anthriscus sylvestris)* and hogweed along with dense stands of common nettle and bramble underscrub.

Photograph 11—Hedgerow H1 along eastern site boundary

6.2.12. Bare Ground (J4)

6.2.12.1. Small patches of bare ground are present throughout the site along tracks and with the base of the quarry. The vegetation her is an open mosaic of developing neutral and acid grassland with abundant ruderal species.

6.2.12.2. Species here included a range of grasses such as Yorkshire fog, common bent, cock's-foot, red fescue and sweet vernal-grass along with some foxglove *(Digitalis purpurea)*, annual meadow-grass *(Poa annua)*, common mouse-ear, common chickweed *(Stellaria media)*, groundsel *(Senecio vulgaris)*, thyme-leaved sandwort, knotgrass *(Polygonum aviculare agg.)*, lesser trefoil *(Trifolium dubium)*, white clover, colt's-foot, common nettle, bracken and creeping thistle.

Photograph 12—Revegetating bare ground in quarry

6.3. Protected Species

6.3.1. Bats

Trees

6.3.1.1. The site does not contain any large trees with potential value to roosting bats. There are several trees present and these were observed carefully from the ground using close focussing binoculars and no PRF's were noted.

Buildings

6.3.1.2. There are no buildings present within the site.

6.3.1.3. However there is a small stone archway under the existing farm access track **(TN2)**. Entry was considered dangerous but the arch structure was observed with close focussing binoculars. Internally the conditions were damp and wet with few potential roost access points. The track above the bridge is used on a daily basis by the farmer whose cattle currently graze the site and accordingly the feature was assessed to have low potential value for roosting bats in compliance with current guidance a single emergence survey was completed on the evening of 15 June 2021.

Habitats

6.3.1.4. The site is located in a landscape of grazed pasture with some areas of woodland, the largest being Park Wood SINC to the west of the site and to which the site is poorly linked by areas of open agricultural grassland and gorse scrub. The eastern site boundary has a gappy but grown out hedgerow which runs for some distance to the north and south with links to

the now deleted Priest Gill SINC and the Grassland at Kirby Hill & Wilfs Wood SINC.

Photograph 13—Archway under existing farm track (TN2)

Roost Presence/likely Absence

6.3.1.5. The roost presence absence survey commenced at 21.15 and finished at 23.00 the weather was mild and still with a temperature of 16^0C at the start of the survey falling to 15^0C at the end of the survey

6.3.1.6. No bats were observed to exit from the archway structure. No bats were observed within the site boundary.

6.3.1.7. However on leaving the site a single common pipistrelle *(Pipistrellus pipistrellus)* was observed feeding along the lane to the east of the site along hedgerow **H1** for several minutes from 23.05 with a number of feeding buzzes recorded. The bat eventually left to the north towards Quarry House.

6.3.2. Badgers

6.3.2.1. No badger setts were recorded within or immediately adjacent to site.

6.3.2.2. No evidence of badger foraging activity was recorded during the field survey.

6.3.3. Otters

6.3.3.1. The site does not contain any habitats of potential value to otter *(Lutra lutra)*, no evidence of otter activity was recorded during the field survey.

6.3.4. Water Vole

6.3.4.1. The site does not contain any habitats of potential value to water vole *(Arvicola amphibius)*, no evidence of water vole activity was recorded during the field survey.

6.3.5. Wild Birds

6.3.5.1. Birds within the site were noted during the survey and included chaffinch *(Fringilla coelebs)*, wren *(Troglodytes troglodytes)*, robin *(Erithacus rubecula)*, blackbird *(Turdus merula)*, chiffchaff *(Phylloscopus collybita)*, willow warbler *(Phylloscopus trochilus)* and blue tit *(Cyanistes caeruleus)*.

6.3.5.2. To the south of the site on the open rush dominated grassland curlew (Numenius arquata), oystercatcher (Haematopus ostralegus) and lapwing (Vanellus vanellus) were heard calling and seen displaying suggesting all three species were breeding south of the site boundary and this was confirmed by the tenant farmer.

6.3.6. Amphibians

6.3.6.1. The site does not contain any ponds suitable for breeding amphibians including great crested newts *(Triturus cristatus)* and no amphibians were recorded during the field survey.

6.3.6.2. Examination of OS maps and satellite imagery indicates that there are no ponds located within 500m of the site boundary that are connected to the site by areas of suitable terrestrial habitat.

6.3.7. Reptiles

6.3.7.1. No reptiles were observed during the field survey.

6.3.7.2. However the site contains a number of habitats of potential value to reptiles including piles of quarry waste, bare ground and open grassland, scrub, bracken dominated vegetation and accessible quarry faces.

6.3.8. Non-Native Invasive Species

6.3.8.1. A small population of the neophyte species Monkeyflower was recorded in the stream to the north of the site boundary.

7. EVALUATION OF SURVEY RESULTS

7.1. Overall Approach to Assessment

7.1.1. Ecological impact assessment is a process of identifying and evaluating important ecological features including habitats, species and ecosystems which may potentially be impacted either positively or negatively by a proposed development or change in a sites management and quantifying the scale and nature of the effects.

7.1.2. The overall approach to assessment adopted by the study team is based upon the Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater and Coastal published by the Chartered Institute of Ecological and Environmental Management (CIEEM 2018) and the key principles of the EcIA approach advocated by CIEEM are:

Avoidance	Seek options that avoid harm to ecological features (for example, by locating on an alternative site).
Mitigation	Adverse effects should be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed – for example, through a condition or planning obligation.
Compensation	Where there are significant residual adverse ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures.
Enhancements	Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation or compensation

7.1.3. To comply with these key principles the approach to the assessment can be summarised as below:

1. To identify the likely zone of influence (study area) arising from the whole lifespan of the project;
2. To identify and value the features of nature conservation interest (species, habitats and ecosystems) within the ecological study area in a systematic way by establishing levels of interest for ecological features measured against definable criteria.
3. To identify the biophysical changes attributable to the project that are likely to affect valued ecological features and resources;
4. To assess whether these biophysical changes are likely to give rise to a significant ecological impact, defined as an impact on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographical area, including cumulative and in-combination impacts;

5. To consider appropriate refinement of the project to avoid or reduce identified negative impacts and incorporate mitigation measures and/or compensation measures for any residual significant negative impacts and ecological enhancement measures to improve the wider environment;
6. To undertake an assessment of the ecological impacts of the refined project and definition of the significance of these impacts, including cumulative and in-combination impacts;
7. To provide advice on the consequences for decision making of the significant ecological impacts, based on the value of the resource, feature or function; and,
8. Where appropriate to make recommendations for monitoring the implementation and success of mitigation and compensation measures and ecological outcomes, including feedback in relation to predicted outcomes.

7.2. Determining Value

7.2.1. Various characteristics can contribute to the importance of ecological features. Examples given by CIEEM include:

- naturalness
- animal or plant species, sub-species or varieties that are rare or uncommon, either
- internationally, nationally or more locally, including those that may be seasonally transient
- ecosystems and their component parts, which provide the habitats required by important species, populations and/or assemblages
- endemic species or locally distinct sub-populations of a species
- habitats that are rare or uncommon
- habitats that are effectively irreplaceable
- habitat diversity
- size of habitat or species population
- habitat connectivity and/or synergistic associations
- habitats and species in decline
- rich assemblages of plants and animals
- large populations of species or concentrations of species considered uncommon or threatened in a wider context
- plant communities (and their associated animals) that are considered to be typical of valued natural/semi-natural vegetation types, including examples of naturally species-poor communities

- species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change.

7.2.2. The CIEEM guidelines advocates an approach to the valuation of ecological features using a geographical framework (full details in Appendix 3) based upon the following:

- International;
- National; (i.e. England/Northern Ireland/Scotland/Wales)
- Regional;
- County/Metropolitan
- District/Unitary Authority/City or Borough
- River Basin District
- Estuarine system/Coastal cell
- Local/Parish
- Within zone of influence only

7.2.3. The thorough evaluation of the ecological importance of the features of a site is essential in order to assess the significance of the ecological effects of the development proposals.

7.2.4. The evaluation criteria are given in detail in Appendix 2. Their aim is to consider the habitats, communities and species present on site in relation to the following:

1. The legislative framework (e.g. the Wildlife and Countryside Act 1981 and the EC Directive on the Conservation of Habitats and Wild Fauna and Flora (92/43/EEC) for the presence of protected species and habitats).
2. Nature conservation designations, including national site designations (Sites of Special Scientific Interest, National Nature Reserves etc), local designations (Sites of Importance for Nature Conservation, Local Nature Reserves, County Wildlife Sites etc).
3. Accepted criteria for species rarity and declining populations, and rarity of habitat types or communities, including species and habitats identified in the British Red Data Books, national biodiversity action plan, and species and habitats identified in regional or local biodiversity action plans where available.
4. Accepted criteria for overall site evaluation (including rarity, diversity, naturalness, historical factors and issues relating to landscape ecology).

7.3. Development Impacts

7.3.1. The quarry will be developed in four loose phases and these are summarised in table 6 below

Table 6—Summary of Development Impacts

Phase	Works Proposed	Habitat Losses	Habitat Creation
Enabling Works	Creation of new site access at south east corner of site and creation of flat working area at quarry base	Loss of areas of semi-improved grassland, acid grassland, gorse scrub, ruderal vegetation and small areas of acid grassland/bare ground. Loss of trees T14-T21 and T2 and T3	Bunds to north of site increased in height to screen the development. Outer slopes to be seeded with Emorsgate EG26 Standard Old Fashioned Grazing Mixture or EM10 Tussock mixture (or similar) and inner slopes to be allowed to revegetate naturally. The batters of the road cutting would also be seeded with EG26 or EM10 mix as detailed above. The land to the east of Phase A will be managed for conservation and landscape purposes. This will involve additional tree and shrub planting to improve the existing hedgerow and low level grazing or cutting regime.
Phase A	Quarrying of phase A	Loss of gorse scrub, semi-improved neutral grassland, bracken dominated vegetation	The top of the quarry void faces will be reduced in angle, soiled and then seeded with the mix detailed above
Phase B	Quarrying of Phase B	Loss of semi-improved neutral grassland, bracken dominated vegetation and gorse and hawthorn scrub with woodland ground flora	Restoration of phase A commences with waster material from phase b to rise back to existing ground levels and then re-seeded with a mix to complement the land to the east. This would either be EG26 or a Emorsgate EM1 Basic general purpose meadow mix. The top of the quarry void faced will be reduced in angle, then soiled and seeded as set out above.
Phase C	Quarrying of Phase B	Loss of semi-improved neutral grassland,	Restoration of phase be commenced but be competed at the end of quarrying phase C when restoration of this area also commences. Finished ground levels to slope back towards the top of the southern quarry face and to be re-seeded with Emorsgate EMI Standard General Purposes Meadow Mixture

7.3.2. The quarry operations will result in the loss of all habitats with the site boundary with the exception of a strip of semi-improved neutral grassland along the eastern site boundary and areas of acid grassland and acid dry dwarf shrub heath in the north west corner of the site.

7.3.3. Habitat losses are summarised in table 7 below.

Table 7—Summary of Habitat Losses

Habitat Type	Habitat Loss (ha)	Habitat Retained (ha)
Dense scrub	0.65	0.00
Semi-improved neutral grassland	1.51	0.38
Neutral Grassland with scattered bracken	0.14	0.05
Semi-improved acid grassland	0.45	0.36
Continuous bracken	1.30	0.00
Tall ruderal vegetation	0.12	0.00
Totals	4.17	0.79

7.3.4. Areas of habitat that are retained will be managed during the life of the quarry operations to maintain or enhance their ecological value.

7.3.5. No significant off-site impacts are predicted. Dust suppression will be implemented under an approved Construction and Environmental Management Plan (CEMP).

7.3.6. The proposed landscape restoration scheme is set out in Figure 4 Restoration Strategy in the landscape and visual Impact Assessment and shows that the final restored site will have significantly more ecological value than the habitats that it will replace such as the extensive areas of bracken dominated vegetation and includes the creation of a wide range of important ecological habitats including:

- Revegetation bare ground and open mosaic habitats on retained screening bunds to include areas of flower rich neutral grassland
- Flower rich grazing meadows on restored southern slopes
- Heathland creation on screening bund above phases B and C
- Tree and shrub planting adjacent to the eastern site boundary to improve the quality of the existing hedgerow.

7.3.7. Table b below quantifies the habitats created after site restoration.

Table 8—Habits after Site Restoration

Item	Restored/retained Area/ha
Tip area restore to acid grassland and heathland	0.09
Screening bund restored to heathland	0.13
Retained acid grassland and heathland	0.35
Retained and Managed Neutral Grassland	0.42
North facing bund restored to wildflower grassland at commencement	0.43
Open mosaic habitat created through natural revegetation with varied topography	0.87
Restored Wildflower Grassland on restored quarry workings	2.69
Total	4.96

7.4. Designation

7.4.1. Statutory Designations

7.4.1.1. The site is not covered by any statutory nature conservation designations and there are no sites covered by statutory nature conservation designations within 2km of the site boundary.

7.4.1.2. There are no sites covered by European or International nature conservation designations within 2km of the site boundary.

7.4.1.3. However within 10km of the site boundary are small areas of the North Pennine Dales Meadows Special Area of Conservation (SAC) whose underlying Site of Special Scientific Interest (SSSI) sites are Gingerfields SSSI and Richmond Meadows SSSI and are located approximately 5km south of the site boundary.

7.4.1.4. There will be no significant off-site impacts arising from the quarry operations, **no** impacts upon designated sites are predicted and **no** further survey and assessment work are recommended.

7.4.2. Non-Statutory Designations

7.4.2.1. The site is not covered by any non-statutory nature conservation designations. However the desktop study data indicates notes that there are 9 Sites of Importance for Nature Conservation (SINC's) within 2km of the site boundary

7.4.2.2. The closes site to the site boundary are Park Wood SINC which is approximately 110m west of the site boundary and Grassland at Kirby Hill & Wilfs Wood SINC located approximately 450m south east of the site boundary

7.4.2.3. None of these designated sites would be directly affected by the development proposals and no significant off-site impacts are predicted given the distanced between them and the site boundary and the nature of the development proposed.

7.4.2.4. **No** impacts upon designated sites are predicted and **no** further survey and assessment work are recommended.

7.5. Habitats

7.5.1. The site supports a range of habitats some of which are quite species poor and widely distributed including gorse and hawthorn scrub, ruderal vegetation, semi-improved neutral grassland, species poor unimproved neutral grassland and bracken dominated vegetation. These habitats support a limited range of common and widespread species and their

losses would only be felt with the zone of influence of the proposed quarry development.

7.5.2. The small area of developing heathland will be largely retained with just a small area lost at its northern end to accommodate the construction of a low screening bund for phases B and C. This screening bund would be seeded with a heathland mix and protected during the life of the quarry and retained at the end of quarrying operations and this will increase the area of heathland by approximately 50%.

7.5.3. The site also supports areas of lowland acid (acid grassland below 300m), and this is a habitat of Principal Importance in England in Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Approximately 58% of the habitat within the site boundary would be lost to the quarrying operations.

7.5.4. A further assessment of impacts arising from the loss of 0.45ha of lowland acid grassland is required and this is presented in Section 8 of this EcIA.

7.6. Protected Species

7.6.1. Bats

7.6.1.1. All UK species of bat are afforded full protection under Section 9 of the Wildlife and Countryside Act 1981 (as amended) through their inclusion on Schedule 5 of the Act and also receive full protection as European Protected Species under Section 41 of The Conservation of Habitats and Species Regulations 2017 through their inclusion on Schedule 2.

Buildings

7.6.1.2. The site does not contain any buildings of potential value to roosting bats. The Archway under the existing access track was assessed to have low potential value for roosting bast and a single emergence survey completed on 15 June 2021 did not record any bats emerging from the archway or within the site boundary in the vicinity of the archway.

7.6.1.3. In any case the archway will be retained and protected during quarrying operations and will not bs used for quarry traffic which will use the proposed new access at the south of the site.

7.6.1.4. **No** significant impacts upon roosting bats in buildings or other structures are predicted and **no** further survey and assessment work is recommended.

Trees

7.6.1.5. The site does not contain any trees of potential value to roosting bats

7.6.1.6. **No** significant impacts upon roosting bats in trees are predicted and **no** further survey and assessment work is recommended.

Habitats

7.6.1.7. The habitats within the site provide sheltered conditions for foraging bats and sheltered feeding conditions will remain throughout the quarrying operations with the retention of vegetation around the quarry margins and as a result of progressive restoration of the site as quarrying operations proceed. The hedgerows along the lane to the east of the site would be retained and protected during the life of the quarry and will continue to provide foraging and commuting habitats for bats.

7.6.1.8. **No** significant impacts upon foraging or commuting bats are predicted and **no** further survey and assessment work is recommended.

7.6.2. Badgers

7.6.2.1. Badgers are protected under the Protection of Badgers Act 1992.

7.6.2.2. No badger setts were recorded within or immediately adjacent to site and no evidence of badger foraging activity was recorded during the field survey.

7.6.2.3. **No** impacts upon badgers are predicted and **no** further survey or assessment work is recommended

7.6.3. Otters

7.6.3.1. Otters are afforded full protection under Section 9 of the Wildlife and Countryside Act 1981 (as amended) through their inclusion on Schedule 5 of the Act and also receive full protection as European Protected Species under Section 41 of The Conservation of Habitats and Species Regulations 2017 through their inclusion on Schedule 2.

7.6.3.2. The site **does not** contain any habitats of potential value to otters, **no** evidence of otter activity was recorded during the field survey and the desktop study did **not** provide any records for this species within 2km of the site boundary. **No** impacts upon otter are predicted and **no** further survey or assessment work for otters is recommended.

7.6.4. Water Vole

7.6.4.1. Water vole is afforded full protection under Section 9 of the Wildlife and Countryside Act 1981 (as amended) through their inclusion on Schedule 5 of the Act.

7.6.4.2. The site **does not** contain any habitats of potential value to water vole, **no** evidence of water vole activity was recorded during the field survey and the desktop study did **not** provide any records for this species within 2km of the site boundary. **No** impacts upon water vole are predicted and **no** further survey or assessment work for water vole is recommended.

7.6.5. Breeding Birds

7.6.5.1. The site supports a limited range of breeding birds which are largely associated with the trees and scrub within the site. The site did not support significant numbers of birds and in any case, potential impacts upon nesting birds can be prevented during construction by ensuring that vegetation removal is programmed to occur outside of the bird nesting season (March to August inclusive) or where this is not possible under the supervision of a suitably qualified and experienced ecologist as set out in the recommendations below.

7.6.5.2. In contrast the rush pasture grasslands to the south of the site would appear to support breeding populations of oystercatcher, curlew and lapwing the latter two species are listed in the red list of Birds of Conservation Concern whilst Oystercatcher is listed in the amber list of birds of conservation concern. The habitats used by these birds will not be directly affected by the proposed quarry and the quarrying operations will be below the visible horizon from the south and this will limit disturbance of the birds.

7.6.5.3. **No** significant impacts upon nesting birds are predicted and **no** further ornithological survey work is recommended.

7.6.6. Amphibians

7.6.6.1. All UK native amphibians are afforded partial or full protection under Section 9 of the *Wildlife and Countryside Act 1981* (as amended) through their inclusion on Schedule 5 of the Act and Great Crested newts *(Triturus cristatus)* are provided the highest level of protection. Great crested newts (GCN) are fully protected from capture, injury, killing and damage or destruction of their breeding sites or resting places under The Conservation of Habitats and Species (as amended) Regulations 2017.

7.6.6.2. The site does not contain any ponds suitable for breeding amphibians including great crested newts and no amphibians were recorded during the field survey. No other ponds linked to the site by semi-natural vegetation were recorded and **no** impacts upon amphibians are predicted and **no** further survey work is recommended.

7.6.7. Reptiles

7.6.7.1. All species of native reptiles are protected under the Wildlife and Countryside Act 1981 (as amended). The sand lizard *(Lacerta agilis)* and smooth snake *(Coronella austriaca)* are further protected under Conservation of Habitats and Species (Amendment) Regulations 2017.

7.6.7.2. The desktop study did not identify any reptile records within 2km of the site boundary. However whilst the site is to a small degree isolated from surrounding areas of habitat, it does contain habitats of potential value to reptiles. Consequently it is recommended that to avoid offences being committed with regard to reptiles that the quarrying operations are completed in accordance with standard mitigation measures and under the guidance of a reasonable avoidance measures method statement which sets out methods of working and timing of works.

7.6.7.3. Furthermore it is recommended that the site restoration be designed to include features of known value to reptiles including leaving piles of quarry waste, bare ground and open mosaic habitats with scrub and tree planting.

7.6.7.4. **No** significant impacts upon reptiles are predicted and **no** further survey work is recommended.

7.6.8. Non-Native Invasive Species

7.6.8.1. No invasive non-native species have been recorded and **no** further survey work is recommended.

7.7. Evaluation Summary

7.7.1. The table below summarises the value of the ecological resource of the proposed development site.

Table 9—Summary of Ecological Evaluation and Initial Assessment

Item	Recommendations
Protected Sites	No further survey or assessment work required
Habitats	Impacts arising from the loss of acid grassland to be subject to further assessment.
Bats	No further survey or assessment work required
Badgers	No further survey or assessment work required
Otters	No further survey or assessment work required
Water Vole	No further survey or assessment work required

Item	Recommendations
Wild Birds	No further survey or assessment work required provided works are timed to avoid the bird nesting season (March to August inclusive) or completed under the supervision of a suitably experienced ecologist
Amphibians	No further survey or assessment work required
Reptiles	No further survey or assessment work required. Reasonable Avoidance Measures Method Statement to be prepared

8. ASSESSMENT OF POTENTIAL ECOLOGICAL IMPACTS

8.1. Impact Assessment Method

8.1.1. Effect Magnitude and Significance

8.1.1.1. Effects may be negative or positive. The characteristics of an effect involve several factors such as magnitude (e.g. number of individuals killed, total or partial loss of habitat structure and function), extent (the area over which it occurs), duration (the time over which the effect occurs), reversibility (whether the effect is temporary or permanent) and its timing/frequency. A level of confidence (e.g. certain/probable/unlikely) should be attached to both the occurrence of a predicted impact and the assessment of its ecological effect in accordance with the following:

Table 10—Impact Predication Confidence Levels

Probability of Impact occurring	Confidence Level
Certain/near-Certain	Probability estimated at 95% chance or higher.
Probable	Probability estimated above 50% but below 95%.
Unlikely	Probability estimated above 5% but less than 50%.
Extremely Unlikely	Probability estimated at less than 5%.

8.1.1.2. Consideration of the above characteristics leads to a determination of the significance of the effect and the probability of it occurring. The CIEEM (2018) guidance defines a significant impact as an effect "(negative or positive) on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a defined geographical area". The importance level of the ecological feature concerned then defines the geographical level at which the effect is significant, although it may also be the case that the effect could be considered significant at a lower geographical level than that at which the feature is important, depending on the magnitude of the effects.

8.1.1.3. The concept of integrity is applied principally to site/ecosystems and is defined as follows. "The integrity of a site is the coherence of its ecological structure and function across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of species for which it was classified" (Scottish Executive 2000). A site that achieves this coherence is said to be in favourable condition. Effects on the integrity of a site/ecosystem will move it towards (positive) or away from (negative) favourable condition by, for instance, changing or removing ecosystem processes; changing the nature, extent, structure and function of component habitats; or by changing the average population size or viability

of component species. Sites with international designations (SACs, SPAs) frequently have conservation objectives (or similar) against which likely changes (and hence potential effects on the site's integrity) should be assessed. SSSIs may also have similar criteria.

8.1.1.4. Guidance on considering a development proposal that might affect a European site is set out in the National Planning Policy Framework and *ODPM Circular 06/2005* (Government Circular: Biodiversity and Geological Conservation—Statutory Obligations and their Impact within the Planning System)

8.1.1.5. Where a proposal is not directly connected with or necessary to site management for nature conservation and the proposal is unlikely to have a significant effect on the internationally important interest features of the site, alone or in combination with other plans and projects, planning permission may be granted without the need for an appropriate assessment. The decision on whether an appropriate assessment is necessary should be made on a precautionary basis and an appropriate assessment is required where there is a probability or a risk that the plan or project will have significant effects on a site.

8.1.1.6. The CIEEM (2018) guidance also recommends that the concept of conservation status is used to determine whether effects are likely to be ecologically significant, using the following definitions:

- "for habitats, conservation status is determined by the sum of the influences acting on the habitat and its typical species, that may affect its long-term distribution, structure and functions as well as the long-term survival of its typical species within a given geographical area;
- "for species, conservation status is determined by the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within a given geographical area".

8.1.1.7. Potential effects on conservation status should be considered in the same way as potential effects on integrity.

8.1.1.8. The assessment process used determines the unmitigated impacts and their significance, considers appropriate mitigation, enhancement and compensation and finally makes an assessment of the significance of the residual impacts.

8.2. Selection of Features to be Assessed

8.2.1. After consideration of the baseline descriptions and the potential zone of influence of the proposed development and the identified effects, the ecological features selected for assessment are:

- Loss of Lowland Acid Grassland Habitats

8.3. Predicted Ecological Effects of the Development Proposals

8.3.1. In the absence of mitigation, enhancement or compensation the potential ecological effects of the proposed development can be summarised as follows:

- Loss of approximately 0.45ha (approximately 58% of the site resource) of lowland acid grassland

8.4. Significance of the Effects

8.4.1. Loss of Lowland Acid Grassland Habitats

Unmitigated Impacts and significance

8.4.1.1. The site supports areas of lowland acid grassland (acid grassland below 300m), listed as a habitat of Principal Importance in England in Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Approximately 58% of the habitat within the site boundary would be lost to the quarrying operations with the remaining areas retained and protected during the life of the quarry.

8.4.1.2. The is an area of approximately 0.19ha of acid grassland that lies outside of the site boundary but is contiguous with areas of acid grassland in the north west corner of the site and this would be protected during the life of the quarry.

8.4.1.3. It is **certain** that the unmitigated effects of the development would have a **negative effect** upon the site resource of lowland acid grassland and habitat list of Principal Importance in Section 41 of the NERC act 2006

Mitigation, Enhancement and Compensation

8.4.1.4. Areas of retained acid grassland would be protected during the life of the quarry and managed in their current form with a low level of livestock grazing.

8.4.1.5. As part of the progressive site restoration it is proposed that areas of acid grassland, open mosaic habitat with acid grassland and heathland will be created amounting to approximately 1.08ha a replacement of more than double the area lost.

8.4.1.6. The areas of new acid grassland and heathland (0.21ha) will be created on sloping ground by using nutrient poor, free draining sub-soil for the restoration and re-seeding with an appropriate acid grassland seed mix such as Emorsgate EM7 – meadow mixture for sandy soils or similar. These areas will be subject to low level livestock grazing once established. To speed up the heathland establishment, locally harvested heather and bilberry brash will be used along with the grassland mix to encourage establishment of these heathland species.

8.4.1.7. Areas of open dry acid grassland (0.87ha) will also be encouraged by re-grading the inner southern facing slopes of the northern bund during the final site restoration with some loose tipping of material to create a varied topography which will be allowed to re-vegetate naturally. This natural rewilding of this area will crate a mosaic of dry open habitats with areas of acid grassland and bare ground. This south facing aspect will also make the area attractive to a range of invertebrates, in particular aculeate Hymenoptera species and some areas of ground will be lightly compacted during the restoration to create suitable conditions for burrowing species.

Residual Significance of Impacts

8.4.1.8. The development will result in the temporary loss of 0.45ha of lowland acid grassland habitat whilst the restoration will create 0.21ha of a lowland acrid grassland and heathland habitat along with areas of open mosaic habitat (0.87ha) supporting open dry acid grassland, bare ground and ephemeral plant communities along with areas of open bare ground.

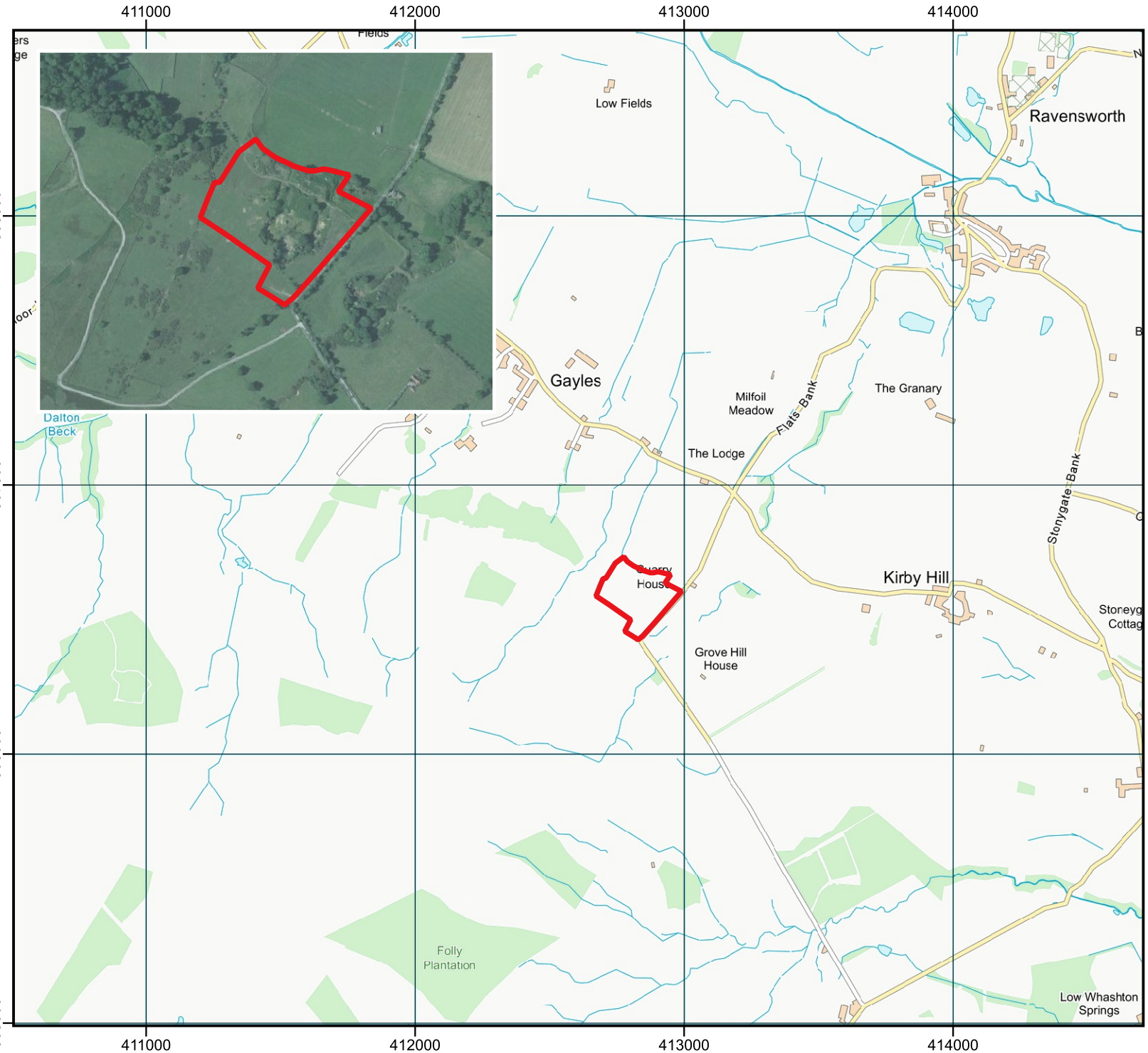
8.4.1.9. It is **certain** that if the site is restored sympathetically and in accordance with the proposals set out above that the development will have an overall slightly beneficial ecological impact.

9. FIGURES

Figure 1—Site Location

Figure 2—Designations

Figure 3—Phase 1 Habitats



Gayles Quarry, Richmond

KEY

Site Boundary

Scale: 1:20,000@A4

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5 Stamford Road
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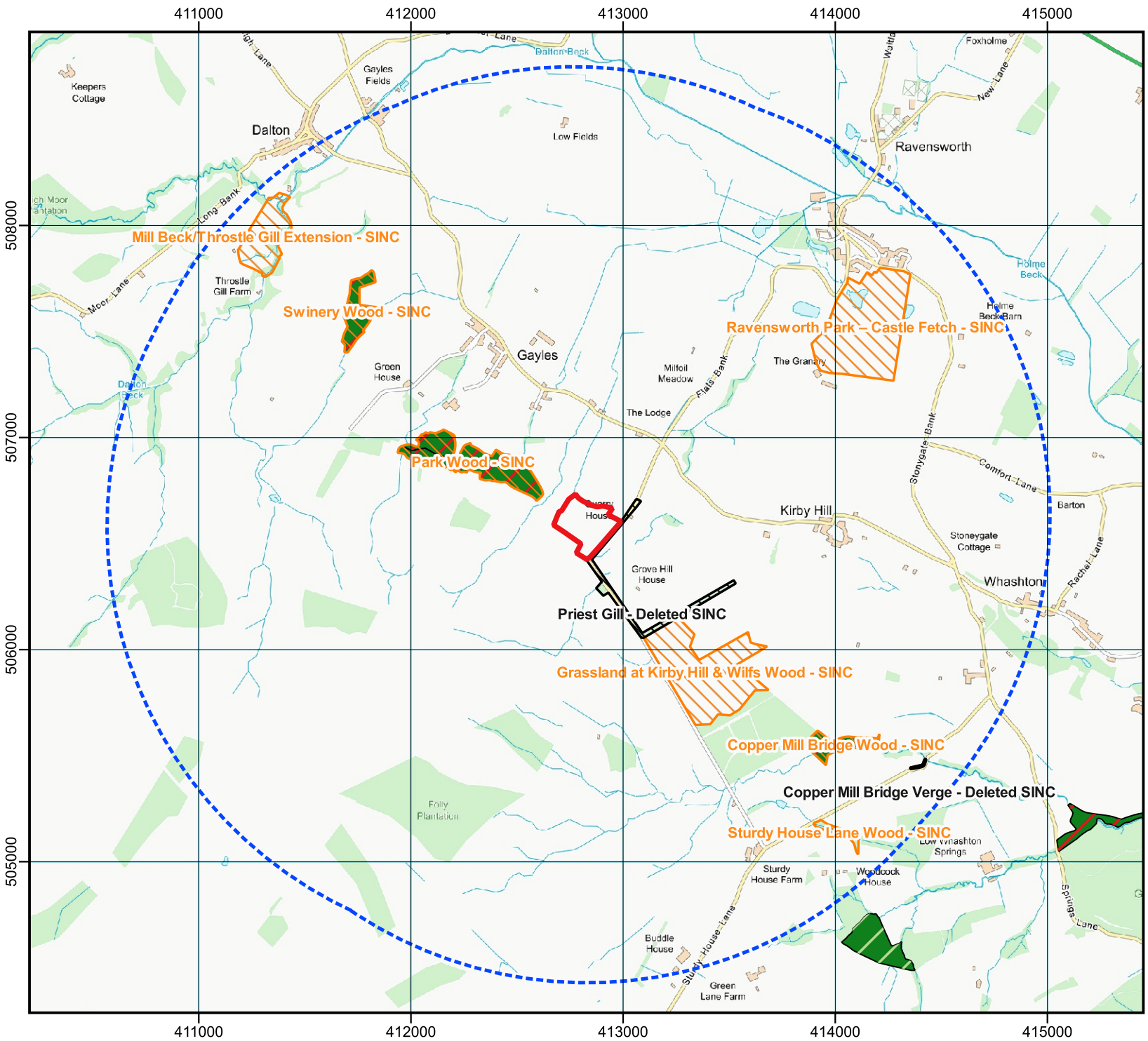
Fig 1: Site Location



Gayles Quarry, Richmond

KEY

- Site Boundary

Sites of Importance for Nature Conservation

- SINC
- Deleted SINC

Ancient Woodlands

- Ancient & Semi-Natural Woodland
- Ancient Replanted Woodland

Scale: 1:25,000@A4

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Fig 2: Designations

412500

413000

506500

0 50 100 m

N

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Gayles Quarry

KEY

- Site Boundary

Phase 1 Habitats

- Dense scrub
- Neutral grassland
- Semi-improved neutral grassland
- Neutral grassland with scattered bracken
- Semi-improved acid grassland
- Continuous dense bracken
- Tall ruderal vegetation
- Acid dry dwarf shrub heath
- Bare ground
- Running water
- Species rich hedgerow with trees
- Quarry edge
- Wall
- Broad-leaved tree
- Broad-leaved tree felled
- Scattered scrub
- Target Notes

Scale: 1:2,000 @A3

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Fig 3 - Phase 1 Habitats A3L

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11. APPENDICES

11.1. Appendix 1—List of Species

English Name	Scientific Name	Dense Scrub	Neutral Grasslands	Acid Grasslands	Bracken Dominated Vegetation	Tall Ruderal Vegetation	Acid Dry Dwarf Shrub Heath	Running Water	Hedgerows	Bare Ground
Sycamore	*Acer pseudoplatanus*	R				R			O	
Yarrow	*Achillea millefolium*	O	O		R	O-LF			O	R
Velvet Bent	*Agrostis canina*			R-O			R-O			
Common Bent	*Agrostis capillaris*	O-LF	F	O-LF	O-LF	O	O		O	O
Creeping Bent	*Agrostis stolonifera*		LF					O		
Garlic Mustard	*Alliaria petiolata*								O	
Sweet Vernal-grass	*Anthoxanthum odoratum*	O	O-LF	O	O	O	O-LF		O	O
Cow Parsley	*Anthriscus sylvestris*	O				O			O-LF	
Thyme-leaved Sandwort	*Arenaria serpyllifolia*		LF							O-LF
False Oat Grass	*Arrhenatherum elatius*	O	O-LA		O	O-LA			O-F	
Mugwort	*Artemisia vulgaris*					O			O	
Daisy	*Bellis perennis*		O							
Hard Fern	*Blechnum spicant*	R	R				R-O			
Heather	*Calluna vulgaris*			R			O-LF			
Wavy Bitter-cress	*Cardamine flexuosa*		O		O	O		O		O
Cuckooflower	*Cardamine pratensis*		LF					LF		
Glaucous Sedge	*Carex flacca*		LF							
Yellow Sedge agg.	*Carex flava agg.*		R							
Hairy Sedge	*Carex hirta*		O-LF					R		
Common Knapweed	*Centaurea nigra*								O-LF	

English Name	Scientific Name	Dense Scrub	Neutral Grasslands	Acid Grasslands	Bracken Dominated Vegetation	Tall Ruderal Vegetation	Acid Dry Dwarf Shrub Heath	Running Water	Hedgerows	Bare Ground
Common Mouse-ear	*Cerastium fontanum*	O-LF	O-LF	R		O	R			O-LF
Rosebay Willowherb	*Chamerion angustifolium*		R			LF				
Creeping Thistle	*Cirsium arvense*	O	O-LF		O	O-LF			O	
Marsh Thistle	*Cirsium palustre*		LF	R				O		
Spear Thistle	*Cirsium vulgare*	O	O			O			O	O
Pignut	*Conopodium majus*		LF							
Hawthorn	*Crataegus monogyna*	O-LF	R		O				F-LA	
Smooth Hawk's-beard	*Crepis capillaris*		O							
Crosswort	*Cruciata laevipes*								LF	
Crested Dog`s Tail	*Cynosurus cristatus*	O	O-LF	O		O			O	
Broom	*Cytisus scoparius*	O			R					
Cock`s Foot	*Dactylis glomerata*	O-LF	O-LF		O-LF	F			F-LA	
Tufted Hair Grass	*Deschampsia cespitosa*		LF					R	R	
Wavy Hair-grass	*Deschampsia flexuosa*			LF			LF			
Foxglove	*Digitalis purpurea*	R				R			O	O
Broad Buckler-fern	*Dryopteris dilatata*	O	LF					R	O	
Male Fern	*Dryopteris filix-mas*	O							O	
Common Couch	*Elytrigia repens*	O	R			O			O	
Broad-leaved Willowherb	*Epilobium montanum*	O				O			O	O
Field Horsetail	*Equisetum arvense*		R			R				R
Sheep's Fescue	*Festuca ovina*			O			O-LF			
Red Fescue agg.	*Festuca rubra agg.*	O	O-LF	R		O	R		O	
Wild Strawberry	*Fragaria vesca*		O-LF							
Ash	*Fraxinus excelsior*								O	

English Name	Scientific Name	Dense Scrub	Neutral Grasslands	Acid Grasslands	Bracken Dominated Vegetation	Tall Ruderal Vegetation	Acid Dry Dwarf Shrub Heath	Running Water	Hedgerows	Bare Ground
Cleavers	*Galium aparine*	O-LF			O	O-LF			F	
Hedge Bedstraw	*Galium mollugo*								R	
Heath Bedstraw	*Galium saxatile*		R-O	O			O-LF			
Cut-leaved Cranesbill	*Geranium dissectum*		O							
Herb Robert	*Geranium robertianum*	R							O-LF	
Water Avens	*Geum rivale*							VR	R	
Wood Avens	*Geum urbanum*								O-LF	
Ivy	*Hedera helix*	R							O-LF	
Hogweed	*Heracleum sphondylium*	R	R-O		O	O			O-LF	
Yorkshire Fog	*Holcus lanatus*	F	F-LA	R-O	LF	F-LA	O		O-LA	O
Creeping Soft-grass	*Holcus mollis*								LF	
Bluebell	*Hyacinthoides non-scripta*		R						R	
Cat's-ear	*Hypochaeris radicata*	R	O-LF	O	R	O	O		O	
Holly	*Ilex aquifolium*								O	
Compact Rush	*Juncus conglomeratus*		R							
Soft Rush	*Juncus effusus*	R	O-LA			R		O		
Hard Rush	*Juncus inflexus*		R					O		
White Dead Nettle	*Lamium album*		R			O-LF			O-LF	R
Oxeye Daisy	*Leucanthemum vulgare*		R						O-LF	
Perennial Ryegrass	*Lolium perenne*	O-LF	F-LA	R	O-LF	F	R		F	O
Bird`s-foot-trefoil	*Lotus corniculatus*		O-LF							
Field Wood-rush	*Luzula campestris*	R	O	O			O			
Great Wood-rush	*Luzula sylvatica*								R	
Pineapple Weed	*Matricaria discoidea*		R							O

English Name	Scientific Name	Dense Scrub	Neutral Grasslands	Acid Grasslands	Bracken Dominated Vegetation	Tall Ruderal Vegetation	Acid Dry Dwarf Shrub Heath	Running Water	Hedgerows	Bare Ground
Black Medick	*Medicago lupulina*	R	O			O			O	
Monkeyflower	*Mimulus guttatus*							O-LF		
Field Forget-me-not	*Myosotis arvensis*		R							R
Wood Forget-me-not	*Myosotis sylvatica*								R	
Mat-grass	*Nardus stricta*			R			R			
Wood Sorrel	*Oxalis acetosella*								LF	
Mouse-ear Hawkweed	*Pilosella officinarum*		R-LF	R						R-LF
Ribwort Plantain	*Plantago lanceolata*	R	O-LF	R-O					O	
Greater Plantain	*Plantago major*		LF	R						
Annual Meadow-grass	*Poa annua*	O	O				O			O
Smooth Meadow-grass	*Poa pratensis*		O		R	O			O	
Rough Meadow-grass	*Poa trivialis*		LF							
Knotgrass agg.	*Polygonum aviculare agg.*		O							O-LF
Tormentil	*Potentilla erecta*		R	O-LF			O			
Creeping Cinquefoil	*Potentilla reptans*	O	O			O-LF			LF	
Selfheal	*Prunella vulgaris*		O						O	
Bracken	*Pteridium aquilinum*	O-LA	O	R	A-LD	O-LA	O-LF		O	
Pedunculate Oak	*Quercus robur*								O	
Meadow Buttercup	*Ranunculus acris*	O	O	R					O	
Lesser Celandine	*Ranunculus ficaria*								LF	
Creeping Buttercup	*Ranunculus repens*		O-LA	O	O	O			O-LF	
Dog Rose agg.	*Rosa canina agg.*	R	~						O	
Bramble agg.	*Rubus fruticosus agg.*	O-LA	O	R	O-LF	O-LF			F-LA	
Common Sorrel	*Rumex acetosa*		O							

English Name	Scientific Name	Dense Scrub	Neutral Grasslands	Acid Grasslands	Bracken Dominated Vegetation	Tall Ruderal Vegetation	Acid Dry Dwarf Shrub Heath	Running Water	Hedgerows	Bare Ground
Sheep`s Sorrel	*Rumex acetosella*			O-LF			O			
Broad-leaved Dock	*Rumex obtusifolius*	O	O-LF			O-LF			O	
Procumbent Pearlwort	*Sagina procumbens*		O	R						
Goat Willow	*Salix caprea*	O							O	
Elder	*Sambucus nigra*								O	
Ragwort	*Senecio jacobaea*	O	O			O-LF			O	
Groundsel	*Senecio vulgaris*		R			O				O-LF
Red Campion	*Silene dioica*	R							O-LF	
Hedge Mustard	*Sisymbrium officinale*				R	O			O	
Perennial Sow-thistle	*Sonchus arvensis*		R			O				O
Prickly Sow Thistle	*Sonchus asper*		O						O	O
Rowan	*Sorbus aucuparia*	R							R	
Hedge Woundwort	*Stachys sylvatica*								O-LF	
Greater Stitchwort	*Stellaria holostea*								O-LF	
Common Chickweed	*Stellaria media*	O	O							O
Dandelion	*Taraxacum officinale agg.*	O	O-LF	O	O	O	R		O-LF	O
Lesser Trefoil	*Trifolium dubium*		R						R	
Red Clover	*Trifolium pratense*	O	O-LF	R	O	O			O	
White Clover	*Trifolium repens*	F	F-LA	O-LF	O-LA	O-LF	O		O-LF	O-LF
Colt's-foot	*Tussilago farfara*					O			O	
Gorse	*Ulex europaeus*	F-LD	O	O	O-LF		R		R	
Common Nettle	*Urtica dioica*	O-LA	O-LA	R	O-LF	O-LA			F-LA	
Bilberry	*Vaccinium myrtillus*						R			
Brooklime	*Veronica beccabunga*							LF		

English Name	Scientific Name	Dense Scrub	Neutral Grasslands	Acid Grasslands	Bracken Dominated Vegetation	Tall Ruderal Vegetation	Acid Dry Dwarf Shrub Heath	Running Water	Hedgerows	Bare Ground
Germander Speedwell	*Veronica chamaedrys*		O						O	
Thyme-leaved Speedwell	*Veronica serpyllifolia*		R	R						
Bush Vetch	*Vicia sepium*	O	O						O	

11.2. Appendix 2—Valuation Criteria

11.2.1. Guidelines for ecological evaluation and the assessment of impacts have been published by Institute of Environmental Assessment (1995) and the Institute of Ecology and Environmental Management (IEEM 2006 and 2010).

11.2.2. The value that is attached to an ecological resource influences:

- whether, as part of screening, potentially affected features or resources are considered sufficiently valuable that there could be a significant effect that would trigger an EIA;
- whether, as part of scoping, ecological features or resources are considered for inclusion in the EcIA—this is influenced by their value in relation to a 'threshold' level of value that should be defined during scoping;
- deciding what mitigation is appropriate and
- considering legal and policy implications.

11.2.1. Legislative Framework

11.2.1.1. Species, communities or habitats receiving legal protection under UK or EC law have high importance on national and international scales.

11.2.1.2. Internationally important sites include Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites. In the UK candidate SACs, potential SPAs and proposed Ramsar sites should be given the same consideration as designated sites in accordance with country specific policies and supporting guidance.

11.2.1.3. Species, communities or habitats requiring protection under EC law are listed on schedules I and II (whose conservation requires the designation of Special Areas of Conservation), IV (species in need of strict protection) and V (species whose exploitation may be subject to management measures) of the EC Directive on the Conservation of Habitats and Wild Fauna and Flora (92/43/EEC). The enabling legislation for the UK is the Conservation (Natural Habitat, &c) Regulations 2010. Species may also be scheduled under Appendix 1 of the Convention on the Conservation of European Wildlife and Natural Heritage 1979 (Bern Convention).

11.2.1.4. Other sites of international importance designated under international obligations include Biosphere Reserves (UNESCO Man and Biosphere Programme), Ramsar Sites (Convention on Wetlands of International Importance especially as Wildfowl Habitat 1971) and Special Protection Areas (EC Wild Birds Directive 79/409).

11.2.1.5. Species with special protection under UK law are listed on the schedules of the Wildlife and Countryside Act 1981 and amendments. The act also gives rise to statutory site designations i.e. National Nature Reserves, Sites of Special Scientific Interest, Areas of Special Protection for Birds, and orders e.g. Limestone Pavement Orders.

11.2.2. UK Site Designations

11.2.2.1. Sites of national importance include the statutorily designated Sites of Scientific Interest (SSSI) and National Nature Reserves (NNRs).

11.2.2.2. Lower levels of importance attach to locally designated sites such as those non-statutory site designations applied by Local Authorities or Wildlife Trusts e.g. Sites of Importance for Nature Conservation (SINC's or equivalent) or Local Nature Reserves designated under the National Parks and Access to the Countryside Act 1949. Such sites may be considered to be of High Local Importance i.e. important at the county or metropolitan level (IEEM 2006).

11.2.3. Rarity of Species and Habitats

11.2.3.1. The British Red Data Book for vascular plants (Perring and Farrell 1983) lists 317 species or subspecies as extinct, endangered, vulnerable and rare. Nationally rare species are defined as occurring in 1–15 10km squares of the national grid in Britain, nationally scarce species occurring in 16–100 10km squares. The presence of a breeding population of any nationally rare species is of national importance whereas a breeding population of a nationally scarce species is of regional importance. Assemblages of 2 or more species may increase the importance of a site further.

11.2.3.2. Regional rarities are defined as occurring in 15 or fewer localities or 1km squares in a former Nature Conservancy Council region (NCC 1989).

11.2.3.3. Biodiversity: The UK Steering Group Report contains a "Long List" of key species in the UK that fall into 1 or more of the following categories: threatened endemics or globally threatened; where the UK holds greater than 25% of the world population; where numbers or range have declined by more than 25% in the last 25 years; nationally rare species; and statutorily protected species. Presence of viable populations of such species may be of high importance.

11.2.3.4. County floras and biodiversity action plans, or district action plans may identify species that are rare at the county or district level. Viable populations will therefore have conservation importance in these contexts.

11.2.3.5. Further information on species rarity may be found in Scarce Plants in Britain (Stewart et al 1994) and the Atlas of the British Flora (Perring and Walters 1962) and subsequent revisions.

11.2.3.6. Biodiversity: The UK Steering Group Report has identified a number of key habitats under the following criteria: those for which the UK has international obligations; rare habitats or those with high rates of decline; functionally critical habitats (marine areas); and habitats that are important for key species. Sites containing good examples of viable areas of any key habitat may be considered nationally important.

11.2.3.7. Importance may be attached to plant community types defined in the National Vegetation Classification (Rodwell 1991 etc) that are also described as rare, declining or with restricted distributions or are identified as being of particular botanical importance (NCC 1989).

11.2.4. Criteria for Overall Site Evaluation

11.2.4.1. The accepted criteria for site evaluation are set out by Ratcliffe (1977) in a Nature Conservation Review and are also explained in Guidelines for the Selection of Biological SSSI's (NCC 1989). The principal criteria are briefly outlined below:

11.2.4.2. **Naturalness.** Truly natural habitats are valued highly but are rare in Britain and most sites are modified and semi-natural at best. Physical habitat modifications vary greatly in their impact, some being beneficial whilst others are harmful. A greater degree of conformity of a particular community or site with semi-natural rather than highly modified vegetation types in the National Vegetation Classification and the absence of species indicating disturbance are likely to lead to attachment of higher importance. However, note that communities that appear to be intermediate between semi-natural NVC types are not necessarily of lesser quality.

Size. The area of a site or habitat judged to be viable varies greatly between different habitat types and with factors such as the condition of the habitat, the shape of the habitat area and surrounding land use. In addition, the territorial requirements of particular species within the site/habitat and habitat management factors may need consideration.

In general, larger sites or areas of habitat tend to be valued more highly because of the greater population sizes and hence more robust populations of the species within them; the potential for increased site or habitat diversity and hence greater species-richness over a larger area; and a reduced importance of edge effects (pollution drift, habitat degradation/change for other reasons at the site edge) if the site is block

rather than ribbon shaped. Small sites become increasingly important in areas of little semi-natural habitat.

Rarity. Criteria for rarity of species and habitats are outlined above. The scarcer the habitat or species then the higher the level of importance attached.

Diversity. Diversity tends to be valued positively as it increases. At the phytosociological level, some habitats are more species-rich than others and so have a higher value, provided that the richness does not involve non-native species. Some plant communities are intrinsically more species-rich than others so comparisons should only be made between the same community type.

The standard of floristic diversity is guided by the floristic tables within the National Vegetation Classification (NVC) (Rodwell 1991 etc). A community having more than 75% of the total plant species list for its type in the NVC would be rated very highly. Diversity of different communities within a vegetation formation (e.g. woodland) may also be rated highly as may structural diversity (e.g. rides, glades and differing age structures or canopy layering in woodland). Habitat diversity across a site may also increase its importance.

Fragility. Fragility is a measure of the intrinsic sensitivity of nearly all natural and semi-natural habitats and species to human impact. It is the fragility of such habitats and species which causes them to be more highly valued than any of the artificial substitutes which replace them through human activity; and the greater their fragility the greater their value. Fragility is therefore clearly related irreplaceability or non-recreatability. Re-creation of habitats that have taken centuries to develop, sometimes with centuries of traditional management, is impossible to the full extent of their former complexity.

Typicalness. Typicalness is an indication of how characteristic the features of a site are compared to its particular ecosystem. It is intended as a guard against designation of those sites with unusual features as being always the most important.

Position in an Ecological/Geographical Unit. This is a landscape ecological criteria designed to identify sites or habitats which may be important to maintaining the viability of a larger group thereof; or which is essential in maintaining the population of a species with a large territory spanning several sites; or is one of a number of sites important to a

metapopulation of a species in fragmented landscapes; or may be important in a wildlife corridor or network of habitat patches.

11.2.5. Amenity Value

11.2.5.1. The amenity value of a site in ecological terms is generally seen as its value for the study or quiet enjoyment of wildlife. Sites with high intrinsic appeal and good access are therefore regarded as important in this context. Also important are issues such as site safety, proximity to schools and population centres and site management difficulties. Less emphasis is placed on the criteria outlined in section 9.1.4 in such situations.

11.2.6. Ecological Importance Summary Table

11.2.6.1. The following table has slightly modified from Regini (2000). Its definitions are adopted in this report. Where species, habitats or sites occur in more than one category, the highest level of importance is applicable. Sites that meet the criteria for a particular designation are afforded the level of importance corresponding to that designation whether or not they are actually designated.

Table 11—Ecological Importance Summary Table

Level of Value	Examples
International	An internationally designated site or candidate site (SPA, pSPA, SAC, cSAC, pSAC , Ramsar site, Biogenetic Reserve). A viable area of a habitat type listed in Annex I of the Habitats Directive, or smaller areas of such habitat which are essential to maintain the viability of a larger whole. Any regularly occurring population of an internationally important species, which is threatened or rare in the UK. i.e. it is a UK Red Data Book species or listed as occurring in 15 or fewer 10km squares in the UK (categories 1 and 2 in the UK BAP) or of uncertain conservation status or of global conservation concern in the UK BAP. A regularly occurring, nationally significant population of any internationally important species. Also a regularly occurring and nationally significant number of an internationally important species during a critical phase of its life cycle.
National	A nationally designated site (SSSI, ASSI, NNR, Marine Nature Reserve) or a discrete area, which meets the published selection criteria for national designation (e.g. SSSI selection guidelines). A viable area of a priority habitat identified in the UK BAP, or of smaller areas of such habitat which are essential to maintain the viability of a larger whole. Any regularly occurring population of a nationally important species which is threatened or rare in the region or county (see local BAP). A regularly occurring, regionally or county significant population of any nationally important species. Also a regularly occurring and regionally or county significant number of a nationally important species during a critical phase of its life cycle.

Level of Value	Examples
Regional	Viable areas of key habitat identified in the Regional BAP or smaller areas of such habitat which are essential to maintain the viability of a larger whole; Viable areas of key habitat identified as being of Regional value in the appropriate Natural Area profile; Any regularly occurring, locally significant population of a species listed as being nationally scarce which occurs in 16-100 10km squares in the UK or in a Regional BAP or relevant Natural Area on account of its regional rarity or localisation; A regularly occurring, locally significant number of a regionally important species during a critical phase of its life cycle; Sites which exceed the County-level designations but fall short of SSSI selection guidelines, where these occur.
County / Metropolitan	Semi-natural ancient woodland greater than 0.25 ha; County/Metropolitan sites and other sites which meet the published ecological selection criteria for designation, including Local Nature Reserves selected on County / metropolitan; A viable area of habitat identified in County BAP; Any regularly occurring, locally significant population of a species which is listed in a County/Metropolitan "red data book" or BAP on account of its regional rarity or localisation; A regularly occurring, locally significant number of a County/Metropolitan important species during a critical phase of its life cycle.
District / Borough	Semi-natural ancient woodland smaller than 0.25 ha; Areas of habitat identified in a sub-County (District/Borough) BAP or in the relevant Natural Area profile; Local Nature Reserves selected on District/ Borough criteria Sites/features that are scarce within the District/Borough or which appreciably enrich the District/Borough habitat resource; A diverse and/ or ecologically valuable hedgerow network; A population of a species that is listed in a District/Borough BAP because of its rarity in the locality or in the relevant Natural Area profile because of its regional rarity or localisation; A regularly occurring, locally significant number of a District / Borough important species during a critical phase of its life cycle.
Parish / Neighbourhood	Areas of habitat considered to appreciably enrich the habitat resource within the context of the Parish or neighbourhood, e.g. species-rich hedgerows. Local Nature Reserves selected on Parish criteria.
Zone of influence Only	Low grade, widespread and common habitats.