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Woodhouse Quarry, Holmbridge

Ecological Appraisal Report

May 2023

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Contents

1 Introduction

Site description

1.1 Woodhouse Quarry (the "Site") is a former sandstone quarry approximately 2.5 ha in size and centred at Ordnance Survey (OS) Grid Reference SE 12906 06479 southeast of Holmbridge, Huddersfield, West Yorkshire.

1.2 At the centre of the Site, the former extraction areas are visible which now support a mosaic of habitats including ephemeral / short perennial, tall ruderal vegetation, neutral grassland, standing water, spoil mounds, cliff faces and bare ground. Acid grassland, modified grassland, heathland and tall ruderal vegetation are present to the southeast of the extraction area within the Site. Areas of modified grassland, heathland, acid grassland and scrub are present in the northwest of the Site. The previous sandstone extraction activity and material sorting on Site has resulted in a varied topography. The Site boundaries are formed by dry stone walls and fences.

1.3 The Site is located within a rural setting where the dominant land use is agriculture together with evidence of ongoing mineral extraction to the east of White Gate Road (Google Earth Pro, accessed 05.03.23). Areas of pasture with dry stone wall boundaries are present to all aspects. There is broadleaved woodland to the west and occasional woodland plantation blocks to the south. An embankment supporting heathland and scrub is adjacent the Site to the east beyond White Gate Road.

Proposed works

1.4 It is understood that formal restoration of the Site is required so as to address health and safety concerns, visual impact and available end use. The Proposed Restoration is considered in relation to its two phases: (1) Site Preparation Phase and (2) Restoration Phase.

Site Preparation Phase

1.5 As part of the restoration, suitable existing worked materials will be re-claimed and the void will be backfilled to an agreed landform using a combination of on-site materials and imported fill. This will result in the temporary removal of the habitats within the centre and north of the Site to facilitate the works ahead of final restoration (as shown on the Proposed Restoration and Reclamation Plan – Phase 4 Final Restoration Plan (Bright and Associates, 2023)). The habitats to the south of the quarry void (grassland and heathland) and areas adjacent to the northeast and southwest Site boundary (pond P2 and scrub) will be retained in-situ.

1.6 Selected areas of heathland and open mosaic habitat and the associated soils will temporarily be removed (stripped), stored and re-used as part of the ecological elements of the restoration.

Restoration Phase

1.7 Once the preparation phase is complete, the Site will be managed in accordance with agreed measures in detailed within an appropriate within a Landscape and Environmental Management Plan (LEMP). It is recommended that the production of the LEMP, and their approval by Kirklees Council, is subject to planning condition.

Scope of commission

1.8 BSG Ecology was first commissioned in April 2021 to provide ecology services to inform the Site evaluation and design process including desk study, extended Phase 1 habitat survey and a Preliminary Ecological Appraisal report. Further survey commissions were received in May 2021 for breeding bird characterisation, great crested newt *Triturus cristatus*, invertebrates, reptiles, botanical and bat roost presence / likely absence. Additional commissions for wintering bird

survey were received in December 2021, breeding bird survey in March 2022 and in December 2022 for Biodiversity Gain[1] assessment and production of an Ecological Impact Assessment report.

Purpose of this report

1.9 The purpose of this report is to describe and evaluate the biodiversity of the Site, assess the potential ecological impacts of the Proposed Restoration, set out mitigation and other measures where necessary, and to identify opportunities for ecological enhancement.

Personnel

1.10 This report was written by Daniel Foster BSc MCIEEM. Daniel is a Principal Ecologist at BSG Ecology and has worked as a professional ecologist since 2005. He has experience in the preparation and review of Preliminary Ecological Appraisals and Ecological Impact Assessments for a range of development types including large scale schemes for various sectors in the UK. Daniel also undertook the biodiversity gain assessment.

1.11 The report was technically reviewed by Kirsty Kirkham, a Director at BSG Ecology, who has nearly 30 years experience of working with the minerals industry both within the public and private sectors.

1.12 Details of the field survey personnel and their relevant experience is provided within the survey appendices and summary profiles of Daniel and Kirsty can be found on the BSG Ecology website https://www.bsg-ecology.com/people/

[1] The Environment Act refers to the term biodiversity gain which is the term used in this report. The term biodiversity net gain is also typically used and both terms have the same meaning.
https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted

2 Methods

Desk study

2.1 BSG Ecology obtained records of non-statutory designated sites, such as Local Wildlife Sites (LWS), and of protected species within a 2 km radius from Site boundary from West Yorkshire Ecology Service (WYES) on 19 May 2021.

2.2 The MAGIC.gov website was accessed (initially on 20 May 2021 and repeated on 13 December 2022) to identify any nationally designated statutory sites of nature conservation interest within 2 km of the Site, such as Sites of Special Scientific Interest (SSSI). The desk study has also considered the location of the Site with respect to Natural England's Impact Risk Zones (IRZ)[2] for statutorily designated sites.

2.3 The MAGIC website was reviewed for information on European Protected Species (EPS) Licences issued by Natural England for bats, and great crested newt *Triturus cristatus* within 1 km of the Site.

2.4 Aerial imagery from Google Earth and Ordnance Survey mapping from MAGIC was also reviewed to determine the ecological context of the Site and to identify any ponds that may be suitable for great crested newt within 500 m of the Site on 20 May 2021.

Field survey

Extended habitat survey

2.5 Daniel Foster MCIEEM (Principal Ecologist) undertook the extended habitat survey on 10 May 2021. The Site was walked over and the habitats were described with reference to the Phase 1 habitat survey methodology (JNCC, 2010).

2.6 The weather during the survey was overcast with intermittent rain, sunny intervals and a temperature of up to 13°C.

2.7 The survey was extended to allow an assessment to be made of the potential for the Site to support protected or notable species of nature conservation interest, including Species of Principal Importance (SPI) for the conservation of biodiversity as listed in response to the NERC Act (2006) (see Appendix 8).

2.8 The Site was also searched for the presence of invasive non-native plants such as Japanese knotweed *Fallopia japonica* and Himalayan balsam *Impatiens glandulifera*.

2.9 Daniel has worked as professional ecologist since 2005 and has undertaken numerous habitat surveys and assessments of a wide variety of habitats throughout the United Kingdom, including former quarries.

Consideration of limitations

2.10 The extended habitat survey was completed in early May, which is acceptable in terms of general habitat classification but just outside the optimum period for detailed botanical survey. The timing of the extended habitat survey is not considered to be a significant constraint on the commission as it has been possible to identify and characterise broad habitat types and because, where appropriate, further habitat surveys have been undertaken.

[2] The Impact Risk Zones (IRZs) are a GIS tool developed by Natural England to make rapid initial assessment of the potential risks posed by development proposals to: Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites.

2.11 Physical access in close proximity to pond P1 (the water filled base of the quarry void) was not possible due to safety considerations (steep sided terrain and unstable ground conditions within the adjacent cliffs). This is not considered to be a significant constraint as an ecological assessment of the pond was made from a safe distance using binoculars where necessary which has enabled an adequate assessment of the pond to be undertaken.

Further survey work

2.12 Upon completion of the desk study and extended habitat survey, an assessment was made of the potential for priority habitats and protected / notable species to be present on-site, and how those species may be adversely affected by the proposals. The following surveys were completed where the potential for adverse impacts was identified:

- Botanical
- Bat roost presence / likely absence survey of the cliff faces
- Breeding bird characterisation
- Wintering bird characterisation
- Great crested newt
- Reptiles
- Terrestrial and aquatic invertebrates

2.13 A summary of the methodology for each of these surveys is provided below. Full methods and results of these surveys are presented in Appendices 1 to 7.

Botanical survey

2.14 Further botanical survey of the Site habitats was undertaken on 14 July 2021 to accurately map the habitat types and plant species present at an optimal time of year. This survey was completed with reference to the UK Habitat Classification Definitions (UK Habitat Classification Working Group, 2018) to inform the biodiversity net gain assessment.

2.15 Detailed botanical survey of selected areas of open mosaic habitat and grassland was also undertaken. A total of 16 randomly positioned quadrats were used; six (Q1 to Q6) in the open mosaic habitat and ten (Q7 to Q16) in the grassland habitat to the south of the quarry void. The quadrat locations are shown on Figure 3.

Consideration of limitations

2.16 There were no perceived limitations to the survey.

Bat roost presence / likely absence survey of the cliff faces

2.17 The preliminary ground-based assessment of the cliff faces identified them as having low bat roost suitability. Industry survey guidance (Collins (ed.), 2016) recommends that where a structure with low roost suitability is to be impacted by works, one nocturnal bat survey is undertaken in the period May to August (inclusive) to ascertain the presence / likely absence of bat roosts.

2.18 A nocturnal dusk emergence survey was undertaken of the cliff faces by two ecologists on 07 June 2021. This was completed with reference to standard industry guidance (chapter 7 Collins (ed.), 2016).

Consideration of limitations

2.19 There were no perceived limitations to the survey.

Breeding birds characterisation survey

2.20 Breeding birds characterisation surveys were undertaken on 25 May 2021, 15 June 2021, 30 March 2022, 14 April 2022 and 02 May 2022.

2.21 During each visit, the surveyor walked across the Site scanning all habitats present (within the survey boundary and the immediate surrounding area) using binoculars as required. During the March to May 2022 survey visits, the Site and a wider area of up to 1 km was surveyed; this was to investigate how notable bird species, particularly those which are qualifying features of the SPA, may use the habitats adjacent the Site and between the Site and the SPA. The off-site areas were surveyed by using public rights of way. Frequent stops were made to listen and scan for singing, calling and displaying birds. Birds observed beyond the boundary were also noted. Bird locations were mapped and behaviour recorded using standard British Trust for Ornithology (BTO) codes and symbols (Gilbert *et al*, 1998).

Consideration of potential limitations

2.22 There were no perceived limitations to the surveys.

***Wintering birds* characterisation survey**

2.23 Characterisation surveys of the wintering bird community were undertaken on 29 December 2021 and 30 January 2022.

2.24 During each visit, the surveyor walked across the Site and a wider survey area scanning all habitats present using binoculars as required. A wider area of up to 1.5 km around the Site was surveyed to investigate how notable bird species, particularly those which are qualifying features of the SPA, may use the habitats adjacent the Site and between the Site and the SPA. The off-site areas were surveyed by using public rights of way. Frequent stops were made to listen and scan for singing, calling and displaying birds. Birds observed beyond the boundary were also noted. Bird locations were mapped and behaviour recorded using standard British Trust for Ornithology (BTO) codes and symbols (Gilbert *et al*, 1998).

Consideration of potential limitations

2.25 There were no perceived limitations to the surveys.

Great crested newt survey

2.26 Onsite ponds P1 and P2 were assessed for their potential to support great crested newt using the Habitat Suitability Index (HSI) scoring method (Oldham *et al.,* 2000) on 10 May 2021.

2.27 Pond P2 was subject to environmental DNA ("eDNA") sampling and analysis for great crested newt on 07 June 2021. This was completed with reference to best practice methodology (Biggs et al., 2014).

Consideration of limitations

2.28 Pond P1 could not be accessed to collect a water sample for eDNA analysis due to safety considerations referred to earlier. This is not considered to be a significant constraint to the great crested newt assessment at the Site as an eDNA survey of pond P2 (located 100m from P1) was completed which returned negative result for the presence of great crested newt. Given the close proximity of these two ponds to each other, and the similarity of HSI scores, it is reasonable to assume that as great crested newt is absent from P2, then this species is also likely to be absent from P1.

Reptiles survey

2.29 The Site supports a mosaic of scrub, heathland, grassland, tall ruderal vegetation, waterbodies, and rubble piles which are considered to provide highly suitable habitat for reptile species. A total of 50 refugia (artificial cover objects) were deployed on 07 June 2021 in suitable reptile habitats throughout the Site.

2.30 Seven reptile presence / likely absence were undertaken by an ecologist during suitable weather conditions between July and October 2021.

Consideration of limitations

2.31 There were no perceived limitations to the survey.

Invertebrates survey

2.32 The Site was assessed for its potential to support important invertebrate assemblages by Dr Jim Fairclough MCIEEM, an experienced entomologist, on 16 June 2021.

2.33 Numerous habitats were identified during the habitat potential assessment with the potential to support important terrestrial invertebrate assemblages, including herb-rich grassland, scrub, sparsely vegetated areas and those with bare ground on the quarry floor and matrices of these. Subsequent invertebrate surveys were designed to target key indicator groups of invertebrates within the Site associated with these habitats.

2.34 The following sampling methods were employed: pitfall traps, pan traps, sweep-netting, pond netting, beating and grubbing. Surveys were conducted on 16 June, 28 June and 2 August 2021, by Dr Jim Fairclough. Figure 9 shows the locations of the various sampling methods used during the surveys.

2.35 Whilst some species could be identified in the field, the majority of specimens were stored in 70% methanol solution for later identification, using a stereoscope microscope with the aid of relevant references/identification literature.

Consideration of limitations

2.36 Pond P1 in the base of the quarry could not be safely accessed to survey for aquatic invertebrates, due to the loose rocky margins and risk of rockfall from above. This is not considered to be a significant constraint to the overall invertebrate assessment as survey of the nearby pond P2 was completed.

2.37 Three seasonal visits targeting four or five insect orders can only detect a proportion of the total species pool using a Site. However, it does provide the opportunity to investigate the assemblage types present and to gauge where the most important parts of the Site for invertebrates are most likely to be found.

EcIA assessment process

2.38 Whilst a formal ecological impact assessment is not required under the provisions of Town and Country Planning (Environmental Impact Assessment) Regulations 2017, the evaluation and assessment within this report have been broadly undertaken with reference to the current Guidelines for Ecological Impact Assessment (EcIA) in the United Kingdom developed by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018), where relevant. Although this is recognised as the industry standard for ecological assessment, the guidance is not prescriptive; rather, it aims to “provide guidance to practitioners for refining their own methodologies”.

Important ecological features

2.39 A first step in EcIA is determination of which ecological features (habitats, species, ecosystems and their functions/processes) are important. Important features should then be subject to detailed assessment if they are likely to be affected by a Development (or in this case a former quarry restoration). It is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to effects of the Development, such that there is no risk to their viability.

2.40 Ecological features can be important for a variety of reasons and the rationale used to identify these is explained below. Importance may relate, for example, to the quality or extent of designated sites or habitats, to habitat/species rarity, to the extent to which they are threatened throughout their range, or to their rate of decline.

Evaluation: determining importance

2.41 The importance of an ecological feature is considered within a defined geographical context. The following frame of reference has been used in this case:

- International and European
- National (UK)
- National (England)
- Regional (Northern England)
- County (West Yorkshire)
- District (Metropolitan Borough of Kirklees)
- Local (the villages of Holmbridge and Holmfirth – an approximate location, intermediate between “Site” and “District”))
- The Site (application boundary and immediate surrounds)

2.42 In certain circumstances, features may be valued below the Site level. In these instances, they are described as being of Negligible importance; see also biodiversity gain section.

Characterising and quantifying effects and assessing their significance

2.43 The CIEEM (2018) guidelines state that ecological effects or impacts should be characterised in terms of ecosystem structure and function and reference should be made *where relevant* to: beneficial, adverse or negligible effects; extent; magnitude; duration; reversibility; timing and frequency; and cumulative effects. The guidelines provide a list of "aspects of ecological structure and function to consider when predicting impacts and effects". The terms impact and effect are used within this chapter in accordance with the following definitions (as provided by the guidelines):

- Impact: “Actions resulting in changes to an ecological feature. For example, the construction activities of a development removing a hedgerow”.
- Effect: “Outcome to an ecological feature from an impact. For example, the effects on a dormouse population from loss of a hedgerow”.

2.44 Following the characterisation of effects, an assessment of the ecological significance of those effects is made. The guidelines promote a transparent approach in which a beneficial or adverse effect is determined to be significant or not, in ecological terms, in relation to the integrity of the defined site or ecosystem(s) and/or the conservation status of habitats or species within a given geographical area, which relates to the level at which it has been valued. The decision about whether an effect is significant or not, is independent of the value of the ecological feature.

2.45 Significance is a concept related to the weight that should be attached to effects when decisions are made. For the purpose of this assessment, 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features'. A

significant effect is simply an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. The EcIA guidelines state:

"*A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant adverse ecological effects can be lawfully permitted following EIA procedures".*

Main phases of works

2.46 The potential impacts of the Proposed Restoration are considered in relation to its two phases as appropriate to each ecological feature: (1) Site Preparation Phase and (2) Restoration Phase.

3 Scheme description

3.1 This planning submission aims to address a long-standing need to complete the restoration of the existing mineral workings at the quarry and rectify areas where the previous operator of the Site had gone beyond the approved Site boundary limits. Is it estimated that the restoration will be take up to 18 months to complete and will be undertaken over four phases. As part of the proposed restoration, existing worked materials will be re-claimed, and the void will be backfilled to an agreed landform using a combination of on-site materials and imported fill. The final restoration layout (as shown on the Proposed Restoration and Reclamation Plan – Phase 4 Final Restoration Plan (Bright and Associates, 2023)) will include a variety of habitats such as heathland, acid grassland, open mosaic habitats, ponds, broadleaved woodland and modified grassland.

Planning history at the Site

3.2 A comprehensive background to the planning history of the Site is provided within the Planning Statement (Environmental Compliance Limited, May 2023).

3.3 The current planning consent for mineral extraction at Woodhouse Quarry was issued in January 2003 (Kirklees Council Planning reference 2001/62/92414/W0). There is an approved restoration plan for the Site (drawing reference WD.007, titled “Restoration Scheme” dated 18/04/01) which was submitted with the original application and is listed as an approved drawing under Condition 3 of planning consent 2001/62/92414/W0. The approved restoration plan is high-level and does not include detailed information on habitats to be created. Condition 36 of consent 2001/62/92414/W0 provided the mechanism for the detailed submission of the restoration scheme once the excavations on site had started, and some certainty could be applied to the final restoration design. It is understood that no details were ever submitted to discharge Condition 36.

3.4 In relation to a previous application at the Site for an extension of time to an existing permission to extract sandstone (Kirklees Council Planning Application Reference 2018_92662), a Habitats Regulations Assessment (Stage 1 screening) was undertaken by Tom Stephenson, Biodiversity Officer, Kirklees Council. It was identified in correspondence from Kirklees Council dated 01 October 2018 that the proposed development had the potential for adverse effects upon the Peak District Moors (South Pennine Moors Phase 1) SPA and South Pennine Moors SAC, stating:

“The proposals will result in additional noise associated with the extraction of stone from the site. The fields surrounding the site provide suitable habitat for foraging golden plover during the breeding season (a qualifying feature of Phase 2 of the SPA). The proposals have the potential to result in disturbance of golden plover if present, which has the potential to be significant depending on the number of birds affected.”

3.5 The Kirklees Council HRA Stage 1 identified that further bird survey would be required to inform an Appropriate Assessment (Stage 2). No further bird survey work was undertaken at that time.

Designed-in measures

3.6 Ecological input has been provided from the start and throughout the evolution of the restoration by BSG Ecology. This input has been used to 'design-in' a range of primary ecological mitigation and enhancement measures into the layout of the Proposed Restoration and also taking into account fixed parameters, specifically, Site stability measures to be addressed and legal compliance measures in relation to protected species such as breeding birds.

3.7 The use of such measures demonstrates that the ecology mitigation hierarchy as set out in paragraph 180a of the NPPF 2021 has been employed from inception for the Proposed Restoration.

3.8 Details of work necessary associated with the retention and creation of new ecological features during Site Preparation and will be provided in a Construction Environmental Management Plan

(CEMP) and the management of these features for their existing or target biodiversity value will be provided within a Landscape and Environmental Management Plan (LEMP) for the Restoration. It is recommended that the production of these documents, and their approval by Kirklees Council, is subject to planning condition. These documents would cover the ecology strategy and designed-in mitigation and any necessary additional ecology mitigation detailed later in this report.

3.9 The designed-in measures include the following avoidance, mitigation and enhancement measures:

- Selected areas of heathland and open mosaic habitat and the associated soils will be temporarily removed, stored, retained and re-used as part of the ecological elements of the restoration. This will enable the soils, associated seedbanks and selected mature heathland plants to be replaced within the Site and provide a greater degree of confidence and certainty in securing the successful reinstatement of these habitats.
- Retention of selected habitats in-situ within the Site where possible for their intrinsic habitat value and to retain suitable habitat for birds, invertebrates and bats, including:
    - Pond P2 and surrounding marginal habitats which will provide a semi-natural buffer around the pond to protect it during the restoration works.
    - The scrub and tree belt along the Sites southwest boundary adjacent Woodhouse Lane.
    - The areas of grassland and heathland to the south of the quarry void that will be enhanced to deliver biodiversity gain at the early stages of the restoration.

4 Results, evaluation, impacts, mitigation and other measures

4.1 This section sets out the summary findings of the baseline ecological survey work and desk study. Further details of the field studies are set out in Figures 1 to 9 and Appendices 1 to 7. It then goes on to evaluate the interest of the identified ecological resources, potential impacts in the absence of mitigation, mitigation, and other measures. Finally, it set out the significance of any residual effects.

4.2 Ecological features are considered in the following order:

- protected sites – both statutory (e.g. SSSI) and non-statutory (e.g. SINC).
- habitats
- species

4.3 Several species are scoped out of the assessment on the basis that they are considered unlikely to be significantly affected by the Proposed Restoration. This is either by virtue of the design; or because they are very commonplace and/or of very low conservation value (unless there are other reasons to consider them further, for example, they may be legally protected or require special care and therefore require particular precautionary measures to be adopted). Where it has been possible to scope out an ecological feature, the rationale for doing so is provided in the text below.

4.4 Several habitats are scoped out of the assessment because the losses are not considered to be significant in ecological impact assessment terms; this may be in relation to their very low intrinsic value or because they are commonplace, readily re-creatable and/or replaceable. These habitats are addressed, however, as part of the biodiversity gain assessment which considers all habitat types regardless of their value.

Statutory designated sites

4.5 There are three statutory designated wildlife sites with the search area. Table 1 lists all statutory designated wildlife sites within the search area.

4.6 In addition, Rake Dike SSSI is located 1.8 km southwest of the Site, which is notified for its geological interest.

Table 1: Statutory designated wildlife sites

Designation	Site Name	Key Interest Features	Distance and Direction from Site
SAC	South Pennine Moors	Semi-natural moorland habitats with Annex I habitats that are the primary reason for selection including blanket bogs, European dry heaths and old sessile oak woods	1.3 km south
SPA	Peak District Moors (South Pennine Moors Phase 1)	Extensive areas of moorland and moorland-fringe habitat. Supports notable breeding populations of Annex I bird species golden plover *Pluvialis apricaria*, merlin *Falco columbarius* and short-eared owl *Asio flammeus.* Non-qualifying species of interest: The SPA supports a rich upland breeding bird assemblage which, as well as the qualifying species listed above, includes important numbers of peregrine falcon *Falco peregrinus*, lapwing *Vanellus vanellus*, dunlin *Calidris alpina schinzii*, snipe *Gallinago gallinago*, curlew *Numenius arquata*,	1.3 km south

Designation	Site Name	Key Interest Features	Distance and Direction from Site
		redshank *Tringa totanus*, common sandpiper *Actitis hypoleucos*, whinchat *Saxicola rubetra*, wheatear *Oenanthe oenanthe*, ring ouzel *Turdus torquatus* and twite *Carduelis flavirostris.*	
SSSI	Dark Peak (component SSSI within the above SAC and SPA)	Extensive tract of semi-natural upland vegetation with blanket mires; wet and dry heaths and acid grasslands. Supports notable populations of a range of bird and invertebrate species.	1.3 km south

4.7 The Site falls within the IRZ of Dark Peak SSSI (a component SSSI within the above SAC and SPA in Table 1) which is located 1.3 km south. The IRZs define zones around each statutory nature conservation site which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts that would generate a need for the local planning authority, Kirklees Council in this instance, to consult Natural England (Natural England, 2019). The types of development which are considered to present a potential risk to the SPA/SAC/SSSI cited by Natural England are:

- Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction.
- Any development that could cause air pollution (including: industrial/commercial processes).
- Pipelines, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance).
- Solar schemes with footprint > 0.5ha, all wind turbines.
- Landfill. Including inert landfill, non-hazardous landfill, hazardous landfill.
- Any discharge of water or liquid waste of more than 20m³/day to ground (i.e. to seep away) or to surface water, such as a beck or stream (NB This does not include discharges to mains sewer which are unlikely to pose a risk at this location).

4.8 The Proposed Restoration of the former quarry is not explicitly cited in the above list. It is anticipated, however, that Kirklees Council may consult Natural England given the reference to minerals and quarries in principle.

Impacts

4.9 Given the previous response provided by Kirklees Council for a time limit extension to sandstone extraction, it is considered likely that a report to inform HRA will be requested by Kirklees Council in association with this application. This is because consideration of the potential risk of impacts is likely to be required. The impact mechanisms that may be generated by the works to facilitate the Proposed Restoration are temporary disturbance related; for example noise or dust arising from the on-site operations and from a potential increase in vehicular movements to and from the Site as part of the infill operations of the quarry void. Further consideration of impact mechanisms is given in the report to inform HRA (BSG Ecology, 2023) relating to the Proposed Restoration.

4.10 During the breeding and wintering bird surveys undertaken at the Site and surrounding areas (detailed later in Section 5 of this report), no evidence was recorded of any of the Annex I qualifying bird species of the Peak District Moors (South Pennine Moors Phase 1) SPA, or the non-qualifying species of interest, using the habitats at the Site.

4.11 The Site habitats are considered to be sub-optimal for these species in terms of both nesting and foraging. There were occasional observations of individual / low numbers of golden plover (a qualifying species of the SPA) and curlew (a non-qualifying species of interest for the SPA) flying

over the Site. The surveys within the wider landscape around the Site recorded nesting and foraging activity by lapwing, golden plover, curlew and oystercatcher, but typically this was in habitats 200 m to 1.2 km to the south of the Site. No nesting activity of these species was recorded in the fields adjacent the Site, with only occasional feeding from low numbers of oystercatcher and curlew. Further consideration to the Site and the fields adjacent is given in the report to inform HRA (BSG Ecology, 2023) relating to the Proposed Restoration.

4.12 The Site lies within the Impact Risk Zone for Dark Peak SSSI (a component SSSI for the SPA SAC cited in Table 1), located 1.3 km south of the Site. Landfill (including inert landfill, non-hazardous landfill and hazardous landfill) is listed as a type of development which requires the local planning authority (Kirklees Council in this instance) to consider whether there may be an impact on the SSSI arising from the proposed infilling of the quarry void to facilitate the Proposed Restoration and to identify whether they need to undertake consultation with Natural England to seek advice on the risk of impacts, the nature of any impacts and how they might be avoided and/or mitigated.

4.13 Due to the location of the Site and the nature of the development no direct impacts on statutory designated sites are considered likely to occur, as a result of this proposed development.

4.14 It is considered unlikely that impacts to statutory designated sites will arise from the Proposed Restoration given their distance and geographical separation from the Site.

Mitigation

4.15 None is proposed.

Residual effects

4.16 Residual effects are likely to be of negligible significance. Further consideration of residual effects is given in the report to inform HRA (BSG Ecology, 2023) relating to the Proposed Restoration.

Non-statutory designated sites and ancient woodland

4.17 There are six non-statutory designated wildlife sites and two ancient replanted woodlands identified within the search area. Table 2 provides information relating to these sites below.

Table 2: Non-statutory designated wildlife sites and ancient woodland

Designation	Site Name	Key Interest Features	Distance and Direction from Site
LWS	Malkin House Wood	Acid woodland including an area also listed on Natural England's Ancient Woodland Inventory as Ancient Replanted Woodland.	690 m north
LWS	Yateholme Reservoirs & Plantations	A large site containing a mixture of habitats including standing and running water, woodland, heath, acid grassland and mire. Includes an area of woodland also listed on Natural England's Ancient Woodland Inventory as Ancient Replanted Woodland.	790 m west
LWS	Digley Reservoir & Marsden Clough	A large site containing a mixture of habitats including standing and running water, woodland, heath and acid grassland. Includes an area of woodland also listed on Natural England's Ancient Woodland Inventory as Ancient Replanted Woodland.	890 m west
Ancient woodland	Fox Clough	Listed on Natural England's Ancient Woodland Inventory as Ancient Replanted	890 m southeast

Designation	Site Name	Key Interest Features	Distance and Direction from Site
		Woodland.	
LWS	Carr Green Meadows	Species-rich neutral grassland.	1.1 km northwest
LWS	New Laith Fields	Species-rich neutral grassland.	1.3 km northwest
Ancient woodland	Reynard Clough	Listed on Natural England's Ancient Woodland Inventory as Ancient Replanted Woodland.	1.4 km southeast
LWS	Holme Styes Heathland	No information provided.	1.6 km southeast

4.18 Due to the nature of the development and the geographical separation from the Site, in the absence of mitigation, no significant impacts on non-statutory designated sites are considered likely to occur. On this basis, non-statutory designated sites and ancient woodland are scoped out and are not considered further in this assessment.

Habitats

4.19 The distribution of habitat types, using Phase 1 habitat survey nomenclature, recorded during the survey is shown in Figure 2, with summary descriptions given below. Dominant or characteristic flora is described together with notes on the relative abundance of floral species within the context of each habitat parcel. Target Notes (TNs) referred to in the text below and are shown on Figure 2. The locations of the quadrats used for the detailed botanical surveys are shown on Figure 3. Photographs are provided below in Section 7.

4.20 The central area of the Site including the former extraction and material storage and sorting areas, comprises early successional habitats including ephemeral / short perennial, heathland, acid grassland, scattered scrub, tall ruderal vegetation and bare ground. These early successional habitats are considered to be characteristic of open mosaic habitat on previously developed land. Other habitats present on-site include ponds, dense scrub, acid dry dwarf shrub heath, acid grassland, semi-improved neutral grassland and species poor semi-improved grassland. The Site boundaries are formed by dry stone walls and fences.

Open mosaic habitat on previously developed land

4.21 The majority of the central area of the Site comprises early successional habitats characteristic of open mosaic habitat on previously developed land (Photographs 1 to 6). The former quarry areas show evidence of previous disturbance in the form of large excavations and quarry workings. More superficial disturbance has occurred where vehicle movements occurred, which has created a patchy structure to the central habitats on Site. The component habitats of the open mosaic habitat are summarised below:

- Bare ground and areas with early colonising ephemeral and short perennial vegetation. During the detailed botanical survey, quadrats Q1, Q2, Q3, Q4, Q5 and Q6 were undertaken within this component of the open mosaic habitat. Typical species recorded include sheep's fescue, procumbent pearlwort *Sagina procumbens,* Yorkshire fog*,* American willowherb *Epilobium ciliatum*, rosebay willowherb *Chamaenerion angustifolium*, common bent grass *Agrostis capillaris*, creeping bent grass *Agrostis stolonifera*, rough hawkbit *Leontodon hispidus*, broadleaved dock, dandelion, red fescue, sweet vernal grass, bird's-foot trefoil, annual meadow grass *Poa annua*, ragwort, foxglove, soft rush *Juncus effusus*, heather, sheep's sorrel *Rumex acetosella*, and wavy hair-grass *Deschampsia flexuosa*.
- Semi-improved neutral grassland areas that are floristically more diverse, that appear to be rabbit *Oryctolagus cuniculus* grazed, creating a short, open sward. In areas, they have developed over a series of spoil mounds and rock piles which provide a varied topography.

Typical grass species recorded include red fescue *Festuca rubra*, sweet vernal grass *Anthoxanthum odoratum*, tufted hair grass *Deschampsia caespitosa*, Yorkshire fog *Holcus lanatus*, field wood-rush *Luzula campestris* and common bent grass, creeping bent. Herb species are locally abundant and include mouse-ear hawkweed *Pilosella officinarum*, bird's-foot trefoil *Lotus corniculatus*, foxglove *Digitalis purpurea*, dandelion *Taraxacum officinale agg*, ribwort plantain *Plantago lanceolata*, ragwort *Senecio jacobaea*, common vetch *Vicia sativa*, tufted vetch *Vicia cracca*, broad-leaved dock *Rumex obtusifolius* and common nettle *Urtica dioica*. An area of abundant field horsetail *Equisetum arvense* is present.

- A pond (P1) is approximately 10 m long and up to10 m wide in a D-shape. It is in the base of the quarry void adjacent to the cliff faces and could not be closely inspected because of the steep sided, unstable and uneven terrain. The margins of the pond in the former quarry void are largely unvegetated bare ground with stone spoil mounds. Aquatic vegetation is present including reedmace and a pondweed species *Potamogeton* sp. The water depth is unknown but is considered unlikely to dry out most years.
- A small ephemeral waterbody approximately 3 m long and 2.5 m wide is present within an area of bare ground and ephemeral / short perennial vegetation (Target Note 1). At the time of survey, it was up to 15 cm deep but it is likely that it dries out frequently. Small amounts of reedmace *Typha latifolia* and soft rush are present.
- The cliff face within the quarry void has large areas of loose soil and slippages with occasional areas of hard rock faces. There are groundwater seepages and occasional small patches of grass and scrub vegetation.
- Discreet areas of dry heath / acid grassland mosaic are present around the tops of the cliff faces. They appear unmanaged and characterised by heather, billberry *Vaccinium myrtillus*, red fescue, sheep's fescue *Festuca ovina*, sweet vernal grass, tufted hair grass, creeping bent, cat's-ear *Hypochaeris radicata*, heath bedstraw *Galium saxatile*, foxglove and moss species.
- Quarry spoils mounds comprising of large boulders that are unvegetated.
- Scattered scrub including bramble *Rubus fruticosus* agg, silver birch *Betula pendula* and downy birch *Betula pubescens*.

4.22 Table 3 below presents a summary of the assessment of the Site habitats against the open mosaic habitats on previously developed land Habitat of Principal Importance (HPI) / Priority Habitat definition[3][4].

Table 3: Assessment of the Site habitats against the Open Mosaic Habitats on Previously Developed Land definition criteria

Criterion	Pass / fail	Notes
1. The area of open mosaic habitat is at least 0.25ha in size.	Pass	Area of open mosaic habitat is approximately 1.24 ha.
2. Known history of disturbance at the site or evidence that soil has been removed or severely modified by previous use(s) of the site. Extraneous materials / substrates such as industrial spoil may have been added.	Pass	Areas of the Site have historically been used for mineral extraction. This has resulted in varied topography.
3. The site contains some vegetation. This will comprise early successional communities consisting mainly of stress-tolerant species (e.g. indicative of low nutrient status or drought). Early successional communities are	Pass	Areas of early successional plant communities including annuals, mosses, flower-rich grassland and heathland are present. Many of

[3] HPI is a term used within the NERC Act (2006) and Priority Habitats is the term used within the NPPF (2021); the habitats associated with these terms are synonymous.

[4] https://data.jncc.gov.uk/data/a81bf2a7-b637-4497-a8be-03bd50d4290d/UKBAP-BAPHabitats-40-OMH-2010.pdf

composed of (a) annuals, or (b) mosses/liverworts, or (c) lichens, or (d) ruderals, or (e) inundation species, or (f) open grassland, or (g) flower-rich grassland, or (h) heathland.		the species are stress-tolerant and indicative of low nutrient soils.
4. The site contains unvegetated, loose bare substrate and pools may be present.	Pass	There are areas of unvegetated loose soils present in soil mounds and a south-facing loose soil embankment. A small permanent waterbody is present (pond P1) as are small, ephemeral pools.
5. The site shows spatial variation, forming a mosaic of one or more of the early successional communities (a)–(h) above (criterion 3) plus bare substrate, within 0.25ha.	Pass	There is spatial variation of habitats throughout the open mosaic habitat area, with small parcels of habitats interspersed by areas of bare ground over a varying topography.
Summary: The area of open mosaic habitat identified within the Site, passes all five criteria. It is therefore considered likely to meet open mosaic habitat on previously developed land Habitat of Principal Importance (HPI) / Priority Habitat type (BRIG (ed. Ant Maddock) 2011).		

4.23 There are habitats within the Site that have not been including in the open mosaic habitat on previously developed land priority habitat classification. This has been determined by reviewing the collected habitat field data and historical aerial images (Google Earth Pro) and applying professional judgement. Such habitats have been excluded on the following basis:

- Areas that have been previously affected by historical quarrying operations but have since progressed through natural habitat succession beyond the early successional habitats characteristic of open mosaic habitat, to become clearly defined, and well-established, habitat parcels. This includes the areas of heathland with overlying scattered scrub in the north of the Site.
- Areas of habitats that have not been affected by quarrying operations. Predominantly this relates to the area of the Site south of the quarry void that supports tall ruderal vegetation, heathland, acid grassland and species-poor semi-improved grassland. Historical aerial images also indicate that the northeast and southwest boundary habitats supporting tall ruderal vegetation, dense scrub, heathland and pond P2 have also been unaffected by quarrying works.

4.24 Open mosaic habitat on previously developed land is a HPI / Priority Habitat and is also listed as a Priority Habitat within the Kirklees Biodiversity Action Plan (2007). Open mosaic habitat on brownfield sites can be extremely diverse, supporting a range of terrestrial and aquatic habitats which can support rare and scarce invertebrates as well as plants, birds, reptiles and amphibians of conservation concern. For the purposes of this evaluation, it is considered to be appropriate to rely on a combination of factors in making a qualitative assessment of the open mosaic habitat mosaic. Therefore in undertaking this assessment, the results of the invertebrates, reptiles, great crested newt and bird surveys have been taken into account; the results of these surveys are detailed in the relevant sections of this report, but in summary:

- The Site supports a reasonably diverse invertebrate fauna, which includes mostly common and widespread species, with a small proportion of species with an assigned conservation status. Of the species recorded, the majority are without any recognised status, being widely distributed and common, and do not exhibit habitat specificity. Twelve species are regarded as Locally Common or Locally Scarce and seven species are currently accorded noteworthy status, being either Species of Principal Importance, Nationally Scarce or Rare.
- No reptiles or great crested newt were recorded at the Site.
- The breeding bird assemblage at the Site is typical of rural, upland edge locations with a small proportion of the species recorded of conservation concern.

4.25 Taking all the above into account, it is considered that the area of open mosaic habitat within the Site is of **District** level value.

Species-poor semi-improved grassland

4.26 Areas of species-poor semi-improved grassland are present to the south of the quarry void (Photographs 7 and 8) with a smaller area adjacent the northern Site boundary. During the detailed botanical survey, quadrats Q7, Q8, Q9, Q10 and Q16 were undertaken within species-poor semi-improved grassland habitats in the southern section of the Site.

4.27 These habitats are currently unmanaged and have developed a tussocky sward dominated by grass species including abundant Yorkshire fog, with frequent to occasional cock's-foot *Dactylis glomerata*, creeping soft-grass *Holcus mollis,* false-oat grass *Arrhenatherum elatius,* common bent grass, red fescue and tufted hair grass. Typically, grass species are dominant with few herbs present in the sward, although there are localised areas with an increased abundancy and diversity of herbs including zigzag clover *Trifolium medium,* tormentil *Potentilla erecta* and heath bedstraw. Other herb species present include common ragwort *Senecio jacobea*, cow parsley *Anthriscus sylvestris,* common sorrel *Rumex acetosa,* common hogweed *Heracleum sphondylium,* yarrow *Achillea millefolium,* and thistle *Cirsium sp*. Patches of locally dominant common nettle are present throughout this habitat.

4.28 The species-poor semi-improved grassland is of inherently low ecological value which is dominated by course grasses with few herbs, and no plant species of recognised local or higher value. This is a common and widespread grassland habitat type which does not conform to any Priority Habitat descriptions and is not an HPI. It is therefore considered to be of Site level value.

Acid grassland

4.29 Areas of acid grassland are present to the south of the quarry void (Photograph 9). During the detailed botanical survey, quadrats Q11, Q12, Q13, Q14 and Q15 were undertaken within acid grassland habitats.

4.30 These habitats are currently unmanaged and have developed a tall, tussocky sward dominated by grass species including common bent, wavy hair-grass, creeping soft-grass, sheep's fescue and red fescue. Herb species present including locally abundant heath bedstraw and tormentil, and occasional common sorrel and bluebell *Hyacinthoides non-scripta*. There are occasional small patches of heather and bilberry developing within the grassland.

4.31 Lowland dry acid grassland is a HPI (BRIG (ed. Ant Maddock) 2008, updated 2011) and is also listed as a Priority Habitat on the Kirklees Biodiversity Action Plan (2007). In helping to identify lowland acid grassland Priority Habitat, the HPI definition[5] and the Kirklees Habitat Action Plan[6] provides the following guidance:

- Typically occurs below 300 m altitude on free draining soils.
- Characterised by a range of plant species including heath bedstraw, sheep's fescue, common bent, sheep's sorrel, wavy hair-grass, and tormentil.
- Dwarf shrubs such as heather and bilberry can occur but at low abundance. Lowland acid grassland, often forms a mosaic with dwarf shrub heath.
- Is normally managed as pasture.
- Within Kirklees this habitat often occurs within a mosaic of woodland, scrub and heathland, which is a distinctive feature of the valley slopes and the wildlife communities found there.

4.32 The acid grassland within the Site supports the majority of the plant species characteristic of lowland dry acid grassland Priority Habitat, and there are very few plant species present that are

[5] https://data.jncc.gov.uk/data/902cafcb-578f-43de-8a99-7143f00d79a2/UKBAP-BAPHabitats-26-LowlandDryAcidGrass.pdf
[6] https://www.kirklees.gov.uk/beta/delivering-services/pdf/lowland-dry-acid-grassland-action-plan.pdf

indicative of significant agricultural improvement (such as through the application of fertilisers). There were no significant numbers of species indicative of damp / wet ground conditions recorded within this habitat at the Site, and it is located on valley slope that will create free draining soils. This area of acid grassland in the Site is located at an altitude of approximately 302 m to 310 m above sea level[7] which is at the upper limit of the typical altitude for lowland dry acid grassland Priority Habitat. In the local Kirklees context, the Site is situated on a valley slope in a predominantly agricultural landscape with extensive areas of pasture grassland, although there are occasional areas of woodland, scrub and heathland nearby.

4.33 On a precautionary basis it is assumed that the acid grassland at the Site does meet the definition of lowland dry acid grassland HPI / Kirklees Priority Habitat but its relatively small extent and lack of management, is considered to limit its biodiversity value. It is likely to be typical of the acid grassland types found locally, and although it is considered to be of greater than Site level importance it is considered unlikely to be of District level importance. On this basis the acid grassland at the Site is considered to be important at the Local level.

Acid dry dwarf shrub heath

4.34 The main area of acid dry dwarf shrub heath is located on an overburden embankment in the northwest of the Site (Photographs 10 and 11). This habitat is characterised by dominant heather and bilberry with locally abundant moss species and occasional grasses such as sheep's fescue and creeping soft-grass. The heath appears to be unmanaged and there is scrub developing over the southern section of this parcel of heath which is typically scattered or small groups of semi-mature downy birch, silver birch, common gorse *Ulex europaeus,* goat willow *Salix caprea* and grey willow *Salix cinerea*. There are occasional exposed piles of quarried stone spoil.

4.35 Smaller areas of acid dry dwarf shrub heath are also present in the south of the Site, typically adjacent to the boundaries and within the acid grassland.

4.36 Lowland heathland is a HPI (BRIG (ed. Ant Maddock) 2008, updated 2011) and is also listed as a Priority Habitat on the Kirklees Biodiversity Action Plan (2007). In helping to identify lowland heathland Priority Habitat, the HPI definition[8] and the Kirklees Habitat Action Plan[9] provides the following guidance :

- Typically occurs below 300 m altitude.
- Characterised by plants such as heather, bilberry, bell heather *Erica cinerea*, common gorse and western gorse *Ulex gallii*.
- Within Kirklees District lowland heathland is often associated with slopes and escarpments, often as part of a habitat mosaic.
- Within Kirklees, areas of good quality heathland are noted to consist of an ericaceous (shrubs preferring acidic conditions) layer of varying heights and structures, some areas of scattered trees and scrub, areas of bare ground, gorse, wet heaths, bogs and open water. Further indicators of good quality include the presence and numbers of characteristic birds such as tree pipit *Anthus trivialis* and linnet *Carduelis cannabina*, reptiles, invertebrates, vascular plants, bryophytes and lichens.

4.37 The larger area of heathland in the north of the Site appears to fit with the lowland heathland HPI / Priority Habitat definitions as it is at an altitude of approximately 280 m, supports several of the characteristic plant species and is located on a valley slope within a wider landscape habitat mosaic. However, many of the features indicative of good habitat condition are absent as the vegetation height is typically fairly uniform with very few areas of bare ground and no wet areas. Additionally, the Site does not support reptiles or breeding tree pipit or linnet. The invertebrate

[7] https://www.freemaptools.com/elevation-finder.htm
[8] https://data.jncc.gov.uk/data/1be8bec3-0437-4758-adc8-ac866d4e0769/UKBAP-BAPHabitats-28-LowlandHeathland.pdf
[9] https://www.kirklees.gov.uk/beta/delivering-services/pdf/lowland-heathland-action-plan.pdf

assemblages associated with the larger heathland parcel was considered to be fairly typical for the habitat type and geographic location.

4.38 It is considered likely that the larger area of heathland in the north of the Site meets the definition of lowland heathland HPI / Kirklees Priority Habitat but the smaller, fragmented areas elsewhere do not. Whilst the larger area of heathland is likely a HPI / Priority Habitat, it is relatively small in extent (in a landscape context) and its condition is limited by the lack of management resulting in excessive scrub encouragement.

4.39 The heathland at the Site is typical of the lowland heathland types found locally, with further examples cover larger areas present immediately east of the Site of the embankment that runs parallel with White Gate Road. Although the resource of heathland at the Site is considered to be of greater than Site level importance it is considered unlikely to be of District level importance. On this basis it is considered to be important at the Local level.

Mixed scrub

4.40 A belt of dense bramble, silver birch and willow scrub is present along the Site's western boundary (Photograph 12). Scattered scrub occurs occasionally throughout the Site, primarily associated with the heathland habitat as detailed above.

4.41 Mixed scrub habitat is widespread in the local area and does not conform to any HPI definition. Scrub is listed within the Kirklees Biodiversity Action Plan under Scrub and Habitat Mosaics on Previously Developed Land Habitat Action Plan. Given the limited amount of scrub within the Site, it is considered to be of Site level value.

Tall ruderal vegetation

4.42 Tall ruderal vegetation is present along the top of the quarry cliff face (Photograph 8), along the Site's northeast boundary and on spoil bunds. Characterised by broad-leaved dock, common nettle and willowherbs *Epilobium* spp.

4.43 Tall ruderal vegetation does not conform to any Priority Habitat descriptions and is not an HPI. This is a common habitat and the tall ruderal vegetation within the Site is considered to be of Site level value.

Standing water

4.44 There are two main waterbodies within the Site and a small ephemeral pool. Pond P1, located within the base of the quarry, and the ephemeral pool (Target Note 1) are described and assessed above as a component part of the open mosaic habitat on previously developed land.

4.45 Pond P2 (Photograph 13) is approximately 10 m long and up to 8 m wide. Marginal vegetation seen during the survey included species such as soft rush. The water depth is unknown but appears to be up to 40 cm deep during spring, which was noted to drop to a depth of 2 to 10 cm by late-summer.

4.46 Pond P2 is not considered to conform to any Priority Habitat descriptions and is not an HPI. It is considered to be of **Site** level value due to its small size, shallow depth and limited plant and invertebrate communities.

Trees

4.47 A number of semi-mature sessile oak *Quercus petraea* and sycamore *Acer pseudoplatanus* trees are present within the Site, located adjacent to the northern boundary. They are considered to be of **Site** level value due to their semi-mature age.

Invasive non-native plant species

4.48 Stands of Japanese knotweed are present within the Site (Target Note 2 – Photograph 14 and Target Note 3 – Photograph 15). An evaluation is not appropriate for this species.

Habitat impacts

4.49 As part of the proposed restoration, existing worked materials will be re-claimed, and the void will be backfilled to an agreed landform using a combination of on-site materials and imported inert fill. This will result in the temporary removal (stripping) of the habitats within the centre and north of the Site including the open mosaic habitat and larger parcel of heathland which are both HPI / local Priority Habitats. Selected areas of heathland and open mosaic habitat and the associated seed source and soils will be retained and re-used for the Proposed Restoration. Further details of the habitat losses, retention, enhancement and creation are presented within the Biodiversity Gain Assessment Report (BSG Ecology, 2023).

4.50 The habitats to the south of the quarry void (acid grassland, tall ruderal vegetation and heathland) and areas of the northeast and southwest Site boundary (pond P2, tall ruderal vegetation, trees and scrub) will be retained in situ and enhanced.

4.51 There is potential for temporary impacts on retained habitats at the Site during the activities to facilitate the Proposed Restoration, including the HPI / local Priority Habitat acid grassland, through processes such as localised, temporary dust deposition, soil compaction, and direct damage by machinery. Potential impacts to the temporarily removed habitats and soils could occur through inappropriate storage of materials, soil compaction and damage from machinery.

4.52 In the absence of mitigation, impacts on other habitats are likely to be adverse, at the Local level**.**

Habitat mitigation

4.53 The designed-in mitigation retains the majority of boundary habitats, pond P2 and the habitats to the south of the quarry void including acid grassland. Harm arising from direct damage and soil compaction to retained habitats will be avoided by installing protection fencing where appropriate during the Site Preparation phase to create biodiversity protection zones. The biodiversity protection zones will be clearly shown on a figure within the CEMP accompanied by a method statement and toolbox talk by the relevant ecologist to ensure inadvertent incursion or use of these areas of the Site. The LEMP will set out the habitat management and any habitat enhancement measures, as appropriate.

4.54 The areas of heathland and open mosaic habitats that will be temporarily stripped and stored on-site for reinstatement within the final restoration will be clearly identified within the CEMP. It is considered that the seed bank for both these habitats will be retained given the short duration of storage, up to two years. As such it is proposed that the materials are stored within the Site in an area where the materials would not be subject to the risks identified below. Details of how the materials would be stripped, stored and replaced would be provided within the CEMP. In principle this would include:

- Safeguarding of the materials by placing in a suitable on-site area that will not be subject to works, surrounded by protective fencing and use of matting to prevent accidental incursion by machinery or equipment, losses, mobilisation of materials due to surface water run-off that could cause siltation and loss of materials.
- Pollution prevention measures in line with Environment Agency guidance to avoid siltation.
- Monitoring during storage to ensure the materials are retained as planned.

4.55 Mitigation for impacts on retained and temporarily removed habitats during the Site Preparation phase, as described above, is to be controlled via an appropriate CEMP.

Habitat enhancement

4.56 The proposed final restoration plan (the Proposed Restoration and Reclamation Plan – Phase 4 Final Restoration Plan (Bright and Associates, 2023) shows that the Site will be restored with a biodiversity focus and will include:

- The reinstatement of the temporarily removed heathland on a like-for-like area basis.
- The re-instatement of the temporarily removed open mosaic habitat using the stored materials. This area will include all the necessary components to meet the HPI definition, including flower rich grassland, ephemeral / short perennial vegetation, scrapes and ephemeral pools and varied topography. There will be a reduction in the overall area of open mosaic habitat in the Site from approximately 1.24 ha to 0.5 ha. However, the restoration and aftercare of the Site will provide the opportunity to knock back the vegetation succession, manage the open mosaic habitat in a favourable condition and control its future rate of succession.
- The acid grassland and areas of heath in the south of the Site will be retained in-situ and brought into a favourable management regime to improve the condition of the habitat.
- Pond P2 will be retained and two new ponds will be created adjacent to P2 to compensate for the loss of pond P1. All ponds will be managed as part of the aftercare to maintain their condition.
- Within the centre of the Site, new areas of acid grassland and modified / amenity grassland will be created.
- The areas of species-poor semi-improved grassland and tall ruderal vegetation will be enhanced through habitat and soil interventions to create acid grassland.
- Retained scrub will be enhanced through supplementary planting of native species shrub species.
- Small areas of native species broadleaved woodland will be planted.

4.57 These habitats will provide suitable habitats for a range of associated fauna such as small mammals, amphibians, reptiles and invertebrates, and provide enhanced foraging habitat for birds and bats.

4.58 Mitigation for impacts on retained habitats during the Site Preparation Phase, as described above, is to be controlled via an appropriate CEMP. Creation of new habitat areas and enhancement of retained areas as part of the Restoration Phase, as described above, is to be detailed within an appropriate LEMP. It is proposed that the production of these documents, and their approval by Kirklees Council is subject to planning condition.

Habitat residual effects

4.59 Further details of the habitat losses, retention, enhancement and creation, including quantification of all areas, are presented within the Biodiversity Gain Assessment Report (BSG Ecology, 2022). Given the extent of the habitat creation and enhancement, and the opportunity to secure the long-term management of these habitats, it is considered that there will be beneficial effects on habitats, at the level of the Site.

Invasive non-native plant species

4.60 Stands of Japanese knotweed are present within the Site (Target Note 2 and Target Note 3). It is an offence to plant or cause the spread of Japanese knotweed in the wild under the Wildlife and Countryside Act 1981 (as amended). All waste containing Japanese knotweed comes under the control of Part II of the Environmental Protection Act 1990.

Impacts

4.61 Without due care, works at the Site could give rise to the spread of Japanese knotweed. In the absence of mitigation, impacts could be adverse, at the level of the Site.

Mitigation

4.62 An exclusion area should be marked around the stands of Japanese knotweed. An appropriate method of clearing the Japanese knotweed and preventing its spread will need be agreed with a specialist contractor.

Residual effects

4.63 By removing an invasive non-native species, the residual effects will be beneficial at the level of the Site.

Badger

4.64 One badger record was provided for a sett 544 m from the Site. No details were given as to the specific location or type of sett.

4.65 Badger is protected under the Protection of Badgers Act 1992. This makes it an offence to wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so; or to intentionally or recklessly interfere with a sett. Sett interference includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it. A badger sett is defined in the legislation as "a structure or place, which displays signs indicating current use by a badger".

4.66 No field signs of badger were recorded on-site during any of the field surveys. The grassland, heathland and scrub provide suitable foraging habitat. There are suitable opportunities for sett creation throughout the Site on embankments and within cavities under piles of large boulders.

4.67 The presence of badgers and the potential for them to be affected by the Site Preparation or restoration works is considered unlikely at the Site. On this basis, badger is scoped out of further consideration and, with the exception of a precautionary pre-site preparation survey to confirm the status of badger, see below, this species is not considered further in this assessment.

4.68 Due to the highly mobile nature of badgers, a precautionary pre-site preparation phase badger survey will be carried out prior to commencement of any construction related activities in order to assess the status of known setts, and check for any new setts which might have been created and assess impacts on these appropriately.

Bats

4.69 The MAGIC website provided details of one EPS bat licence granted within the desk study area. This relates to a licence granted in 2018 to permit the destruction of a non-maternity roost of brown long-eared bat 1.9 km west of the Site.

4.70 WYES returned 67 records for bats dated from 2003 to 2017. No bat records were returned within or adjacent to the Site. There are 17 roost records, the closest roost is that for a single unidentified bat 300 m west of the Site from 2003. A common pipistrelle *Pipistrellus pipistrellus* bat maternity roost was identified 490 m west of the Site within a house. Other bat species roosts within 2 km of the Site include a *Myotis* species, a *Pipistrelle* species and brown long-eared *Plecotus auritus*.

4.71 Non-roost records of common pipistrelle, soprano pipistrelle *Pipistellus pygmaeus*, noctule *Nyctalus noctula*, Daubenton's bat *Myotis daubentonii,* Natterer's bat *Myotis nattereri,* whiskered bat *Myotis mystacinus,* Leisler's bat *Nyctalus leisleri* and brown long-eared were also provided, all of which were over 600 m from the Site.

4.72 All UK bat species are a European Protected Species (EPS) and the animals and their places of rest / shelter (roosts) are fully protected under the Conservation of Habitats and Species Regulations 2017 (as amended) and under the Wildlife and Countryside Act 1981 (as amended). Seven UK bat species are listed as SPI under the provisions of the NERC Act 2006 and are listed on Kirklees Local Biodiversity Action Plan.

Roosting

4.73 No buildings are present within the Site. No trees were observed within the Site that have bat roost suitability.

4.74 The majority of the cliff faces are considered unsuitable for roosting bats as they are obscured by soil from landslips or are wet where groundwater seeps through. The side cliff faces have occasional deep, upward and horizontal directing crevices that could be used by roosting and hibernating bats. With reference to industry guidance (Collins (ed.), 2016) the cliff faces are considered to provide Low bat roosting suitability.

4.75 A dusk emergence survey was undertaken on 7 June 2021 to ascertain the status (presence / likely absence) of roosting bats in the cliff face. No bats were recorded emerging from the cliff faces during the survey. Foraging activity was recorded within the quarry void from common pipistrelle bats, and a single pass from a *Myotis* species bat was also recorded.

4.76 Inspection of the cliff face potential roost features using an endoscope is not possible due to safety concerns from landslips and rock fall.

4.77 There was no confirmed bat roosting at the Site, and few suitable roosting opportunities that are limited to occasional crevices in the cliff faces. The presence of roosting bats, and the potential for them to be affected by the proposals, is considered unlikely at the Site. On this basis, roosting bats are scoped out and are not considered further in this assessment.

Foraging / commuting

4.78 The scrub, ponds and quarry void provide suitable bat foraging habitat; the more open and unsheltered areas of the Site, such as the grassland, heathland and bare ground areas (typically and in the centre and south of the Site) are of lower suitability. During the bat emergence survey of the cliff faces, foraging activity was recorded within the quarry void from common pipistrelle bats, and a single pass from a *Myotis* species bat was also recorded. The foraging and commuting habitats within the Site are largely typical of the local area based on a review of aerial photography (Google Earth Pro accessed 05.03.23).

4.79 In the wider landscape, suitable bat habitats are present with large woodland valleys 360 m southwest and 600 m north and treelined reservoirs 1.1 km west and 1.1 km southeast. There are small blocks of woodland and scrub throughout the landscape. Pasture with dry stone wall field boundaries are adjacent to the Site, and in the local landscape, which are of lower foraging and commuting suitability for bats. The Site has some habitat connectivity to potential bat roost locations and suitable foraging habitats to the west along tree and scrub belts along Woodhouse Lane. Habitat connectivity to the north, east and south is limited given the presence of open agricultural land with dry stone walls that are considered to provide suboptimal suitability for foraging / commuting bats.

4.80 Given the small size of the Site which supports a typical foraging / commuting habitat resource, and the presence of other suitable habitats locally, based on professional opinion the Site is considered likely to of Local value for foraging / commuting bats.

Impacts

4.81 No evidence of roosting bats has been recorded and therefore impacts to roosting bats are unlikely. No mitigation is considered necessary for roosting bats.

4.82 The dense scrub, pond P2 and adjacent scrub / semi-mature trees will be retained in-situ and continue to provide suitable opportunities for foraging bats during the Site Preparation phase. The retained areas of grassland and heathland to the south of the quarry are considered to provide sub-optimal foraging habitat for bats. The quarry void including pond P1 and areas of scattered scrub developing over the heathland in the north of the Site will be lost as a foraging resource for bats as part of facilitating the overall restoration. The Restoration phase includes new woodland planting, the replacement of the habitats temporarily removed during Site Preparation (i.e. open mosaic

habitats and heathland) and the enhancement of the retained scrub along the south-east boundary; these are adjacent to off-site woodland habitats beyond Woodhouse Lane (a narrow single-carriageway road that is unlit) and are therefore reasonably well connected to existing bat habitats in the local area.

4.83 The Site Preparation and Restoration Phases are unlikely to require working after dark. No lighting other is proposed at the Site as part of the restoration. Therefore, no lighting impacts on bats are anticipated.

Mitigation

4.84 Bat roosts can be transient and there is a minor risk that individual bats may use the cliff face on an occasional basis, including during winter. The low level risk of potential impacts to individually roosting bats should be managed through appropriate working practices (including timing) during the infilling of the void as part of Site Preparation, the details of which would be detailed in a CEMP.

Enhancement

4.85 Three bat boxes (e.g. Schwegler 2F or similar) should be installed on retained trees at the Site in order to provide enhanced roosting opportunities for bats.

Residual effects

4.86 As they are not likely to be significantly adversely affected, effects on the local bat population is assessed as negligible. There is potential for a medium to long term beneficial effect on the local bat population as the habitats created and enhanced during the restoration phase mature and because the habitats will be managed for biodiversity purposes on an ongoing basis.

Birds

4.87 123 records for birds were returned by WYES dated from 2007 to 2018 from 21 species, including eight red-listed were species of conservation concern (Eaton et al., 2015) (linnet *Carduelis cannabina,* lapwing, curlew *Numenius arquata*, skylark, mistle thrush *Turdus viscivorus*, yellow wagtail *Motacilla flava*, twite *Carduelis flavirostris* and cuckoo *Cuculus canorus*) and nine amber-listed species (wheatear, golden plover, kestrel *Falco tinnunculus*, meadow pipit *Anthus pratensis*, house martin *Delichon urbica*, bullfinch *Pyrrhula pyrrhula*, snipe *Gallinago gallinago*, oystercatcher *Haematopus ostralegus* and red grouse *Lagopus lagopus*).

4.88 The nearest record to the Site were for a pair of linnet 60 m east. There are several records of lapwing from 100 m to 500 m east and south of the Site.

4.89 There are eight records of golden plover dated between April to July 2012. The closest of these are between 380 m to 430 m south of the Site with up to ten adult birds recorded. Golden plover is one of the qualifying bird species for which Peak District Moors (South Pennine Moors Phase 1) SPA is classified.

4.90 All nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended), which makes it an offence to kill, injure or take any wild bird or take, damage or destroy its nest whilst in use or being built, or take or destroy its eggs. Birds listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), receive additional protection against disturbance whilst they are nesting.

Breeding birds

4.91 A total of eight bird species were recorded within the Site during the 2021 survey visits and 17 during the 2022 visits that were confirmed to be breeding or were considered likely to be breeding. Overall, a total of 17 different species have been recorded breeding / likely breeding at the Site.

The locations of breeding bird territories are shown in Figures 4, 5 and 6 and further detail is provided in Appendix 3.

4.92 One of these bird species (Greenfinch *Chloris chloris)* is on the red list of Birds of Conservation Concern (Eaton et al., 2021) and nine species are amber listed (Dunnock *Prunella modularis*, whitethroat *Sylvia communis, m*allard *Anas platyrhynchos,* meadow pipit *Anthus pratensis*, stock dove *Columba oenas*, song thrush *Turdus philomelos*, woodpigeon *Columba palumbus*, willow warbler *Phylloscopus trochilus* and wren *Troglodytes troglodytes*). Song thrush is listed as a Species of Principal Importance under Section 41 of the Natural Environment and Rural Communities Act 2006.

4.93 The areas of scrub, including the scattered scrub within the heathland in the north of the Site, supported confirmed and probable breeding blackbird *Turdus merula* (two pairs), chaffinch *Fringilla coelebs* (one pair), dunnock (one pair), greenfinch (one pair), great tit *Parus major* (one pair), robin *Erithacus rubecula* (two pairs), wren (two pairs), woodpigeon, (one pair), song thrush (one pair) and willow warbler (one pair). The tall ruderal vegetation, scattered scrub at the top of the cliff faces supported single pairs of whitethroat, stock dove and pheasant *Phasianus colchicus*. The acid grassland and scattered heathland adjacent the Site's southern boundary supported two pairs of meadow pipit *Anthus pratensis* and one pair of whitethroat. One pair of mallard *Anas platyrhynchos* was recorded using pond P2.

4.94 A further 15 bird species were recorded during the survey visits for which no evidence of breeding was noted. This included individuals flying over the Site or species which may breed locally but for which suitable nesting habitat either does not occur on Site, or where no behaviour suggesting breeding was recorded.

4.95 During the surveys within the wider off-site areas undertaken between March and May 2022, observations were made of the following notable bird species including oystercatcher, curlew, golden plover and lapwing. Typically, much of the activity was recorded within the agricultural land to the south of the Site located closer to Peak District Moors (South Pennine Moors Phase 1) SPA; this is summarised below and shown on Figure 1.

- The grassland pasture field adjacent the Site to the north was used by up to two oystercatcher and two curlew for occasional feeding during each survey.
- A row of four grassland pasture fields located between 100 m and 500 m south of the Site were used by up to two oystercatcher and two curlew for occasional feeding during each survey.
- A large area of grassland pasture is located on the plateau above the escarpment at a distance of 200 m to 1.2 km to the south and southeast of the Site, which was noted to support breeding activity from two pairs of oystercatcher, four to five pairs of curlew, and 10 to 15 pairs of lapwing. Within this area is a large, open grassland pasture field 500 m south of the Site that was noted to be used for feeding by at least five golden plover during the April and May 2022 surveys; these birds were observed flying from the SPA further south before landing in the field and feeding.

4.96 During the breeding bird surveys, no evidence was recorded of any of the Annex I qualifying bird species of the Peak District Moors (South Pennine Moors Phase 1) SPA, or the non-qualifying species of interest, using the habitats at the Site. The Site habitats are considered to be sub-optimal for these species in terms of both nesting and foraging. There were occasional observations of individual / low numbers of golden plover and curlew flying over the Site. As summarised above, the surveys within the wider landscape around the Site recorded notable bird species, but typically this was in habitats 200 m to 1.2 km to the south of the Site. No nesting activity of any of these notable species was recorded in the fields adjacent the Site, with only occasional feeding from low numbers of oystercatcher and curlew. Taking all the above into account, it is considered that the Site and the fields adjacent, are unlikely to be functionally linked to the Peak District Moors (South Pennine Moors Phase 1) SPA. Further consideration to the Site and the fields adjacent is given in the report to inform HRA (BSG Ecology, 2023) relating to the Proposed Restoration.

4.97 Overall, the Site is considered to support a typical breeding bird assemblage for the habitats present. All of the bird species of conservation concern / SPI bird species found within the Site are likely to be widespread breeding species throughout the county. The Site is considered to be of Local value for birds.

Impacts

4.98 The key adverse impact on nesting birds will be loss of scattered scrub habitats in the north of the Site, and disturbance from Site Preparation related infill and Restoration activities, depending on the time of year. Low levels of bird nesting activity were also recorded around the tops of the cliff face associated with the scrub and tall ruderal vegetation. Clearance works during the breeding season could result in destruction and disturbance of active nests within these habitats.

4.99 The permanent loss of areas of scrub in the north of the Site and scrub / tall ruderal at the top of cliff face will lead to a reduction in nesting habitat within the Site.

4.100 The designed-in measure of retaining boundary scrub and trees will maintain the existing bird territories in these areas and continue to provide suitable nesting opportunities for the birds displaced by the loss of other scrub habitats; however due to the larger quantity of scrub being removed than retained, the retained areas are unlikely to be able to accommodate all the territories being affected. The areas of proposed woodland will, once the planting becomes semi-mature, provide nesting opportunities for a range of bird species, including those currently present within the scrub areas.

4.101 The grassland and heathland supporting territories of meadow pipit and whitethroat in the south of the Site will be retained. It is possible that some birds using the retained habitats will be displaced temporarily potentially resulting in reduced breeding on-site during the restoration works.

4.102 The area of heathland in the north of the Site, will be temporarily removed, and then reinstated once reprofiling works have been completed as part of the restoration.

4.103 Areas of open mosaic habitat will be reinstated as part of the restoration. These will form part of a site-wide matrix of habitats along with the heathland and acid grassland that provide nesting opportunities for a range of ground nesting species of conservation concern such as meadow pipit, skylark and lapwing.

4.104 In the absence of mitigation, there is likely to be a temporary adverse effect on the bird assemblage at the Site level.

Additional mitigation

4.105 There are no mitigation measures proposed in relation to SPA qualifying features, see the report to inform HRA (BSG Ecology, 2023).

4.106 Clearance of potential bird nesting habitat should be avoided in the bird nesting season (typically March to August as a guide but can be affected by factors such as the prevailing weather conditions). If habitat clearance needs to take place during or close to the breeding season, it should only proceed once a suitably experienced ecologist has checked the area and confirmed that nesting birds are not present. If nesting birds are found, they will need to be retained in a suitable buffer until any young have fledged, or the nest becomes inactive.

4.107 Mitigation measures will be provided that make grassland more suitable for nesting and foraging bird species in general terms. Grassland management would seek to provide a range of sward heights and to deliver a diverse structure that would benefit to a range of bird species such as meadow pipit, lapwing, curlew and golden plover. If mowing is to be used as a management method, this should only be undertaken after the bird breeding season to avoid the disturbance of ground-nesting birds.

4.108 Further measures relating to mitigating potential disturbance to off-site bird nesting and foraging are not proposed as they are not expected to be significantly impacted by the proposals.

Enhancement

4.109 The habitat creation and enhancement measures will benefit a wide range of farmland birds at the Site.

4.110 Five bird boxes suitable for a range of species are to be installed on retained mature trees at the Site in order to provide enhanced bird nesting opportunities at the Site.

Residual effects

4.111 Negative impacts to birds during the breeding period will be temporary for the duration of the restoration works. Following the creation / enhancement, and favourable management, of habitats at the Site, it is expected that the Site will continue to support a similar abundance and range of bird species during the breeding season. Overall, the post-restoration breeding bird assemblage is unlikely to be significantly affected in the long-term, and residual effects are considered to be negligible or potentially minor beneficial at the level of the site due to favourable habitat management.

Wintering birds

4.112 During the wintering bird surveys, no evidence was recorded of any of the Annex I qualifying bird species of the Peak District Moors (South Pennine Moors Phase 1) SPA, or the non-qualifying species of interest, using the habitats at or adjacent to the Site.

4.113 A total of 28 bird species were recorded outside the Site within the wider survey area; further detail is provided in Appendix 4. Wintering bird activity which was considered to be notable in the local context (i.e. by species for which the Peak District Moors (South Pennine Moors Phase 1) SPA is classified, and / or increased levels of activity from birds of conservation concern) is shown on Figure 7 and is summarised below:

- Foraging fieldfare *Turdus pilaris* throughout the survey area, with larger aggregations of 78 birds located 370 m southwest of the Site, 10 birds 480 m east of the Site and 100 birds 800 m south of the Site. Fieldfare is a red listed species on the Birds of Conservation Concern (Eaton et al., 2021).
- 48 roosting lapwing in grassland pasture located 450 m south of the Site and four roosting lapwing in grassland pasture 980 m southwest of the Site. Lapwing is not listed as a qualifying species for the SPA but is noted on the SPA citation as a non-qualifying species of interest and is a red listed species on the Birds of Conservation Concern (Eaton et al., 2021).
- Foraging redwing *Turdus iliacus* throughout the survey area with a larger aggregations of 30 birds 880 m south of the Site in an area of scrub and woodland. Redwing is an amber listed species on the Birds of Conservation Concern (Eaton et al., 2021).
- A foraging curlew was recorded in grassland pasture 690 m southeast of the Site. Curlew is not listed as a qualifying species for the SPA but is noted on the SPA citation as a non-qualifying species of interest and is a red listed species on the Birds of Conservation Concern (Eaton et al., 2021).

4.114 The habitats at the Site, particularly the areas of scrub, provide some foraging and sheltering opportunities, typically for common and widespread species, but could on occasion be used by fieldfare (red listed species) or redwing (amber listed species). The areas of acid grassland are considered to be suboptimal for foraging notable bird species that may be resident within the Peak District Moors (South Pennine Moors Phase 1) SPA such as lapwing, oystercatcher and golden plover as it is unmanaged with a taller sward height; typically, these species prefer short areas of grassland for foraging. The grassland pasture fields adjacent the Site to the north, east and south provide some suitable foraging opportunities for lapwing, oystercatcher and golden plover; however, none was recorded during the surveys. It is possible that these species may utilise these fields on occasion as part of a resource within the wider landscape. There is a large resource of grassland pasture to the south of the Site located closer to Peak District Moors (South Pennine Moors Phase 1) SPA, where lapwing and curlew were recorded during the wintering bird surveys;

these areas are located over 500 m from the Site. On this basis, it is considered that the Site and the fields adjacent, are unlikely to be functionally linked to the Peak District Moors (South Pennine Moors Phase 1) SPA.

4.115 Due to the low levels of wintering bird activity, no bird species relevant to the SPA recorded within and adjacent the Site during the surveys, and the geographical distance to areas of increased wintering activity from notable species, the proposed restoration is considered unlikely to directly (through habitat loss) or indirectly (through noise or vehicular movements) affect wintering birds. The final restoration will include new areas of acid grassland which along with the retained grassland will be brought into a favourable management regime that would seek to provide a shorter sward height over the winter period; this would provide a modest increase in suitable winter foraging habitat in the local area for lapwing, oystercatcher and golden plover.

4.116 Impacts to wintering birds are unlikely at the Site, and they will not be impacted by the proposals. On this basis, wintering birds are scoped out and are not considered further in this assessment.

Great crested newt

4.117 Information on the MAGIC website indicates there are no issued EPS licences for great crested newt within a 2 km radius of the Site.

4.118 No records for great crested newt were returned by WYES.

4.119 Great crested newt is a European Protected Species (EPS) and the animals and their places of rest / shelter are fully protected under the Conservation of Habitats and Species Regulations 2017 (as amended) and under the Wildlife and Countryside Act 1981 (as amended). Great crested newt is listed as a Priority Species on the Kirklees BAP and are also SPI.

4.120 Two ponds are present at the Site, ponds P1 and P2; descriptions of the ponds are provided earlier in the Habitats section of this report. There are no off-site ponds within 500 m of the Site. The locations of the ponds are shown in Figure 2 and further detail of the HSI and eDNA results are provided in Appendix 5.

4.121 Ponds P1 and P2 both have 'average' HSI suitability for great crested newt. The eDNA survey was negative for the presence of great crested newt within P2. Pond P1 could not be physically accessed to collect a water sample for eDNA analysis due to safety considerations. This is not considered to be a significant constraint to the great crested newt assessment at the Site as an eDNA survey of pond P2 (located 100m from P1) was completed which returned negative result for the presence of great crested newt. Given the close proximity of these two ponds to each other, the mobility of the species and the similarity of HSI scores, it is reasonable to assume that as great crested newts are absent from P2, they are also likely to be absent from P1.

4.122 The presence of great crested newt and the potential for the species to be affected by the proposals is considered unlikely at the Site. On this basis, great crested newt is scoped out and is not considered further in this assessment.

Invertebrates

4.123 WYES provided 17 invertebrate records including:

- Eight undated beetle records located 400 m to 1.9 km from the Site. All records are for Nationally scarce category A and B species.
- Seven moth records dated 2002 to 2016 located 700 m north of the Site. Species include knot grass *Acronicta rumicis*, dusky brocade *Apamea remissa*, broom moth *Melanchra pisi*, white ermine *Spilosoma lubricipeda*, buff ermine *Spilosoma luteum* and dark-barred twin-spot carpet *Xanthorhoe ferrugatai*. These species are listed as Species of Principal Importance (SPI) under the provisions of the NERC Act (2006).
- Two records of wall butterfly *Lasiommata megera* located 1.4 km and 1.9 km from the Site. Wall butterfly is an SPI.

Habitat potential assessment

4.124 Habitat parcels within the Site were distinguished based on their potential value to invertebrates. This acted as a means of focussing subsequent targeted survey effort on the areas where valued invertebrate assemblages were considered more likely to be encountered.

4.125 The Site can be separated into three areas which are shown on Figure 9. Habitat descriptions for each of the sections are set out below and photographs of features / habitats of note are referred to where relevant.

Area 1

4.126 Area 1 in the north, western and eastern flank of the Site includes a range of established habitats (including heathland, scrub and tall, herb-rich grassland) with small patches of bare ground, sparsely vegetated ground and exposed rocky substrates. Patches of tall ruderal vegetation are frequent throughout.

4.127 Amongst the more abundant plants in this area are nectar and pollen-rich species including bird's-foot trefoil, red clover, white clover, common ragwort, coltsfoot *Tussilago farfara*, dandelion, bramble, foxglove, common nettle, rosebay willowherb, heath bedstraw and various species of willowherb. Grey willow is also an important source of nectar and pollen, particularly early in the year. Similarly, bilberry, which is in the north of this area is any early flowering low growing shrub. Alongside this, is heather, a late flowering short shrub. Collectively, these plants are important for a wide variety of nectar and pollen feeding invertebrates, which include plants that flower early, and those that continue flowering late in the season, which can be important for those species that rely on nectar and pollen early or late in the year. They may also be important for phytophagous (plant feeding) invertebrates such as weevils and various plant bugs that may be well represented given the variable structure of the vegetation and variety of plants, afforded by a range of successional stages from sparsely vegetated substrate through to willow and silver birch scrub, with occasional oak saplings. Local structural variation is provided by informal grazing / browsing wild animals (e.g. deer and rabbits).

4.128 In the north-east of this area is a small, ephemeral pond. The water level fluctuates through the year, almost drying completely by late summer. Marginal vegetation is dominated by soft rush and creeping bent. The ephemeral nature of this pond could make it of value to invertebrates specialised in living in seasonally wet muddy substrates.

Area 2

4.129 Area 2 occupies the former quarry void, its sides, and trackways around the void. The void itself has near vertical sides to the south, east and west and more gradual slopes to the north. The majority of sampling effort for invertebrates was on the northern side, for two main reasons. Firstly, the northern slopes are sheltered from prevailing winds and (unlike the other aspects) exposed to sunlight for much of the day, meaning that these are likely to provide ideal conditions for thermophilic (warmth-loving) species, many of which may create burrows (e.g. solitary bees and wasps) in exposed soils or seek refuge in crevices within the substrate (e.g ground and rove beetles). The second reason is that the other sides were not able to be safely accessed, even at the base, due to risk of rock fall. The other sides were visually assessed, and it was found that some areas have seepages that are locally vegetated, with bryophytes, ferns and grasses which have potential for groups including craneflies and rove beetles.

4.130 Vegetation in Area 2 is patchy compared to the adjacent Area 1, with sparse cover of ephemeral and short perennial herbs. The cover of short herbs is notable in that many of these herbs are species favoured by nectar and pollen feeding (and often, thermophilous) invertebrates, including bird's-foot trefoil (amongst other Fabaceae), small yellow composites and patches of trailing bramble. Various dock and species which are used by a diverse range of invertebrates, are frequent to locally abundant, adding to the structural complexity of Area 2.

4.131 In the base of the quarry void is a well vegetated pond (P1). This was not physically accessed for survey due to health and safety concerns (see limitations section, above).

Area 3

4.132 Area 3 was not subject to targeted invertebrate survey due to it being assessed as of low potential for invertebrates interest. Overall, species-poor grassland was the primary habitat type. This habitat lacks structural diversity and plant species diversity that is needed to support a diverse and unique invertebrate assemblage. A bank of heather and bilberry runs through this Area, which is suitable vegetation for invertebrate interest; however, this vegetation is localised, and it was considered that the survey effort for similar vegetation sampled in Area 1, was sufficient and it was not considered proportionate to survey this bank too.

Targeted surveys

4.133 The results of the targeted surveys provide an indication of the relative species diversity within the targeted groups of invertebrates. Over 450 specimens were collected or recorded over the course of the survey, allowing 123 species to be identified from the Site.

4.134 Of the target groups, Coleoptera was the dominant order recorded, represented by 48 species; Hemiptera was represented by 19 species; Hymenoptera was represented by 22 species; Diptera was represented by 13 species, and Lepidoptera by 11 species. Other species which made up the remaining records included those belonging to the Dermaptera (earwigs), Isopoda (woodlice), Julida (snake-millipedes), Lithobiomorpha (stone centipedes), Opiliones (harvestmen), Orthoptera (crickets and grasshoppers), Polydesmida (flat-backed millipedes) and Pulmonata (lunged snails).

4.135 Of the species recorded, the majority are without any recognised conservation status, being widely distributed and common, and exhibiting little habitat specificity. Twelve are regarded as Locally Common or Locally Scarce and seven are currently accorded noteworthy status, being either Species of Principal Importance, Nationally Scarce or Rare. Further details and complete list of invertebrates recorded within the Site is provided at Appendix 7. A summary of the species with a designated conservation status is provided below:

- Chrysomelidae (Leaf Beetles) *Agelastica alni* – UK Status: Nationally Rare (Data Deficient). Despite being the subject of a recent review in Hubble (2014) in which it was accorded Nationally Rare status, the beetle is experiencing a range expansion from its initial loci in Cheshire (Stenhouse, 2006) and can be found abundantly at numerous sites across north-west, central, and southern England. One specimen was identified from Area 1 on 16 June 2021.
- Curculionidae (True Weevils) *Polydrusus formosus* – UK Status: Nationally Scarce. This species is found on a wide variety of tree species typically in wooded areas. Formerly very local in southern England and Wales, it is now much more common and widespread, so does not merit the current status and is likely to be downgraded to locally common in any future review of the Curculionidae. Two specimens were swept from Area 1 on 16 June 2021.
- Staphylinidae (Rove Beetles) *Neuraphes plicicollis* – UK Status: Nationally Scarce. This tiny beetle is not well recorded and there are few records in the national database. However, it is not easily found, and difficult to identify, so may be under-recorded. According to an unpublished and undated key by Peter Skidmore, it can be found in rotten wood or under loose bark, or sometimes in *Sphagnum* moss, in wooded areas. It has been recorded in most months of the year. It is very local, with most records being on the eastern side of England as far north as Yorkshire. One beetle was extracted from a pitfall trap set in Area 2, retrieved on 28 June 2021.
- Nymphalidae (Butterfly) *Coenonympha pamphilus* (small heath butterfly) - UK status: Vulnerable. Section 41 listed Species of Principal Importance. Small heath butterflies typically occur in well-drained semi-improved grassland habitats. The species was recorded in several locations in Areas 1 and 2 in June 2021.
- Andrenidae (Mining Bees) *Andrena nigriceps* (black-headed mining bee) - UK status: Nationally Scarce. This species according to the BWARS (2012), nests singly in short turf or bare ground in lighter soils of flower grasslands. It is widespread in England but mainly coastal and found as far north as southern Scotland. One bee was swept from Area 1 on 2 August 2021.

- Halictidae (Sweat Bees) *Sphecodes crassus* (swollen-thighed blood bee) - UK status: Nationally Scarce. It was regarded as scarce but has apparently become more common in recent years and is widespread and locally common across southern England and the midlands (Falk, 2015). This suggests that it will be downgraded in any future review. Two bees were taken from pan traps set in Area 1 on 16 June 2021.
- Tiphiidae (Tiphiid Wasps) *Tiphia minuta* (small Tiphia) - UK status: Nationally Scarce. This small wasp is widespread in Britain, although mainly recorded from central and southern England. It is difficult to find during fieldwork due to its habit of hovering just above ground level. This suggests that it may be under-recorded and may require a status review (BWARS, 2001). One wasp was taken from a pan trap set in Area 1 on 16 June 2021.

Pantheon assemblage analysis

4.136 Details regarding the methodology of Pantheon assemblage analysis is provided in Appendix 7. The Pantheon database has been used principally to help understand which assemblages within the Site are likely to be important. The species list derived from the terrestrial invertebrate surveys was entered into Pantheon. The data output from the analysis is described below, which considers the invertebrate assemblages at three different levels.

Broad biotopes

Table 4: Summary of Pantheon output for Broad Biotopes

Broad biotope	No. of species	Species with conservation status
Open habitats	86	3
Tree-associated	13	3
Wetland	12	0

4.137 Table 4 shows that there are three broad assemblages that were covered by the surveys of the Site, which are recognised by Pantheon. The best represented are those species belonging to open habitats, which is unsurprising given that much of the survey effort targeted this broad biotope that includes bare and sparsely vegetated substrates, grassland and ruderal vegetation. Sampling also took in woodland/scrub edge and an ephemeral pond, therefore it is to be expected that a proportion of the species recorded would be those associated with woodland/ trees and wetland.

Habitats

Table 5: Summary of Pantheon output for Habitats

Broad biotope	Habitat[10]	No. of species	SQI	Species with conservation status
Open habitats	Tall sward and scrub	65	100	0
	Short sward and bare ground	16	138	4 (*Andrena nigriceps, Sphecodes crassus, Tiphia minuta* and *Coenonympha pamphilus*)
Tree-associated	Arboreal	9	N/A	2 (*Agelastica alni* and *Polydrusus formosus*)
Other habitats within tree associated biotope, represented by 5 or fewer species: shaded woodland floor (2 sp) and decaying wood (2 sp.; 1: *Neuraphes plicicollis* has Conservation Status).				

[10] With > 5 associated species

Other habitats within open habitats biotope, represented by 5 or fewer species: upland (1 sp). Habitats within wetland biotope, represented by 5 or fewer species: acid & sedge peats (5 sp.), marshland (3 sp.), running water (2 sp.) and lake (1 sp.).

4.138 Table 5 adds a finer level of detail to Table 4, sub-dividing broad biotopes into habitats. The most prominent habitat is that of 'tall sward and scrub' that lies within the broad biotope of open habitats. As mentioned above, this habitat was extensive throughout the Site, and whilst being the most extensively surveyed habitat over the course of the survey period, it did not return any species with conservation status. Due to the absence of species with conservation status associated with this habitat, a low Species Quality Index (SQI) score (of 100) has been returned by Pantheon.

4.139 The 'short sward and bare ground' habitat within the open habitats broad biotope scored a high SQI score (of 138). This habitat type was also covered large areas of the Site, especially in Area 2, but also patchily in Area 1. Four species of conservation status were included within this habitat which suggests that this habitat is of value to invertebrates.

4.140 The 'arboreal' habitat included two species of conservation status however, little weight should be applied to this due to the number of species overall being less than 15 (a reliable SQI score could not be calculated), and the fact that both species accorded status are species that no longer deserve such status (see relevant descriptions above for *Agelastica alni* and *Polydrusus formosus*).

4.141 The remaining habitats all had 5 or fewer species; therefore reliable SQI scores could not be calculated. One of these habitats included a species with conservation status, which was *Neuraphes plicicollis*, associated with the decaying wood habitat. Decaying wood (of any size or age that would merit value) was generally absent from the Site, however, the species is understood to be found under loose bark, of which the willow and birch scrub may offer potential habitat for the beetle.

Specific assemblage types (SAT)

4.142 Four Specific Assemblage Types (SATs) are represented by the species list derived from the surveys. None of these SATs was in 'favourable condition'. The 'rich flower resource' SAT had the highest number of associated species (12 species) although this number is just below the threshold of 15 species required to demonstrate 'favourable condition' therefore it could be considered that this habitat falls just short of being of high quality within the Site. Further survey may reveal favourable condition, and if this were to be the case, it would imply that the open habitats across the Site provide an important resource of large flower patches capable of supporting a range of associated species (most often dominated by aculeate Hymenoptera). Flower patches were prominent throughout the surveys, with willow and foxglove providing sources of nectar and pollen early in the season, replaced by an array of composites, legumes, bedstraw and bilberry in mid-summer, followed by a different range of composites in late summer, such as thistle, ragwort and ling. As explained in Pantheon, the detection of this assemblage is relevant in that it flags up the importance of the floral resource within the Site.

4.143 The remaining SATs had fewer than ten associated species therefore do not merit further consideration.

Evaluation of invertebrate assemblage

4.144 There is no widely accepted published guidance presently available that provides a clear description of how to evaluate an invertebrate assemblage of a site. Various authors (e.g. Plant, undated) have previously proposed that threshold levels of species with a recognised conservation status could be used to distinguish sites of varying levels of importance across a geographical scale (e.g. a site with more than ten Nationally Scarce species might merit Regional value). However, this relies on relatively comprehensive surveys being undertaken covering a broad range of groups, and the constant state of flux of status applied to species compounds the difficulty in applying such an approach. Former English Nature guidance (English Nature, 2005) advised that an appropriate approach is to compare with other sites of similar nature and habitat. So, for

example, a site in West Yorkshire is of County importance if it compares well with other similar sites in West Yorkshire. This however introduces doubt, especially where useful data are unavailable (e.g., poorly recorded areas or where data have not been shared with Local Record Centres).

4.145 For the purposes of the present evaluation, it is considered to be more useful to rely on a combination of factors in making a qualitative assessment of the invertebrate value of a site. This considers the Pantheon output, including the number of species with a recognised conservation status found within the Site during surveys, the SQI scores and number and condition of SATs. It also takes into account professional judgement of the author, based on a knowledge and understanding of the invertebrate importance of sites across the particular geographic region (in this case northern England).

4.146 Overall, the Site supports a reasonably diverse invertebrate fauna, which includes mostly common and widespread species, with small proportion of species with conservation status. Two habitats (recognised by Pantheon) within the Site offered potentially suitable habitat for invertebrate assemblages; both associated with the 'open habitats' biotope. These were 'short sward and bare ground' and 'tall sward and scrub'. For tall sward and scrub, the lack of rare and nationally scarce species suggests that the habitat is not of importance for invertebrates. However, for short sward and bare ground the proportion and number of species accorded conservation status was relatively high, which included three nationally scarce species of aculeate Hymenoptera[11]. The value of this habitat, typical of the priority habitat 'open mosaic habitat on previously developed land' is also reflected in the 'rich flower resource' SAT, which was close to achieving favourable condition; therefore, some value should be placed on this, and is therefore concluded that the importance of the assemblage is of District level.

Impacts

4.147 Areas of open mosaic habitat will be reinstated as part of the Proposed Restoration. These will form part of a site-wide matrix of habitats along with the heathland, acid grassland and ponds that will be a value to the species of terrestrial invertebrates (including those with conservation status) present at the Site. The Site habitats will be favourably managed to be of benefit to invertebrate populations.

4.148 The key adverse impact to invertebrates will be the temporary removal of areas of the open mosaic habitat that is of greater habitat value of terrestrial invertebrates; this does not apply to the entire resource of open mosaic habitat. The areas with the greater suitability for invertebrates are located in the north of the Site where the open mosaic habitat borders the heathland and scattered scrub, supporting flower-rich grassland, areas of fallen deadwood and topographical variation with south facing embankments (as shown on Figure 9). The removal of these habitats without mitigation could result in a reduction of terrestrial invertebrate populations at the Site, potentially including species with conservation status. These impacts would be greatest should the entire resource of high suitability open mosaic habitat be removed at the same time during the Site Preparation phase. This is because the ability of certain terrestrial invertebrate populations (including those with conservation status) to persist within the Site may be affected. In the absence of mitigation, it is considered likely that impacts to the terrestrial invertebrate populations would be temporary and be likely to recover over time as invertebrate species recolonise the Site from retained on-site habitats and alternative off-site sources.

4.149 The habitats to the south of the quarry void (acid grassland, tall ruderal vegetation and heathland) and areas of the northeast and southwest Site boundary (pond P2, tall ruderal vegetation, trees and scrub) will be retained and enhanced. These designed in habitat retention measures will provide suitable habitats for the invertebrate species associated with those habitats to use through the Site Preparation phase and into the final Restoration.

4.150 The loss of pond P1 is unlikely to result in a significant impact to aquatic invertebrates at the Site as pond P2 will be retained, and the designed-in measures will create two new ponds that will provide compensatory habitat.

[11] This is a group of invertebrates that can often include dozens of species, including rarities, in areas of higher value for open habitats

4.151 In the absence of additional mitigation, there is likely to be a temporary adverse effect on the invertebrate assemblage at the Local level.

Mitigation

4.152 To allow for a continuation of terrestrial invertebrate populations at the Site, an invertebrate mitigation area should be created in advance of the removal of the higher suitability habitat (as shown on Figure 9). This could be created in an area of retained habitat, such as the area along the Site's northeast boundary, and would include:

- Creating mounds and south facing banks using existing soils, crushed brick and concrete from existing spoil piles.
- Existing large diameter fallen tree trunks / dead wood would be relocated into this mitigation area.
- The sowing of a flower rich grassland mixture would allow the mitigation area to develop nectar sources rapidly.

4.153 The new ponds will be created to be of maximum benefit to a range of aquatic invertebrate species. This could be achieved by having shallow margins that would periodically dry, with deeper central areas (at least 1m depth) that would retain water through the year. The ponds should be planted with a range of aquatic and marginal vegetation species.

Enhancement

4.154 The habitat creation and enhancement measures detailed in the Habitat Mitigation and Enhancement section will benefit a wide range of invertebrates at the Site.

4.155 Woody material felled during scrub removal will be retained and used to create log / brash piles within retained habitats. This will benefit a range of invertebrate species.

Residual effects

4.156 Impacts to invertebrate populations will be temporary with the habitats of the greatest value reinstated following Site Preparation works using existing site materials and seed sources. The Site habitats will subsequently be managed favourably that will deliver long-term benefits for invertebrate populations. Effects on invertebrate populations are considered to be beneficial at the Local level.

Reptiles

4.157 WYES did not provide any records of reptiles within the search area.

4.158 All common reptile species are partially protected under Schedule 5 (Sections 9(1) and 9(5)) of the Wildlife and Countryside Act 1981 (as amended). This legislation protects these animals from intentional killing and injury and selling, offering for sale, possessing, or transporting for the purpose of the sale or publishing advertisements to buy or sell a protected species.

4.159 The Site supports a mosaic of scrub, heathland, grassland, tall ruderal vegetation, waterbodies, and rubble piles which are considered to provide highly suitable habitat for reptile species. To determine the presence / likely absence of reptiles at the Site, seven reptile surveys were undertaken between July and October 2021.

4.160 During each survey visit, the deployed artificial refugia (roofing felt tiles each 0.5m by 1 m in size) were inspected for any reptiles basking on the upper surface then lifted and checked for sheltering animals beneath before being carefully replaced. Potential reptile refuges already present, such as deadwood and debris, were also inspected for the presence of reptiles. No evidence of reptile presence was recorded during any of the surveys. The approximate locations the refugia is shown on Figure 8 and further survey details are provided in Appendix 6.

4.161 The presence of reptiles and the potential for reptiles to be affected by the proposals is considered unlikely at the Site. On this basis, reptile species are scoped out of further consideration and is not considered further in this assessment.

Other notable species

Common toad

4.162 WYES provided one record of common toad *Bufo bufo* was provided 1.7 km from the Site. Common toad is an SPI and the on-site ponds P1 and P2 are suitable for this species, if present, for breeding and the heathland, grassland, rubble piles and scrub are suitable for foraging and shelter throughout the year. P1 will be lost under the proposals and there will be temporary removal of suitable terrestrial habitats, including places for foraging and hibernating. Pond P2, the areas of grassland in the south of the Site and other boundary habitats will be retained; should common toads, or other widespread amphibians, be present, this would allow for populations to be maintained during the restoration period. Two new ponds will be created which will provide further breeding habitat for common toad. As they are not likely to be significantly adversely affected, common toad is scoped out and not considered further in this assessment.

European brown hare

4.163 WYES provided four records of European brown hare *Lepus europaeus* dated 2011 to 2018 located 1.3 km to 1.8 km from the Site. European brown hare is listed as a SPI. This species was not observed at the Site during the site visits but the grassland, tall ruderal vegetation, scrub and heath would provide suitable foraging and shelter opportunities. The retained grassland and new habitat creation proposals will provide suitable habitat for European brown hare. As they are not likely to be significantly adversely affected, European brown hare is scoped out and not considered further in this assessment.

Hedgehog

4.164 WYES did not return any records of hedgehog *Erinaceus* europaeus within the desk study area. Hedgehog is listed as a SPI the grassland, tall ruderal vegetation, scrub and heath would provide suitable foraging and shelter opportunities and areas of spoil and log / brash piles would also provide suitable hibernation sites. The habitat creation and enhancement proposals will provide suitable habitat for hedgehog. As they are not likely to be significantly adversely affected, hedgehog is scoped out and not considered further in this assessment.

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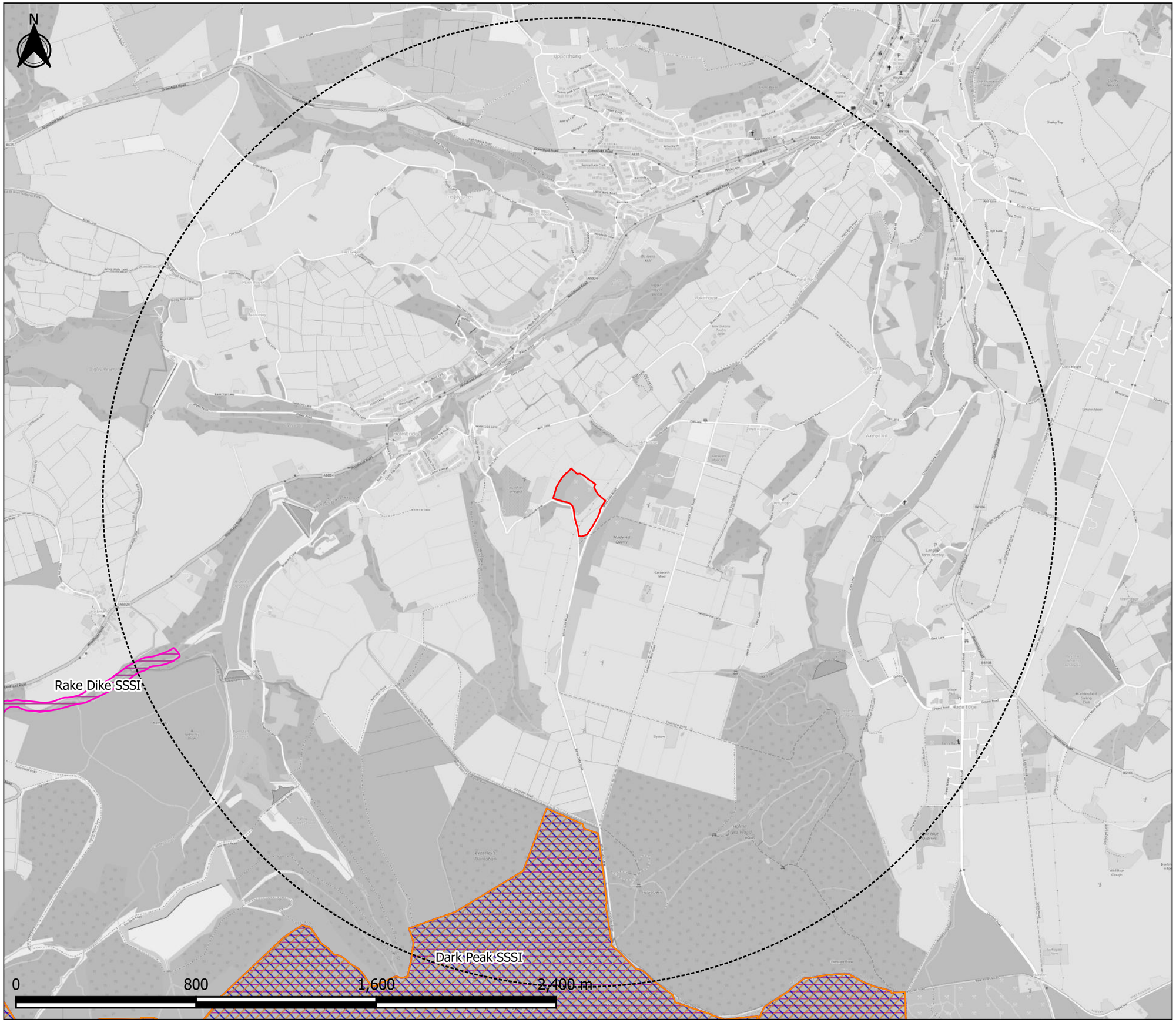
6 Figures



Legend

- Special Areas of Conservation
- Special Protection Areas
- Sites of Special Scientific Interest
- Site boundary
- 2km from site boundary

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Figure 1: Statutory Designated Sites

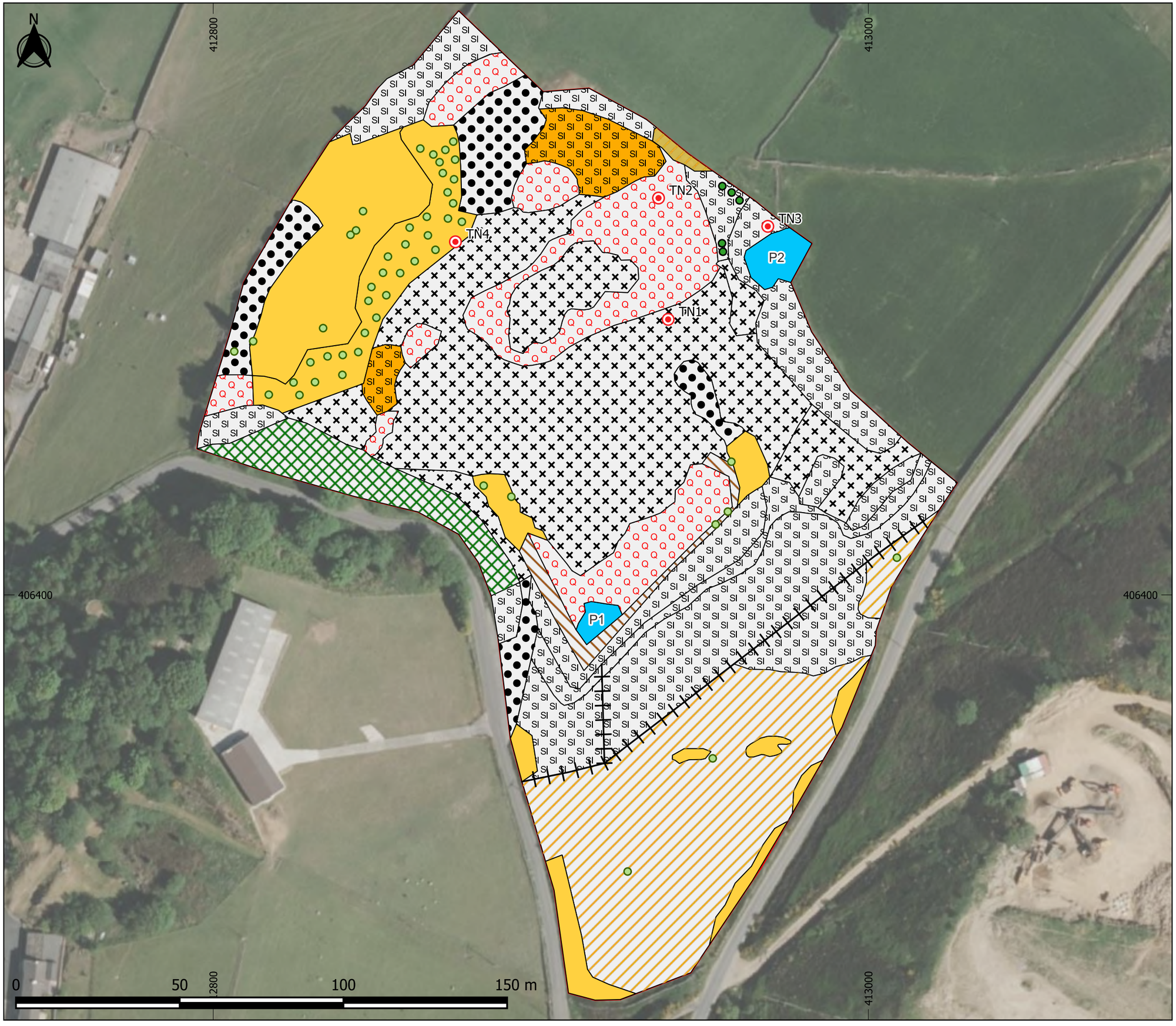
DATE: 30/01/2023 CHECKED: DF SCALE: 1:16,000

DRAWN: CS APPROVED: DF VERSION:1.0

Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: © Natural England

Graphics Ref. No.: 02608



Legend

- Site boundary
- Scattered scrub
- Tree
- Target note
- Fence
- Scrub - dense/continuous
- Acid grassland - unimproved
- Neutral grassland - semi-improved
- Poor semi-improved grassland
- Other tall herb and fern - ruderal
- Dry dwarf shrub heath - acid
- Dry heath/acid grassland
- Standing water
- Quarry
- Cultivated/disturbed land - ephemeral/ short perennial
- Bare ground

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Figure 2: Phase 1 Habitat Survey Results

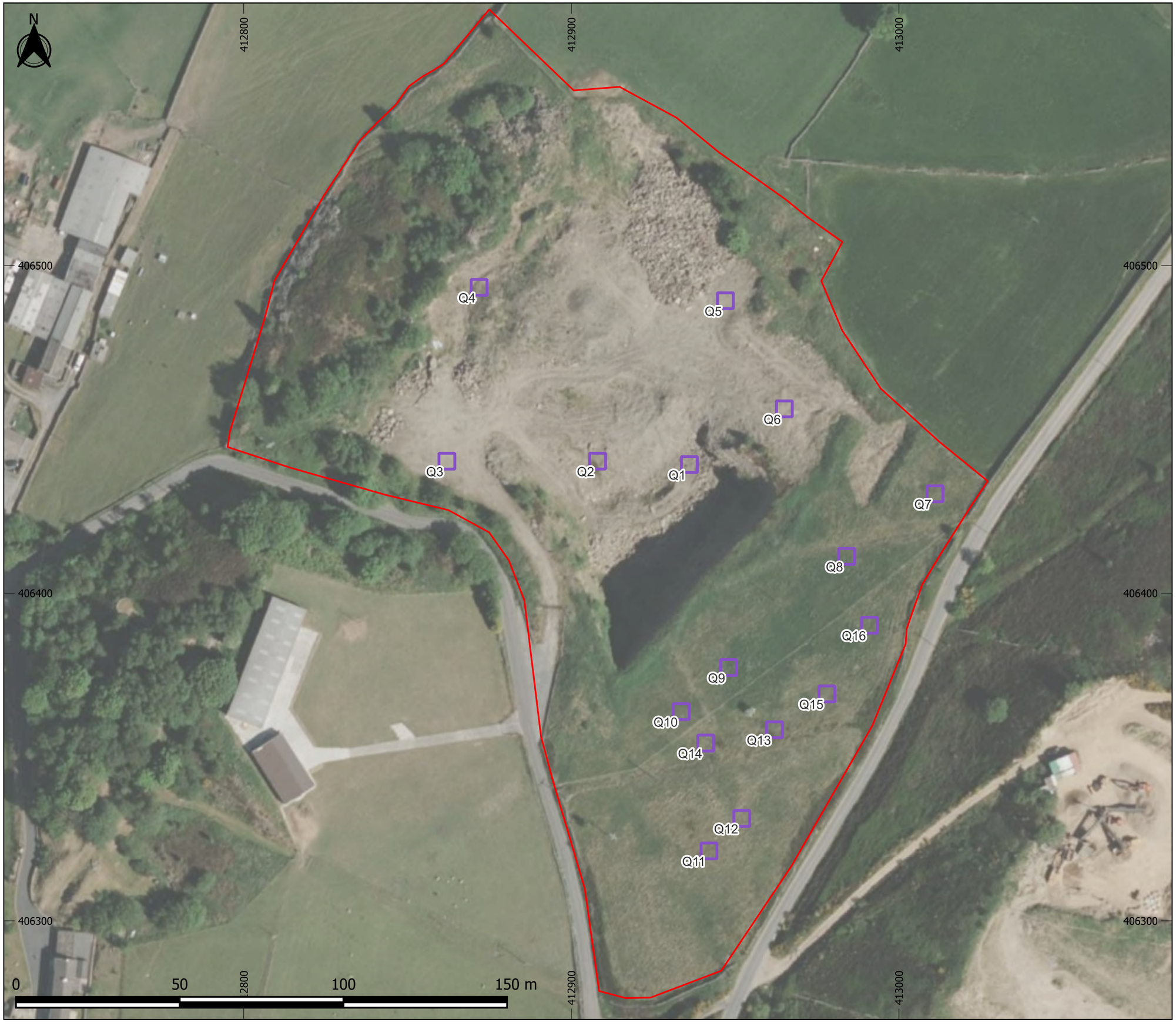
DATE: 07/02/2023 CHECKED: DF SCALE: 1:1,100

DRAWN: CS APPROVED: DF VERSION:1.1

Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

Graphics Ref. No.: 02684



Legend

- Site boundary
- Location of 1m x 1m botanical survey quadrat

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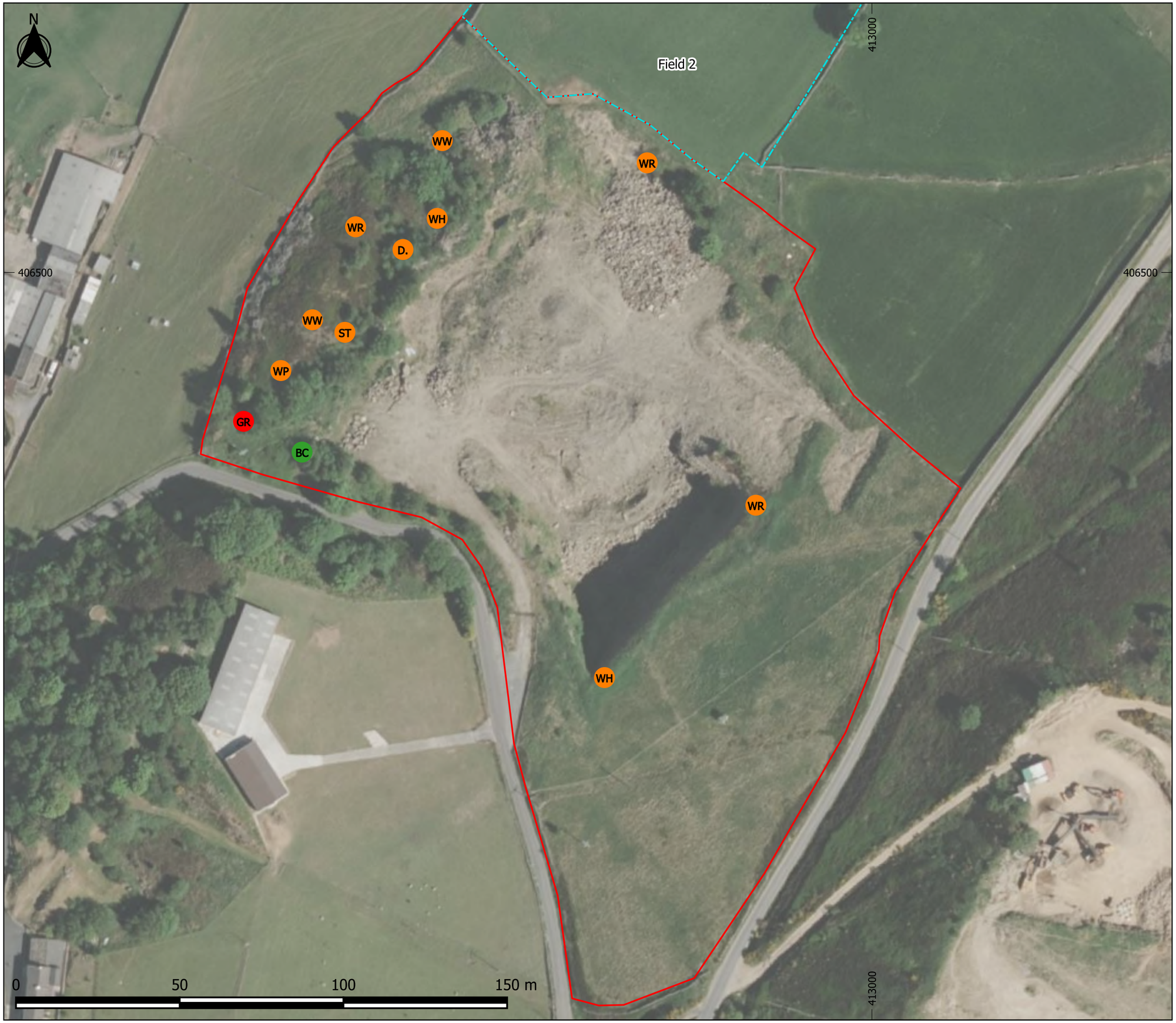
Figure 3: Botanical survey quadrat locations

DATE: 30/01/2023	CHECKED: DF	SCALE: 1:1,100
DRAWN: CS	APPROVED: DF	VERSION:1.0

Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

Graphics Ref. No.: 02685



Legend

Site boundary

BOCC Status

CH Red

CH Amber

CH Green

BTO Code	Common Name
BC	Blackcap
D.	Dunnock
GR	Greenfinch
ST	Song Thrush
WH	Whitethroat
WP	Woodpigeon
WR	Wren
WW	Willow Warbler

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Figure 4: Breeding Bird Territory Map (May and June 2021)

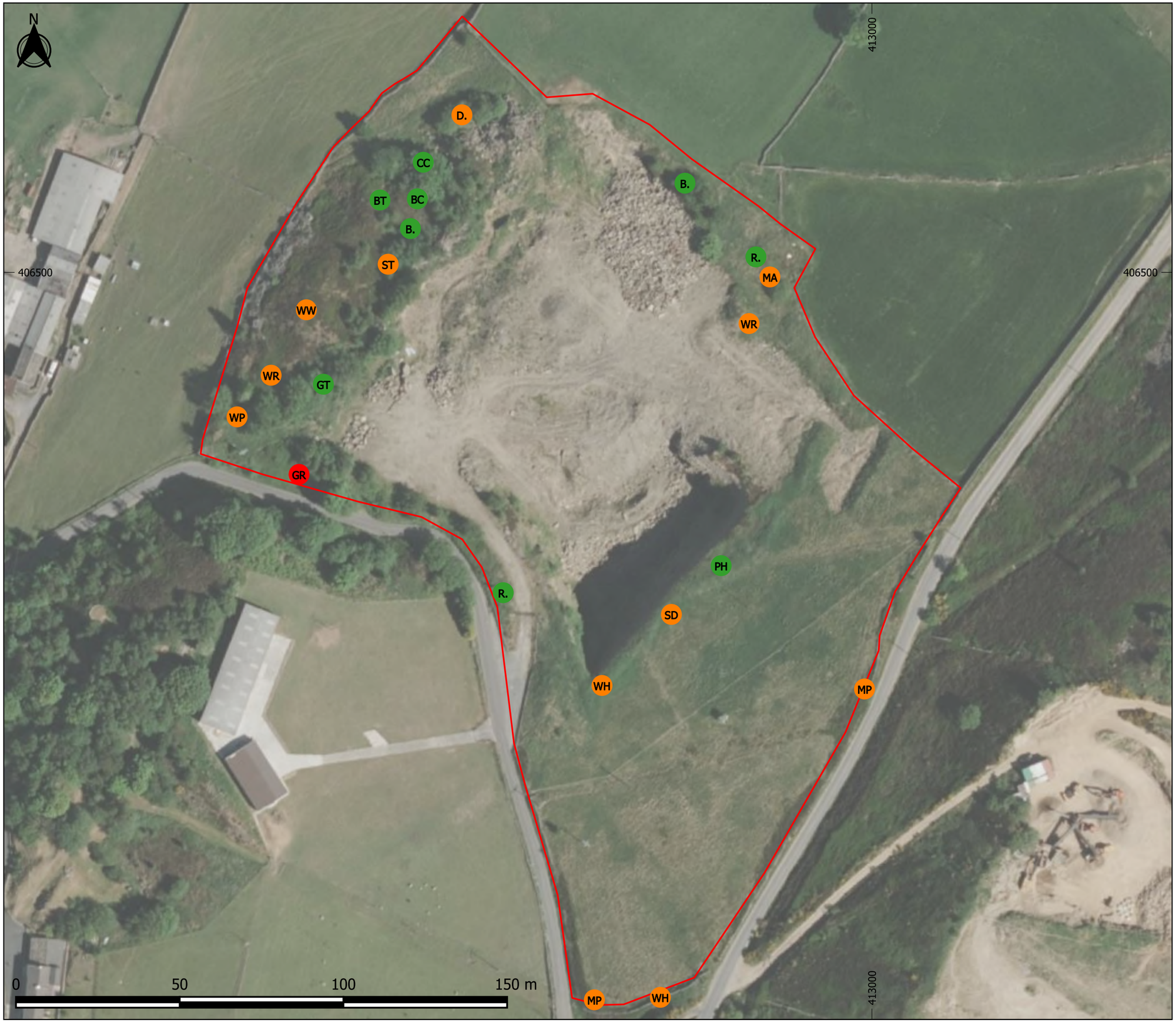
DATE: 30/01/2023 CHECKED: DF SCALE: 1:1,100

DRAWN: CS APPROVED: DF VERSION:1.0

Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

Graphics Ref. No.: 02610



Legend

Site boundary

BOCC Status

CH Red

CH Amber

CH Green

BTO Code	Common Name
B.	Blackbird
BC	Blackcap
BT	Blue Tit
CC	Chiffchaff
D.	Dunnock
GR	Greenfinch
GT	Great Tit
MA	Mallard
MP	Meadow Pipit
PH	Pheasant
R.	Robin
SD	Stock Dove
ST	Song Thrush
WP	Woodpigeon
WR	Wren
WH	Whitethroat
WW	Willow Warbler

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Figure 5: Breeding Bird Territory Map (March to May 2022)

DATE: 30/01/2023 CHECKED: DF SCALE: 1:1,100

DRAWN: CS APPROVED: DF VERSION:1.0

Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

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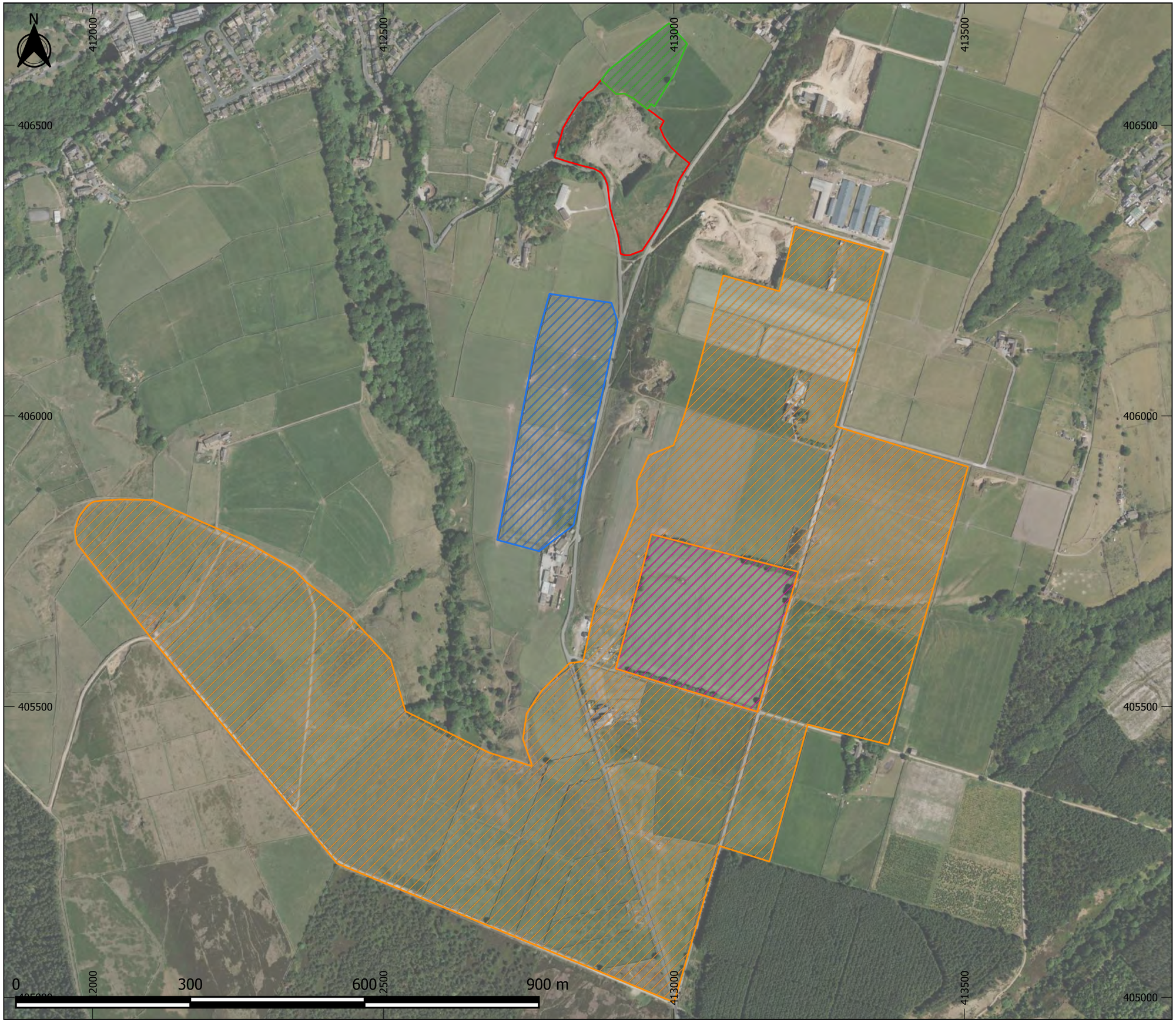

Legend

- Site boundary
- Area used by up to 2 oystercatcher and 2 curlew for occassional feeding during each survey visit
- Area used by up to 2 oystercatcher and 2 curlew for occassional feeding during each survey visit
- Area used for feeding by up to 5 golden plover during April and May 2022 survey visits
- Area used for breeding by approximately 2 pairs of oystercatcher, 4-5 pairs of curlew and 10-15 pairs of lapwing.

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Figure 6: Notable off-site birds recorded during breeding bird characterisation surveys (March to May 2022)

DATE: 07/02/2023 | CHECKED: DF | SCALE: 1:6,200

DRAWN: CS | APPROVED: DF | VERSION:1.0

Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

Graphics Ref. No.: 02686

Legend

- Site boundary
- Survey boundary

BOCC Status

- CH Red
- CH Amber
- CH Green
- (x) Number of birds

BTO Code	Common Name
CU	Curlew
FF	Fieldfare
L.	Lapwing
RE	Redwing

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DRAWING TITLE

Figure 7: Notable Bird Survey Results during Wintering Bird Surveys (December 2021 and January 2022)

DATE: 07/02/2023 CHECKED: DF SCALE: 1:10,000

DRAWN: CS APPROVED: DF VERSION:1.0

Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

Graphics Ref. No.: 02612

Legend

- Site boundary
- Location of artificial cover object

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DRAWING TITLE

Figure 8: Reptiles survey plan

DATE: 07/02/2023 CHECKED: DF SCALE: 1:1,100

DRAWN: CS APPROVED: DF VERSION:1.0

Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

Graphics Ref No.: 02687

Legend

Site boundary

Survey boundary

Invertebrate Sampling Method

Pan traps

Pitfall traps

Pond Netting

Habitat Potential Area

Area 1 (Sweeping and beating technique concentrated in this area)

Area 2 (Grubbing technique concentrated in this area)

Area 3

Area of higher invertebrate suitability

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DRAWING TITLE

Figure 9: Invertebrate Survey Areas

DATE: 07/02/2023 CHECKED: DS SCALE: 1:1,090

DRAWN: CS APPROVED: DS VERSION:1.0

Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

Graphics Ref. No.: 0249

7 Photographs

Photograph 1: Central area of the Site showing open mosaic habitat and the quarry void.

Photograph 2: View down into the quarry void, showing areas of open mosaic habitat and cliff faces.

Photograph 3: Pond P1 within the quarry void.

Photograph 4: Area of open mosaic habitat with high suitability for invertebrates.

Photograph 5: Area of open mosaic habitat with high suitability for invertebrates.

Photograph 6: Ephemeral waterbody at Target Note 1 within the open mosaic habitat.

Photograph 7: Species-poor semi-improved grassland to the south of the quarry void.

Photograph 8: Species-poor semi-improved grassland and ruderal vegetation to the south of the quarry void.

Photograph 9: Acid grassland in south of the Site.

Photograph 10: Heath and scattered scrub in the northwest of the Site.

Photograph 11: Heath and scattered scrub in the northwest of the Site.

Photograph 12: Mixed bramble and birch scrub along Sites southwest boundary.

Photograph 13: Pond P2.

Photograph 14: Japanese knotweed at Target Note 2.

Photograph 15: Japanese knotweed at Target Note 3.

8 Appendices

Appendix 1: Botanical survey methodology and results

Methodology

8.1 Further botanical survey of the Site habitats was undertaken on 14 July 2021 to accurately map the habitat types and species present at an optimal time of year. This survey was completed with reference to the UK Habitat Classification Definitions (UK Habitat Classification Working Group, 2018). The weather during the botanical survey was light cloud and sunny intervals and a temperature of up to 20°C.

8.2 Targeted botanical survey of selected areas of open mosaic habitat and grassland was undertaken on 14 July 2021. A total of 16 quadrats were used; six (Q1 to Q6) located in the open mosaic habitat and ten (Q7 to Q16) in the grassland habitat to the south of the quarry void. The quadrat locations were randomly positioned, yet evenly spaced intervals across the areas surveyed. At each quadrat location, a photograph of the sward was taken and grid reference taken using a GPS. Figure 3 shows the locations of the quadrats.

8.3 Each quadrat measured 1 m². Plant species were recorded and a DAFOR scale[12] count allocated to each species, which were entered onto a recording form. The percentage cover of moss and bare ground were also recorded.

8.4 Table A1-1: Location of quadrats

Quadrat reference	Grid reference	Quadrat location photograph
Q1	SE12936 06441	

[12] DAFOR = Dominant, Abundant, Frequent, Occasional, Rare (a prefix of L = 'Locally', e.g. LF = Locally Frequent)

Q2	SE12908 06442	
Q3	SE12862 06442	No photograph available.
Q4	SE12876 06492	No photograph available.
Q5	SE12947 06491	
Q6	SE12965 06458	

Q7	SE13011 06432	
Q8	SE12984 06413	
Q9	SE12948 06379	

Q10	SE12995 06363	
Q11	SE12942 06323	
Q12	SE12952 06333	

Q13	SE12962 06360	
Q14	SE12941 06356	
Q15	SE12978 06371	

Q16	SE12991 06392	

Personnel

8.5 The team for this survey and reporting included:

- Dr Jim Fairclough (Principal Ecologist, BSG Ecology) was the lead surveyor for the botanical surveys. He has worked full-time as a professional ecologist since 2003 during which time he has completed botanical surveys and assessment at many development sites.
- Jim was assisted by Daniel Foster (Principal Ecologist, BSG Ecology) who has worked as an ecologist since 2005.

Results

8.6 Table A1-2 below provides the results of the survey.

Table A1-2 Quadrat survey results

Common name	Scientific name	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
Common bent	*Agrostis capillaris*		F	O	F	F	O	O	O		F	F	O			F	O
Creeping bent	*Agrostis stolonifera*	F	O	F													
Bog pimpernel	*Anagallis tenella*		O														
Cow parsley	*Anthriscus sylvestris*								O								
False oat grass	*Arrhenatherum elatius*							O									
Downy birch	*Betula pubescens*		R		O	R											
Heather	*Calluna vulgaris*	O			O	O	O							O	O		
Common mouse-ear	*Cerastium fontanum*			O		O											
Rosebay willowherb	*Chamaenerion angustifolium*	F			O		O										
Creeping thistle	*Cirsium arvense*					R	O										
Marsh thistle	*Cirsium palustre*								O								
Spear thistle	*Cirsium vulgare*		O	O													
Cock's-foot	*Dactylis glomerata*		O						O	F	O						
Tufted hair-grass	*Deschampsia cespitosa*		O						F								O
Wavy hair-grass	*Deschampsia flexuosa*	F	O		O							F		A	F		
Foxglove	*Digitalis purpurea*	O			F	O	O										
American willowherb	*Epilobium ciliatum*	F	F	O	O		O			R							
Short-fruited willowherb	*Epilobium obscurum*					O	O										
Marsh willowherb	*Epilobium palustre*	R															
Hoary willowherb	*Epilobium parviflorum*	R	F	O													
Sheep's fescue	*Festuca ovina*		F		O	F	O					O	O			O	
Red fescue	*Festuca rubra*							A				F	A	O	F	O	O
Heath bedstraw	*Galium saxatile*	O					O	F			O	A	A		F	A	
Hogweed	*Heracleum sphondylium*							R									O

Hieracium species	*Hieracium sp.*	O															
Yorkshire fog	*Holcus lanatus*	O	O	F		F	F		F	A	A					O	A
Creeping soft-grass	*Holcus mollis*		O		F			F			F	F	A	F	O	A	F
Bluebell	*Hyacinthoides non-scripta*											O	F				
Cat's-ear	*Hypochaeris radicata*	O			O		R										
Soft rush	*Juncus effusus*		O				R										
Bird's-foot trefoil	*Lotus corniculatus*						O										
Field woodrush	*Luzula campestris*						O										
Black medick	*Medicago lupulina*		O														
Fox and cubs	*Pilosella aurantiaca*	F	F														
Mouse-ear hawkweed	*Pilosella officinarum*	O					R										
Greater plantain	*Plantago major*			O													
Knotgrass	*Polygonum aviculare*			R													
Tormentil	*Potentilla erecta*							F					R	A	A	A	
Selfheal	*Prunella vulgaris*		F	O													
Creeping buttercup	*Ranunculus repens*				R						O						
Bramble	*Rubus fruticosus agg.*		O		F												
Common sorrel	*Rumex acetosa*	O						O	O	R	F	R	O			O	O
Broadleaved dock	*Rumex obtusifolius*	O			R	R											
Procumbent pearlwort	*Sagina procumbens*	F	F	F			O										
Autumn hawkbit	*Scorzoneroides autumnalis*	O															
Common ragwort	*Senecio jacobaea*		O	F	O	O	O		O								
Rowan	*Sorbus aucuparia*		R														
Dandelion	*taraxacum officinale agg.*	R	O		R		R										
Zigzag clover	*Trifolium medium*								A	A							
White clover	*Trifolium repens*		O														
Scentless mayweed	*Tripleurospermum*			R													

	inodorum																
Common nettle	*Urtica dioica*									F	O						
Billberry	*Vaccinium myrtillus*													F	A		
Thyme-leaved speedwell	*Veronica serpyllifolia*			O													
Tufted vetch	*Vicia cracca*								O								
Total species count		**19**	**23**	**14**	**15**	**11**	**18**	**8**	**10**	**6**	**8**	**8**	**8**	**6**	**7**	**8**	**7**
Moss cover (%)		10	10	20	5	15	5	10	0	0	20	100	100	100	100	100	40
Bare ground (%)		50	40	50	30	35	55	0	0	0	0	0	0	0	0	0	0

Appendix 2: Bat survey methodology and results

Methodology

8.7 To ascertain the presence / likely absence of bat roosts within the cliff faces, a nocturnal dusk emergence survey was undertaken on 07 June 2021. This was completed with reference to standard industry guidance (Collins (ed.), 2016).

8.8 During the dusk survey, two ecologists were positioned so that the best visual coverage could be gained of any potential bat roost access points on the cliff faces.

8.9 Bat recording equipment used comprised Anabat Scout hand-held bat detectors. These models of detector automatically record all bat passes, allowing species identification to be confirmed by analysis of call characteristics using appropriate computer software.

Table A2-1: Details of Bat Survey Timings, Personnel and Weather Conditions

Date	Bat Survey Type	Sunrise/ Sunset	Survey Times	Weather during Survey[13][14]
07/06/21	Dusk emergence	21:30	21:10 - 22:55	Dry, wind F1, cloud 2/8, temp. 17°C at the start, dropping to 14°C.

Personnel

8.10 Daniel Foster (Principal Ecologist, BSG Ecology) led on the bat survey and undertook the bat call analysis. He has held a Natural England Level 2 bat survey license since 2007 (reference: 2015-14980-CLS-CLS). Survey assistance was provided by Andrew Cockcroft (freelance ecologist).

Results

8.11 No bats were recorded emerging from the cliff faces during the survey. From 21:54 (24 minutes after sunset) four common pipistrelle bats flew into the quarry void from the northwest and foraged continuously within this area until 22:33. Following this, bat activity within the void reduced and became more sporadic with occasional periods of foraging from individual common pipistrelle bats. A single pass from a *Myotis* species bat was also recorded at 22:28.

[13] Wind strength is measured using the beaufort scale, whereby calm = 0 and a hurricane = 12. A strong breeze = 6.

[14] Cloud cover is measured in Oktas, whereby a clear sky = 0 Oktas and full cloud cover = 8 Oktas.

Appendix 3: Breeding bird characterisation survey methodology and results

Methodology

8.12 Breeding bird characterisation surveys were undertaken on 25 May 2021, 15 June 2021, 30 March 2022, 14 April 2022 and 02 May 2022.

8.13 During each visit, the surveyor walked across the Site scanning all habitats present (within the survey boundary and the immediate surrounding area) using binoculars as required. During the March to May 2022 survey visits, the Site and a wider area of up to 1 km was surveyed; this was to investigate how notable bird species, particularly those which are qualifying features of the SPA, may use the habitats adjacent the Site and between the Site and the SPA. The off-site areas were surveyed by using public rights of way. Frequent stops were made to listen and scan for singing, calling and displaying birds. Birds observed beyond the boundary were also noted. Bird locations were mapped and behaviour recorded using standard British Trust for Ornithology (BTO) codes and symbols (Gilbert *et al*, 1998).

8.14 The breeding status of all birds recorded was categorised and the results of the breeding bird surveys from a specific year were combined to create a single map showing the estimated territory centre of all breeding birds.

8.15 The survey details are summarised in Table A3-1.

Table A3-1: Dates of breeding bird characterisation survey visits and weather conditions

Date	Wind (Beaufort)	Cloud (Oktas)	Precipitation	Temperature (ºC)	Visibility	Survey time
25/05/2021	1	7/8	Dry	9	Excellent	05:00 to 08:30
15/05/2021	1	4/8	Dry	13	Excellent	04:40 to 09:00
30/03/2022	2	8/8	Dry	5	Excellent	07:30 to 11:00
14/04/2022	2	4/8	Dry	11	Excellent	07:30 to 11:00
02/05/2022	2	1/8	Dry	12	Excellent	07:30 to 11:00

8.16 Birds exhibiting breeding behaviour were assigned to one of two categories: likely breeding or confirmed breeding:

- Likely breeding: birds heard singing or alarm calling or simply present in suitable breeding habitat on one of the survey visits; a pair of birds present in suitable breeding habitat; a repeat observation of territorial behaviour (song or alarm calling) on two or more different visits in the same location; courtship behaviour or display in suitable breeding habitat; birds apparently visiting a nest site; or evidence of nest building (including excavation of a hole).
- Confirmed breeding: one or more adults undertaking a distraction display; the presence of a used nest or eggshells; the presence of recently fledged or downy young (that are clearly of local origin); apparently incubating adults or adults commuting to and from a nest hole; adult birds carrying faecal sacs or food for young; or, a nest with eggs or young present.

8.17 To inform the assessment in this report, the numbers of potential territories identified, the abundance of species at the county and national level, the quality of the habitat present and the geographical range of the birds concerned have been considered, based on national and regional accounts.

8.18 The conservation status of each species of bird was also taken into account and the following lists were considered:

- The Wildlife and Countryside Act 1981 (as amended), Schedule 1;
- Species of Principal Importance (SPI) for the Conservation of Biodiversity in England as listed in accordance with section 41 of the Natural Environment and Rural Communities Act (NERC) 2006 (S41);
- Species of high and medium conservation concern (red and amber listed species respectively) included in Birds of Conservation Concern 3 (Eaton *et al*., 2021);

Personnel

8.19 The breeding bird characterisation surveys were undertaken by Andrew Cockcroft (Ornithological subcontractor). Andrew has over 30 years of bird survey experience and regularly undertakes breeding and wintering bird surveys based on established methodologies. He has extensive bird surveying experience in the Kirklees region and the Peak District Moors (South Pennine Moors Phase 1) SPA.

Results

8.20 A total of eight bird species were recorded within the Site during the 2021 survey visits and 17 during the 2022 visits that were confirmed to be breeding or were considered likely to be breeding. These are summarised in Tables A3-2 and A3-3AAA. The May and June 2021 results are shown on Figure 5 and the March to May 2022 results on Figure 6. A summary of the notable bird species recorded off-site during the March to May 2022 surveys is shown on Figure 6.

Table A3-2: Summary of confirmed breeding or likely breeding species at the Site from the breeding bird characterisation surveys in May and June 201

Common name	Scientific name	Estimated no. of territories	Conservation status*
Blackcap	*Sylvia atricapilla*	1	Green listed
Dunnock	*Prunella modularis*	1	Amber listed
Greenfinch	*Chloris chloris*	1	Red listed
Song thrush	*Turdus philomelos*	1	Amber listed; SPI; KBAP
Whitethroat	*Sylvia communis*	1	Amber listed
Woodpigeon	*Columba palumbus*	1	Amber listed
Wren	*Troglodytes troglodytes*	3	Amber listed
Willow warbler	*Phylloscopus trochilus*	2	Amber listed

* Red / Amber / Green listed= Birds of Conservation Concern (Eaton et al., 2021) listing assesses bird species on the basis of their population status, reflecting changes in their abundance and range. Red list species are of high nature conservation concern; Amber list species are of medium conservation concern.

KBAP = Included in Kirklees Habitat Action Plan.

SPI = Species of Principal under the provisions of the NERC Act 2006

Table A3-3: Summary of confirmed breeding or likely breeding species at the Site from the breeding bird characterisation surveys in March, April and May 2022.

Common name	Scientific name	Estimated no. of territories	Conservation status*
Blackbird	*Turdus merula*	1	Green listed
Blackcap	*Sylvia atricapilla*	2	Green listed
Blue tit	*Cyanistes caeruleus*	1	Green listed
Chaffinch	*Fringilla coelebs*	1	Green listed

Dunnock	*Prunella modularis*	1	Amber listed
Greenfinch	*Chloris chloris*	1	Red listed
Great tit	*Parus major*	1	Green listed
Mallard	*Anas platyrhynchos*	1	Amber listed
Meadow pipit	*Anthus pratensis*	2	Amber listed
Pheasant	*Phasianus colchicus*	1	Non-native / introduced
Robin	*Erithacus rubecula*	1	Green listed
Stock dove	*Columba oenas*	1	Amber listed
Song thrush	*Turdus philomelos*	1	Amber listed; SPI; KBAP
Woodpigeon	*Columba palumbus*	1	Amber listed
Wren	*Troglodytes troglodytes*	2	Amber listed
Whitethroat	*Sylvia communis*	2	Amber listed
Willow warbler	*Phylloscopus trochilus*	1	Amber listed

* Red / Amber / Green listed= Birds of Conservation Concern (Eaton et al., 2021) listing assesses bird species on the basis of their population status, reflecting changes in their abundance and range. Red list species are of high nature conservation concern; Amber list species are of medium conservation concern.

KBAP = Included in Kirklees Habitat Action Plan.

SPI = Species of Principal under the provisions of the NERC Act 2006

8.21 In addition to the above, a further 15 bird species were recorded during the survey visits for which no evidence of breeding was noted. This included individuals flying over the Site or species which may breed locally but for which suitable nesting habitat either does not occur on Site, or where no behaviour suggesting breeding was recorded. These species are summarised in Table A3-4 below together with notes on use of the Site.

Table A3-4: Non-breeding bird species recorded

Common name	**Scientific name**	**Notes**
Carrion crow	*Corvus corone*	Occasional individual birds foraging at the Site. Minimal suitable habitat and unlikely to breed on-site.
Collared dove	*Streptopelia decaocto*	Occasional foraging recorded at the Site. Minimal suitable habitat and unlikely to breed on-site.
Cuckoo	*Cuculus canorus*	One flew over site during June 2021 and May 2022 surveys. No evidence of breeding or courtship recorded but this species can be difficult to demonstrate breeding as it is a brood parasite. Small numbers of preferred breeding host species dunnock and meadow pipit are present at the Site.
Goldfinch	*Carduelis carduelis*	Occasional individual birds foraging at the Site. Some suitable habitat present but no evidence of breeding recorded.
Golden plover	*Pluvialis apricaria*	Occasional flights over the Site by individual or pairs of birds. Minimal suitable habitat and unlikely to breed on-site.

House martin	*Delichon urbicum*	An individual bird seen foraging over the Site during the May 2022 survey. No suitable breeding habitat at the Site.
Jay	*Garrulus glandarius*	Occasional individual birds flying within and over at the Site. Some suitable habitat present but no evidence of breeding recorded.
Kestrel	*Falco tinnunculus*	Occasional flights around and over the Site including foraging. Minimal suitable habitat and unlikely to breed on-site.
Linnet	*Linaria cannabina*	An individual bird seen foraging at the Site during the May 2022 survey. Some suitable habitat present but no evidence of breeding recorded.
Mistle thrush	*Turdus viscivorus*	Occasional individual birds foraging at the Site. Some suitable habitat present but no evidence of breeding recorded.
Magpie	*Pica pica*	Individuals and small groups occasional foraging within the Site. No evidence of breeding recorded. This species is hard to demonstrate breeding as it rarely shows obvious territorial behaviour. Minimal suitable habitat and unlikely to breed on-site.
Oystercatcher	*Haematopus ostralegus*	Occasional flights over the Site by individual birds. Minimal suitable habitat and unlikely to breed on-site
Raven	*Corvus corax*	Occasional foraging recorded at the Site. Minimal suitable habitat and unlikely to breed on-site.
Sparrowhawk	*Accipiter nisus*	Occasional flights around and over the Site. Minimal suitable habitat and unlikely to breed on-site.
Swallow	*Hirundo rustica*	Occasional individual birds foraging over the Site. No suitable breeding habitat at the Site.

Appendix 4: Wintering bird characterisation survey methodology and results

Methodology

8.22 Characterisation surveys of the wintering bird community were undertaken on 29 December 2021 and 30 January 2022.

8.23 During each visit, the surveyor walked across the Site and a wider survey area scanning all habitats present using binoculars as required. A wider area up to 1.5 km around the Site was surveyed to investigate how notable bird species, particularly those which are qualifying features of the SPA, may use the habitats adjacent the Site and between the Site and the SPA. The off-site areas were surveyed by using public rights of way. Frequent stops were made to listen and scan for singing, calling and displaying birds. Birds observed beyond the boundary were also noted. Bird locations were mapped and behaviour recorded using standard British Trust for Ornithology (BTO) codes and symbols (Gilbert *et al*, 1998).

8.24 The survey details are summarised in Table A4-1.

Table A4-1: Dates of wintering bird characterisation survey visits and weather conditions

Date	Wind (Beaufor	Cloud Cover	Precipitation	Temperatur e (ºC)	Visibility
29/12/2021	2	4/8	Dry	6	Excellent
30/01/2022	2	4/8	Dry	3	Excellent

8.25 To inform the assessment in this report the abundance of species at the county and national level, the quality of the habitat present and the geographical range of the birds concerned have been considered, based on national and regional accounts.

8.26 The conservation status of each species of bird was also taken into account and the following lists were considered:

- The Wildlife and Countryside Act 1981 (as amended), Schedule 1
- Species of Principal Importance (SPI) for the Conservation of Biodiversity in England as listed in accordance with section 41 of the Natural Environment and Rural Communities Act (NERC) 2006 (S41)
- Species of high and medium conservation concern (red and amber listed species respectively) included in Birds of Conservation Concern 3 (Eaton *et al*., 2021)

Personnel

8.27 The wintering bird characterisation surveys were undertaken by Andrew Cockcroft (Ornithological subcontractor). Andrew has over 30 years of bird survey experience and regularly undertakes breeding and wintering bird surveys based on established methodologies. He has extensive bird surveying experience in the Kirklees region and the Peak District Moors (South Pennine Moors Phase 1) SPA.

Results

8.28 No notable bird species of conservation concern were recorded utilising the Site or adjacent fields during the wintering bird surveys.

8.29 A total of 28 bird species were recorded within the survey area. The most notable species recorded included:

- Foraging fieldfare *Turdus pilaris* throughout the survey area, with larger aggregations of 78 birds located 370 m southwest of the Site, 10 birds 480 m east of the Site and 100 birds 800 m south of the Site.
- 48 roosting lapwing in grassland pasture located 450 m south of the Site and four roosting lapwing in grassland pasture 980 m southwest of the Site.
- Foraging redwing *Turdus iliacus* throughout the survey area with a larger aggregations of 30 birds 880 m south of the Site in an area of scrub and woodland.

8.30 Activity within the survey areas is summarised in Table A4-2. A summary of the notable wintering bird species is shown on Figure 7.

Table A4-2: Wintering bird species recorded within the survey area.

Common name	**Scientific name**	**Numbers recorded 29.12.21**	**Numbers recorded 30.01.22**	**Notes**
Black headed gull	*Chroicocephalus ridibundus*	70 +	150 +	Foraging birds seen around the survey area.
Blackbird	*Turdus merula*	4	6	Foraging birds seen around the survey area.
Blue tit	*Cyanistes caeruleus*	3	2	Foraging birds seen around the survey area.
Carrion crow	*Corvus corone*	4	5	Foraging birds seen around the survey area.
Coal tit	*Periparus ater*	0	3	Calling from a conifer woodland plantation.
Common buzzard	*Buteo buteo*	2	3	Foraging birds seen around the survey area and a pair were displaying on the second visit.
Common gull	*Larus canus*	30+	30+	Foraging birds seen around the survey area.
Cormorant	*Phalacrocorax carbo*	0	7	Flew over the survey area heading west.
Curlew	*Numenius arquata*	0	1	1 bird calling and foraging
Dunnock	*Prunella modularis*	2	2	Foraging birds seen around the survey area.
Fieldfare	*Turdus pilaris*	100+	100+	Foraging birds seen around the survey area.
Goldcrest	*Regulus regulus*	0	1	Calling from a conifer woodland plantation.
Great tit	*Parus major*	2	1	Foraging birds seen around the survey area.
Herring gull	*Larus argentatus*	2	3	Foraging birds seen around the survey area.
Jackdaw	*Corvus monedula*	20	20	Foraging birds seen around the survey area.
Kestrel	*Falco tinnunculus*	3	2	Foraging birds can be seen around the survey area and a pair were displaying on the second visit.
Lapwing	*Vanellus vanellus*	6	52	6 birds were roosting on the first visit this had increased to 48 birds by the second visit.

Lesser black-backed gull	*Larus fuscus*	2	4	Foraging birds seen around the survey area.
Magpie	*Pica pica*	2	1	Foraging birds seen around the survey area.
Mistle thrush	*Turdus viscivorus*	10	12	Foraging birds seen around the survey area.
Pheasant	*Phasianus colchicus*	common	common	Foraging birds seen around the survey area.
Raven	*Corvus corax*	0	3	3 birds calling and displaying around the Quarry on the second visit.
Red grouse	*Lagopus lagopus*	0	4	Calling and displaying birds from the SPA.
Redwing	*Turdus iliacus*	50 +	50+	Foraging birds seen around the survey area.
Robin	*Erithacus rubecula*	3	2	Foraging birds seen around the survey area.
Stock dove	*Columba oenas*	15	22	Foraging birds seen around the survey area.
Woodpigeon	*Columba palumbus*	40	70	Foraging birds seen around the survey area.
Wren	*Troglodytes troglodytes*	3	3	Foraging birds seen around the survey area.

Appendix 5: Great crested newt survey methodology and results

Methodology

8.31 The Site and a buffer 500 m around it were initially assessed using aerial photographs and Ordnance Survey maps for the presence of small, non-flowing waterbodies that were considered to have potential suitability to support identified within 500 m of the Site which may have potential to support great crested newt. No off-site ponds were identified within 500 m of the Site.

8.32 Ponds P1 and P2 were assessed for their potential to support great crested newt using the Habitat Suitability Index (HSI) scoring method (Oldham *et al.,* 2000) on 10 May 2021.

8.33 Pond P2 was subject to environmental DNA ("eDNA") sampling and analysis for great crested newt in on 07 June 2021. This was completed with reference to best practice methodology (Biggs et al., 2014).

Habitat Suitability Index (HSI) assessment

8.34 HSI assessment is a quantitative means of evaluating habitat quality for great crested newt and is measured using ten indices:

- UK location
- Pond surface area
- Desiccation rate
- Water quality
- Percentage shade
- Waterfowl presence/absence
- Fish presence/absence
- No. of ponds within 1 km
- Suitability of terrestrial habitat
- Percentage of macrophyte cover

8.35 The HSI provides a numerical index between 0 and 1 where 0 indicates very poor habitat with minimal probability of great crested newt occurrence and 1 represents optimal habitat with a high probability of occurrence. A score of ≥ 0.5 is considered indicative that the pond contains features that are likely to be suitable to support a population of great crested newts.

eDNA Survey

8.36 Great crested newt DNA is released into aquatic environments through shed skin cells, urine, faeces and saliva. It can persist in water for several weeks and can be collected. A test has been developed for detecting the environmental DNA (eDNA) of the species which can be an effective way to determine presence or likely absence of great crested newt. All sample collection was undertaken with reference to published methodology (Biggs *et al.,* 2014).

Personnel

8.37 Daniel Foster (Principal Ecologist) undertook HSI assessments and eDNA surveys. He has held a Natural England great crested newt survey licence (reference: 2015-19152-CLS-CLS) since 2006.

Results

8.38 Ponds P1 and P2 were considered to have 'average' suitability to support great crested newt (see HSI results provided in Table A5-1 below). Pond P2 tested negative for the presence of great crested newt (see the laboratory results provided below). P1 could not be sampled for eDNA analysis due to close access health and safety restrictions.

Table A5-1: Results of great crested newt Habitat Suitability (HSI) assessment

Pond ID	Location	Area / size	Permanence	Water quality	Shading	Waterfowl	Fish	Local pond count	Terrestrial Habitat	Macrophyte Cover	HSI Score	Suitability Class
P1	1	0.1	1	0.67	1	1	1	0.45	0.33	1	0.63	Average
	Pond P1 is approximately 10 m long and up to10 m wide in a D-shape. It is in the base of the quarry void adjacent to the cliff faces and could not be closely inspected because of the steep sided, unstable and uneven terrain. The margins of the pond in the former quarry void are largely unvegetated bare ground with stone spoil mounds. Aquatic vegetation is present including reedmace and a pondweed species Potamogeton sp. The water depth is unknown but is considered unlikely to dry out most years											
P2	1	0.10	1	0.67	1	1	1	0.45	0.67	1	0.68	Average
	Pond P2 is approximately 10 m long and up to 8 m wide. Marginal vegetation seen during the survey included species such as soft rush. The water depth is unknown but appears to be up to 40 cm deep during spring, which was noted to drop to a depth of 2 to 10 cm by late-summer											

Appendix 6: Reptile survey methodology and results

Methodology

8.39 The Site supports a mosaic of scrub, heathland, grassland, tall ruderal vegetation, waterbodies, and rubble piles which are considered to provide highly suitable habitat for reptile species.

8.40 A total of 50 refugia (artificial cover objects) comprising roofing felt measuring 0.5 m x 1.0 m, were placed facing a variety of aspects to enable survey findings to be indicative of use of the area by reptiles at different times of day, but where possible, favouring southerly aspects that would remain warm all day.

8.41 Refugia were deployed on 7 June 2021, and allowed to 'bed-in' before the first survey. The refugia density in areas of suitable habitat used exceeded industry standard guidance, which suggests a minimum refugia density of 5-10 refugia per hectare (Froglife, 1999), enabling a robust assessment of the presence/likely absence of reptiles. The approximate locations of each refugia shown on Figure 8.

8.42 During each survey visit, the refugia were inspected for any reptiles basking on the upper surface then lifted and checked for sheltering animals beneath before being carefully replaced. Potential reptile refuges already present, such as deadwood and debris, were also inspected for the presence of reptiles.

8.43 A visual search for reptiles within suitable habitats within the wider Site was also undertaken during each visit. This helped to ensure that all areas were fully considered in the survey and helped eliminate a bias towards those reptile species more likely to use refugia. Visual searches involved walking slowly around each area of suitable habitat to systematically search potential basking areas for reptiles in the areas between artificial refugia locations (Froglife, 1999).

8.44 Seven surveys were undertaken at each survey area during suitable weather conditions (i.e. temperatures between 9 and 18ºC). Details of the survey dates, personnel and weather conditions are summarised in Table A6-1.

Table A6-1: Reptile survey details

Survey number	Date	Surveyor	Time		Weather conditions[15]
			Start	Finish	
1	14.07.21	Daniel Foster	08:00	10:30	Start: Wind 3, cloud 2/8, 17°C, dry. Finish: Wind 3, cloud 2/8, 19°C, dry.
2	02.08.21	Jim Fairclough	08:00	10:30	Start: Wind 3, cloud 4/8, 16°C, dry. Finish: Wind 3, cloud 4/8, 18°C, dry.
3	12.09.21	Andrew Cockcroft	10:00	13:30	Start: Wind 2, cloud 7/8, 14°C, dry. Finish: Wind 2, cloud 4/8, 20°C, dry.
4	20.09.21	Andrew Cockcroft	10:00	13:30	Start: Wind 2, cloud 7/8, 14°C, dry. Finish: Wind 2, cloud 4/8, 20°C, dry.
5	25.09.21	Andrew Cockcroft	09:30	13:00	Start: Wind 2, cloud 5/8, 13°C, dry. Finish: Wind 2, cloud 3/8, 19°C, dry.
6	28.09.21	Andrew Cockcroft	09:30	13:00	Start: Wind 3, cloud 4/8, 13°C, dry. Finish: Wind 2, cloud 4/8, 17°C, dry.

[15] Wind strength is measured using the Beaufort scale, whereby calm = 0 and a hurricane = 12. A strong breeze = 6. Cloud cover is measured in Oktas, whereby a clear sky = 0 Oktas and full cloud cover = 8 Oktas.

Survey	Date	Surveyor	Time		Weather conditions[15]
7	01.10.21	Daniel Foster	10:30	13:00	Start: Wind 2, cloud 3/8, 12°C, dry. Finish: Wind 2, cloud 4/8, 14°C, dry.

Personnel

8.45 The team for this survey and reporting included:

- Daniel Foster (Principal Ecologist, BSG Ecology) set up the reptile survey and undertook field surveys. He has managed and undertaken numerous reptile surveys since 2004.
- Dr Jim Fairclough (Principal Ecologist, BSG Ecology) undertook field surveys. He has worked as a professional ecologist since 2003 during which time he has completed reptile surveys and assessment at many development sites.
- Andrew Cockcroft (Freelance Ecologist) undertook field surveys. Andrew is an experienced reptile surveyor and has completed reptile surveys and assessment at many development sites.

Appendix 7: Invertebrate survey methodology and results

Habitat Potential Assessment

8.46 The Site was assessed for its importance to support important invertebrate assemblages by Dr Jim Fairclough MCIEEM, an experienced entomologist, on 16 June 2021. The assessment was conducted with reference to the as yet unpublished Invertebrate Habitat Potential Protocol (Dobson & Fairclough, in litt).

8.47 Notes were made of the habitats present, which were documented in a photographic record (see Section 7). To enable a full characterisation of the Site for invertebrates, this included observations of features that might limit invertebrate interest in addition to those which might be of particular value for invertebrates. In particular, emphasis was placed on the following features (where present):

- Woodland edge and scrub: especially where there is a diverse vegetation structure and species composition;
- Species-rich grassland: especially that in association with scrub, with a high proportion of plants providing nectar and pollen, and with a varied vegetation structure;
- Early successional habitat: (e.g. cliff faces, quarry bases, eroded banks, periodically disturbed bare or sparsely vegetation ground) especially free-draining ground where there is a high proportion of exposed bare earth; and
- Wetland: including watercourses (e.g. ditches, flushes and seepages), standing water or waterbodies (e.g. ponds, lakes and swamp) and associated terrestrial habitat (e.g. wet heath and marshy grassland).

8.48 Numerous habitats were identified during the habitat potential assessment with the potential to support important terrestrial invertebrate assemblages, including herb-rich grassland, scrub, sparsely vegetated areas and those with bare ground on the quarry floor and matrices of these. Subsequent invertebrate surveys were designed to target key indicator groups of invertebrates within the Site associated with these habitats, namely Coleoptera (beetles), Hemiptera (true bugs), larger Brachycera (a group of loosely related flies whose ecology is relatively well understood), Syrphidae (hoverflies) and aculeate Hymenoptera (bees, ants and wasps). A small ephemeral pond was also surveyed for aquatic and semi-aquatic species of invertebrate

8.49 The results of these targeted surveys were used to assess the main groups of invertebrates present within the Site, and to provide an indication of the relative species diversity within the targeted groups.

Targeted survey for invertebrates

8.50 The following sampling methods were employed: pitfall traps, pan traps, sweep-netting, pond netting, beating and grubbing. These methods are described below. Whilst Coleoptera, larger Brachycera, Syrphids, aculeate Hymenoptera and Hemiptera formed the focus of the survey, incidental observations of other invertebrate taxa were also recorded. Surveys were conducted on 16 and 28 June, and 2 August (all in 2021), by Dr Jim Fairclough. Figure 9 shows the locations of the various sampling methods used during the surveys.

Pitfall traps

8.51 Pitfall trapping involved the use of circular plant pot trays (24 cm diameter x 5 cm depth) that were sunk into a circular hole that was excavated using a spade. The trays were installed such that the tray rims were flush with the surrounding ground level. Preserving fluid, comprising one part ethylene glycol (antifreeze) to three parts water, was poured into the trays until they were half full. A drop of detergent was added to the fluid to break the surface tension and lastly, a layer of mesh (aperture size 2 cm x 1 cm) was balanced over the tray to prevent capture of small mammals,

amphibians and reptiles. Photograph 1 shows a typical pitfall trap and locations where pitfall traps were set are shown on Figure 9. The traps were in operation during the period from 16 June to 28 June 2021. Pitfall trapping is considered to be an effective method for the sampling of ground dwelling beetles, particularly those belonging to the family Carabidae (ground beetles).

Pan traps

8.52 Sets of pan traps were set out in flower-rich areas of the Site on all survey visits. Their approximate location during the surveys is shown on Figure 9. The pan traps comprised yellow or white plastic trays into which a small amount of water was poured (along with a few drops of detergent to break the surface tension). These traps mimic large flowers and attract flying insects of many groups, which then become trapped in the fluid, for later collection. Photograph 2 shows a pan trap in situ at the Site. The traps were operational for the duration of the survey visits (ranging from between 4 to 6 hrs).

8.53 Such “flower” traps may favour the collection of bees (which forage for nectar and pollen and therefore spend more time at flowers) rather than wasps, which hunt for invertebrates as food for their developing young. However, many wasps do, nonetheless, visit flowers to drink nectar for their own energy supplies, and so both major groups of Hymenoptera can be sampled in this way (with a bias towards the bees). Such traps are a good way of collecting spider-hunting wasps, which generally move on or close to the ground and are difficult to catch using hand nets.

Sweep netting

8.54 Sweep netting was conducted on all survey visits, at various habitats within the Site, and was focussed in the vegetated habitats of Area 1 (see Figure 9). Sweep netting involved walking at a steady pace through the vegetation and passing an entomologist’s sweep net back and forth through vegetation in a figure of eight motion. This method is particularly suitable for capturing phytophagous (foliage-feeding) families such as Curculionidae (weevils), Chrysomelidae (leaf or flea beetles), Nitidulidae (pollen beetles) and Cantharidae (soldier beetles). Sweep netting is also an effective method for collecting many families of bugs, although the Miridae (capsid bugs) can often be the most numerous both in number of individuals and number of species.

8.55 Sweep netting was accompanied by ‘spot-sweeping’ where individual invertebrates were targeted, that could be detached from vegetation and collected via a single sweep.

8.56 A pond net was used to sample the shallow water in the pond in the east of Area 1. At the time of survey in August, the pond held water to a depth of several centimetres. Despite the shallow depth, this would still have been sufficient for species typical of seasonal waterbodies, especially freshwater snails and certain families of beetles (e.g. Hydrophilidae and Dytiscidae).

Beating

8.57 Beating was conducted in tandem with the sweep netting during all survey visits, targeting scrub edge habitat within Area 1 (see Figure 9). Beating is a useful technique for extracting beetles from overhanging branches. This method involves placing a beating tray beneath a branch before delivering several sharp blows to the branch, sending any dislodged invertebrates into the beating tray for inspection. This method may uncover a diverse array of beetle families (similar to those found during the sweeping).

Grubbing

8.58 Grubbing was conducted during all survey visits, focussed mainly in the quarry base and rocky edges of the access track (Area 2 on Figure 9). Grubbing is the name generally applied to the extraction of invertebrates by hand from a variety of mediums such as loose rocks and stones, dead wood or fungi and under bark; or dense aggregations of leaf matter and detritus (e.g. base of grass tussocks, fern shuttlecocks and leafy / woody deposits). To assist in the detection of small beetles, material was sieved or placed in a bucket of water to capture invertebrates struggling to the surface.

Sample sorting and identification

8.59 Whilst some species could be identified in the field, the majority of specimens were stored in 70% methanol solution for later identification, using a stereoscope microscope with the aid of identification literature.

Weather conditions and survey effort

8.60 The weather conditions preceding and during the targeted invertebrate surveys are detailed in Table A7-1 below. The period of time for the survey is also provided.

Table A7-1: Weather conditions preceding and during surveys

Survey date	Survey Duration	Weather conditions prior to survey	Weather conditions during survey
16/06/2021	08.45 – 12.30 4.75 hrs	Warm and sunny in the preceding week with little rain. Temperatures ranging from 17°C to 21°C.	Hot and sunny throughout the day. Light air with a maximum temperature of 23°C
28/06/2021	9.30 – 13.30 4 hrs	Warm, sunny and dry in the preceding week with highs of 26°C.	Dry, sunny and warm with occasional cloud. A maximum temperature of 18°C with a light breeze.
02/08/2021	08.30 – 13.30 6 hrs	Mild and warm in the preceding week, with occasional overcast and showery days and hights of 20°C.	After a wet start to the day, becoming dry, sunny and warm in the afternoon. A maximum temperature of 22°C with a light breeze.

Data analysis – Pantheon

8.61 The subsequent Results section places a value on the rare and notable invertebrates found at the Site dependent on their current national status.

8.62 The list of species derived from the invertebrate surveys was analysed using the "Pantheon" database tool being developed by Natural England and the Centre for Ecology and Hydrology (Webb et al., 2018). For each species recognised by Pantheon various attributes relating to associated habitats and resources, assemblage types and habitat fidelity scores are placed against them. Reports can then be generated including those that provide:

- Information on each individual species entered into the database.
- A list of species belonging to different feeding guilds (e.g. xylophagous, saprophagous, nectivorous).
- A list of species with different associations (e.g. to certain groups of plant, fungi or animal).
- A summary of the number of species within the sample that have a particular score or fidelity and, if relevant an overall score that provides insight into the quality of the site that the sample has come from.
- Summary tables that assess where species live and what assemblages they are associated with.

8.63 In the context of the present assessment, it is the report that Pantheon provides relating to where species live and what assemblages they are associated with, that is most useful in evaluating the relative importance of a site for its invertebrates. This considers the habitats and resources used by an invertebrate species at various hierarchical levels, from broad biotopes (e.g. tree associated, wetland, coastal) at the highest level, down to specific habitats (e.g. tall sward and scrub, decaying wood, arboreal, marshland) at a mid-level, and resources (e.g. sapwood & bark decay, heart rot and fungal fruiting bodies all associated with the decaying wood habitat) at the finest level. The

assessment also considers the "ISIS" (Invertebrate Species-habitat Information System) assemblage types that had previously been developed by Natural England (Drake et al., 2007). The original Specific Assemblage Types (SATs) are therefore carried forward in their original form, although 'Habitats' have replaced the ISIS Broad Assemblage Types (BATs).

8.64 SATs include only habitat specific species, which are normally faithful to a single habitat or resource, which are often closely associated with sites of higher conservation value. Analysis of SATs is helpful to inform the determination of the nature conservation value of a site for invertebrates; sites with high-scoring SATs are considered to have good quality invertebrate assemblages.

8.65 The original role of ISIS was to guide Natural England on assessing the conservation value of SSSIs for their invertebrate assemblages (especially for the purposes of Common Standards Monitoring). This was done by identifying whether an assemblage associated with a site was in a "favourable condition" (i.e. where it was considered to be of sufficient condition to meet the threshold criteria for an assemblage of SSSI-level value). However, whilst the condition assessment function is still retained within Pantheon, it is not the sole use. Accordingly, the analysis may be used in other situations (e.g. by nature reserve managers or those assessing the effects of a development) to help understand which assemblages (SATs) within a site are likely to be important.

8.66 A useful measure of the quality of a site for its invertebrate assemblage is to count and assign scores that are more heavily weighted towards the rarer species. The Species Quality Index (SQI) is a numerical scoring system contained within Pantheon that does exactly this. Each species recorded from a sample is given a Species Quality Score (SQS) based on its conservation status. The SQI is the sum of all SQSs divided by the number of species in that sample. This score is multiplied by 100 to give a 3 figure value without decimal places (e.g.100 rather than a 1.00). This SQI score is preferred to a score derived from SQSs alone since it eliminates, to a greater extent the effect of recorder effort. Notwithstanding this, sites where little effort has been made to record the common species could result in overly amplified SQI scores. There is presently no published guidance on what SQI score might be classed as 'good' or 'average' as this might vary between habitats and regions (e.g. northern vs. southern England). However, as a general rule of thumb, based on the experience of BSG Ecology, a habitat with an SQI score exceeding 125 is likely to be of some value and merit further consideration.

Personnel

8.67 The team for this project involved the following personnel:

- Dr Jim Fairclough BSc PhD MCIEEM: Jim's role in this project was to complete the Habitat Potential Assessment and field survey work. Jim undertook the technical reporting on this project.
- Don Stenhouse MSc FRES: Don completed the laboratory identification of invertebrates for the project.

Limitations to methods

8.68 A pond in the base of the quarry could not be safely accessed to survey, due to the loose rocky margins and risk of rockfall from above.

8.69 Three seasonal visits targeting four or five insect orders can only detect a proportion of the total species pool using a Site. However, it does provide the opportunity to investigate the assemblage types present and to gauge where the most important parts of the Site for invertebrates are most likely to be found.

8.70 The surveys were carried out during favourable weather conditions.

Results

Targeted Surveys

8.71 The results of the targeted surveys provide an indication of the relative species diversity within the targeted groups of invertebrates. Over 450 specimens were collected or recorded over the course of the survey, allowing 123 species to be identified from the Site.

8.72 Of the target groups, Coleoptera was the dominant order recorded, represented by 48 species; Hemiptera was represented by 19 species; Hymenoptera was represented by 22 species; Diptera was represented by 13 species, and Lepidoptera by 11 species. Other species which made up the remaining records included those belonging to the Dermaptera (earwigs), Isopoda (woodlice), Julida (snake-millipedes), Lithobiomorpha (stone centipedes), Opiliones (harvestmen), Orthoptera (crickets and grasshoppers), Polydesmida (flat-backed millipedes) and Pulmonata (lunged snails).

8.73 Of the species recorded, the majority are without any recognised status, being widely distributed and common, and exhibiting little habitat specificity. Twelve are regarded as Locally Common or Locally Scarce and seven are currently accorded noteworthy status, being either Species of Principal Importance, Nationally Scarce or Rare. The full list of invertebrates recorded within the Site is displayed in tabular format in Appendix 2.

8.74 Further information relating to species with a designated status is provided below.

Coleoptera (Beetles)

Chrysomelidae (Leaf Beetles) *Agelastica alni* – UK Status: Nationally Rare (Data Deficient)

8.75 Although primarily found on alder *Alnus glutinosa* and related species, this distinctive beetle can also be found on silver birch *Betula pendula* and willow *Salix sp.*. Originally native to Britain (Stenhouse, 2012), it became extinct hundreds of years ago and was re-introduced in the early 2000's (Stenhouse, 2006).

8.76 Despite being the subject of a recent review in Hubble (2014) in which it was accorded Nationally Rare status, the beetle is experiencing a range expansion from its initial loci in Cheshire (Stenhouse, 2006) and can be found abundantly at numerous sites across north-west, central, and southern England.

8.77 One specimen was identified from Area 1 on 16 June 2021.

Curculionidae (True Weevils) *Polydrusus formosus* – UK Status: Nationally Scarce

8.78 This species is found on a wide variety of tree species typically in wooded areas. Formerly very local in southern England and Wales, it is now much more common and widespread, so does not merit the current status and is likely to be downgraded to locally common in any future review of the Curculionidae.

8.79 Two specimens were swept from Area 1 on 16 June 2021.

Staphylinidae (Rove Beetles) *Neuraphes plicicollis* – UK Status: Nationally Scarce

8.80 This tiny beetle is not well recorded and there are few records in the national database. However, it is not easily found, and difficult to identify, so may be very under-recorded. According to an unpublished and undated key by Peter Skidmore, it can be found in rotten wood or under loose bark, or sometimes in *Sphagnum* moss, in wooded areas. It has been recorded in most months of the year. It is very local, with most records being on the eastern side of England as far north as Yorkshire.

8.81 One beetle was extracted from a pitfall trap set in Area 2, retrieved on 28 June 2021.

LEPIDOPTERA (BUTTERFLIES AND MOTHS)

Nymphalidae (Butterfly) *Coenonympha pamphilus* (small heath butterfly) - UK status: Vulnerable. Section 41 listed Species of Principal Importance

8.82 Small heath butterflies typically occur in well-drained semi-improved grassland habitats where they lay their eggs on fine grasses such as fescues (*Festuca* spp.), meadow grasses (*Poa* spp.) and bents (*Agrostis* spp.) (Asher *et al*., 2001). The species was recorded in several locations in Areas 1 and 2 in June 2021.

8.83 According to the UK Butterflies website (accessed 2022), this small nymphalid 'has shown a severe decline over the long term and is therefore a priority species for conservation efforts'. This is reflected by the species moving from Near Threatened to Threatened (Vulnerable) IUCN category (Fox *et. al* (2022)).

HYMENOPTERA (SAWFLIES, BEES, WASPS AND ANTS)

Andrenidae (Mining Bees) *Andrena nigriceps* (black-headed mining bee) - UK status: Nationally Scarce

8.84 This species according to the BWARS (2012), site nests singly in short turf or bare ground in lighter soils of flowery grasslands. It is widespread in England but mainly coastal, and found as far north as southern Scotland.

8.85 One bee was swept from Area 1 on 2 August 2021.

Halictidae (Sweat Bees) *Sphecodes crassus* (swollen-thighed blood bee) - UK status: Nationally Scarce

8.86 This very small bee is found in a wide variety of open habitats and visits mayweeds, thistles and umbellifers. It was regarded as scarce but has apparently become more common in recent years and is widespread and locally common across southern England and the midlands (Falk, 2015). This suggests that it will be downgraded in any future review.

8.87 Two bees were taken from pan traps set in Area 1 on 16 June 2021.

Tiphiidae (Tiphiid Wasps) *Tiphia minuta* (small Tiphia) - UK status: Nationally Scarce

8.88 This small wasp is widespread in Britain, although mainly recorded from central and southern England. It is difficult to find during fieldwork due to its habit of hovering just above ground level. This suggests that it may be under-recorded and is another hymenopteran that needs a status review (BWARS, 2001).

8.89 One wasp was taken from a pan trap set in Area 1 on 16 June 2021.

8.90 The full list of invertebrates recorded within the Site is displayed in tabular format in Table A7-2 below.

Table A7-2: Invertebrate species list recorded at the Site

Order	Family	Taxon	Status
Coleoptera	Apionidae	*Perapion violaceum*	None
Coleoptera	Apionidae	*Stenopterapion meliloti*	None
Coleoptera	Byrrhidae	*Byrrhus pilula*	None
Coleoptera	Byturidae	*Byturus ochraceus*	Local
Coleoptera	Cantharidae	*Cantharis cryptica*	None
Coleoptera	Cantharidae	*Cantharis flavilabris*	None

Order	Family	Taxon	Status
Coleoptera	Cantharidae	*Cantharis nigricans*	None
Coleoptera	Cantharidae	*Cantharis pallida*	Local
Coleoptera	Cantharidae	*Cantharis pellucida*	None
Coleoptera	Cantharidae	*Rhagonycha fulva*	None
Coleoptera	Cantharidae	*Rhagonycha lignosa*	None
Coleoptera	Cantharidae	*Rhagonycha nigriventris*	None
Coleoptera	Carabidae	*Bembidion deletum*	Local
Coleoptera	Carabidae	*Bradycellus verbasci*	None
Coleoptera	Carabidae	*Nebria brevicollis*	None
Coleoptera	Carabidae	*Pterostichus madidus*	None
Coleoptera	Carabidae	*Pterostichus niger*	None
Coleoptera	Chrysomelidae	*Agelastica alni*	Rare
Coleoptera	Chrysomelidae	*Altica palustris*	None
Coleoptera	Chrysomelidae	*Crepidodera fulvicornis*	None
Coleoptera	Chrysomelidae	*Longitarsus suturellus*	None
Coleoptera	Chrysomelidae	*Oulema obscura*	None
Coleoptera	Coccinellidae	*Coccinella septempunctata*	None
Coleoptera	Coccinellidae	*Propylea quattuordecimpunctata*	None
Coleoptera	Cryptophagidae	*Antherophagus similis*	Local
Coleoptera	Curculionidae	*Euophryum confine*	None
Coleoptera	Curculionidae	*Exomias pellucidus*	None
Coleoptera	Curculionidae	*Micrelus ericae*	None
Coleoptera	Curculionidae	*Phyllobius argentatus*	None
Coleoptera	Curculionidae	*Polydrusus formosus*	NS
Coleoptera	Curculionidae	*Rhinoncus pericarpius*	None
Coleoptera	Curculionidae	*Rhynchaenus fagi*	None
Coleoptera	Curculionidae	*Strophosoma sus*	Local
Coleoptera	Dytiscidae	*Ilybius ater*	None
Coleoptera	Elateridae	*Athous haemorrhoidalis*	None
Coleoptera	Elateridae	*Hypnoidus riparius*	None
Coleoptera	Hydrophilidae	*Anacaena globulus*	None
Coleoptera	Hydrophilidae	*Helophorus aequalis*	None
Coleoptera	Hydrophilidae	*Megasternum concinnum*	None
Coleoptera	Nitidulidae	*Epuraea melanocephala*	None
Coleoptera	Nitidulidae	*Meligethes aeneus*	None
Coleoptera	Oedemeridae	*Oedemera lurida*	None
Coleoptera	Oedemeridae	*Oedemera nobilis*	None
Coleoptera	Staphylinidae	*Aloconota gregaria*	None
Coleoptera	Staphylinidae	*Eusphalerum sorbi*	Local
Coleoptera	Staphylinidae	*Neuraphes plicicollis*	NS
Coleoptera	Staphylinidae	*Quedius levicollis*	None
Coleoptera	Staphylinidae	*Tachyporus dispar*	None
Dermaptera	Forficulidae	*Forficula auricularia*	None

Order	Family	Taxon	Status
Diptera	Bibionidae	*Bibio johannis*	None
Diptera	Scathophagidae	*Scathophaga stercoraria*	None
Diptera	Syrphidae	*Cheilosia illustrata*	None
Diptera	Syrphidae	*Episyrphus balteatus*	None
Diptera	Syrphidae	*Eristalis arbustorum*	None
Diptera	Syrphidae	*Eristalis tenax*	None
Diptera	Syrphidae	*Helophilus pendulus*	None
Diptera	Syrphidae	*Metasyrphus latifasciatus*	Local
Diptera	Syrphidae	*Platycheirus manicatus*	None
Diptera	Syrphidae	*Sericomyia silentis*	None
Diptera	Syrphidae	*Sphaerophoria scripta*	None
Diptera	Syrphidae	*Syritta pipiens*	None
Diptera	Tipulidae	*Nephrotoma flavescens*	None
Hemiptera	Acanthosomatidae	*Elasmostethus interstinctus*	None
Hemiptera	Aphrophoridae	*Neophilaenus campestris*	None
Hemiptera	Aphrophoridae	*Neophilaenus lineatus*	None
Hemiptera	Aphrophoridae	*Philaenus spumarius*	None
Hemiptera	Cercopidae	*Cercopis vulnerata*	None
Hemiptera	Cicadellidae	*Anoscopus serratulae*	None
Hemiptera	Cicadellidae	*Aphrodes makarovi*	None
Hemiptera	Cicadellidae	*Cicadella viridis*	None
Hemiptera	Cicadellidae	*Megophthalmus scabripennis*	None
Hemiptera	Delphacidae	*Dicranotropis hamata*	None
Hemiptera	Lygaeidae	*Scolopostethus thomsoni*	None
Hemiptera	Miridae	*Capsus ater*	None
Hemiptera	Miridae	*Pithanus maerkelii*	None
Hemiptera	Miridae	*Stenodema calcarata*	None
Hemiptera	Miridae	*Stenodema holsata*	None
Hemiptera	Miridae	*Stenodema laevigata*	None
Hemiptera	Nabidae	*Nabis flavomarginatus*	None
Hemiptera	Pentatomidae	*Dolycoris baccarum*	None
Hemiptera	Rhopalidae	*Myrmus miriformis*	None
Hymenoptera	Andrenidae	*Andrena bicolor*	None
Hymenoptera	Andrenidae	*Andrena minutula*	None
Hymenoptera	Andrenidae	*Andrena nigriceps*	NS
Hymenoptera	Andrenidae	*Andrena scotica*	None
Hymenoptera	Andrenidae	*Andrena subopaca*	None
Hymenoptera	Apidae	*Apis mellifera*	None
Hymenoptera	Apidae	*Bombus hortorum*	None
Hymenoptera	Apidae	*Bombus pascuorum*	None
Hymenoptera	Apidae	*Bombus terrestris ssp audax*	None
Hymenoptera	Apidae	*Epeolus variegatus*	Local
Hymenoptera	Crabronidae	*Trypoxylon attenuatum*	None

Order	Family	Taxon	Status
Hymenoptera	Formicidae	*Formica fusca*	None
Hymenoptera	Formicidae	*Formica lemani*	None
Hymenoptera	Formicidae	*Lasius niger*	None
Hymenoptera	Formicidae	*Myrmica ruginodis*	None
Hymenoptera	Halictidae	*Lasioglossum calceatum*	None
Hymenoptera	Halictidae	*Lasioglossum cupromicans*	Local
Hymenoptera	Halictidae	*Lasioglossum morio*	None
Hymenoptera	Halictidae	*Sphecodes crassus*	NS
Hymenoptera	Tiphiidae	*Tiphia minuta*	NS
Hymenoptera	Vespidae	*Dolichovespula norwegica*	Local
Hymenoptera	Vespidae	*Dolichovespula sylvestris*	None
Isopoda	Oniscidae	*Oniscus asellus*	None
Julida	Julidae	*Ophyiulus pilosus*	None
Julida	Julidae	*Tachypodoiulus niger*	None
Lepidoptera	Erebidae	*Tyria jacobaeae*	Sec41
Lepidoptera	Hesperiidae	*Ochlodes sylvanus*	None
Lepidoptera	Lycaenidae	*Lycaena phlaeas*	None
Lepidoptera	Nymphalidae	*Aglais urticae*	None
Lepidoptera	Nymphalidae	*Aphantopus hyperantus*	None
Lepidoptera	Nymphalidae	*Coenonympha pamphilus*	Sec41
Lepidoptera	Nymphalidae	*Maniola jurtina*	None
Lepidoptera	Nymphalidae	*Pyronia tithonus*	None
Lepidoptera	Pieridae	*Pieris brassicae*	None
Lepidoptera	Pieridae	*Pieris napi*	None
Lepidoptera	Sesiidae	*Bembecia ichneumoniformis*	NS
Lithobiomorpha	Lithobiidae	*Lithobius forficatus*	None
Opiliones	Phalagiidae	*Phalangium opilio*	None
Orthoptera	Acrididae	*Chorthippus brunneus*	None
Orthoptera	Tetrigidae	*Tetrix subulata*	Local
Polydesmida	Polydesmidae	*Polydesmus angustus*	None
Pulmonata	Helicidae	*Cepaea hortensis*	None

Appendix 8: Summaries of relevant policy, legislation and other instruments

This section briefly summarises the legislation, policy and related issues that are relevant to the main text of the report. The following text does not constitute legal or planning advice.

National Planning Policy Framework (England)

The Government revised the National Planning Policy Framework (NPPF) on 19 February 2019. Text excerpts from the NPPF are shown where they may be relevant to planning applications and biodiversity including protected sites, habitats and species.

The Government sets out the three objectives for sustainable development (economy, social and environmental) at paragraphs 8-10 to be delivered through the plan preparation and implementation level and 'are not criteria against which every decision can or should be judged.' At paragraph 8c) the planning system's environmental objective refers to 'protecting and enhancing our natural, built and historic environment' and to 'helping to improve biodiversity'

In conserving and enhancing the natural environment, the NPPF (Paragraph 170) states that 'planning policies and decisions should contribute to and enhance the natural and local environment' by:

- Protecting and enhancing...sites of biodiversity value... '(in a manner commensurate with their statutory status or identified quality in the development plan)'.
- Recognising the wider benefits from natural capital and ecosystem services including trees and woodland.
- Minimising impacts on and providing net gains 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.

In respect of protected sites, at paragraph 171, the NPPF requires local planning authorities to distinguish, at the plan level, '…between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value...take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.'

Paragraph 174 refers to how plans should aim to protect and enhance biodiversity. 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 [a footnote refers to ODPM Circular 06/2005 for further guidance in respect of statutory obligations for biodiversity in the planning system], wildlife corridors and stepping stones that connect them and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation;' and to 'promote the conservation, restoration and re-creation 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.'

Paragraph 175 advises that, when determining planning applications, '…local planning authorities should apply the following principles:

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

b. development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments) should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact 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;

c. development resulting in the loss or deterioration of irreplaceable habitats, (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and

d. development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.'

In paragraph 176, the following should be given the same protection as habitats sites[16]:

i. potential Special Protection Areas and possible Special Areas of Conservation

ii. listed or proposed Ramsar sites; and

iii. sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.'

In paragraph 177 the NPPF refers back to sustainable development in relation to appropriate assessment and states: 'the presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site'.

In paragraph 178, the NPPF refers to planning policies and decisions taking account of ground conditions and risks arising from land instability and contamination at sites. In relation to risks associated with land remediation account is to be taken of 'potential impacts on the natural environment' that arise from land remediation.

In paragraph 180 the NPPF states that planning policies and decisions should ensure that development is appropriate to the location and take into account likely effects (including cumulative) on the natural environment and , in doing so, they 'should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.'

Government Circular ODPM 06/2005 Biodiversity and Geological Conservation (England only)

Paragraph 98 of Government Circular 06/2005 advises that "the presence of a protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat. Local authorities should consult Natural England before granting planning permission. They should consider attaching appropriate planning conditions or entering into planning obligations under which the developer would take steps to secure the long-term protection of the species. They should also advise developers that they must comply with any statutory species' protection provisions affecting the site concerned..."

Paragraph 99 of Government Circular 06/2005[17] advises that "it is essential that the presence or otherwise of protected species, and the extent that they may be affected by the proposed development, is established before the planning permission is granted, otherwise all relevant material considerations may not have been addressed in making the decision. The need to ensure ecological surveys are carried out should therefore only be left to coverage under planning conditions in exceptional circumstances, with the result that the surveys are carried out after planning permission has been granted".

Standing Advice (GOV.UK - England only)

The GOV.UK website provides information regarding protected species and sites in relation to development proposals: 'Local planning authorities should take advice from Natural England or the Environment Agency about planning applications for developments that may affect protected species.' GOV.UK advises that 'some species have standing advice which you can use to help with planning decisions. For others you should contact Natural England or the Environment Agency for an individual response.'

[16] Habitats sites are defined in the glossary as 'Any site which would be included within the definition at regulation 8 of the Conservation of Habitats and Species Regulations 2017 (as amended) for the purpose of those regulations, including candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation, Special Protection Areas and any relevant Marine Sites.'
[17] *ODPM Circular 06/2005. Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impacts within the Planning System* (2005). HMSO Norwich.

The standing advice (originally from Natural England and now held and updated on GOV.UK18) provides advice to planners on deciding if there is a 'reasonable likelihood' of protected species being present. It also provides advice on survey and mitigation requirements.

When determining an application for development that is covered by standing advice, in accordance with guidance in Government Circular 06/2005, Local planning authorities are required to take the standing advice into account. In paragraph 82 of the aforementioned Circular, it is stated that: 'The standing advice will be a material consideration in the determination of the planning application in the same way as any advice received from a statutory consultee…it is up to the planning authority to decide the weight to be attached to the standing advice, in the same way as it would decide the weight to be attached to a response from a statutory consultee.'

Natural Environment and Rural Communities (NERC) Act 2006 – Habitats and species of principal importance (England)

The Natural Environment and Rural Communities (NERC) Act came into force on 1st October 2006. Section 41 (S41) of the Act require the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The list has been drawn up in consultation with Natural England as required by the Act. In accordance with the Act the Secretary of State keeps this list under review and will publish a revised list if necessary, in consultation with Natural England.

The S41 list is used to guide decision-makers such as public bodies, including local authorities and utilities companies, in implementing their duty under Section 40 of the NERC Act 2006, to have regard to the conservation of biodiversity in England, when carrying out their normal functions, including development control and planning. This is commonly referred to as the 'Biodiversity Duty.'

Guidance for public authorities on implementing the Biodiversity Duty[19] has been published by Defra. One of the key messages in this document is that 'conserving biodiversity includes restoring and enhancing species populations and habitats, as well as protecting them.' In England the administration of the planning system and licensing schemes are highlighted as having a 'profound influence on biodiversity conservation.' Local authorities are required to take measures to "promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species. The guidance states that 'the duty aims to raise the profile and visibility of biodiversity, clarify existing commitments with regard to biodiversity, and to make it a natural and integral part of policy and decision making.'

In 2007, the UK Biodiversity Action Plan (BAP) Partnership published an updated list of priority UK species and habitats covering terrestrial, freshwater and marine biodiversity to focus conservation action for rarer species and habitats in the UK. The UK Post-2010 Biodiversity Framework[20], which covers the period from 2011 to 2020, now succeeds the UK BAP. The UK priority list contained 1150 species and 65 habitats requiring special protection and has been used as a reference to draw up the lists of species and habitats of principal importance in England.

In England, there are 56 habitats of principal importance and 943 species of principal importance on the S41 list. These are all the habitats and species found in England that were identified as requiring action in the UK BAP and which continue to be regarded as conservation priorities in the subsequent UK Post-2010 Biodiversity Framework.

European protected species (Animals)

The Conservation of Habitats and Species Regulations 2017 (as amended) consolidates various amendments that have been made to the original (1994) Regulations which transposed the EC Habitats Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Council Directive 92/43/EEC) into national law.

"European protected species" (EPS) of animal are those which are shown on Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended). They are subject to the provisions of Regulation 43 of those Regulations. All EPS are also protected under the Wildlife and Countryside Act 1981 (as amended). Taken together, these pieces of legislation make it an offence to:

[18] https://www.gov.uk/guidance/protected-species-how-to-review-planning-applications#standing-advice-for-protected-species
[19] Defra, 2007. *Guidance for Public Authorities on Implementing The Biodiversity Duty*. (http://www.defra.gov.uk/publications/files/pb12585-pa-guid-english-070516.pdf)
[20] JNCC and Defra (on behalf of the Four Countries' Biodiversity Group). 2012. *UK Post-2010 Biodiversity Framework*. July 2012. (http://jncc.defra.gov.uk/page-6189)

a. Intentionally or deliberately capture, injure or kill any wild animal included amongst these species
b. Possess or control any live or dead specimens or any part of, or anything derived from a these species
c. deliberately disturb wild animals of any such species
d. deliberately take or destroy the eggs of such an animal, or
e. intentionally, deliberately or recklessly damage or destroy a breeding site or resting place of such an animal, or obstruct access to such a place

For the purposes of paragraph (c), disturbance of animals includes in particular any disturbance which is likely—

a. to impair their ability—
    i. to survive, to breed or reproduce, or to rear or nurture their young, or
    ii. in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
b. to affect significantly the local distribution or abundance of the species to which they belong.

Although the law provides strict protection to these species, it also allows this protection to be set aside (derogated) through the issuing of licences. The licences in England are currently determined by Natural England (NE) for development works and by Natural Resources Wales in Wales. In accordance with the requirements of the Regulations (2017, as amended), a licence can only be issued where the following requirements are satisfied:

a. The proposal is necessary 'to preserve public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment'
b. 'There is no satisfactory alternative'
c. The proposals 'will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

Definition of breeding sites and resting places

Guidance for all European Protected Species of animal, including bats and great crested newt, regarding the definition of breeding and of breeding and resting places is provided by The European Council (EC) which has prepared specific guidance in respect of the interpretation of various Articles of the EC Habitats Directive.21 Section II.3.4.b) provides definitions and examples of both breeding and resting places at paragraphs 57 and 59 respectively. This guidance states that 'The provision in Article 12(1)(d) [of the EC Habitats Directive] should therefore be understood as aiming to safeguard the ecological functionality of breeding sites and resting places.' Further the guidance states: 'It thus follows from Article 12(1)(d) that such breeding sites and resting places also need to be protected when they are not being used, but where there is a reasonably high probability that the species concerned will return to these sites and places. If for example a certain cave is used every year by a number of bats for hibernation (because the species has the habit of returning to the same winter roost every year), the functionality of this cave as a hibernating site should be protected in summer as well so that the bats can re-use it in winter. On the other hand, if a certain cave is used only occasionally for breeding or resting purposes, it is very likely that the site does not qualify as a breeding site or resting place.'

Competent authorities

Under Regulation 7 of the Conservation of Habitats and Species Regulations 2017 (as amended) a "competent authority" includes "any Minister of the Crown…, government department, statutory undertaker, public body of any description or person holding a public office.

In accordance with Regulation 9, "a competent authority must exercise their functions which are relevant to nature conservation, including marine conservation, so as to secure compliance with the requirements of the [Habitats and Birds] Directives. This means for instance that when considering development proposals a

[21] Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC. (February 2007), EC.

competent authority should consider whether EPS or European Protected Sites are to be affected by those works and, if so, must show that they have given consideration as to whether derogation requirements can be met.

Birds

All nesting birds are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to intentionally kill, injure or take any wild bird or take, damage or destroy its nest whilst in use or being built, or take or destroy its eggs. In addition to this, for some rarer species (listed on Schedule 1 of the Act), it is an offence to disturb them whilst they are nest building or at or near a nest with eggs or young, or to disturb the dependent young of such a bird.

The Conservation of Habitats and Species Regulations 2017 (as amended) places duties on competent authorities (including Local Authorities and National Park Authorities) in relation to wild bird habitat. These provisions relate back to Articles 1, 2 and 3 of the EC Directive on the conservation of wild birds (2009/147/EC, 'Birds Directive'[22]) (Regulation 10 (3)) requires that the objective is the 'preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds in the United Kingdom, including by means of the upkeep, management and creation of such habitat, as appropriate, having regard to the requirements of Article 2 of the new Wild Birds Directive…' Regulation 10 (7) states: 'In considering which measures may be appropriate for the purpose of security or contributing to the objective in [Regulation 10 (3)] Paragraph 3, appropriate account must be taken of economic and recreational requirements'.

In relation to the duties placed on competent authorities under the 2017 Regulations, Regulation 10 (8) states: 'So far as lies within their powers, a competent authority in exercising any function [including in relation to town and country planning] in or in relation to the United Kingdom must use all reasonable endeavours to avoid any pollution or deterioration of habitats of wild birds (except habitats beyond the outer limits of the area to which the new Wild Birds Directive applies).'

Badger

Badger is protected under the Protection of Badgers Act 1992. It is not permitted to wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so; or to intentionally or recklessly interfere with a sett. Sett interference includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it. A badger sett is defined in the legislation as "a structure or place, which displays signs indicating current use by a badger".

ODPM Circular 06/2005[23] provides further guidance on statutory obligations towards badger within the planning system. Of particular note is paragraph 124, which states that "The likelihood of disturbing a badger sett, or adversely affecting badgers' foraging territory, or links between them, or significantly increasing the likelihood of road or rail casualties amongst badger populations, are capable of being material considerations in planning decisions."

Natural England provides Standing Advice[24], which is capable of being a material consideration in planning decisions. Natural England recommends mitigation to avoid impacts on badger setts, which includes maintaining or creating new foraging areas and maintaining or creating access (commuting routes) between setts and foraging/watering areas.

Reptiles

All native reptile species receive legal protection in Great Britain under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Viviparous lizard, slow-worm, grass snake and adder are protected against killing, injuring and unlicensed trade only. Sand lizard and smooth snake receive additional protection as "European Protected species" under the provisions of the Conservation of Habitats and Species Regulations 2017 (as amended) and are fully protected under the Wildlife and Countryside Act 1981 (as amended).

All six native species of reptile are included as 'species of principal importance' for the purpose of conserving biodiversity under Section 41 (England) of the NERC Act 2006 and Section 7 of the Environment (Wales) Act 2016.

[22] 2009/147/EC Birds Directive (30 November 2009. European Parliament and the Council of the European Union.
[23] *ODPM Circular 06/2005. Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impacts within the Planning System* (2005). HMSO Norwich.
[24] http://www.naturalengland.org.uk/ourwork/planningdevelopment/spatialplanning/standingadvice/specieslinks.aspx

Current Natural England Guidelines for Developers[25] states that 'where it is predictable that reptiles are likely to be killed or injured by activities such as site clearance, this could legally constitute intentional killing or injuring.' Further the guidance states: 'Normally prohibited activities may not be illegal if 'the act was the incidental result of a lawful operation and could not reasonably have been avoided'. Natural England 'would expect reasonable avoidance to include measures such as altering development layouts to avoid key areas, as well as capture and exclusion of reptiles.'

The Natural England Guidelines for Developers state that 'planning must incorporate two aims where reptiles are present:

- To protect reptiles from any harm that might arise during development work;
- To ensure that sufficient quality, quantity and connectivity of habitat is provided to accommodate the reptile population, either on-site or at an alternative site, with no net loss of local reptile conservation status.'

Japanese knotweed

It is an offence to plant or cause the spread of Japanese knotweed in the wild under the Wildlife and Countryside Act 1981 (as amended). All waste containing Japanese knotweed comes under the control of Part II of the Environmental Protection Act 1990.

The Environment Agency has produced "The Knotweed Code of Practice", which provides guidance on how to manage Japanese knotweed legally on development sites[26]. This document provides ecological information on Japanese knotweed, details of how to prevent its spread, how to manage Japanese knotweed and information on disposal. Natural Resources Wales refers to Environment Agency guidance in respect of landowners responsibilities in Wales and to the Wildlife and Countryside Act 1981 (as amended).

[25] English Nature, 2004. *Reptiles: guidelines for developers.* English Nature, Peterborough. https://webarchive.nationalarchives.gov.uk/20150303064706/http://publications.naturalengland.org.uk/publication/76006

[26] *Managing Japanese knotweed on development sites: the knotweed code of practice* (2006). Environment Agency. https://www.gov.uk/government/publications/japanese-knotweed-managing-on-development-sites. See also 2013 Code of Practice update.