

Preliminary Ecological Appraisal Report
Horn Crag Quarry

A.D. Calvert Architectural Stone Supplies

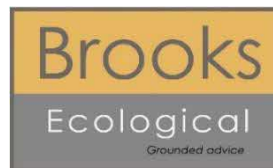
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Report Title:	Preliminary Ecological Appraisal Report Horn Crag Quarry
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Summary

This report is produced to inform A.D. Calvert Architectural Stone Supplies of potential ecological constraints associated with their proposed reopened quarry site and the need for further reporting or output to support a planning application.

This report is based on a desk study of designated wildlife sites and records of protected or notable species, and an extended Phase 1 Habitat Survey carried out in March 2021.

Key Findings

The Site comprises high value habitat that has a score of 58.42 Biodiversity Units. Dependant on the  it is highly unlikely that a net gain can be achieved on but a high quality restoration may deliver a neutral score at best.

Further survey is required for badger, bats, breeding/foraging birds, and reptile to determine their status or extent on Site.

Introduction

1. Brooks Ecological Ltd was commissioned by A.D. Calvert Architectural Stone Supplies to carry out an updating Preliminary Ecological Appraisal (PEA) of land at Horn Crag Quarry, off Fishbeck Lane, Silsden, BD20 0NP, grid reference SE 053 480.
2. This report is produced with reference to British Standard BS:42020 'Biodiversity Code of Practice for Planning and Development' and the CIEEM (2017) Guidelines for Preliminary Ecological Appraisal.

Purpose of a PEA

3. A PEA is an *initial assessment* of the baseline for a proposed development site and establishes whether the Site is likely to be constrained by ecology, and whether more information is needed to identify the ecological baseline.
4. The subsequent Preliminary Ecological Appraisal Report (PEAR) is intended to give guidance to a developer and assist with the early stages of project planning and design. Where a site is not complex or constrained, and no additional ecological input is necessary the PEAR *may* be sufficient, and suitable to support a planning application.
5. Biodiversity Accounting metrics are used to quantify the value of a Site in Biodiversity Units - which helps in the later stage of assessing the ecological impacts of the proposed development.
6. Biodiversity Units can help to inform avoidance, or on-Site mitigation levels required; or as a last resort can translate to a direct monetary value where compensation (off-Site) is required. Please be aware that they *can* significantly impact on costs and viability.

The Site

7. The application site 'the Site' comprises a former quarry and surrounding land having long since ceased active quarrying and allowing heathland and associated mature secondary habitats to develop.
8. The assessment uses a 2km area of search around the Site for records of protected and notable species and locally or nationally designat wildlife sites.

Figure 1 The Site



Desk Study

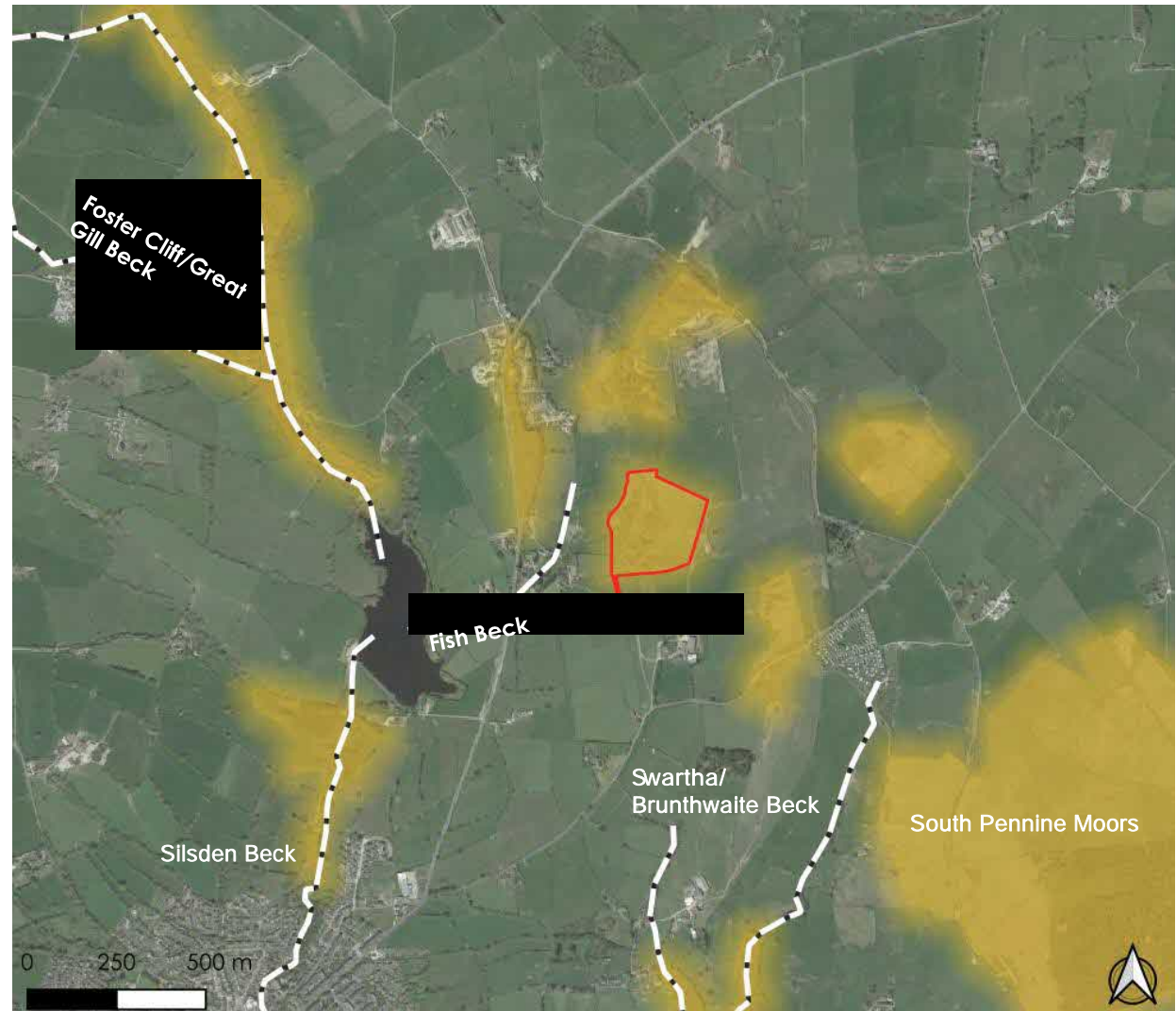
Landscape

9. The Site is located 2km north east of Silsden. It is set in a landscape characterised by improved permanent pasture punctuated by smallholdings, woodland blocks and pockets of moorland.
10. The Site is underlain by Middleton Grit – Sandstone which gives rise to acidic loamy conditions. With the Site having been previously quarried, the underlying bedrock is likely to heavily influence habitats on Site.

Wildlife Corridors

11. Small scale linear corridors are found locally, with Fish Beck being the closest at 100m west of the Site. These corridors do not appear to have a strong connective function with any particular habitat although appear to be flanked with woodland and riparian vegetation along their course.
12. Small pockets of heath/moorland are seen in the vicinity, the most notable being the South Pennine Moors some 1km south east.

Figure 2 Analysis of aerial landscape features; potential wildlife corridors (white dashed) and better structured habitat (orange shading) visible on mapping in relation to the Site



Designated Sites

Statutory Designations

- A search has been made to identify any nationally designated sites within a 2km radius of the Site, or internationally designated sites within a 10km radius. The results are shown in the below table.

Table 1 Statutory Designated Sites.

Site Name/ Distance from Site	Designation	Summary Interest
South Pennine Moors 1.2km W	Site of Special Scientific Interest (SSSI)	Largest area of unenclosed moorland within W Yorkshire and contains the most diverse extensive examples of upland plant communities in the county.
	Special Area of Conservation (SAC)	Qualifying habitats that are primary reselection include blanket bogs, European heaths and, old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles.
South Pennine Moors Phase 2 1.2km W	Special Protection Area (SPA)	Qualifying species include breeding populations merlin <i>Falco columbarius</i> and golden plover <i>Pluvialis apricaria</i> along with assemblage of characteristic moorland and moorland fringe species.
North Pennine Moors 5.5km S	SAC	Qualifying habitats that are primary reselection include blanket bogs, European dry heaths, <i>Juniperus communis</i> formations on heath or calcareous grasslands, petrifying springs or tufa formation (Cratoneurion), siliceous rocky slopes with chasmophytic vegetation, and sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles.
	SPA	Qualifying species include breeding populations merlin <i>Falco columbarius</i> , golden plover <i>Pluvialis apricaria</i> , hen harrier <i>Circus cyaneus</i> and peregrine <i>Falco peregrinus</i> .

- Quarrying of the Site may have potential to result in disturbance and negative indirect impacts on the qualifying species of the South Pennine

Moors – further bird survey and analysis of whether the site is functionally linked to the SPA will be required by the Local Planning Authority.

SSSI Impact Risk Zones (IRZs)

- The Site falls within the 2km impact risk zone for the South Pennine Moors SSSI. While development at the Site is likely to be classed as “Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction” and therefore meet criteria requiring the Local Planning Authority to consult Natural England in relation to potential impacts. The further bird surveys recommended will inform this process.

Non-Statutory Designations

- There are 6 Local Wildlife Sites in the search area. None of these are of potential relevance to the application:
- Direct and indirect impacts on these sites as a result of this development are unlikely due to the Site’s separation, distance and lack of functional links

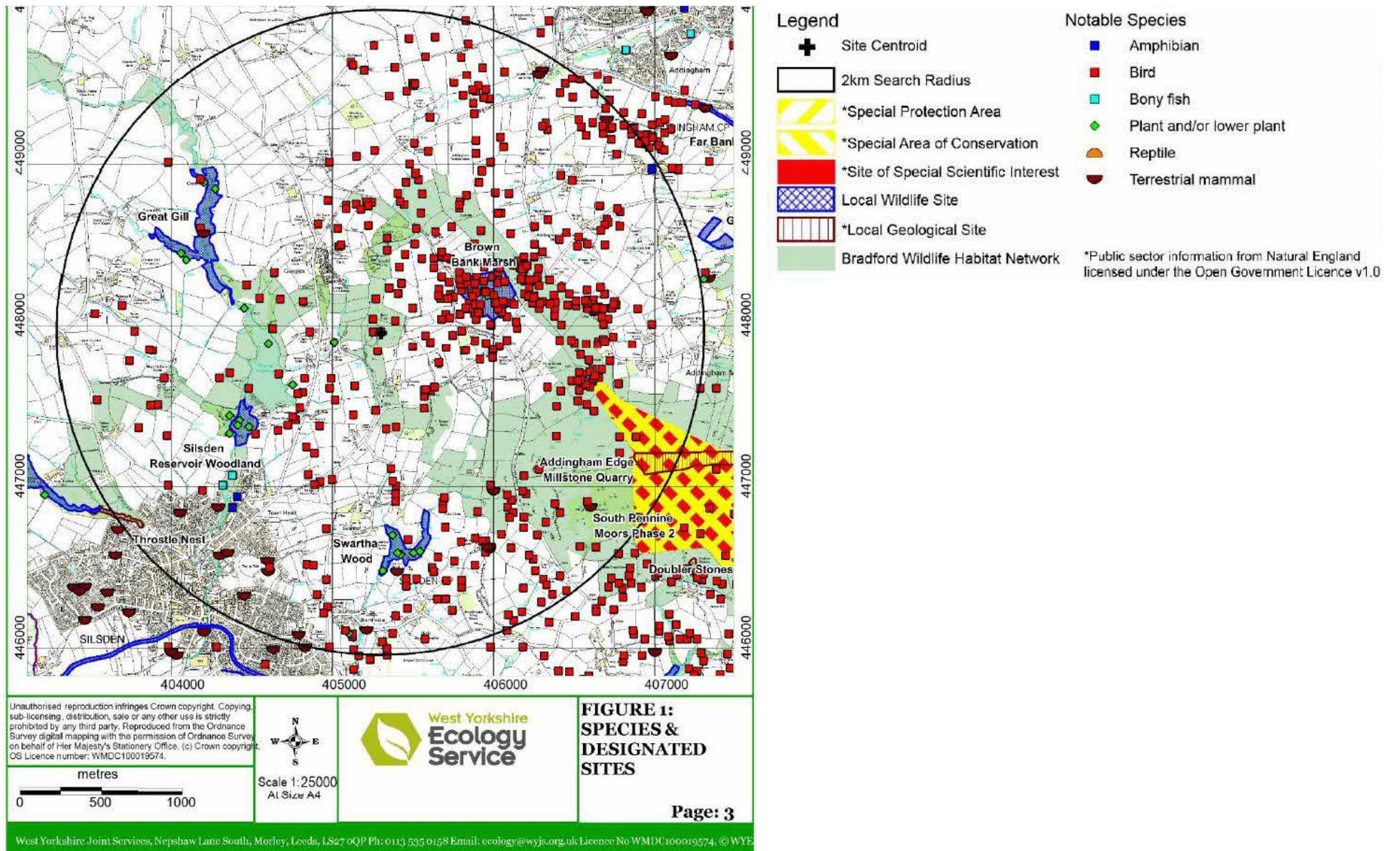
Bradford Wildlife Habitat Network (BWHN)

- The entirety of the Site falls within the BWHN. Measures will need to be in place to ensure the continued connective function of the network throughout the Site.

Granted EPSM Licenses

- There are no granted licenses that show up within 1km of the Site.

Figure 3 West Yorkshire Ecology: Species and Designated Sites



Survey

Method

20. The survey was carried out during March 2021¹ and followed the principles of Extended Phase 1 Habitat Survey methodology (JNCC, 2010).
21. The survey was carried out by Olivia Benson BSc (Hons) and Peter Brooks BSc (Hons), MA, MCIEEM, CEnv.

Limitations

22. Enough time was afforded the surveyor to carry out the survey. The survey was not constrained by poor weather.
23. Whilst the majority of the Site was accessible, at least 20% of the Site was inaccessible due to very dense vegetation, which could not be closely inspected. This could have concealed invasive species or protected species evidence.
24. The survey was undertaken outside the peak growing season for some species; the full extent of habitat composition may not be noted however the habitat type and condition can be reasonably identified.

¹ This Report has been prepared during March/April 2021 following a visit to the site in March 2021 and our findings are based on the conditions of the site that were reasonably visible and accessible at that

Habitat Appraisal

Habitats Identified

25. The Site's habitats are described in order on the following pages. In line with the requirement to provide information on **Biodiversity Net Gain (BNG)**, habitats are named in accordance with the UK Habitats classification system - we have used the relevant UK Habs guidance referenced at the back of the report in identifying habitats. Habitat descriptions are divided into the 'distinctiveness' categories used in the calculations - with more weight being afforded the more distinctive / important habitats.
26. Generally, the following apply to each tier of distinctiveness; although some authorities might highlight some lower distinctiveness habitats as having a higher importance locally. Where relevant we have highlighted these.

Very Low Distinctiveness Habitats

27. Habitats of little or no habitat value i.e., lacking any significant native vegetation, but could still provide supporting habitat for protected or notable fauna such as birds or bats. In the context of BNG - their areas are included in calculation, but mitigation or compensation is not required.

Low Distinctiveness Habitats

28. Habitats which are ubiquitous, often which have been created or modified by man. They tend to lack diversity of species and structure. They are unlikely to support notable flora but could still provide supporting habitat for protected or notable fauna. In the context of BNG they are included in calculations, but compensation / mitigation needs only to provide habitat of similar or higher distinctiveness.

Moderate Distinctiveness Habitats

29. Habitats which are common but provide a higher level of structural and species diversity, though unlikely to support more notable assemblages, species of interest could be present here and they are more likely to be important supporting habitat to fauna. In the context of BNG mitigation needs to provide habitat of the same broad habitat type, or that of higher distinctiveness.

date. We accept no liability for any areas that were not reasonably visible or accessible, nor for any subsequent alteration, variation or deviation from the site conditions which affect the conclusions set out in this report.

High Distinctiveness Habitats

30. These are habitats which are more natural and by definition contain more important assemblages of plants and potentially species which are rare in their own right. They will provide good supporting habitat for fauna. These habitats are likely to be targeted as conservation priorities and will be the subject of additional policy guidance or legislation. In the context of BNG whilst mitigation or compensation for loss or damage is possible, provision of more of the same type of habitat would be required – which (with a few exceptions) is likely to be difficult.

Very High Distinctiveness Habitats

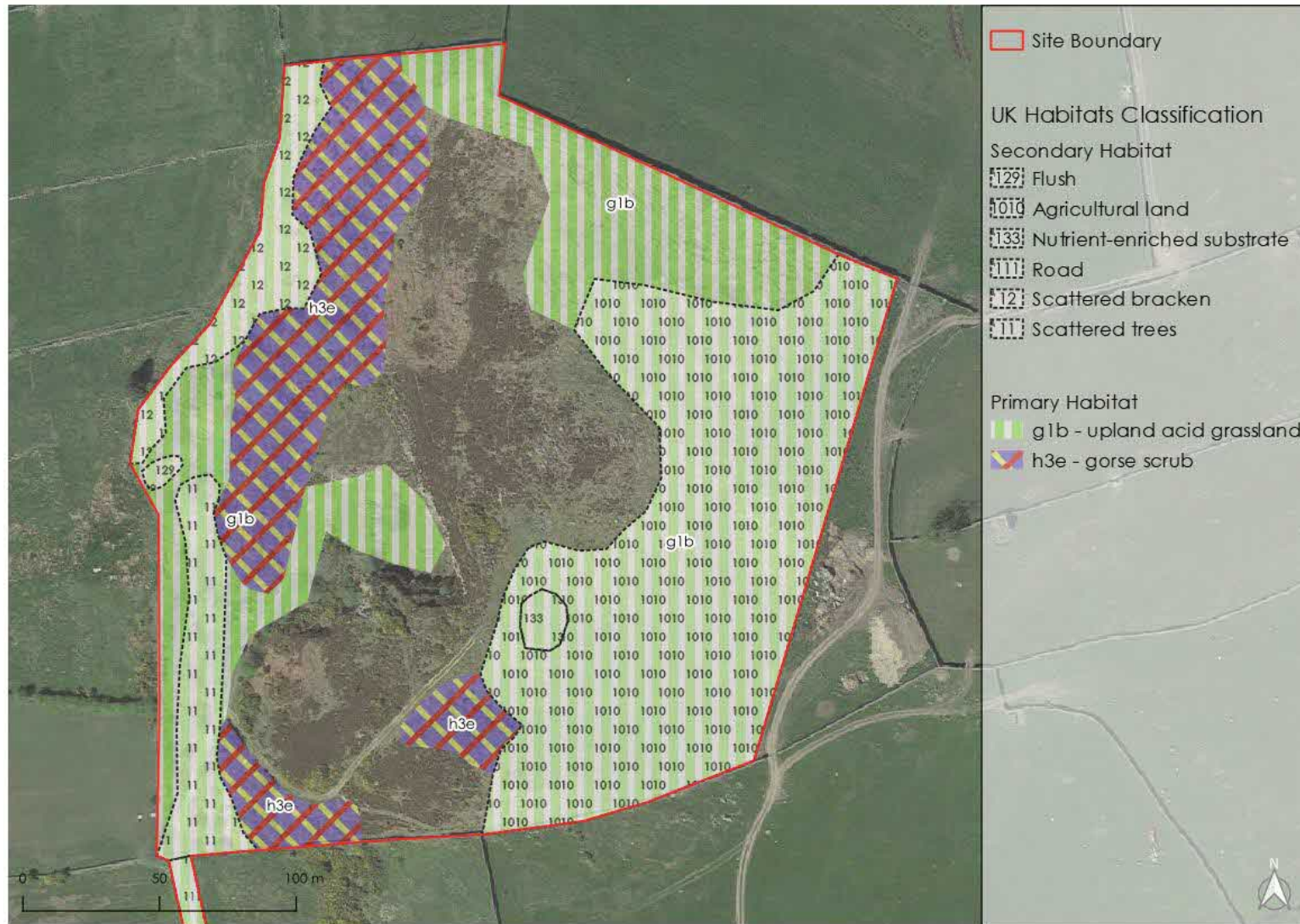
31. These are the UKs rarest / best habitats. They will be present in very particular locations and a range of rare or important plant and animal species will depend on the particular conditions they provide. These habitats will be the subject of restrictive policy guidance or legislation. Whilst the BNG metric does not preclude mitigation or compensation in respect of these habitats, creation of the same habitat type would be required and this would range between very difficult/expensive and impossible.
32. Each habitat is mapped and an area for each type is provided in the format of the DEFRA Biodiversity Metric 2.0 Calculation Tool. The areas can be used to quantify the impacts of development in an Ecological Impact Assessment if this is required by the Local Planning Authority.

Condition Assessment

33. Our condition assessment for each habitat described references where available the criteria set out in The Biodiversity Metric 2.0 auditing and accounting for biodiversity TECHNICAL SUPPLEMENT Beta Edition.
34. Habitats in the Very Low Distinctiveness tier do not require a condition assessment.
35. Habitats in the Low Distinctiveness tier tend to fall into the poor condition category by default. Where we feel this is not the case, we have explained our reasoning.
36. Habitats within the other higher tiers can fall into a range of conditions. We set out our reasoning based on the given criteria and guidelines.

Habitats of Moderate Distinctiveness

Figure 4 Approximate location and extent of habitats of moderate distinctiveness



Habitats of Moderate Distinctiveness

g1b Upland Acid Grassland

37. Grassland is found across the Site. Composition and condition vary throughout, although can be separated into two distinct parcels.
38. To the north and west, an acid grassland creates a broad mosaic with gorse scrub and heathland. Matgrass is locally dominant with wavy hair grass, and common bent found throughout the sward at varying cover levels along with frequent calcifuge associates like heath rush, field wood-rush, heath bedstraw and occasional mouse-ear hawkweed. Soft rush and heath rush are scattered throughout. Mosses *Rhytidiadelphus squarrosus* and *Dicranum scoparium* are locally abundant, with steep rocky areas to the south west where *Pleurozium schreberi* is dominant. Wood sage, willowherbs and soft shield fern are noted rarely here. To the northmost section where soils are damper, purple moor grass is frequent along with bilberry and ling.
39. Within the eastern parcel, some level of agricultural improvement has been undertaken, leading to a sward dominated by more palatable grasses—bents, fescues and Yorkshire fog are most abundant, with locally frequent perennial rye-grass over sowings. Forbs are occasional and associated with improvement; common mouse-ear, broad leaved dock, common sorrel and clover with small amounts of sheep's sorrel and heather indicating underlying acid influences. Bare ground is frequent and soft rush is locally abundant.

Secondary Codes

Code	Habitat	Description
129	Flush	Small flush at lower elevation to west of Site, lead off-Site. Marsh thistle, broad buckler fern and soft rush noted in association. Wet areas abundant with blinks.
1010	Agricultural land	Eastern parcel subject to agricultural improvement
133	Nutrient enriched substrate	To the south is the dumping of nutrient rich material leading to a proliferation of nettle, dock, ragwort, buttercup.
111	Road	Southern extent of red line plan used as an access road. Sward dominated by palatable grasses.
12	Scattered bracken	To north west Site extent, appears up to around 70% dominant.
11	Scattered trees	Line of scattered semi-mature trees/scrub including birch, rowan, ash, willow, hawthorn and dog rose.

Defra Metric Condition Assessment – *Moderate* to *Poor*

40. North/west parcel meets 3 criteria and fits within 'moderate' condition. South parcel meets two criteria and fits within 'poor' condition.

	Condition Assessment Criteria Grassland habitat type	Meets criteria?	
		N/W	S
1	Clearly and easily recognisable as a good example of this type of habitat.	No	No
2	Appearance and composition very closely matches the characteristics for the specific Priority Habitat	No	No
3	Wildflowers, sedges and indicator species for the specific Priority grassland habitat are very clearly and easily visible throughout the sward and occur at high densities in high frequency.	Yes	No
4	Undesirable species and physical damage is below 5% cover	Yes	No
5	Cover of bare ground greater than 10%	Yes	Yes
6	Cover of bracken less than 20% & cover of scrub and brambles less than 5%.	No	Yes

Figure 5 Looking SW from centre



Figure 6 Looking over eastern side



Figure 7 Scattered bracken



Figure 8 Scattered trees to west



Habitats of Moderate Distinctiveness

h3e Gorse Scrub

- 41. A band of dense gorse scrub runs through the west of the Site flanked by grassland or heathland. Small patches of these adjacent habitats are dotted throughout at low densities.
- 42. Gorse dominates and is mostly dense impenetrable scrub although scattered trees and scrub species are noted on occasion, including birch, hawthorn, and dog rose.

Defra Metric Condition Assessment Moderate

- 43. Fails all but 2 criteria.

	Condition Assessment Criteria: Scrub broad habitat type	Meets criteria?
1	There are at least three woody species, with no one more than 75% of the cover	No
2	There is a good age range – a mixture of seedlings, saplings, young shrub and mature shrubs	No
3	Pernicious weeds and invasive species make up less than 5% of the ground cover.	Yes
4	Well-developed edge with un-grazed tall herbs	No
5	There are many clearings and glades within the scrub.	Yes

Figure 9 Looking south over gorse



Figure 10 Dense gorse scrub



Habitats of High Distinctiveness

Figure 11 Approximate location and extent of habitats of high distinctiveness



Habitats of High Distinctiveness

h1b Upland heathland

- 44. Dry heathland runs through the centre of the Site and over the top of the quarry. Ling dominates, comprising over 60% of vegetation across the habitat with less frequent bilberry. Typical heathland mosses are threaded throughout with frequent *Hypnum cupressiforme/jutlandicum*, *Pleurozium schreberi*, and *Polytrichum juniperinum* characteristically. Lichens including *Cladonia sp.* and *Peltigera canina* are noted in places. Forbs are sparse to absent and limited to foxglove and those noted in the grassland habitat.
- 45. Small patches of acid grassland, bracken and gorse scrub punctuate throughout, along with scattered trees and shrub species. Species and composition are similar to habitats described above, with additional but very infrequent holly and bramble.

Defra Metric Condition Assessment *Moderate*

- 46. Fails three criteria.

	Condition Assessment Criteria: Upland heath broad habitat type	Meets criteria?
1	Cover of dwarf shrubs at least 50%	Yes
2	Range of heather age classes present	No
3	No signs of cutting or burning	Yes
4	No more than 30% heather shoots grazed	No
5	Cover undesirable species less than 5%	No
6	Cover of trees/shrubs less than 15%	Yes
7	Physical damage absent	Yes

Figure 12 Grazed area to right



Figure 13 Looking over the habitat



DEFRA Metric (Baseline)²

47. This metric sets out the baseline for the Site - proposals should seek to **Avoid** areas of higher value, **Mitigating** any loss on-Site through retention and enhancement, or habitat creation.

Horn Crag Quarry									
A-1 Site Habitat Baseline									
Condense / Show Columns		Condense / Show Rows							
Main Menu		Instructions							
Habitats and areas				Habitat distinctiveness	Habitat condition	Ecological connectivity	Strategic significance	Suggested action to address habitat losses	Ecological baseline
Ref	Broad Habitat	Habitat type	Area (hectares)	Distinctiveness	Condition	Ecological connectivity	Strategic significance	Suggested action to address habitat losses	Total habitat units
1	Grassland	Grassland - Upland acid grassland	1.836	Medium	Poor	Low	Within area formally identified in local strategy	Same broad habitat or a higher distinctiveness habitat required	8.45
2	Grassland	Grassland - Upland acid grassland	1.4482	Medium	Moderate	Low	Within area formally identified in local strategy	Same broad habitat or a higher distinctiveness habitat required	13.32
3	Heathland and shrub	Heathland and shrub - Gorse scrub	0.8983	Medium	Moderate	Low	Within area formally identified in local strategy	Same broad habitat or a higher distinctiveness habitat required	8.26
4	Heathland and shrub	Heathland and shrub - Upland Heathland	1.8701	High	Moderate	Medium	Within area formally identified in local strategy	Same habitat required	28.39
5									
6									
7									
8									
9									
Total site area ha			6.05					Total Site baseline	58.42

² Our report provides an estimate of the sites value in Biodiversity Units. This is based on thorough assessment at the time of survey and using the information available at this time. In this assessment we have used the latest version of DEFRA's Biodiversity Metric Tool, the UK Habitats Classification and relevant guidance. This assessment requires subjective judgments to be made in terms of habitat type and condition and could be open to other interpretations. Reliance on the Unit Score, or conversion of this into a monetary value, would be at the developer's own risk.

Faunal Appraisal

48. The following pages discuss only the groups and species that could be reasonably expected to be found on the type of habitats present on, or adjacent to, the site.

Amphibians

Desk evidence

49. There are two ponds within 500m of the Site; a pond connected to Fish Beck some 200m west, and ponds associated with the LWS Brown Bank Marsh some 500m east. No records have been returned within 1km, with only common frog recorded outside this area.
50. No records of great crested newt (GCN) have been returned.

Field Evidence

51. The flush on Site supported frogspawn at the time of survey.
52. Ponds associated with Brown Bank Marsh are likely to provide breeding habitat to amphibians.

Summary Evaluation

53. The flush and Site itself provide suitable habitat for frogs in low numbers. Breeding is likely to be irregular with failure in dry years.
54. Pond one is considered unlikely to support GCN due to its associated flow from Fish Beck. Lack of GCN records in the search area suggests their likely absence here particularly given the presence of a well recorded LWS and the wider absence of GCN in most of the Bradford District.

Further Surveys

55. Not recommended.

Figure 14 Ponds in relation to the Site.



Bats

Desk evidence

56. Records of pipistrelle and brown long-eared bats have been returned, mainly of roosts associated with the town. All records are over 1km from the Site, likely due to under-recording of this group.

Field Evidence

Potential Roost Sites

Structures: The quarry face provides vertical gaps that could be used for roosting.

Trees: The majority of trees appear to lack any gaps which would provide suitable roost features however roosting cannot be ruled out.

Foraging and Commuting Habitat

57. The Site's mosaic of moorland habitat provides moderate level foraging opportunities. There are no particular linear features noted on Site that may be valued for commuting.

Summary Evaluation

58. The Site provides potential roost features for bats along with suitable foraging habitat.

Further Surveys

59. Further surveys are recommended to determine the roosting status of the quarry face. Bat roost suitability assessment of any individual trees subject to works/removal would be recommended should these be affected, followed by climbed inspection should they support potential roost features.
60. Activity surveys are also recommended to characterise levels of foraging on Site by bats.

Birds

Desk Evidence

61. There are records of red listed species linnet and curlew from the former being records of pairs within the breeding season. Other red listed species within 500m include redshank, cuckoo and local BAP species lapwing.

Field Evidence

62. The Site provides a relatively undisturbed mosaic of heathland, grassland and scrub that are likely to provide suitable breeding habitat to a number of bird species.
63. A small number of bird species were noted during the survey including robin, chiff chaff and long tailed tit on-Site, with curlew and buzzard in close proximity.

Summary Evaluation

64. The Site provides breeding habitat for a number of species which should be determined through suitable survey.
65. Given its location within Zone B (<2.5km) of the SPA and records/field evidence of curlew, and its potential to be functionally linked to the SPA appropriate survey will be required to determine any effects of quarrying on the qualifying assemblage species. Disturbance to adjacent habitats where curlew have been observed will need to be taken into consideration.

Further Surveys and Recommendations

66. Breeding bird surveys and SPA assemblage foraging bird studies are recommended.
67. Standard precautions also apply in relation to pre-works clearance. Depending on the timing of works to the Site, pre-emptive measures may be worthwhile in limiting the potential of the Site to support nesting.

Reptiles

Desk evidence

72. There are no records of reptiles for the Site or search area. It is likely this group is under recorded in the wider area.

Field Evidence

73. Whilst no field evidence was found, the Site provides good potential habitat for common lizard, being a mosaic of heathland, grassland and gorse scrub with suitable shelter, basking and hibernation spots.

Summary Evaluation

74. An isolated population of common lizard cannot be ruled out due to ideal potential habitat. If present quarrying would lead to wildlife offences in the absence of mitigation.

Further Surveys

75. Further survey to determine reptile presence/likely absence is recommended.

Hedgehogs

Desk evidence

76. Hedgehogs are not recorded within the search area but are likely to be present.

Field Evidence

77. No evidence of hedgehogs was found on site.

Summary Evaluation

78. The Site provides suitable habitat for this species and measures to allow them to have access need to be planned for.

Further Surveys

79. Presence assumed no further surveys are considered necessary.

Brown hares

Desk evidence

80. Brown hares are recorded within the search area.

Field Evidence

81. A brown hare was noted during the Site walkover.

Summary Evaluation

82. The Site provides suitable habitat for this species but given the surrounding habitat, brown hares are not expected to be reliant on the Site.

Further Surveys

83. Presence assumed no further surveys are considered necessary.

Invasive Non-Native Species (INNS)

84. INNS are species listed on Schedule 9 of the Wildlife and Countryside Act (1981), for which it is an offence to cause or allow it to grow in the wild.
85. No species were noted³.

Survey constraints

86. This survey is highly constrained by the significant areas that were inaccessible due to the density of vegetation.
87. Although no INNS have been identified in this preliminary survey it is not always possible to conclude absence from preliminary survey alone due to factors such as season, accessibility, 3rd party attempts to hide evidence or undisclosed treatment programmes. For this reason, this report should not be relied upon as definitive evidence of absence of INNS.
88. This site presents a medium risk of supporting undetected INNS based on the following factors

Areas of site inaccessible to survey

Suboptimal survey season

Potential for recent earthworks or management which may have obscured viable material

Potential for tipping of material

³ Whilst our ecologists are trained in the identification of invasive species this report is not a dedicated invasive species survey. Detectability of invasive plant species can be affected by several factors, and conclusive determination status, or extent, is not possible through preliminary survey alone. As the

presence of invasive species can generate significant costs to development, the client may wish to instruct a dedicated invasive species survey prior to entering into contracts.

Ecological Constraints

Designations

89. The Site is within 2.5km of the SPA – disturbance should be taken into account particularly given the Site's proposals.
90. The Site currently sits within the Bradford Wildlife Habitat Network, the function of which should remain unaltered throughout and beyond development of the Site.

Habitat Value

91. The Site comprises a mix of medium and high distinctiveness habitats which have a high biodiversity score.
92. The upland heathland component is priority habitat which would normally need to be avoided and retained. However, this is not possible if the quarry is to be reopened. The DEFRA calculator does require that the same habitat is replaced. Measures to recreate heathland in the quarry restoration will be essential. A clear plan with dates of when heathland will be made and how it will be brought into appropriate condition will be needed.
93. It is highly unlikely that a net gain can be achieved but a high quality restoration may deliver a neutral score at best.

Faunal constraints

94. The Site should be subject to further survey to determine the presence or numbers of a range of protected or notable species; bats, badgers, reptiles, breeding birds and qualifying birds associated with the nearby SPA.

Ecological Opportunities

95. The key ecological opportunities here relate to the ultimate replacement of low value agriculturally managed grassland to the east of the Site with high value restored habitats on the theme of dry and wet acid grasslands and heathland.

Figure 15 Potential constraints associated with the Site's development



Conclusions and Recommendations

Planning considerations		
Recommendation	Rationale	When
R1 Additional Surveys	Badger Survey (camera monitoring) Bat Activity Surveys (Seasonal) Bat Emergence Surveys including BRSA (and climbed inspection if required) c removed SPA Bird Foraging Study Breeding Bird Surveys Reptiles	February-May optimal Spring, summer & autumn visit May onwards, BRSA/climbed inspection anytime April April-June April-September
R2 Produce a quarry development plan which minimises loss of biodiversity.	Engage with Constraints and Opportunities once fully identified involve your ecologist in design at an early stage. The proposals will need to consider the NPPF hierarchy of Avoid - Mitigate - Compensate in minimising any loss of biodiversity. The LPA is likely to be seeking at least a no-net-loss situation and could request that a contribution is made to address any residual loss he Site. Your layout may need to change to accommodate your findings from R1 surveys.	During the design process
R3 Biodiversity Net Gain Strategy (BNS)	Engage an ecologist to advise the quarry restoration plan to maximise available Biodiversity Units on site.	During the design process
R4 Landscape/ restoration Design	Make sure your landscape architect follows ecological advice or the BNS to maximise Biodiversity Units on site and make sure there are no design conflicts.	During the design process
R5 Ecological Impact Assessment (EcIA) to include Calculated Biodiversity Impact Score.	Summarises all survey findings and assesses the impacts of the scheme in respect of these. Uses DEFRA metric to quantify net gain/loss of biodiversity.	Prior to submission. After a fixed design is agreed and all key additional survey are completed.
R6 Produce a CEMP (Biodiversity)	To show how the quarry will be worked without affecting surrounding habitats and minimising risk of affecting protected or notable fauna. The CEMP will detail the following protection measures: Location of Biodiversity Protection zones or fences Dealing with known or discovered invasive species Pre- or during- clearance ecology checks for protected species. Protected/notable species method statements where licensing is not needed. Nesting bird management	Delivery report Suitable for planning condition.

Planning considerations		
Recommendation	Rationale	When
R7 Produce a Biodiversity Management Plan	To specify in detail how the restoration will deliver biodiversity on site and to show how habitat incorporated through the Biodiversity Net Gain Strategy be maintained in the condition that Biodiversity Calculations were based on.	Delivery report Suitable for planning condition.

Other considerations (managing legal or financial risks)		
Issue	Rationale	When
R8 Nesting bird management (if not produced and committed to in the CEMP)	As with most sites the standard precaution in relation to birds would apply: The proposed works impacting on nesting birds, any clearance of vegetation undertaken outside of the breeding bird season which is 1st March – 31st August inclusive. Any clearance required during the breeding bird season should be preceded by a nesting bird survey to ensure that the law is not contravened through the destruction of nests and that any nests are identified and adequately protected during the construction phase of the development.	Pre - and during -clearance

Outline Biodiversity Net Gain (BNG) Implications

139. The NPPF and most aligned local policies require that development achieves a 'no net loss' or unquantified 'net gain' situation for biodiversity. The forthcoming (2020/21) Environment Bill is likely to mandate a 10% net gain position and many LPA's have pre-empted this with revised policies and SPG's, some are providing a means of developers contributing to strategic off-site enhancement where BNG can't be secured on Site.
140. Pre-application discussions with the LPA should aim to identify their approach to BNG from an early stage.
141. Outline BNG Implications at this Site have been calculated below. This is based on *outline calculation from the assumption that half the Site will be cleared and used for quarrying purposes. Figures are provided for habitat area units only.
142. **This is not the final calculation** but provides what is hoped is a useful illustration to work forward from. Proposals will still be required to work within the NPPF's mitigation hierarchy of Avoid, Mitigate, Compensate and by doing so losses are likely to reduce. Similarly, high quality landscaping proposals and enhancement of retained habitats would also help to reduce any deficit.

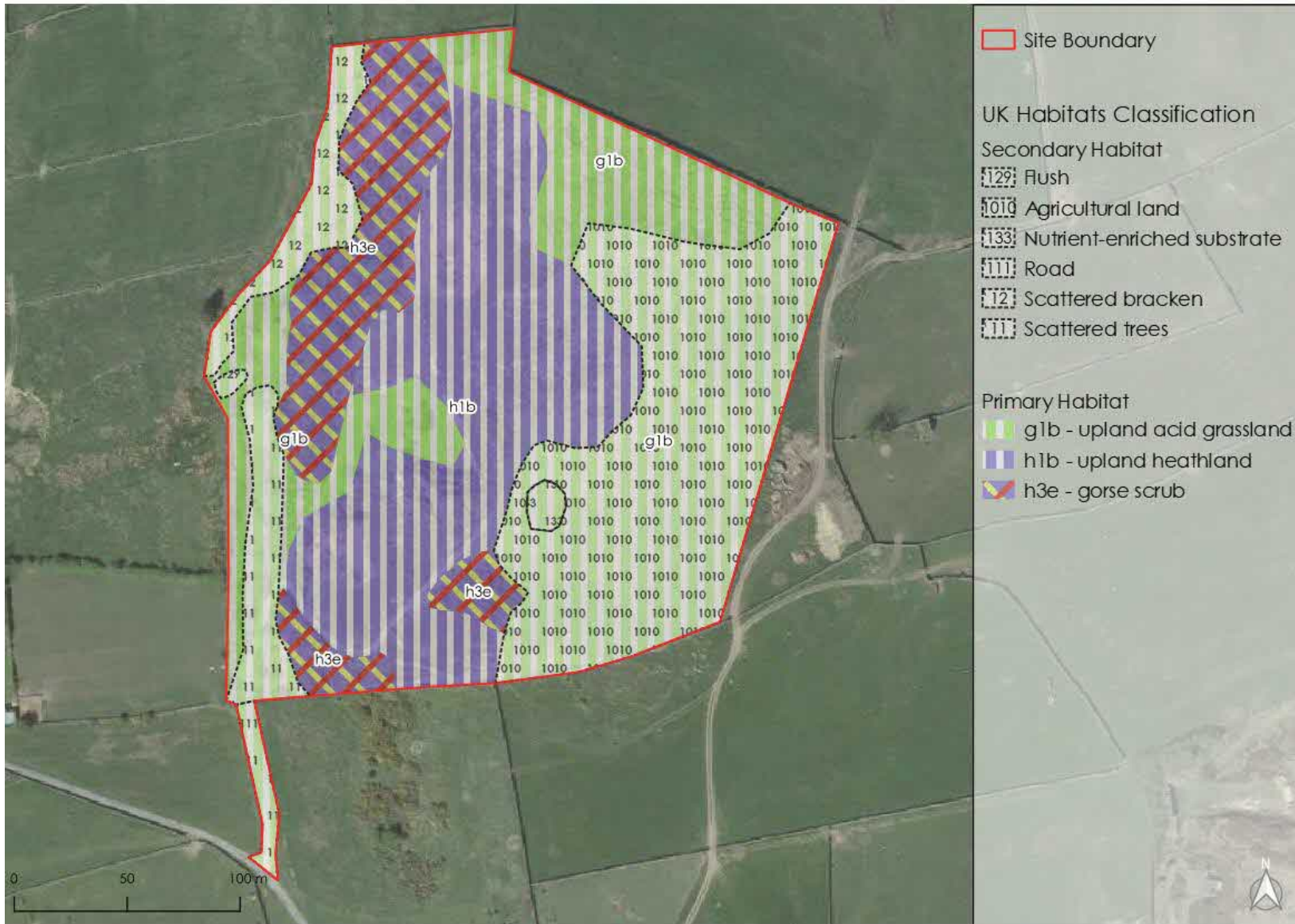
Pre-development Baseline Units	Post Development Units *	Units still required to achieve No Net Loss	Units still required to achieve 10% Gain
58.42	33.83	24.59	30.43

143. BNG is very much an evolving situation and the importance of pre-application discussions is again emphasised. For purely illustrative purposes if this project was in our home district of Leeds the 'backstop' position of achieving BNG through the LPA's contribution scheme would incur a cost of £20,000 /unit plus 20% facilitation and monitoring fees <https://www.leeds.gov.uk/planning/conservation-protection-and-heritage/achieving-net-gain-in-biodiversity-guidance-for-developers>

References

- Andrews H. L. (2011) *A habitat key for the assessment of potential bat roost features in trees.*
- Bat Conservation Trust (2016) *Bat Surveys For Professional Ecologists– Good Practice Guidelines*
- BSI (2013) British Standards Institute *BS:42020:2013 Biodiversity — Code of Practice for Planning and Development.*
- CIEEM (2017) *Guidelines for Preliminary Ecological Appraisal.*
- DEFRA (2019) The Biodiversity Metric 2.0 Auditing and Accounting for Biodiversity Technical Supplement, Beta Edition 29th July 2019
- English Nature (2004) *Bat Mitigation Guidelines* English Nature, Peterborough.
- English Nature (2001) *Great Crested Newt Mitigation Guidelines.* http://www.naturalengland.org.uk/Images/GreatCrestedNewts_tcm6-21705.pdf
- Fay N. (2007) *Defining and Surveying Veteran and Ancient Trees*<https://www.treeworks.co.uk/about-treework/publications>
- Gent T and Gibson S, 2003, *Herpetofauna Workers' Manual*, JNCC
- Hill et al. 2005, *Handbook of Biodiversity Methods* Cambridge
- JNCC (2004) *The Bat Workers Manual.* 3rd Edition.
- Ministry of Housing, Communities and Local Government (July 2018) *National Planning Policy Framework*
- Natural England (2019) The Biodiversity Metric 2.0 Auditing and Accounting For Biodiversity Technical Supplement, Beta Edition 29th July 2019
- Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). *Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus).* Herpetological Journal 10(4), 143-155.
- Ratcliffe, D.A. (1977) *A Nature Conservation Review*, Cambridge University Press
- UK Habs (2018) The UK Habitat Classification Habitat Definitions Version 1.0 UK Habitat Classification Working Group May 2018

Appendix 1 Habitats and Ecological Features



Appendix 2 List of species recorded

Ash	<i>Fraxinus excelsior</i>
Bilberry	<i>Vaccinium myrtillus</i>
Birch	<i>Betula sp.</i>
Bittercress	<i>Cardamine spp.</i>
Blinks	<i>Montia fontana</i>
Braeken	<i>Pteridium aquilinum</i>
Bramble	<i>Rubus fruticosus</i>
Broad buckler fern	<i>Dryopteris dilatata</i>
Clover	<i>Trifolium sp.</i>
Common bent	<i>Agrostis capillaris</i>
Common heather/ling	<i>Calluna vulgaris</i>
Common mouse-ear	<i>Cerastium fontanum</i>
Common ragwort	<i>Senecio jacobaea</i>
Common sorrel	<i>Rumex acetosa</i>
Creeping bent	<i>Agrostis stolonifera</i>
Creeping buttercup	<i>Ranunculus repens</i>
Dog lichen	<i>Peltigera sp.</i>
Dog rose	<i>Rosa canina</i>
Fescues	<i>Festuca spp.</i>
Field wood-rush	<i>Luzula campestris</i>
Foxglove	<i>Digitalis purpurea</i>
Gorse	<i>Ulex europaeus</i>
Hard fern	<i>Blechnum spicant</i>
Hawthorn	<i>Crataegus monogyna</i>
Heath bedstraw	<i>Galium saxatile</i>

Heath rush	<i>Juncus squarrosus</i>
Holly	<i>Ilex aquifolium</i>
Marsh thistle	<i>Cirsium palustre</i>
Matt grass	<i>Nardus stricta</i>
Mouse-ear hawkweed	<i>Pilosella officinarum</i>
Nettle	<i>Urtica dioica</i>
Perennial rye grass	<i>Lolium perenne</i>
Purple moor-grass	<i>Molinia caerulea</i>
Red fescue	<i>Festuca rubra agg.</i>
Rowan/mountain ash	<i>Sorbus aucuparia</i>
Sheep's sorrel	<i>Rumex acetosella</i>
Silver birch	<i>Betula pendula</i>
Soft rush	<i>Juncus effusus</i>
Soft shield fern	<i>Polystichum setiferum</i>
Wavy hair-grass	<i>Deschampsia flexuosa</i>
Willow	<i>Salix sp.</i>
Willowherb	<i>Epilobium sp.</i>
Wood sage	<i>Teucrium scorodonia</i>
Yorkshire fog	<i>Holcus lanatus</i>
	<i>Cladonia sp.</i>
	<i>Dicranum sp.</i>
	<i>Hypnum cupressiforme</i>
	<i>Hypnum jutlandicum</i>
	<i>Pleurozium schreberi</i>
	<i>Polytrichum juniperinum</i>
	<i>Rhytidiadelphus squarrosus</i>

Appendix 3 Explanatory Notes and Resources Used

Site Context

Aerial photographs published on commonly used websites were studied to place the site in its wider context and to look for ecological features that would not be evident on the ground during the walkover survey. This approach can be very useful in determining if a site is potentially a key part of a wider wildlife corridor or an important node of habitat in an otherwise ecologically poor landscape. It can also identify potentially important faunal habitat (in particular ponds) which could have a bearing on the ecology of the application site. Ponds may sometimes not be apparent on aerial photographs so we also refer to close detailed maps that identify all ponds issues and drains.

Designated Sites

A search of the MAGIC (Multi-Agency Geographic Information for the Countryside) website was undertaken. The MAGIC site is a Geographical Information System that contains all statutory (e.g. Sites of Special Scientific Interest [SSSI's]) as well as many non-statutory listed habitats (e.g. ancient woodlands and grassland inventory sites). It is a valuable tool when considering the relationship of a potential development site with nearby important habitats. In addition, information from the local record holders was referred to on locally designated sites.

Functional linkage with off-Site habitats

When assessing these we consider whether the Site could be functionally linked to them, considering links such as;

Hydrological links - is the Site upstream downstream, or could ground water issues affect it?

Physical links - is the site in close proximity and could it be directly or indirectly affected by construction and operational effects? Conversely it may be that despite proximity major barriers separate the two.

Recreational links - do footpaths and roads make it likely that increased recreational pressure could be felt?

Habitat links - is the site part of a network of similar habitat types in the wider area? These could be joined by linear corridors or could simply be 'stepping stones of habitat of similar form or function.

Method

Phase 1 habitat survey methodology (JNCC, 2010). This involves walking the site, mapping and describing different habitats (for example: woodland, grassland, scrub). The survey method was "Extended" in that evidence of fauna and faunal habitat was also recorded (for example droppings, tracks or specialist habitat such as ponds for breeding amphibians). This modified approach to the Phase 1 survey is in accordance with the approach recommended by the Guidelines for Baseline Ecological Assessment (IEA, 1995) and Guidelines for Preliminary Ecological Appraisal (CIEEM 2017).

Faunal Appraisal

This section first looks at the types of habitat found on Site or within the sphere of influence of potential development, then considers whether these could support protected, scarce or NERC Act 2006 Section 41 species (referred to collectively as 'notable species').

Records of notable species supplied from a 2km area of search by West Yorkshire Ecology are used to inform this appraisal.

We discuss further only notable species or groups which could be a potential constraint due to the presence of suitable habitat and their presence (or potential presence) in the wider area. We screen out and do not present accounts of notable species or groups which do not meet these criteria – in some cases it may be necessary to explain this reasoning.

Consideration is given to the Local Biodiversity Action Plan (LBAP), which for this site is the 'Bradford Biodiversity Action Plan.

Priority Species	Priority Habitats
Otter	Upland Oak Woodland
Water Vole	River Corridors
Pipistrelle	In Bye Pasture
Brown Hare	Hedgerows
Crayfish	
Grayling (fish)	
White Letter Hairstreak	
Green Hairstreak	
Blue Butterflies	
Twite	
Yellowhammer	
Lapwing	
Lesser Twayblade	
Marsh Fern	

Bats

Bat roosting potential is classified according to the following criteria set out below, taken from the Bat Conservation Trust Good Practice Guidelines (2016).

Bat Roosting Suitability of Buildings and Trees

Suitability	Criteria
<i>Negligible</i>	Negligible habitat features on site likely to be used by roosting bats.
<i>Low</i>	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions, and/or suitable surrounding habitat to be used on a regular basis or by a larger number of bats (i.e. unlikely suitable for maternity or hibernation). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.
<i>Moderate</i>	A structure or tree with one or more potential roost sites that could be used due to their size, shelter, protection, conditions, and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only - the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
<i>High</i>	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protections, conditions and surrounding habitats.

Evaluation

In evaluating the Site, the ecologist will take into account a number of factors in combination, such as;

- the baseline presented above,
- the site's position in the local landscape,
- its current management and
- its size, rarity or threats to its integrity.

There are a number of tools available to aid this consideration, including established frameworks such as Ratcliffe Criteria or concepts such as Favourable Conservation Status. Also of help is reference to Biodiversity Action Plans in the form of the Local BAP and Section 41 of the NERC Act (2006) to determine if the site supports any Priority habitats or presents any opportunities in this respect.

The assessment of impacts considers the generic development proposals from which potential effects include:

- Vegetation and habitat removal
- Direct effects on significant faunal groups or protected species
- Effects on adjacent habitats or species such as disturbance, pollution and severance
- Operation effects on wildlife such as noise and light disturbance

Appendix 4 Wildlife Legislation, Policy and Guidance

This is not an exhaustive list but sets out briefly the relevance of Legislation, Policy and Guidance in terms of planning applications and this assessment.

Legislation

Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (EC Habitats Directive).

Provides framework at an international (EU) level for the consideration / protection of European Protected Species (EPS), and habitats through the designation of sites.

Council Directive 79/409/EEC on the Conservation of wild birds (EC Birds Directive) and The Ramsar Convention on Wetlands of International Importance (1971)

Provides framework at an international (EU) level for the consideration / protection of important bird populations and the sites on which they are dependant.

The Conservation of Habitats and Species Regulations (2010)

This transposes 1) into UK law and provides the basis on which all EPS are protected and impacts on them can be licensed in the UK.

The Wildlife and Countryside Act (1981) as amended

This provides the basis on which UK species are legally protected or restricted and confers protection on Sites of Special Scientific Interest SSSIs. It contains annexes of plants and animals which are legally protected as well as those which are considered to be invasive or harmful. It provides the basis on which impacts on such species can be licensed in the UK and provides controls on work on or near SSSIs.

The Countryside and Rights of Way Act 2000 (CRoW)

Provides a statutory basis for nature conservation, strengthens the protection of SSSIs and UK protected species and requires the consideration of habitats and species listed on the UK and Local Biodiversity Action Plans (UKBAP / LBAP).

Natural Environment and Rural Communities Act 2006 (NERC)

Sets out the responsibilities of Local Authorities in conserving biodiversity. Section 41 of the Act requires the publishing of lists of habitats and species which are "of principal importance for the purpose of conserving biodiversity". At present these largely reflect those making up the UKBAP lists.

Hedgerows Regulations (1997)

Define and provide protection for Important Hedgerows.

Protection of Badgers Act (1992)

Protects badgers from persecution, this includes excavation / development in the proximity of setts.

Protected Sites

Statutory EU/ International Protected Sites

Special Areas of Conservation (SACs); and Special Protection Areas (SPAs) and Ramsar Sites contain examples of some of the most important natural ecosystems in Europe. Work on or near these sites is strictly protected and Local Authorities will be expected to carry out 'Appropriate Assessment' of development in proximity of them. In this case there is often an increased burden on the developer in relation to provision of information and assessment.

Statutory UK Protected Sites

Local Nature Reserves (LNRs); National Nature Reserves (NNRs); Sites of Special Scientific Interest (SSSIs) all receive strict protection under UK legislation. Work in or in proximity to these sites would be restricted with any needing to be agreed with Natural England. Natural England now provide guidance on the nature of development which could impact on SSSIs through Impact Risk Zones.

Locally Protected Sites

Local Authorities have a variety of protected wildlife sites designated at a local or regional level. These are gradually being brought under the banner of Local Wildlife Sites (LWS) but at present a plethora of different designations exist - all subject to local policy.

Protected Species

European Protected Species

A number of species (most relevantly bats, great crested newts [GCN], and otters) receive strict protection from killing, injury and disturbance under The Conservation of Habitats and Species Regulations (2010). Protection is also conferred on the habitats on which they rely such as roost space in the case of bats and ponds and fields etc. in the case of GCN.

UK Protected Species

A number of species (including bats, GCN, water vole and white clawed crayfish) are strictly protected under The Wildlife and Countryside Act (1981) as amended, from killing, injury, disturbance and damage or destruction of their resting places etc. Certain species (such as reptiles) and some birds (such as barn owl) receive partial protection e.g. at certain times of the year or from certain activities only. All nesting bird species are protected from damage or destruction of their nests - whilst active.

Invasive species

Schedule 9 of the Wildlife and Countryside Act (1981) as amended, lists these species and makes it an offence to cause or allow their spread in the wild. This often has impacts on development and planning in relation to the presence of invasive plant species such as: himalayan balsam (*Impatiens glandulifera*), japanese knotweed (*Fallopia japonica*) and giant hogweed (*Heracleum mantegazzianum*).

Planning Policy / Guidance

The National Planning Policy Framework (NPPF):

The National Planning Policy Framework was updated in February 2019. The most relevant paragraphs from the NPPF are set out below.

The approach to assessing the natural environment is now embedded within the definition of what 'sustainable development' is and this falls under one of three objectives of the planning system – the 'environmental objective' applying in this case. Paragraph 8c (P8c) of the NPPF states that sustainable development should “*contribute to protecting and enhancing our natural environment*” and “*help to improve biodiversity*”. P10 sets out the Framework’s presumption in favour of sustainable development.

Section 11 of the NPPF details making effective use of land. The Framework states that planning policies and decisions should “*take opportunities to achieve net environmental gains– such as developments that would enable new habitat creation*” and should “*recognise that some undeveloped land can perform functions for wildlife*” (P118).

Section 15 details conserving and enhancing the natural environment; policies and decisions should be “*protecting and enhancing sites of biodiversity value*”, “*recognise the intrinsic character and beauty of the countryside*” and contribute to conserving and enhancing the natural environment and reducing pollution (P170). Allocation of land for development should, “*prefer land of lesser environmental value, where consistent with other policies in this Framework and take a strategic approach to maintaining and enhancing networks of habitats*” (P171).

The Framework sets out ways to minimise the impacts on biodiversity through “*identifying, mapping and safeguarding components of local wildlife rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity*” and the “*conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and (the need to) identify and pursue opportunities for securing measurable net gains for biodiversity*” (P174).

It is made clear in P175 that local planning authorities should apply principles when determining planning applications. Planning permission should be refused “*if significant harm to biodiversity resulting in development cannot be avoided, adequately mitigated, or, as a last resort, compensated for*”. Development should not normally be permitted where an adverse effect on a SSSI is likely and “*opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity*”.

Biodiversity 2020: A Strategy for England’s Wildlife and Ecosystem Services.

This strategy builds on the Natural Environment White Paper (June 2011) - Setting out the current UK Government's approach to nature conservation. It promotes a more coherent and inclusive approach to conservation and the valuing in economic and social terms of economic resources.

The strategy promotes initiatives such as Biodiversity Offsetting, Nature Improvement Areas and a focus on well-connected natural networks and introduces the concept of securing a 'no net loss' situation with regard to UKBAP / Section 41 habitats and species.

ODPM circular 06/05 (2005) Biodiversity and Geological Conservation - Statutory Obligations and Their Impact Within the Planning System

Provides guidance to Local Authorities on their obligations to biodiversity – particularly in relation to assessing planning applications and ensuring the adequacy of information.

BSI (2013) British Standards Institute BS 42020:2013 Biodiversity — Code of Practice for Planning and Development.

Provides a standard for the biodiversity assessment and development industries and decision makers such as Local Planning Authorities to work to.