Harras Moor

ECOLOGICAL APPRAISAL

784-A090070-410 Rev 2

Homes England

September 2021

Prepared on Behalf of Tetra Tech Limited. Registered in England number: 01959704

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Document control

Document:	Ecological Appraisal
Project:	Harras Moor
Client:	Homes England
Job Number:	784_A090070-410
File Origin:	\\lds-dc-vm-002\Group Ecology\Projects\Projects A090000 on\A090070-410 Harras Moor\REPORTS\

Revision:		**Status:**	**Final**
Date:	20/09/2021		
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Description of revision: **Including HE comments**			

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EXECUTIVE SUMMARY

Contents	Summary
Site Location	The 'site' is located at Harras Moor in Whitehaven, Cumbria and is centred at Ordnance Survey National Grid Reference NX986180.
Proposals	The proposal includes 370 new homes with a mix of family homes, including a large proportion of larger executive homes.
Existing Site Information	Previous ecological reports completed by TEP in 2019 and 2018.
Scope of this Survey(s)	The scope of this survey was to record broad habitat types in accordance with the *Handbook for Phase 1 habitat survey*, *a technique for environmental audit* (JNCC, 2010). The scope of the survey also included desk review of the previous ecological reports completed by TEP; a search for evidence of notable and protected species; and to record the potential for habitats recorded to support notable and protected species. The information gathered during the survey was supported by information from the Cumbria Biodiversity Data Centre (CBDC) and MAGIC, to contextualise results.
Results	**Designated sites** The Solway Firth SPA is located 1.7 km west of the site and the River Ehen SAC is located 5.3 km south-east from site. St Bees SSSI is located 1.7 km south-west from site. Midgey Wood CWS is adjacent west to the site with A595 road separating this CWS from the proposed development site. Castle Park Woods CWS is located 50m away from the proposed development site. **Habitats** The site comprises broad-leaved plantation woodland, scattered trees, scrub, semi-improved grassland, marshy grassland, species-poor semi-improved grassland, swamp, tall ruderal, bracken and various boundary features including hedgerows and fences. **Protected and notable species** The site has habitat suitability for bats, badgers, breeding birds, red squirrel invertebrates, hedgehog and brown hare. Invasive montbretia, Himalayan balsam and rhododendron were recorded on site.
Recommendations	**Habitats and Designated Sites** Report to Inform HRA Screening (HRA Stage 1) is recommended to identify any likely significant effects upon European designated sites (Solway Firth SPA and River Ehen SAC) either alone or in combination with other plans or projects. The broad-leaved woodland and species-rich grassland habitats within site should be retained wherever possible. Midgey Wood CWS and Castle Park Woods CWS must be protected through woodland buffer planting.

	A Habitat and Landscape Management Plan (HLMP) and Biodiversity Net Gain Assessment is recommended to accompany the final detailed design layout for the site. This should include appropriate mitigation measures to off-set any habitat loss as a result of the development and provisions for biodiversity enhancement in line with Biodiversity Net Gain principal and the Copeland Borough Council Local Plan Policy DM25. The protection of on-site and adjacent habitats (including Midgey Wood ancient woodland and Midgey Gill CWS) during construction works should be addressed through the provision of a Construction Environmental Management Plan (CEMP). **Protected Species** It is recommended that an unlit buffer between woodlands and new housing infrastructure is maintained, and the retained woodland habitats are protected from light disturbance through implementation of a wildlife-friendly lighting scheme for both the construction and operational phases of the development. Any trees proposed for removal should be subject to a up-to-date Preliminary Roost Level Assessment prior to works. A pre-works badger survey should be undertaken on site at least three months prior to works. Any trees are proposed for removal, should be checked for squirrel dreys prior works. These checks should be conducted at least three months prior to works in order to allow for mitigation measures if red squirrel are discovered to be breeding on site. Nesting bird habitats should be retained wherever possible. Habitat / vegetation clearance should avoid the nesting period (March to September inclusive) or be immediately preceded (within 48 hours) by a nesting bird check by a suitably qualified ecologist. Provisions to compensate for the loss of suitable invertebrate habitats should be included in the HLMP. Invasive Species Method Statement should be produced and implemented to control and eradicate invasive plant species on site. Before clearance works commence, any areas covered by dense vegetation should be checked by ECoW for presence hedgehog and other species; it is also recommended that an ECoW delivers a Toolbox talk to site personnel regarding the best practice with regard to ecological issues in advance of working.

GLOSSARY

BAP	Biodiversity Action Plan
BCT	Bat Conservation Trust
BoCC	Bird(s) of Conservation Concern
BSI	British Standard Institute
BTO	British Trust for Ornithology
CBAP	Cumbria Biodiversity Action Plan
CBDC	Cumbria Biodiversity Data Centre
CIEEM	Chartered Institute of Ecology & Environmental Management
CRoW Act	Countryside and Rights of Way Act 2000
CWS	County Wildlife Site
DEFRA	Department for the Environment, Food and Rural Affairs
ECoW	Ecological Clark of Works
EPS	European Protected Species
EPSML	European Protected Species Mitigation Licence
HAP	Habitat Action Plan
Hedgerow Regulations	The Hedgerow Regulations 1997
HLMP	Habitat and Landscape Management Plan
HPI	Habitat(s) of Principal Importance
HRA	Habitats Regulations Assessment
ILP	Institute of Lighting Professionals
JNCC	Joint Nature Conservation Committee
LBAP	Local Biodiversity Action Plan
LNR	Local Nature Reserve
MCIEEM	Member of Chartered Institute of Ecology & Environmental Management
MCZ	Marine Conservation Zone
Natura 2000 site	A European site designated for its nature conservation value
NE	Natural England
NERC Act	Natural Environment and Rural Communities Act 2006
NNR	National Nature Reserve
PEA	Preliminary Ecological Appraisal
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SAP	Species Action Plan
SIS	Site of Invertebrate Significance
SPA	Special Protection Area
SPI	Species of Principal Importance
SSSI	Site(s) of Special Scientific Interest
TEP	The Environment Partnership
W&CA	Wildlife & Countryside Act 1981 (as amended)

1.0 INTRODUCTION

1.1 BACKGROUND

Tetra Tech was commissioned by Homes England in June 2021 to undertake an Ecological Appraisal of the site known as Harras Moor.

This report has been prepared by Senior Ecologist Patryk Gruba MCIEEM and the conditions pertinent to it are provided in Appendix A.

1.2 SITE LOCATION

The 'site' is located at Harras Moor in Whitehaven, Cumbria and is centred at Ordnance Survey National Grid Reference NX986180 – see Figure 1. The site is bounded by dwellings on Laurel Bank to the north, by Harras Road and Red Lonning Industrial Estate to the east, by dwellings and Midgey Wood to the south and dwellings along the A595 to the west and south-west.

It comprises broad-leaved plantation woodland, scattered trees, scrub, semi-improved grassland, marshy grassland, species-poor semi-improved grassland, swamp, tall ruderal, bracken and various boundary features including hedgerows and fences.

1.3 DEVELOPMENT PROPOSALS

The proposal includes up to 370 new homes with a mix of family homes, including a large proportion of larger executive homes. See Appendix B for the Draft Illustrative Masterplan (Dwg Nº: A090070-410 003) Rev: G.

1.4 PURPOSE OF THE REPORT

The purpose of this report is to complete:

- A desk study to obtain existing information on statutory and non-statutory sites of nature conservation interest and relevant records of protected/notable species within the site and its zone of influence;
- An extended Phase 1 Habitat Survey, involving a walkover of the site to record habitat types and dominant vegetation, including any invasive species, and a reconnaissance survey for evidence of protected fauna or habitats capable of supporting such species; and
- An assessment of the potential ecological receptors present on site, identify any constraints they pose to future development and (if possible) any recommendations for any further surveys, avoidance, mitigation or enhancement measures that are needed (as appropriate).

Note that scientific names are provided at the first mention of each species and common names (where appropriate) are then used throughout the rest of the report for ease of reading.

A summary of the key legislation is also provided in Appendix C.

2.0 METHODOLOGY

2.1 DESK STUDY

2.1.1 Previous Reports

The following reports were reviewed:

- TEP (2019), Harras Moor, Whitehaven. Ecological Assessment. 5060.Eco.Harras.003
- TEP (2018c), Harras Moor, Whitehaven. Winter Bird Survey Report. 5060.Eco.HarrasMoorEcoandArb.005.004.
- TEP (2018d), Harras Moor, Whitehaven, Woodland and Hedgerow Survey Report. 5060.Eco.HarrasMoor.008.
- TEP (2018b), Harras Moor, Whitehaven, Breeding Bird Survey. 5810.66.001
- TEP (2018a), Harras Moor, Whitehaven, Bat Appendix Report. 5810.66.002
- TEP (2018e), Harras Moor, Whitehaven, Vegetation Survey Technical Report. 5810.66.003
- TEP (2018f), Harras Moor, Whitehaven, Arboricultural Impact Assessment (Outline Planning). 5060.Eco.Harras.006.

2.1.2 Local Ecological Records Centre

Information was requested from the Cumbria Biodiversity Data Centre (CBDC) for information on any nature conservation designations and protected or notable species records within 2 km of the site. Only records post year 2000 were considered in this report.

The data search covered:

- Statutory designated sites for nature conservation, namely Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR);
- Non-statutory designated sites for nature conservation, namely County Wildlife Sites (CWS)
- Legally protected species, such as great crested newts *Triturus cristatus*, badger *Meles meles* and bats;
- Notable habitats and species, such as those listed as Habitats or Species of Principal Importance (HPIs or SPIs); and
- Priority habitats or species within the Cumbria LBAP.

The data search did not cover:

- Tree Preservation Orders (TPOs); or
- Conservation Areas designated for their special architectural and historic interest.

Note that relevant extracts from the desk study is provided in Appendix D.

A search for relevant information within the site and surrounding 2 km was made on MAGIC www.magic.gov.uk - DEFRA's interactive, web-based database for statutory designations and information on any European Protected Species Mitigation Licences EPSML applications that have been granted in the local area since 2000.

2.2 FIELD SURVEYS

The following methodologies have been used to identify the ecological receptors present on or near the site, which are relevant to the proposed development.

2.2.1 Habitats

An extended Phase 1 habitat survey was undertaken on the site on 7th July 2021 by Tetra Tech Senior Ecologist Patryk Gruba MCIEEM and Tetra Tech Assistant Ecologist Elizebeth Wilcox with an additional site visit conducted by Elizebeth Wilcox on the 15th July 2021. The weather conditions during both survey visits in July were clear with an air temperature ranging between 19 and 24°C, clear sky, no wind and no precipitation.

The vegetation and broad habitat types within the site were noted during the survey in accordance with the categories specified for a Phase 1 Habitat Survey (JNCC, 2010). Dominant plant species were recorded for each habitat present using nomenclature according to New Flora of the British Isles (Stace, 2019). The site was also appraised for its suitability to support notable flora, with regard to the *Guidelines for Preliminary Ecological Appraisal* (CIEEM, 2017).

2.2.2 Protected & Notable Species

The site was inspected for evidence of, and its potential to support, protected or notable species, especially those listed under the Schedule 2 of the Habitat Regulations, Schedule 5 of the W&CA, the CRoW Act, those given extra protection under the NERC Act, and species included in the Cumbria LBAP.

Great Crested Newt

The site was appraised for its suitability to support GCN. The assessment was based on Guidance outlined in the *Herpetofauna Workers' Manual* (Gent & Gibson, 2003) and the *Great Crested Newt Conservation Handbook* (Langton, Becket & Foster, 2001).

Bats

Roosting Bats – Structures / Trees

Any suitable buildings, structures or trees on site were assessed from the ground for their suitability to support breeding, resting and hibernating bats using survey methods based on the BCT *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins, 2016) – hereafter referred to as the 'BCT Guidelines'. The categories used to classify the bat roost suitability of any features found, are explained in Table 1 below.

Table 1 Categories of Bat Roost Suitability (BCT Guidelines)

Suitability	Typical Roosting Features
Negligible	Negligible habitat feature on site likely to be used by roosting bats.
Low	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 larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain potential roost features but with none seen from the ground or features seen with only very limited roosting potential.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the

Suitability	Typical Roosting Features
	assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
High	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 & potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

Foraging/commuting Bats

The BCT Guidelines use the criteria in Table 2 below to categorise the potential value of habitats and features for use by foraging and commuting bats and these have been used to characterise the value of this site.

Table 2 Categories of Habitat Suitability (BCT Guidelines)

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

Reptiles

The site was appraised for its suitability to support reptiles. The assessment was based on guidance outlined in the Herpetofauna Workers' Manual (Gent & Gibson, 2003).

Badger

The site was surveyed for evidence of badger setts or other badger activity such as paths, latrines or signs of foraging. Methodologies used and any setts recorded were classified according to published criteria (Harris, Cresswell & Jefferies, 1989).

Other Species

The site was also appraised for its suitability to support other protected or notable fauna including mammals (such as red squirrel), amphibians, birds and invertebrates with regard to the Guidelines for Preliminary Ecological Appraisal (CIEEM, 2017) and *BS42020:2013 Biodiversity – Code of Practice for Planning and Development* (BSI, 2013). Evidence of any current or historical presence of such species was recorded.

Invasive Species

The site was searched for evidence of invasive plant species, such as Japanese *knotweed Reynoutria japonica* (formerly *Fallopia japonica*), Indian (Himalayan) balsam *Impatiens glandulifera*, giant hogweed *Heracleum mantegazzianum*, wall cotoneaster *Cotoneaster horizontalis* and rhododendron *Rhododendron ponticum*. A full list of all invasive plant species is provided in Appendix C.

2.3 LIMITATIONS

The optimal period to undertake an extended Phase 1 habitat survey is April-September. The survey was completed in July which inside the optimal survey window. As such this is not considered to be a limitation to the accurate assessment of the habitats as the dominant species of the respective vegetation types were visible and identifiable.

To determine presence or likely absence of protected species usually requires multiple visits at suitable times of the year. As a result, this survey focuses on assessing the potential of the site to support species of note, which are considered to be of principal importance for the conservation of biodiversity with reference to those given protection under UK or European wildlife legislation. This report cannot therefore be considered a comprehensive assessment of the ecological interest of the site. However, it does provide an assessment of the ecological interest present on the day the site was visited and highlights areas where further survey work may be recommended.

The details of this report will remain valid for a **18 months** from the date of the survey, after which the validity of this assessment should be reviewed to determine whether further updates are necessary. Note that the recommendations within this report should be reviewed (and reassessed if necessary) should there be any changes to the red line boundary or development proposals which this report was based on.

3.0 BASELINE CONDITIONS

3.1 DESIGNATED SITES

The following designated sites of ecological importance have been identified within 2 km of the site.

Table 3 Designated Sites Within 2 km

Designation	Site Name	Distance & Direction	Summary of features
Statutory Designated Sites			
SSSI	St Bees Head	1.7 km SW	The SSSI comprises an 8 km stretch of coast between St Bees and Whitehaven and encompasses the sheer cliff face, an area of cliff-top grassland and the shore down to the mean low-water mark. There are a number of habitats represented including natural cliff-top grassland and heath, sheer cliff face and cliff-fall rubble, shingle and wave-cut platform. The cliffs provide the only breeding site on the coast of Cumbria for a number of seabirds including over 2,000 pairs of guillemots *Uria aalge* and lesser numbers of fulmar *Fulmarus glacialis*, kittiwake *Rissa tridactyla,* razorbill *Alca torda,* cormorant *Phalacrocorax carbo*, puffin *Fratercula arctica*, shag *Phalacrocorax aristotelis* and herring gull *Larus argentatus.* The cliffs are the only site on the entire coast of England for black guillemots *Cepphus grylle.* Other birds that use the site for breeding include tawny owl *Strix aluco,* sparrowhawk *Accipiter nisus*, peregrine *Falco peregrinus,* raven *Corvus corax* and rock pipit *Anthus petrosus.* There is geological interest in the form of sedimentary cliffs, Sandstone formations and Permian rock sequences.
SPA	Solway Firth	1.8 km W	Assemblage qualification: A large estuarine / marine site (1,393.39 km^2) of international importance that includes existing Upper Solway Flats and Marshes SPA. The area qualifies under Article 4.2 of the Directive (79/409/EEC) by **regularly supporting at least 20,000 waterfowl**. This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of **over-wintering** species listed on Annex I of the Directive including red throated diver *Gavia stellate*, bar-tailed godwit *Limosa lapponica*, barnacle goose *Branta leucopsis*, golden plover *Pluvialis apricaria* and whooper swan *Cygnus Cygnus*.

Designation	Site Name	Distance & Direction	Summary of features
			This site also qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the **migratory** species including but not limited to pink footed goose *Anser brachyrhynchus*, shelduck *Tadorna tadorna*, teal *Anas crecca*, pintail *Anas acuta*, shoveler *Anas clypeata*, scaup *Aythya marila*, common scoter *Melanitta nigra*, goldeneye *Bucephala clangula*, goosander *Mergus merganse*r, oystercatcher *Haematopus ostralegus*, knot *Calidris canutus*, ringed plover *Charadrius hiaticula*, grey plover *Pluvialis squatarola*, lapwing *Vanellus vanellus*, dunlin *Calidris alpine*, sanderling *Calidris alba*, redshank *Tringa tetanus*, turnstone *Arenaria interpres*, curlew *Numenius arquata*, and cormorant *Phalacrocorax carbo*.
MCZ	Cumbria Coast – Zone 1 and 2	1.8 km SW	This comprises an 18 km^2 area and is designated for the following habitat types: high energy intertidal rock, intertidal sand and muddy sand, intertidal biogenic reefs, moderate energy and infralittoral rock, intertidal underboulder communities, peat and clay exposures and Honeycomb worm (*Sabellaria alveolata*) reefs. This was designated in 2013.
Non-Statutory Designated Sites[1]			
CWS	Midgey Gill	Adjacent SW to site (separated by the A595 road)	Local County Wildlife Site
CWS	Castle Park Wood	50 m W	Local County Wildlife Site
SIS	Priestgill Wood	650 m E	Local Site of Invertebrate Significance
CWS	Hope Mission Pond	650 m NE	Local County Wildlife Site
SIS	River Keekle	1.2 km E	Local Site of Invertebrate Significance
CWS	Redness Point	1.5 km NW	Local County Wildlife Site
CWS	Woodhouse Quarry	1.5 km SW	Local County Wildlife Site
SIS	Weddicar Hall	1.5 km E	Local Site of Invertebrate Significance
CWS	Bonnywood	1.65 km NE	Local County Wildlife Site

[1] No citation available for the Non-Statutory Designated Sites

In addition to the above designations, the nearest SAC site is River Ehen SAC and SSSI – 5.3 km SE from site.

3.2 HABITATS

3.2.1 HPI Habitats

The following HPI were identified as occurring on or adjacent to the site, using MAGIC:

Onsite

- Deciduous woodland (Priority Habitat Inventory and National Forest Inventory) present at TN30 (Figure 2).

Adjacent (south of the most western boundary)

- Deciduous woodland (Priority Habitat Inventory and National Forest Inventory).
- Midgey Wood - Ancient woodland (Priority Habitat Inventory and National Forest Inventory).

The following habitats have been identified through our assessment, with detailed Target Notes (TN) included in Appendix E, as appropriate, with locations shown on Figure 2:

3.2.2 Broad-leaved Plantation Woodland

Broad-leaved woodland plantation occurred on the western boundary (Figure 2; TN3), with two sections of woodland connecting the eastern and western boundaries (Figure 2; TN20, TN43), and two section east of Red Lonning Industrial Estate (Figure 2; TN35, TN39), with a 0.6 ha section adjacent south to the industrial estate (identified as deciduous woodland on MAGIC, Figure 2; TN30).

The woodlands were between 9 – 12m tall, with even aged canopies, comprised of up to nine broadleaved species and with less than 10% conifers (pine Pinus sp.). The shrub layer was up to 2m and included hawthorn *Crataegus monogyna* and bramble *Rubus fruticosus* agg. The majority of the woodlands were dense, with bare ground and a limited ground flora. In localised areas the canopy was more open, with a grass-dominated ground flora containing false oat-grass *Arrhenatherum elatius* creeping soft-grass *Holcus mollis* and hogweed *Heracleum sphondylium* was present.

Please note that all the woodlands on site have been assessed as broad-leaved plantation woodland. The previous Ecological Assessment report (TEP, 2019) assessed some of the woodlands as mixed plantation woodland, however the percentage presence of coniferous species present is deemed below the threshold (10%) for mixed plantation woodland, as defined in the Phase 1 Habitat Survey Handbook (JNCC, 2016).

3.2.3 Scrub

Areas of both scattered (Figure 2; TN7 and TN28) and dense/continuous scrub (Figure 2; TN10, TN18, TN19, TN27 and TN49), occurred onsite.

Scrub generally contained abundant bramble, blackthorn *Prunus spinosa* or willow *Salix sp*., and often occurred with tall ruderal vegetation or Bracken *Pteridium aquilinum*. Areas of scrub that differed from this included scattered sea buckthorn *Hippophae rhamnoides* at (Figure 2; TN 49) and species-rich scrub at (Figure 2; TN19), which contained Wild cherry *Prunus avium,* Goat willow *Salix caprea,* Elder *Sambucus nigra* and Whitebeam *Sorbus sp.*

3.2.4 Scattered trees

A line of young alder *Alnus* sp. were present within the horse grazed semi-improved neutral grassland (Figure 2; TN6).

3.2.5 Hedgerows

A total of three hedgerows were recorded on site (Figure 2; TN37, TN45 and TN47). These were all overgrown, defunct, species-poor hedgerows primarily comprised of hawthorn, with rowan *Sorbus aucuparia* also present within the hedgerow at (Figure 2; TN45).

3.2.6 Semi-improved Neutral Grassland

Stands of semi-improved neutral grassland were recorded throughout the site. These comprised areas including a horse-grazed field in the south of the site (Figure 2; TN4), ungrazed margins between and adjacent to grazed fields (Figure 2; TN2, TN13, TN22, TN41), a disused football pitch in the east of the site (Figure 2; TN33), in the north-eastern field adjacent to Harras Road (Figure 2; TN46) and in the northern field leading down to Loop Road (Figure 2; TN54). There was also a small area (Figure 2; TN8), present between a poor semi-improved horse grazed field and the woodland on the western boundary of the site.

These grasslands appeared unmanaged and were grass-dominated. The species present varied but most contained Yorkshire-fog *Holcus lanatus*, common couch *Elymus repens*, creeping bent *Agrostis stolonifera*, Timothy *Phleum pratense* and meadow foxtail *Alopecurus pratensis*. Common herbs such as silverweed Potentilla anserina and common mouse-ear Cerastium fontanum occurred, with more ruderal species such as creeping thistle *Cirsium arvense* and hogweed *Heracleum sphondylium* locally abundant in places.

3.2.7 Marshy Grassland

Marshy grassland was noted within the areas on site where impeded drainage occurred. The main areas were in the far south of the site (Figure 2; TN1), adjacent to the woodland on the western boundary (Figure 2; TN12), adjacent to housing on the southern boundary (Figure 2; TN23) and within fields north-west of the site (Figure 2; TN32, TN38, TN44, TN52, TN55, TN58).

This marshy grassland stands recorded on site were tussocky and dense and were characterised by soft rush *Juncus effusus* and Tufted hair-grass *Deschampsia cespitosa* with occasional herbs such as Marsh bird's-foot trefoil *Lotus pedunculatus* and Wild angelica *Angelica sylvestris.*

3.2.8 Poor Semi-Improved Grassland

Poor semi-improved grassland was recorded throughout the site the site (Figure 2; TN4, TN9, TN15, TN21, TN40, TN42 and TN51). Several fields within the site were grazed by horses at the time of the survey; there was also evidence of previous sheep grazing.

3.2.9 Bracken

Stands of continuous bracken were present alongside Caldbeck Road, (Figure 2; TN17 and TN18).

3.2.10 Tall Ruderal

Tall ruderal vegetation was present on the southern edge of the former football field (Figure 2; TN34) and within one of the fields in the northern section of the site (Figure 2; TN53). Creeping thistle and Yorkshire-fog were the dominant species.

3.2.11 Swamp

Small areas of swamp were present within larger areas of marshy grassland (Figure 2; TN1 and TN23). These were characterised by species such as reed canary-grass *Phalaris arundinacea,* yellow iris *Iris pseudacorus* and Hoary willowherb *Epilobium parviflorum.*

3.2.12 Other Habitats

Dry ditches were present within the grassland parcel alongside the western boundary woodland (Figure 2; TN11, TN14) and west of Caldbeck Road.

A stable shed was present within the horse pasture (TN16).

3.3 PROTECTED & NOTABLE SPECIES

3.3.1 Great Crested Newt

The desk study returned no records for GCN within 2 km of the site. Furthermore, MAGIC returned no records for GCN EPSMLs within 2 km radius from site.

No ponds / suitable waterbodies were observed within the survey area and therefore there is no suitable breeding habitat for GCN within the potential works area. The previous Ecological Assessment for the site (TEP, 2019) noted ephemeral pools during the previous site survey but these were not recorded during the current walkover survey (2021).

There are five ponds within 250m from the proposed development site; these ponds are associated with the Whitehaven golf course. The previous Ecological Assessment (TEP; 2019) has concluded that these ponds have moderate connectivity to the site with majority of them being recent features that are unlikely to support GCN. The previous desk study has also revealed that GCN were absent from the ephemeral water body located in the field north of the Harras Road (approximately 100m north from site) which was subject to the presence / absence and eDNA survey in 2016 (Copeland Borough Council Planning Reference and 4/16/2415/0O1). Subsequently the 2019 Ecological Assessment Report (TEP, 2019) concluded that GCN is not considered to be concern for the development.

Based on the 2021 walkover survey, it is considered that that there are no substantial changes to the ecological baseline in relation to the suitability of the site for GCN and likelihood of this species being present on site. **Therefore, it is considered that GCN are unlikely to be present on site and are not considered a constraint to the proposed development.**

3.3.2 Bats

The desk study returned four records for bat species within 2 km of the site which included records for common pipistrelle *Pipistrellus pipistrellus,* Pipistrelle species *Pipistrellus sp.* and unidentified bat species. These included two records for bat roosts (both maternity roosts) with the first record including 98 count of common pipistrelle in the now demolished Smurfit Kappa factory and the second record including unknown numbers within the maternity roost for the unidentified bat species recorded in the Brandsty area in Whitehaven, approx 1.2 km from site. MAGIC returned no records for bat related EPSMLs within 2 km radius from site.

The horse shelter structures / buildings on site (Figure 2; TN16) were considered to provide negligible suitability for roosting bats. The previous Ecological Assessment (TEP; 2019) has concluded that no trees on site were considered to have value for roosting bats; these included trees to be removed to facilitate the proposed road crossing points.

Detailed updated bat assessment of the trees on site was not commissioned and therefore, not conducted during the 2021 walkover survey. **Based primarily on the previous assessment conducted by TEP (2019), roosting bats are considered unlikely to be a constraint for the proposed development. However, further survey of the trees proposed for removal may be**

required since the original assessment was conducted in 2019 and trees can develop new roosting features over a course of time

The bat activity surveys conducted by TEP in 2018 (Bat Appendix Report, 2018a) revealed that the site is used for commuting and foraging by several species of bat including common pipistrelle, soprano pipistrelle *Pipistrellus pygmaeus*, brown-long eared *Plecotus auritus*, noctule *Nyctalus noctula* and unidentified myotis species *Myotis sp;* the majority of the bat activity recorded in 2018 was distributed along woodland edges and it was assessed that this habitat is of importance to local bat populations. Subsequently, it was concluded that overall the site is considered to be of local importance to bats. **Therefore, based primarily on the previous assessment conducted by TEP (2018), commuting and foraging bats my pose a constraint for the proposed development – see section 5.**

3.3.3 Reptiles

The desk study returned 29 records for reptiles within 2 km radius from site; these included 20 records for common lizard *Zootoca vivipara* and 20 records for slow worm *Anguis fragilis*; all of the records provided by the CBDC were associated with the land adjacent to the Corkickle station (750 m southwest of the site) and the section of shore north of Whitehaven marina (1.5 km north-west from site).

The mosaic of scrub, grassland and woodland habitats on site is considered to be suitable to support local reptile populations such as common lizard *Zootoca vivipara* or slow worm. However, the reptile survey conducted by TEP in 2018 did not confirm presence of reptile populations on site. Furthermore, the site appears to be fragmented from the known reptile populations by residential estates and roads; therefore, it is considered unlikely that reptile populations would have colonised the site since the previous survey was conducted in 2018.

Based on the current walkover survey and assessment, is considered that that there are no substantial changes to the ecological baseline in relation to likelihood of reptile species being present on site. **Therefore, it is considered that reptiles are unlikely to be present on site and are not considered a constraint to the proposed development.**

3.3.4 Badger

The desk study returned no records for badger within a 2 km radius from site. The previous ecological surveys conducted by TEP (2019) found no evidence of badger on site.

The habitats on site including woodland and scrub appeared to be of suitability for badgers; however, there were no badger setts or other signs of badgers recorded within the site boundary or within a 50 m buffer radius from site (wherever access allowed).

It is considered that badgers are currently absent from site; however, the habitats on and adjacent to site provide good opportunities for sett building, foraging and connectivity features.

Badgers may pose a constraint to proposed works on site – see section 5.3.3

3.3.5 Otter & Water Vole

The desk study returned five records for otter within a 2 km radius from site. All of these were associated with the Whitehaven Harbour and Marina with the nearest record located approximately 850 m north-west from site. The previous ecological survey conducted by TEP on site (2019) found no evidence of otter on site or within Midgey Wood CWS adjacent west to site.

There are no freshwater features on site and therefore the site is considered to provide negligible suitability for foraging, commuting, resting and breeding otter. Therefore, **it is considered that the site is unlikely to be of value to local otter population and otter is not considered to be a constraint to the proposed development.**

The desk study returned no records for water vole within 2 km radius from site. The site did not provide suitable habitat which is typically required for water voles with no water features (wet ditches, streams or rivers) noted on site. The dry ditches within marshy grassland (Figure 2; TN11, TN14 and TN17) on site did not contain water and did not connect to any other suitable water vole features.

No signs of water voles were discovered on site during the walk over surveys conducted by Tetra Tech on the 7th or 15th of July 2021.

The previous Ecological Assessment (TEP, 2019) reported that field signs of water vole were observed during the surveys conducted in 2018 and 2017; these included feeding remains, droppings, burrows and one incidental sighting of a water vole. The above field evidence was potentially attributed to the fossorial population that may be present on site. Subsequently, the droppings were sent for the eDNA analysis that returned inconclusive results; furthermore, targeted further water vole surveys conducted by TEP in 2018 also did not find any conclusive evidence of this species on site.

The water vole has very limited distribution in Cumbria with no known current (post 2000) populations in West Cumbria and the core distribution area located in the North Pennines (The Cumbria Evidence Base Information, 2010). **Therefore, considering the historical distribution of this species in the county, lack of records in the local area and the fact that eDNA analysis and targeted water vole surveys conducted by TEP did not find any conclusive evidence of water voles being present on site it is considered highly unlikely for water vole populations to be present on site.**

The Ecological Assessment report prepared by TEP (2019) recommended further water vole mitigation measures, licensing and trapping despite the fact that no conclusive evidence of this species being present on site was discovered. In order to be viable, any licensing and mitigation schemes need to be based on sound and conclusive evidence and the follow up surveys did not reveal any conclusive evidence of this species on site. **Therefore, taking into account all of the above factors, it is considered that water vole is highly unlikely to pose a constraint to the proposed development on site and no further mitigation works are required regarding this species.**

3.3.6 Red Squirrel

The desk study returned 202 records for red squirrel within 2 km of the site; the closest record for this species was located along the site northern boundary (adjacent to the residential gardens at Laurel Bank).

The woodland habitats on site were considered suitable for breeding and foraging red squirrel; there was no evidence of red squirrel dreys observed within the woodlands / trees on site although it has to be noted that no detailed inspection was conducted / commissioned. The previous ecological surveys conducted on site (TEP, 2019) revealed that none of the trees affected by the development supported red squirrel at the time of the survey. However, a detailed up-to-date survey may be required for any trees required for removal as a result of the development.

Red squirrel may pose a constraint to the proposed remedial road works on site – see Section 5.3.

3.3.7 Birds

The desk study returned 1901 current records (post year 2000) of 112 bird species within 2 km of the site (including 63 records for 10 sensitive species – as defined by the CBDC).

These included 97 records for 16 legally protected bird species listed under Schedule 1 of the W&CA, 363 records for 29 Birds of Conservation Concern (BoCC) Red List species, 512 records for 37 bird BoCC Amber List species and 155 records for 15 NERC Act bird species (Table 4).

Table 4 Bird species on the BoCC red and amber lists recorded within 2 km of site.

Latin name	Common name	BoCC status	No. of records
Acanthis cabaret	Lesser Redpoll	Bird-Red	9
Alauda arvensis	Eurasian Skylark	Bird-Red	12
Alca torda	Razorbill	Bird-Amber	3
Anas crecca	Teal	Bird-Amber	3
Anas platyrhynchos	Mallard	Bird-Amber	28
Anser anser	Greylag Goose	Bird-Amber	7
Anser brachyrhynchus	Pink-footed Goose	Bird-Amber	4
Anthus pratensis	Meadow Pipit	Bird-Amber	21
Apus apus	Swift	Bird-Amber	16
Aythya ferina	Pochard	Bird-Red	1
Calidris maritima	Purple Sandpiper	Bird-Amber	20
Cepphus grylle	Black Guillemot	Bird-Amber	29
Charadrius hiaticula	Common Ringed Plover	Bird-Red	3
Chroicocephalus ridibundus	Black-headed Gull	Bird-Amber	22
Cinclus cinclus	Dipper	Bird-Amber	14
Clangula hyemalis	Long-tailed Duck	Bird-Red	2
Cuculus canorus	Cuckoo	Bird-Red	4
Cygnus olor	Mute Swan	Bird-Amber	43
Delichon urbicum	Common House Martin	Bird-Amber	9
Emberiza citrinella	Yellowhammer	Bird-Red	1

Latin name	Common name	BoCC status	No. of records
Emberiza schoeniclus	Common Reed Bunting	Bird-Amber	21
Falco tinnunculus	Kestrel	Bird-Amber	31
Fratercula arctica	Puffin	Bird-Red	1
Fulmarus glacialis	Fulmar	Bird-Amber	8
Gallinago gallinago	Snipe	Bird-Amber	7
Haematopus ostralegus	Oystercatcher	Bird-Amber	19
Ichthyaetus melanocephalus	Mediterranean Gull	Bird-Amber	2
Larus argentatus	European Herring Gull	Bird-Red	69
Larus canus	Common Gull	Bird-Amber	12
Larus fuscus	Lesser Black-backed Gull	Bird-Amber	22
Larus marinus	Great Black-backed Gull	Bird-Amber	14
Linaria cannabina	Linnet	Bird-Red	16
Locustella naevia	Grasshopper Warbler	Bird-Red	16
Mareca penelope	Wigeon	Bird-Amber	1
Morus bassanus	Gannet	Bird-Amber	2
Motacilla cinerea	Grey Wagtail	Bird-Red	14
Muscicapa striata	Spotted Flycatcher	Bird-Red	7
Numenius arquata	Curlew	Bird-Red	9
Passer domesticus	House Sparrow	Bird-Red	53
Passer montanus	Tree Sparrow	Bird-Red	2
Perdix perdix	Grey Partridge	Bird-Red	3
Phalacrocorax aristotelis	Shag	Bird-Red	6
Phylloscopus sibilatrix	Wood Warbler	Bird-Red	1
Phylloscopus trochilus	Willow Warbler	Bird-Amber	28

Latin name	Common name	BoCC status	No. of records
Prunella modularis	Dunnock	Bird-Amber	53
Pyrrhula pyrrhula	Eurasian Bullfinch	Bird-Amber	17
Rissa tridactyla	Kittiwake	Bird-Red	1
Scolopax rusticola	Woodcock	Bird-Red	7
Botaurus stellaris	Bittern	Bird-Amber	1
Bucephala clangula	Goldeneye	Bird-Amber	3
Circus cyaneus	Hen Harrier	Bird-Red	7
Falco columbarius	Merlin	Bird-Red	2
Asio flammeus	Short-eared Owl	Bird-Amber	4
Turdus pilaris	Fieldfare	Bird-Red	6
Somateria mollissima	Eider	Bird-Amber	1
Spatula clypeata	Shoveler	Bird-Amber	1
Strix aluco	Tawny Owl	Bird-Amber	10
Sturnus vulgaris	Starling	Bird-Red	53
Thalasseus sandvicensis	Sandwich Tern	Bird-Amber	1
Tringa nebularia	Greenshank	Bird-Amber	1
Tringa totanus	Redshank	Bird-Amber	30
Turdus iliacus	Redwing	Bird-Red	5
Turdus philomelos	Song Thrush	Bird-Red	40
Turdus viscivorus	Mistle Thrush	Bird-Red	4
Uria aalge	Common Murre	Bird-Amber	4
Vanellus vanellus	Lapwing	Bird-Red	9

The Breeding Bird Surveys completed by TEP in 2018 (TEP, 2018b) confirmed 38 birds to be breeding within the site or within 100m site buffer. These included three confirmed notable species: house martin, house sparrow and starling nesting in the residential properties adjacent to site and four probably breeding species: dunnock, willow warbler, mistle thrush and song thrush recorded within the site itself.

The habitats on site including woodland, scrub provide suitable habitats for nesting birds (including some of these mentioned in Table 4).

Breeding birds may pose a constraint to proposed works on site – see Section 5.3.5.

The Wintering Bird Surveys completed by TEP in 2017 / 2018 (TEP, 2018c) revealed that during the 2017/2018 season the site supported flocks of snipe in early winter and a migratory flock of twite in late winter, individual peregrine and kestrel were seen flying over the site on single occasions indicating low interest for birds of prey. **No wetland birds qualifying under the Solway Firth SPA were seen on site, indicating no functional link with the SPA.**

There were no significant changes to the site conditions since the previous wintering bird surveys were conducted in 2017 / 2018 and it is considered that the site is unlikely to be functionally linked with the Solway Firth SPA. **Therefore, wintering bird populations considered unlikely to pose a constraint to the proposed development.**

3.3.8 Invertebrates

The desk study returned 240 records of 57 notable invertebrate species in the 2 km search radius. There are 23 insect species listed under the NERC Act (SPI) (Table 5).

Table 5: Favoured food plants of NERC insect species within the desk study

Latin name	Common name	Foodplant preferences*
Acronicta psi	Grey Dagger	A range of broadleaved trees and shrubs including blackthorn *Prunus spinosa*, hawthorns, apple *Malus domestica*, birches, sweet shestnut (*Castanae sativa),* limes, elms and rowan *Sorbus aucuparia*
Allophyes oxyacanthae	Green-brindled Crescent	Caterpillars feed on a wide range of shrubs and fruit trees but especially hawthorn and blackthorn
Arctia caja	Garden Tiger	A wide variety of herbaceous plants, including common nettle *Urtica dioica*, broad-leavedd (*Rumex obtusifolius*, water dock *Rumex hydrolapathum*, burdocks *Arctium* spp., hounds's-tongue *Cynoglossum officinale* and many garden plants
Atethmia centrago	Centre-barred Sallow	Willow / sallow *Salix sp.*
Chiasmia clathrata	Latticed Heath	Clovers *Trifolium* spp. and lucerne *Medicago sativa*
Coenonympha pamphilus	Small Heath	Fine grasses; fescues *Festuca* spp., meadow-grasses *Poa* spp., and bents *Agrostis* spp.
Cupido minimus	Small Blue	Kidney vetch *Anthylllis vulneraria*
Diarsia rubi	Small Square-spot	Various grass species but also herbaceous plants such as plantains *Plantago sp.* and cleavers *Gallium aparine.*

Latin name	Common name	Foodplant preferences*
Diarsia rubi	Small Square-spot	Mainly on grasses, but also herbaceous plants such as plantains and cleavers.
Ecliptopera silaceata	Small Phoenix	The main larval foodplants are willowherbs *Epilobium spp.*
Helotropha leucostigma	Crescent	Stems of marshland plants, such as yellow flag *Iris pseudacorus*
Hepialus humuli	Ghost Moth	The roots of grasses and a variety of cultivated herbaceous plants including common nettle *Urtica dioica*, docks, burdocks and wild swtrawberry *Fragaria vesca*.
Hipparchia semele	Grayling	Sheep's-fescue *Festuca ovina*, red fescue *F. rubra,* bristle bent *Agrostis curtisii*, and early hair-grass Aira praecox.
Hoplodrina blanda	Rustic	The larvae feed on herbaceous plants such as plantains and docks.
Hydraecia micacea	Rosy Rustic	Range of low plants, but especially dock *Rumex sp*.
Lasiommata megera	Wall	Grasses; Tor-grass *Brachypodium pinnatum*, false brome *B. sylvaticum*, cock's-foot *Dactylis glomerata* and Yorkshire fog *Holcus lanatus.*
Litoligia literosa	Rosy Minor	Autumn moth on herbaceous plants, bushes and trees.
Melanchra persicariae	Dot Moth	A wide range of wild and cultivated herbaceous plants including common nettle, hop *Humulus lupulus*, field bindweed *Convolvulus arvensis*, broad-leaved dock *Rumex obtusifolius*, groundsel *Senecio vulgaris*, white clover *Trifolium repens,* ivy *Hedera helix*, hazel *Corylus avellana*, elder *Sambucus nigra* and willows.
Mniotype adusta	Dark Brocade	The caterpillars feed on a wide range of herbaceous plants and trees, as well as grasses.
Scotopteryx chenopodiata	Shaded Broad-bar	Clovers and vetches
Spilosoma lubricipeda	White Ermine	A wide range of herbaceous plants including common nettle and docks.
Spilosoma lutea	Buff Ermine	A wide range of herbaceous plants, especially common nettle *Urtica dioica* and woody species including honeysuckle Lonicera periclymenum, hop humulus lupulus and birch *Betula sp.*

Latin name	Common name	Foodplant preferences*
Tyria jacobaeae	Cinnabar	Feeds on the leaves and flowers of common ragwort *Senecio jacobaea*

*Foodplant sources for butterflies (Butterfly Conservation, 2021) and moths (UK moths, 2021). Some of these NERC Act insect species may be found on site as their preferred foodplant has been recorded on site.

The mosaic of habitats in the south and east of the site is considered likely to be of potential importance to scarce, rare and notable species of invertebrates listed in the Table 7, including small blue butterfly.

Important assemblages of invertebrates may pose a constraint to proposed works on site - see Section 5.3.6.

3.3.9 Invasive species

The desk study returned six plant species and one animal species listed under the Schedule 9 of the W&CA. Table 6 displays each species and the nearest record to the site.

Table 6: Invasive species identified in the desk study

Species	Number of records	Distance and direction
Canadian Waterweed *Elodea canadensis*	1	1.1 km NE
Montbretia *Crocosmia pottsii x aurea = C. x crocosmiiflora*	1	0.1 km E
Japanese Knotweed *Fallopia japonica*	7	0.3km – 1.5 km S
Himalayan Balsam *Impatiens glandulifera*	1	0.4 km E
Rhododendron *Rhododendron ponticum*	1	0.8 km W
Japanese Rose *Rosa rugosa*	1	1.8 km W
Grey Squirrel *Sciurus carolinensis*	28	On site boundary

The previous survey identified Himalayan balsam, montbretia and cotoneaster onsite (TEP, 2019).

The current survey conducted by Tetra Tech in 2021 identified Himalayan balsam (Figure 2; TN29, TN31, TN48, TN50), montbretia (Figure 2; TN1, TN23, TN26) rhododendron (Figure 2; TN26, TN56) occurring either on site or directly adjacent to the site, Japanese Knotweed was observed in Midgey Gill woodland adjacent to Hillcrest Avenue. Stands of cotoneaster species were also identified but these were non-invasive garden escapes (Figure 2; TN5 and TN57)

3.3.10 Other species

Hedgehog

The desk study returned 37 records for hedgehog *Erinaceus europaeus* within a 2 km radius from site; the nearest of these was located 25m west from site. The site has the potential to support hedgehog and the scrub and grassland on site provide suitable habitat for foraging and may contain hedgehog nests.

Hedgehog may pose a constraint to proposed works on site – see section 5.3

Brown Hare

The desk study returned two records for brown hare *Lepus europaeus* within a 2 km radius from site; the nearest of these was located 650m north-west from site. The unmanaged grassland habitats on site have potential to support brown hare.

Brown hare may pose a constraint to proposed works on site – see section 5.3

3.4 IMPORTANCE OF ECOLOGICAL FEATURES

In line with the CIEEM PEA Guidelines, and based on the above baseline information, the importance of each ecological feature recorded within the study area is given in Table 7 below. The categories used are those which are defined in Section 4 of the CIEEM EcIA Guidelines (2018 v1.1):

Table 7 Importance of Ecological Features

Feature	Importance	Rationale
Solway Firth SPA	International	A designated Natura 2000 site for wintering and passage birds
St Bees Head SSSI	National	Designated nationally for its breeding bird assemblage
Cumbria Coast Zone 1 and 2 MCZ	National	Designated nationally for important marine features.
Midgey Gill CWS	County	Designated County Wildlife Site; adjacent to the site.
Castle Park Wood CWS	County	Designated County Wildlife Site
Hope Mission Pond CWS	County	Designated County Wildlife Site
Redness Point CWS	County	Designated County Wildlife Site
Woodhouse Quarry CWS	County	Designated County Wildlife Site
Bonnywood CWS	County	Designated County Wildlife Site
Priestgill Wood SIS	Local	Locally designated Site of Invertebrate Significance.
River Keekle SIS	Local	Locally designated Site of Invertebrate Significance.
Weddicar Hall SIS	Local	Locally designated Site of Invertebrate Significance.
Broad-leaved plantation woodland	Local	Habitat is common and widespread but it is likely to support a diverse range of fauna including invertebrates, nesting birds and foraging/commuting bats. Some sections designated as HPI
Dense and scattered scrub	Negligible	Habitat is common and widespread within the locale. Although scrub is considered to be of negligible ecological value, it may have supporting value to nesting birds and invertebrates.
Hedgerows	Negligible	Hedgerows on site were species-poor and defunct. Habitat is common and widespread within the locale.
Semi-improved neutral and marsh grasslands	Local	The grasslands on site are unlikely to qualify under HPI however, some of the unmanaged grassland parcels are floristically diverse and may have

Feature	Importance	Rationale
		supporting value for nesting birds, invertebrates and other species. The habitats may have supporting value nesting birds, reptiles and invertebrates (such as small blue butterfly)
Species-poor semi-improved grassland	Negligible	Habitat is common and widespread within the locale. Low conservation value due to the current grazing regime.
Bracken and ruderal vegetation	Negligible	Habitat is common and widespread within the locale, with low conservation value.
GCN	Negligible	No records for local populations in the wider area; negligible breeding opportunities on site
Bats	Negligible / Local	Site is likely to provide negligible value for roosting bats, but it is of local importance for foraging and commuting. Further tree assessment may be required.
Reptiles	Negligible	The previous reptile surveys (TEP, 2019) found no evidence of reptile populations on site. There were no substantial changes to the ecological conditions on site and it is considered unlikely that reptiles would have colonised the site since the previous surveys were conducted.
Badger	Negligible	No evidence of badger during current and previous surveys. The habitats on site may be of suitability for badgers
Otter	Negligible	No suitable habitat on site
Water Vole	Negligible	Previous water vole surveys (TEP, 2019) on site provided no conclusive evidence for presence of this species on site. The site is of negligible suitability for water vole populations and there are no verified historical records (post 2000) for this species in West Cumbria.
Red squirrel	Local	Woodlands on site my provide suitable breeding and foraging habitat.
Breeding birds	Local	The habitats on site offered suitability to support common and widespread bird species.
Wintering birds	Negligible	The site is of negligible importance for wintering bird species and does not support wintering populations of birds designated under the Solway Firth SPA.
Invertebrates	Unknown	The site and surrounding area may support notable invertebrate species listed under S41 of NERC Act.
Other notable species	Local	The site is considered to provide suitability for hedgehog and brown hare.
Either: International (incl. European) / National / Regional / County / Local / Negligible **Or:** Unknown (i.e. further surveys/information needed)		

The potential for the proposals to have adverse or beneficial impacts on these features, along with the need for any mitigation or enhancement measures are discussed in detail in the following sections.

4.0 RELEVANT PLANNING POLICY & LEGISLATION

4.1 REVISED NATIONAL PLANNING POLICY FRAMEWORK

A revised NPPF was issued on 20th July 2021 (Ministry of Housing Communities and Local Government, 2019) and currently supplements government Circular *06/2005, Biodiversity and Geological Conservation: Statutory Obligations and their Impact within the Planning System* (Office of the Deputy Prime Minister, 2005).

Circular 06/2005 states that the presence of protected species is a material consideration in the planning process. Paragraph 174 of the NPPF also states that:

'*Planning policies and decisions should contribute to and enhance the natural environment by:*

a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan)

b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland

c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate

d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and

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

The conservation and enhancement of wildlife is also specifically reference re: development within the National Parks or the Broads.

Paragraph 180 then goes on to confirm 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 integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public assess to nature where this is appropriate*

Regarding EcIA's and HRA's – any sites identified, or required, as compensatory measures for adverse effects on any Natura 2000/habitats site should also be given the same level as protection as the pSPA's and cSAC's themselves. In addition, when an application is being determined, Paragraph 182 clarifies that:

"*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.*"

Paragraph 183 is also relevant as;

Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:…

c) *limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*

4.2 BIODIVERSITY 2020: A STRATEGY FOR ENGLAND'S WILDLIFE & ECOSYSTEM SERVICES

Biodiversity 2020 (DEFRA, 2011) replaces the previous UK Biodiversity Action Plan and sets national targets to be achieved. The intent of Biodiversity 2020, however, is much broader than the protection and enhancement of less common species and is meant to embrace the wider countryside as a whole.

The priority species and habitats considered under Biodiversity 2020 are the SPI & HPI detailed under NERC Act (see Appendix C for further details).

4.3 LOCAL BIODIVERSITY ACTION PLAN

Local Biodiversity Action Plans (LBAPs) identify habitat and species conservation priorities at a local level (typically County by County) and are usually drawn up by a consortium of local Government organisations and conservation charities. Although they are no-longer managed at a national level many are still reviewed and updated at a local level.

The Cumbria Biodiversity Action Plan (CBAP) was launched in 2001; SAPs were drawn up for 21 species and HAPs were drawn up for 19 habitats. Following the UKBAP review in 2007, the CBAP was reviewed in 2009 and it was decided to include all habitats and species which are listed as HPI and SPI under the NERC Act 2006. A list of all 268 SPI which occur in Cumbria is provided at:

https://www.cumbriawildlifetrust.org.uk/sites/default/files/cumbria%20bap%20species%20updated%20list%202009%20web.pdf

The original action plans for Cumbria were further reviewed as part of the Cumbria Biodiversity Evidence Base (CBEB) and detailed statements have been prepared for 11 species/species groups

(Table 8) and 21 habitats (Table 9). For the purposes of this report, the species and habitats listed in the following tables are considered to represent the current CBAP:

Table 8 LBAP SAPs

Species Action Plans	
Barn owl, *Tyto alba*	Red squirrel, *Sciurus vulgaris*
Bats, *Chiroptera*	Reptiles
Great crested newt, *Triturus cristatus*	Small blue butterfly, *Philotiella speciosa*
Hen harrier, *Circus cyaneus*	Water vole, *Avicola amphibius*
Natterjack toad, *Epidalea calamita*	Wintering geese and swans
Otter, *Lutra lutra*	-

Table 9 LBAP HAPs

Habitats Action Plans	
Bogs	Hedgerows
Calaminarian Grasslands	Lakes, Ponds and Tarns
Calcareous Grassland	Lowland Dry Acid Grassland
Coastal and Floodplain Grazing Marsh	Montane Habitats
Coastal Habitats Above High Water	Open Mosaic Habitats on Previously Developed Land
Coastal Intertidal Habitats	Rivers
Coastal Subtidal Habitats	Rock Habitats
Fen, Marsh and Swamp	Saline Lagoons
Hay Meadows and Pastures	Semi-Natural Woodland
Heathland	Traditional Orchards
Wood-Pasture and Parkland	-

It should be noted that the existence of a SAP or HAP does not always infer an elevated level importance for those features. These plans may be designed to encourage an increase in these habitats/species, rather than to protect a county-scarce feature (for example).

4.4 LOCAL PLAN

The site lies within Copeland Borough. Chapter 7 of the adopted Local Plan for Copeland (LPC) (2013 – 2028) *Environmental Protection and Enhancement* incorporates one policy covering Biodiversity and Geodiversity.

Policy ENV3 – Biodiversity and Geodiversity

The Council will contribute to the implementation of the UK and Cumbria Biodiversity Action Plan within the plan area by seeking to:

A. *Improve the condition of internationally, nationally and locally designated sites*
B. *Ensure that development incorporates measures to protect and enhance any biodiversity interest*
C. *Enhance, extend and restore priority habitats and look for opportunities to create new habitat*
D. *Protect and strengthen populations of priority or other protected species*
E. *Boost the biodiversity value of existing wildlife corridors and create new corridors, and stepping stones that connect them, to develop a functional Ecological Network*

F. *Restrict access and usage where appropriate and necessary in order to conserve an area's biodiversity value*

Policy DM25 *supports this policy, setting out the detailed approach towards managing development proposals that are likely to have an effect on nature conservation sites, habitats and protected species.*

The core strategy policies are supported by Development Mitigation Polices, one of which relates to '*Nature Conservation, Habitat and Species Protection'*:

Policy DM25 – Protecting Nature Conservation Sites, Habitats and Species

A All development proposals should:

i) Protect the biodiversity value of land and buildings

ii) Minimise fragmentation of habitats

iii) Maximise opportunities for conservation, restoration, enhancement and connection of natural habitats and creation of habitats for species listed in UK and Cumbria Biodiversity Action Plans. Special consideration should also be given to those European habitats that lie outside the boundaries of European designated sites

B Development proposals that would cause a direct or indirect adverse effect on locally recognised sites of biodiversity and geodiversity importance, including County Wildlife Sites, Local Nature Reserves and Regionally Important Geological/Geomorphological Sites or protected species will not be permitted unless:

i) The benefits of the development clearly outweigh the impacts on the features of the site and the wider network of natural habitats, and;

ii) Prevention, mitigation and/or compensation measures are provided. An appropriate long-term management plan will be sought and arrangements to provide adequate funding will be made in accordance with a formal planning agreement or obligation

C Where compensatory habitat is created, it should be of equal or greater size than the area lost as a result of the development

D Development proposals where the principal objective is to conserve or enhance biodiversity or geodiversity interests will be supported in principle

E Where there is evidence to suspect the presence of protected species any planning application should be accompanied by a survey assessing their presence and, if present, the proposal must be sensitive to, and make provision for, their needs

F All development proposals must take into account any likely significant effects on the internationally important sites both within the Borough and within a 20km radius of the Borough boundary as well as those that are hydrologically linked to the development plan area

4.5 LEGISLATION

Full details of the UK legislation and offences which are relevant to the ecological receptors identified are included in Appendix C. However, based on the findings of our assessment, it is considered that the proposals will need to consider the following legal provisions:

- Harm to a Natura 2000 site
- Disturbance or killing of a W&CA species;
- Disturbance or killing of a S41 Priority Species;
- Disturbance of nesting wild birds; and
- Cause of permit the spread of an invasive species into the wild.

5.0 DISCUSSION

5.1 DESIGNATED SITES

5.1.1 Natura 2000 Sites

The Solway Firth SPA is located 1.7 km west of the site and the River Ehen SAC is located 5.3 km south-east of the site.

The site is considered to be of negligible significance to wintering and passage birds designed under Solway Firth SPA as no significant wintering bird populations were recorded on site during the wintering bird surveys conducted by TEP in 2017 / 2018 (TEP; 2018c). Therefore, it is considered that as the proposed development site is not functionally linked to the Solway Firth SPA no direct impact from habitat loss is anticipated. In addition, due to the distance of the site from Solway Firth no impacts are anticipated as a result of construction phase disturbance events which may affect the bird populations designated under this Natura 2000 site and cause local displacement.

However, the proposed development will result in the increase in local residents which may transpose into the increase of recreational activity along the coastal areas (including St Bees Head). Such an increase in recreational pressure has the potential to cause disturbance to the Solway Firth SPA qualifying birds using the costal habitats during the winter and passage season.

It is **recommended that a Report to Inform HRA Screening (HRA Stage 1) is prepared** to identify any likely significant effects upon European designated sites, either alone or in combination with other plans or projects.

River Ehen SAC is over 5 km from site and it is unlikely that there are direct or indirect pathways of effect on this SAC resulting from the proposed development. However, it is recommended that River Ehen SAC is also considered within the HRA Stage 1 report in order to screen out any potential pathways of effect that may occur as a result of the proposed development.

5.1.2 Sites of Special Scientific Interest

The site lies within the Impact Risk Zone (IRZ) for St Bees SSSI. This is located 1.7 km south-west from site.

However, according to the guidance provided by MAGIC, the IRZ overlapping with the proposed development site do not list any risks associated with the residential developments; therefore, it is considered that further consultation with Natural England is unlikely to be required.

5.1.3 Local Wildlife Sites

The nearest local wildlife site is Midgey Wood CWS which is adjacent west to the site with A595 road separating this CWS from the proposed development site. Furthermore, Castle Park Woods CWS is located 50m away from the proposed development site.

Previous Ecological Assessment (TEP, 2019) identified that there are significant functional links between the application site and the locally designated sites and the distance between the closest sites (Midgey Gill and Castle Park Woods CWS) is considered small enough for there to be possible impacts as a result of the proposals. However, the previous assessment concluded that any potential impact should be mitigated by creating a 15m buffer of new semi-natural woodland planting along the site boundary adjacent to the CWS sites.

It is considered that proposed development is considered unlikely to have any direct impact on the local wildlife sites and the mitigation measures highlighted in the previous Ecological Assessment (TEP, 2019) – which include new planting of the 15m semi-natural woodland buffer zone – should be adhered to in order to reduce any indirect impacts on Midgey Gill CWS and Castle Park Woods CWS.

5.2 HABITATS

5.2.1 Previous Recommendations

The previous Ecological Assessment (TEP, 2019) concluded that the woodlands and unmanaged grassland areas form a habitat mosaic which creates an important ecological network connecting Midgey Wood ancient woodland with the open land adjacent east to the site. The previous report highlighted that the majority of this important ecological network has been considered within the Masterplan for the site (See Appendix B) which proposes that the habitats within the ecological network will be retained and enhanced through long-term management secured though a Landscape and Habitat Management Plan.

The TEP report (2019) has also identified that there will be no loss of HPI with expectation of the 160 m length of hedgerow. It was recommended that the loss of hedgerow should be mitigation through new hedge planting within the proposed development area.

The previous assessment has also recommended that the species-rich parcels of marshy grassland and semi-improved neutral grassland (See Figure 2; TN1, TN8, TN12, TN22, TN23, TN32 and TN46) should be retained wherever possible or translocated if necessary. These areas should be protected through maintenance of current hydrology and fencing to prevent encroachment by machinery and vehicles. They should also be enhanced through a combination of the measures such as:

- Control of invasive plant species and garden escapes;
- Reduction of nutrient from animal waste;
- Wildflower plug planting or seeding to include plants of local provenance;
- Implementing mowing regime to encourage grassland species diversity; and
- Scrub control within the grassland areas.

It may also be appropriate to fence some areas during the operation phase of development to protect them from encroachment.

5.2.2 Habitat and Landscape Management Plan and Biodiversity Net Gain Assessment

The EU 2020 Biodiversity Target aims to achieve ‘no net loss’ and restoring at least 15% of degraded ecosystems. This necessitated member states to produce national Biodiversity Strategies. Ultimately this places a duty on local authorities to consider Natural Capital; including, Biodiversity. No Net Loss of biodiversity and Net Gain are fundamental principles in policy in the UK at present. These aim to halt the loss of biodiversity and maximise improvements. The Copeland Local Plan also states that ‘all proposals for development should protect and (where possible) enhance any priority habitats, European and nationally protected species, and priority species as defined in the England, Natural Environment and Rural Communities Act (2006).’

A Habitat and Landscape Management Plan (HLMP) and Biodiversity Net Gain (BNG) assessment is recommended to accompany the final detailed design layout for the site. This

should include appropriate mitigation measures to off-set any habitat loss as a result of the development and provisions for biodiversity enhancement in line with Biodiversity Net Gain principal and the Copeland Borough Council Local Plan Policy DM25.

5.2.3 Construction Environmental Management Plan

It is recommended that the protection of on-site and adjacent habitats (including Midgey Wood ancient woodland and Midgey Gill CWS) during construction works should be addressed through the provision of a Construction Environmental Management Plan (CEMP).

Measures relating to the protection of ecological features should include:

- Guidance for Pollution Prevention (GPP5) for working in, near or over streams / watercourses;
- A safe system for the correct storage of materials/chemicals should be implemented so that materials are stored in a suitable manner as to avoid spills or runoff;
- Appropriate measures to manage dust generation during construction should be implemented (e.g. damping down of bare areas in summer);
- A system to make sure waste is removed at the earliest opportunity to avoid contamination of ground. Contractors should also avoid leaving construction waste within the site;
- Chemical applications should be avoided where possible. If the application of herbicide or pesticide is required, then a non-residual chemical should be applied using either a wiping or spraying (i.e. localised) method only to clear areas of weeds;
- ECoW checks for hedgehog, breeding birds, red squirrel and other species prior to any vegetation clearance / habitat removal and ground disturbance; and
- Biosecurity measures to avoid spread of the invasive plant species.

5.3 PROTECTED & NOTABLE SPECIES

5.3.1 Bats

All bats and their roosts receive full protection both under The Conservation of Habitats and Species Regulations 2017 (as amended) and the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to:

- Intentionally kill, injure or take a bat;
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a bat; or
- Disturb a bat while it is occupying a structure or place which it uses for that purpose.

In addition, the provisions of the NERC require local authorities to have due regard to protected species when determining planning applications, including all UK bat species. Bats are listed in the Cumbria LBAP.

Roosting

Based primarily on the previous assessment conducted by TEP (2019), roosting bats are considered unlikely to be a constraint for the proposed development. However, the original assessment was conducted in 2019 and trees can develop new roosting features over a course of time, Therefore, any trees proposed for removal should be subject to a up-to-date Preliminary Roost Level Assessment prior to works.

Foraging and Commuting

The previous Bat Activity Report (TEP; 2018a) identified light sensitive woodland species (brown long-eared bat and myotis species) to be using the site for foraging and commuting.

According to the current masterplan (Appendix B) the majority of the woodland habitat on site will be retained as part of the proposed development. It is recommended that an unlit buffer between woodlands and new housing infrastructure (5 to 10 m in width) should be maintained; furthermore, the retained woodland habitats are protected from light disturbance through implementation of a wildlife-friendly lighting scheme for both the construction and operational phases of the development. The design should minimise light spill onto hedgerows, trees and suitable habitats on and adjacent to the site. An example of how this may be achieved is through the use of surface down lighters using LED lamps mounted within the under croft or soffit of new builds, low level light bollards or surface / recessed bulkhead LED lights fitted along public walkways and the use of columns with asymmetric optics and shields to reduce light spill. Please note that **lighting schemes should be developed in accordance with the Institute of Lighting Professionals (ILP) Guidance Note 08/8 *Bats and artificial lighting in the UK* (ILP, 2018).**

5.3.2 Badger

Badgers are protected and so are the setts (burrows) they live in. Under the Protection of Badgers Act 1992, in England and Wales it is an offence to:

- Wilfully kill, injure or take a badger (or attempt to do so);
- Cruelly ill-treat a badger;
- Dig for a badger;
- Intentionally or recklessly damage or destroy a badger sett, or obstruct access to it;
- Cause a dog to enter a badger sett; and/or
- Disturb a badger when it is occupying a sett.

No signs of badger or badger setts were observed within the survey area and immediate surroundings during the walkover survey. However, badger are highly mobile and can rapidly colonise new areas. It should be noted that there are numerous records for badgers within 2 km from site.

As a precaution, it is recommended that a pre-works badger survey is undertaken on site at least three months prior to works.

If a badger sett is found during works, an application for a licence to disturb or destroy the sett may be required to be completed and approved by NE, to avoid contravention of legislation.

5.3.3 Red Squirrel

The red squirrel is a protected species in the UK and is included in Schedules 5 and 6 of the Wildlife & Countryside Act 1981 (as amended). It is an offence to intentionally kill or injure a red squirrel or intentionally or recklessly damage or destroy any structure or place a red squirrel uses for shelter or protection or disturb a red squirrel while it occupies such a place.

Any trees that are proposed for removal, should be checked for squirrel dreys prior works. These checks should be conducted at least three months prior to works in order to allow for mitigation measures if red squirrel are discovered to be breeding on site.

5.3.4 Birds

All wild birds, their nests and eggs are protected by the Wildlife and Countryside Act 1981 (as amended). **It is recommended that any works affecting bird nesting habitat (i.e. any vegetation / ground clearance and structure / building removal) should be carried out outside the main bird breeding season (i.e. considered to be March to September inclusive).**

If this is not possible, then it is recommended that an ECoW conducts a check for nesting birds of any vegetation to be cleared on site 48 hours in advance of any works commencing.

If a nesting bird is identified, the ecologist will advise on suitable working methods and exclusion zones to restrict works and/or vehicular access in the area until the chicks have fledged or the nest becomes otherwise inactive. Measures will depend on the nature of the works in that area as well as the bird species identified to be nesting.

5.3.5 Invertebrates

The site is likely to support a range of commonly occurring invertebrate species as well as some local BAP Priority and SPI species that were recorded within 2 km.

The mosaic of woodland, scrub and grassland habitats on site are considered to be of local value for invertebrates (including SPI insect species listed in Table 5).

Provisions to compensate for the loss of these habitats should be included in the HLMP (See section 5.2). Plants selected for inclusion in the final planting strategy, should be chosen to maximise the overall biodiversity value of the re-developed site, including nectar-rich species of local providence for butterflies and bees. In addition, landscaping should be managed in a sympathetic manner, using few chemicals to encourage invertebrate diversity.

5.3.6 Invasive species

Montbretia, Himalayan balsam and rhododendron are listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended); these species have been identified on site. This makes it an offence to plant these species in the wild, knowingly allow it to spread, or otherwise cause it to grow.

It is advised that an Invasive Species Method Statement is produced by a specialist contractor and implemented to control and eradicate these species on site. The stands of invasive species should be marked out and all contractors aware of its location. Species specific approaches should be taken, and an aftercare period should also be detailed.

5.3.7 Other Species

The site has potential for hedgehog and brown to be present. Before clearance works commence, any areas covered by dense vegetation should be checked by ECoW for presence of these animal; it is also recommended that ECoW should deliver a Toolbox talk to site personnel regarding the best practice with regard to ecological issues in advance of working.

Boundary features should utilise hedgerow planting where possible. Any new fencing used within the proposed housing development should include gaps at ground level (13 x 13cm) or clearance beneath to allow hedgehog dispersal throughout the site.

5.3.8 Other Species Enhancements

Opportunities should be sought where possible for nature conservation enhancement of the site in line with current policy guidance (NPPF, 2021), Biodiversity Net Gain principals and the Copeland Borough Council Local Plan 2013-2028 Policy DM25:

The following enhancement measures are recommended for the proposed development. These measures include previous recommendation suggested by TEP in their Ecological Assessment report (TEP, 2019):

- Existing network of woodland across the site can be enhanced by the creation of grassland, wetland and woodland edge habitats within buffers;
- Loss of grassland could be compensated through the creation of grassy swales along roadways and footpaths;
- Enhancements for birds and bats can be achieved by installing bat and bird boxes on suitable retained trees or incorporating bat and bird boxes within new buildings, boxes into the exterior walls of the new buildings. These could include boxes such as Schwegler 1FR Bat Tube or Woodstone Build in Open Nest Box.

- Planting native species rich hedges as property boundaries as opposed to fences to create suitable habitat:
- Provisions of hedgehog boxes to provide areas for shelter and breeding to be incorporated within the new design; these should be sited out of direct sunlight with the entrance facing away from prevailing winds, in or under thick vegetation. Any wood panel fencing should include small gateways (13cm x 13cm) to allow dispersal of hedgehogs across the site; and
- Creation of habitat / brash piles on the periphery of the site as a further aid to increasing biodiversity.

6.0 SUMMARY

6.1 DESIGNATED SITES

- The Solway Firth SPA is located 1.7 km west of the site and the River Ehen is located 5.3 km south-east from site. It is recommended that a Report to Inform HRA Screening (HRA Stage 1) is prepared to identify any likely significant effects upon European designated sites, either alone or in combination with other plans or projects.
- St Bees SSSI is located 1.7 km south-west from site. The proposed development site does not fall within the IRZ of this SSSI for the residential development category.
- Midgey Wood CWS is adjacent west to the site with A595 road separating this CWS from the proposed development site. Castle Park Woods CWS is located 50 m away from the proposed development site. It is considered that proposed development is considered unlikely to have any direct impact on the local wildlife sites. Indirect impacts on the adjacent CWS can be mitigated for by the new planting of the 15 m semi-natural woodland buffer zone.

6.2 HABITATS

- The woodlands and unmanaged grassland areas within site form a habitat mosaic which creates an important ecological network connecting Midgey Wood ancient woodland with the open land adjacent east to the site. The masterplan for the site proposes that most of these habitats will be retained within the new development.
- The the species-rich parcels of marsh grassland semi-improved neutral grassland should be retained or translocated if necessary. These areas should be protected through maintenance of current hydrology and fencing to prevent encroachment by machinery and vehicles; the grasslands can be also enhanced through control of invasive species, wildflower seeding / plug planting, scrub management and appropriate mowing regime.

- A Habitat and Landscape Management Plan (HLMP) and Biodiversity Net Gain Assessment is recommended to accompany the final detailed design layout for the site. This should include appropriate mitigation measures to off-set any habitat loss as a result of the development and provisions for biodiversity enhancement in line with Biodiversity Net Gain principal and the Copeland Borough Council Local Plan Policy DM25.
- The protection of on-site and adjacent habitats (including Midgey Wood ancient woodland and Midgey Gill CWS) during construction works should be addressed through the provision of a Construction Environmental Management Plan (CEMP).

6.3 PROTECTED & NOTABLE SPECIES

- The previous Bat Activity Report (TEP; 2018) identified light sensitive woodland species (brown long-eared bat and myotis species) to be using the site for foraging and commuting. According to the current masterplan the majority of the woodland habitat on site will be retained as part of the proposed development. It is recommended that an unlit buffer between woodlands and new housing infrastructure should be maintained and the retained woodland habitats are protected from light disturbance through implementation of a wildlife-friendly lighting scheme for both the construction and operational phases of the development. Any trees proposed for removal should be subject to a up-to-date Preliminary Roost Level Assessment prior to works.
- A pre-works badger survey should be undertaken on site at least three months prior to works
- Any trees are proposed for removal, should be checked for squirrel dreys prior works. These checks should be conducted at least three months prior to works in order to allow for mitigation measures if red squirrel are discovered to be breeding on site.
- Nesting bird habitats should be retained wherever possible. Habitat / vegetation clearance should avoid the nesting period (March to September inclusive or be immediately preceded (within 48 hours) by a check by a suitably qualified ecologist.
- Provisions to compensate for the loss of suitable invertebrate habitats should be included in the HLMP.
- Invasive Species Method Statement should be produced and implemented to control and eradicate invasive plant species on site
- Before clearance works commence, any areas covered by dense vegetation should be checked by ECoW for presence hedgehog and other species; it is also recommended that ECoW an should deliver a Toolbox talk to site personnel regarding the best practice with regard to ecological issues in advance of working.

6.4 ENHANCEMENTS

Enhancements in line with NPPF and the Copeland Borough Council Local Plan Policy ENV3 and DM25 to include;

- Creating wetland, woodland and grassland habitats on site;
- Creating grassland swales along the roadways and footpaths;
- Provision of bat and bird boxes on site – these include incorporating bat and bird features into the new build house;
- Provision of bat access within the new houses;
- New hedgerow planting within the development;
- Hedgehog provisions on site;
- Creating habitat piles on site.

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Please note that the legislation which is relevant to this report is not included in the list above, but details are included in Appendix C below.

FIGURES

Figure 1 – Site Location Plan

Figure 2 – Phase 1 Habitat Plan

Site Location Plan

Harras Moor

Homes England

Legend

Site boundary

Notes:

Drawn by: BB
Checked by: EW
Office: Southampton

Figure No. 1
Revision No. A

0 300 600 900 Meters
Scale 1:20,000 @A3

04 August 2021

NGR: 298633E 517973N

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Hampshire, SO30 2AF

C:\Users\ben.blowers\Tetra Tech, Inc\WYG.Ecology GIS - Projects\A090070-410_HarrasMoor\A090070-410_HarrasMoor.aprx

Phase 1 Habitat Plan

Harras Moor

Homes England

Legend

- Site boundary
- Buildings
- Hardstanding
- SI — Neutral grassland - semi-improved
- Marsh/marshy grassland
- SI — Poor semi-improved grassland
- Broad-leaved plantation woodland
- Scrub - dense/continuous
- Bracken - continous
- Tall ruderal
- Swamp
- Scattered scrub - broad-leaved
- Scattered tree - broad-leaved
- Defunct hedge - native species-poor
- Dry ditch
- Fence
- Wall
- Target note

Notes:

Drawn by: BB
Checked by: EW
Office: Southampton

Figure No. 2
Revision No. A

0 50 100 150 Meters
Scale 1:3,650 @A3

04 August 2021
NGR: 298633E 517977N

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Hampshire, SO30 2AF

APPENDIX A – REPORT CONDITIONS

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The report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections'. Environmental conditions can vary and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times. No investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather-related conditions. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions. The “shelf life” of the Report will be determined by a number of factors including; its original purpose, the Client’s instructions, passage of time, advances in technology and techniques, changes in legislation etc. and therefore may require future re-assessment.

The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. Tetra Tech accept no liability for issues with performance arising from such factors.

APPENDIX B – DRAFT ILLUSTRATIVE MASTERPLAN

Legend

- Site boundary
- Proposed residential block
- Proposed frontage
- Primary street
- Secondary street
- Private drive
- Public open space
- Proposed pedestrian linkages
- Proposed attenuation pond
- Proposed vehicular access
- Potential pedestrian access
- Proposed Planting
- Existing Trees and Woodland
- Play — Local Equipped Area of Play

Project title:

Harras Moor

Drawing title:

Draft Illustrative Masterplan

Dwg Nº: A090070-410 003 Rev: G

Drawn:KC Checked:SP Date: 08/05/18

Scale @ A2: 1:2500

North

Quay West, Trafford Wharf Road, Trafford Park, Manchester, M17 1HH
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APPENDIX C – KEY LEGISLATION

Bern Convention
The *Convention on the Conservation of European Wildlife and Natural Habitats* (the *Bern Convention*) was adopted in Bern, Switzerland in 1979, and was ratified in 1982. Its aims are to protect wild plants and animals and their habitats listed in Appendices 1 and 2 of the Convention, and regulate the exploitation of species listed in Appendix 3. The regulation imposes legal obligations on participating countries to protect over 500 plant species and more than 1000 animals. To meet its obligations imposed by the Convention, the European Community adopted the *EC Birds Directive* (1979) and the *EC Habitats Directive* (1992 – see below). Since the Lisbon Treaty, in force since 1st December 2009, European legislation has been adopted by the European Union.
Bonn Convention
The Convention on the Conservation of Migratory Species of Wild Animals or 'Bonn Convention' was adopted in Bonn, Germany in 1979 and came into force in 1985. Participating states agree to work together to preserve migratory species and their habitats by providing strict protection to species listed in Appendix I of the Convention. It also establishes agreements for the conservation and management of migratory species listed in Appendix II. In the UK, the requirements of the convention are implemented via the Wildlife & Countryside Act 1981 (as amended), Wildlife (Northern Ireland) Order 1985 (as amended), Nature Conservation and Amenity Lands (Northern Ireland) Order 1985 and the Countryside and Rights of Way Act 2000 (CRoW).
Habitats Directive
The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, or the 'Habitats Directive', is a European Union directive adopted in 1992 in response to the Bern Convention. Its aims are to protect approximately 220 habitats and 1,000 species listed in its several Annexes. In the UK, the Habitats Directive is transposed into national law via the Conservation of Habitats and Species Regulations 2017 (as amended) in England and Wales, and via the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended) in Northern Ireland.
Birds Directive
The EC Directive on the Conservation of Wild Birds (791409/EEC) or 'Birds Directive' was introduced to achieve favourable conservation status of all wild bird species across their distribution range. In this context, the most important provision is the identification and classification of Special Protection Areas (SPAs) for rare or vulnerable species listed in Annex 1 of the Directive, as well as for all regularly occurring migratory species, paying particular attention to the protection of wetlands of international importance.
Conservation of Habitats and Species Regulations 2017 (as amended)
Regulations place a duty on the Secretary of State to propose a list of sites which are important for either habitats or species (listed in Annexes I or II of the Habitats Directive respectively) to the European Commission. These sites, if ratified by Ministers, are then designated as Special Protection Areas (SPAs) within six years. Public bodies must also help preserve, maintain and re-establish habitats for wild birds. The 2018 amendments mainly related to the impact of the *People Over Wind* decision and some implications arising for neighbourhood plan development and a range of other planning tools including Local Development Orders and Permission in Principle – see here for full details: https://www.legislation.gov.uk/uksi/2018/1307/note/made The Regulations make it an offence to deliberately capture, kill, disturb or trade in the animals listed in Schedule 2, or pick, uproot, destroy, or trade in the plants listed in Schedule 5 - see below:

Schedule 2 – European Protected Species of Animals	Schedule 5 – European Protected Species of Plants
Horseshoe bats *Rhinolophidae* - all species	Shore dock *Rumex rupestris*
Common bats *Vespertilionidae* - all species	Killarney fern *Trichomanes speciosum*
Large Blue Butterfly *Maculinea arion*	Early gentian *Gentianella anglica*
Wild cat *Felis sylvestris*	Lady's-slipper *Cypripedium calceolus*
Dolphins, porpoises and whales *Cetacea* – all sp.	Creeping marsh-wort *Apium repens*
Dormouse *Muscardinus avellanarius*	Slender naiad *Najas flexilis*
Pool frog *Rana lessonae*	Fen orchid *Liparis loeselii*
Sand lizard *Lacerta agilis*	Floating-leaved water plantain *Luronium natans*
Fisher's estuarine moth *Gortyna borelii lunata*	Yellow marsh saxifrage *Saxifraga hirculus*
Great crested newt *Triturus cristatus*	
Otter *Lutra lutra*	
Lesser whirlpool ram's-horn snail *Anisus vorticulus*	
Smooth snake *Coronella austriaca*	
Sturgeon *Acipenser sturio*	
Natterjack toad *Epidalea calamita*	
Marine turtles *Caretta caretta, Chelonia mydas, Lepidochelys kempii, Eretmochelys imbricata, Dermochelys coriacea*	

Wildlife & Countryside Act 1981 (as amended)

This is the principal mechanism for the legislative protection of wildlife in the UK. This legislation is the chief means by which the 'Bern Convention' and the Birds Directive are implemented in the UK. Since it was first introduced, the Act has been amended several times.

The Act makes it an offence to (with exception to species listed in Schedule 2) intentionally:

- kill, injure, or take any wild bird;
- take, damage or destroy the nest of any wild bird while that nest is in use; or
- take or destroy an egg of any wild bird.

Or to intentionally do the following to a wild bird listed in Schedule 1:

- disturbs any wild bird while it is building a nest or is in, on or near a nest containing eggs or young; or
- disturbs dependent young of such a bird.

In addition, the Act makes it an offence (subject to exceptions) to:

- intentionally or recklessly kill, injure or take any wild animal listed on Schedule 5;
- interfere with places used for shelter or protection, or intentionally disturbing animals occupying such places; and
- The Act also prohibits certain methods of killing, injuring, or taking wild animals.

Finally, the Act also makes it an offence (subject to exceptions) to: intentionally pick, uproot or destroy any wild plant listed in Schedule 8, or any seed or spore attached to any such wild plant; unless an authorised person, intentionally uproot any wild plant not included in Schedule 8; or sell, offer or expose for sale, or possess (for the purposes of trade), any live or dead wild plant included in Schedule 8, or any part of, or anything derived from, such a plant.

Following all amendments to the Act, Schedule 5 'Animals which are Protected' contains a total of 154 species of animal, including several mammals, reptiles, amphibians, fish and invertebrates. Schedule 8 'Plants which are Protected' of the Act, contains 185 species, including higher plants, bryophytes and fungi and lichens. A comprehensive and up-to-date list of these species can be obtained from the JNCC website.

Part 14 of the Act makes unlawful to plant or otherwise cause to grow in the wild any plant which is listed in Part II of Schedule 9.

It is recommended that plant material of these species is disposed of as bio-hazardous waste, and these plants should not be used in planting schemes.

Schedule 1 - Birds which are protected by special penalties			
Avocet	*Recurvirostra avosetta*	Osprey	*Pandion haliaetus*
Bee-eater	*Merops apiaster*	Owl, Barn	*Tyto alba*
Bittern	*Botaurus stellaris*	Owl, Snowy	*Nyctea scandiaca*
Bittern, Little	*Ixobrychus minutus*	Peregrine	*Falco peregrinus*
Bluethroat	*Luscinia svecica*	Petrel, Leach's	*Oceanodroma leucorhoa*
Brambling	*Fringilla montifringilla*	Phalarope, Red-necked	*Phalaropus lobatus*
Bunting, Cirl	*Emberiza cirlus*	Plover, Kentish	*Charadrius alexandrinus*
Bunting, Lapland	*Calcarius lapponicus*	Plover, Little Ringed	*Charadrius dubius*
Bunting, Snow	*Plectrophenax nivalis*	Quail, Common	*Coturnix coturnix*
Buzzard, Honey	*Pernis apivorus*	Redstart, Black	*Phoenicurus ochruros*
Capercaillie	*Tetrao urogallus*	Redwing	*Turdus iliacus*
Chough	*Pyrrhocorax pyrrhocorax*	Rosefinch, Scarlet	*Carpodacus erythrinus*
Corncrake	*Crex crex*	Ruff	*Philomachus pugnax*
Crake, Spotted	*Porzana porzana*	Sandpiper, Green	*Tringa ochropus*
Crossbills (all species)	*Loxia*	Sandpiper, Purple	*Calidris maritima*
Curlew, Stone	*Burhinus oedicnemus*	Sandpiper, Wood	*Tringa glareola*
Divers (all species)	*Gavia*	Scaup	*Aythya marila*
Dotterel	*Charadrius morinellus*	Scoter, Common	*Melanitta nigra*
Duck, Long-tailed	*Clangula hyemalis*	Scoter, Velvet	*Melanitta fusca*
Eagle, Golden	*Aquila chrysaetos*	Serin	*Serinus serinus*
Eagle, White-tailed	*Haliaetus albicilla*	Shorelark	*Eremophila alpestris*
Falcon, Gyr	*Falco rusticolus*	Shrike, Red-backed	*Lanius collurio*
Fieldfare	*Turdus pilaris*	Spoonbill	*Platalea leucorodia*
Firecrest	*Regulus ignicapillus*	Stilt, Black-winged	*Himantopus himantopus*
Garganey	*Anas querquedula*	Stint, Temminck's	*Calidris temminckii*
Godwit, Black-tailed	*Limosa limosa*	Swan, Bewick's	*Cygnus bewickii*
Goshawk	*Accipiter gentilis*	Swan, Whooper	*Cygnus cygnus*
Grebe, Black-necked	*Podiceps nigricollis*	Tern, Black	*Chlidonias niger*
Grebe, Slavonian	*Podiceps auritus*	Tern, Little	*Sterna albifrons*
Greenshank	*Tringa nebularia*	Tern, Roseate	*Sterna dougallii*
Gull, Little	*Larus minutus*	Tit, Bearded	*Panurus biarmicus*
Gull, Mediterranean	*Larus melanocephalus*	Tit, Crested	*Parus cristatus*
Harriers (all species)	*Circus*	Tree-creeper, Short-toed	*Certhia brachydactyla*
Heron, Purple	*Ardea purpurea*	Warbler, Cetti's	*Cettia cetti*
Hobby	*Falco subbuteo*	Warbler, Dartford	*Sylvia undata*
Hoopoe	*Upupa epops*	Warbler, Marsh	*Acrocephalus palustris*
Kingfisher	*Alcedo atthis*	Warbler, Savi's	*Locustella luscinioides*
Kite, Red	*Milvus milvus*	Whimbrel	*Numenius phaeopus*
Merlin	*Falco columbarius*	Woodlark	*Lullula arborea*
Oriole, Golden	*Oriolus oriolus*	Wryneck	*Jynx torquilla*
Animal (Vertebrate) Species Listed in Schedule 5 (full legal protection at all times)			
Horseshoe Bats (all species)	*Rhinolophidae*	Newt – Great Crested	*Triturus cristatus*
Typical Bats (all species)	*Vespertilionidae*	Snake – Smooth	*Coronella austriaca*
Dolphin – Bottle-nosed	*Tursiops truncatus (tursio)*	Toad, Natterjack	*Epidalea calamita*
Dolphin – Common	*Delphinus delphis*	Turtles – All Species	*Cheloniidae & Dermochelyidae*
Dormouse – Hazel	*Muscardinus avellanarius*	Basking Shark	*Cetorhinus maximus*
Pine Marten	*Martes martes*	Burbot	*Lota lota*
Porpoise – Harbour	*Phocaena phocaena*	Goby – Giant	*Gobius cobitis*
Otter – Eurasian	*Lutra lutra*	Goby – Couch's	*Gobius couchii*
Squirrel – Red	*Sciurus vulgaris*	Seahorse – Short-snouted[2]	*Hippocampus hippocampus*
Walrus	*Odobenus rosmarus*	Seahorse – Spiny	*Hippocampus guttulatus*
Water Vole	*Arvicola amphibius*	Sturgeon	*Acipenser sturio*
Whales – All Species	*Cetacea*	Vendace	*Coregonus albula*

[2] Both sea horse species are protected in England only.

Wildcat	*Felis sylvestris*	Whitefish	*Coregonus lavaretus*
Lizard – Sand	*Lacerta agilis*		
Animal (Vertebrate) Species Protected under Section 9 (1) part: Killing and Injuring & Section 9 (5) Sale			
Adder	*Vipera berus*	Slow-worm	*Anguis fragilis*
Lizard – Viviparous	*Zootoca vivipara*	Snake – Grass	*Natrix helvetica (natrix)*
Animals (Vertebrate) Species Protected under Section 9 (5) Sale only			
Frog – common	*Rana temporaria*	Newt – Smooth	*Lissotriton vulgaris*
Newt – Palmate	*Lissotriton helvetica*	Toad – Common	*Bufo bufo*
Animals (Vertebrate) Species Protected under Section 9 (1) (4)(a): Killing, Injuring & Taking and Damage / Destruction of place of shelter / protection only			
Allis Shad	*Alosa alosa*	Shark – Angel	*Squatina squatina*
Twaite Shad	*Alosa fallax*		
Butterflies & Moths – Full Protection under Schedule 5[3] at all times			
High brown fritillary	*Argynnis adippe*	Fisher's Estuarine Moth	*Gortyna borelii*
Large Blue	*Maculinea arion*	Barberry Carpet	*Pareulype berberata*
Heath Fritillary	*Mellicta athalea*	Black-veined Moth	*Siona lineata*
Marsh Fritillary	*Eurodryas aurinia*	Sussex Emerald	*Thalera fimbrialis*
Swallowtail	*Papilio machaon britannicus*	Essex Emerald	*Thetidia smaragdaris*
Large Copper	*Lycaena dispar*	Fiery Clearwing	*Bembecia chrysidiformis*
Reddish-buff Moth	*Acosmetia caliginosa*	New-Forest Burnet	*Zygaena viciae*
Butterflies – Protected under Section 9 (5) Sale Only			
Purple Emperor	*Apatura iris*	Adonis Blue	*Lysandra bellargus*
Northern Brown Argus	*Aricia artaxerxes*	Chalkhill Blue	*Lysandra coridon*
Pearl-bordered Fritillary	*Boloria euphrosyne*	Glanville Fritillary	*Melitaea cinxia*
Chequered Skipper	*Carterocephalus palaemon*	Large Tortoiseshell	*Nymphalis polychloros*
Large Heath	*Coenonympha tullia*	Silver-studded Blue	*Plebejus argus*
Small Blue	*Cupido minimus*	Black Hairstreak	*Strymonidia pruni*
Mountain Ringlet	*Erebia epiphron*	White-letter Hairstreak	*Strymonidia w-album*
Duke of Burgundy	*Hamearis lucina*	Brown Hairstreak	*Thecla betulae*
Silver-spotted Skipper	*Hesperia comma*	Lulworth Skipper	*Thymelicus acteon*
Wood White	*Leptidea sinapis*		
Other Invertebrates – Full Protection under Schedule 5 at all times			
Rainbow Leaf-beetle	*Chrysolina cerealis*	Tadpole Shrimp	*Triops cancriformis*
Spangled Diving-beetle	*Graphopterus zonatus*	Trembling Sea-mat	*Victorella pavida*
Lesser Silver Water-beetle	*Hydrochara caraboides*	De Folin's Lagoon Snail	*Caecum armoricum*
Moccas Beetle	*Hypebaeus flavipes*	Sandbowl Snail	*Catinella arenaria*
Violet Click-beetle	*Limoniscus violaceus*	Freshwater Pearl Mussel	*Margaritifera margaritifera*
Bembridge Beetle	*Parcymus aeneus*	Glutinous Snail	*Myxas glutinosa*
New Forest Cicada	*Cicadetta montana*	Lagoon Snail	*Paludinella littorina*
Wart-Biter	*Decticus verrucivorus*	Lagoon Sea Slug	*Tenellia adspersa*
Mole-Cricket	*Gryllotalpa gryllotalpa*	Northern Hatchet-shell	*Thyasira gouldi*
Field-Cricket	*Gryllus campestris*	Tentacled Lagoon-worm	*Alkmaria romijni*
Norfolk Hawker Dragonfly	*Aeshna isosceles*	Lagoon Sand-worm	*Armandia cirrhosa*
Southern Damselfly	*Coenagrion mercuriale*	Medicinal Leech	*Hirudo medicinalis*
Fen Raft Spider	*Dolomedes fimbriatus*	Marine Hydroid	*Clavopsella navis*
Ladybird Spider	*Eresus niger (cinaberinus)*	Ivell's Sea Anemone	*Edwardsia ivelli*
Fairy Shrimp	*Chirocephalus diaphanus*	Starlet Sea Anemone	*Nematosella vectensis*
Lagoon Sand Shrimp	*Gammarus insensibilis*	Atlantic Stream (White-clawed) Crayfish	*Austropotamobius pallipes*
Other Invertebrates Protected under Section 9 (1) Possession & 9 (2) (5) Sale only			
Stag Beetle	*Lucanus cervus*	Roman Snail[4]	*Helix pomatia*

[3] Viper's Bugloss Moth *Hadena irregularis* was removed from Schedule 5 in 1996 as it is believed to be extinct.

[4] England only

Fan Mussel	*Atrina fragilis*	Pink Sea-fan	*Eunicella verrucosa*
Other Invertebrates Protected under Section 9 (4) (a) Damage / Destruction of Place of Shelter / Protection only			
Mire Pill Beetle	*Curimopsis nigrita*		
Vascular Plant Species - Full Protection under Schedule 8 at all times (previous Scientific name in brackets)			
Adder's-tongue Least	*Ophioglossum lusitanicum*	Lily – Snowdon	*Gagea serotina (Lloydia serotina)*
Alison- Small	*Alyssum alyssoides*	Marsh-mallow – Rough	*Malva setigera (Althaea hirsuta)*
Broomrape – Bedstraw	*Orobanche caryophyllacea*	Milk-parsley – Cambridge	*Selinum carvifolia*
Broomrape – Oxtongue	*Orobanche picridis*	Mudwort – Welsh	*Limosella aquatica*
Broomrape – Thistle	*Orobanche reticulata*[5]	Naiad – Holly-leaved	*Najas marina*
Cabbage – Lundy	*Coincya wrightii (Rhynchosinapis wrightii)*	Orache – Stalked	*Atriplex pedunculata (Halimione pedunculata)*
Calamint – Wood	*Clinopodium menthifolium (Calamintha sylvatica)*	Orchid – Early Spider	*Ophrys sphegodes*
Catchfly – Alpine	*Silene suecica (Lychnis alpina)*	Orchid – Ghost	*Epipogium aphyllum*
Centaury – Slender	*Centaurium tenuiflorum*	Orchid – Lapland Marsh	*Dactylorhiza lapponica*
Cinquefoil – Rock	*Potentilla rupestris*	Orchid – Late Spider	*Ophrys fuciflora*
Clary – Meadow	*Salvia pratensis*	Orchid – Lizard	*Himantoglossum hircinum*
Club-rush – Triangular	*Schoenoplectus triqueter (Scirpus triqueter)*	Orchid – Military	*Orchis militaris*
Colt's-foot – Purple	*Homogyne alpina*	Orchid – Monkey	*Orchis simia*
Cotoneaster – Wild	*Cotoneaster cambricus (C. integerrimus)*	Pear – Plymouth	*Pyrus cordata*
Cotton-grass – Slender	*Eriophorum gracile*	Pennycress – Perfoliate	*Microthlaspi perfoliatum (Thlaspi perfoliatum)*
Cow-wheat – Field	*Melampyrum arvense*	Pennyroyal	*Mentha pulegium*
Crocus – Sand	*Romulus columnae*	Pigmyweed	*Crassula aquatica*
Cudweed – Broad-leaved	*Filago pyramidata*	Pine - Ground	*Ajuga chamaepitys*
Cudweed – Jersey	*Gnaphalium luteoalbum*	Pink – Cheddar	*Dianthus gratianopolitanus*
Cudweed – Red-tipped	*Filago lutescens*	Pink – Childing	*Petrorhagia nanteuilii*
Cut-grass	*Leersia oryzoides*	Ragwort – Fen	*Jacobaea paludosa (Senecio paludosa)*
Deptford Pink	*Dianthus armeria*	Ramping-fumitory – Martin's	*Fumaria reuteri (F. martinii)*
Diapensia	*Diapensia lapponica*	Rampion – Spiked	*Phyteuma spicata*
Eryngo – Field	*Eryngium campestre*	Restharrow – Small	*Ononis reclinata*
Fern – Dickie's-bladder	*Cystopteris dickieana*	Rock-cress – Alpine	*Arabis alpina*
Fleabane – Alpine	*Erigeron borealis*	Rock-cress – Bristol	*Arabis scabra*
Fleabane – Small	*Pulicaria vulgaris*	Sandwort – Norwegian	*Arenaria norvegica*[6]
Galingale – Brown	*Cyperus fuscus*	Sandwort – Teesdale	*Minuartia stricta*
Gentian – Alpine	*Gentiana nivalis*	Saxifrage – Drooping	*Saxifraga cernua*
Gentian - Dune	*Gentianella amarella subsp. occidentalis (Gentianella uliginosa)*	Saxifrage – Tufted	*Saxifraga cespitosa*
Gentian – Fringed	*Gentianopsis ciliata (Gentianella ciliata)*	Solomon's-seal – Whorled	*Polygonatum verticillatum*
Gentian - Spring	*Gentiana verna*	Sow-thistle – Alpine	*Cicerbita alpina*
Germander – Cut-leaved	*Teucrium botrys*	Spearwort – Adder's-tongue	*Ranunculus ophioglossifolius*
Germander – Water	*Teucrium scordium*	Speedwell – Fingered	*Veronica triphyllos*

[5] The Weeds Act 1959 does not apply to thistles *Cirsium* & *Carduus* species supporting this broomrape.

[6] All subspecies occurring in the UK

Gladiolus – Wild	*Gladiolus illyricus*	Speedwell – Spiked	*Veronica spicata*[7]
Goosefoot – Stinking	*Chenopodium vulvaria*	Spike-rush – Dwarf	*Eleocharis parvula*
Grass-poly	*Lythrum hyssopifolia*	South-stack Fleawort	*Tephroseris integrifolia ssp. maritima*
Hare's-ear – Sickle-leaved	*Bupleurum falcatum*	Star-of-Bethlehem – Early	*Gagea bohemica*
Hare's-ear – Small	*Bupleurum baldense*	Starfruit	*Damasonium alisma*
Hawk's-beard – Stinking	*Crepis foetida*	Strapwort	*Corrigiola littoralis*
Hawkweed – Northroe	*Hieracium northroense*	Violet – Fen	*Viola persicifolia*
Hawkweed – Shetland	*Hieracium zetlandicum*	Viper's-grass	*Scorzonera humilis*
Hawkweed – Weak-leaved	*Hieracium attenuatifolium*	Water-plantain – Ribbon-leaved	*Alisma gramineum*
Heath – Blue	*Phyllodoce caerulea*	Wood-sedge – Starved	*Carex depauperata*
Helleborine – Red	*Cephalanthera rubra*	Woodsia – Alpine	*Woodsia alpina*
Horsetail – Branched	*Equisetum ramosissimum*	Woodsia – Oblong	*Woodsia ilvensis*
Hound's-tongue – Green	*Cynoglossum germanicum*	Wormwood – Field	*Artemisia campestris*
Knawel – Perennial	*Scleranthus perennis*[8]	Woundwort - Downy	*Stachys germanica*
Knot-grass – Sea	*Polygonum maritimum*	Woundwort – Limestone	*Stachys alpina*
Leek – Round-headed	*Allium sphaerocephalon*	Yellow-rattle – Greater	*Rhinanthus angustifolius*
Lettuce – Least	*Lactuca saligna*		
Vascular Plant Species – Partial Protection under Section 13 (2) Protection from commercial exploitation and sale			
Bluebell	*Hyacinthoides non-scripta*		
Bryophytes – Full Protection under Schedule 8 at all times			
Anamodon – Long-leaved	*Anomodon langifolius*	Flamingo Moss	*Desmatodon cernuus*
Blackwort	*Southbya nigrella*	Frostwort	*Gymnomitrion apiculatum*
Crystalwort – Lizard	*Riccia bifurca*	Glaucous Beard Moss	*Barbula glauca*
Earwort – Marsh	*Jamesoniella undulifolia*	Green Shield Moss	*Buxbaumia viridis*
Feathermoss – Polar	*Hygrohypnum polare*	Hair Silk Moss	*Plagiothecium piliferum*
Flapwort – Norfolk	*Leiocolea rutheana*	Knothole Moss	*Zygodon forsteri*
Grimmia – Blunt-leaved	*Grimmia unicolor*	Large Yellow Feather Moss	*Scorpidium turgescens*
Petalwort	*Petalophyllum ralfsii*	Millimetre Moss	*Micromitrium tenerum*
Lindenberg's Leafy-Liverwort	*Adelanthus lindenbergianus*	Multi-fruited River Moss	*Cryphaea lamyana*
Feather-moss Slender Green	*Drepanocladus vernicosus*	Nowell's Limestone Moss	*Zygodon gracilis*
Alpine Copper-Moss	*Mielichoferia meilicoferia*	Rigid Apple Moss	*Bartramia stricta*
Baltic Bog-Moss	*Sphagnum balticum*	Round-leaved feather Moss	*Rhynchostegium rotundifolium*
Blue Dew-Moss	*Saelania glaucescens*	Schleicher's Thread Moss	*Bryum schleicheri*
Blunt-leaved bristle-Moss	*Orthotrichum obtusifolium*	Triangular Pygmy Moss	*Acaulon triquetrum*
Bright-Green Cave-Moss	*Cyclodictyon laetevirens*	Turpswort	*Geocalyx graveolens*
Cordate Beard Moss	*Barbula cordata*	Vaucher's Feather Moss	*Hypnum vaucheri*
Cornish Path Moss	*Ditrichum cornubicum*	Western Rustwort	*Marsupella profunda*
Derbyshire Feather Moss	*Thamnobryum angustifolium*		
Stoneworts – Full Protection under Schedule 8 at all times			
Bearded Stonewort	*Chara canescens*	Foxtail Stonewort	*Lamprothamnium papullosum*

[7] Both subspecies: *spicata* & *hybrida*

[8] Includes both subspecies: *perennis* & *prostratus*

Lichens – Full Protection under Schedule 8 at all times			
New Forest Beech Lichen	*Enterographa elaborata*	Forked Hair Lichen	*Bryoria furcellata*
Snow Caloplaca	*Caloplaca nivalis*	Golden Hair Lichen	*Teloschistes flavicans*
Tree Catapyrenium	*Catapyrenium psoromoides*	Orange-fruited Elm Lichen	*Caloplaca luteoalba*
Laurer's Catillaria	*Catillaria laurei*	River Jelly Lichen	*Collema dichotomum*
Convoluted Cladonia	*Cladonia convoluta*	Starry Breck Lichen	*Buellia asterella*
Upright Mountain Cladonia	*Cladonia stricta*	Caledonia Pannaria	*Pannaria ignobilis*
Goblin Lights	*Catolechia wahlenbergii*	New Forest Parmelia	*Parmelia minarum*
Elm Gyalecta	*Gyalecta ulmi*	Oil Stain Parmentaria	*Parmentaria chilensis*
Tarn Lecanora	*Lecanora archariana*	Southern Grey Physcia	*Physcia tribacioides*
Copper Lecidea	*Lecidea inops*	Ragged Pseudo-cyphellaria	*Pseudocyphellaria lacerata*
Arctic Kidney Lichen	*Nephroma arcticum*	Rusty Alpine Psora	*Psora rubiformis*
Ciliate Strap Lichen	*Heterodermia leucomelos*	Rock Nail	*Calicium corynellum*
Coralloid Rosette Lichen	*Heterodermia propagulifera*	Serpentine Selanopsora	*Selanopsora liparina*
Ear-lobed Dog Lichen	*Peltigera lepidophora*	Sulphur Tresses	*Alectoria ochroleuca*
Lichens – Partial Protection under Section 13 (2) Commercial Exploitation and Sale Only			
Tree Lungwort	*Lobaria pulmonaria*		
Fungi – Full Protection under Schedule 8 at all times			
Royal Bolete	*Boletus regius*	Oak Polypore	*Buglossosporus pulvinus*
Hedgehog Fungus	*Hericium erinaceum*	Sandy Stilt Ball	*Battaria phalloides*
Invasive plant species listed in Schedule 9			
Alexanders, Perfoliate	*Smyrnium perfoliatum*	Kelp, Japanese	*Laminaria japonica*
Algae, Red	*Grateloupia luxurians*	Knotweed, Giant	*Reynoutria (Fallopia) sachalinensis*
Archangel, Variegated Yellow	*Lamiastrum galeobdolon subsp. argentatum*	Knotweed, Hybrid	*Reynoutria (Fallopia) japonica x sachalinensis*
Azalea, Yellow	*Rhododendron luteum*	Knotweed, Japanese	*Reynoutria (Fallopia) japonica*
Balsam, Himalayan	*Impatiens glandulifera*	Leek, Few-flowered	*Allium paradoxum*
Cotoneaster, Wall	*Cotoneaster horizontalis*	Lettuce, water	*Pistia stratiotes*
Cotoneaster, Entire-leaved	*Cotoneaster integrifolius*	Montbretia	*Crocosmia x crocosmiiflora*
Cotoneaster, Himalayan	*Cotoneaster simonsii*	Parrot's Feather	*Myriophyllum aquaticum*
Cotoneaster, Hollyberry	*Cotoneaster bullatus*	Pennywort, Floating	*Hydrocotyle ranunculoides*
Cotoneaster, Small-leaved	*Cotoneaster microphyllus*	Potato, Duck	*Sagittaria latifolia*
Creeper, False Virginia	*Parthenocissus inserta*	Primrose, Floating Water	*Ludwigia peploides*
Creeper, Virginia	*Parthenocissus quinquefolia*	Primrose, Water	*Ludwigia grandiflora*
Dewplant, Purple	*Disphyma crassifolium*	Primrose, Water	*Ludwigia uruguayensis*
False-acacia	*Robinia pseudoacacia*	Rhododendron	*Rhododendron ponticum* and hybrid *R. ponticum x R. maximum*
Fanwort/Carolina Water-Shield	*Cabomba caroliniana*	Rhubarb, Giant	*Gunnera tinctoria*
Fern, Water	*Azolla filiculoides*	Rose, Japanese	*Rosa rugosa*
Fig, Hottentot	*Carpobrotus edulis*	Salvinia, Giant	*Salvinia molesta*
Garlic, Three-cornered	*Allium triquetrum*	Seafingers, Green	*Codium fragile*
Hogweed, Giant	*Heracleum mantegazzianum*	Seaweed, Californian Red	*Pikea californica*

Hyacinth, Water	*Eichhornia crassipes*	Seaweed, Hooked Asparagus	*Asparagopsis armata*
Kelp, Giant species	*Macrocystis angustifolia, M. integrifolia, M. laevis, M. pyrifera*	Seaweed, Japanese	*Sargassum muticum*
Seaweeds, Laver	*Porphyra spp* except except native species, P. *amethystea, P. leucosticte, P. linearis, P. miniate, P. purpurea, P. umbilicalis*	Wakame	*Undaria pinnatifida*
Shallon	*Gaultheria shallon*	Waterweed, Curly	*Lagarosiphon major*
Stonecrop, Australian Swamp/New Zealand Pygmyweed	*Crassula helmsii*	Waterweeds	All species of the genus *Elodea*

Protection of Badgers Act 1992

The main legislation protecting badgers in England and Wales is the Protection of Badgers Act 1992 (the 1992 Act). Under the 1992 Act it is an offence to: wilfully kill, injure, take or attempt to kill, injure or take a badger; dig for a badger; interfere with a badger sett by, damaging a sett or any part thereof, destroying a sett, obstructing access to a sett, causing a dog to enter a sett or disturbing a badger while occupying a sett.

The 1992 Act defines a badger sett as: “any structure or place which displays signs indicating current use by a badger”

Natural Environment and Rural Communities Act 2006

Section 41 (S41) of this Act requires the Secretary of State to publish a list (in consultation with Natural England) of Habitats and Species which are of Principal Importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers such as public bodies including local and regional authorities, in implementing their duty under Section 40 of the Natural Environment and Rural Communities (NERC) Act 2006, to have regard to the conservation of biodiversity in England, when carrying out their normal (e.g. planning) functions. The S41 list includes 65 Habitats of Principal Importance and 1,150 Species of Principal Importance.

Hedgerow Regulations 1997

The Hedgerow Regulations were made under Section 97 of the Environment Act 1995 and came into force in 1997. They introduced new arrangements for local planning authorities in England and Wales to protect important hedgerows in the countryside, by controlling their removal through a system of notification. Important hedgerows are defined by complex assessment criteria, which draw on biodiversity features, historical context and the landscape value of the hedgerow.

Birds of Conservation Concern

This is a review of the status of all birds occurring regularly in the United Kingdom. It is regularly updated and is prepared by leading bird conservation organisations, including the British Trust for Ornithology (BTO), Joint Nature Conservation Committee (JNCC) and The Royal Society for the Protection of Birds (RSPB).

The latest report was produced in 2015 (Eaton *et al*, 2015) and identified 67 red list species, 96 amber species, and 81 green species. The criteria are complex, but generally:

- **Red list** species are those that have shown a decline of the breeding population, non-breeding population or breeding range of more than 50% in the last 25 years.
- **Amber list** species are those that have shown a decline of the breeding population, non-breeding population or breeding range of between 25% and 50% in the last 25 years. Species that have a UK breeding population of less than 300 or a non-breeding population of less than 900 individuals are also included, together with those whose 50% of the population is localised in 10 sites or fewer and those whose 20% of the European population is found in the UK.

- **Green list** species are all regularly occurring species that do not qualify under any of the red or amber criteria are green listed

Global IUCN Red List

The International Union for Conservation of Nature (IUCN) Threatened Species was devised to provide a list of those species that are most at risk of becoming extinct globally. It provides taxonomic, conservation status and distribution information about threatened taxa around the globe.

The system catalogues threatened species into groups of varying levels of threat, which are: Extinct (EX), Extinct in the Wild (EW), Critically Endangered (CE), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DD), Not Evaluated (NE). Criteria for designation into each of the categories is complex, and consider several principles.

Local Biodiversity Action Plan (LBAP)

Local Biodiversity Action Plans (LBAP) identify habitat and species conservation priorities at a local level (typically at the County level), and are usually drawn up by a consortium of local Government organisations and conservation charities.

Some LBAP's may also include Habitat Action Plans (HAP) and/or Species Action Plans (SAP), which are used to guide and inform the local decision making process.

Wild Mammals (Protection) Act 1996

This Act offers protects a form of protection to all wild species of mammals, irrespective of other legislation, and focussed on animal welfare, rather than conservation.

Unless covered by one of the exceptions, a person is guilty of an offence if he mutilates, kicks, beats, nails or otherwise impales, stabs, burns, stones, crushes, drowns, drags or asphyxiates any wild mammal with intent to inflict unnecessary suffering.

It's application is typically restricted to preventing deliberate harm to wildlife (in general) during construction works etc.

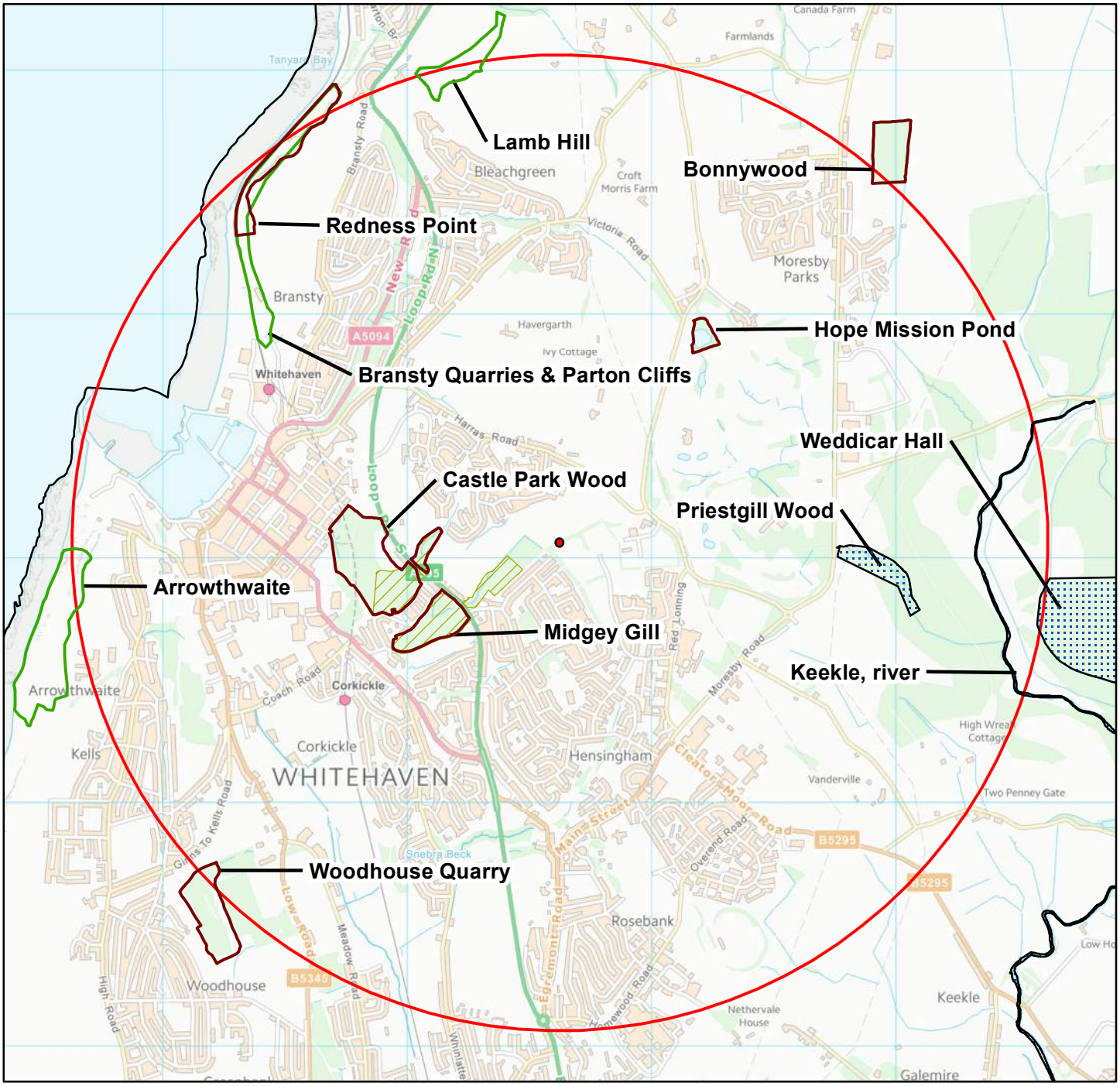
APPENDIX D – RELEVANT DESK STUDY DATA

Cumbria Biodiversity Data Centre (CBDC): Non-Statutory Sites Search

For: Patryk Gruba at Tetratech

Centroid: NX 98624 18062
Site Name: Harras Moor Whitehavne - A090070-410
Buffer: 2km
Search Date: 13/07/2021

N.B. Sites are displayed only if they exist within the search area



Key

- County Wildlife Sites
- Local Geological Sites
- Site of Invertebrate Significance
- Ancient Woodland

0 250 500 1,000 m

N

Any queries in the first instance contact:
Dr Moustafa Eweda
Biological Data Officer
Cumbria Biodiversity Data Centre (CBDC)

T. 01228 618770
E. dataofficer@cbdc.org.uk

APPENDIX E – TARGET NOTES

TN	Description	Photograph
TN 1	NX9885917662 Marshy grassland with an area of swamp, a stand of mature scrub and invasive species. Height between 30 cm and 2m.; 100 % cover. Soft rush *Juncus effusus* A Hoary willowherb *Epilobium parviflorum* A Timothy *Phleum pratense* A Reed canary-grass *Phalaris arundinacea* D Yorkshire-fog *Holcus lanatus* F Silverweed *Potentilla anserina* F Montbretia *Crocosmia x crocosmiiflora* F Tufted hair-grass *Deschampsia cespitosa* F Common couch *Elymus repens* F Great willowherb *Epilobium hirsutum* F Creeping buttercup *Ranunculus repens* F Broad-leaved Dock *Rumex obtusifolius* F Willow *Salix sp.* F Creeping thistle *Cirsium arvense* O Wild angelica *Angelica sylvestris* O Yellow iris *Iris pseudacorus* O Hedge woundwort *Stachys sylvatica* O Common knapweed *Centaurea nigra* R Hemp agrimony *Eupatorium cannabinum* R Articulated rush *Juncus articulatus* R	
TN 2	NX9882517670 Semi-improved neutral grassland along the verge of the path with scrub and ruderal vegetation. False oat-grass *Arrhenatherum elatius* a Hoary willowherb *Epilobium parviflorum* a Dogwood *Cornus sanguinea* f Common couch *Elymus repens* f Silverweed *Potentilla anserina* f Bramble *Rubus fruticosus* agg. f Hogweed *Heracleum sphondylium* o Common nettle *Urtica dioica* o Pendulous sedge *Carex pendula* r	

TN 3	NX9871117886 Broad-leaved plantation woodland. 90% Cover; canopy 12m; shrub layer 5m. Hawthorn *Crataegus monogyna* A Ash *Fraxinus excelsior* D Silver birch *Betula pendula* F Norway maple *Acer platanoides* O Hazel *Corylus avellana* O Oak *Quercus sp.* O Rowan *Sorbus aucuparia* O	
TN 4	NX9883417702 Semi-improved neutral grassland with section of marshy grassland along the western field margin. Height 20 cm to 1.5 m. Grazed by horses at the time of the survey. Yorkshire-fog *Holcus lanatus* A Creeping buttercup *Ranunculus repens* D Creeping bent *Agrostis stolonifera* F Marsh bird's-foot trefoil *Lotus pedunculatus* F Broad-leaved Dock *Rumex obtusifolius* F Meadow foxtail *Alopecurus pratensis* O Common mouse-ear *Cerastium fontanum* O Soft rush *Juncus effusus* O Common couch *Elymus repens* R Hogweed *Heracleum sphondylium* R Common nettle *Urtica dioica* R Creeping thistle *Cirsium arvense* R Cock's-foot *Dactylis glomerata* R Common spotted-orchid *Dactylorhiza fuchsii* R Willowherb *Epilobium sp.* R Yellow iris *Iris pseudacorus* R Perennial rye-grass *Lolium perenne* R Blackthorn *Prunus spinosa* R Meadow buttercup *Ranunculus acris* R	

TN 5	NX9877317771 Cotoneaster species – likely garden escape but not invasive.	
TN 6	NX9874417845 Line of young alder trees *Alnus sp.* within the field	
TN 7	NX9872417896 Mature scrub with sections of ruderal vegetation and semi-improved neutral grassland Bramble *Rubus fruticosus* agg. A Common nettle *Urtica dioica* F False oat-grass *Arrhenatherum elatius* F Alder *Alnus glutinosa* F Willow *Salix sp.* F Hawthorn *Crataegus monogyna* O	

TN 8	NX9869717948 Semi-improved neutral grassland with stands for marshy grassland Meadow foxtail *Alopecurus pratensis* A Creeping buttercup *Ranunculus repens* F Common bent *Agrostis capillaris* F Timothy *Phleum pratense* F Yorkshire-fog *Holcus lanatus* O Soft rush *Juncus effusus* O Creeping thistle *Cirsium arvense* O Perennial rye-grass *Lolium perenne* O Wild angelica *Angelica sylvestris* O Compact rush *Juncus conglomeratus* O Meadow vetchling *Lathyrus pratensis* O Docks *Rumex sp.* O Red Clover *Trifolium pratense* O	
TN 9	NX9874417938 Species-poor semi-improved grassland grazed by horses at the time of the survey. Height 5 cm to 10 cm and 70% cover. Yorkshire-fog *Holcus lanatus* A Meadow buttercup *Ranunculus acris* A Creeping buttercup *Ranunculus repens* F Silverweed *Potentilla anserina* F	
TN 10	NX9868117952 Stand of scrub within the semi-improved neutral grassland adjacent to the woodland comprising dominant bramble *Rubus fruticosus* agg and frequent rose species *Rosa sp.*	

TN 11	NX9869117940 Dry ditch within the grassland	
TN 12	NX9867417982 Marshy grassland with scattered scrub. Yorkshire-fog *Holcus lanatus* A Meadow foxtail *Alopecurus pratensis* A Soft rush *Juncus effusus* A Timothy *Phleum pratense* A Sweet vernal-grass *Anthoxanthum odoratum* F Dotted loosestrife *Lysimachia punctata* F Marsh bird's-foot trefoil *Lotus pedunculatus* O Common spotted-orchid *Dactylorhiza fuchsii* O	
TN 13	NX9868617990 Strip of semi-improved neutral grassland between two field grazed by horses. Species composition and cover similar to TN8.	
TN 14	NX9863118023 Species poor semi-improved rank grassland with abundant stand of soft rush and scattered scrub / young trees dissected by ditches Soft rush *Juncus effusus* A Timothy *Phleum pratense* A Creeping buttercup *Ranunculus repens* A Yorkshire-fog *Holcus lanatus* D False oat-grass *Arrhenatherum elatius* D Common sorrel *Rumex acetosa* F Bramble *Rubus fruticosus* agg. F Common spotted-orchid *Dactylorhiza fuchsii* O Alder *Alnus glutinosa* O	

TN 15	NX9868418031 Species-poor semi-improved grassland grazed by horses on rotation. Species cover and composition similar to TN 9	
TN 16	NX9877317994 Stable building within the horse pasture. No features suitable for bats.	
TN 17	NX9878617981 Dense bracken along the ditch	
TN 18	NX9877418017 Dense scrub with bracken and ruderal vegetation Bramble *Rubus fruticosus* agg. A Bracken *Pteridium aquilinum* A Common nettle *Urtica dioica* F Hawthorn *Crataegus monogyna* F Creeping thistle *Cirsium arvense* F Willow *Salix sp.* O Willowherb *Epilobium sp.* O Dotted loosestrife *Lysimachia punctata* R	

TN 19	NX9881717970 Stand of mature, tall scrub. Blackthorn *Prunus spinosa* A Bramble *Rubus fruticosus* agg. F Hawthorn *Crataegus monogyna* O Hazel *Corylus avellana* O Rowan *Sorbus aucuparia* O Wild cherry *Prunus avium* O Goat willow *Salix caprea* O Elder *Sambucus nigra* O Whitebeam *Sorbus sp.* O Pine *Pinus* sp. R	
TN 20	NX9877417914 Block of broad-leaved plantation woodland.90% cover; canopy layer 12 m in height; scrub layer 2 m in height. Blackthorn *Prunus spinosa* A Willow *Salix sp.* A Elder *Sambucus nigra* F Ash *Fraxinus excelsior* F Oak *Quercus sp.* F Rowan *Sorbus aucuparia* O	
TN 21	NX9885617891 Species-poor semi-improved grassland grazed by horses. Perennial rye-grass *Lolium perenne* A White clover *Trifolium repens* A Creeping buttercup *Ranunculus repens* F	
TN 22	NX9884217880 Semi-improved neutral grassland along the verge between the grazed field and road. Creeping buttercup *Ranunculus repens* F Yorkshire-fog *Holcus lanatus* F Broad-leaved Dock *Rumex obtusifolius* F Tufted hair-grass *Deschampsia cespitosa* F Creeping soft-grass *Holcus mollis* F Rough meadow-grass *Poa trivialis* F White clover *Trifolium repens* O Meadow foxtail *Alopecurus pratensis* O Common couch *Elymus repens* O Cock's-foot *Dactylis glomerata* O	

	Hoary willowherb *Epilobium parviflorum* O Silverweed *Potentilla anserina* O Common knapweed *Centaurea nigra* R Meadow vetchling *Lathyrus pratensis* R Ribwort plantain *Plantago lanceolata* R	
TN 23	NX9889217860 Marshy grassland with a small section of swamp and scattered scrub and invasive species. Height between 30 cm and 2 m; 100 cover. Yorkshire-fog *Holcus lanatus* A Soft rush *Juncus effusus* A Hoary willowherb *Epilobium parviflorum* A Timothy *Phleum pratense* A Reed canary-grass *Phalaris arundinacea* A Creeping buttercup *Ranunculus repens* F Broad-leaved Dock *Rumex obtusifolius* F Tufted hair-grass *Deschampsia cespitosa* F Common couch *Elymus repens* F Silverweed *Potentilla anserina* F Marsh bird's-foot trefoil *Lotus pedunculatus* F Montbretia *Crocosmia x crocosmiiflora* F Great willowherb *Epilobium hirsutum* F Hemp agrimony *Eupatorium cannabinum* F Creeping thistle *Cirsium arvense* O Wild angelica *Angelica sylvestris* O Field horsetail *Equisetum arvense* O Cleavers *Galium aparine* O Cock's-foot *Dactylis glomerata* R Articulated rush *Juncus articulatus* R	
TN 24	NX9886017854 Area of swamp within the marsh grassland dominated by reed-canary grass *Phalaris arundinacea*	

TN 25	NX9891917855 Dense stand of dotted loosestrife within marshy grassland *Lysimachia punctata*	
TN 26	NX9895817858 Stands of invasive montbretia *Crocosmia x crocosmiiflora* and rhododendron within marshy grassland *Rhododendron ponticum*	
TN 27	NX9894817908 Dense bramble scrub within marshy grassland.	
TN 28	NX9897017896 Scattered scrub within marshy grassland including willow *Salix sp.,* gorse *Ulex sp.* and heather *Calluna vulgaris*	

TN 29	NX9894417951 Stand of invasive Himalayan balsam *Impatiens glandulifera*	
TN 30	NX9894817979 Block of broad-leaved plantation woodland. 80% Cover; canopy layer 7-8m in height; shrub layer 3m in height Bramble *Rubus fruticosus* agg. A Sycamore *Acer pseudoplatanus* D Beech *Fagus sylvatica* D Elder *Sambucus nigra* F Ash *Fraxinus excelsior* F Hawthorn *Crataegus monogyna* F Rowan *Sorbus aucuparia* R Wild cherry *Prunus avium* R Crack-willow *Salix x fragilis* R	
TN 31	NX9892517968 Stand of invasive Himalayan balsam *Impatiens glandulifera*	
TN 32	NX9897218010 Marshy grassland with some shallow drainage present. Soft rush *Juncus effusus* F Silverweed *Potentilla anserina* F Field horsetail *Equisetum arvense* F Common sorrel *Rumex acetosa* F Hogweed *Heracleum sphondylium* F Meadow buttercup *Ranunculus acris* F Compact rush *Juncus conglomeratus* F Yorkshire-fog *Holcus lanatus* O Creeping thistle *Cirsium arvense* O Meadow foxtail *Alopecurus pratensis* O Common knapweed *Centaurea nigra* O	

	Common spotted-orchid *Dactylorhiza fuchsii* O Sweet vernal-grass *Anthoxanthum odoratum* O Hemp agrimony *Eupatorium cannabinum* R Colt's-foot *Tussilago farfara* R	
TN 33	NX9899918028 Semi-improved neutral grassland; former football pitch. Height 50 cm to 2 m; 100% cover. Yorkshire-fog *Holcus lanatus* D Common couch *Elymus repens* F Creeping bent *Agrostis stolonifera* F Soft rush *Juncus effusus* O Meadow buttercup *Ranunculus acris* O Silverweed *Potentilla anserina* R Field horsetail *Equisetum arvense* R Common sorrel *Rumex acetosa* R Common spotted-orchid *Dactylorhiza fuchsii* R Timothy *Phleum pratense* R Tufted hair-grass *Deschampsia cespitosa* R	
TN 34	NX9900817985 Tall ruderal vegetation with scattered alder scrub. Height 75cm to 2m; 100% cover. Hogweed *Heracleum sphondylium* D Yorkshire-fog *Holcus lanatus* A Creeping thistle *Cirsium arvense* A Broad-leaved Dock *Rumex obtusifolius* A False oat-grass *Arrhenatherum elatius* A Field horsetail *Equisetum arvense* F Hoary willowherb *Epilobium parviflorum* F Common nettle *Urtica dioica* F Soft rush *Juncus effusus* O Common sorrel *Rumex acetosa* O Creeping buttercup *Ranunculus repens* O	
TN 35	NX9905217966 Plantation broad-leaved woodland, between the discharged football field and housing estate. Canopy height: 8m, Shrub layer height: 2m. Ash dieback evident. Ash *Fraxinus excelsior* D Hawthorn *Crataegus monogyna* A Alder *Alnus glutinosa* F Sycamore *Acer pseudoplatanus* O Hazel *Corylus avellana* O Osier *Salix viminalis* O Oak *Quercus sp.* R Bramble *Rubus fruticosus* agg. A	

TN 36	NX9908317986 Bramble *Rubus fruticosus* agg. Scrub.	
TN 37	NX9903218076 Overgrown defunct, species-poor hedgerow comprised of hawthorn *Crataegus monogyna.*	
TN 38	NX9907818071 Area of marshy grassland with bramble scrub Height: 50cm – 1.5m 100% cover Bramble *Rubus fruticosus* agg. D Rosebay willowherb *Chamaenerion angustifolium* D Hogweed *Heracleum sphondylium* A Creeping thistle *Cirsium arvense* F False oat-grass *Arrhenatherum elatius* F Tufted hair-grass *Deschampsia cespitosa* F Hoary willowherb *Epilobium parviflorum* F Marsh bird's-foot trefoil *Lotus pedunculatus* F Ribwort plantain *Plantago lanceolata* F Common knapweed *Centaurea nigra* O Soft rush *Juncus effusus* O Upright hedge-parsley *Torilis japonica* O Tufted vetch *Vicia cracca* O Common nettle *Urtica dioica* R Meadow vetchling *Lathyrus pratensis* R	

TN 39	NX9896918075 A small area of plantation broad-leaved woodland adjacent to the industrial units Canopy height: 9m 80% cover Shrub layer: 2m 30% cover Ground flora: Ash *Fraxinus excelsior* D Alder *Alnus glutinosa* F Osier *Salix viminalis* O Scot's pine *Pinus sylvestris* F Hawthorn *Crataegus monogyna* O Hazel *Corylus avellana* O Hoary willowherb *Epilobium parviflorum* F Cock's-foot *Dactylis glomerata* F Common nettle *Urtica dioica* F Tufted hair-grass *Deschampsia cespitosa* O Male-fern *Dryopteris filix-mas* O Herb Robert *Geranium robertianum* O Red campion *Silene dioica* O	
TN 40	NX9884518010 Poor semi-improved grassland. Evidence of grazing with some areas of bare ground, with vegetation of varying heights 5cm - 1m. 95% cover. Meadow foxtail *Alopecurus pratensis* A Creeping bent *Agrostis stolonifera* F Creeping thistle *Cirsium arvense* F White clover *Trifolium repens* F Broad-leaved Dock *Rumex obtusifolius* O Cock's-foot *Dactylis glomerata* O Soft rush *Juncus effusus* O Creeping buttercup *Ranunculus repens* O Tufted hair-grass *Deschampsia cespitosa* O	
TN 41	NX9881318016 Ungrazed, dense neutral semi-improved grassland. Height: 50cm - 2m 100% cover Yorkshire-fog *Holcus lanatus* A Meadow foxtail *Alopecurus pratensis* O Hogweed *Heracleum sphondylium* A Silverweed *Potentilla anserina* F Timothy *Phleum pratense* F Creeping thistle *Cirsium arvense* O White clover *Trifolium repens* F Broad-leaved Dock *Rumex obtusifolius* R Common knapweed *Centaurea nigra* O Great willowherb *Epilobium hirsutum* R Common nettle *Urtica dioica* A Cock's-foot *Dactylis glomerata* O Perennial rye-grass *Lolium perenne* A Common sorrel *Rumex acetosa* F	

	Creeping buttercup *Ranunculus repens* O Common mouse-ear *Cerastium fontanum* R Common bent *Agrostis capillaris* R Square-stalked willowherb *Epilobium tetragonum* O Meadow vetchling *Lathyrus pratensis* O	
TN 42	NX9877918088 Poor semi-improved grassland on a gentle western slope. Evidence of sheep grazing. Height: 5cm – 75cm. 100% cover. Meadow foxtail *Alopecurus pratensis* A Creeping bent *Agrostis stolonifera* F Creeping thistle *Cirsium arvense* F White clover *Trifolium repens* F Sweet vernal-grass *Anthoxanthum odoratum* O Broad-leaved Dock *Rumex obtusifolius* O Cock's-foot *Dactylis glomerata* O Soft rush *Juncus effusus* O Creeping buttercup *Ranunculus repens* O Crested dog's tail *Cynosurus cristatus* O Tufted hair-grass *Deschampsia cespitosa* O	
TN 43	NX9884218094 Broadleaved plantation woodland running through the centre of the site. Some areas of the woodland with a more open canopy and therefore more developed ground flora. Deadwood present and regenerating ash and blackthorn. Height: Canopy 10m Ground flora: 10cm – 1m Hawthorn *Crataegus monogyna* F Ash *Fraxinus excelsior* O Alder *Alnus glutinosa* D Rowan *Sorbus aucuparia* O Willow *Salix sp.* R Sycamore *Acer pseudoplatanus* F Pine *Pinus* sp. R Poplar *Populus sp.* R Cherry *Prunus sp.* F Blackthorn Prunus spinosa F Sycamore *Acer pseudoplatanus* R Hazel *Corylus avellana* R Oak *Quercus sp.* R Common nettle *Urtica dioica* A Bramble *Rubus fruticosus* agg. D Cleavers *Galium aparine* F Creeping soft-grass *Holcus mollis* F Hogweed *Heracleum sphondylium* O False oat-grass *Arrhenatherum elatius* O Cock's-foot *Dactylis glomerata* O	

	Dog-rose *Rosa canina* agg. O Male-fern *Dryopteris filix-mas* R Herb Robert *Geranium robertianum* R	
TN 44	NX9874818074 Marshy grassland, species-poor with evidence of mowing and grazing. Height: c.50cm Cover: 100% Soft rush *Juncus effusus* D Yorkshire-fog *Holcus lanatus* A Common bent *Agrostis capillaris* A Common sorrel *Rumex acetosa* O Willowherb *Epilobium sp.* O Common mouse-ear *Cerastium fontanum* O Common nettle *Urtica dioica* R Wild angelica *Angelica sylvestris* R Creeping buttercup *Ranunculus repens* R	
TN 45	NX9871518099 Defunct, overgrown species-poor hedgerow on a hedgebank between the marshy grassland and broadleaved plantation woodland. Flytipping present. Height: 1 - 1.5m, Width c. 2m Hawthorn *Crataegus monogyna* A Rowan *Sorbus aucuparia* F Bramble *Rubus fruticosus* agg. F Scaly male-fern *Dryopteris affinis* s.l. O Holly *Ilex aquifolium* O Foxglove *Digitalis purpurea* R	
TN 46	NX9882518166 Unmanaged semi-improved neutral grassland Height: 20cm – 1.2m Cover: 100% Yorkshire-fog *Holcus lanatus* F Common couch *Elymus repens* O Meadow foxtail *Alopecurus pratensis* F Common bent *Agrostis capillaris* O Meadow buttercup *Ranunculus acris* R Common spotted-orchid *Dactylorhiza fuchsii* O Timothy *Phleum pratense* O Creeping thistle *Cirsium arvense* A Compact rush *Juncus conglomeratus* O Field horsetail *Equisetum arvense* A White clover *Trifolium repens* R Sweet vernal-grass *Anthoxanthum odoratum* O Broad-leaved Dock *Rumex obtusifolius* O Soft rush *Juncus effusus* R Hogweed *Heracleum sphondylium* R False oat-grass *Arrhenatherum elatius* F Cock's-foot *Dactylis glomerata* F	

	Common nettle *Urtica dioica* O Yarrow *Achillea millefolium* R Creeping buttercup *Ranunculus repens* O Ragwort *Jacobaea vulgaris* R Creeping cinquefoil *Potentilla reptans* R Red Clover *Trifolium pratense* R Meadow vetchling *Lathyrus pratensis* A	
TN 47	NX9888818161 Defunct, overgrown species-poor hedgerow comprised of hawthorn, *Crataegus monogyna,* present on a small hedgebank (wall).	
TN 48	NX9888618156 Stand of invasive Himalayan balsam *Impatiens glandulifera*	
TN 49	NX9888218193 Sea buckthorn *Hippophae rhamnoides* scrub,	

TN 50	NX9889218185 Stand of invasive Himalayan balsam *Impatiens glandulifera* along the woodland edge	
TN 51	NX9878318234 Poor semi-improved grassland, unmanaged. Height: 70cm – 1m. 100% cover. Perennial rye-grass *Lolium perenne* A Yorkshire-fog *Holcus lanatus* F Meadow foxtail *Alopecurus pratensis* F Common bent *Agrostis capillaris* F White clover *Trifolium repens* O Soft rush *Juncus effusus* O Creeping buttercup *Ranunculus repens* O Crested dog's tail *Cynosurus cristatus* O Timothy *Phleum pratense* R Creeping thistle *Cirsium arvense* R Spear thistle *Cirsium vulgare* R Curled dock *Rumex crispus* R	
TN 52	NX9881618224 Marshy grassland within a fenced area. Height: 30cm – 1.5m 100% cover. Soft rush *Juncus effusus* D Yorkshire-fog *Holcus lanatus* A Creeping buttercup *Ranunculus repens* F Tufted hair-grass *Deschampsia cespitosa* F Meadow buttercup *Ranunculus acris* O Broad-leaved Dock *Rumex obtusifolius* R	

TN 53	NX9876618192 Tall ruderal Height: 1 - 1.2m 100% cover Yorkshire-fog *Holcus lanatus* A Meadow foxtail *Alopecurus pratensis* O Creeping bent *Agrostis stolonifera* F Common bent *Agrostis capillaris* O Compact rush *Juncus conglomeratus* R Cock's-foot *Dactylis glomerata* O Common nettle *Urtica dioica* O Creeping thistle *Cirsium arvense* D Broad-leaved Dock *Rumex obtusifolius* O	
TN 54	NX9859018147 Semi-improved neutral grassland Height 30cm – 70cm 100% cover. Perennial rye-grass *Lolium perenne* O Yorkshire-fog *Holcus lanatus* F Soft rush *Juncus effusus* F White clover *Trifolium repens* F Common bent *Agrostis capillaris* F Meadow foxtail *Alopecurus pratensis* F Sweet vernal-grass *Anthoxanthum odoratum* O Common mouse-ear *Cerastium fontanum* O Articulated rush *Juncus articulatus* O Creeping buttercup *Ranunculus repens* O Ribwort plantain *Plantago lanceolata* R Common sorrel *Rumex acetosa* R Crested dog's tail *Cynosurus cristatus* F Ragwort *Jacobaea vulgaris* R Selfheal *Prunella vulgaris* R Lesser stitchwort *Stellaria graminea* R Meadow vetchling *Lathyrus pratensis* R Marsh thistle *Cirsium palustre* R Marsh bedstraw *Galium palustre* R	
TN 55	NX9856618094 Marshy grassland, tussock and dense, unmanaged. Height 50cm – 1.5m 100% cover. Soft rush *Juncus effusus* D Yorkshire-fog *Holcus lanatus* A Tufted hair-grass *Deschampsia cespitosa* A Common bent *Agrostis capillaris* O Creeping buttercup *Ranunculus repens* O Common sorrel *Rumex acetosa* R Common mouse-ear *Cerastium fontanum* R Wild angelica *Angelica sylvestris* R Marsh thistle *Cirsium palustre* R Marsh bedstraw *Galium palustre* R Cat's-ear *Hypochaeris radicata* R	

TN 56	NX9827617845 Invasive species Rhododendron *Rhododendron ponticum* present within woodland adjacent to the site boundary.	
TN 57	NX9827217854 Garden escape species of Cotoneaster (but non-invasive) and Rhododendron *Rhododendron ponticum* present within woodland adjacent to the site boundary.	
TN 58	NX9839418132 Marshy grassland flush within semi-improved neutral grassland. Soft rush *Juncus effusus* D Marsh bird's-foot trefoil *Lotus pedunculatus* R Willow *Salix sp.* R