LAND AT HURST QUARRY, HURST ROAD, BIDDULPH, STAFFORDSHIRE -

EXTENDED PHASE 1 HABITAT SURVEY

REVISED FEBRUARY 2017

ces ecology
consultant ecologists

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EXECUTIVE SUMMARY

- Cheshire Ecological Services Ltd. (CES), the consultancy arm of Cheshire Wildlife Trust, to which all profits are covenanted, was commissioned to conduct an Extended Phase 1 Habitat Survey of land at Hurst Quarry, Biddulph, in connection with an outline planning application to develop the site for residential use.

- The purpose of the survey was to gain baseline ecological information of the site in order to assess its current status, to identify any ecological constraints to development that may currently be associated with the development areas and/or the surrounding land, and to recommend further survey if necessary.

- The proposed development site totals 9.5 hectares and is located within the larger survey area which totalled approximately 13.8Ha. The survey area is located approximately 820m to the north-east of the town of Biddulph whilst Congleton is located approximately 2.4km to the north-west.

- At the time of survey the survey area comprised a disused sand quarry with industrial buildings, ponds/water-bodies, areas of woodland, grassland, scrub and dry heath.

- As part of the desk-based study, the Local Biodiversity Recording Centre provided records of protected and BAP Priority Species occurring within 2km of the proposed development site, within the past twenty years.

- Features of ecological interest identified during the survey included ponds, woodland, grassland/heathland mosaic, herb-rich unimproved neutral grassland, dry heath and cliff faces. Although not necessarily afforded legal protection, it is recommended that where practicable, these features be retained and sufficiently protected during development works.

- The ponds, woodland and heathland/grassland mosaic habitats present within the survey area and proposed development site qualify as Priority habitats and so are material considerations under the National Planning Policy Framework (NPPF).

- The habitat composition of the site was considered to have potential to support legally protected and Priority wildlife species, including badger, barn owl, bats, birds, bluebell, brown hare, great crested newt, hedgehog, invertebrates, polecat and reptiles.

- It is considered appropriate and proportionate to recommend further survey effort in respect of barn owl and invertebrates before any potentially disturbing works take place. CES has been commissioned to conduct a number of surveys in relation to badger, bats, breeding birds, great crested newt and reptiles.

- A number of recommendations have been made made in respect of the protection of bluebell, brown hare, hedgehog and the control of non-native invasive species which may inadvertently stray on to/colonise the development site.

1.0 INTRODUCTION

1.1 Cheshire Ecological Services Ltd. (CES), the consultancy arm of Cheshire Wildlife Trust, to which all profits are covenanted, was commissioned to conduct an Extended Phase 1 Habitat Survey of land at Hurst Quarry, Biddulph, in connection with an outline planning application to develop the site for residential use.

1.2 The purpose of the survey was to gain baseline ecological information of the site in order to assess its current status, to identify any ecological constraints to development that may currently be associated with the development area and/or the surrounding land, and to recommend further survey if necessary.

1.3 The survey was conducted by Natasha Firth BSc (Hons) MSc Grad CIEEM and Matthew Lawton BSc (Hons) ACIEEM on 9th August 2016.

1.4 Weather conditions at the time of survey were changeable with sunny spells and heavy rain showers, with a temperature of 17°C.

2.0 SITE DESCRIPTION

2.1 The survey was centred on the following OS grid reference: SJ 90179 59559.

2.2 The area of land requested to be surveyed totals approximately 13.8 hectares, and is hereafter referred to as the 'survey area'. The proposed development site totals approximately 9.5Ha, and is hereafter referred to at the 'site'. It is contained within the survey area. The survey area is located approximately 820m to the north-east of the town of Biddulph whilst Congleton is located approximately 2.4km to the north-west.

2.3 At the time of survey the survey area comprised a disused sand quarry with industrial buildings, ponds/water-bodies, areas of woodland, grassland, scrub and dry heath.

2.4 Land use in the wider area comprised the Biddulph Grange Country Park, grazed farmland and residential properties (refer to Appendix A – Site Location Plan).

2.5 The survey area was bounded to the north and west by farmland, to the east by farmland and Troughstone Hill Site of Biological Importance (SBI), and to the south by Hurst Road with Spring Wood and Biddulph Grange Country Park beyond.

3.0 SURVEY METHODS

Desk-based study

3.1 The desk-based study comprised consultation with the following consultees:

- Defra - Magic Map
- Staffordshire Ecological Record (SER) - the Biodiversity Information Service for Staffordshire

- Ordnance Survey - OS mapping of the local and wider area

3.2 The desk-based study comprised consultation with Defra's online facility 'Magic Map' to search for statutorily designated nature conservation sites within the local and wider area.

3.3 SER was asked to provide information on statutory and non-statutory nature conservation sites and protected/Biodiversity Action Plan (BAP) Priority species and habitats within, and surrounding, the proposed development site (within approximately a 2km radius).

Extended Phase 1 Habitat Survey

3.4 This survey involved the mapping of various habitat types on the site in addition to any habitat features and botanical species of conservation importance. A thorough walk-over survey was undertaken of the site. The methodology for this survey followed that described by the Joint Nature Conservation Committee (JNCC, 2010).

3.5 Priority habitats, for which there is a national or local Biodiversity Action Plan (BAP) and those listed under Section 41 (S41) of the Natural Environment and Rural Communities Act, 2006, were recorded as such where present. The UK BAP list of Priority habitats and species has now been superseded by the S41 list, however, as it is still widely recognised the two should be considered interchangeable.

3.6 Preliminary searches were also carried out for protected and Priority species such as badgers, bats, reptiles and great crested newts (GCN) that may potentially use the site. Scientific names and the national status of vegetative species recorded follow Stace (1997). Scientific and common names stated in the text are also presented in Appendix D.

3.7 The abundance of all recorded botanical species identified in potential Priority habitats was assessed using the DAFOR scale, as described by Sutherland (1996). The DAFOR scale is a broad interpretive assessment whereby the surveyor assigns one of the following categories to the abundance of the species; Dominant, Abundant, Frequent, Occasional or Rare.

Survey Limitations

3.8 The observations made during this survey have been used to assess the presence, or potential presence, of protected and/or Priority species within the proposed area of works and to recommend further actions where required. It should however, be noted that this survey serves as a single visit representing a 'snap-shot in time' whereby only the species present at the time of survey were recorded.

3.9 Positive evidence of species that use this site periodically or are in growth at different times of the year may not have been recorded. It is important to consider that the absence of a species from a particular survey does not necessarily indicate the absence (or continued absence) of that species from the area.

4.0 RESULTS

Desk-based Study

4.1 Defra's online facility 'Magic Map' indicates that the closest statutorily designated nature conservation site is Biddulph Valley Way Local Nature Reserve (LNR), which has an area of approximately 4.3Ha and is located approximately 1.6km to the west of the site at its nearest point. This site is a former branch of the North Staffordshire Railway and comprises a 4.5 mile long flat path. Habitats include small copses, hedgerows and ditches.

4.2 Defra's online facility 'Magic Map' also indicates that the site lies within the Impact Risk Zones for a number of Sites of Special Scientific Interest (SSSI). The closest of which is Gannister Quarry SSSI which is located approximately 2.9km to the west of the proposed development site at its nearest point. This site is designated for its valuable exposures of a sequence of shales, sandstones and three ganister layers. Rocks have been found to contain the fossils of marine animals which indicate the deposits accumulated near to the sea shore.

4.3 Roe Park Woods SSSI is located approximately 3.6km to the south-west of the proposed development site and totals 34.6Ha. This site is noted for its extensive area of semi-natural ancient woodland which contains rare woodland types for Cheshire. Dane-in-Shaw Pasture SSSI is located approximately 3.6km to the north-west of the proposed development site and totals 7.7Ha. This area of unimproved pasture is noted as one of the largest and most botanically diverse areas of flushed neutral grassland in lowland Cheshire.

4.4 SER indicated that a number of non-statutorily designated nature conservation sites are located within 2km of the survey area:

- Troughstone Hill Site of Biological Importance (SBI) is located immediately adjacent the north-eastern boundary of the survey area and within approximately 70m of the proposed development site. This site totals approximately 7.1Ha and is in a steep hillside location with rock outcrops and scree. This lowland heathland site is dominated by a dry heath/acid grassland mosaic with areas of regeneration woodland and bracken dominated herbs.
- The Sprink SBI is located approximately 190m to the south-east of the survey area and totals 4.4Ha. This site comprises a wooded valley which runs either side of a series of meandering streams. This oak dominated woodland has a diverse ground flora which includes ancient woodland indicator species.
- Dingle Brook SBI is located approximately 1.1km to the north-east of the survey area at its closest point and totals 12.8Ha. This site comprises Dingle Brook and some of its tributaries, woodland, semi-improved grassland and cattle-grazed grassland.
- Whitemore Farm (east of) SBI is located approximately 1.1km to the north-west of the survey area and totals approximately 2.1Ha. This site comprises a sycamore and silver birch dominated steep-sided woodland. Biddulph Brook runs along the western edge of this woodland. This woodland is listed on the Ancient Woodland Inventory.

- Band's Wood and Cheshire Brook Wood SBI is located approximately 1.2km to the north of the survey area at its nearest point and totals 11.8Ha. This woodland site is partly listed on the Ancient Woodland Inventory and has a diverse canopy. Ground flora is generally indicative of the woodland's antiquity. Two small streams and an area of unimproved acid grassland are also present on site.
- Shirkley Wood SBI is located approximately 1.5km to the east of the survey area and totals 3.8Ha. This ancient semi-natural woodland is located on a steep ridge and ground flora is generally lacking in diversity with greater numbers of species recorded in the steep gorge.
- Congleton Edge (South of) SBI is located approximately 1.5km to the north-west of the survey area and totals 35Ha. This site comprises a woodland ridge with acidic ground flora and grazed acidic and neutral fields with some marshy areas. Key acid grassland species included wavy hair-grass and sheep sorrel.
- Pleasant View Verges Biodiversity Alert Site (BAS) is located approximately 1.3km to the north-east of the survey area and totals 0.15Ha. This site is noted for its mosaic of dry heath and acid grassland on the inner edge and neutral grassland sward on the outer edge.

4.5 SER highlighted the presence of ancient and semi-natural woodland, and ancient replanted woodland occurring within 2km of the survey area, with the closest located approximately 40m to the south-west of the site.

4.6 SER highlighted the presence of the following protected species occurring within approximately 2km of the proposed development site since 1996:

Scientific name	Common name	Designations
Tyto alba	Barn Owl	WCA1, WCA9, LBAP, BAm (RSPB)
Hirundo rustica	Barn Swallow	BAm(RSPB)
Limosa limosa	Black-tailed Godwit	WCA1, BRd(RSPB)
Hyacinthoides non-scripta	Bluebell	WCA8
Fringilla montifringilla	Brambling	WCA1
Myotis brandtii	Brandt's Bat	WCA5, S41, HabRegs2
Lepus europaeus	Brown Hare	S41, UKBAP
Plecotus auritus	Brown Long-eared Bat	WCA5, S41, HabRegs2, UKBAP
Spilosoma lutea	Buff Ermine	S41, UKBAP
Pyrrhula pyrrhula	Common Bullfinch	BAm(RSPB)
Loxia curvirostra	Common Crossbill	WCA1, BAm(RSPB)
Cuculus canorus	Common Cuckoo	S41, BRd(RSPB), UKBAP
Alcedo atthis	Common Kingfisher	WCA1, BAm(RSPB)
Pipistrellus pipistrellus	Common Pipistrelle	WCA5, HabRegs2, LBAP
Gallinago gallinago	Common Snipe	LBAP, BAm(RSPB)
Sturnus vulgaris	Common Starling	BRd(RSPB)
Apus apus	Common Swift	BAm(RSPB)
Sylvia communis	Common Whitethroat	BAm(RSPB)
Emberiza calandra	Corn Bunting	S41, LBAP, BRd(RSPB)
Myotis daubentonii	Daubenton's Bat	WCA5, S41, HabRegs2, LBAP
Melanchra persicariae	Dot Moth	S41, UKBAP
Prunella modularis	Dunnock	BAm(RSPB)
Meles meles	Eurasian Badger	BAct
Numenius arquata	Eurasian Curlew	S41, UKBAP, BAm(RSPB)
Falco subbuteo	Eurasian Hobby	WCA1
Passer montanus	Eurasian Tree Sparrow	S41, UKBAP, BRd(RSPB)
Scolopax rusticola	Eurasian Woodcock	BAm(RSPB)

Turdus pilaris	Fieldfare	WCA1, BRd(RSPB)
Anas strepera	Gadwall	BAm(RSPB)
Hepialus humuli	Ghost Moth	S41, UKBAP
Picus viridis	Green Woodpecker	BAm(RSPB)
Perdix perdix	Grey Partridge	S41, UKBAP, LBAP, BRd(RSPB)
Delichon urbicum	House Martin	BAm(RSPB)
Passer domesticus	House Sparrow	S41, BRd(RSPB), UKBAP
Acronicta rumicis	Knot Grass	S41, UKBAP
Chiasmia clathrata	Latticed Heath	S41, UKBAP
Acanthis cabaret	Lesser Redpoll	S41, UKBAP, BRd(RSPB)
Dendrocopos minor	Lesser Spotted Woodpecker	S41, BRd(RSPB)
Linaria cannabina	Linnet	S41, LBAP, BRd(RSPB),
Anas platyrhynchos	Mallard	BAm(RSPB)
Myotis	Myotis Bat sp.	WCA5, S41, HabRegs2
Myotis nattereri	Natterer's Bat	WCA5, S41, HabRegs2
Nyctalus noctula	Noctule Bat	WCA5, S41, HabRegs2, UKBAP, LBAP
Vanellus vanellus	Northern Lapwing	S41, UKBAP, LBAP, BRd(RSPB)
Falco peregrinus	Peregrine Falcon	WCA1
Ficedula hypoleuca	Pied Flycatcher	BAm(RSPB)
Mustela putorius	Polecat	S41, HabRegs4, UKBAP
Milvus milvus	Red Kite	WCA1
Vespula (Vespula) rufa	Red Wasp	LBAP
Turdus iliacus	Redwing	WCA1, BRd(RSPB)
Turdus torquatus	Ring Ouzel	S41, UKBAP, BRd(RSPB)
Alauda arvensis	Sky Lark	S41, LBAP, BRd(RSPB)
Diarsia rubi	Small Square-spot	S41, UKBAP
Plectrophenax nivalis	Snow Bunting	WCA1, BAm(RSPB)
Turdus philomelos	Song Thrush	S41, UKBAP, BRd(RSPB)
Pipistrellus pygmaeus	Soprano Pipistrelle	WCA5, S41, HabRegs2, UKBAP, LBAP
Columba oenas	Stock Dove	BAm(RSPB)
Andrena (Andrena) fulva	Tawny Mining Bee	LBAP
Erinaceus europaeus	West European Hedgehog	S41, UKBAP
Myotis mystacinus	Whiskered Bat	WCA5, S41, HabRegs4,
Spilosoma lubricipeda	White Ermine	S41, UKBAP
Phylloscopus trochilus	Willow Warbler	BAm(RSPB)
Phylloscopus sibilatrix	Wood Warbler	BRd(RSPB)

Note: All species names provided by SER.

Designations key:

WCA1 - Wildlife & Countryside Act, 1981 - Schedule 1
WCA5 - Wildlife & Countryside Act, 1981 - Schedule 5
WCA9 - Wildlife & Countryside Act, 1981 - Schedule 9
S41 - National Environment and Rural Communities Act 2006, Section 41 species
HabRegs2 - Conservation (Habitats and Species) Regulations 2010 - Schedule 2
UKBAP - UK Biodiversity Action Plan Priority Species
LBAP - Local Biodiversity Action Plan Species
BRd(RSPB) - Birds of Conservation Concern (RSPB) - Red
BAm(RSPB) - Birds of Conservation Concern (RSPB) - Amber

Fieldwork

4.7 Features of interest recorded on the site during this survey are described in the Target Notes (TN) below. All numbered Target Notes correspond with the Extended Phase 1 Habitat Map (Appendix B). Species lists for each area and photographic plates are presented within Appendices D and E respectively.

Target Notes

TN1 - Unimproved neutral grassland - Priority habitat (Plates 1a, 1b & 2)

TN2 - Dry heath - Priority habitat (Plate 3)

TN3 - Semi-natural broadleaved woodland - Priority habitat (Plates 4a & 4b)

TN4 - Ponds - Priority habitat (Plates 5a, 5b, 5c & 5d)

TN5 - Cliff faces - Provides suitable habitat for invertebrates and sand martin (Plates 6a, 6b & 6c)

TN6 - Pioneer habitat - of moderate species diversity (Plate 7)

TN7 - Spoil mounds - provides suitable habitat for invertebrates (Plate 8)

TN8 - Rubble piles/dry stone walls - potential refuge for amphibians, reptiles and small mammals (Plate 9)

TN9 - Stone buildings - potential to support roosting/hibernating bats

TN10 - Species-rich hedgerow - potentially important under the ecological criteria of the *Hedgerow Regulations, 1997* (Plate 10)

TN11 - Bird nest box (Plate 11)

TN12 - Native bluebell - listed on *Schedule 8 of the Wildlife and Countryside Act, 1981* (as amended)

TN13 - Rhodondron sp. - potentially listed on Part 2 of *Schedule 9 of the Wildlife and Countryside Act, 1981* (as amended) (Plate 12)

TN14 - Cotoneaster sp. - potentially listed on Part 2 of *Schedule 9 of the Wildlife and Countryside Act, 1981* (as amended) (Plate 13)

TN15 - Troughstone Hill SBI (off-site) - located approximately 70m to the east of the proposed development site

TN16 - The Sprink SBI (off-site) - located approximately 230m to the south-east of the proposed development site

TN17 - Biddulph Grange Country Park/Spring Wood (off-site) - located approximately 35m to the south of the proposed development site

5.0 DISCUSSION

Designated Sites

5.1 Defra's 'Magic Map' indicates that the closest statutorily designated nature conservation site is Biddulph Valley Way Local Nature Reserve (LNR), which is located approximately 1.6km to the west of the site. It is considered unlikely that the proposed development would adversely affect the status of this statutorily designated site due to distance and a lack of habitat connectivity between the sites.

5.2 Defra's 'Magic Map' also indicated that the site lies within the Impact Risk Zones for a number of Sites of Special Scientific Interest (SSSI). The closest of which is Gannister Quarry SSSI which is located approximately 2.9km to the west of the proposed development site at its nearest point. Given the nature of the development (low-density residential which is not cited as a potential impact upon this SSSI) and the distance and apparent lack of habitat connectivity between the survey area and the SSSI, it is considered unlikely that the proposed development would have a significant impact upon this statutorily designated site.

5.3 Defra's 'Magic Map' also identified that the site lies within the Impact Risk Zones for Roe Park Woods SSSI and Dane-in-Shaw Pasture SSSI which are both located approximately 3.6km from the proposed development site. Given the nature of the development (low-density residential which is not cited as a potential impact upon this SSSI) and the distance and apparent lack of habitat connectivity between the survey area and these sites, it is considered unlikely that the proposed development would have a significant impact upon these or any other statutorily designated sites.

5.4 SER indicated that Troughstone Hill SBI is located immediately adjacent the survey area to the north-east and within approximately 70m of the proposed development site. The Sprink SBI is located within 190m of the survey area. If the local planning authority considers the proposed development of the site has the potential to adversely impact on the status of either of these Sites of Biological Interest, it should consult SER. It is considered unlikely that any proposed development would adversely affect the status of Dingle Brook SBI, Shirkley Wood SBI, Round Wood SBI, Whitemore Farm (east of) SBI, Bands Wood & Cheshire Brook Wood SBI and Congleton Edge SBI, due to the distance and apparent lack of habitat connectivity between the survey area and these sites. It is also considered unlikely that the proposed development would impact upon Pleasant View Verges Biodiversity Alert Site due to a lack of habitat connectivity.

Habitats

5.5 <u>Unimproved neutral grassland / heathland mosaic(Plates 1a, 1b & 2)</u>
Areas of herb-rich unimproved neutral grassland were present within the survey area and within the proposed development site. These areas were confined to the north and far south-west of the proposed development site. The grassland areas to the north of the site were present on slopes which had not been subject to recent quarrying. Grassland species included wavy hair-grass, sweet vernal-grass, red fescue and Yorkshire-fog. Herbaceous species included common spotted orchid, common knapweed, ox-eye daisy, meadow vetchling and common bird's-foot trefoil. This area

was interspersed with frequent heather and gorse, both of which were at pioneer stage, forming a grassland/heathland mosaic. It is important to note that whilst some acid grassland indicator species were present in these areas (e.g. wavy hair-grass, fescue sp.), they were recorded as 'neutral grassland' due to the assemblages of herbaceous species they support not typically being associated with true acid grassland.

The area of unimproved neutral grassland to the south-east of the site was located on a gently sloping area adjacent Hurst Road. Grasses in this area included crested dog's-tail, fescue sp. and Yorkshire-fog. Herbaceous species included common knapweed, bush vetch, red clover and cat's-ear. Heather was rare whilst common bird's-foot trefoil and hairy sedge were locally abundant.

Assessment against Staffordshire SBI selection criteria indicates that these areas qualify and are therefore of county importance. (Refer to Appendix C - Priority Habitats Location Map).

5.6 Semi-improved neutral grassland (Plate 14)

Semi-improved neutral grassland was present to the north-east of the survey area, outside of the proposed development footprint, immediately adjacent Troughstone Hill SBI. Parts of this area had recently been cattle grazed. At the time of survey vegetation was dominated by Yorkshire-fog with frequent perennial rye-grass whilst marsh foxtail and tufted hair-grass locally dominant. Herbaceous species included common sorrel, marsh thistle and creeping buttercup. Soft rush was locally abundant and bilberry was locally frequent. This area of land is being made available for habitat enhancement/creation to mitigate impacts on biodiversity resulting from the proposed development.

5.7 Poor semi-improved grassland (Plate 15)

A field located to the north-east of the survey area comprised poor-semi improved grassland. Vegetation in this field was tall and unmanaged at the time of survey. Dominant grass species included Yorkshire-fog with frequent perennial-rye grass. Herbaceous species included common ragwort, common sorrel and meadow buttercup. This area of land is being made available for habitat enhancement/creation to mitigate impacts on biodiversity resulting from the proposed development.

5.8 Dry heath (Plate 3)

An area of dry heath was located to the north of the site. Vegetation in this area was generally low and relatively sparse. Heather and moss sp. were abundant whilst silver birch and grey willow regeneration was frequent. Gorse and broom were frequent.

5.9 Semi-natural broadleaved woodland (Plates 4a & 4b)

The proposed development site was bounded to the west and east by semi-natural broadleaved woodland. To the northeast of the proposed development site, on the steep slopes of the former quarry workings, woodland was relatively immature with frequent areas of bare ground. The canopy was dominated by silver birch with frequent goat willow and occasional oak. Bramble and broad buckler fern were the dominant ground flora species. This area of woodland approximates to W10 woodland under the National Vegetation Classification (NVC) system.

Towards the southern edge of the eastern area of woodland, trees were more mature with ash locally dominant. The shrub layer comprised hawthorn, holly and rowan. A stand of Rhododendron was also present in this area. Ground flora included tutsan, hogweed and locally abundant native bluebell.

The area of steep-sided woodland to the west of the survey area was located adjacent to two large ponds (former quarry reservoirs). This area was dominated by immature silver birch and grey willow. Rhododendron, privet and cotoneaster sp. were present in the shrub layer. Ground flora was dominated by broad buckler fern, bramble and common nettle.

5.10 Ponds (Plates 5a, 5b, 5c & 5d)

Nine ponds were recorded on site during an initial site visit on 10th March 2016. At the time of this survey, a number of these had dried although the larger ponds were holding water. No marginal vegetation was present at a reservoir which had concrete walls. Limited marginal vegetation was present around the ponds to the north of the site. Species included jointed rush, marsh willowherb and horsetail sp. Emergent vegetation was limited. Many of these ponds were heavily shaded by scrub and woodland and were very turbid.

5.11 Quarry cliffs (Plates 6a, 6b & 6c)

Cliffs resulting from quarrying were present around the boundary of the proposed development site. Soft cliffs comprising a sandy substrate were present in the most recently quarried areas. A cliff face located mid-way along the west of the site was stone. Vegetation cover was variable on these cliff faces, with pioneer species and trees present in places. The tops of the cliffs comprised a combination of scrub, woodland and grassland.

5.12 Pioneer habitat (Plate 7)

Areas of pioneer habitat were present around the periphery of the quarry bowl. These areas were colonised with pioneer species including Yorkshire-fog, rosebay willowherb and horsetail sp. Willow sp. and silver birch regeneration was also present.

5.13 Scattered trees (Plates 2, 3 & 15)

A number of scattered trees were present on site. These were predominantly self-set and immature, although occasional mature oak trees were present. The dominant species were silver birch and grey willow, with occasional oak and sycamore. The grassland to the south of the site had planted scattered trees.

5.14 Tall ruderal herbs (Plates 16a & 16b)

Areas of tall ruderal herbs were present within the survey area. These areas comprised tall unmanaged vegetation with species including broad-leaved willowherb, rosebay willowherb, common sorrel and foxglove.

5.15 Scrub (Plates 3, 6c, 17 & 19)

Dense scrub was present to the north and east of the site. Species in these areas included grey willow, gorse and broom.

5.16 Hedgerows (Plate 10)

A single hedgerow was present on site (Hedgerow 1). This hedgerow was located adjacent Hurst Road which totalled approximately 65m in length and was intact and unmanaged at the time of survey. Woody species included alder, ash, rowan, hornbeam sp., hawthorn and elder. This hedgerow is considered to be over 30 years old. This hedgerow has an associated wall and was connected with an area of woodland.

It is therefore concluded that Hedgerow 1 could potentially qualify as important under the ecological criteria of the *Hedgerow Regulations, 1997*, due to the diversity of woody species and associated features. Therefore a detailed hedgerow assessment will be required if this hedgerow or any of its associated features are due be affected by the proposed development. It should however be noted that hedgerows over thirty years old can also be protected by the Regulations for a number of other factors such as historical and landscape interest. It is not the place of this ecological report to assess such other factors.

A hedgerow assessment differs from the phase 1 hedgerow classification as it is far more detailed. It assesses each 30m stretch of hedgerow, looking at species diversity, associated features and management regimes. Even if the further surveys determine that the hedgerow is not ecologically important (under the Regulations), it is recommended that it be retained wherever possible.

5.17 Ephemeral vegetation (Plate 18)

Areas of ephemeral/short perennial vegetation were present around the periphery of the site and on spoil heaps. Vegetation was typically low and variably sparse. Species included creeping bent, yarrow, black medick and toad rush.

5.18 Bare ground (Plate 9b)

The bowl of the quarry predominantly comprised bare sandy ground. Vegetation communities were not recorded in these areas, other than the areas of ephemeral and pioneer vegetation (see Paragraphs 5.12 and 5.17).

5.19 Bare rock (Plate 19)

A relatively small area of bare rock was present in a quarried area to the east of the site. No vegetation communities were recorded in this area at the time of survey.

5.20 Hard-standing (Plate 20)

Areas of hard-standing; compacted aggregate and asphalt, were present to the south of the site, adjacent the existing access point and operational industrial premises. A compacted gravel track was present to the north of the site.

5.21 Buildings (Plates 20, 21a-21c)

Eight buildings were present within the survey area at the time of survey. Buildings 1 to 4 comprised a series of corrugated metal-clad sheds and storage buildings. Building 5 was a small concrete block pump house with a corrugated asbestos sheet roof. Building/s 6 comprised two small concrete block sheds which had corrugated asbestos sheet roofs. Building 7 was a tall stone building with a part corrugated metal sheet, part corrugated asbestos sheet and part tile roof. Building 8 comprised single storey

brick and corrugated metal offices and large workshop and storage areas with corrugated metal roofs. This building was in use as operational industrial premises at the time of survey.

Features of Ecological Interest

5.22 The following features of 'significant ecological interest' were identified during the survey:

- Ponds
- Woodland
- Grassland/heathland mosaic
- Herb-rich unimproved grassland
- Dry heath
- Cliff faces

5.23 Although not necessarily afforded legal protection, it is recommended that where practicable, the above features of ecological interest should be retained and sufficiently protected during development works.

Priority Habitats

5.24 Ponds, woodland and heathland/grassland mosaic habitats present within the study area and proposed development site qualify as Priority habitats (refer to Appendix C - Priority Habitats Location Map) in accordance with the UK BAP and NERC S41 list, and so are a material consideration under the National Planning Policy Framework (NPPF). Recommendations for retention of and/or compensation for the loss of these habitats are detailed below.

5.25 <u>Ponds</u>

Ponds to be lost should be replaced at a ratio of at least 1:1 (per unit and/or surface area) within the site. No ponds were of notable botanical interest, therefore, with LPA consent, ponds may be in-filled to facilitate development providing all replacements are created before the loss has taken place, and they hold water in time to support amphibian breeding in early spring. It should be noted that the quarry is known to support a sizeable breeding population of common toad and palmate newt. Common toad is a Priority species and generally requires large ponds/water-bodies for breeding. The permanent provision of suitable amphibian breeding habitat within the site is therefore necessary.

5.26 <u>Woodland</u>

The areas of established woodland on the steep slopes qualify as Priority habitat. Its connectivity to Biddulph Grange/Spring Wood makes it of particular value.

Given the current development proposals, it should be possible to retain all mature/established woodland within the survey area given that it is located on steep embankments which are unlikely to be developed. Loss of trees may require a felling licence to be obtained. To mitigate for the likely loss of some trees, woodland enhancement works, including removal of rhododendron, should be undertaken.

5.27 Heathland and grassland mosaic

Land to the north of the site supports species-rich grassland and heathland mosaic. Assessment against Staffordshire SBI selection criteria indicates that these areas qualify and are therefore of county importance.

It is recommended that this area of habitat is retained. The farmland fields within the survey area and vendor's ownership are unlikely to be suitable for heathland creation due to their agricultural enrichment and impeded drainage, but could be used to provide wildflower meadow creation to offset the impacts on wildflower species caused by developing the lower sections of the site. Compensation should be provided before the impact is created.

5.28 If impacts on Priority habitats cannot be avoided, detailed proposals for compensation will be required by the LPA. Detailed proposals for all habitat compensation and habitat creation, along with a commitment to funding long-term habitat management and a detailed habitat management plan for all retained/compensatory areas of land, will be required to support any future reserved matters application.

Protected Species

5.29 The habitat composition of the site has potential to support legally protected and Priority wildlife species. It was not within the scope of this survey to carry out detailed searches for protected species, although the potential for the study site to support the following species is discussed below:

- Badger
- Barn owl
- Bats
- Birds
- Bluebell
- Brown hare
- Great crested newt
- Hedgehog
- Invasive species
- Invertebrates
- Polecat
- Reptiles

Legislation relating to each species discussed in this report is presented in Appendix F - Legislation. No other legally protected species are considered likely to be associated with the proposed development site due to a lack of suitable habitat on, and surrounding the site.

5.30 Badgers

Badgers and their setts are protected under British law. Therefore surveys are required to check for the presence of badgers or their setts if they are likely to be disturbed for any reason. Statutory guidance indicates that a licence may be required if potentially disturbing works are to take place within 30m of a badger sett.

SER provided details of badgers occurring within 2km of the survey area since 1996.

Badgers are known to utilise the site. CES have been commissioned to conduct a badger survey at the site, the results of which are detailed in the CES Land at Hurst Quarry Badger Survey Report 2016.

5.31 Barn owl

Barn owls receive special protection under Schedule 1 of the Wildlife & Countryside Act, 1981 (as amended). In addition to the protection afforded to all wild birds under Section 1 of the Act, species listed on Schedule 1 also receive special legal protection when breeding; making it an offence to intentionally or recklessly disturb any wild barn owl whilst it is at or near a nest containing eggs or young, or disturb the dependent young of such a bird. Barn owls nest and roost in buildings and within deep cavities in trees, and will readily utilise nest boxes where available.

Record provided details of Barn Owl occurring within around 2km of the survey area since 1996.

No evidence of barn owl roosting or nesting was recorded during this survey, or during the daytime bat surveys involving internal inspections of the buildings. The grassland habitats to the north-east of the survey area were considered to provide suitable foraging habitat for barn owl i.e. Type 1 habitat (Shawyer, 2011); these areas are not due to be affected by the proposed development. Grassland habitat within the site was generally too sparse to support high densities of small mammals on which barn owls prey. A number of buildings are present within the site which provide suitable roosting opportunities for barn owl, however, no features suitable for barn owl nesting have been identified. The site is bounded by woodland and a number of scattered trees are also present. However these trees were predominantly too immature and/or lacking in suitable features to support roosting/nesting barn owl and no such features were observed. Further survey for this species will be required prior to demolition of any buildings on site as the status of this species can change within a short period of time. This survey may be combined with any updated survey/s for roosting bats.

5.32 Bats

All British species of bat are protected under both European and British law. Therefore surveys are required to check for their presence in areas where bats or their roosts are likely to be disturbed for any reason.

Bats are known to roost in buildings and mature trees, where they rest, give birth, raise young and hibernate. Buildings provide a choice of safe, dry places and can present a whole range of potential roost sites such as within wall cavities, eaves or roofs.

Some bat species rely exclusively on trees for roost sites; others use them for only part of the year. The importance of trees to bats depends on species, season and foraging behaviour. Even in winter, deep cavities can provide protection against bad weather and fluctuations in temperature. Furthermore, trees and hedgerows, especially native ones, can host many species of insects, which are food for bats, and can also aid bat navigation.

Record provided details of brown long-eared bats, Brandt's bat, common pipistrelle, Daubenton's bat, Noctule bat, soprano pipistrelle and whiskered bats occurring within around 2km of the survey area since 1996.

CES have been commissioned to conduct daytime internal bat surveys of the buildings on site, dusk and dawn emergence surveys, and bat activity surveys at the site. Refer to the relevant CES reports for details of these surveys.

5.33 Birds

All species of wild bird, their nest and eggs are protected under Section 1 of the *Wildlife and Countryside Act*, 1981 (as amended). Therefore surveys are required to check for their presence where they are likely to be disturbed for any reason. In addition to the protection afforded to all wild birds under Section 1 of the Act, species listed on Schedule 1 receive special legal protection when breeding; making it an offence to intentionally or recklessly disturb any wild bird listed on Schedule 1 whilst it is at or near a nest containing eggs or young, or disturb the dependent young of such a bird. Legislation does not permit disturbance licences to be issued for nesting birds in relation to development of land.

SER provided numerous records of Priority and protected bird species occurring within approximately 2km of the survey area since 1996.

CES have been commissioned to conduct a breeding bird survey at the site, the results of which are detailed in the CES Hurst Quarry Breeding Bird Survey Report 2016.

5.34 Bluebell

SER provided details of native bluebell occurring within approximately 2km of the survey area since 1996. The native bluebell is protected from uprooting under Schedule 8 of the Wildlife and Countryside Act 1981 (refer to Appendix F). Bluebell was recorded in the area of woodland to the south-east of the survey area. The woodland habitats elsewhere within the survey area provide suitable habitat for this species. The current proposed development plan indicates that areas of woodland are due to be lost as part of the proposed development, particularly the areas adjacent Building 8. It is therefore considered possible that the proposed development has the potential to impact upon this species. It is recommended that where possible, areas of suitable habitat i.e. woodland and hedgerows be retained and appropriately protected during the works.

5.35 Brown hare

Brown hare is a Local and UK BAP Priority species, and is listed on Section 41 of the Natural Environment & Rural Communities Act, 2006. SER provided details of brown hare occurring within around 2km of the survey area since 1996.

Brown hares are associated with farmland habitats, such as those found to the north-east of the survey area, where they feed on grass shoots and utilise areas of tall vegetation for cover. These are due to be retained and so it is considered unlikely that any brown hare potentially associated with these habitats would be adversely

impacted upon by the proposed development. Brown hare are considered unlikely to utilise the proposed development site for breeding due to a lack of suitable habitat.

If brown hares or leverets are discovered during development works, CES Ecology should be contacted for advice. No further survey effort in respect of this species is considered necessary.

5.36 Great crested newt and other amphibians

GCN are protected under both European and British law. Adult GCN predominantly live terrestrially, but utilise ponds for breeding purposes during the spring and summer months. Statutory guidance indicates that a survey may be necessary to check for the presence of GCN if background information on distribution suggests that they may be present.

SER did not provide details of any GCN or other amphibians occurring within 2km of the survey area since 1996.

CES have been commissioned to conduct a GCN and amphibian survey at and within 250m of the survey area, the results of which are detailed in the CES GCN Survey Report 2016.

5.37 Hedgehog

Hedgehog is a UK BAP Priority species and is listed on Section 41 of the Natural Environment & Rural Communities (NERC) Act, 2006. SER provided details of hedgehog occurring within approximately 2km of the survey area since 1996.

The survey area was considered to offer hedgehog with suitable foraging and shelter habitat. Development at the site does have potential to impact upon hedgehogs, therefore it is recommended that all woody and scrub vegetation (standing or fallen) to be affected by the works be removed by hand prior to any potentially disturbing works taking place. These measures should be sufficient in discouraging and/or displacing hedgehogs from the working areas. Upon completion of the development, it is also recommended that hedgehogs be able to gain access to the gardens through a series of holes/gaps if close-panel fencing or walls are to be used; although ideally boundaries would comprise hedgerows. Gaps should be at ground level, approximately 10cm by 15cm, and at least two incorporated in to each garden.

5.38 Invasive species

Cotoneaster sp. and Rhododendron sp. were recorded within the area of woodland to the east of the site during the survey. Cotoneaster is a popular garden and landscaping species whose berries are utilised and spread by birds. When introduced to the wild they damage native vegetation and can be difficult to eradicate. As a result, cotoneaster is listed on Part 2 of Schedule 9 of the Wildlife and Countryside Act, 1981 (as amended).

Rhododendron is a highly invasive exotic plant that out-competes native shrub species leading to a reduction in diversity. It is also a host of Phytophthora which causes a potentially lethal disease that affects plants, trees and shrubs.

It is recommended that these species be removed from the areas of woodland and care should be taken to prevent their spread (such as digging up and allowing the roots to become dried out, thus killing the plant before disposal), prior to the commencement of works.

5.39 Invertebrates

SER provided details of a number of invertebrate species occurring within approximately 2km of the survey area.

An independent invertebrate ecologist (Andy Jukes of Conops Entomology Ltd.) conducted a walkover visit at the site in August 2016. The ecologist concluded that the habitats on site provided suitable habitat to support a number of invertebrate groups including ground-nesting solitary bees and wasps, butterflies and beetles, amongst others.

In order to fully appraise the value of the site to invertebrates, a series of survey visits (one per month) are proposed to be undertaken during the principal flight periods of the main invertebrate groups (between April and August 2017). Survey methods will include sweep sampling, spot sampling, beating, suction sampling and pitfall trapping. The invertebrate groups surveyed will include beetles, bees and wasps, various fly families, butterflies and day-flying moth and Heteropteran bugs.

5.40 Polecat

Polecats are a UK and Local Biodiversity Action Plan (BAP) species and are listed on Section 41 of the Natural Environment & Rural Communities Act, 2006 (refer to Appendix F). SER provided details of polecat occurring within approximately 2km of the survey area since 1996.

It is possible that polecat occur within the survey area as this species is known to frequent farmland and woodland edge habitats, as found at this site. Polecats breed between March and April, making nests in stone piles or tree hollows. The piles of rock and stone within the site offer suitable shelter/nesting opportunities to this species. The development proposals will result in the loss or disturbance of potential polecat nesting sites. Care should be taken during the removal of boulders to avoid disturbing potential polecat nest sites; such activity should be conducted outside of the polecat breeding period (i.e. May - February).

5.41 Reptiles

All six species of British reptile are protected against intentional killing, injury or sale under Schedule 5 of the *Wildlife and Countryside Act*, 1981. The sand lizard and smooth snake are afforded a higher degree of protection under European law, which, amongst other things, makes it an offence to damage, destroy or obstruct their places of shelter or disturb these species in such a place. However, the distribution of these species is limited, and is largely restricted to a few southern counties in England, with the exception of some coastal sites in Merseyside and North Wales which support populations of sand lizard. The distribution of the remaining 'common' species (i.e. adder, grass snake, slow worm and common lizard) is widespread. With some variation between species, reptiles prefer undisturbed habitats with open areas for basking and warmth, and more vegetated areas for shelter and feeding. They shelter

and hibernate in crevices underground, such as within old mammal burrows, cracks within concrete bases and within spoil/rubble mounds.

SER did not provide details of reptiles occurring within around 2km of the proposed development site since 1996. It is noted that the adjacent Troughstone Hill SBI supports suitable reptile habitat; namely for common lizard and adder, although the adder abundance within this region of Staffordshire is considered to be scarce.

CES have been commissioned to conduct a reptile survey of the survey area, the results of which are detailed in the CES Hurst Quarry Reptile Survey Report 2016.

6.0 SUMMARY RECOMMENDATIONS TABLE

	Species potentially associated with the site/s?	Further survey effort required?	Survey timing	Recommendations
Badger	Yes	CES have been commissioned to conduct a badger survey of the survey area.	-	Refer to the CES Hurst Quarry Badger Survey Report 2016.
Barn owl	Yes	A pre-start check should be undertaken of all buildings immediately prior to their demolition.	-	A pre-commencement check of all buildings on site should be conducted prior to demolition works.
Bats	Yes	CES have been commissioned to conduct a daytime internal bat survey of the on-site buildings, dusk/dawn emergence surveys and bat activity surveys at the survey area.	-	Refer to the relevant CES bat survey reports.
Birds	Yes	CES have been commissioned to conduct a breeding bird survey of the survey area.	-	Refer to the CES Hurst Quarry Breeding Bird Survey Report 2016. All woody vegetation has the potential to support nesting birds. Vegetation removal works should take place outside of the bird breeding season (i.e. October - February). A survey will not be required if potentially disturbing works are undertaken during this period.
Bluebell	On site	No	-	Where possible, areas colonised by this species (notably hedgerows and areas of woodland) should be retained and appropriately protected during the works.
Brown hare	Yes	No	-	Brown hare are considered unlikely to be associated with the proposed development site, however if brown hare and/or leverets are

				subsequently recorded on site, CES should be contacted for advice.
Great crested newt	Yes	CES have been commissioned to conduct a GCN survey at and within 250m of the survey area.	-	Refer to the CES Hurst Quarry GCN Survey Report 2016.
Hedgehog	Yes	No	-	Where possible, all woody/scrub vegetation to be affected should be removed by hand prior to potentially disturbing works taking place. It is recommended that gaps be provided in boundary fences/walls to enable hedgehogs to move through gardens at the development.
Invasive species	On site	No	-	It is recommended that such species be removed, with care taken to avoid causing their spread.
Invertebrates	Yes	Yes: A series of **invertebrate survey** visits will be required prior to the commencement of potentially disturbing works.	**April - August**	Not potentially disturbing works should take place until the results of the survey are known.
Polecat	Yes	No	-	Where possible, removal of boulders/rock piles should take place outside of the polecat breeding period to avoid disturbing potential nest sites.
Reptiles	Yes	CES have been commissioned to conduct a reptile survey of the survey area.	-	Refer to the CES Hurst Quarry Reptile Survey Report 2016.
Hedgerows	On site	Hedgerow 1 should be subject to a detailed **hedgerow assessment** if it is to be lost/impacted by the proposed development.	**April - October**	No potentially damaging works to this hedgerow or its associated features should take place until the results of the hedgerow assessment are known.
Priority Habitats				
Ponds	On site	No	**-**	Ponds to be lost should be replaced at a ratio of at least 1:1 (per unit & surface area). All replacement ponds should be created before the loss has taken

				place and should hold water in time to support amphibian breeding in early spring.
Woodland	On site	No	-	Loss of trees may require a felling licence to be obtained. To mitigate the loss of the likely loss of some trees, woodland enhancement works, including removal of rhododendron, should be undertaken.
Heathland & Grassland mosaic	On site	No	-	This habitat should ideally be retained. The farmland fields could be used to provide wildflower meadow creation to offset the impacts on wildflower species caused by developing the lower sections of the quarry bowl.

7.0 REFERENCES

BCT (2012). Hundt L. Bat Surveys: Good Practice Guidelines, Second Edition, Bat Conservation Trust.

JNCC (2010). Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit. Joint Nature Conservation Council.

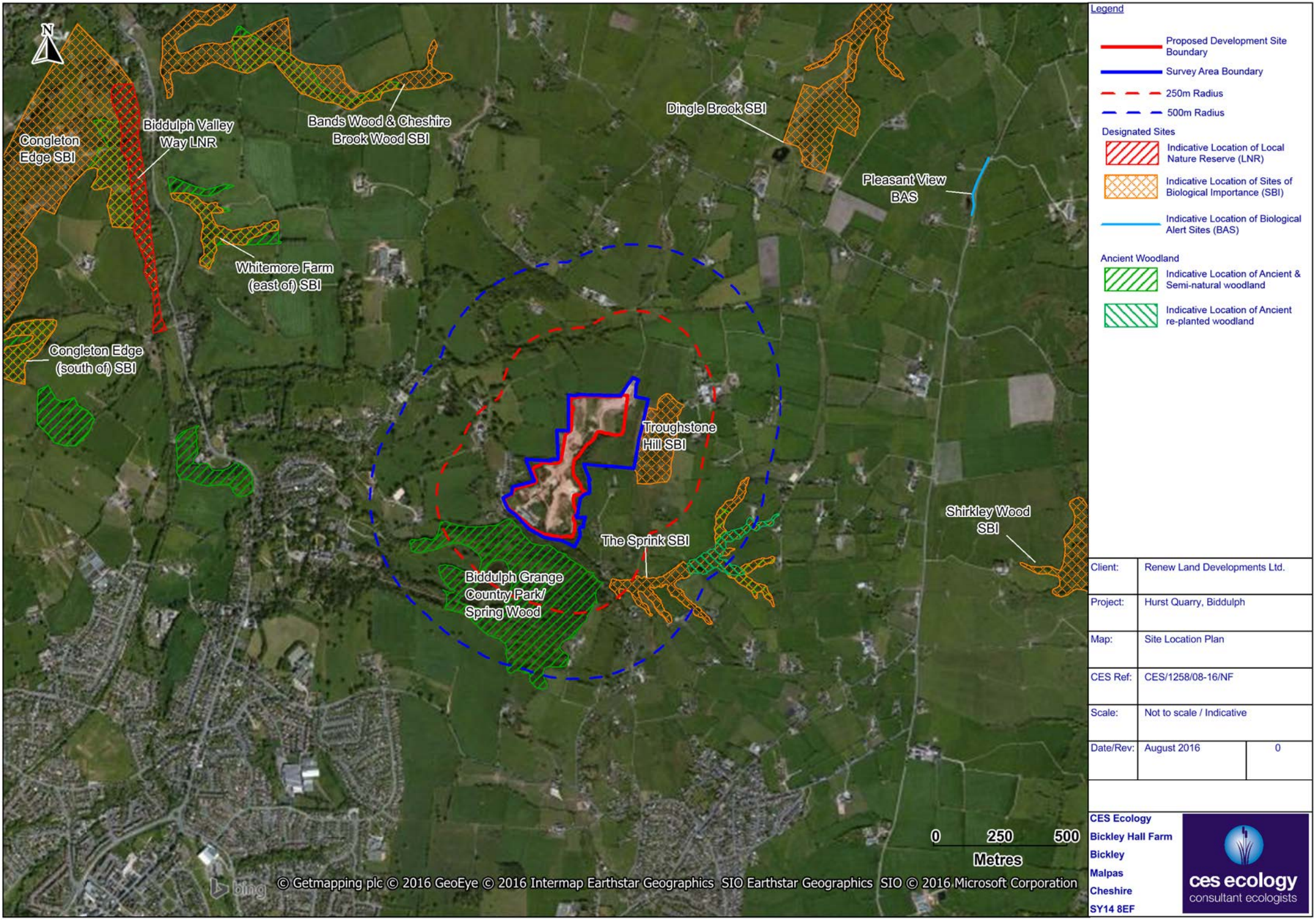
Shawyer, C. R. (2011). Barn Owl (Tyto alba) Survey Methodology and Techniques for use in Ecological Assessment: Developing Best Practice in Survey and Reporting. IEEM, Winchester.

Stace, C. (1997). New Flora of the British Isles. Second Edition. Cambridge.

Sutherland, W.J. (Ed.) (1996) Ecological Census Techniques: A Handbook. University of Cambridge

Appendices

Appendix A: Site Location Plan



Legend

- Proposed Development Site Boundary
- Survey Area Boundary
- 250m Radius
- 500m Radius

Designated Sites

- Indicative Location of Local Nature Reserve (LNR)
- Indicative Location of Sites of Biological Importance (SBI)
- Indicative Location of Biological Alert Sites (BAS)

Ancient Woodland

- Indicative Location of Ancient & Semi-natural woodland
- Indicative Location of Ancient re-planted woodland

Client:	Renew Land Developments Ltd.	
Project:	Hurst Quarry, Biddulph	
Map:	Site Location Plan	
CES Ref:	CES/1258/08-16/NF	
Scale:	Not to scale / Indicative	
Date/Rev:	August 2016	0

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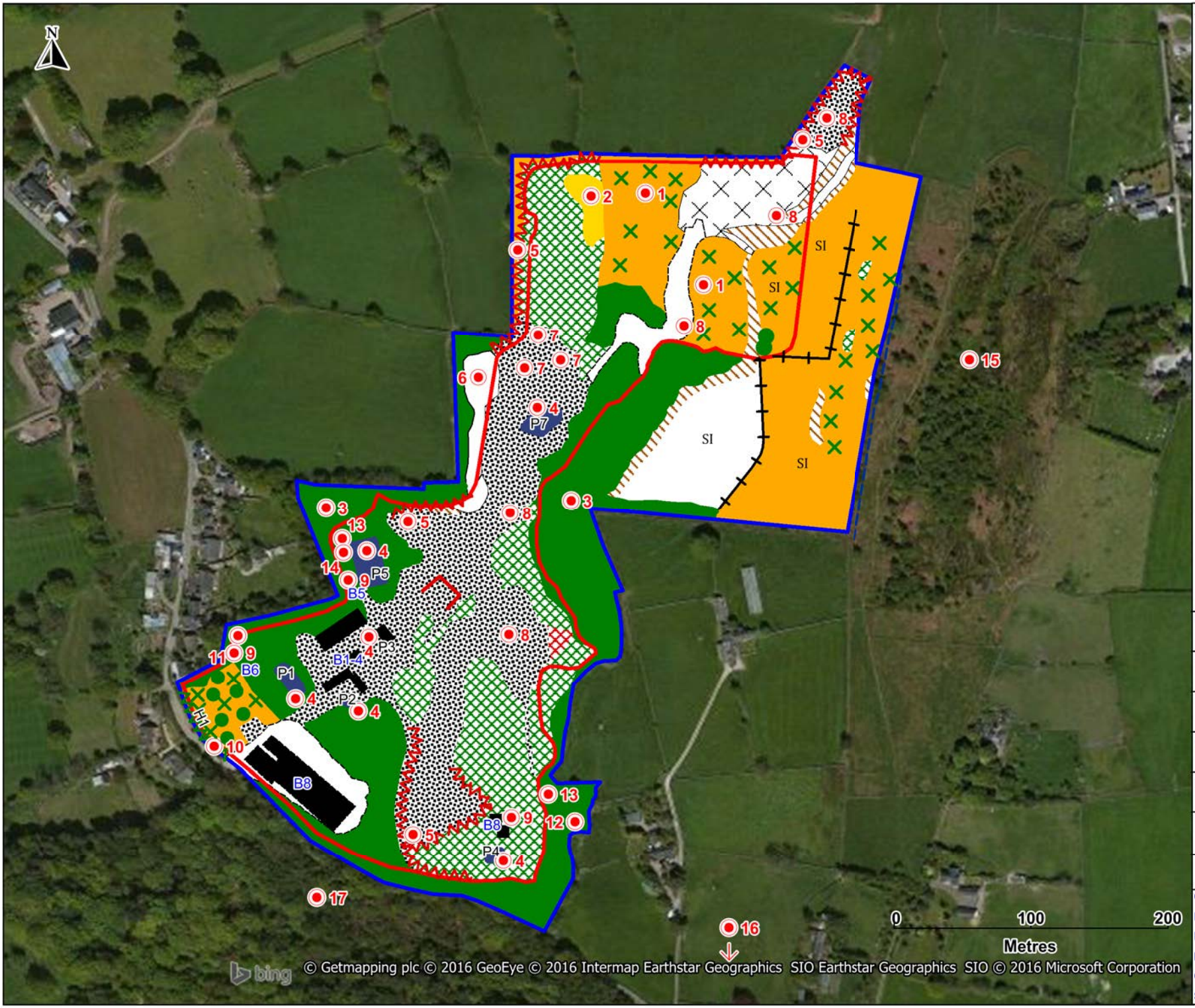
Appendix B: Extended Phase 1 Habitat Survey Map & Key



Legend

Please see overleaf

Client:	Renew Land Developments Ltd.	
Project:	Hurst Quarry, Biddulph	
Map:	Extended Phase 1 Habitat Map	
CES Ref:	CES/1258/08-16/NF	
Scale:	Not to scale / Indicative	
Date/Rev:	August 2016	0

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Extended Phase 1 Habitat Map Key

Proposed Development Site Boundary

Survey Area

Target Note (Refer to Extended Phase 1 Habitat report for further details)

Habitats

A111 - Semi-natural broadleaved woodland

A21 - Dense/continuous scrub

X A22 - Scattered scrub

A31 - Scattered broadleaved trees

B21 - Unimproved neutral grassland

SI B22 - Semi-improved neutral grassland

SI B6 - Poor semi-improved neutral grassland

C31 - Tall ruderal herbs

D12 - Dry heath

G1 - Pond

I112 - Inland cliff

I142 - Bare rock

J13 - Ephemeral/short perennial vegetation

J36 - Buildings

J4 - Bare ground

J5 - Pioneer vegetation

Hard-standing

Boundaries

J211 - Species-rich intact hedge

J24 - Fence

J25 - Wall

J26 - Dry ditch

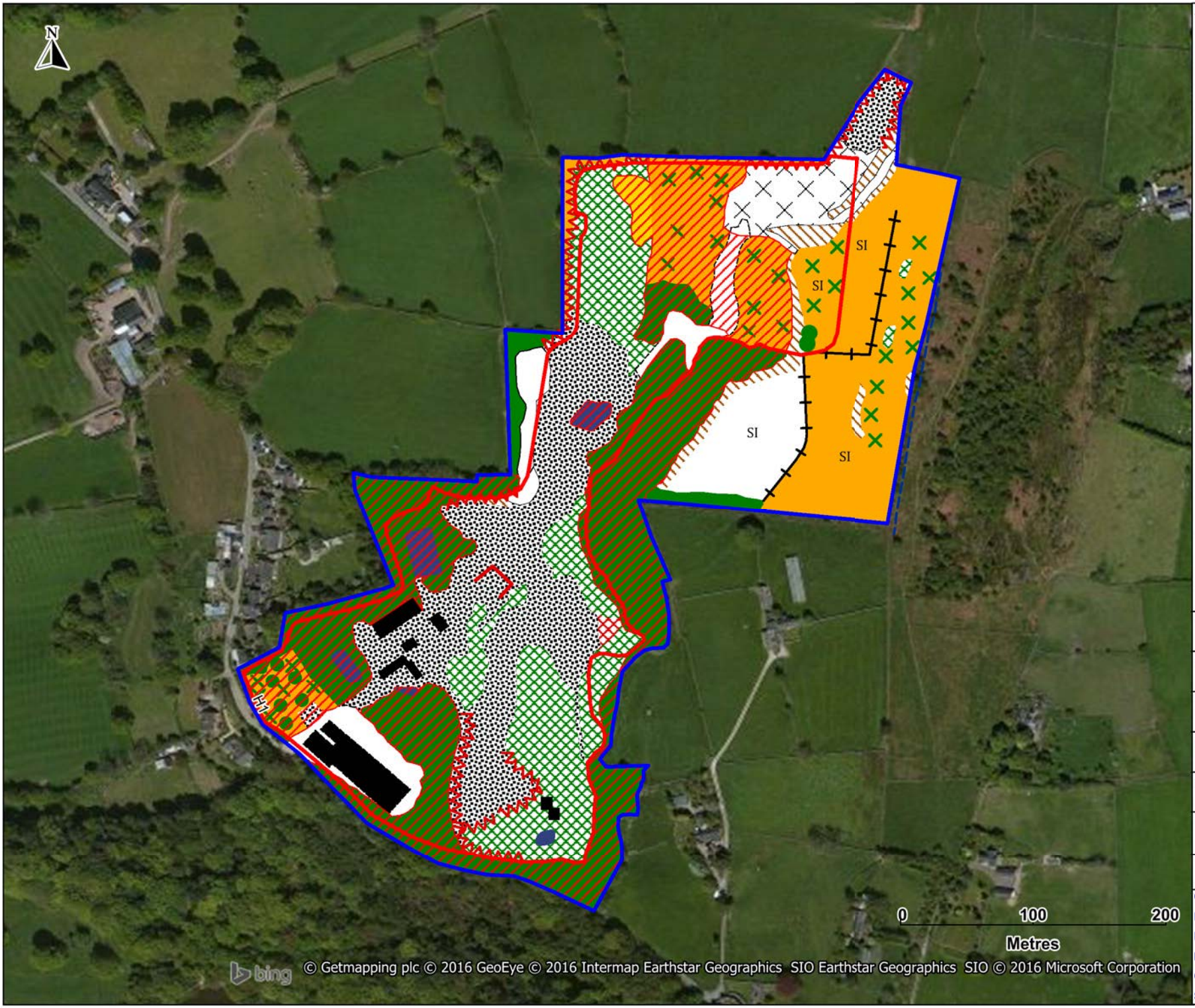
Other

P# Pond number (In line with the CES GCN Survey Report 2016)

B# Building number (In line with the CES Daytime Bat Survey Report 2016)

H# Hedgerow number

Appendix C: Priority Habitat Location Plan



Legend

- Proposed Development Site Boundary
- Survey Area Boundary
- Indicative Location of Areas of Priority Habitat

For a key to the habitat types, refer to the Extended Phase 1 Habitat map & key (Appendix B)

Client:	Renew Land Developments Ltd.	
Project:	Hurst Quarry, Biddulph	
Map:	Priority Habitats Location Plan	
CES Ref:	CES/1258/08-16/NF	
Scale:	Not to scale / Indicative	
Date/Rev:	August 2016	0

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Appendix D: Species Lists

Species present in the areas of unimproved grassland located to the north-east of the survey area

Scientific name	Common name	*Abundance
Achillea millefolium	Yarrow	Rare
Agrostis capillaris	Common bent	Occasional
Agrostis stolonifera	Creeping bent	Occasional
Anthoxanthum odoratum	Sweet vernal-grass	Abundant
Betula pendula	Silver birch regeneration	Frequent
Calluna vulgaris	Heather	Frequent
Centaurea nigra	Common knapweed	Occasional
Cerastium fontanum	Common mouse-ear	Rare
Cirsium palustre	Marsh thistle	Occasional
Cynosurus cristatus	Crested dog's-tail	Frequent
Cytisus scoparius	Broom	Occasional
Dactylis glomerata	Cock's-foot	Rare
Dactylorhiza fuchsii	Common spotted orchid	Occasional
Deschampsia caespitosa	Tufted hair-grass	Occasional
Deschampsia flexuosa	Wavy hair-grass	Occasional
Epilobium montanum	Broad-leaved willowherb	Rare
Festuca rubra	Red fescue	Occasional
Holcus lanatus	Yorkshire-fog	Abundant
Hypochaeris radicata	Cat's-ear	Frequent
Juncus conglomeratus	Compact rush	Rare
Juncus effusus	Soft rush	Rare
Lathyrus pratensis	Meadow vetchling	Locally frequent
Leucanthemum vulgare	Ox-eye daisy	Occasional
Lotus corniculatus	Common bird's-foot-trefoil	Locally dominant
Lotus pedunculatus	Greater bird's-foot-trefoil	Rare
Plantago lanceolata	Ribwort plantain	Frequent
Polytrichum sp.	Polytrichum moss sp.	Occasional
Potentilla erecta	Tormentil	Occasional
Prunella vulgaris	Self-heal	Locally frequent
Quercus sp.	Oak sp. regeneration	Rare
Ranunculus acris	Meadow buttercup	Rare
Ranunculus repens	Creeping buttercup	Rare
Rumex acetosa	Common sorrel	Occasional
Rumex crispus	Curled dock	Rare
Rumex obtusifolius	Broad-leaved dock	Rare
Senecio jacobaea	Common ragwort	Rare
Trifolium pratense	Red clover	Frequent
Trifolium repens	White clover	Occasional
Ulex europaeus	Gorse	Frequent
Vicia sativa	Common vetch	Rare

Species present in the area of unimproved grassland located to the north of the survey area

Scientific name	Common name	*Abundance
Agrostis capillaris	Common bent	Abundant
Anthoxanthum odoratum	Sweet vernal-grass	Occasional
Betula pendula	Silver birch regeneration	Frequent

Calluna vulgaris	Heather	Locally frequent
Centaurea nigra	Common knapweed	Locally abundant
Chamerion angustifolium	Rosebay willowherb	Locally abundant
Cirsium arvense	Creeping thistle	Frequent
Cytisus scoparius	Broom	Occasional
Dactylis glomerata	Cock's-foot	Rare
Deschampsia caespitosa	Tufted hair-grass	Frequent
Digitalis purpurea	Foxglove	Rare
Epilobium hirsutum	Great willowherb	Rare
Epilobium montanum	Broad-leaved willowherb	Occasional
Equisetum spp.	Horsetail sp.	Rare
Holcus lanatus	Yorkshire-fog	Abundant
Hypochaeris radicata	Cat's-ear	Occasional
Juncus effusus	Soft rush	Rare
Lathyrus pratensis	Meadow vetchling	Locally abundant
Leucanthemum vulgare	Ox-eye daisy	Rare
Melilotus officinalis	Ribbed melilot	Rare
Plantago lanceolata	Ribwort plantain	Occasional
Prunella vulgaris	Self-heal	Occasional
Rubus fruticosus	Bramble	Occasional
Rumex obtusifolius	Broad-leaved dock	Rare
Senecio jacobaea	Common ragwort	Rare
Trifolium campestre	Hop trefoil	Frequent
Trifolium pratense	Red clover	Abundant
Tussilago farfara	Colt's-foot	Locally dominant
Ulex europaeus	Gorse	Abundant
Vicia sativa	Common vetch	Locally frequent
Vicia sepium	Bush vetch	Locally frequent

Species present in the area of unimproved grassland located to the south-west of the survey area

Scientific name	**Common name**	***Abundance**
Achillea millefolium	Yarrow	Occasional
Aegopodium podagraria	Ground-elder	Locally abundant
Anthoxanthum odoratum	Sweet vernal-grass	Frequent
Calluna vulgaris	Heather	Rare
Carex hirta	Hairy sedge	Locally abundant
Centaurea nigra	Common knapweed	Occasional
Cirsium arvense	Creeping thistle	Occasional
Cynosurus cristatus	Crested dog's-tail	Abundant
Cytisus scoparius	Broom	Occasional
Festuca sp.	Fescue sp.	Abundant
Fraxinus excelsior	Ash saplings	Frequent
Heracleum sphondylium	Hogweed	Occasional
Holcus lanatus	Yorkshire-fog	Frequent
Hypochaeris radicata	Cat's-ear	Occasional
Juncus articulatus	Jointed rush	Occasional
Leucanthemum vulgare	Ox-eye daisy	Occasional
Lotus corniculatus	Common bird's-foot-trefoil	Locally abundant
Mosses sp.	Mosses sp.	Occasional
Plantago lanceolata	Ribwort plantain	Abundant

Quercus sp.	Oak sp.	Rare
Ranunculus acris	Meadow buttercup	Occasional
Ranunculus repens	Creeping buttercup	Abundant
Rumex acetosa	Common sorrel	Frequent
Rumex obtusifolius	Broad-leaved dock	Occasional
Senecio jacobaea	Common ragwort	Rare
Trifolium pratense	Red clover	Occasional
Trifolium repens	White clover	Occasional
Vicia sepium	Bush vetch	Occasional

Species present in the area of semi-improved neutral grassland located to the north-east of the survey area

Scientific name	Common name	*Abundance
Alopecurus geniculatus	Marsh foxtail	Locally dominant
Alopecurus pratensis	Meadow foxtail	Occasional
Anthoxanthum odoratum	Sweet vernal-grass	Occasional
Cerastium fontanum	Common mouse-ear	Rare
Cirsium palustre	Marsh thistle	Occasional
Cynosurus cristatus	Crested dog's-tail	Occasional
Deschampsia caespitosa	Tufted hair-grass	Locally dominant
Deschampsia flexuosa	Wavy hair-grass	Locally frequent
Holcus lanatus	Yorkshire-fog	Dominant
Juncus effusus	Soft rush	Locally abundant
Lolium perenne	Perennial rye-grass	Abundant
Pteridium aquilinum	Bracken	Locally dominant
Ranunculus acris	Meadow buttercup	Occasional
Ranunculus repens	Creeping buttercup	Frequent
Rumex acetosa	Common sorrel	Occasional
Rumex crispus	Curled dock	Occasional
Senecio jacobaea	Common ragwort	Occasional
Vaccinium myrtillus	Bilberry	Locally frequent

Species present in the area of poor semi-improved grassland located to the north-east of the survey area

Scientific name	Common name
Alopecurus geniculatus	Marsh foxtail
Alopecurus pratensis	Meadow foxtail
Cynosurus cristatus	Crested dog's-tail
Deschampsia caespitosa	Tufted hair-grass
Holcus lanatus	Yorkshire-fog
Juncus effusus	Soft rush
Lolium perenne	Perennial rye-grass
Ranunculus acris	Meadow buttercup
Rubus fruticosus	Bramble
Rumex acetosa	Common sorrel
Senecio jacobaea	Common ragwort

Species present in the areas of semi-natural broadleaved woodland in the survey area

Scientific name	Common name	*Abundance
Acer pseudoplatanus	Sycamore	Rare
Asplenium scolopendrium	Hart's-tongue fern	Rare
Betula pendula	Silver birch	Dominant
Cotoneaster sp.	Cotoneaster sp.	Rare
Crataegus monogyna	Common hawthorn	Occasional
Digitalis purpurea	Foxglove	Rare
Dryopteris dilatata	Broad buckler fern	Dominant
Epilobium montanum	Broad-leaved willowherb	Occasional
Fraxinus excelsior	Ash	Locally dominant
Heracleum sphondylium	Hogweed	Occasional
Holcus lanatus	Yorkshire-fog	Dominant
Hypericum androsaemum	Tutsan	Rare
Ilex aquifolium	Holly	Rare
Juncus effusus	Soft rush	Rare
Ligustrum ovalifolium	Garden privet	Rare
Lonicera periclymenum	Honeysuckle	Locally dominant
Quercus sp.	Oak sp.	Occasional
Rhododendron ponticum	Rhododendron	Occasional
Rubus fruticosus	Bramble	Frequent
Salix cinerea	Grey willow	Frequent
Sorbus aucuparia	Rowan	Rare
Urtica dioica	Common nettle	Frequent

Species present in the areas of tall ruderal herbs located to the north-east of the survey area

Scientific name	Common name
Chamerion angustifolium	Rosebay willowherb
Cirsium arvense	Creeping thistle
Deschampsia caespitosa	Tufted hair-grass
Digitalis purpurea	Foxglove
Epilobium montanum	Broad-leaved willowherb
Juncus effusus	Soft rush
Rubus fruticosus	Bramble
Rumex acetosa	Common sorrel
Rumex obtusifolius	Broad-leaved dock
Tussilago farfara	Colt's-foot
Urtica dioica	Common nettle

Species present in the areas of tall ruderal herbs elsewhere within the survey area

Scientific name	Common name
Chamerion angustifolium	Rosebay willowherb
Cirsium arvense	Creeping thistle
Cytisus scoparius	Broom
Dactylis glomerata	Cock's-foot
Digitalis purpurea	Foxglove
Rumex obtusifolius	Broad-leaved dock

Senecio jacobaea	Common ragwort
Urtica dioica	Common nettle

Species associated with the on-site ponds

Scientific name	Common name	*Abundance
Betula pendula	Silver birch	Frequent
Calluna vulgaris	Heather	Rare
Chamerion angustifolium	Rosebay willowherb	Occasional
Epilobium hirsutum	Great willowherb	Occasional
Epilobium paulstre	Marsh willowherb	Rare
Equisetum spp.	Horsetail sp.	Occasional
Holcus lanatus	Yorkshire-fog	Occasional
Juncus articulatus	Jointed rush	Frequent
Salix caprea	Goat willow	Frequent
Salix fragilis	Crack willow	Occasional
Trifolium pratense	Red clover	Occasional
Trifolium repens	White clover	Occasional
Ulex europaeus	Gorse	Frequent

Species associated with the area of dry heath located to the north of the survey area

Scientific name	Common name	*Abundance
Agrostis capillaris	Common bent	Abundant
Agrostis stolonifera	Creeping bent	Frequent
Betula pendula	Silver birch saplings	Frequent
Calluna vulgaris	Heather	Abundant
Chamerion angustifolium	Rosebay willowherb	Occasional
Mosses sp.	Mosses sp.	Abundant
Oenothera biennis	Common evening-primrose	Rare
Pinus sp.	Pine sp. sapling	Rare
Salix sp.	Willow sp. saplings	Frequent

Species associated with area of pioneer vegetation on embankment located to the west of the survey area

Scientific name	Common name	*Abundance
Agrostis capillaris	Common bent	Frequent
Betula sp.	Birch sp.	Locally dominant
Calluna vulgaris	Heather	Occasional
Chamerion angustifolium	Rosebay willowherb	Rare
Cytisus scoparius	Broom	Occasional
Dryopteris dilatata	Broad buckler fern	Occasional
Dryopteris filix-mas	Male fern	Rare
Equisetum spp.	Horsetail sp.	Frequent
Holcus lanatus	Yorkshire-fog	Abundant
Juncus effusus	Soft rush	Abundant
Salix sp.	Willow sp.	Locally dominant
Senecio jacobaea	Common ragwort	Occasional

Species associated with areas of scrub

Scientific name	Common name
Betula pendula	Silver birch
Crataegus monogyna	Common hawthorn
Cytisus scoparius	Broom
Rubus fruticosus	Bramble
Salix cinerea	Grey willow
Salix sp.	Willow sp.
Sorbus aucuparia	Rowan
Ulex europaeus	Gorse

Species present in areas of scattered trees within the survey area

Scientific name	Common name
Acer pseudoplatanus	Sycamore
Larix sp.	Larch sp.
Betula pendula	Silver birch
Salix cinerea	Grey willow
Sorbus aucuparia	Rowan
Quercus sp.	Oak sp.

Species present in areas of ephemeral vegetation

Scientific name	Common name
Achillea millefolium	Yarrow
Agrostis stolonifera	Creeping bent
Bellis perennis	Daisy
Betula pendula	Silver birch
Cerastium fontanum	Common mouse-ear
Cirsium vulgare	Spear thistle
Holcus lanatus	Yorkshire-fog
Hypochaeris radicata	Cat's-ear
Juncus bufonius	Toad rush
Lotus corniculatus	Common bird's-foot-trefoil
Medicago lupulina	Black medick
Mosses sp.	Mosses sp.
Poa trivialis	Rough meadow-grass
Prunella vulgaris	Self-heal
Senecio jacobaea	Common ragwort
Sonchus asper	Prickly sow-thistle
Taraxacum agg.	Dandelion
Trifolium campestre	Hop trefoil
Trifolium repens	White clover
Tussilago farfara	Colt's-foot
Veronica serpyllifolia	Thyme-leaved speedwell

Species present in Hedgerow 1

Scientific name	Common name	*Abundance
Alnus glutinosa	Common alder	Occasional
Carpinus sp.	Hornbeam sp.	Occasional
Crataegus monogyna	Common hawthorn	Frequent
Fraxinus excelsior	Ash	Rare
Sambucus nigra	Elder	Rare
Sorbus aucuparia	Rowan	Rare

*** The abundance of all recorded botanical species identified in potential Biodiversity Action Plan Priority habitats was assessed using the DAFOR scale. The DAFOR scale is a broad interpretive assessment whereby the surveyor assigns one of the following categories to the abundance of the species; Dominant, Abundant, Frequent, Occasional or Rare.**

N.B. These species lists represent those species identified during the survey. Those species which were not in growth or could not be identified due to the growth stage are not included. Exotic species (such as garden escapes) may also have been omitted from the above lists. However, it is considered that the information gathered during the survey was sufficient to provide an accurate assessment of the site.

Appendix E: Photographic Plates


Plates 1a & 1b: View of areas of unimproved neutral grassland located to the north of the site (TN1)

Plate 2: View of area of unimproved neutral grassland located to the south-west of the site (TN1)

Plate 3: View of area of dry heath with scattered scrub located to the north of the site (TN2)


Plates 4a & 4b: View within the areas of semi-natural broadleaved woodland (TN3)




Plates 5a, 5b, 5c & 5d: View of Ponds 7, 5, 3 and 2 (clockwise from top left) (TN4)



Plates 6a, 6b & 6c: View of cliffs around the site with varying levels of vegetative cover (TN5)

Plate 7: View of pioneer vegetation (TN6)

Plate 8: View of spoil mound (TN7)

Plates 9a & 9b: View of rubble piles on site (TN8)

Plate 10: View of Hedgerow 1 (TN10)

Plate 11: View of bird box located within the survey area (TN11)

Plate 12: View of Rhododendron sp. on site (TN13)

Plate 13: View of Cotoneaster sp. on site (TN14)

Plate 14: View of semi-improved neutral grassland with scrub and locally abundant soft rush located within the survey area

Plate 15: View of poor semi-improved neutral grassland located within the survey area

Plates 16a & 16b: Views of tall ruderal herbs on site

Plate 17: View of dense scrub located to the north of the site

Plate 18: View of ephemeral vegetation on site

Plate 19: View of area of bare rock

Plate 20: View of hard-standing and Building 8

Plates 21a, 21b & 21c: View of some of the buildings on site

Appendix F: Legislation

Species/Habitat	Protected by:	UK BAP	Local BAP
Badger	*Protection of Badgers Act,* 1992	No	No
Barn owl	Schedule 1, Part 1 of the *Wildlife and Countryside Act,* 1981	No	Yes
Bats	Regulation 41 of *The Conservation of Habitats and Species Regulations*, 2010 Section 9 of the *Wildlife and Countryside Act,* 1981 (as amended) Section 40 of the *Natural Environment and Rural Communities (NERC) Act,* 2006	Dependent on species	Dependent on species
Bluebell	Schedule 8 of the *Wildlife and Countryside Act,* 1981 (as amended)	No	No
Brown hare	Section 41 of *The Natural Environment and Rural Communities (NERC) Act,* 2006	Yes	Yes
Common frog	Provision 5 of Section 9 of the *Wildlife and Countryside Act*, 1981 (as amended)	No	No
Common toad	Provision 5 of Section 9 of the *Wildlife and Countryside Act*, 1981 (as amended) Section 41 of the *Natural Environment and Rural Communities (NERC) Act,* 2006	Yes	No
Cotoneaster	Section 14 of the *Wildlife and Countryside Act,* 1981 (as amended)	No	No
Great crested newt	Regulation 41 of *The Conservation of Habitats and Species (Amendment) Regulations*, 2012 Section 9 of the *Wildlife and Countryside Act,* 1981 (as amended) Section 41 of the *Natural Environment and Rural Communities (NERC) Act,* 2006	Yes	Yes
Hedgehogs	Section 41 of the *Natural Environment and Rural Communities (NERC) Act,* 2006	Yes	No
Invertebrates	Section 41 of the *Natural Environment and Rural Communities (NERC) Act,* 2006	Dependent on species	Dependent on species
Nesting birds	Section 1 of the *Wildlife and Countryside Act,* 1981	Dependent on species	Dependent on species
Palmate newt	Provision 5 of Section 9 of the *Wildlife and Countryside Act*, 1981 (as amended)	No	No
Polecat	Section 41 of the *Natural Environment and Rural Communities (NERC) Act,* 2006 Section 6 of the *Wildlife and Countryside Act*, 1981 (as amended)	Yes	Yes
Rhododendron	Section 14 of the *Wildlife and Countryside Act*, 1981 (as amended)	No	No
Smooth newt	Provision 5 of Section 9 of the *Wildlife and*	No	No

	Countryside Act, 1981 (as amended)		
'Widespread' reptiles	Provisions 1 and 5 of Section 9 of the *Wildlife and Countryside Act*, 1981 (as amended) Section 41 of the *Natural Environment and Rural Communities (NERC) Act,* 2006	Yes	Dependent on species

The *Conservation of Habitats and Species Regulations,* 2010

European protected species are listed on Schedule 2 of the *Conservation of Habitats and Species Regulations* 2010. Those species listed on Schedule 2 are protected under Regulation 41, which refers to the protection of wild animals of a European Protected Species. The following is a summary of the offences listed under Regulation 41, however, the *Conservation Regulations* should always be referred to for the exact and current wording:

Under Regulation 41 of the *Conservation of Habitats and Species Regulations,* 2010 it is an offence to –

- deliberately capture or kill a wild animal of a European protected species;
- deliberately disturb wild animals, in particular any disturbance which is likely:
    - to impair their ability to survive, to breed or reproduce, or to rear or nurture their young; or
    - to impair their ability, in the case of animals of a hibernating or migratory species, to hibernate or migrate;
    - to affect significantly the local distribution or abundance of the species to which they belong
- deliberately take or destroy the eggs of such an animal; or
- damage or destroy a breeding site or resting place of such an animal.
- keep, transport, sell or exchange, or offer for sale or exchange, any live or dead wild animal of a European protected species, or any part of, or anything derived from, such an animal.

***Wildlife and Countryside Act,* 1981 (as amended)**

British protected species of animal are listed on Schedule 5 of the *Wildlife and Countryside Act*, 1981 (as amended). Those species listed on Schedule 5 are protected under Part 1, Section 9, which refers to the protection of certain wild animals. The following is a summary of the offences listed under Section 9; however the Act should always be referred to for the exact and current wording:

Under Section 9 of the *Wildlife and Countryside Act*, 1981 (as amended) if any person –

- intentionally kills, injures or takes any wild animal included in Schedule 5;
- has in his possession or control any live or dead wild animal included in Schedule 5 or any part of, or anything derived from such an animal;
- intentionally or recklessly damages or destroys, or obstructs access to, any structure or place which any wild animal included in Schedule 5 uses for shelter or protection;
- disturbs any such animal included in Schedule 5 while it is occupying a structure or place which it uses for that purpose;

- sells, offers or exposes for sale, or has in his possession or transports for the purpose of sale, any live or dead wild animal included in Schedule 5, or any part of, or anything derived from, such an animal; or,
- publishes or causes to be published any advertisement likely to be understood as conveying that he buys or sells, or intends to buy or sell, any of those things, he shall be guilty of an offence.

This legislation applies to all life stages of GCN. Heavy fines (up to £5,000 per incident) can be imposed for **each** offence, and a prison sentence of up to 6 months for each offence can be given to any person found guilty of an offence. In certain circumstances, any machine, tool or implement involved in an illegal act can also be seized.

Natural England (NE) issue licences for the disturbance of European Protected Species including GCN, certain criteria must be met before a licence can be issued to enable otherwise prohibited works to proceed. Such criteria may be subject to change without notice. For further information please visit www.naturalengland.org.uk

Wildlife and Countryside Act, **1981 (as amended) - Birds**

All species of wild bird, their nests and eggs are protected under Section 1 of the *Wildlife and Countryside Act,* 1981 (as amended); therefore surveys are required to check for their presence where they are likely to be disturbed for any reason.

The following is a summary of the offences listed under Section 1; however the Act should always be referred to for the exact and current wording:

Under Section 1 of the *Wildlife and Countryside Act*, 1981 (as amended), if any person:

- Intentionally kills, injures or takes any wild bird;
- Intentionally takes, damages or destroys the nest of any wild bird while that nest is in use or being built;
- Intentionally takes or destroys an egg or any wild bird, he shall be guilty of an offence;
- Has in his possession or control any live or dead wild bird or any part of, or anything derived from, such a bird; or
- Has in his possession or control an egg of any wild bird or any part of such an egg, he shall be guilty of an offence.

Schedule 1 (Part 1 and Part 2) of the *Wildlife and Countryside Act,* 1981 (as amended) lists bird species that receive special attention under Section 1. Any person convicted of an offence listed above, in respect of a bird included in Schedule 1 or any part of, or anything derived from, such a bird; the nest of such a bird; or an egg of such a bird or any part of such an egg, shall be liable to a special penalty.

Also, if any person intentionally or recklessly disturbs any wild bird included in Schedule 1 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, he shall be guilty of an offence and liable to a special penalty.

Schedules 1, 2, 3 and 4 of the *Wildlife and Countryside Act*, 1981 (as amended) list different species of bird and different Parts of Section 1 of the Act refer to different offences which may be committed in relation to the varying Schedules. The following is a summary of the type of protection offered to species of wild bird listed on each of the Schedules, however the Act itself should always be referred to for the exact and current wording and full species lists:

Schedule 1: Birds which are protected by special penalties:
Part 1: At all times.
Part 2: During the close season.
Schedule 2: Birds which may be killed or taken:
Part 1: Outside the close season.
Part 2: By authorised persons at all times.
Schedule 3: Birds which may be sold:
Part 1: Alive at all times if ringed and bred in captivity.
Part 2: Dead at all times.
Part 3: Dead from 1st September to 28th February.
Schedule 4: Birds which must be registered and ringed if kept in captivity.

The *Natural Environment and Rural Communities (NERC) Act,* 2006 (as amended)

The following is a summary of the *Natural Environment and Rural Communities (NERC),* Act, 2006 (as amended), the *NERC Act* itself should be referred to for the exact and current wording:

- Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity;
- In complying with the above, a Minister of the Crown, government department or the National Assembly for Wales must in particular have regard to the United Nations Environmental Programme Convention on Biological Diversity of 1992;
- Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat.

The Hedgerow Regulations, 1997

Hedgerows are distinctive features in the countryside and are the traditional type of field boundary in many areas of England and Wales. Many of these date back to the original enclosure of the land and so are of historic interest and importance.

Hedgerows (particularly older hedgerows) can contain a diverse mix of species and provide important links between other areas of habitat thus allowing wildlife to disperse. This role that hedgerows play in conserving and enhancing biodiversity is recognised by the UK BAP for this habitat type.

Hedgerows which meet certain criteria are protected by *The Hedgerows Regulations,* 1997. The aim of the Regulations is to protect important hedgerows in the countryside by controlling their removal through a system of notification. Under the Regulations it is against the law to remove or destroy certain hedgerows without permission from the Local Planning Authority (LPA). The criteria used to assess hedgerows relate to the value of a hedgerow from an archaeological, historical, landscape or wildlife perspective. They exclude hedgerows that are less than 30 years old. If a hedgerow is at least 30 years old and qualifies under any one of the criteria, then it is important and LPA approval is required before it can be lawfully removed or destroyed.

Removal of a hedgerow in contravention of the Regulations is a criminal offence, punishable in some cases in the Magistrates Court, by a fine of up to £5,000. For anyone convicted on indictment in the Crown Court, the fine is unlimited.

If a hedgerow is over 30 years old and meets the criteria in the Regulations it is classified as 'important'. A summary of the criteria is set out below, however, *The Hedgerow Regulations,* 1997 should be referred to for the exact and current wording:

- Marks a pre-1850 parish or township boundary; or
- Incorporates an archaeological; or
- Is part of, or associated with, an archaeological site; or
- Marks the boundary of, or is associated with, a pre-1600 estate or manor; or
- Forms an integral part of a pre-Parliamentary enclosure field system; or
- Contains certain categories of species of birds, animals or plants listed in the Wildlife and Countryside Act or Joint Nature Conservation Committee (JNCC) publications.
- Includes:
    - At least 7 woody species, on average, in a 30 metre length; or
    - At least 6 woody species, on average, in a 30 metre length and has at least 3 associated features; or
    - At least 6 woody species, on average, in a 30 metre length, including a black-poplar tree, or large-leaved lime, or a small-leaved lime, or wild service-tree; or
    - At least 5 woody species, on average, in a 30 metre length and has at least 4 associated features.
- Runs alongside a bridleway, footpath, road used as a public path, or byway open to all traffic and includes at least 4 woody species, on average, in a 30 metre length and has at least 2 of the associated features listed at (i) to (v) below.

  (Note: The number of woody species is reduced by one in the North of England (which does not include Cheshire). The list of 56 woody species comprises mainly shrubs and trees. It generally excludes climbers (such as clematis, honeysuckle and bramble) but includes wild roses)

Associated features:

(i) A bank or wall supporting the hedgerow;
(ii) Less than 10% gaps;
(iii) On average, at least one tree per 50 metres;
(iv) At least 3 species from a list of 57 woodland plants;
(v) A ditch;
(vi) A number of connections with other hedgerows, ponds or woodland; and
(vii) A parallel hedge within 15 metres.

The *Protection of Badgers Act,* 1992

The following is a summary of the offences contained in the Act; however the *Protection of Badgers Act,* 1992 itself should always be referred to for the exact and current wording.

Under the *Protection of Badgers Act*, 1992 a person is guilty of an offence if, except as permitted by or under this Act he:

- wilfully kills, injures or takes, or attempts to kill, injure or take, a badger;
- has in his possession or under his control any dead badger or any part of, or anything derived from, a dead badger;
- cruelly ill-treats a badger;

- uses badger tongs in the course of killing or taking, or attempting to kill or take, a badger;
- digs for a badger; or,
- sells a live badger or offers one for sale or has a live badger in his possession or control.

A person is also guilty of committing an offence under the *Protection of Badgers Act*, 1992 if he intentionally or recklessly interferes with a badger sett by doing any of the following things:

- damaging a badger sett or any part of it;
- destroying a badger sett;
- obstructing access to, or any entrance of, a badger sett;
- causing a dog to enter a badger sett; or,
- disturbing a badger when it is occupying a badger sett,

The definition of a badger sett within the meaning of the 1992 Act is given as “any structure or place, which displays signs indicating current use by a badger”. ‘Current’ is not defined in the Act, and may be open to interpretation. Natural England indicates that a sett is in ‘current’ use if it has been occupied at all over the previous 12 months. Whatever the interpretation of ‘current use’ however, it is important to note that a sett is protected whether or not there is a badger actually in residence at the time of inspection.

Natural England Guidelines state that work that disturbs badgers or their setts is illegal if not carried out under licence. Badgers could be disturbed by work near their sett even if there is no direct interference or damage to the sett itself, for example, using very heavy machinery within 30 metres of an active sett. Lighter machinery (particularly for any digging operation) within 20 metres, or light work such as hand digging or scrub clearance within 10 metres of an active sett, all require a licence. There are some activities which can cause disturbance at a far greater distance (such as using explosives or pile driving) and should therefore be given individual consideration. Certain criteria must be met before a licence can be issued to enable otherwise prohibited works to proceed. Such criteria may be subject to change without notice.

Timing of operations should also be considered. If required, site-specific badger disturbance licences are normally only issued between the months of July and October so as to avoid the badger’s breeding season. This aspect should be borne in mind when assessing any possible constraints upon the development timetable.

Appendix G: List of Wildlife Friendly Plants

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LIST OF NATIVE & WILDLIFE FRIENDLY PLANTS

Important note: It is entirely the responsibility of the client to ensure that any species chosen from the list provided is suitable for the specific attributes of the location.

Species	Height/Spread	Colours	Flowers/Berries	Wildlife benefits	Plant conditions and notes	Deciduous or Evergreen
Native Trees						
Field Maple *Acer campestre*	to 25m	Leaves: Green then amber in Autumn. Flowers: Yellow/green. Seeds: Green then brown with wings	Flowers May to June	51 species of insects/mites and 24 species of lepidoptera. Fruits eaten by small mammals	Calcareous or clay soils preferably in full sun	Deciduous
Alder *Alnus glutinosa*	6 - 15m	Leaves: Green, Catkins: Yellow/brown, Fruits: Cone-like, small and brown	Catkins in March to April	141 species of insects/mites and 71 species of lepidoptera. Seeds are good for birds such as siskins	Damp soil. Plant hardwood cuttings in the open in late autumn	Deciduous
Silver Birch *Betula pendula*	to 18m	Leaves: Green turning yellow in Autumn, Catkins: Yellow/brown then seeding, Bark: White	Catkins open in April and break up in winter releasing it's seeds	Excellent for insects and to attract inset eating birds. Best tree for moth larvae. Catkins good food source for birds such as redpolls and tits	Dry acid best.	Deciduous
Downy Birch *Betula pubescens*	to 24m	Leaves: Green turning yellow in Autumn, Catkins: Yellow/brown then seeding, Bark: White	Catkins open in April and break up in winter releasing it's seeds	Excellent for insects and to attract inset eating birds. Catkins good food source for birds	Favours wetter more peaty soil	Deciduous

Hornbeam *Carpinus betulus*	to 24m	Leaves: Green, Catkins: Green/crimson then seeding	Flowers in May	51 species of insects/mites and 32 species of lepidoptera. Seeds for birds. Can provide dense nesting cover	Woods and copses on clay soils, will tolerate shade. Sow seeds or fruits in spring	Deciduous
Hazel *Corylus avellana*	to 10m	Leaves: Green, Flowers: Long Yellow/Crimson tassels. Seeds: Brown nuts	Flowers in February	106 species of insects/mites and 68 species of lepidoptera. Nuts eaten by birds and mammals i.e. squirrels, mice and jays	Hedgerows, scrub and woodland in well-drained soil. Full sun or light shade preferable. Remove and plant rooted suckers or offsets in autumn	Deciduous
Beech *Fagus sylvatica*	to 46m	Leaves: Green then orange to red/brown in Autumn, Flowers: Green/white. Seeds: Brown nuts encased in a brown husk	Flowers March to April	98 species of insects/mites and 51 species of lepidoptera. The masts are eaten by birds and mammals including wood mice and jays	Well-drained soils. Can survive in shallow soil. Sow seeds or fruits in autumn	Deciduous. Can hold dead leaves through the winter
Ash *Fraxinus excelsior*	to 37m	Leaves: Green, Flowers: Green/Purple prior to the leaves. Seeds: Green single seeds in bunches with a long wing	Flowers: April-May	68 species of insects/mites and 32 species of lepidoptera. Seeds eaten by birds and mammals	Will survive on most soils with reasonable light. Sow seeds or fruits in autumn	Deciduous
Juniper *Juniperus communis*	Shrub or tree to 7m	Leaves: Spiky Green needles, Flowers: Small green to yellow flowers, Berries: Green ripening to purple in the second year	Flowers May to June. Berries take two years to ripen	32 species of insects/mites and 14 species of lepidoptera	Well-drained limestone and acid sandstone	Evergreen

Crab Apple *Malus sylvestris*	to 10m	Leaves: Green, Flowers: White and pink. Fruits: Green/yellow/red apples	Flowers: April to May. Fruits ripen in Autumn	118 species of insects/mites and 76 species of lepidoptera. Fruits are eagerly consumed by birds and mammals despite its bitter taste	Well-drained soil in full sun	Deciduous
Scots Pine *Pinus sylvestris*	to 36m	Leaves: Green needles, Flowers: Yellow and crimson, Cones: Short and brown		172 species of insects/mites and 36 species of lepidoptera. Cones are a valuable food source for birds and other mammals	Prefers sandy well-drained soil in full sun	Evergreen
Black Poplar *Populus nigra*	33m	Leaves: Green turning yellow in Autumn, Flowers: Green and crimson catkins, turning fluffy when fruiting	Catkins produced in March	153 species of insects/mites and 69 species of lepidoptera found within all the poplar species. Good for larger moth species i.e. Hawk moths	Fertile soil near water. Remove and plant rooted suckers or offsets in autumn. Reduced in numbers due to easy hybridisation with other poplars	Deciduous
Aspen *Populus tremula*	to 24m	Leaves: Green turning yellow in Autumn, Flowers: Green and brown catkins, turning fluffy when fruiting	Catkins arrive in March and set seed in May	Good for invertebrates and birds. Food plant of the hairstreak butterfly	Will survive on most soils with full sun or partial shade	Deciduous
Wild Cherry *Prunus avium*	9 - 12m	Leaves: Green turning crimson in Autumn, Flowers: White, Berries: Bright red	Flowers: April, Berries: July	Birds feed on the cherries	Prefers fertile soil, will tolerate some shade	Deciduous
Bird Cherry *Prunus padus*	Shrub or tree to 19m	Leaves: Green, Flowers: White, Berries: Black cherries	Flowers in May	9 species of lepidoptera. Berries eaten by birds	Woods and scrub. Well-drained soil with full sun or light shading	Deciduous

Oaks (native) *Quercus spp.*	to 42m	Leaves: Green, Flowers: Slim yellow catkins, Seeds: Green acorns turning brown when ready to fall	Flowers in May. Acorns produced in Autumn.	423 species of insects/mites and 193 species of lepidoptera. Acorns eaten by a variety of birds and mammals. Very important for insect eating birds	Variety of soils with reasonable depth and preferably in full sun, below 300m altitude. Sow seeds or fruits in autumn	Deciduous
Willows *Salix spp.*	to 25m (species dependent)		Flowers February to March	450 species of insects/mites and 166 species of lepidoptera	Damp areas. Plant hardwood cuttings in the open in late autumn	Deciduous
Goat Willow aka 'pussy willow' *Salix caprea*	Shrubby tree to 10m	Leaves: Oval, dark grey/green on top with a hairy underside, Flowers; Green and yellow short catkins turning fluffy when seeding	Flowers March to April	Early provider of pollen and nectar for insects	Most soils as long as they are at least slightly damp	Deciduous
Grey Willow *Salix cinerea*	Shrubby tree to 6m	Leaves: Grey/green on top with a lighter hairy underside, Flowers; Yellow catkins turning fluffy when seeding	Flowers March to April	Good for insects and birds	Most soils as long as they are at least slightly damp	Deciduous
Crack Willow *Salix fragilis*	Can reach 25m	Leaves: Long, shiny green on top with a grey/green underside, Flowers; Green and yellow catkins turning fluffy when seeding	Flowers in April with the catkins appearing in May and ripening in the summer	Good for insects and birds	Most soils as long as they are at least slightly damp	Deciduous
Bay Willow *Salix pentandra*	to 10m	Leaves: Long, shiny green on top with a grey/green underside, Flowers: Yellowish catkins turning fluffy	Flowers May to June	Good for insects and birds	Wet ground by water	Deciduous

		when seeding				
Elderberry *Sambucus nigra*	to 10m	Leaves: Green, Flowers: Small creamy white flowers in large numbers. Berries: Dark purple/black in bunches	Flowers May to June	Berries for birds and nectar for insects	Sun or partial shade	Deciduous
Whitebeam *Sorbus aria*	10 to 24m	Leaves: Green with white hairy underside turning yellow/crimson in Autumn, Flowers: White, Berries: Green ripening to bright red	Flowers: May	Flowers attract insects and the fruits are eaten by birds	Prefers calcareous soil	Deciduous
Rowan *Sorbus aucuparia*	18m	Leaves: Pinnate green leaves turning crimson in Autumn, Flowers: Small white flowers in clusters, Berries: Bright red	Flowers in May. Produces berries in autumn	58 species of insects/mites and 28 species of lepidoptera. The ripe berries attract birds such as redwings and fieldfares	Will tolerate most soils apart from very heavy soils	Deciduous
Wild Service Tree *Sorbus torminalis*	to 20m	Leaves: Shiny green leaves with a lighter coloured underside, turning purple/red in Autumn, Flowers: Creamy white in clusters, Seeds: Brown speckled seeds in clusters	Flowers: May or June Fruit: September	Good for insects. Fruits eaten by birds	Withstands shade. Prefers clay and limestone soil	Deciduous

Lime *Tilia europaea*	to 46m	Leaves: Green heart-shaped leaves with slightly hairy underside, Flowers: Greenish/yellow flowers, Seeds: Small round and hairy with a grey-brown colour	Flowers June to July	57 species of insects/mites and 31 species of lepidoptera. The nectar is highly sought by bees	Needs well-drained soil with full or partial sun	Deciduous
Wych Elm *Ulmus glabra*	to 37m	Leaves: Green turning yellow in autumn , Flowers: very small purplish flowers, Seeds: Circular winged fruits with the seed in the centre	Flowers produced in spring prior to the leaves, with winged fruits produced in July	Good tree for insects and birds	Full sun or light shade on most soils especially limestone. This species is less susceptable to Dutch elm disease	Deciduous
Dutch Elm *Ulmus hollandica*	to 32m	Leaves: Green, Seeds: Circular winged fruits with the seed in the centre	Winged fruits produced in July	Good tree for insects and birds	A native tree which has occurred naturally as a hybridisation between two other elms. Full sun or light shade. This species is less susceptable to Dutch elm disease	Deciduous
English Elm *Ulmus procera*	to 33m	Leaves: Green, Flowers: Small crimson flowers, Seeds: Circular winged fruits with the seed in the centre	Crimson flowers produced in spring with winged fruits produced in July	124 species of insects/mites and 24 species of lepidoptera are associated with elm trees	Full sun or light shade. 1 in 5 trees have caught Dutch elm disease to which English elms are susceptable	Deciduous

Species	Height/Spread	Colours	Flowers/Berries	Wildlife benefits	Plant conditions and notes	Deciduous or Evergreen
Introduced Trees						
Sweet Chestnut *Castanea sativa*	to 35m	Leaves: Green, Flowers: Long yellow tassels. Seeds: Brown nuts encased in a green spiky husk	Flowers July. Seeds produced in autumn decreasing in size the further north the plants are situated	11 species of insects/mites and 1 species of lepidoptera. Seeds eaten by a variety of mammals	Well-drained soil, in full or partial sun. Sow seeds or fruit in spring	Deciduous
European Larch *Larix decidua.*	to 46m	Leaves: light green needles, Flowers Yellow/dull-red small globes, Cones: Light brown	Spring	38 species of insects/mites and 15 species of lepidoptera. Cones provide food for tits and finches	Likes plenty of space in full sun	Deciduous
Magnolia *Liriodendron*				Early source of nectar for insects		
Apple *Malus domestica*	to 11m	Leaves: Green, Flowers: Deep pink. Fruits: Reddish-purple	Flowers: April to May. Fruits ripen in Autumn.	Good for invertebrates. Fruits are eagerly consumed by birds and mammals	Well-drained soil in full sun	Deciduous
Purple Crab *Malus purpurea*	to 10m	Leaves: Green, Flowers: White and pink. Fruits: Green/yellow/red apples	Flowers: April to May. Fruits ripen in Autumn	Good for invertebrates. Fruits are eagerly consumed by birds and mammals	Well-drained soil in full sun	Deciduous
Norway Spruce *Picea abies*	to 46m	Leaves: Green needles, Flowers: Yellow and pink, Cones: Long and brown	Flowers open in May. Cones ripen in autumn	70 species of insects/mites and 13 species of lepidoptera. The cones are eaten by birds and mammals which include crossbills, treecreepers and red squirrels	Any reasonable soil, preferably in good sun	Evergreen

White Poplar *Populus alba*	24m	Leaves: Dark green upper with pale hairy underside, Flowers: Green catkins, turning fluffy when fruiting	Catkins produced in March	Good for invertebrates and birds especially larger moth species	Full sun or partial shade. Remove and plant rooted suckers or offsets in autumn. Can tolerate pollution well, but the roots can damage pipelines and paving	Deciduous
Wild Plum *Prunus domestica*	to 8m	Leaves: Green, Flowers: White, Fruits: Small purple plums	Flowers: March to May. Fruits ripen in Autumn	Nectar and fruits for invertebrates. Fruits are eagerly consumed by birds and mammals	Well-drained soil in full sun	Deciduous
Peach *Prunus persica*	6m	Leaves: Dark green, Flowers: Deep pink, Fruits: Usual peach	Flowers: April to May. Fruits ripen in Autumn.	Nectar and fruits for invertebrates. Fruits are eagerly consumed by birds and mammals	Well-drained soil in full sun	Deciduous
Pear *Pyrus communis*	to 15m	Leaves: Dark glossy green, Flowers: White, Fruits Yellow-green to brown	Flowers: April to May. Fruits ripen in Autumn.	Good for invertebrates. Fruits are eagerly consumed by birds and mammals	Well-drained soil in full sun	Deciduous
Wild Pear *Pyrus pyraster*	to 15m	Leaves: Dark glossy green, Flowers: White, Fruits Yellow-red to brown, 1-4cm. The tree/shrub is usually spiny	Flowers: April to May. Fruits ripen in Autumn	Good for invertebrates. Fruits are eagerly consumed by birds and mammals	Well-drained soil in full sun	Deciduous

Native Shrubs						
Box *Buxus sempervirens*	to 3m	Leaves: Small, dark green and glossy, Flowers: Small green/yellow, Seeds: Black encased in blue green capsules turning brown in September	Flowers April to May	Provides good nesting cover and winter roosting cover for birds	Calcareous soils in full sun or partial shade	Evergreen
Heather *Calluna vulgaris*	50-100cm	Leaves: Green and minute, Flowers: Pink/purple, Seeds: Very small replacing flowers	Flowers in July to November	Good for invertebrates with a late supply of nectar	Well-drained acid soil in full sun	Evergreen
Dogwood *Cornus sanguinea*	to 4m	Leaves: Green and hairy turning crimson an Autumn, Flowers: Greenish white in groups, Berries: Black in clusters	Flowers in June. Produces bitter black berries in August-September	17 species of lepidoptera. Larval food plant of the green hairstreak butterfly. Flowers produce an unpleasant smell which is attractive to insects. Some birds manage to eat the berries	Woods and scrub on limestone or base rich clays	Deciduous
Hawthorn *Crataegus monogyna*	6m	Leaves: Small and green, Flowers: Bright yellow, Seeds: In green pods	Flowers: White – mid May. Berries: Red/orange in Autumn	Nectar. Berries good food source for thrushes, redwings and fieldfares. Good nesting if dense. Excellent for moth larvae	Any soil	Deciduous
Broom *Cytisus scoparius*	2.5m	Leaves: Small green and deeply lobed, Flowers: White, Berries: Red	Yellow flowers April-June	Good for 39 species of lepidoptera. Food plant of the hairstreak butterfly	Calcifuge, heathland, sandy banks, open woodland and rough ground. Well drained soil in full sun. Plant semi-ripe cuttings in a cold frame in summer	Semi-evergreen

Spurge Laurel *Daphne laureola*	1m	Leaves: Light green, Flowers: White/green, Berries: Black	Flowers in February to April	Early source of nectar for insects. Berries for birds which are poisonous to man	Well-drained humus-rich or chalky soil in full sun or deep shade	Evergreen
Mezereon *Daphne mezereum*	1m	Leaves: Light green with cream tinged edges, Flowers: Bright pink, Berries: Red	Flowers in February to April	Early source of nectar for insects	Well-drained humus-rich soil in full sun or light shade	Deciduous
Heath 'Bell' *Erica cinerea*	to 50cm	Leaves: Green and minute, Flowers: Pink/purple, Seeds: Very small replacing flowers	Flowers July to August	Provides nectar for invertebrates	Well-drained acid soil in full sun	Evergreen
Heath 'Cross-leaved' *Erica tetralix*	to 50cm	Leaves: Green and minute, Flowers: Pink/purple, Seeds: Very small replacing flowers	Flowers July to August	Provides nectar for invertebrates	Damp acid soil in full sun	Evergreen
Spindle *Euonymus europaeus*	5m (8m max)	Leaves: Light green turning to crimson in Autumn, Flowers: Greenish yellow, Seeds: encased in a four lobed pink capsule	Fruit October to December	10 species of lepidoptera. Nectar is good for insects. Berries are good for birds but induce vomiting in people	Woods, hedgerows and scrub on calcareous or base rich clays. Plant semi-ripe cuttings in a cold frame in summer	Deciduous
Alder Buckthorn *Frangula alnus*	2.5m	Leaves: Shiny green, Flowers: very small greenish flowers, Berries: Green berries turning red then purple	Flowers: Early summer. Berries: Autumn	Berries for birds. Important food plant for brimstone butterfly larvae	Damp acidic soil/peat	Deciduous
Tutsan *Hypericum androsaemum*	80cm	Leaves: Green turning red in autumn, Flowers: Yellow, Berries: Black	Flowers June to October followed by berries	Flowers attract insects especially bees. Berries are eaten by birds and small mammals	Full sun or light shade in damp soil. Plant semi-ripe cuttings in a cold frame in summer	Deciduous

Holly *Ilex aquifolium*	300 x 150+ cm	Leaves: spiky glossy green, Flowers: Small pink/white, Berries: Bright red	Flowers: May. Berries: (only on female trees) October to December	Berries good for birds and small mammals. Caterpillars of the holly blue butterfly feed on the leaves. Holly leaf miner provides winter food for birds	Not wet. Layer stems in spring. Need male and female plants near each other to produce berries	Evergreen
Privet *Ligustrum vulgare*	3m	Leaves: Green, Flowers: White, Berries: Small black berries	Flowers: July	24 species of insects/mites, nectar for the butterflies. Berries eaten by birds	Hedgerows and scrub, especially on base rich soil. Plant hardwood cuttings in the open in late autumn	Deciduous or semi-evergreen in mild areas
Shrubby Cinquefoil *Potentilla fruticosa*	1m	Leaves: Green, Flowers: Yellow	Flowers May to September	Nectar source for bees and butterflies	Well-drained soil in full sun or light shade. Semi-ripe cuttings in a cold frame in summer	Deciduous
Blackthorn *Prunus spinosa*	4m	Leaves: Green, Flowers: White, Berries: Blue/black	Flowers: spring	Good for nesting birds if grown as thicket or in hedge. Rich in insects. Fruit for birds. Black hairstreak butterfly lays its eggs mainly on blackthorn	Well-drained soil preferably in a sunny location	Deciduous
Buckthorn *Rhamnus catharticus*	5m	Leaves: Yellow green, Flowers: Yellow/green, Berries: Black. Stems with spines	Flowers: May to June	Larval food plant for brimstone butterfly	Damp, peat or base-rich soils	Deciduous
Dog Rose *Rosa canina*	3 - 4m	Leaves: Green , Flowers: Pink/white, Hips: Red	Flowers: June to July. Hips: autumn	Provides nectar for bees and butterflies. Hips good for small birds and mammals	Dislikes wet or exposed sites Can tolerate poor fertility	Deciduous
Sweet Briar *Rosa rubiginosa*	240 x 240cm	Leaves: Green , Flowers: Pink, Hips: Red/orange	Flowers: mid summer. Berries: autumn	Hips food source for small mammals and birds. Good nesting cover	Prefers sun and well drained soil	Deciduous

Raspberry *Rubus idaeus*	1.5 - 2.5m	Leaves: Green with thorns on underside, Flowers White, Berries: Red, Stems also have thorns	Flowers May to August with berries following	Nectar source for bees and butterflies. Berries for birds and mammals	Any reasonable soil in full sun or partial shade	Deciduous shrub
Gorse *Ulex europaeus*	2 - 2.5m	Leaves: Thin and spiky, green in colour, Flowers: Yellow	Autumn flowers, can flower throughout the year	29 species of insect. Provides good protection for birds nests frequently used by linnets, whinchats and stonechats.	Sandy or peaty well-drained soil in full sun. Grassland, heathland and open woods. Plant semi-ripe cuttings in a cold frame in summer	Evergreen
Wayfaring Tree *Vibernum lantana*	3m	Leaves: Green, Flowers: Whitish yellow, Berries: Red then becoming black	Flowers in June to July	Berries for birds and nectar for insects	Most soils especially base rich	Deciduous
Guelder Rose *Viburnum opulus*	300 x 250cm	Leaves: Green, Flowers: White, Berries: Bright red	Flowers: May to June. Berries: autumn	Nectar for insects, particularly hoverflies. Fruits for birds and small mammals, especially liked by woodmouse. Note: leaves, bark and berries are all poisonous	Plant semi-ripe cuttings in a cold frame in summer	Deciduous
Introduced Shrubs						
Juneberry *Amelanchier lamarkii*	to 6m	Leaves: Pink when unfolding, turning green then yellow-brown in Autumn, Flowers: White in large quantities, Berries: Round red fruits turning purple when ripe	Flowers April to May with berries in the summer	Nectar source for bees and butterflies. Berries for birds	Full sun or partial shade on light acid soils	Deciduous

Spotted Laurel *Aucuba japonica*	2 - 3m	Leaves: Dark green with yellow speckles, leathery in texture, Flowers: Small and white, Berries: Green, ripening to red the following spring	Berries: October-January	Berries for birds	Sun or deep shade, all soils	Evergreen
Darwin's Barberry *Berberis darwinii*	to 3m	Leaves: Sharp holly-like green leaves, Flowers: Orange in small clusters, Berries: Blue berries in bunches, Stems: with spines	Flowers in spring. Berries in autumn	Berries for birds and nectar for insects. Can provide good nesting cover for small passerines	Sun or light shade. Various propagation methods. Note: this shrub is a winter host for wheat rust - agricultural fungal pest	Evergreen
Hooker's Barberry *Berberis hookeri*	to 3m	Leaves: Sharp green leaves, Flowers: Yellow in small clusters, Berries: Black berries in bunches, Stems: with spines	Flowers in spring. Berries in autumn	Berries for birds and nectar for insects. Can provide good nesting cover for small passerines	Sun or light shade. Various propagation methods. Note: this shrub is a winter host for wheat rust - agricultural fungal pest	Evergreen
Hedge Barberry *Berberis stenophylla*	to 3m	Leaves: Small sharp green leaves, Flowers: Yellow in small clusters, Berries: Blue/black berries in bunches, Stems: with spines	Flowers in spring. Berries in autumn	Berries for birds and nectar for insects. Can provide good nesting cover for small passerines	Sun or light shade. Various propagation methods. Note: this shrub is a winter host for wheat rust - agricultural fungal pest	Evergreen
Thunberg's Barberry *Berberis thunbergii*	to 1.5m	Leaves: Bright red in Autumn, Flowers: Yellow in small clusters, Berries: Red berries in bunches, Stems: with spines	Flowers in spring. Berries in autumn	Berries for birds and nectar for insects. Can provide good nesting cover for small passerines	Sun or light shade. Various propagation methods. Note: this shrub is a winter host for wheat rust - agricultural fungal pest	Deciduous

Thunberg's Barberry *Berberis thunbergii 'Atropurpurea'*	to 2m	Leaves: Bronze leaves bright red in Autumn, Flowers: Yellow in small clusters, Berries: Red berries in bunches, Stems: with spines	Flowers in spring. Berries in autumn	Berries for birds and nectar for insects. Can provide good nesting cover for small passerines	Sun or light shade. Various propagation methods. Note: this shrub is a winter host for wheat rust - agricultural fungal pest	Deciduous
Thunberg's Barberry *Berberis thunbergii 'Atropurpurea Nana'*	60cm	Leaves: Bronze leaves bright red in Autumn, Flowers: Yellow in small clusters, Berries: Red berries in bunches, Stems: Almost spineless	Flowers in spring. Berries in autumn	Berries for birds and nectar for insects. Can provide good nesting cover for small passerines	Sun or light shade. Various propagation methods. Note: this shrub is a winter host for wheat rust - agricultural fungal pest	Deciduous
Barberry *Berberis vulgaris*	to 3m	Leaves: Green leaves, Flowers: Yellow in small clusters, Berries: Red berries in bunches, Stems: with spines	Flowers in spring. Berries in autumn	Berries for birds and nectar for insects. Can provide good nesting cover for small passerines	Sun or light shade. Various propagation methods. Note: this shrub is a winter host for wheat rust - agricultural fungal pest	Deciduous
Alternate-Leaved Butterfly-Bush *Buddleia davidii*	Willow like shrub to 8m	Leaves: Green , Flowers: Lilac found on long drooping stems covered in globular shaped flower bunches, Seeds: Found in the flower heads which stay on the plant for most of the winter	Flowers July to September	Nectar for bees and butterflies. The best bush available for butterflies especially if planted in a sun trap	Dryish soil in full sun or partial shade. Plant semi-ripe cuttings in a cold frame in summer or plant hardwood cuttings in the open in late autumn	Deciduous

Buddleia (butterfly-bush) *Buddleia davidii*	300 x 180cm	Leaves: Dark green above with a lighter hairier underside, Flowers: Long spikes with a lavender colour, Seeds: Found in the flower heads which stay on the plant for most of the winter	Flowers July to September	Nectar for bees and butterflies. The best bush available for butterflies especially if planted in a sun trap	Dryish soil in full sun or partial shade. Plant semi-ripe cuttings in a cold frame in summer or plant hardwood cuttings in the open in late autumn	Deciduous
Orange Ball Tree *Buddleia globosa*	to 5m	Leaves: Dark green above with a lighter hairier underside, Flowers: Orange in a globular shape, Seeds: Found in the flower heads which stay on the plant for most of the winter	Flowers May to June	Nectar for bees and butterflies	Dryish soil	Deciduous to semi-evergreen
Weyer's Butterfly-Bush *Buddleia weyeriana*	300 x 180cm	Leaves: Green, Flowers: Yellow found on inflorescence which is interrupted with spaces slightly globular in shape, Seeds: Found in the flower heads which stay on the plant for most of the winter	Flowers May to June	Nectar for bees and butterflies. Flowers slightly later then *davidii* attracting the butterflies from these bushes	Dryish soil in full sun or partial shade. Plant semi-ripe cuttings in a cold frame in summer or plant hardwood cuttings in the open in late autumn	Deciduous to semi-evergreen
Blue Spiraea *Caryopteris clandonensis*	1m	Leaves: Blue/green, Flowers: Blue in clusters	Flowers, September to October	Provides a late source of pollen and nectar	Requires well-drained soil in full sun	Deciduous
Californian Lilac *Ceanothus 'Autumnal Blue'*	1.8 x 1.8+m	Leaves: Green and shiny, Flowers: Purple in clusters	Flowers in July to October	Nectar for bees and butterflies	Fertile soil in a sunny location	Evergreen

Californian Lilac *Ceanothus 'Gloire de Versailles'*	1.8 x 1.8m	Leaves: Dark green and shiny, Flowers: Light blue in clusters	Flowers in July to October	Nectar for bees and butterflies	Fertile soil in a sunny location	Deciduous
Japanese Quince *Chaenomeles japonica*	1m	Leaves: Green , Flowers: Red, Fruits: Large, golden brown	Flowers March-May followed by fruits which ripen in October	Berries for birds and mammals	Full sun	Deciduous
Quince variety *Chaenomeles speciosa*	Bush to 1.5m or train as a Climber to 3m x 30cm thick	Leaves: Green sparser then *japonica* , Flowers: depends on variety, Fruits: Large, golden brown	Flowers March-May and the fruits ripen in October	Nectar source for bees and butterflies. Berries for birds and mammals. Good for birds to nest in as branches are sturdy with spines to deter cats	Sun or shade	Deciduous
Smoke Bush Cotinus coggygria	3m	Leaves: Green turning orange or red in autumn, Flowers: Light pink feathery flowers	Flowers June - July	Good for bees and birds	Sandy infertile soil best, full sun preferred	Deciduous
Daphne *Daphne odora*	1m	Leaves: Dark green, Flowers: Bright pink	Flowers in February to April	Early source of nectar for insects	Well-drained humus-rich soil in full sun or light shade	Evergreen
Broad-leaved Oleaster *Elaeagnus macrophylla*	to 3m	Leaves: Silvery when unfolding turning dark glossy green, Flowers: Creamy yellow bell shaped, Berries: Red	Flowers in October to November	Provides a late source of pollen and nectar	Any reasonable soil, preferably in good sun	Evergreen

Spreading Oleaster *Elaeagnus umbellata*	2 - 6m	Leaves: Silvery when unfolding turning bright green, Flowers: Creamy yellow bell shaped, Berries: Red	Fragrant flowers in May to June. Berries in October to December	Provides nectar for bees and butterflies, and food for wild birds	Any reasonable soil, preferably in good sun	Deciduous
Hydrangea *Escallonia macrantha*	1 - 3m (Species dependent)	Leaves: Dark green and glossy, Flowers: Pinkish red	Flowers June to September	Provides nectar for bees and butterflies	Full sun or light shade	Evergreen
Fuchsia *Fuchsia magellancia*	2 - 3m	Leaves: Dark green leaves, Flowers: Purple and red	Flowers: July to October	Attracts bees	Full sun or light shade	Deciduous
Hebe *Hebe spp.*	80cm		Flowers May-September (depending on variety)	Food source for 26 species of butterfly including the Speckled Wood	Well-drained soil in full sun. Plant semi-ripe cuttings in a cold frame in summer	Evergreen
Hebe *Hebe albicans.*	30cm x 90cm	Leaves: Small and Green, Flowers: White	Flowers in June to July	Nectar for bees and butterflies	Well-drained soil in full sun. Plant semi-ripe cuttings in a cold frame in summer	Evergreen
Hebe *Hebe andersonii 'variegata'.*	to 2m	Leaves: Small and Green, Flowers: Mauve	Flowers in August to September	Good for invertebrates with a late supply of nectar	Well-drained soil in full sun. Plant semi-ripe cuttings in a cold frame in summer	Evergreen
Hebe *Hebe brachysiphon.*	to 2m	Leaves: Small and Green, Flowers: White	Flowers in June to July	Nectar for bees and butterflies	Well-drained soil in full sun. Plant semi-ripe cuttings in a cold frame in summer	Evergreen
Hebe *Hebe salicifolia.*	90 - 150cm	Leaves: Small and Green, Flowers: White	Flowers in June to September	Nectar for bees and butterflies	Well-drained soil in full sun. Plant semi-ripe cuttings in a cold frame in summer	Evergreen

Shrubby Helichrysum *Helichrysum italicum*	60cm	Leaves: Grey-green silvery leaves, Flowers: Yellow	Yellow flowers in June to August	Nectar source for bees and butterflies	Well-drained sandy soil in full sun	Evergreen
Hydrangea *Hydrangea spp.*	1 - 2.5m	Leaves: Green, Flowers: Depends upon species/varieties	Flowers July to September	Provides nectar for bees and butterflies	Well-drained fertile soil in full sun, needs watering through dry spells	Deciduous
St. John's Wort aka 'Rose of Sharon' *Hypericum calycinum*	to 1m	Leaves: Green turning red in autumn, Flowers: Yellow, Berries: Red	Flowers June to October	Flowers attract insects especially bees. Berries are eaten by birds and small mammals	Full sun or light shade. Plant semi-ripe cuttings in a cold frame in summer	Semi-evergreen
Hyssop *Hyssopus officinalis*	60cm	Leaves: Green, Flowers: Small blue flowers on spikelets	Low evergreen shrub	Attractive for some butterflies	Well-drained fertile soil in full sun	Semi-evergreen
Holly 'Golden King' *Ilex altaclerensis*	300 x 150+ cm	Leaves: Glossy green with yellow borders and small spines, Flowers: Small pink/white, Berries: Bright red	Flowers: May. Berries: (only on female trees) October to December	Berries good for birds and small mammals. Holly leaf miner provides winter food for birds	Any reasonable soil in full sun or partial shade. Need male and female plants near each other to produce berries	Evergreen
Lavender *Lavandula angustifolia*	75 x 75 cm	Leaves: Greyish-green, Flowers: Blue/purple	Flowers: July to September	Attracts butterflies	Plant semi-ripe cuttings in a cold frame in summer	Evergreen
Oregon Grape *Mahonia aquifolium*	1m	Leaves: Green and glossy with small spikes, Flowers: Yellow	Flowers March to April	Nectar for bees and butterflies	Thrives best in partial shade	Evergreen
Daisy Bush *Olearia haastii*	1 - 2m	Leaves: Green and glossy, Flowers: White	Flowers white, July to August	Nectar for bees and butterflies	Well drained soil in full sun	Evergreen
Russian Sage *Perovskia atriplicifolia*	1m	Leaves: Greyish-green, Flowers: Blue/purple	Flowers: August to October	Good for bees	Full sun essential	Deciduous

Mock Orange *Philadelphus coronarius*	1.5 - 3m	Leaves: Yellow and green, Flowers: White	Flowers June to July	Nectar for bees and butterflies	Full sun	Deciduous
Firethorn *Pyracantha atalantioides*	3m	Leaves: Dark green, Flowers: White, Berries: Red/orange	Berries: October-January	Good for nesting thrushes and a site or an open robin box. Nectar for bees, berries for birds	Thrives in most good soils	Evergreen
Firethorn *Pyracantha coccinea*	to 3.5m	Leaves: Dark green, Flowers: White, Berries: Red/orange	Berries: October-January	Good for nesting thrushes and a site or an open robin box. Nectar for bees, berries for birds	Thrives in most good soils	Evergreen
Black Currant *Ribes nigrum*	2m	Leaves: Green , Flowers: Pink, Berries: Black	Flowers: April	Good for bees, birds and small mammals	Thrives in full sun or partial shade	Deciduous
Ornamental Currant *Ribes odoratum*	2m	Leaves: Green turning purple in Autumn, Flowers: Yellow, Berries: Black	Flowers: April	Good for bees and birds	Thrives in full sun or partial shade	Deciduous
Flowering Currant *Ribes sanguineum*	2m x 1.5m	Leaves: Green , Flowers: Pink, Berries: Black.	Flowers March to April	Provides nectar for bees and butterflies	Full sun or light shade	Deciduous
Rosemary *Rosemarinus officinalis*	1.5m	Leaves: Green and thin, Flowers: Lilac	Flowers April to May	Nectar source for bees and butterflies	Well-drained soil in full sun.	Evergreen
Blackberry *Rubus fruticosus*	Sprawling plant 1.5 - 2.5m	Leaves: Green with thorns on underside, Flowers White, Berries: Red turning black when ripening	Flowers May to September with berries following the flowers until mid September	Nectar source for bees and butterflies. Berries for birds and mammals	Any soil in full sun or partial shade. Can be very invasive	Deciduous shrub

Loganberry *Rubus loganobaccus*	1.5 - 2.5m	Leaves: Green with thorns on underside, Flowers White, Berries: Dark red, Stems also have thorns	Flowers May to August with large berries following	Nectar source for bees and butterflies. Berries for birds and mammals	Any reasonable soil in full sun or partial shade	Deciduous shrub
Skimmia *Skimmia japonica*	to 1m	Leaves: Dark glossy green, Flowers: White, Berries: Red (but only if male and female trees are located near each other)	Flowers in April to May	Nectar source for bees and butterflies	Well-drained, neutral to acid soil in full sun or partial shade	Evergreen
Bridal Wreath *Spiraea arguta*	2m	Leaves: Green, Flowers: Masses of white flowers	Flowers April to May	Nectar for bees and butterflies	Full sun on most soils	Deciduous
Snowberry *Symphoricarpos albus*	1 - 2m	Leaves Green, Flowers: Small and pink in terminal spikes, Berries: White	Flowers: June to September	Caterpillars of the death's head hawk moth feed on the leaves. Good ground cover. Birds may feed on the berries when other food is scarce	Forms dense thickets unless regularly pruned	Deciduous
Lilac *Syringa vulgaris*	150 x 300cm	Leaves Green, Flowers: Colour depends on variety, in terminal spikes	Flowers May to June	Nectar for bees and butterflies	Best in full sun	Deciduous
Viburnum *Viburnum bodnantense*	1 - 2.5m	Leaves: Green, Flowers: Pink	Flowers January to March	Provides early nectar source for invertebrates and berries for birds. One of the most valuable winter flowering shrubs	Sun or shade in most soils	Deciduous
Laurustinus *Viburnum tinus*	2 - 6m	Leaves: Green, Flowers: White to pink, Berries: Blue/black	Flowers November - February	Provides late nectar source for invertebrates and berries for birds	Sun or shade in most soils	Evergreen

Weigela *Weigela florida*	1.2m x 1.2m	Leaves: Green or green with yellow tinges (variety dependant), Flowers: Pink	Flowers May to June	Provides nectar for bees and butterflies	Rich, moist soils in full sun or partial shade	Deciduous
Native Herbaceous						
Teasel *Dipsacus fullonum*	2m	Leaves: Green, Flowers: Light purple	Flowers: July to August	A food source of the Brimstone butterfly. Attracts other insects for its nectar and birds for its seeds	Well-drained soil in full sun or light shade	Biennial
Purple Loosestrife *Lythrum salicaria*	to 1.8m	Leaves: Green, Flowers: Purple	Flowers in June to September	Provides nectar for bees and butterflies	Humus-rich soil in full sun or light shade with plenty of water, preferably boggy	Border perennial
Musk Mallow *Malva moschata*	60cm	Leaves: Green Flowers: Pink	Flowers between July and August	Provides nectar for bees and butterflies	Well-drained soil in full sun	Border perennial
Cat-mint *Nepeta cataria*	60 - 90cm	Leaves: Green above, white below. Flowers: White	Flowers July to September	Berries for birds and nectar for insects	Well-drained soil in full sun	Perennial
Wild Marjoram *Origanum vulgare*	50 - 70cm	Leaves: Green Flowers: Pale pink	Flowers July to September	Good plant for butterflies and bees	Dry soil preferably on calcareous soil	Perennial
Tormentil *Potentilla erecta*	30 - 45cm	Leaves: Green, Flowers: Yellow	Flowers June to September	Good plant for butterflies and bees	Well drained soil preferably acidic	Perennial
Goldenrod *Solidago virgaurea*	70 - 100cm	Leaves: Green. Flowers: Yellow	Flowers July to September	27 species of lepidoptera.	Open woodland, grassland and hedgerows. Well-drained soil. Full sun or light shade	Perennial
Betony *Stachys officinalis*	to 60cm	Leaves: Green. Flowers: Pink/purple	Flowers June to September	Nectar source for bees and butterflies	Well-drained soil in full sun or partial shade	Border perennial

Common Valerian *Valeriana officinalis*	Stems to 1m	Leaves: Green. Flowers: Pink/white	Flowers June to September	Provides nectar for bees and butterflies	Dry or damp grassy or rough ground	Perennial
Introduced Herbaceous						
Rockery Alyssum *Alyssum saxatile*	20cm	Leaves: Green, Flowers: Bright yellow	Flowers April to June	Provides nectar for bees and butterflies	Grows well in poor, well-drained soil in full sun. It can soon spread if left unchecked	Perennial
Michaelmas Daisy *Aster novae-belgii*	to 75cm	Leaves: Green, Flowers: Dark pink	Dark pink flowers in September to October	Good for invertebrates with a late supply of nectar	Well-drained soil in full sun. Needs watering in dry weather	Border perennial
Perennial Wallflower *Erysimum 'Bowles Mauve'*	to 75cm	Leaves: Dark green, Flowers: Mauve	Blooms nearly all year round	Provides nectar for insects	Well-drained non-acid soil in full sun	Evergreen perennial
Dame's-violet *Hesperis matronalis*	60 - 100cm	Leaves: Green Flowers: Pink	Flowers May to July	Very good nectar source for bees and butterflies	Well-drained soil in full sun or partial shade	Border perennial
Candytuft *Iberis sempervirens*	20cm high with 60cm spread	Leaves: Dull yellowish green, Flowers: White	Flowers May to June	Very good nectar source for bees and butterflies	Well-drained soil in full sun	Rocky perennial
Golden Rays aka Leopardplant *Ligularia dentata*	to 1m	Leaves: Bluish green, Flowers: Yellow	Flowers July to September	Provides nectar for bees and butterflies	Humus-rich soil in light shade with plenty of water, preferably boggy	Border perennial
Ice Plant *Sedum spectabile*	60 x 30cm	Leaves: Grey/green. Flowers: Pink	Flowers, June to October	Provides nectar for bees and butterflies. The plant is extremely good for butterflies	Average garden soil in full sun	Perennial

Nasturtium *Tropaelumm majus*	1.8m	Leaves: Green. Flowers: Red, orange and yellow	Flowers: June-October	Good for bees and beetles. Seeds eaten by birds and small mammals. Good insect plant	Plant in sun or partial shade. Likes poor soil	Climbing annual
Native Climbers						
Clematis 'Old Mans Beard' *Clematis vitalba*	Climber to 30m	Leaves: Green. Flowers: White/green	Flowers in July	Provides nectar for bees and butterflies	Prefers calcareous and alluvial soils	Deciduous
Ivy *Hedera helix*	Climber	Leaves: Dark green, shiny. Flowers: Green/yellow. Berries: Black	Flowers October to November	Provides late nectar source and cover/hibernating sites for invertebrates. Food source for the Holly Blue butterfly larva	Trees, banks, rocks and crawling over the floor. Thrives in shade. Remove and plant rooted runners in spring	Evergreen
Hop *Humulus lupulus*	Climber to 8m	Leaves: Yellowish-green, Flowers: Small yellowish brown	Flowers July to August	Provides nectar for bees and butterflies	Well-drained soil in full sun or light shade	Perennial
Honeysuckle *Lonicera periclymenum*	Climber to 6m	Leaves: Dark green on top and bluish underneath. Flowers: red outside cream within Berries: Bright red	Flowers July to August	Excellent food source for invertebrates including the Speckled Wood butterfly. Berries eaten by birds	Woods, scrub and hedges. Sun or light shade. Plant semi-ripe cuttings in a cold frame in summer or Layer stems in spring	Deciduous
Introduced Climbers						
Everlasting Pea *Lathyrus latifolius*	Spreading climber to 1.8m	Leaves: Green, Flowers: Pink-purple. Has long thin seed pods	Flowers in July to September	Provides nectar for bees and butterflies	Well-drained soil in full sun or light shade	Border perennial
Japanese Wisteria *Wisteria floribunda*	Climber (needs tying)	Leaves: Yellowish-green Flowers: Blue-purple in large drooping clusters	Flowers early to mid summer but may not flower for the first year or two	Provides nectar for bees and butterflies	Well-drained soil in full sun or light shade. Needs plenty of space	Evergreen

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