Ecological Assessment

BE-1400-01B
Hebden Royd

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1. Introduction

1.1. Background

David Watts Associates Ltd (DWA) have been instructed by Hebden Royd Town Council to produce an Ecological Assessment relating to the Hebden Royd and Hilltop Parishes Neighbourhood Plan (HRHPNP).

The study area consists of Hebden Royd, a civil parish within the Metropolitan Borough of Calderdale in West Yorkshire. The study area covers an area of approximately 11,630 ha and includes the settlements of Hebden Bridge and Mytholmroyd, and the parishes of Blackshaw, Charleston, Erringden and Wadsworth (refer to Figure 1.1 for a boundary of the study area).

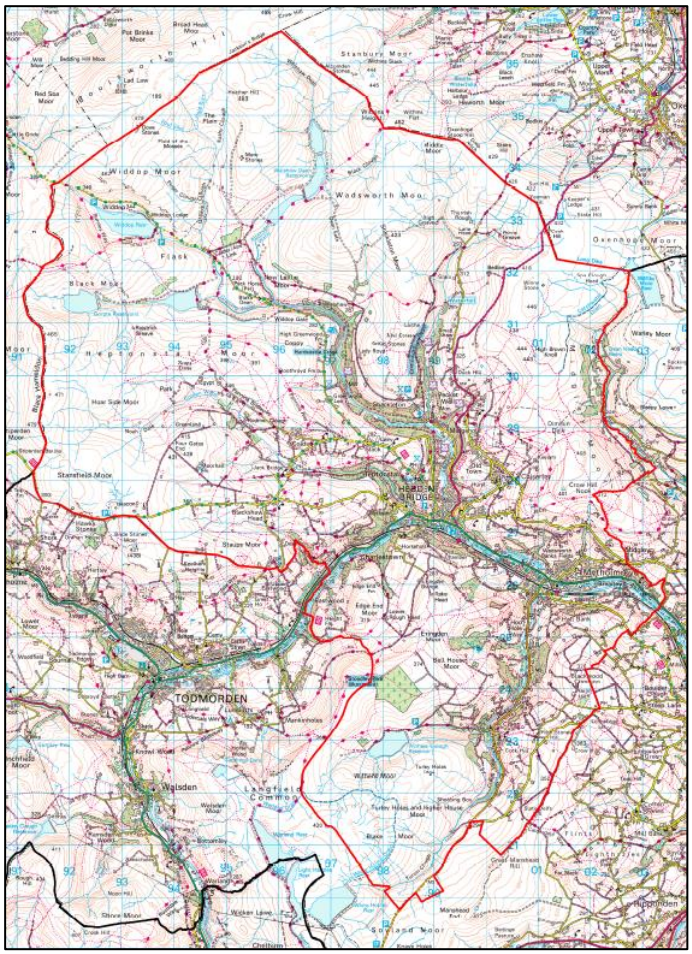


Figure 1.1 Boundary of Study Area

1.2. Aims and Objectives

The purpose of the report is to provide a desk-based study to assess the ecological value of the study area. This includes:

- An assessment of the habitat types within the study area, which are classified according to UKHab (2018) methodology, and which are assessed using CIEEM's guidelines (CIEEM, 2018) on ecological importance.

- An assessment of statutory designated sites within the study area.
- An assessment of any protected and notable species recorded within the study area.
- Identification of potential threats to the ecological value of the study area.
- Review of policies within the draft HRHPNP, produced in 2020.
- Recommendations regarding maintenance and enhancement of the ecological value of the study area.
- Recommendations regarding further survey effort to further understand the habitats and species within the study area.

1.3. Data Sources

The following data sources were consulted:

- West Yorkshire Joint Services (WYJS), who provided details of all records of protected and notable species and designated habitats within the study area. This included a spreadsheet with over 15,000 records of protected and notable species, and locations of designated sites which were provided as a GIS layer.
- West Yorkshire Bat Group, who were consulted as to any records of bat species within the study area.
- National Trust, who provided records of mammal species at Hardcastle Crags from surveys dating back to the early 1990's. The Hardcastle Crags Management Plan for the period 2017-2027 (National Trust, 2017), viewable on the Forestry Commission website, was also consulted.
- DWA own records; these are regularly submitted to WYJS; however, some recent records had not been uploaded onto the database.
- DEFRA's Magic Maps website, which provides details on designated sites, priority habitats and granted European Protected Species (EPS) licences.
- Natural England's website, which provides details of designated sites.
- Google Earth Pro (2020), which was assessed for habitat types and terrestrial connectivity throughout the study area.

1.4. Site Surveys

Although primarily a desk-based study, habitat information was supplemented with results from site surveys undertaken by David Watts between 22nd October – 5th November 2020.

2. Designated Sites

Plans showing the location of designated sites can be viewed in *Appendix 2: South Pennine Moors SPA and SAC* and *Appendix 3: Hebden Royd LWS and LGS*. A summary of the protection afforded designated sites can be viewed in *Appendix 6: Summary of Key Legislation and Policy*.

2.1. South Pennine Moors

The South Pennine Moors is a Special Protection Area (SPA), Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI). The site comprises an area of 20,938 ha which extends well beyond the study area into Calderdale, Bradford, Kirklees, Leeds, Craven, Burnley, Pendle, Oldham and Rochdale. Within Hebden Royd, the South Pennine Moors SPA and SAC encompasses an area of approximately 6000 ha.

The site is the largest area of unenclosed moorland within West Yorkshire and contains the most diverse and extensive examples of upland plant communities within the county. Habitats include blanket bog, punctuated by species rich acidic flushes and mires; wet and dry heaths; and acid grasslands. The blanket bogs are dominated by cotton grasses (*Eriophorum* spp.) and heather (*Calluna vulgaris*). The lower slopes are dominated by heather moorland and upland acid grassland. Some parts of the heather moors are burnt for red grouse (*Lagopus lagopus*) and sheep management. The most species rich areas are the acidic flushes, mires and seepage lines.

The site provides habitat for upland breeding bird assemblages, and as such, is of international importance. The blanket bogs are the main breeding grounds for golden plover (*Pluvialis apricaria*) and dunlin (*Calidris alpine*), which require relatively short vegetation to nest in and access to wet areas to feed. The heather provides cover for bird species including merlin (*Falco columbarius*), red grouse and golden plover, and the wet acid grasslands provide suitable breeding habitat for curlew (*Numenius arquata*), lapwing (*Vanellus vanellus*), snipe (*Gallinago gallinago*) and redshank (*Tringa totanus*). Twite (*Linaria flavirostris*) utilise all habitats on the moors, and the population on the South Pennine Moors is of international importance.

Of the total site area of 20,938 ha, Natural England lists the condition of 1.16% as favourable, 94.68% as favourable-recovering and 4.16% as unfavourable.

The South Pennine Moors (left) provide important breeding habitat for golden plover (right; photograph courtesy of Andrej Chudy)

2.2. Broadhead Clough

Broadhead Clough is a SSSI and a Local Wildlife Site (LWS) 64.7 ha in size, owned and managed by Yorkshire Wildlife Trust. The site occupies a broad clough (wooded valley) with adjacent moorland which comprises part of Erringden Moor.

The woodland is the best known example of a clough woodland in West Yorkshire, with a canopy dominated by sessile oak (*Quercus petraea*) and birch (*Betula* spp.), with some holly (*Ilex aquifolium*) and alder (*Alnus glutinosa*). There are numerous wet flushes within the woodland, which contribute to a diverse *Sphagnum* moss cover. Interspersed within the woodland are areas of acid and neutral grassland. The moorland component is typical of South Pennine moorland, consisting of purple moor grass (*Molinia caerulea*), with mat-grass (*Nardus stricta*), deergrass (*Trichophorum germanicum*) and hare's-tail cottongrass (*Eriophorum vaginatum*).

2.3. Crimsworth Dean

Crimsworth Dean is a 13.8 ha SSSI, of national importance due to a sequence of rocks of the Namurian Kinderscoutian Stage.

2.4. Withens Clough

Withens Clough is a SSSI 3 ha in size, comprising two small fields. The scientific interest of the site arises from the springs and lines of drainage within the field. The site provides the best known example of a soligenous mire, a habitat which is rare in West Yorkshire.

2.5. Colden Clough

An 80.7 ha site designated as an LWS, a Local Nature Reserve (LNR) and a Local Geological Site (LGS). Consists of species rich acid woodland, with acid grassland, semi-improved neutral grassland and rock outcrops.

2.6. Wood Hey

A 9.3 ha LWS which consists of a range of upland acidic communities. The main area of woodland consists of wet woodland, with the canopy dominated by alder, willow (*Salix* spp.) and silver birch (*Betula pendula*). This is surrounded by dryer woodland consisting of birch and oak (*Quercus* spp.). The woodlands grade out to a central area of grassland/heathland mosaic.

2.7. Brearley Wood

An LWS approximately 11 ha in size, which consists of ancient/semi-natural woodland, surrounded by semi-improved neutral and acid grassland. Most of the woodland consists of upland oak woodland. Beech (*Fagus sylvatica*) and sycamore (*Acer pseudoplatanus*) are frequent within the canopy, and Himalayan balsam (*Impatiens glandulifera*) is abundant within the ground flora.

2.8. Clunters Moor

A 24 ha LWS which consists of species-poor dry heath, with evidence of controlled burning and grouse management. Consists predominantly of heather with occasional bilberry (*Vaccinium myrtillus*).

2.9. Staups Moor

A 40 ha LWS which consists of species-poor heather-dominated upland dry heath. The site has significant bird interest with red grouse, lapwing, curlew, snipe and twite known to occur.

2.10. Earnshaw Hole Moor

An LWS approximately 16 ha in size, consisting of around 95% wet heath, dominated by heather and common cotton grass (*Eriophorum angustifolium*). There is a small area of sedge (*Carex* spp.) swamp close to a stream on the eastern side of the moor. As well as providing a distinct habitat, this provides an ecosystem service by slowing down the flow rate of water and reducing water runoff through transpiration.

2.11. Popples Common

A 14.18 ha LWS consisting of a mosaic of habitats, which include dry heath, acid grassland, neutral grassland and mire.

2.12. Parrock Clough, Cragg Vale

A 3.49 ha LWS consisting of an open woodland leading up to Broadhead Clough, with canopy species including sessile oak, beech, ash (*Fraxinus excelsior*) and birch, and an understorey diverse in fern species. Qualifies as ancient/semi-natural woodland.

2.13. Height and Burnt Acres Woods

A 16 ha LWS, consisting of ancient woodland which is open to grazing.

2.14. Whinny Nook, Slack Grassland

An LWS approximately 3 ha in size, consisting of a series of small sheep-grazed pastures separated by dry stone walls. The grassland is unimproved, with 12 species of waxcaps (*Hygrocybe*) and five species of club fungi (*Clavaria* spp. and *Clavulinopsis* spp.).

2.15. Redacre Wood

An LWS approximately 5 ha in size, designated as ancient/semi-natural woodland and consisting of sessile oak with sycamore and beech.

2.16. Hollin Hall

An LWS consisting of a 5 ha cluster of unimproved grasslands between Hebden Water and Crimsworth Dean Beck. Surveys in 2015-2018 recorded a total of 24 waxcap species, in addition to unimproved grassland indicator species of flora. Stands of bracken (*Pteridium aquilinium*) are a feature within all fields.

2.17. New High Laithe Farm

An LWS approximately 9 ha in size, which consists of grassland noted for its assemblage of waxcap species.

2.18. Hardcastle Crags

A 253 ha LWS, which is mostly under the ownership of the National Trust. The majority of the site is woodland planted in the 1870's, although habitats also include ancient woodland, neutral grassland, acid grassland and upland heath.

A woodland management plan is in place (National Trust, 2017), which covers the period 2017-2027. Broad management objectives include increasing opportunities for local wildlife; to reduce the passage of water over the land and thus alleviate flooding; and maintenance of the site's amenity value and cultural heritage. For purposes of the management plan, the woodland is divided into 12 compartments, with aims and objectives for individual compartments including the diversification of the age structure of trees; restoration of ground flora; the increase of the woodland deadwood component; increased proportion of native trees; increased light levels; and removal of Himalayan balsam.


Left: upland oak woodland, and right: pine plantain at Hardcastle Crags

2.19. Crimsworth Dean Pastures

An LWS approximately 5 ha in size consisting of unimproved grassland. Surveys in 2017 recorded 14 waxcap species, along with two fairy clubs, three pink gills (*Entoloma* spp.) and one crazed cap (*Dermoloma* spp.).

2.20. Clough Hole Pasture

An LWS consisting of a single paddock of enclosed unimproved acid grassland, approximately 0.4 ha in size. Eleven waxcap fungi and four additional unimproved grassland indicator fungi have been identified within the grassland. Areas to the east were invaded with bracken.

2.21. Great House Farm, Cragg Vale

An LWS approximately 0.7 ha in size, consisting of lowland acid grassland adjacent to Broadhead Clough SSSI.

2.22. Jumble Hole Wood

An LWS approximately 45 ha in size, which consists of two sections of woodland. The southern portion of the woodland, known as Common Bank Wood, consists of ancient/semi-natural woodland, although the canopy is dominated by sycamore and beech. The northern section is made up of three

woodlands: Spring Wood, Naze Wood and Cowbridge Wood, and two smaller fragmented sections have been recorded as ancient woodland. The canopy comprises mature sycamore and sessile oak, with young sessile oak and silver birch regeneration developed over dry heath. There is an open area of unimproved acid grassland.

2.23. Ridings, Wainstalls

An LWS consisting of eight adjacent south facing fields on the north side of Luddenden Dean, altogether comprising a site 6.96 ha in size. Consists of lowland enclosed grassland. The site has not been assessed for waxcap fungi.

2.24. Rochdale Canal

An LWS 24 km in length, which runs from Warland Aqueduct south of Walsden to Salterhebble Canal basin. The main ecological interest of the canal is the presence of small areas of the nationally protected floating water plantain (*Luronium natans*), known only to occur within the Lancashire-West Yorkshire canal network and the Outer Hebrides. The Lancashire section of the canal (outside of the study area) is designated as a SSSI.

2.25. Cludders Rocks

An LGS which consists of exposures of upper carboniferous Kinderscout grit from a series of 25 m high crags overlooking Widdop Reservoir.

2.26. Foster Clough Delves

An LGS consisting of exposures of Upper Carboniferous East Carlton Grit.

2.27. Hell Hole Quarry

An LGS consisting of an extensive outcrop of Lower Kinderscout Grit in a 20 m high quarry face.

2.28. Lumb Falls

An LGS consisting of Upper Carboniferous Lower Kinderscout Grit, with a waterfall and eroded shale which forms a deep plunge pool.

2.29. Calderdale Wildlife Habitat Network

The Calderdale Wildlife Habitat Network aims to link recognised wildlife sites of at least district-level importance through identification of continuous stretches of habitat that can be utilised by species moving between core areas. Where continuous habitat is not available, terrestrial connectivity is ensured through the use of steppingstone sites.

The Calderdale Wildlife Habitat Network encompasses much of the study area, including the designated SPA, SAC, SSSI and LWS detailed above. These are linked through Priority Habitats (e.g. deciduous woodland, upland acid grassland and other habitats listed under the UKBAP), identified from the Magic Maps website.

The Habitat Network can be viewed in *Appendix 4: Calderdale Wildlife Habitat Network*.

3. Habitats

The habitat mapping exercise found the most predominant land use in Hebden Royd to be moorland, which consists of two main habitat types: blanket bog, which constitutes 48% of total land use in Hebden Royd, and upland heath, which constitutes 18%. Following this, grassland was found to constitute 21% of total land use, and woodland 9%. Urban land use constituted 3% and rivers and lakes 1%.

A summary of the habitat types by area can be viewed in Figure 3.1, below. A plan detailing habitat types can be viewed in *Appendix 1: Hebden Royd Habitat Plan*.

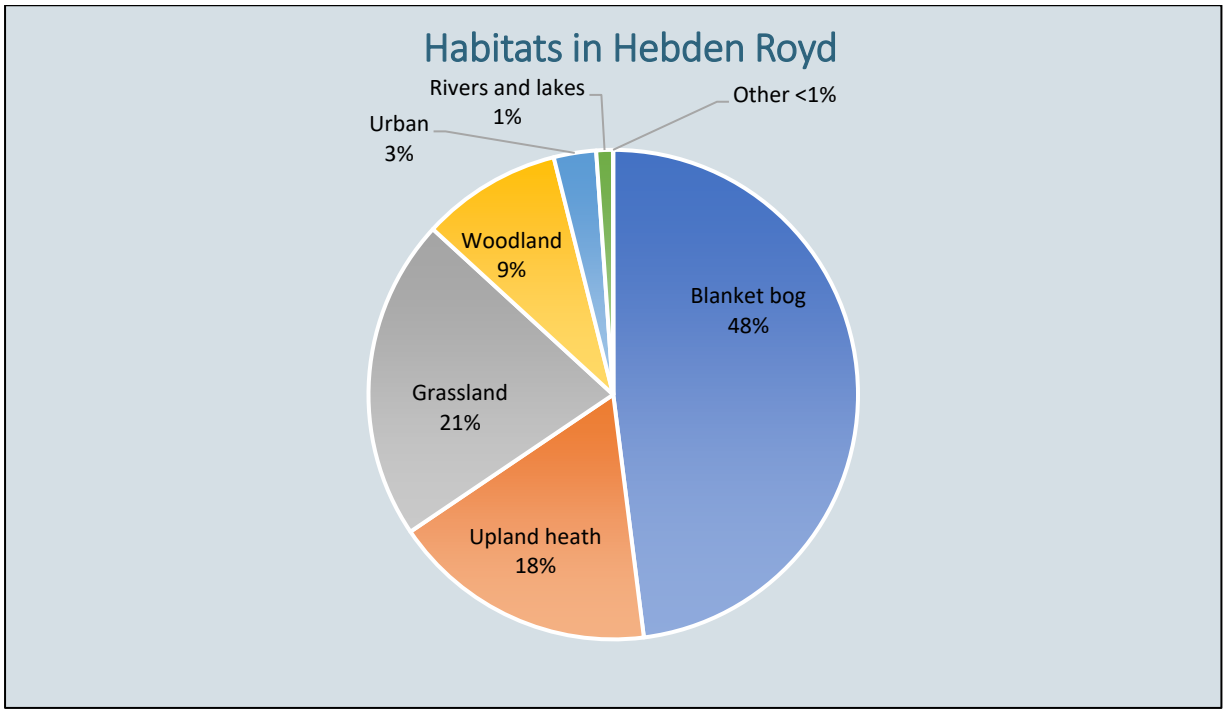


Figure 3.1 Habitats in Hebden Royd

Further information on individual habitat types is detailed below. Each habitat type is given an alphanumeric code; for more information, refer to UKHab (2018).

3.1. Grassland

Grassland (g)

Covering an area of 2424 ha, this includes acidic, neutral and modified grassland, although without further survey effort, detailed classification for most areas was not possible. The ecological value of grassland can range from poor (e.g. modified amenity grassland) to national importance (e.g. upland acidic grassland with diverse flora and mycological communities).

Upland acid grassland (g1b)

Acid grassland within the uplands. These are important habitats, often of local to national importance. Upland acid grassland appeared to cover a relatively large proportion of the survey area, although

detailed mapping of the majority of this was not possible, and only a total of 64 ha of this habitat type was mapped.

Upland acidic grassland

Bracken (g1c)

Areas of vegetation >0.04 ha in size dominated by bracken. Although a native species which provides cover for nesting birds and small mammals, this can be invasive on some grassland and heathland habitats. Generally, bracken could not be mapped from aerial imagery alone, although further mapping in the field would likely identify larger areas of this habitat.

Neutral grassland (g3)

Grassland on a range of neutral soils, usually with a pH of 4.5-6.5. Includes dry hay meadows and pastures, together with a range of grasslands which are periodically inundated with water or permanently moist. Often lacks indicator species, but unlike modified grassland, usually has <25% cover of perennial ryegrass (*Lolium perenne*) and has more than nine species per m^2. Includes five communities: *Other neutral grassland (g3c), Arrhenatherum neutral grassland (g3c5), Lolium-Cynosurus neutral grassland (g3c6), Deschampsia neutral grassland (g3c7)* and *Holcus-Juncus neutral grassland (g3c8)*. Many of these habitats are agriculturally improved, and of low ecological value, although some hay meadows are of higher value.

Modified grassland (g4)

Vegetation dominated by a few fast-growing grasses on agriculturally improved soils, usually dominated by perennial ryegrass and white clover (*Trifolium repens*). Includes agriculturally improved pasture and amenity grassland (e.g. parks, sports pitches). Generally, of low ecological value. A total of 15 ha of modified grassland were mapped, which predominantly included sports pitches and public parks.

3.2. Woodland

Ancient/semi-natural woodland

A relatively high proportion of the woodland within Hebden Royd is designated as ancient/semi-natural woodland. Ancient woodland is a woodland which has existed before 1600, and includes a number of different woodland habitats. It can for example include western acidic oak woodland, the climax vegetation type in the majority of the study area, or can include coniferous plantations on ancient woodland (referred to as plantations on ancient woodland sites, or PAWS). Ancient woodland typically has a diverse ground flora, with species that are slow to colonise new sites. As such, these habitats are of high ecological importance.

Broadleaved mixed and yew woodland (w1)

A range of woodland types, all comprising woody vegetation to a height of at least 5 m and canopy cover of greater than 25%. This habitat type covered an area of 1057 ha. Where possible woodlands were subclassified as detailed below. There was relatively little information on veteran trees; these are presumed to be relatively rare in Hebden Royd, however if any are present within woodlands then these are important ecological features.

Western acidic oak woodland (w1ac5)

Acidophilous sessile oak woodland, with birch and sometimes with pedunculate oak (*Quercus robur*) and hybrids. These habitats often have diverse fern, bryophyte and lichen communities. Small areas of wet woodland are often found along streams within these woodlands. Equivalent to Priority Habitat and an Annex 1 Habitat.

Wet woodland (w1d)

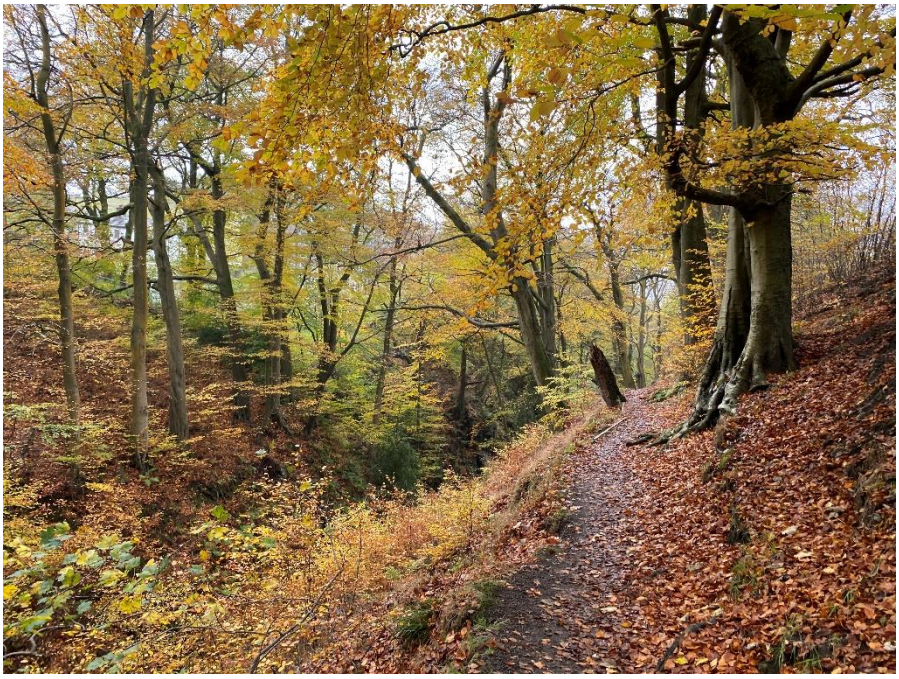
Woodland dominated by alder, with silver birch and willow (*Salix* spp.). A Priority Habitat, which is relatively rare in the uplands.

Upland birch woods (w1e)

Woodlands dominated by silver birch and downy birch (*Betula pubescens*), often with rowan (*Sorbus aucuparia*), willow and juniper (*Juniperus communis*). A Priority Habitat.

Other broadleaved woodland types (w1g7)

Broadleaved woodland which does not meet the criteria of woodlands detailed above. Typically includes plantation woodland and small urban woodlands. Includes beech plantations within Hebden Royd; a significant proportion of these were planted in the 1800's, both for their aesthetic value and for their timber. Note that there is a habitat definition for beech woodland in UKHab (*w1c5 Beech forests on acid soils*), however this habitat is confined to the natural range of beech within the south of England.



Nutclough Wood, beech and sycamore woodland typical in Hebden Royd

Other woodland; mixed (w1h5 & w1h6)

A mixture of broadleaved and coniferous woodland, often similar to the habitat described above, with predominantly 50-80% broadleaved cover or 50-80% coniferous cover respectively.

Coniferous woodland (w2)

Coniferous plantation, usually including species such as Norway spruce (*Picea abies*), Scot's pine (*Pinus sylvestris*) and larch (*Larix* spp.). A relatively rare habitat in Hebden Royd; historically commercial forestry has been avoided within the area due to the steep slopes on which most woodlands are situated.

3.3. Heathland and Scrub

Upland heathland (h1b)

Occurs on mineral soils and thin peats (<0.5 m deep). Characterised by the presence of dwarf shrubs such as heather, cross-leaved heather (*Erica tetralix*) and bilberry. Includes *Dry heaths (h1b5)* and *Wet heathland with cross leaved heath (h1b6)*. This habitat often forms a mosaic with grassland around the edges of blanket bog. Impoverished swards are often dominated by purple moor-grass (*Molinia caerulea*). A Priority Habitat and an Annex 1 Habitat, which when in good condition can be of international importance.

A total of 2200 ha of upland heath was mapped; the actual area is likely to differ due to the limited survey data available and the difficulty in distinguishing upland heath from blanket bog and upland grassland from aerial imagery.

Hedgerows (h2)

These include *Hedgerow (Priority Habitat) (h2a)*, a Priority Habitat consisting of at least 80% woody native species, and *Other hedgerow (h2b),* which do not meet these criteria. Hedgerows are not mapped in detail, mainly due to their being linear features, and as such are not visible on the resolution of relatively large-scale mapping.

Dense scrub (h3)

Includes *Blackthorn scrub (h3a), Bramble scrub (h3d)* and *Mixed scrub (h3h)*. These are transient habitats, often consisting of successional vegetation on grassland and heathland, which left unmanaged will revert to woodland. These can be important habitats, providing cover for a diverse range of fauna. Around 1 ha of dense scrub was identified within the habitat and mapping exercise; it is however likely that small areas of scrubs throughout the study area contribute to a wider total coverage of this habitat.

3.4. Wetland

Blanket bog (f1a)

Blanket bogs are characterised by a peat deposit >0.5 m deep formed from *Sphagnum* and other peat forming species. Usually with heathers and deergrass (*Trichophorum cespitosum*). Includes *Blanket bog (f1a5)*, a Priority Habitat and Annex 1 Habitat and *Degraded blanket bog (f1a6)*, where drainage channels are in place and the vegetation is dominated by purple moor-grass.

Blanket bog is the predominant land use in Hebden Royd. It was not possible, however, to determine the quality of the habitat type within the majority of the study area. Citations from designated sites and limited survey information indicate that the majority of this is in a degraded state.

Aquatic marginal vegetation (f2)

Vegetation fringing open water, often within a narrow strip. Typically found next to the Rochdale Canal and River Calder, although areas were too small to map.

Reedbeds (f2e)

Vegetation dominated by stands of common reed (*Phragmites australis*), with the water table above ground level for most of the year. Several stands next to rivers and ponds were identified, although were too small to map.

3.5. Urban

Horticulture (c1f)

Predominantly allotment gardens. Approximately 1 ha of allotments were mapped.

Suburban/mosaic of developed/natural surface (u1d) and *Built linear features (u1e)*

Mosaic of developed and natural surfaces; these two land use types were mapped as a single habitat. Predominant within more urbanised areas at the bottom of the valleys, including Hebden Bridge and Mytholmroyd.

3.6. Sparsely Vegetated Land

Inland rock (s1)

Natural rock exposures and quarries. Can include plant communities within cracks and fissures of rock faces. The majority of these were too small to map.

3.7. Rivers and Lakes

Together, rivers and lakes comprised approximately 125 ha of total land use. It is likely that this figure is slightly higher, as it was difficult to calculate areas of small streams and tributaries.

Standing open water and canals (r1)

This includes ponds, reservoirs, and Rochdale Canal (an LWS also detailed in Section 2.24).

Rivers (r2)

The River Calder and its associated tributaries, including Hebden Water, Colden Water, Cragg Brook and Luddenden Brook. The majority of the water bodies are highly modified and canalised, with the banks built up.

Hebden Beck, near its source at Walshaw Dean Reservoir (left), and the canalised section in Hebden Bridge right)

4. Protected and Notable Species

Lists of notable species are presented in *Appendix 5: Species Lists*. Legislation afforded protected species is summarised in *Appendix 6: Key Legislation and Policy*.

4.1. Flora

WYJS hold records of numerous plant species within the study area, the majority of which are common and widespread. A number of notable fern and flowering species listed under the Calderdale Biodiversity Action Plan (BAP) have been recorded at Hardcastle Crags, Nutclough Woods and Broadhead Clough, with occasional records also at Redacre Wood, Jumble Hole Clough and Withens Clough.

A number of rare flowering plant species have been identified within the study area, including lesser skullcap (*Scutellaria minor*) at Bell Bottom Wood (although this has not been recorded since 1997); Northern dock (*Rumex longifolius*) and floating water-plantain (*Luronium natans*), in Cragg Vale; fine-leaved sheep's fescue (*Festuca filiformis*) at Jumble Hole Clough; and spreading meadow grass (*Poa humilis*) at School Lane.

A number of rare bryophytes have been identified within the study area, including fir clubmoss (*Huperzia selago*), near Withens Clough Reservoir; *Dicranodontium denudatum*, at Broadhead Clough, grove earwort (*Scapania nemorea*), at Cordon Clough and Jumble Hole Clough, and *Jubula hutchinsiae*, at Hardcastle Crags.

Hebden Royd has a diverse assemblage of ferns, with a number of rare species recorded within the study area, including Killarney fern (*Tricgomanes specoisum*) and buckler fern (*Dryopteris x deweveri*).

4.2. Invasive Plant Species

WYJS hold records of invasive plant species throughout the study area including rhododendron (*Rhododendron ponticum*), Himalayan balsam, Japanese knotweed (*Reynoutria japonica*), montbretia (*Crocosmia x crocosmiiflora*), Japanese rose (*Rosa rugosa;* a single record at Whiddop Reservoir), Canadian waterweed (*Elodea canadensis*; a single record at Hardcastle Crags), giant hogweed (*Heracleum mantegazzianum;*, a single record at Colden) and Virginia creeper (*Parthenocissus quinquefolia*; a single record in Hebden Bridge). Some of these, particularly rhododendron and Himalayan balsam, are firmly established in the wild.

4.3. Fungi

WYJS hold records of numerous fungi species within the study area. Notably these include 26 species of waxcap (*Hygrocybe* spp.), six species of pinkgill (*Entoloma* spp.), six species of club fungus (*Claviariaceae*), one species of earthtongue (*Geoglossum cookeanum*) and one species of crazed cap (*Dermoloma cuneifolium*). Records were predominantly at Hardcastle Crags and Broadhead Clough. A full list of notable fungi species identified within the study area can be viewed in the appendices.

4.4. Bats

WYJS hold records of nine bat species within the study area, including Brandt's bat (*Myotis brandtii*), Daubenton's bat (*Myotis daubentonii*), whiskered bat (*Myotis mystacinus*), Natterer's bat (*Myotis nattereri*), Leisler's bat (*Nyctalus leisleri*), noctule (*Nyctalus noctula*), common pipistrelle (*Pipistrellus*

pipistrellus), soprano pipistrelle (*Pipistrellus pygmaeus*) and brown long-eared bat (*Plecotus auritus*). Table 4.1, below, summaries the bat species identified within the study area and their conservation status. All species were relatively widespread within the study area, with the exception of Brandt's bat, for which there was a single record (*Myotis* species can be difficult to identify unless examined in the hand, and Brandt's bat is superficially similar to whiskered bat, therefore this species may be underrepresented in the data). No records of Nathusius' pipistrelle (*Pipistrellus nathusii*) were identified; this may be due to under recording rather than absence of the species, as Nathusius' pipistrelle can only reliably be identified in the hand.

A number of large maternity roosts of bats were identified throughout the study area. Most notably, Gibson Mill is occupied by a large maternity roost of common pipistrelle bats, and surveys in 2019 identified a peak count of 428 bats, making it the largest recorded common pipistrelle roost in Yorkshire.

Common pipistrelle trapped at Hardcastle Crags

4.5. Badgers

WYJS hold 49 records of badger (*Meles meles*) including 19 setts throughout the study area. Setts are generally located within woodlands, and badger records are absent from the moorlands to the north, northeast and west of the study area.

4.6. Otters

WYJS hold numerous records of otter (*Lutra lutra*) within the study area. These are predominantly concentrated around the River Calder; the close proximity of most records indicates that this species is over-recorded in relation to its abundance, with numerous records of the same otters and/or otters from the same holts likely recorded. The majority of records are centred around Hebden Bridge and Mytholmroyd, where higher human populations result in increased records. Overall, otters have been recorded along the River Calder from Walden to Brierley. Otters are also recorded along Cragg Brook and Hebden Water.

4.7. Water voles

WYJS hold four records of water vole (*Arvicola amphibius*). Records are between 2003 and 2015. Two records are at Redmere Dam, near Blackshaw Head; one is near Hardcastle Crags; and one is near Cragg Vale.

4.8. Red Squirrels

Red squirrels (*Sciurus vulgaris*) are, as within most areas of England, locally extinct. This species was however present until relatively recently, and Hardcastle Crags hold records of red squirrels until 1994.

4.9. Other Mammals

WYJS hold records of stoat (*Mustela erminea*) and weasel (*Mustela nivalis*) within the study area. There are only nine records, and given that these species are common yet elusive, it is likely they are under recorded.

European rabbit (*Oryctolagus cuniculus*) is common and widespread throughout the study area. WYJS hold numerous records of brown hare (*Lepus europaeus*) throughout the study area, and a single record of mountain hare (*Lepus timidius*) at Marsden Moor.

WYJS hold records of common rodent species within the study area, including wood mouse (*Apodemus sylvaticus*), bank vole (*Clethrionomys glareolus*) and field vole (*Microtus agrestis*).

WYJS hold numerous records of roe deer (*Capreolus capreolus*) and several records of red deer (*Cervus elaphus*) within the study area.

WYJS hold records of insectivores, including hedgehog (*Erinaceus europaeus*), common shrew (*Sorex Araneus*), mole (*Talpa europaea*) and pygmy shew (*Sorex minutus*) throughout the study area.

WYJS hold records of fox (*Vulpes vulpes*) throughout the study area.

WYJS hold records of grey squirrel (*Sciurus carolinensis*) throughout the study area.

WYJS hold records of American mink (*Mustela vison*) within River Calder, Cragg Brook and Hebden Water.

4.10. Amphibians

WYJS hold a single record of great crested newt (*Triturus cristatus*), recorded within a pond at Hardcastle Crags in 2013.

WYJS hold three records of smooth newt (*Lissotriton vulgaris*), two of which were recorded in Hardcastle Crags in 2010, and one of which was recorded in Heptonstall in 2006.

WYJS hold 13 records of palmate newt (*Lissotriton helveticus*), all recorded between 1988 and 2012, the majority of which were recorded in Hardcastle Crags, although records are also held in Mytholmroyd, Brearley Wood and Hebden Hey.

WYJS hold numerous records of common frog and common toad throughout the study area.

4.11. Reptiles

WYJS hold records of three reptile species within the study area, including slow worm (*Anguis fragilis*), adder (*Vipera berus*) and common lizard (*Zootoca vivipara*). There were no recent records of adder and slow worm, the most recent being in 1965 (there are however more recent anecdotal records of adder at Hardcastle Crags). There were ten records of common lizard, five of which were from 1904-1994, and five from 2000-2013. Recent records were located at Hardcastle Crags, Dukes Cut, Stoodley Pike and Withens Clough.

All records of reptiles appeared to be incidental, and there was no evidence of any comprehensive reptile surveys undertaken.

4.12. Bird Species

WYJS identified 137 bird species within the study area, the majority of which are listed in the Calderdale BAP and/or the West Yorkshire BAP. A full list of bird species identified within the study area can be viewed in the appendices.

Protected bird species (i.e. under Schedule 1 Part 1 of the Wildlife and Countryside Act 1981) identified within the study area included barn owl (*Tyto alba*), whooper swan (*Cygnus cygnus*), brambling (*Fringilla montifringilla*), red kite (*Milvus milvus*), kingfisher (*Alcedo atthis*), dotterel (*Charadrius morinellus*), redwing (*Turdus iliacus*), fieldfare (*Turdus pilaris*), common scoter (*Melanitta nigra*), merlin (*Falco columbarius*), little ringed plover (*Charadrius dubius*), hobby (*Falco subbuteo*) and peregrine (*Falco peregrinus*).

Kingfisher, a protected bird species commonly recorded on River Calder and Rochdale Canal

Protected bird species including long-tailed duck (*Clangula hyemalis*), garganey (*Anas querquedula*), Bewick's swan (*Cygnus columbianus*), honey buzzard (*Pernis apivorus*), snow bunting (*Plectrophenax nivalis*), velvet scoter (*Melanitta fisca*), golden oriole (*Oriolus oriolus*), black redstart (*Phoenicurus*

ochruros), Slovenian grebe (*Podiceps auritus*), scaup (*Aythya marila*), red-backed shrike (*Lanius collurio*) and wryneck (*Jynx torquilla*) have been identified within the study area, but not since 1988.

4.13. Invertebrates

WYJS hold records of notable Lepidoptera species (butterflies and moths) within the study area, including 43 species protected under the UKBAP, West Yorkshire BAP and/or Calderdale BAP (see appendices for full listing). The majority of these records were from trapping surveys at Knott Wood and Hardcastle Craggs between 2007-2010.

WYJS hold records of four notable species of Hymenoptera (ants and bees), including hairy wood ant (*Formica lugubris*), red wood ant (*Formica rufa*) *Trybliographa cubitalis* and shining guest ant (*Formicoxenus nitidulus*), all of which are listed under the Calderdale BAP. The majority of records are at Hardcastle Crags, Broadhead Clough and Nutclough Wood. Particularly notable are records of hairy wood ant at Hardcastle Crags; these are one of the most southerly populations of this species in the UK.

WYJS hold records of 11 species of beetle species listed under the UKBAP and/or Calderdale BAP. The majority of records were based in Hardcastle Crags and Broadhead Clough. See appendices for further details.

5. Potential Threats

5.1. Habitat Management

Moorland (blanket bog and upland heath)

Poor management of moorland habitats, particularly blanket bog, is a key threat to conservation in Hebden Royd. Moorland is consistently over-grazed and periodically burned for grouse management. Burning blanket bog dries out the peat soil and damages the ecosystem, resulting in reduced species diversity, and also resulting in the release of carbon and inhibiting the ability of the habitat to reduce the flow of water, exacerbating flooding in the valleys below.

While the main threat to conservation comes from over management of moorland habitats, these habitats may also become degraded if left completely unmanaged. The cessation of grazing on moorland would result in encroachment of shrubs and trees. This could result in the loss of an important habitat, and could result in carbon being released into the atmosphere, particularly on deep peat.

Grassland

Hebden Royd has relatively large areas of upland acidic grassland, diverse in floral and mycological communities. As with moorland, these habitats face threats from over management, with high livestock density and the application of fertiliser posing a threat to species diversity. However, as with moorland habitats, grazing is still required to ensure that these habitats do not revert to scrub and trees.

Grasslands can face threats from tree planting, often by well-intentioned landowners. Generally, tree planting on grassland (with the exception of some highly modified grassland) will have negative impacts upon biodiversity, and in some instances, can result in the release of carbon into the atmosphere.

Woodland

The woodlands in Hebden Royd consist predominantly of high canopy forest, and as such require little management to maintain biodiversity (excepting the removal of invasive species, as detailed below). Management practices which could have a negative impact on biodiversity, such as the establishment of non-native timber plantations, haven't been widely practiced in Hebden Royd since the early 20th century. Effective management plans for a relatively large proportion of the woodland in Hebden Royd are already in place.

Rivers

Increasing canalisation of rivers poses a threat to riparian ecosystems, primarily by limiting vegetation at the river edges and reducing habitat availability for riparian species. The installation of dams throughout rivers also limits the ability of fish to migrate throughout the river system.

5.2. Invasive Plant Species

Invasive plant species, particularly Himalayan balsam and rhododendron, pose a significant threat to biodiversity within Hebden Royd. These species can be particularly impactful in woodland and riparian habitats, and can suppress native plant species and thus reduce biodiversity.

Japanese knotweed not only poses a threat to biodiversity, but can also cause damage to buildings, and can cause a constraint to development.

5.3. Housing Development

Housing development can pose a threat to biodiversity, both through the direct removal of habitats, and indirect impacts resulting from increased human occupation. The majority of areas designated within the HRHPNP are located within areas which are already urbanised, and therefore may be suitable for development. However, further assessment of these sites will be required to determine if there is either any impacts upon habitat, either in or adjacent to the sites; if there is any impact upon protected and/or notable species; and/or if there are any indirect impacts upon protected habitats (i.e. SACs, SPAs) resulting from increased human occupation.

While proposed developments appear to be restricted to urban areas, this can still potentially lead to habitat loss and fragmentation. While individually developments may only have a minor impact, progressive development can ultimately contribute to the decline of species, and can potentially result in local extinctions.

Pet ownership

An additional factor arising from increased development is increased predation from domestic pets. This can be particularly impactful if development is within proximity to protected habitats, particularly the South Pennines SPA. Domestic cats have been found to predate an average of 14 animals per year (Churcher and Lawton, 1987), and typically have a range of 3-6 km. This can have a significant negative impact upon wildlife, particularly small mammals and protected bird species.

Light Pollution

An additional impact resulting from housing development is increased light pollution. Light pollution can impact upon nocturnal mammals, particularly species of bat such as brown long-eared and Natterer's bat. It can also impact upon nocturnal invertebrates, particularly moths; as moths are attracted to artificial light, this can disrupt mating behaviour and result in increased rates of predation.

5.4. Air Pollution

Pollution from traffic is a threat to the ecological value of the area and is likely to be exacerbated by housing development and an increased human population. This may be an issue for woodlands located adjacent to smaller roads (e.g. Scout Road and Heights Road), where the spread of excess traffic from the A646 may result in additional air pollution, potentially threatening bryophyte and lichen communities within woodlands.

5.5. Climate Change

Climate change poses threats to many species and habitats within the UK. Climate change is anticipated to change the natural distribution of many species, resulting in expansion or contraction

at the edge of their range. Changing temperatures also results in changes to the phenology of plants; this can be particularly disruptive in woodlands, where shifts in phenology result in summer flowering/leafing species coming into flower/leaf at the same time as spring flowering/leafing species, thus introduced competition between species which previously occupied separate ecological niches. This can be particularly impactful when exacerbated by other threats to wildlife, such as development, poor habitat management and pollution.

6. Discussion

6.1. Habitats

There are 28 designated sites within Hebden Royd, including SPA, SAC, SSSI, LNR, LWS and LGW. These provide a network encompassing a wide variety of upland habitats, including heathland, grassland, woodland and rivers.

The habitat covering the most area in Hebden Royd is moorland, including dry heath and blanket bog. The desk-based study indicates that the majority of this habitat is degraded due to previous unsympathetic management. If in a more favourable condition, the blanket bog would not only have more species diversity, but would also offer significant ecosystem services through the sequestration of carbon and flood attenuation.

The valleys in Hebden Royd provide some good examples of acidic oak woodland, with a relatively high proportion of ancient woodland. The largest and most notable of these are Hardcastle Crags and Broadhead Clough, although there is also a large network of privately owned woodlands, predominantly located on the sides of the valleys. The majority of these are in good condition and well managed, although the phased removal of beech and invasive species such as rhododendron and Himalayan balsam could improve the ecological value of the surrounding area.

Hebden Royd has a number of acidic grasslands of high ecological value, with a high diversity of waxcap and other unimproved grassland indicator species. Further management of these habitats will be required to ensure that the grassland is not overgrazed yet does not revert to scrub or trees. Tree planting within grassland must be discouraged.

Full assessment to determine if the River Calder qualifies as Priority Habitat have not been undertaken. The presence of species such as dipper (*Cinclus cinclus*), grey wagtail (*Motacilla cinerea*) and otter throughout the watercourses does indicate that water quality is good, however the river is highly canalised, and as a result fish cannot migrate effectively throughout the river system, and animals such as otters are frequently disturbed during flooding. From an ecological perspective the river and its tributaries could be enhanced, potentially through de-canalisation and the installation of fish passes at dams.

Dipper, a visible indicator of riparian ecosystem health (Photograph courtesy of Mark Medcalf)

6.2. Protected and Notable Species

The viability of protected and notable species is directly underpinned by the presence and functionality of suitable habitat, and therefore protection of species is often better assessed at a landscape rather than an individual species level. For example, diverse woodland within Hebden Royd provides terrestrial connectivity for species of bats, badgers and other mammals, while functioning river ecosystems provide suitable habitat for otters and riparian birds.

There are a number of large common pipistrelle roosts within Hebden Royd which are of high conservation status; while individual bats may switch and change roosts regularly, bats show high fidelity to maternity roosts, and if these are destroyed, they are irreplaceable. The greatest threats to these result from development, including the direct impact of potential roost removal, and indirect impacts such as increased noise and artificial lighting.

There are sparse records of water vole within Hebden Royd. Many of the waterways in Hebden Royd are unsuitable for this species, which typically require steep sloping vegetated banks in which to construct their burrows. The main constraining factor on abundance of this species however is the presence of mink in the waterways.

Red squirrels are extinct within Hebden Royd, most likely due to fragmentation of suitable habitat and the introduction of grey squirrels. As within most of the UK, the population of grey squirrels is firmly established.

Amphibian and reptile populations appear to be relatively low. For amphibian species this is to be expected due to the absence of a diverse network of ponds, and the extensive upland heath which is suboptimal for most amphibian species. The cause of the low numbers of reptiles is unknown; it could be due to an absence of survey effort, or could be due to the degraded nature of much of the heath and grassland, with periodic burning and intensive grazing impacting upon the structural vegetation required for reptiles.

The upland heath and blanket bog in Hebden Royd provides suitable habitat for an assemblage of rare and protected bird species, and therefore continued management of this habitat is required.

6.3. Flood Risk and Mitigation

The habitats within Hebden Royd provide an essential ecosystem service by mitigating flood risk within the valleys. Most notable of these are the large areas of moorland, particularly blanket bog, and the woodlands located on the valley tops and sides of valleys. However, as the majority of the blanket bog is in a degraded state, this is attenuating a fraction of the water it could be if it were managed more favourably. Restoration of blanket bog habitat is therefore potentially the most significant factor in alleviating future flood damage to the towns of Hebden Bridge and Mytholmroyd.

7. Recommendations

7.1. Further Surveys

Further survey effort to classify the habitats within Hebden Royd is recommended. Detailed survey of the entirety of the area is unlikely to be feasible, however some further survey effort of the moorland and grassland within the study area would be beneficial.

Regarding moorland, further survey effort is recommended to distinguish areas of upland heath and blanket bog, and to determine their condition; particularly the quality of the blanket bog. Areas of blanket bog would also benefit from detailed mapping of any drainage features already in place. This could help identify works to attenuate flooding within the valleys.

Grasslands would benefit from more robust assessment to help identify those of high ecological value (particularly those supporting diverse waxcap communities) and those in need of further management. Further surveys in autumn would be required to distinguish grasslands with waxcaps and other unimproved grassland indicator fungi; it is understood that waxcap surveys throughout Hebden Royd are ongoing.

Areas of grassland and heath would benefit from further reptile surveys to determine if there is a significant population within Hebden Royd. An understanding of any reptile species present would have implications both for the management of habitats and for any proposed development in proximity to these habitats.

7.2. Maintenance and Enhancement of Habitats

Moorland (upland heath and blanket bog)

The impoverished condition of undisturbed moorland habitats mean that little management is needed to maintain them, although on most upland heaths some management is required to prevent the invasion of shrubs and trees. This should be either grazing during the summer, with stock removed during the winter, or year-round grazing at very low densities. Burning should be avoided on high quality blanket bog or practiced only if carefully managed. Artificial drainage can result in lowering of the water table, increased erosion of peat and increased risk of flooding, and therefore should be avoided. Existing drains and gullies on wet upland heath should be blocked; this will both improve the quality of the habitat and mitigate for flooding.

The majority of moorland is under private ownership. Much of the current land is used for sheep grazing and/or grouse shooting. This ensures continued management of the habitats and is preferential to their being left unmanaged. However, the high density of livestock and grouse populations has left the majority of the habitat degraded, and in need of more sympathetic management. If this habitat is to be restored, viable economic incentives must be in place. Furthermore, management of upland heath is complex, and therefore further input from conservationists, farmers and gamekeepers will be required.

Woodland

The majority of the woodland in Hebden Royd should be maintained as high forest; this will enable it to continue to provide suitable conditions for the diverse assemblage of ferns, bryophytes and lichens

found in Hebden Royd. The main management objectives of woodland within Hebden Royd should be to remove invasive species, such as Himalayan balsam and rhododendron, and to remove species which are not native to the local area, such as conifers and beech, in favour of restoration of upland oak woodlands. This should be done as part of a phased management programme, avoiding the requirement for large scale felling (such a programme is in place at Hardcastle Crags, with the selective felling of mature beech within the woodland).

Grassland

Grassland habitats require ongoing grazing to ensure that they do not succeed to scrub and/or woodland. It is necessary to ensure that grassland habitats are not overgrazed, however there are no standardised stocking rates for grassland, as this varies according to the livestock type and the local site conditions. Therefore, further advice from relevant livestock owners and grazing specialists is required. In general, it is best to either graze grassland periodically at different points throughout the year, or graze year-round at very low densities.

Tree planting within acidic and neutral grasslands should be avoided. Tree planting may be suitable in some areas of modified grassland of low ecological value, this should however be confined to urban areas within Hebden Bridge and Mytholmroyd.

Invasive Plant Species

Invasive plant species have been recorded throughout Hebden Royd, and these, particularly Himalayan balsam and rhododendron, pose a significant threat to biodiversity. Japanese knotweed, where present, also poses a threat to biodiversity and to development. Attempts by individual landowners to remove these species are often confounded, as after removal they will continue to colonise from seed sources on adjacent land.

To remove invasive species effectively, a comprehensive management plan should be produced, which should cover the entirety of Hebden Royd. This will require the participation of landowners (particularly landowners of designated sites) within Hebden Royd, but will also require support from the general public, as invasive species will proliferate in private gardens, fields and woodlands.

7.3. Development

Any development should be subject to individual assessment to determine the level of ecological impact. The local planning authority, Calderdale Council, is responsible for determining whether any ecological impact arising from a development is acceptable. Developments will also need to comply with relevant regulations, particularly the Wildlife and Countryside Act 1981 and the Conservation of Habitats and Species Regulations 2017. For those developments which have potential to impact upon designated sites (including both direct and indirect impacts), further Habitat Regulations Assessment (HRA) will be required.

Overall, development should seek to attain higher densification of existing urban areas, such as Hebden Bridge and Mytholmroyd, as opposed to development which will result in habitat removal. Development should avoid the removal of important habitats such as upland heath, blanket bog, upland acidic grassland and woodland. Many of these habitats are of national or international importance, and are irreplaceable if removed or damaged.

In addition to the direct impacts, development should ensure that indirect impacts resulting from increased human occupation (e.g. pet ownership, light pollution, air pollution) are either avoided or mitigated. Development should seek to avoid fragmentation of habitats, and potential impacts of any development upon the connectivity of the Calderdale Wildlife Habitat Network should be considered.

Development should also ensure a net gain, with ecological enhancement of 10% recommended. This can be attained either through the incorporation of habitat into any development, or through offsite compensation. The provision of offsite compensation may also be a mechanism through which to secure funding for maintenance and enhancement of grassland, woodland and moorland habitats as recommended above.

7.4. Climate Change

Legal protection is possibly the most important factor in safeguarding habitats and species against climate change. The designated sites within Hebden Royd offer a haven for threatened species and will minimise the impacts of climate change. Further appropriate management of these habitats, and the designation of additional protected sites where appropriate, is arguably the most effective mitigation against climate change on a local level.

7.5. Species Reintroductions

Water voles, while present within small numbers in Hebden Royd, would benefit from reintroduction throughout the waterways in the area. This should be facilitated by the removal of mink. This would need to be undertaken as part of a managed and organised eradication programme (with relevant stakeholders cooperation), rather than through ad-hoc trapping and killing.

Red squirrels became locally extinct in Hebden Royd in the early 1990's. A desirable yet ambitious objective would be to establish the reintroduction of this species. Reintroduction would best be centred around Hardcastle Crags and would need to be undertaken as part of a phased recovery, which would require the co-operation of both the National Trust and the landowners of the neighbouring woodland network. Reintroduction would also require the eradication of grey squirrels from the surrounding area, which can be viewed as contentious and would require cooperation with the general public.

Species reintroductions would require the cooperation of a large number of organisations and individuals. Most notably, cooperation from Natural England would be required to reintroduce a legally protected species. Detailed feasibility assessments and management plans would be required. As a first stage however, consultation with the public is recommended to determine whether there is widespread support for species reintroductions in Hebden Royd.

8. Conclusion

Hebden Royd boasts a diverge assemblage of habitats, encompassing upland heath, blanket bog, woodland and grassland. The moorland component is the largest of this, with blanket bog and upland heath combined covering half of the total area. Despite the relatively low urbanisation of the area, the habitats, particularly the moorland, within Hebden Royd are degraded and in suboptimal condition. This has implications for biodiversity, as functioning blanket bog will be more species-diverse, and for ecosystem services, as functioning habitats will sequester more carbon and attenuate flooding in urban areas located in valleys.

Further sympathetic management will be required to enhance the moorland habitats. As these are part of working landscapes, for this to be effective there must be suitable economic incentives. Ideally, future management of Hebden Royd's moorlands will provide net benefits for biodiversity, ecosystem services and the economy.

Many of the recommendations within this report, including the enhancement of habitats, removal of invasive species and reintroduction of key native species, are ambitious, yet realisable. Securing any of these goals will require a joined up, collaborative approach involving landowners and conservation organisations. Most importantly, further input and support from local residents will be required if these goals are to be met.

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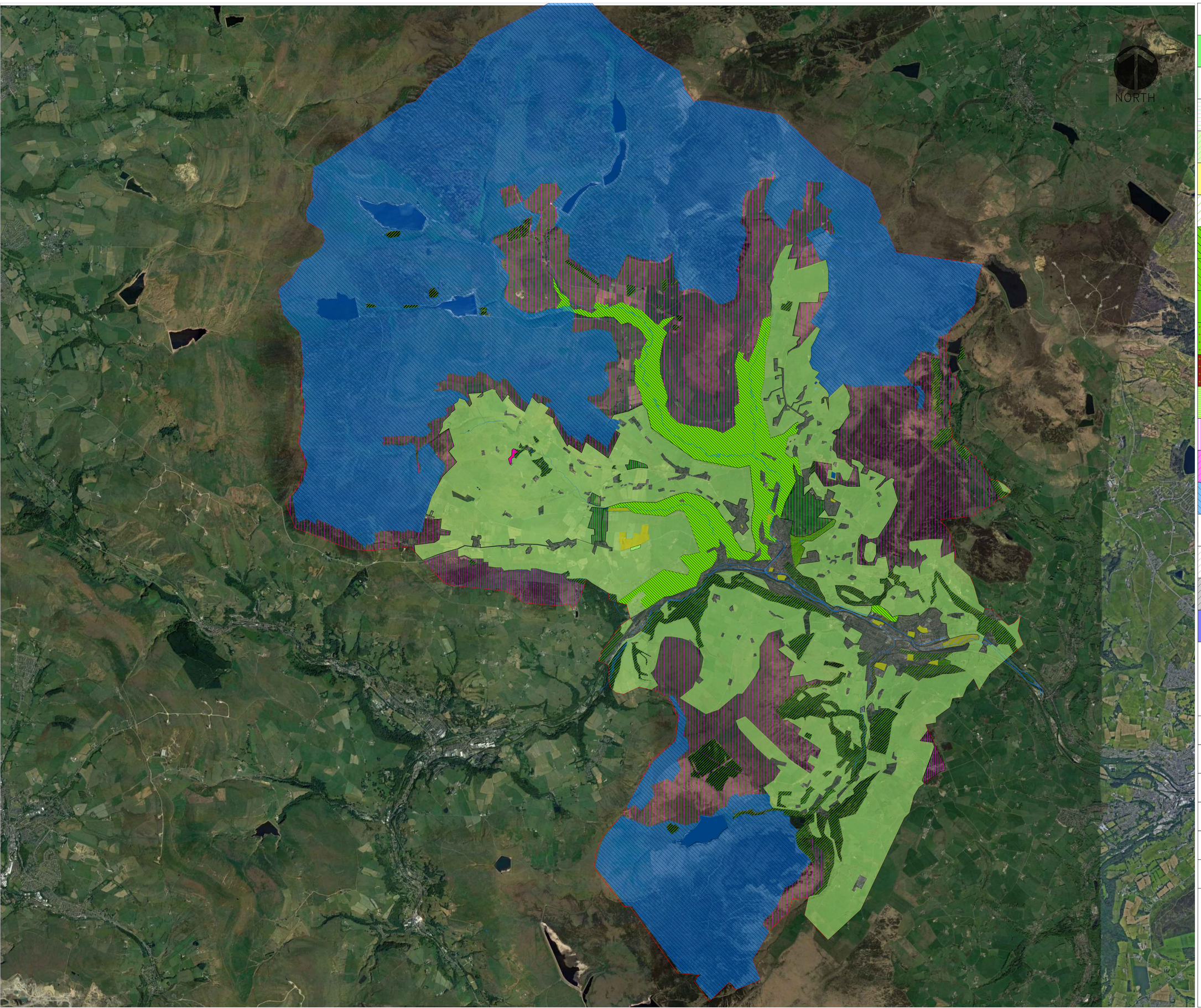
Appendix 1: Hebden Royd Habitat Plan



Key:

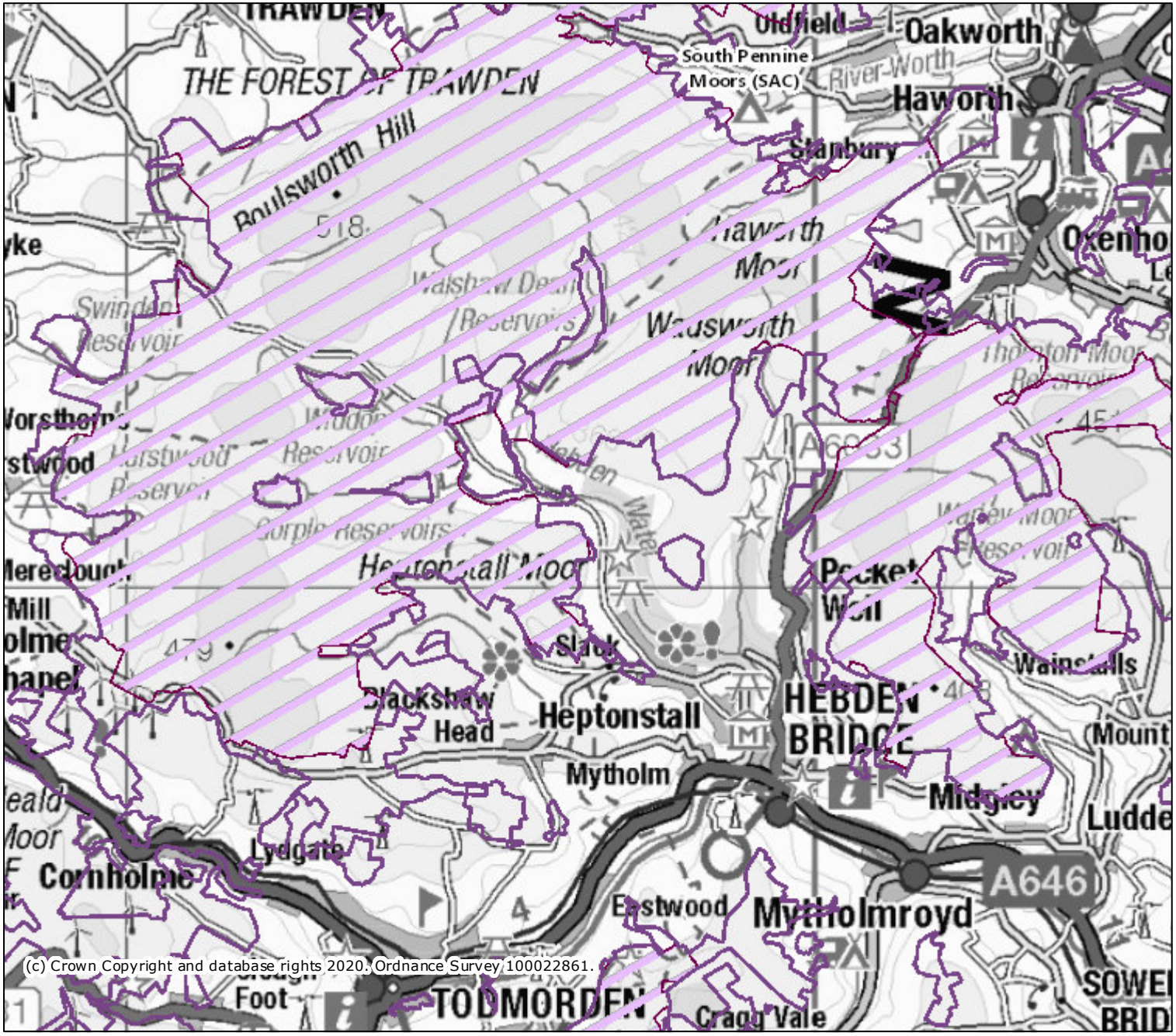
	g grassland
	g1b upland acid grassland
	g1c bracken
	g3 neutral grassland
	g4 modified grassland
	w1 broadleaved mixed and yew woodland
	w1a upland oakwood
	w1d wet woodland
	w1e upland birchwoods
	w1g other woodland - broadleaved
	w1h other woodland - mixed
	w2c other coniferous woodland
	h1b upland heathland
	H3d dense scrub
	f1a blanket bog
	c1f horticulture
	u1 built up areas and gardens
	s1 inland rock
	r rivers, lakes and streams

Drawing title:	Habitat Plan
Project:	Hebden Royd
Drawing number:	P1H-1400-01
Drawn by:	David Watts
Date:	02/11/2020
Scale:	1:20,000 @ A0

DAVID WATTS
ASSOCIATES

Appendix 2: South Pennine Moors SPA & SAC

Pennine Moors SPA & SAC



Legend

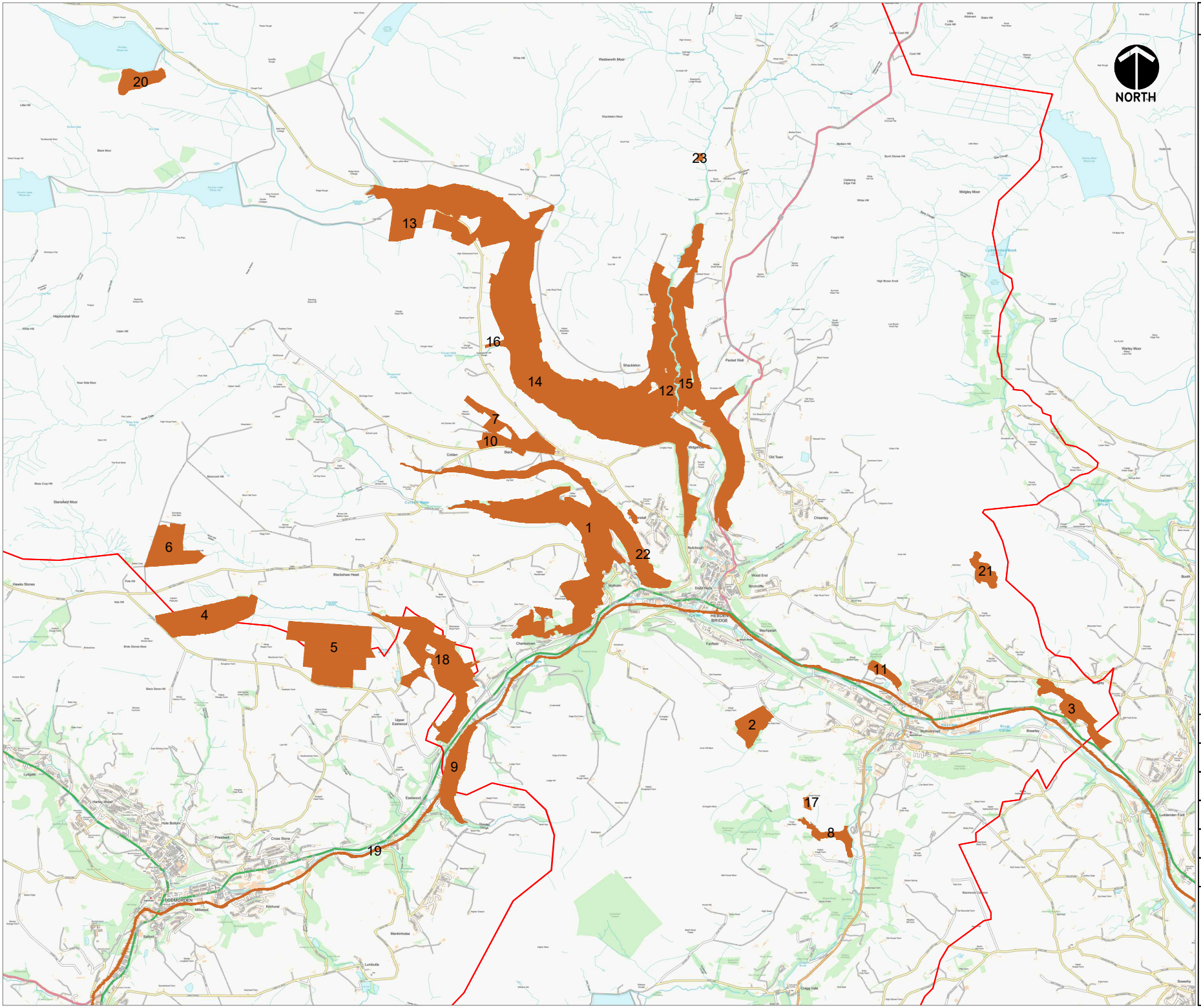
- Moorland Line (England)
- Special Areas of Conservation (England)
- Special Areas of Conservation (Wales)
- Potential Special Protection Areas (England)

Projection = OSGB36
xmin = 375000
ymin = 420700
xmax = 418400
ymax = 441300

0 1.5 3 km

Map produced by MAGIC on 27 October, 2020.

Appendix 3:
Hebden Royd Local Wildlife Sites and Local Geological Sites



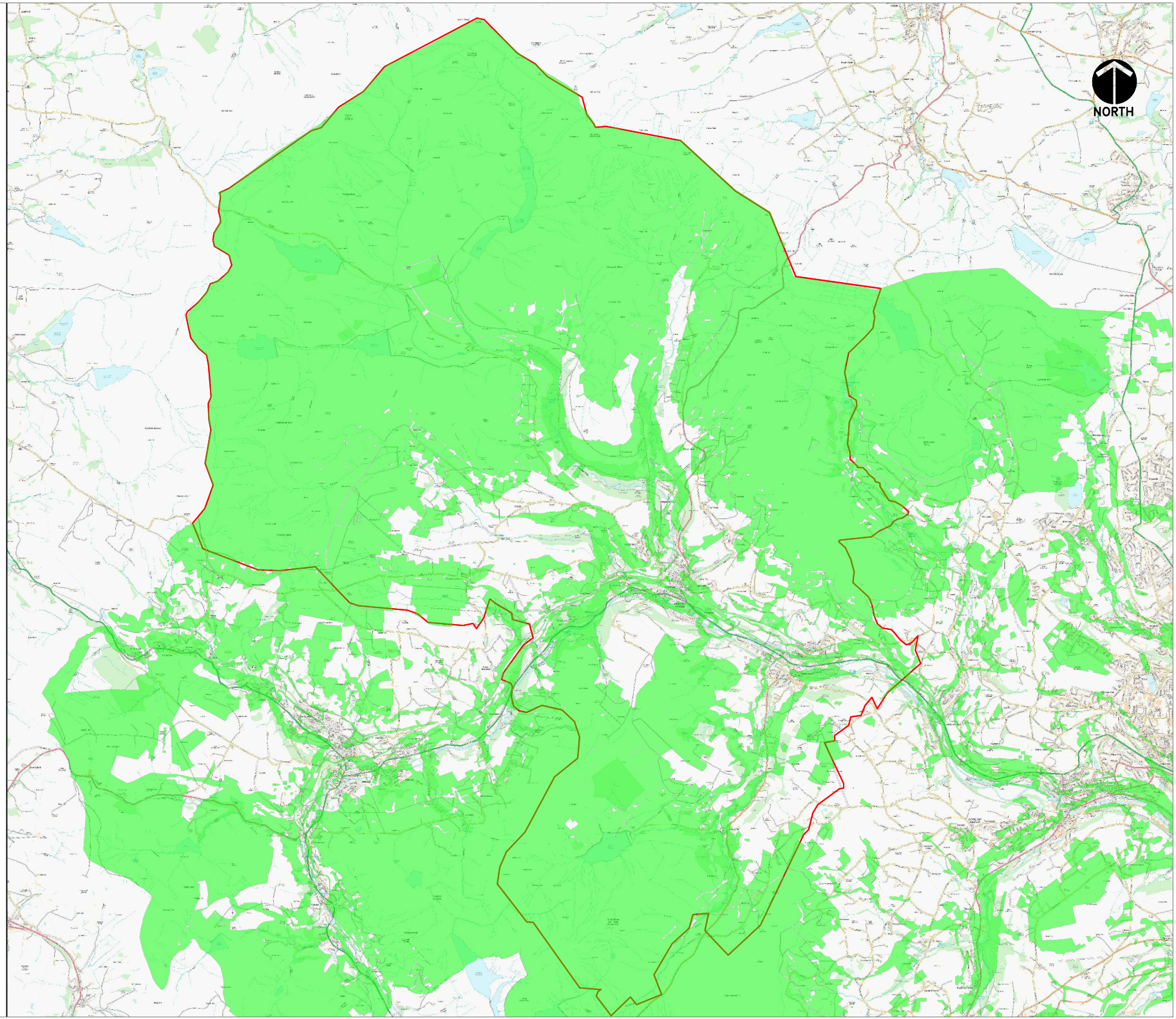
Key:

1 Colden Clough
2 Wood Hey
3 Brearley Wood
4 Clunters Moor
5 Staups Moor
6 Earnshaw Hole Moor
7 Popple Common
8 Parrock Clough
9 Height and Burnt Acres Wood
10 Whinny Nook, Slack Grassland
11 Redacre Wood
12 Hollin Hall
13 New high Laithe Farm
14 Hardcastle Crags
15 Crimsworth Dean Pastures
16 Clough Hole Pasture
17 Great House Farm
18 Jumble Hole
19 Rochdale Canal
20 Cludders Rocks
21 Foster Clough Delves
22 Hell Hole Quarry
23 Lumb Falls

Drawing title:	Hebden Royd LWS & LGS
Project:	Hebden Royd
Drawing number:	P1H-1400-02
Drawn by:	David Watts
Date:	27/10/2020
Scale:	1:50,000 @ A4

DAVID WATTS
ASSOCIATES

Appendix 4:
Calderdale Wildlife Habitat Network



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Project:	Hebden Royd
Drawing number:	P1H-1400-03
Drawn by:	David Watts
Date:	27/10/2020
Scale:	1:80,000 @ A4

DAVID WATTS
ASSOCIATES

Appendix 5: Species Lists

Mammals	
Apodemus sylvaticus	Wood mouse
Arvicola amphibius	Water vole
Capreolus capreolus	Roe deer
Cervus elaphus	Red deer
Clethrionomys glareolus	Bank vole
Erinaceous europaeus	Hedgehog
Lepus europaeus	Brown hare
Lepus timidus	Mountain hare
Lutra lutra	Otter
Microtus agrestis	Field vole
Mustela erminea	Stoat
Mustela nivalis	Weasel
Mustela vison	American mink
Myotis brandtii	Brandt's bat
Myotis Daubentonii	Daubenton's bat
Myotis mystacinus	Whiskered bat
Myotis nattereri	Natterer's bat
Neomys fodiens	Water shrew
Nyctalus leisleri	Leisler's bat
Nyctalus noctula	Noctule
Oryctolagus cuniculus	Rabbit
Pipistrellus pipistrellus	Common pipistrelle
Pipistrellus pygmaeus	Soprano pipistrelle
Plecotus auritus	Brown long-eared bat
Sciurus carolinensis	Grey squirrel
Sorex araneus	Common shrew
Sorex minutus	Pygmy shrew
Talpa europaea	Mole
Vulpes vulpes	Red fox

Amphibians	
Bufo bufo	Common toad
Rana temporaria	Common frog
Triturus cristatus	Great crested newt
Lissotriton helveticus	Palmate newt
Lissotriton vulgaris	Smooth newt

Reptiles	
Anguis fragilis	Slow worm
Vipera berus	Adder
Zootoca vivipara	Common lizard

Birds	
Accipter gentilis	Goshawk
Accipter nisus	Sparrow hawk
Acrocephalus schoenobaenus	Sedge warbler
Actitis hypoleucos	Common sandpiper

Birds	
Aegithalos caudatus	Long-tailed tit
Alauda arvensis	Skylark
Alcedo atthis	Kingfisher
Anas acuta	Pintail
Anas cracca	Teal
Anas penelope	Wigeon
Anas platyrhynchos	Mallard
Anser anser	Greylag goose
Anser brachyrhynchus	Pink-footed goose
Anthus pratensis	Meadow pipit
Anthus trivialis	Tree pipit
Apus apus	Swift
Ardea cinerea	Grey heron
Asio flammeus	Short-eared owl
Asio otus	Long-eared owl
Athene noctua	Little owl
Athya fuligula	Tufted duck
Aythya marila	Waxwing
Branta canadensis	Canada goose
Bubo bubo	Eagle owl
Bucephala clangula	Goldeneye
Buteo buteo	Buzzard
Buteo lagopus	Rough-legged buzzard
Calidris alpina	Dunlin
Carduelis cabaret	Lesser redpoll
Carduelis cannabina	Linnet
Carduelis carduelis	Goldfinch
Carduelis chloris	Greenfinch
Carduelis flammea	Redpoll
Carduelis flavirostris	Twite
Carduelis spinus	Siskin
Certhia familiaris	Tree creeper
Charadrius dubius	Little ringed plover
Charadrius hiaticula	Ringed plover
Charadrius morinellus	Dotterel
Cinclus cinclus	Dipper
Circus aeruginosus	Marsh harrier
Clangula hyemalis	Long-tailed duck
Columba oenas	Stock dove
Columba palumbus	Wood pigeon
Corvus corax	Raven
Corvus corone	Carrion crow
Corvus frugilegus	Rook
Corvus monedula	Jackdaw
Cuculus canorus	Cuckoo
Cyanistes caeruleus	Blue tit
Delichon urbica	House martin
Dendrocopos major	Greater spotted woodpecker
Emberiza citrinella	Yellowhammer

Birds	
Emberiza schoeniclus	Reed bunting
Erithacus rubecula	Robin
Falco columbarius	Merlin
Falco peregrinus	Peregrine
Falco tinunculus	Kestrel
Ficedula hypoleuca	Pied flycatcher
Fringilla coelebs	Chaffinch
Fringilla montifringilla	Brambling
Fulica atra	Coot
Gallinago gallinago	Snipe
Gallinula chloropus	Moorhen
Garrulus glandarius	Jay
Haematopus ostralegus	Oystercatcher
Hirundo rustica	Bird
Lagopus lagopus	Red grouse
Lanius collurio	Red-backed shrike
Larus argentatus	Herring gull
Larus fuscus	Lesser black-backed gull
Larus marinus	Great black-backed gull
Larus ridibundus	Black-headed gull
Locustella naevia	Grasshopper warbler
Melanitta fusca	Velvet scoter
Mergus merganser	Goosander
Milvus milvus	Red kite
Motacilla alba	Pied wagtail
Motacilla cinerea	Yellow wagtail
Motacilla flava	Yellow wagtail
Muscicapa striata	Spotted flycatcher
Numenius arquata	Curlew
Oenanthe oenanthe	Wheatear
Oriolus oriolus	Golden oriole
Parus ater	Coal tit
Parus major	Great tit
Parus montanus	Willow tit
Parus palustris	Marsh tit
Passer domesticus	House sparrow
Passer montanus	Tree sparrow
Perdix perdix	Grey partridge
Pernis apivorus	Honey buzzard
Phalacrocorax aristotelis	Shag
Phalacrocorax carbo	Cormorant
Phalaropus fulicarius	Grey phalarope
Phasianus colchicus	Pheasant
Phoenicurus ochuros	Black redstart
Phoenicurus phoenicurus	Redstart
Phylloscopus collybita	Chiffchaff
Phylloscopus sibilatrix	Wood warbler
Phylloscopos trochilus	Willow warbler
Pica pica	Magpie

Birds	
Picus viridis	Green woodpecker
Plectrophenax nivalis	Snow bunting
Pluvialis apricaria	Golden plover
Podiceps auritus	Slavonian grebe
Podiceps grisegena	Red-necked grebe
Prunella modularis	Dunnock
Pyrrhula pyrhhula	Bullfinch
Regulus regulus	Goldcrest
Riparia riparia	Sand martin
Saxicola rubetra	Whinchat
Saxicola torquate	Stonechat
Scolopax rusticola	Woodcock
Sitta europaea	Nuthatch
Somateria mollissima	Eider
Stercorarius longicausus	Long-tailed skua
Streptopelia decaocto	Long-tailed dove
Streptopelia turtur	Turtle dove
Strix aluco	Tawny owl
Sturnus vulgaris	Starling
Sula bassana	Gannet
Sylvia atricapilla	Blackcap
Sylvia borin	Garden warbler
Sylvia communis	Whitethroat
Tachybaptus ruficollis	Little grebe
Tadorna tadorna	Shelduck
Tringa totanus	Redshank
Troglodytes troglodytes	Wren
Turdus iliacus	Redwing
Turdus merula	Blackbird
Turdus philomelos	Song thrush
Turdus pilaris	Fieldfare
Turdus torquatus	Ring ouzel
Turdus viscivorus	Mistle thrush
Tyto alba	Barn owl
Vanellus vanellus	Lapwing

Invertebrates – Lepidoptera (BAP Species only)	
Aglais urticae	Small Tortoiseshell
Archiearis parthenias	Orange Underwing
Drepana falcataria	Pebble Hook-tip
Hydraecia petasitis	Butterbur
Lasiocampa quercus	Oak Eggar
Odezia atrata	Chimney Sweeper
Saturnia pavonia	Emperor Moth
Syngrapha interrogationis	Scarce Silver Y
Xylena vetusta	Red Sword-grass
Agrochola litura	Brown-spot Pinion

Invertebrates – Lepidoptera (BAP Species only)	
Agrochola helvola	Flounced Chestnut
Allophyes oxyacanthae	Green-brindled Crescent
Amphipyra tragopoginis	Mouse Moth
Blepharita adusta	Dark Brocade
Celaena haworthii	Haworth's Minor
Hydraecia micacea	Rosy Rustic
Melanchra pisi	Broom Moth
Stilbia anomala	Anomalous
Xestia agathina	Heath Rustic
Coenonympha pamphilus	Small Heath
Hepialus humuli	Ghost Moth
Acronicta psi	Grey Dagger
Acronicta rumicis	Knot Grass
Amphipoea oculea	Ear Moth
Apamea remissa	Dusky Brocade
Diarsia rubi	Small Square-spot
Ecliptopera silaceata	Small Phoenix
Epirrhoe galiata	Galium Carpet
Lycia hirtaria	Brindled Beauty
Mesoligia literosa	Rosy Minor
Mythimna comma	Shoulder-striped Wainscot
Orthosia gracilis	Powdered Quaker
Scotopteryx chenopodiata	Shaded Broad-bar
Spilosoma lubricipeda	White Ermine
Spilosoma luteum	Buff Ermine
Tyria jacobaeae	Cinnabar
Xanthia icteritia	Sallow
Xestia castanea	Neglected Rustic
Lasiommata megera	Wall
Chiasmia clathrata	Latticed Heath
Eugnorisma glareosa	Autumnal Rustic
Xanthorhoe ferrugata	Dark-barred Twin-spot Carpet
Anthocharis cardamines	Orange-tip

Invertebrates – Beetles (BAP species only)	
Cneorhinus plumbeus	
Coccinella magnifica	Scarce Seven-Spot Ladybird
Ctenicera pectinicornis	
Dorcatoma flavicornis	
Ancistronycha abdominalis	Blue Soldier Beetle
Hylecoetus dermestoides	
Hyperaspis pseudopustulata	
Rhizophagus nitidulus	

Invertebrates – Beetles (BAP species only)	
Trechus rubens	
Anotylus mutator	
Agelastica alni	

Notable plant species	
Carex hostiana	Tawny Sedge
Carex paniculata	Greater Tussock-Sedge
Chrysosplenium alternifolium	Alternate-Leaved Golden-Saxifrage
Coeloglossum viride	Frog Orchid
Convallaria majalis	Lily of The Valley
Cystopteris fragilis	Brittle Bladder-Fern
Dryopteris carthusiana	Narrow Buckler-Fern
Dryopteris x deweveri	Buckler-Fern
Eleocharis acicularis	Needle Spike-Rush
Festuca altissima	Wood Fescue
Festuca filiformis	Fine-Leaved Sheep's-Fescue
Galium uliginosum	Fen Bedstraw
Gentianella amarella	Autumn Gentian
Geranium sylvaticum	Wood Crane's-bill
Geum x intermedium	Hybrid Avens
Gnaphalium sylvaticum	Heath Cudweed
Gnaphalium sylvaticum	Heath Cudweed
Hyacinthoides non-scripta	Bluebell
Hypericum elodes	Marsh St. John's-Wort
Hypericum humifusum	Trailing St. John's-Wort
Luronium natans	Floating Water-Plantain
Melica nutans	Mountain Melick
Myosotis stolonifera	Pale Forget-Me-Not
Nepeta cataria	Cat-Mint
Osmunda regalis	Royal Fern
Pinguicula vulgaris	Common Butterwort
Poa humilis	Spreading Meadow-Grass
Polystichum setiferum	Soft Shield-Fern
Potamogeton epihydrus	American Pondweed
Prunus x fruticans	Cherry
Pyrola media	Intermediate Wintergreen
Ranunculus arvensis	Corn Buttercup
Rosa x dumalis	Rose
Rumex longifolius	Northern Dock
Ruscus aculeatus	Butcher's-Broom
Scutellaria minor	Lesser Skullcap
Tephroseris palustris	Marsh Fleawort
Trichomanes speciosum	Killarney Fern
Umbilicus rupestris	Navelwort

Notable plant species	
Valeriana dioica	Marsh Valerian
Viola tricolor	Wild Pansy

Fungi (waxcaps, pinkgills, fairy clubs, earthtongues and crazed caps)	
Clavaria fumosa	Smokey clavaria
Clavaria vermicularis	
Clavaria zollingeri	Violet coral
Clavulinopsis corniculate	Meadow coral
Clavulinopsis helvola	Yellow club
Clavulinopsis luteoalba	Apricot club
Dermoloma cuneifolium	Crazed cap
Entoloma chalybaeum	
Entoloma conferendum	Star pinkgill
Entoloma porphyrophaeum	Lilac pinkgill
Entoloma prunuloides	
Entoloma sericatum	
Entoloma serrulatum	
Geoglossum cookeanum	Earthtongue
Hygrocybe calyptraeformis	Pink meadow cap
Hygrocybe canthrallus	
Hygrocybe ceracea	Butter waxcap
Hygrocybe chlorophana	Golden waxcap
Hygrocybe citrinovirens	
Hygrocybe coccinea	Scarlet hood
Hygrocybe conica	Conical waxcap
Hygrocybe flavescens	
Hygrocybe flavipes	Yellow foot waxcap
Hygrocybe glutinipes	Glutinous waxcap
Hygrocybe insipida	Spangle waxcap
Hygrocybe intermedia	Fibrous waxcap
Hygrocybe irrigata	Slimy waxcap
Hygrocybe laeta	Heath waxcap
Hygrocybe miniata	Vermilion waxcap
Hygrocybe nigrescens	Blackening waxcap
Hygrocybe nitrata	
Hygrocybe ovina	
Hygrocybe pratensis	Meadow waxcap
Hygrocybe psittacine	Parrot waxcap
Hygrocybe punicea	Crimson waxcap
Hygrocybe quieta	Oily waxcap
Hygrocybe reidii	Honey waxcap
Hygrocybe russpcoriacea	Cedarwood waxcap
Hygrocybe splendissima	Splendid waxcap
Hygrocybe subminutula	
Hygrocybe unguinosa	Slimy waxcap
Hygrocybe virginea	Snowy waxcap
Hygrocybe vitellina	

Appendix 6: Summary of Key Legislation and Policy

Designated Sites

Special Protection Areas (SPA)

SPA are European designated sites and have being identified by JNCC/Natural England as being of interest for their bird species classified under the Wildlife and Countryside Act 1981 (as amended). SPA are classified in accordance with the European Council Directive 2009/147/EC on the conservation of wild birds, also known as the Birds Directive. SPA are of international importance and have statutory protection.

Special Areas of Conservation (SAC)

SAC are European designated sites under the Conservation of Habitat and Species Regulations 2017 (as amended) and have been identified by JNCC/Natural England as being of interest for their habitat type and species. Under the regulations, the UK government are required to estabvlish a network of important high-quality conservation sites that will make a significant contribution to conserving the habitats and species identified in Annex I and Annex II. Of the Annex I habitat types, 78 are believed to occur in the UK, and under the Annex II species, 43 are native to the UK. SAC are of international importance and have statutory protection.

Sites of Special Scientific Interest (SSSI)

SSSI are first-tier sites for conservation. They are identified by JNCC/Natural England as being of interest by reason of their flora, fauna, geological or physiological features. The legal framework for SSSI is within the Wildlife and Countryside Act 1981 (as amended). They are of national importance and have statutory protection.

Local Nature Reserves (LNR)

LNR have been designated by local authorities in combination with Natural England under the National Parks and Access to the Countryside Act 1949. LNR are usually greater than 2 ha and are capable of being managed for the conservation of biodiversity and the maintenance of special opportunities for the study, research or enjoyment of nature.

Local Sites

Local Sites include Local Wildlife Sites (LWS) and Local Geological Sites (LGS). Unlike NNR, their designation does not require public access. Local Sites are areas of substantive value including both the most important and most distinctive species, habitats, geological and geomorphological features within a national, regional and local context.

Protected Species

The Conservation of Habitats and Species Regulation 2017 makes it an offence to deliberately capture, kill or disturb any animal protected under Schedule 2 of the regulations. It is also an offence to damage or destroy a breeding site or resting place of an animal, even if the animal is not present at the time.

The Wildlife and Countryside Act 1981 (As Amended), makes it an offence to:

- Deliberately or recklessly injure, kill or capture any animal protected under Schedule 5 of the act.

- Deliberately or recklessly kill, injure or take any wild bird; to take, damage or destroy the nest of any wild bird while occupied or being built, or to take or destroy the egg of a wild bird. Additional protection is afforded to bird species listed under Schedule 1 of the Act.
- Intentionally pick, uproot or destroy any wild plant included in Schedule 8 of the Act.

Badgers (*Meles meles*) benefit from specific protection under the provisions of the Protection of Badgers Act 1992. Under the Act, it is an offence to wilfully kill, injure or take a badger (or attempt to do so), to cruelly ill-treat a badger, to interfere with a sett, cause a dog to enter a sett, and to disturb a badger while it is occupying a sett.

Planning Policy

The UK Biodiversity Action Plan (UKBAP) includes a list of 943 national priority species and 56 habitats of principal importance, with all species and habitats having specific action plans defining the measures required to ensure their conservation. Although the UKBAP has since been superseded by the UK-Post 2010 Biodiversity Framework and a focus on County Biodiversity Plans, it remains a useful point of reference. Section 41 of the Natural Environment and Rural Communities Act (NERC) 2006 required that any public bodies take into consideration any species and habitats listed in the UKBAP when implementing their duty and exercising any normal functions.

The National Planning Policy Framework (NPPF) states that planning decisions should aim to protect or enhance biodiversity and conservation interests, and where possible any development should aim to increase net gains in biodiversity.