

ILKLEY MOOR MANAGEMENT PLAN 2016 - 2026

1. Introduction.

- 1.1 Ilkley Moor is the largest outdoor resource owned and managed by the City of Bradford Metropolitan District Council. Although widely regarded as a natural and wild place, free from human interference, the moor as we know it today, in common with most of the uplands of Northern England is a product of thousands of years of human influence and natural processes.
- 1.2 Since sporadic settlement in Mesolithic times, through to the extensive woodland clearances of the Mid-Bronze Age (around 2000 BC), the uplands, including Ilkley Moor, have been settled, used and managed by humans up to the present day. Nowadays the moor provides valuable semi-natural habitat, recreational opportunity, quality landscape, cultural and historical value and supports agricultural activity as well as providing wider environmental benefits. All of these require continued management and conservation input. This management plan sets out a vision for the moor and the management that is required to achieve this in a way that meets the Council's social obligations and its legal duty of care for the environment .
- 1.3 In 1893 the moor was acquired by Bradford Council's predecessor, the Local Board of Health for the District of Ilkley; on condition that it be preserved as open space. The land is subject to the provisions of the Open Spaces Act 1906 by virtue of section 12 of the Act. The Act requires local authorities to hold and administer open spaces:
- "in trust to allow, and with a view to, the enjoyment thereof by the public as an open space within the meaning of this Act and under proper control and regulation and for no other purpose".*
- 1.4 Since 1974, the moor has been managed by Bradford Council's Countryside and Rights of Way Service. Over that period, specific moorland management projects and research have been undertaken as part of the South Pennine Moors LIFE Programme, funded by the European Community.
- 1.5 More recently, the Council, in partnership with Pennine Prospects and the Friends of Ilkley Moor, utilised Heritage Lottery Funding (via the Watershed Landscapes project) to carry out significant access management works on the moor. The experience developed over the last 40 years or so, coupled with specific projects

developed during the LIFE programme and the Watershed Landscapes project has informed the future management of the moor

- 1.6 Ilkley Moor is a famous, iconic and highly cherished landscape, often described as the “jewel in the crown” of Bradford’s assets. **The Vision for Ilkley Moor** is that it will be a place where its conservation, cultural, agricultural, historic and recreational significance is fully acknowledged and recognised. It will continue to be resilient to change, as it has proven to be, in the face of increasing interest from visitors and an ever-widening range of recreational activity resulting from increasing local populations in nearby urban centres.

The Vision for Ilkley Moor is that it will:

- be managed in a way that conserves and enhances its unique habitats so that it is resilient to these pressures and other more fundamental trends such as climate change. Management approaches will ensure that the moor continues to function as an important habitat and carbon store, by maintaining and restoring its active blanket bog whilst putting plans in place to prevent and manage uncontrolled fire events. These in turn, will play their part in managing flood risk and water management in the adjacent valleys of Wharfedale and Airedale.
 - continue to provide a home for protected species, such as the upland moorland birds which thrive there and help to give the moor its identity.
 - serve to provide inspiration, artistically, academically and emotionally, through its landscape, cultural history and archaeological interest – so that people can easily connect to previous inhabitants and natural and human activities that have shaped the moor.
 - serve as an economic asset to the District, both as a tourist destination and in providing employment and supporting local agricultural endeavour.
 - Continue to be a place to find solitude, active leisure, education and inspiration for generations to come.
- 1.7 National and European legislation requires the Council to manage the moor so that its conservation value is maintained and enhanced. This duty influences the management proposals set out in this plan so that they satisfy the Habitats Directive and Conservation of Habitats and Species Regulations 2010 as amended (‘the

Habitats Regulations') and Article 6(3) of the European Habitats Directive by way of an Appropriate Assessment.

This management plan for Ilkley Moor therefore will:

- Compliment the Vision for Ilkley Moor, to provide a blueprint for management practices and act as a reference for future managers and other interested parties,
- Enable the delivery of sustainable, quality management of the moor, and
- Serve as a legally compliant proposal to gain a time limited consent from Natural England for the management approaches detailed herein.

2. Description of the site.

2.1 Ilkley Moor is situated in the northern part of the Bradford Metropolitan District, some 15 miles from Bradford to the south and Leeds to the south east. The site forms part of the South Pennines which lie between the Yorkshire Dales to the north and the Peak District to the south.

2.2 The moor covers an area of 676 hectares (1670 acres) on the southern slope of Wharfedale and forms part of the upland watershed between Wharfedale to the north and Airedale to the south - collectively known as Rombalds Moor. Rombalds Moor is made up of Ilkley Moor, Burley Moor, Hawksworth Moor, Bingley Moor, Morton Moor and Addingham High Moor.

2.3 Topography.

From the edge of the town of Ilkley the moor rises to the south by 250m (820ft), the highest point being at the triangulation point near the southern boundary of the moor at 402m (1320ft) above sea level.

2.4 In topographical terms, the moor forms three distinct terraces or "slacks", separated by resistant bands of Millstone Grit. These gritstone bands run along Wharfedale and form distinct cliffs or escarpments at places on the moor such as Rocky Valley, Cow and Calf rocks and Hangingstones quarry. It is the same band of rock which forms

Otley Chevin further down Wharfedale. The landform is principally a result of glacial activity, landslip and erosion caused by glacial retreat.

- 2.5 The escarpment slope at the front edge of the moor is intercut by ghylls or small valleys formed by the streams which run off the moor.

2.6 **Landscape Character**

Ilkley Moor lies within the Rombalds Ridge Landscape Character Area as set out in Bradford Council's Landscape Character Supplementary Planning Document produced in 2008. This describes the area as a primarily high level plateau with an upland character dominated by moorland. Strong cultural association, archaeological interest, ecological importance and recreation value add depth and meaning to this Character Area.

- 2.7 The Rombalds Ridge displays a series of "terraces" or "steps" along its northern flank. This creates distinctive features such as the Cow and Calf Rocks and a series of alternating steep crags and flatter "slacks". The ridge forms the most easterly block of Millstone Grit in the South Pennines and there is evidence that it was singled out for particularly intensive activity during prehistoric times.

- 2.8 The Landscape Character assessment concludes as follows:

Rombalds Ridge can be regarded as very sensitive to change due to its strong character, high historic continuity, displaying a safe feeling of remoteness.

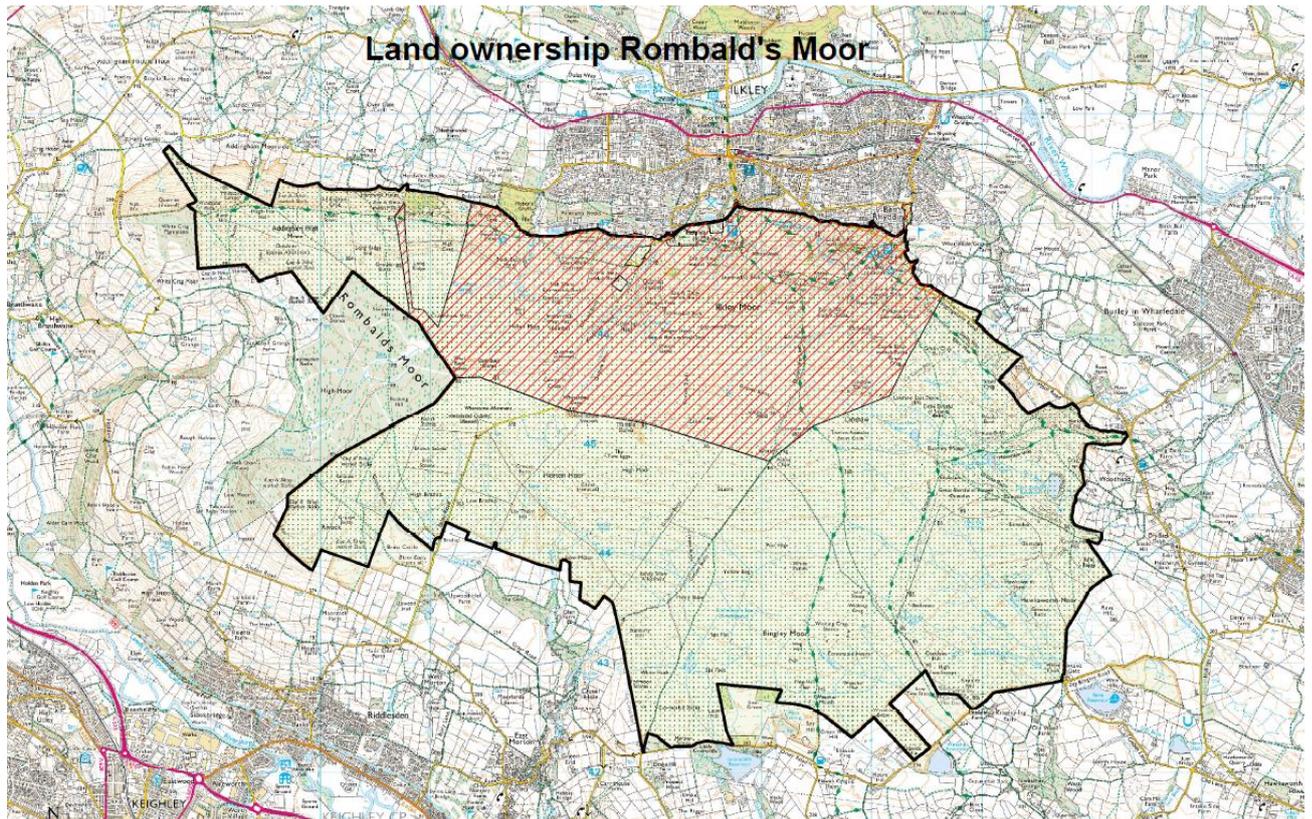
2.9 **Ownership.**

Map below shows the extent of Ilkley Moor owned by City of Bradford M.D.C. (shaded red).

- 2.10 The moor came into public ownership in 1893 when it was passed to the Ilkley Board of Health from the previous owner, Marmaduke Middleton, as a public pleasure

ground. The moor has been publically owned by Ilkley Urban District Council and subsequently by City of Bradford M.D.C.

2.11 The surrounding moors which make up the rest of Rombald's Moor are all in private ownership.



Designations / Status.

The moor carries a number of official designations:

2.12 **Urban Common.**

Under the Law of Property Act 1925, Ilkley Moor is designated as urban common. As such there are certain rights and restrictions attached to the moor. These include a right to graze up to 1100 sheep shared between three properties.

Public access for “air and exercise” on the whole of the moor is unlimited. This includes access on foot and on horseback. The riding or driving of any vehicle on urban common (including bicycles) is not permitted without lawful authority.

The moor’s status as urban common also restricts the erection of buildings, fences and any other works which may affect general rights of access or grazing. Any such proposals require consent from the Secretary of State.

2.13 Site of Special Scientific Interest (SSSI).

In 1994 the whole of Ilkley Moor was designated, by English Nature (now Natural England), as a Site of Special Scientific Interest because of the range of upland vegetation types which it supports. The moor was included as part of the designation of the South Pennine Moors as nationally important habitats, particularly for upland birds, under Section 28 of the Wildlife and Countryside Act (1981).

2.14 The South Pennine Moors SSSI comprise three blocks of moorland stretching from Ilkley in the north to the Peak District in the south. These moorlands contain the most diverse and extensive examples of upland communities in the area. Extensive areas of blanket bog occur on the upland plateaux and are interspersed with species-rich acidic flushes and mires. There are also mosaics of wet and dry heaths and acidic grasslands.

2.15 This range of habitats supports a moorland breeding bird assemblage (see 2.21 & 2.22) which is of international importance. It includes several species listed on the EC Birds Directive in internationally important numbers.

2.16 South Pennine Moors Special Protection Area (SPA)

The moor is internationally important as, under EU legislation, the South Pennine Moors SPA was designated in two phases in 1996 and 1997, Ilkley Moor being part of the Phase II designation and extending over an area of some 66,207 hectares and spanning 13 local authorities. It includes the same major moorland areas of the South Pennines from Ilkley in the north to Leek and Matlock in the south, as designated SSSI (see above). The SPA covers extensive expanses of semi-natural moorland habitat including upland heath and blanket mire.

- 2.17 The SPA is of European importance for several upland breeding bird species, including birds of prey and waders. Both Merlin (*Falco columbarius*) and Golden Plover (*Pluvialis apricaria*) feed upon farmland or in-by land on the edge of the moors that is outside of the SPA boundary; this is considered important to the long term conservation of the SPA population of these birds.
- 2.18 The South Pennine Moors SPA qualifies under Article 4.1 of the Birds Directive (2009/147/EC) by supporting populations of European importance of the following species listed on Annex 1 of the Directive:
- Golden Plover *Pluvialis apricaria*
 - Merlin *Falco columbarius*
- 2.19 The site also qualifies under Article 4.2 of the Birds Directive by supporting populations of the following regularly occurring migratory species (referred to as the “breeding bird assemblage”):
- Dunlin *Calidris alpina schinzii*
 - Common sandpiper *Actitis hypoleucos*
 - Twite *Carduelis flavirostris*
 - Snipe *Gallinago gallinago*
 - Curlew *Numenius arquata*
 - Wheatear *Oenanthe oenanthe*
 - Whinchat *Saxicola rubetra*
 - Redshank *Tringa totanus*
 - Ring ouzel *Turdus torquatus*
 - Short-eared owl *Asio flammeus*
 - Lapwing *Vanellus vanellus*.
- 2.20 South Pennine Moors Special Area of Conservation (SAC)
The South Pennine Moors SAC, which has identical boundaries to the SPA, was selected for its representation of three Annex 1 habitat types (European dry heaths, Blanket bogs, and Old sessile oak woodlands) while a further two were subsequently identified as being present as qualifying features within the SAC (Northern Atlantic wet heaths, and transition mires and quaking bogs. This is another EU designation, made under the European Habitats Directive and of equal significance to the SPA status.

2.21 Scheduled Ancient Monuments

Ilkley Moor contains significant concentrations of pre-historic rock art, possibly one of the most important in Britain. Comprehensive surveys and recording projects have been undertaken in recent years and the extent of the archaeological interest is now well documented. A considerable proportion of these carvings are legally protected, due to their designation as scheduled ancient monuments

3. ECOSYSTEM SERVICES ON ILKLEY MOOR

- 3.1 The concept of “ecosystem services” is one which has been used to describe the variety of functions that individual landscapes or ecosystems provide for wider benefit to society as well as the species which thrive there.
- 3.2 In the case of upland moorland areas such as Ilkley Moor, these functions or services include:
- Nature conservation / biodiversity protection
 - Carbon storage and sequestration
 - Flood mitigation and water quality
 - Recreational opportunity, tourism and cultural heritage
 - Agriculture and food production
 - Economic and provision of jobs
- 3.3 Although the bulk of the management of the moor is focused on biodiversity and recreation, and on balancing these two sometimes competing functions, the other services are important by-products of well managed moorland and have wide societal benefits.
- 3.4 **Carbon:** It is widely recognised that active blanket bogs which form peat, act as a store for carbon, being made from dead and decaying organic matter. Where these are affected by erosion or other processes which dry and fragment the material (eg wildfire), they will release carbon into the atmosphere and this in turn will contribute to greenhouse gases and ultimately climate change. Where blanket bogs are maintained in a healthy, active state this cycle of storage and release can be geared more towards storage than release, aiming for no net loss of carbon or, preferably, a carbon-positive state.
- 3.5 Peat areas are the UK’s largest terrestrial carbon store covering around 10% of UK land area and storing approximately 3.2 billion tonnes of carbon¹ - a higher rate of storage than the UK’s woodland resource.

¹ IUCN Commission of Inquiry on Peatlands (2011)

- 3.6 The management actions described in this plan relating to management of blanket bog/peat/heath areas and erosion control will all help to sustain the moor's carbon storage capability and assist in reducing leakage to the atmosphere.
- 3.7 **Flooding and water quality:** In addition to storing carbon; peat and blanket bog on the moor retain ground water and help slow down run-off. Events in Airedale and Wharfedale in past years and more recently in the Calder Valley, suggest that the rate at which water flows from the moorland streams into main rivers can contribute to flooding in valleys. Again, well-maintained moorland bogs, drainage management and erosion control will contribute to the flood mitigation properties of Ilkley Moor. Recent research suggests that surface roughness influences surface flow-rates and is perhaps the primary factor to be considered when contemplating the flood mitigation properties of moorland. This surface roughness can be increased by encouraging species such as sphagnum mosses and cotton grass on blanket bog – something which will be implemented on Ilkley Moor.
- 3.8 Reducing suspended silt and peat in run-off from moorland by improving environmental condition also helps preserve water quality and helps meet EU Water Framework Directive requirements. Although Ilkley Moor is no longer used for water catchment, and so the direct effect on water entering supplies is limited; run-off does eventually make its way into the River Wharfe. Here, excessive sediment can affect river ecosystems and overall water quality. This is exacerbated after moorland fires – particularly unmanaged wildfire or poorly managed rotational burning which can burn into peat and result in run-off introducing significant sediment (organic particles) and colour (dissolved organic material) into river systems. Excessively eroded areas will also have the same contributory effect.
- 3.9 Where high levels of sediment and colour occur in water catchment areas, the cost of ensuring that this is filtered out can be excessive, so there is an economic as well as environmental incentive to reduce such incidents. Further research is currently underway into how re-vegetation and moorland restoration improves the downstream water quality. Much of this is being led by the Peak District-based Moors for the Future project, whose MoorLIFE 2020 programme has recently received significant funding from the EU for restoration of active blanket bog in the South Pennines. The Council will maintain links with this team with a view to applying knowledge and good practice on Ilkley Moor.
- 3.10 **Agriculture and food production:** In common with most upland moorland areas in the UK, Ilkley Moor supports agricultural activity, primarily sheep farming. This

provides food to local and regional markets provides employment and helps sustain traditional farming land-management practices which in turn can have beneficial environmental and landscape outcomes.

- 3.11 Sheep graze on the moor under common grazing rights, those relating to Ilkley Moor being attached to Crag Farm at Addingham Moorside and amounting to around 550 sheep. The sheep numbers that are regularly grazed on the moor have been adjusted under a Higher Level Stewardship agreement to allow for better environmental conditions (see Section 4).
- 3.12 The management of sheep on and around the moor has other benefits. In-bye pasture below the moorland edge, whilst providing sustenance for the sheep, can also be important supporting habitat for a number of moorland birds which nest on the moor. Species such as golden plover, lapwing, curlew and short-eared owl use these areas for feeding, foraging and nesting and the land management practices which maintain them also benefit the birds. In this way the supporting in-bye habitat is functionally linked to the upper moor. Boundary maintenance linked to this farming practice, in the form of dry-stone walls are also important landscape features and linear wildlife corridors.
- 3.14 Recreation, tourism and cultural heritage:** Section 5 covers recreational use of Ilkley Moor in detail but it is useful to note here that this, plus the related cultural and tourism opportunities that the moor provides, are significant benefits to locals and visitors alike.
- 3.15 Ilkley Moor, particularly the area around the Cow and Calf, is an iconic and well-known landscape. It is possibly the most famous moor in the UK – not least because of the widespread fame of a certain song. It is a key destination for many visitors annually and, in terms of the Bradford District is as equally attractive as the other local “honey-pots”, Saltaire World Heritage Site and Haworth/Bronte Country.
- 3.16 Without a doubt visitors to the moor contribute to the tourism economy of Yorkshire and Humberside and the District itself, but it is difficult to be specific about how much the moor generates in visitor numbers and spend. An impression of the moor’s importance to the town of Ilkley has been gained, however, from a series of visitor surveys which were undertaken during the summer of 2013. Based on responses to the question whether people who visited the moor also went into Ilkley itself (38% said “yes”), and if so how much did they spend, it was possible to

estimate that the people who visited the moor could generate approximately £1.5 million per annum in additional spends in Ilkley².

- 3.17 The human heritage that the moor presents – including prehistoric and Victorian landscapes – contribute significantly to our appreciation and understanding of how the moor has been used and enjoyed culturally by people over time. Similarly, the aesthetic qualities presented by the moor’s landscapes and views are associated significant benefits.
- 3.18 In terms of public health the moor also provides a range of opportunities for active recreation - generating a sense of well-being and the benefits to mental health that come from being active or simply “getting away from it all”.
- 3.19 **Nature conservation / biodiversity:** One of the most significant ecosystem services that the moor provides is in relation to biodiversity. The habitats and species that the moor supports contribute to the overall national and international resource – for example the UK holds 7-13% of the global resource of blanket bog.
- 3.20 The importance of these habitats and species are reflected in their national and international designations, and the management of them is described in detail in Section 4.
- 3.21 **Employment and economy:** Although not easy to accurately quantify, the moor supports the local economy both directly and indirectly. It provides employment and support for local businesses. It was clear, when access to the moor was temporarily suspended in 2001 due to the foot and mouth outbreak, that this affected a number of local hotels and other commercial enterprises that either traded on the fact that they were close to the moor, or used it for related activity (eg cafes at White Wells and Cow and Calf, various management or outdoor activity course providers).

3. 22 **UPLAND EVIDENCE REVIEW**

In May 2013, Natural England published a review of evidence relating to biodiversity and ecosystem services in the uplands and the impact of land management activities upon them. This was undertaken to ensure that Natural England uses the most robust evidence available when formulating advice and taking decisions related to its work in the uplands.

² Bradford Council visitor surveys 2013

3.23 Natural England has a statutory role to work alongside a range of stakeholders, including Bradford Council, to ensure the sustainable management of the uplands.

The review considered five priority topics:

- The impact of tracks on the integrity and hydrological function of blanket bog
- Restoration of degraded blanket bog
- The effects of managed burning on upland peatland biodiversity, carbon and water
- Upland hay meadows: what management regimes maintain the diversity of meadow flora and populations of breeding birds
- Moorland grazing & stocking rates

With the exception of management of upland hay meadows, the outcomes of these reviews will inform wherever possible, the works outlined in this Management Plan and extracts from the reviews are included as appendices. Further detail on this can be found at: <http://publications.naturalengland.org.uk/category/5968803>

4: MANAGEMENT ON THE MOOR

- 4.1 In order to ensure that the moor continues to provide the services and benefits outlined in the previous section, and achieve the long-term vision, it needs to be properly managed so that it functions as a productive and sustainable resource without declining in quality. The following sections outline the objectives and actions proposed to achieve this.

The main areas of management activity relate to **habitat and species, recreation and access** and **archaeology**.

4.2 HABITAT AND SPECIES MANAGEMENT

As reflected in its status as SSSI, SPA and SAC, Ilkley Moor contains nationally and internationally important natural and semi-natural habitats and associated bird assemblage.

- 4.3 This Management Plan focuses on stabilising and, where possible, improving key habitats with a view to achieving and/or maintaining favourable SSSI condition. In common with most upland areas, the habitats and species on Ilkley Moor have endured historic decline due to a range of factors³, including:

- Habitat loss and fragmentation caused by overgrazing, agriculture and forestry
- Decreases in prey abundance (eg crane flies) due to intensive upland management – grazing or silviculture drainage and drying

³ Consultation to the Birds Directive Article 3: Birds of conservation concern and delivery mechanisms (David Noble, Ian Henderson, Rachel Taylor, Veronica Mendez) BTO 2013

- Recreational disturbance and erosion
- Inappropriate management (over-grazing, under-grazing, burning), or scrub and bracken encroachment and structural change
- Drainage/drying/abstraction affecting bogs, wet heathland and attendant insect populations
- Nutrient enrichment from atmospheric deposition (air pollution) and over grazing
- Exacerbating effects of predation on productivity and population recovery

4.4 Although some of these trends have largely been slowed or reversed in the last 20 years or so, one of the main objectives of the Management Plan is to consider the habitat and species management in order to avoid further damage and recover from these impacts.

4.5 For the purposes of this management plan, the priority habitats on Ilkley Moor can be identified as **wet and dry heath and blanket bog** interspersed with moorland grasses and areas of woodland and scrub (eg. gorse).

4.6 Before considering these habitats in more detail, it is useful to set out the recent context in which their management has been undertaken. Since 2008, much of the habitat management work which has taken place on the moor has been under the aegis of a Department for Environment, Food and Rural Affairs (DEFRA) **Higher Level Stewardship (HLS)** agri-environment scheme. This is a joint agreement with the owners of Burley Moor (the Bingley Moor Estate) and is administered through the DEFRA agency, Natural England (NE). It runs for a period of 10 years (from 2008) and has provided annual and capital payments for management of the moors designated habitat and species. The management prescriptions and indicators of success set out within this agreement essentially guided the land/habitat management activity on these moors during its term. Beyond 2018, it is the Council's intention to explore the opportunities to enter into future agri-environment agreements (also currently called "Countryside Stewardship" schemes) so that continued funding for management for the moor which reflects the objectives set out in this plan, can be secured. At the time of writing, and following the EU referendum result, the situation as regards agri-environment schemes is unclear. The Council will however keep abreast of developments with a view to securing further support for management of the moor through whatever "stewardship" arrangements are in place.

4.7 The area to which the current HLS applies is described in the agreement as:

Unenclosed grazing unit made up of Ilkley Moor, Burley Moor, Addingham Moorside, Burley rifle range, Burley reservoirs and the enclosed units of Panorama Allotments.

4.8 The HLS sets out a series of options for these areas. The management prescribed under these options is aimed at maintaining / restoring moorland habitats to benefit upland wildlife, provide nesting and feeding grounds for a range of native bird species, retaining historic features, maintaining soil conditions and strengthening the landscape character. The management prescriptions are designed to achieve “favourable” condition across all the management units which make up the moor given sufficient time. Prior to entering the HLS scheme, the condition of these units was described as “un-favourable, no-change”, in common with many upland SSSI’s, at present they are regarded as “unfavourable recovering”.

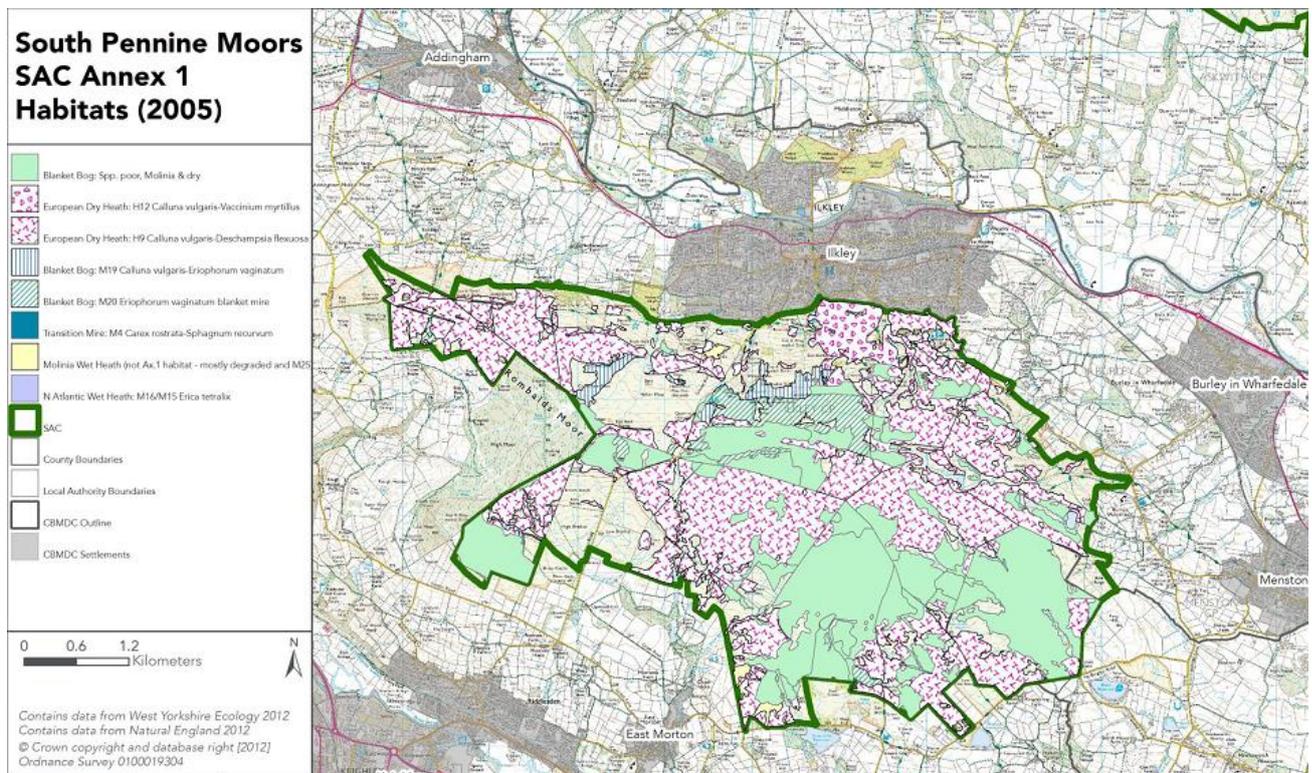
4.9 Specifically, the prescribed management is intended to benefit the following features:

- Wet and dry upland heath, with fragmented heath
- Grass moorland and rough grazing
- Blanket bog and mire
- Curlew, lapwing, snipe, golden plover and ring ouzel (plus other bird species in the assemblage e.g. twite, or others listed individually, e.g. merlin)
- Above ground historic features including 12 separate features listed on the Historic Environment Record
- Below ground historic features listed on the Historic Environment Record

4.10 The overriding land management approaches are:

- Maintaining, enhancing and where possible, restoring the number and diversity of species and structure of existing moorland
- Improving the condition and cover of grazing suppressed dwarf shrubs on dry heath, blanket bog and wet heath
- Maintaining and restoring the hydrological integrity of the peatland system and other wetland features
- Maintaining the existing native broadleaf woodland and enhance, where appropriate, woodland cover eg, along gills and cloughs

- Maintaining, subject to natural change, breeding bird species numbers and assemblages for which the moor has been designated
- Restoring areas of degraded habitat especially dry heath, wet heath or blanket bog
- Maintaining other site-specific interests eg, rare plants, geology etc.
- Maintaining all the features listed on the Historic Environment Record and protect them from damage



4.11 The main habitats on the moor include European dry heath and blanket bog – varying in terms of cover between heather (*Calluna vulgaris*), bilberry (*Vaccinium myrtillus*), wavy hair grass (*Deschampsia flexuosa*), cotton grass (*Eriophorum angustifolium and vaginatum*) and Purple moor grass (*Molinia caerulea*). These form a mosaic interspersed with areas of transition between one habitat type and another plus areas where other plants and habitat dominates (eg woodland). As a general rule, heath habitat (whether wet or dry) is characterised by having at least 25% cover of heather or bilberry/moorland grass on thin mineral soils or peat less than 0.4m deep. Blanket bog is generally defined by the depth of the peat cover (usually >0.4m)

and the fact that it is directly fed by rainfall. It is formed as a result of the very slow decomposition of plant material under conditions of waterlogging – ultimately forming peat. “Active” blanket bog is a term used to define those areas which are “still supporting a significant area of vegetation that is normally peat forming”⁴ (eg. Sphagnum mosses and cotton grasses). Both upland heath and active blanket bog are UK priority habitats as defined in the UK Biodiversity Action Plan – similarly, both are priorities as regards this management plan.

- 4.12 Other plant species which occur on the open moor include crowberry (*Empetrum nigrum*) and acid-tolerant grass areas (often degraded dry heaths that are the result of past overgrazing) including soft rush (*Juncus effusus*), wavy hair grass (*Deschampsia flexuosa*), sheeps fescue (*Festuca ovina*), mat grass (*Nardus stricta*) and purple moor grass (*Molinia caerulea*). Such grass areas on the moor are particularly important for birds such as curlew, lapwing, snipe, redshank - these favour cotton grasses and rushes on the wetter areas - and golden plover, wheatear, whinchat, ring ouzel and skylark on the shorter, drier grasses. Twite will use grassy tussocks for nesting but feed over a wider range of grasslands.
- 4.13 On the lower slopes of the moor (up to around the 330m contour) bracken is dominant and covers a significant proportion of these areas. Although of some conservation value, the plant can out-compete and dominate other priority species and habitat and detract from public enjoyment of the moor, often obscuring paths and making access difficult.
- 4.14 In the wetter parts of the moor plants such as bog asphodel (*Narthecium ossifragum*) bogbean (*Menyanthes trifoliata*), bog pondweed (*Potamogeton polygonifolius*), bog pimpernel (*Anagallis tenella*) and knotted pearlwort (*Sagina nodososa*), carnation sedge (*Carex panicea*), star sedge (*Carex echinata*) and Sphagnum mosses occur. In addition, these areas also support varied populations of insects, in particular dragonflies such as Southern Hawker (*Aeshna cyanea*), Common Hawker (*Aeshna juncea*), Black Darter (*Sympetrum danae*) and Blue Tailed damselfly (*Ischnura elegans*). The moor also supports a range of Lepidoptera species (butterflies and moths), including the Emperor moth (*Saturnia pavonia*) and the Common heath moth (*Ematurga atomaria atomaria*), Small copper butterfly (*Hycalena phlaeas*), Peacock (*Aglais io*), Red Admiral (*Vanessa atalanta*) and Painted Lady (*Vanessa cardui*). The higher levels of the moor, especially with bilberry cover, support Green Hairstreak (*Callophrys rubi*) which is Biodiversity Action Plan butterfly species.

⁴ EU Habitats Directive

- 4.15 The middle terrace of the moor (between the 335m and 355m contours), is an extensive blanket mire supporting significant stands of soft rush and cotton grass. This mire extends from the eastern boundary of the moor, close to Lanshaw Delves, westwards to Crawshaw Moss near the Rivock Edge plantation below Buck Stones. Communities of the plants and mosses described above thrive within the grasses and heath species. In parts, particularly around Hollin Hall peat pits and at Crawshaw Moss, this vegetation is interspersed with open pools.
- 4.16 A significant mire is located at Crawshaw Moss on the western edge of Ilkley Moor. Past drainage patterns associated with heather management (gripping), have resulted in some localised drying of these wet areas. Drainage reversal, including blocking of grips carried out over the last 10-15 years is helping to keep the moor wetter and maintain the active blanket bog.
- 4.17 A number of water courses run from the moor, including Willy Hall Spout, Backstone Beck, Spicey Gill and Black Beck. These form important habitats and water supplies in themselves as well as supporting a range of vegetation - including ferns, mosses and lichens, and forming wooded cloughs which are prime nesting sites for ring ouzel (*Turdus torquatus*).
- 4.18 **Future management activity:** A number of approaches will be adopted for future management of the moor over the life of this plan. These will hopefully secure the continued conservation and improvement of the priority habitats outlined above. These approaches include **management of grazing, management of upland heath, management of blanket bog and wet heath / drainage, management of bracken, management of trees, scrub and woodland.**
- 4.19 **Management of grazing.** It is fair to say that much of the current habitat on Ilkley Moor, if not entirely a product of, has at least been affected by previous sheep grazing regimes. Overgrazing of upland heath habitat can lead to loss of dwarf shrubs and colonisation by grasses. Under grazing can lead to spread of tree cover. It is important, therefore to aim for sustainable grazing levels which should assist in maintaining heathland habitat, increase habitat diversity and structure and provide dung which is an important habitat for invertebrates, which in turn provide food for bird species.
- 4.20 Ilkley Moor is an urban common and as such, there are common grazing rights attached to one of the nearby farms (at Addingham Moorside). In the past there has been little in the way of incentive to influence the levels of grazing on the moor.

If the farmers with grazing rights wanted to graze to their full limit, they could do so. This changed with the introduction of the HLS scheme in 2008. Stocking rates have been prescribed for the moor under this scheme and calculated according to vegetation type and carrying capacity.

- 4.21 Clearly the success of grazing regimes depends upon the co-operation of the moorland graziers – who are also signatories to the existing HLS agreement. Although only one farm has grazing rights attached to Ilkley Moor (Cragg Farm at Addingham Moorside), sheep belonging to other graziers (notably Hagg Farm at Burley in Wharfedale which has rights on Burley Moor) can also access parts of Ilkley Moor as there is no physical boundary between Burley and Ilkley Moor. Traditionally, moorland sheep flocks are hefted. That is, they have their own grazing territory which they generally stick to owing to pressure from neighbouring hefts, although there remains the possibility that sheep will drift onto the neighbouring moor. It was important therefore to ensure that both these graziers signed up to the HLS agreement.
- 4.22 The shepherding regime prescribed for Ilkley-hefted sheep (i.e. those belonging to Cragg Farm) is to keep sheep away from the 2006 fire damaged area to the west of Keighley Road. Sheep must be raked out a minimum of 3 days a week and this may have to be undertaken more frequently in winter to aid the restoration of the dwarf shrub on the fire damaged area.
- 4.23 The stocking rate for sheep on Ilkley Moor is also set by the HLS agreement. Common grazing rights for Ilkley Moor total 350 sheep. A stocking rate of 0.08 LU/h⁵ is prescribed which means the annual stocking rate would be reduced to 275 ewes. There is provision, however for seasonal variation, so that a 25% increase is allowed in summer (up to 344 ewes) and a 25% reduction in winter (down to 207 ewes). The graziers are compensated in the HLS for this reduction in sheep numbers through annual payments.
- 4.24 These rates have been set to achieve recovering condition and monitoring will be undertaken to assess vegetation recovery. The prescriptions may be amended if the indicators of success are not being achieved. The most recent condition monitoring undertaken by Natural England (October 2015) indicates that the grazing management is playing its part in reversing the effects of past overgrazing and, as a result, the condition of some monitored units on the moor is on a trajectory to favourable condition.

⁵ LU/h = Livestock Unit per hectare

- 4.25 When the HLS agreement ends (in 2018), Natural England will advise on future grazing management to benefit the moor. The Council intends to explore with Natural England the possibility of continuing this management work.
- 4.26 **Management of upland heath:** In order to achieve the management objectives set out in 4.10, particularly those relating to maintaining, enhancing and restoring the number and diversity of species and structure of existing moorland, it is sometimes necessary to manage upland heath areas on the moor sensitively, not just for the vegetation itself but also for breeding bird species, butterflies, moths and other insects and species and to manage scrub, bracken and tree colonisation.
- 4.27 The previous section addressed grazing, which is one key way of managing heathland. Other approaches are outlined in this section, which will be employed in tandem with the continued management of sheep grazing.
- 4.28 Historically, rotational burning has been employed on the moor as one of the ways of managing heathland. This is the process whereby stands of heather are burnt off to encourage re-growth of young heather, favoured by certain moorland bird species, particularly red grouse. Rotational burning has therefore become synonymous with the management of the uplands for grouse shooting. During the term of the current HLS agreement, the amount of rotational burning allowed on the moor was limited – confined to relatively small areas of heath, principally in the extreme west and south/south-eastern margins of the moor. Within these areas, the cycle of burning was also prescribed –varying between a 15 year and 20 year cycle depending on location. As the primary aim of burning is maintaining heath communities and avoiding succession to scrub, areas of moor with no or low dwarf heath shrub cover are considered to be outside the burning rotation, including most land dominated by bracken or rush and areas of grassland.
- 4.29 In summary, therefore, although rotational burning has been employed on the moor, it has been limited in scale and frequency. In other areas, burning, or other management of blanket bog is either not needed or is not desirable for nature conservation and/or wider land management purposes. However, where burning

has taken place, the guiding principle has been to ensure that the peat resource and any sensitive vegetation is not damaged.

- 4.30 In addition, there is now a growing movement to consider other heather management techniques (eg. cutting) as more research into the potentially damaging effects of burning is published⁶.
- 4.31 **Future heath management on Ilkley Moor:** Ongoing national debate about the merits or otherwise of burning heather are, at the time of writing, causing moorland managers and environmental organisations and agencies to consider whether alternative methods would be preferable and effective. For some time the possible environmental impacts of burning heather have been used as arguments to see it cease. This is in addition to the already acknowledged damage that burning on deep peat blanket bog can do to this valuable resource.
- 4.32 The wider environmental impacts include release of carbon through the burning process and pollution of water sources in run-off - resulting in suspended sediment which is difficult and costly to remove where moorland areas are used for water catchment and the run-off ends up in rivers and reservoirs. There is also the atmospheric pollution which can arise when moorland is burnt.
- 4.33 The Council, through its Environment and Waste Management Overview and Scrutiny Committee considered this issue in relation to Ilkley Moor in November 2015 and recommended that alternative techniques (such as cutting or flailing) be explored. Other parties argue that management of heath is not necessary at all, especially as some species (eg. merlin) prefer long heather. The roughness of the surface vegetation (ie. longer rather than shorter sward height) can also increase the flood mitigation properties of moorland by slowing the rate of overground flow which appears to be a relatively significant contributory factor in down-valley flood events. The Council is -receptive to- these arguments, however the position is not currently to abandon heather burning entirely, but to shift the emphasis of any future heathland management it undertakes, or allows to be undertaken, towards alternative methods where necessary, possible and appropriate. In addition, the Council will consider identifying areas of heathland which will not be managed. For example, an area on the middle terrace of the moor has been identified as containing populations of the rare ostrich-plume feather-moss (*Ptilium cristacastrensis*) – a species which is particularly vulnerable to burning. The only circumstances in which the Council will allow burning is where there is a clear

⁶ Brown, L.E., Holden, J. & Palmer, S.M., 2014. Effects of Moorland Burning on the Ecohydrology of River basins. Key findings from the EMBER project. University of Leeds

defined need to manage heath (for example, to create fire breaks to prevent the spread of wildfire), where no other species or habitat is likely to be adversely affected and where alternative methods are not possible.

- 4.34 The main alternative to burning is to cut the heather using heavy duty mowers or flails but this requires relatively flat, accessible land, free from boulders and rocky outcrops which can damage the machines. It also pre-supposes that such machinery, which can be expensive, is readily available. There is also the issue of potential damage caused by driving the machinery on the moor particularly on wet areas to consider, as well as the real risk of damaging scheduled (or unscheduled) ancient rock carvings – which are present in abundance on Ilkley Moor and which is a particular concern to Historic England (formerly English Heritage). This is explored further in section 6.
- 4.35 Similar to the Council, Natural England do not currently have a “no-burning” policy as they consider that this would remove a management option should the need to occasionally burn for specific reasons arise (eg. to create fire breaks to mitigate against wildfire, or to remove an area of heather prior to conducting restoration work, e.g. cotton grass or Spahagnum plug planting).
- 4.36 As things stand, the current HLS agreement runs until 2018 and allows burning in prescribed areas on a long rotation (15-20 years minimum). During the remainder of the term of this agreement, alternative heather management options will be considered and employed where appropriate in those areas where it is required. If the national guidance or regulation in relation to heather burning changes in the meantime, this will be reflected in future management approaches.
- 4.39 **Blanket bog and wetlands:** Blanket bog is one of the key priority habitats on the moor. As outlined in earlier sections, this is a product of very slow decomposition of plants in waterlogged conditions and ultimately forms peat. The blanket bog areas are characterised by deeper peat layers (generally over 0.4m) and are located mainly on the upper and middle terraces of the moor, east of the Keighley Road. There is also a significant area of bog, known as Crawshaw Moss, just east of the conifer plantation at Rivock Edge. Surface vegetation on such areas includes moorland grasses such as cotton grass and purple moor grass, plus heather and *Sphagnum* mosses.
- 4.40 The basic management objective for blanket bog is to maintain and restore the hydrological integrity of the peatland system and other wetland features. The key actions are to re-vegetate bare peat, improve hydrology and increase the diversity of

existing vegetation. On Ilkley Moor, there are little or no significant areas of bare peat. The most vulnerable part of the moor in this regard is the area west of Keighley Road which was subject to a significant wildfire in 2006. This area has now largely re-vegetated and although the plant cover is still relatively young and fragile it is not intended to undertake large scale re-vegetation on this part of the moor. Graziers are required to shepherd their sheep away from this area under HLS and this will continue whilst the vegetation recovers.

- 4.41 Other actions which can be implemented relate to maintaining and restoring the hydrological integrity and diversifying the existing vegetation. In terms of the hydrology, our main influence in this regard is to ensure that blanket bog areas remain waterlogged so that peat-forming plants have the opportunity to thrive. In effect this means that there is little management intervention required, other than to ensure that no drainage work is undertaken that may threaten this, and opportunities to expand wet areas by adjusting local drainage will be explored. At present, most of the moorland “grips” or drainage networks that were dug on the moor (principally to dry out areas to encourage heather cover for grouse and improve grazing) have been filled in and so the drainage intended to dry out parts of the moor has been reversed.
- 4.42 Diversifying existing vegetation on blanket bog again is achieved principally through management of grazing and maintaining the wet conditions. A further intervention which will be explored is to consider planting *Sphagnum* moss – as this is one of the key species which assists in active peat formation. Active blanket bog in this sense is an indicator of a healthy and favourable habitat and so to achieve this status on blanket bog on the moor is desirable. The Peak District National Park based Moors for the Future initiative has been undertaking upland blanket bog restoration for a number of years. They have recently been awarded significant EU grant funding to further this work into the South Pennine area as part of their MoorLife 2020 project. The Yorkshire Peat Partnership, focused mainly in the Yorkshire Dales, also have significant expertise in this field. We will engage with Moors for the Future, the Yorkshire Peat Partnership and Natural England with a view to securing some advice and input to encourage active blanket bog on agreed areas of the moor.
- 4.43 Another key benefit of maintaining blanket bog is its role in flood mitigation off the moor. The wet areas of the moor retain and slow down run-off, depending on the health and capacity of the blanket bog and the surface roughness of vegetation. Not only does this assist with habitat quality, peat formation and carbon storage, but it can also reduce peak flooding into water courses and rivers in the valleys below the moor. Both the Airedale and Wharfedale side of the moor have experienced flood

events in recent years with the associated damaging effects. If the management of the moor can assist in mitigating these impacts that is a further societal benefit (see also Section 4.64 – 4.67).

- 4.44 **Bracken control:** Bracken coverage on Ilkley Moor continues to pose concerns for land managers and users, for conservation and aesthetic reasons. Many people who use the moor report that walking through tall stands of bracken can be difficult and unpleasant and that the coverage can detract visually in landscape and scenery terms. In addition, well established bracken beds dominate areas of the moor at the expense of other, perhaps more favourable vegetation types.
- 4.45 It should be noted, however, that bracken does have some conservation value and can provide cover and feeding and nesting areas for some bird species (eg. Twite) plus reptiles, mammals and insect life. It can also contain rarer fern species and assist in stabilising certain terrain, such as steep clough sides, where the absence of bracken could result in increased erosion.
- 4.46 The approach to management of bracken on Ilkley Moor therefore acknowledges that it is neither possible nor desirable to completely eradicate the plant, and that in some locations it would not be prudent to attempt control. A realistic approach to bracken management is therefore to accept that there will always be a certain percentage cover of bracken on the moor and to identify areas where any future management can realistically be achieved and focus on those areas.
- 4.47 Whether undertaken for habitat improvement or aesthetic/recreational reasons, the same general principles apply on the moor when considering bracken control. These cover the methods adopted and areas chosen for control.
- 4.48 There are basically two methods for controlling bracken – chemical and mechanical. Chemical control can be undertaken over a range of terrain types and areas, depending on application method. For large scale control, the use of Asulam sprayed from helicopters is the most cost effective technique and covers the largest areas in the shortest time. Asulam can also be applied on smaller localised stands of bracken using hand held equipment or from tractor mounted booms. Clearly this is more labour intensive and is limited somewhat by terrain type, especially when using vehicles to apply the chemical. Glyphosate can, at the time of writing, also be used to control bracken in very dense stands with no underlying vegetation using weed wipes or for spot treatment of regrowth. It cannot be applied using spray equipment

or aerially from helicopters as it non-specific and will kill plant species other than bracken.

- 4.49 Some concern has been expressed about the impact of chemicals on insects, butterflies and so on – which further adds to the arguments for judicious use of chemical spray.
- 4.50 Mechanical control covers a range of approaches, generally more labour intensive but often cheaper than chemical control. This includes cutting and crushing bracken either using machinery or hand-tools. Tractor or vehicle mounted flails and rollers can be used, but often the terrain limits the areas which can be worked effectively. Mechanical control by hand is sometimes employed on areas of difficult terrain – using small cutting tools or even just walking over bracken areas in an attempt to crush the plant. Such “bracken bashing” events are often undertaken by volunteers or as part of conservation events, such as those included within the Friends of Ilkley Moor’s annual Events and Learning Programme. Care should be taken to ensure that participants are adequately dressed to avoid exposure to ticks which can be harboured in bracken.
- 4.51 One of the main drawbacks with mechanical control is that it can cause damage to historic features. NE and Historic England’s advice is that where historic features are, or may be present, control should be restricted to hand or aerial spray application.
- 4.52 One of the key aspects of bracken control, and perhaps the one which makes it most difficult to achieve effectively is the need for follow-up treatment (either chemical or mechanical) in subsequent years. Bracken spreads and regenerates through a system of underground rhizomes which spread laterally under the soil surface. However thorough the chemical or mechanical control, some rhizomes will survive and produce bracken plants in subsequent years. It is essential therefore to plan for follow-up treatment of the same area for at least 3 years after the initial control, to catch the residual growth. This makes the whole process expensive, time consuming and resource heavy.
- 4.53 Areas where it is undesirable to control bracken on the moor, by either chemical or mechanical means are:
- on steep slopes, cloughs and gullies where treatment is likely to lead to erosion
 - where other plant or fern species may be adversely affected
 - where bracken is only in competition with mat grass
 - in areas of known importance for breeding birds

- along the edges of water courses
- on old stands of bracken with thick litter and no other vegetation underneath

4.55 **Trees, Woodland, Scrub and Gorse:** Relatively small areas of the moor are currently wooded but these are locally significant. The wooded areas have either been specifically planted as landscape features or have naturally regenerated in cloughs and on the lower edges of the moor. On the northern edges of the moor, established areas of woodland lie adjacent to the moor boundary and fall within the Council's ownership. These are Hebers Ghyll and Panorama Woods to the west of Ilkley and Wheatley Rakes towards the eastern edge of the town. Hebers Ghyll and Wheatley Rakes connect directly to the open moor and extend down cloughs leading off the moor - Black Beck runs from the moor down through Hebers Ghyll. They provide access onto and off the moor and are quite heavily used by local people, with housing backing onto them. Wheatley Rakes is included in the registered urban common and so provides the same statutory access rights as the rest of the moor. It would therefore be appropriate to include Wheatley Rakes in the management approaches relating to recreation and access as the rest of the unenclosed moor. The enclosed part of Wheatley Rakes, beyond the boundary wall on Hangingstones Road is outside the SPA/SAC boundary and therefore not subject to the same protection or habitat/species management objectives as the rest of the moor. Hebers Ghyll lies outside the common and the SPA/SAC boundary; it is not therefore included in either the habitat or recreation/access aspirations set out in this plan. Panorama Woods are isolated from the moor, outside the common and SPA/SAC boundaries and can be regarded as an entirely separate resource.

4.56 Both Hebers Ghyll and Wheatley Rakes have been included in the Council's submissions for Forestry Commission registration and both therefore have specific management plans for this purpose. The relevant woodland management strategy statements for both woods are:

Wheatley Rakes:

The objectives will be achieved by allowing the wood to continue regenerating, with selection favouring native species. Non natives will be removed as circumstances allow. There are open spaces including adjacent to the stream within the site which suggest a variety of habitats are present. These will be preserved.

An invasive weed (possibly a variety of bamboo) is present in a clump on the south side of the site. Control will be by non chemical means if possible.

Where possible standing deadwood will be left in place, all other deadwood will be left on site, arisings will be formed into habitat piles

Hebers Ghyll:

The long term vision is to maintain regenerating broadleaf woodland of good biodiversity on the site, providing recreational opportunities for the surrounding community.

To achieve the above objectives it will be necessary to remove the larch, however, given the current financial constraints this will have to be a long term aim and will occur in small numbers, less than 10% of canopy cover per year, starting in years 6-10. Regeneration of non native species will be controlled.

Regeneration of native species will be encouraged. Planting of small numbers of trees will be carried out when removal of the larch occurs

Where possible standing deadwood will be left in place, all other deadwood will be left on site, arisings will be formed into habitat piles

- 4.57 On the moor itself, a number of pine mixed with larch and spruce plantations exist on the lower moor slopes, notably at Hangingstones Quarry, Rocky Valley, to the rear of White Wells, at Willy Hall Spout and above Spicey Gill. These were planted some years ago and have become established landscape features. They provide woodland habitat for birds and mammals and are important in this respect. Discussion will be held with Natural England and Forestry Commission to decide whether these small plantations should be maintained and restored. Although not native to the moor, they are, to many, an iconic part of its landscape.
- 4.58 A number of small woodland cloughs are located in the valleys which run from the moor edges, notably at Spicey Gill, Backstone Beck and Hebers Ghyll. These contain a mixture of planted and self-seeded native species such as mountain ash (*Sorbus aucuparia*), hawthorn (*Crataegus monogyna*), oak (*Quercus spp*), birch (*Betula spp*), sycamore (*Acer pseudoplatanus*) as well as conifers. Again, these form important

moorland edge habitats and shelter for birds. These will be allowed to regenerate naturally.

- 4.59 On the lower parts of the open moor there is evidence of natural colonisation of small trees particularly birch (*Betula spp*), rowan (*Sorbus aucuparia*) and hawthorn (*Crataegus monogyna*). This is most likely to be result of reduced livestock grazing. This should be monitored to establish the rate of succession and reversion of open moorland to semi-wooded heath and eventually woodland on these lower edges. Consideration needs to be given to the view that this is a natural succession and possibly should be allowed to take place, leading to greater biodiversity, although the present guidance for the SSSI is that moorland should be retained. Removal of these trees, however, will be time consuming and costly. It is proposed that a strategy be developed with the Friends of Ilkley Moor and Natural England to define areas on the lower slopes where tree removal will be focused, as it is not feasible with current resources to cover all parts of the lower moor. Wherever they occur, the removal of non-native species (eg rhododendron) will be prioritised.
- 4.60 For other reasons in some areas, it may be prudent to leave naturally regenerating trees in place, for example where they grow up in extensive strands of bracken. Over time, the trees will shade out the bracken and assist in reducing bracken cover on the moor.
- 4.61 Stands of gorse also occur in localised areas mainly on the lower slopes. These provide a welcome variation in scrub habitat and are visually attractive when in bloom. They can, however, create problems when overhanging footpaths and so a programme of gorse cutting to clear such routes has been undertaken. As and when this proves necessary, this will be repeated. Large stands of gorse can also create a hazard in terms of wildfire and so the spread and intensification of such stands will be monitored and action taken to thin out or clear fire breaks should the need arise.
- 4.62 Walls:** Ilkley Moor contains significant lengths of drystone wall which form boundaries along the southern and western edges of the moor (between Ilkley and Bingley Moor to the south and Ilkley and Rivock Edge plantation to the west) and around the enclosed Panorama Allotments west of Keighley Road. This totals approximately 7.5kms. The edge boundary walls are in the ownership of the neighbouring moors and substantial restoration of these has been carried out as part of the HLS capital works. Some years ago the Panorama Allotment walls, which are the responsibility of Bradford Council, were also all restored using funding from the previous Countryside Stewardship scheme.

- 4.63** The walls are important features and, where they are the responsibility of Bradford Council will be maintained. They provide shelter and linear habitat for a variety of fauna, assist in control of sheep movement and are valued landscape features – demonstrating the skill and craftsmanship of traditional stone walling techniques.
- 4.64 Drainage and Natural Flood Management:** The moor is drained by a combination of natural and man-made water courses. The hydrology of the moor contributes to the creation of blanket bog, wet heath, flushes and mires which are important habitats. Given that one of the key management objectives is to maintain and restore the hydrological integrity of the peatland system and other wetland features on the moor, any activity which interferes with this will be avoided. Specifically no new drainage works or gripping will be carried out on the moor – unless this is very localised work to move water off path surfaces using cross drains for example.
- 4.65** In order to contribute to habitat and flood mitigation measures (see 4.39-4.43), the majority of historic man-made drainage channels on the moor (or grips) have already been blocked or infilled. The only man-made drains which are maintained are those which drain the sides of major routes or alongside Keighley Road, and some of these drain back onto the moor itself rather than directly into watercourses. Experience from other upland areas has shown that considerable flood management benefits can be derived by slowing down flows in existing drains and watercourse so that flooding lower down is reduced. This falls under the umbrella of “natural flood management” and is achieved mainly by installing “leaky dams” in watercourses. These can be constructed using natural products, fallen timber and brash, heather bales – possibly even bracken bales – or using post and rail type fencing or other man-made materials. They are secured at strategic points usually on the upper reaches of watercourses. Here they act to slow down flows during flood peaks but tend not to affect flows under normal condition. They allow water to dam in the watercourses, releasing it slowly and flooding out onto the surrounding moor – thus slowing down the flow further down the watercourse and reducing flooding peaks on the lower edges of the moor. In order to gain maximum benefit from this, a whole catchment approach is often recommended. However, there potentially local benefits to be derived from employing this technique on Ilkley Moor.
- 4.66** During the flooding which occurred over Christmas 2015, there were some localised incidents at the bottom edges of the moor. One watercourse which flows from the moor of particular concern in terms of downstream flooding is Backstone Beck. This flows from the moor through Ilkley and into the Wharfe in the vicinity of Leeds Road

and represents a small catchment in itself. A successful funding bid has been made to the Environment Agency to undertake flood mitigation measures along the length of Backstone Beck and this will include natural flood management measures on the moor. It is proposed therefore that the “leaky dam/slow the flow” interventions will be carried out – using Backstone Beck as a prototype. This will be monitored and, if successful, expanded to include the other key watercourses which run off the moor. In the aftermath of the Christmas 2015 flooding in the Bradford District, the Council is carrying out a review of flood management processes. The actions outlined in this plan will therefore be subject to the findings of this review and potentially expanded to incorporate wider actions relating to upland management and flood mitigation within the District.

- 4.67** The moor is no longer used as water catchment and the apparatus which was associated with this in the past (covered reservoirs, pipes and water filter/pump houses) have mostly all been de-commissioned by Yorkshire Water. The apparatus which was located on the moor and the surrounding areas, previously in the ownership of Yorkshire Water (with the exception of the filter houses on Wells Road and at the Cow and Calf – which are now in private ownership) has been infilled, re-vegetated and transferred to Bradford Council and now form part of the moor. Yorkshire Water have retained ownership of the covered reservoir and associated apparatus adjacent to the former filter house on Wells Road.
- 4.68 Shooting:** Grouse shooting has taken place on Ilkley Moor for over 100 years, with the exception of a 10 year period between 1997 and 2007 when the Council chose not to renew the shooting tenancy.
- 4.69** A sporting deed is currently in place (until 2018) which allows the neighbouring landowners (the Bingley Moor Partnership) to come onto Ilkley Moor above the 300m contour, for the purpose of shooting grouse on up to 8 days per season. It also restricts grouse moor management work on the moor, in line with the Management Plan and the HLS agreement. It is a condition of any consent for the sporting activity that associated management work does not depart from agreed HLS management prescriptions or agreed other works as part of this Management Plan.
- 4.70** In addition to the approved management works which the keepers may undertake, their presence on the moor, day and night, provides an additional level of protection to the moor. As such, the threat of wildfire, such as that which destroyed a large part of the moor in 2006, is reduced as the keepers are able to spot, raise the alarm and attend to outbreaks quickly. This has proved particularly effective in the last 2 years, when the keepers employed by the Bingley Moor Estate worked with Fire and

Rescue Services to control wildfires on Ilkley Moor. Similarly they have dealt with unauthorised campers and other unwanted activity which could impact on protected habitats or cause other general problems.

- 4.71** On shooting days there is a requirement that sufficient beaters and marshalls are provided by the tenant to give users of the moor fair warning that drives are taking place. A basic condition of the sporting agreement is that it should not interfere with the public's rights of access to the moor.
- 4.72** At the half-way point of the sporting licence, in 2013, a review was undertaken by the Council's Environment and Waste Management Overview and Scrutiny Committee. This concluded that the licence should continue to its end date, subject to a number of recommendations, including the review and updating of this Management Plan.
- 4.73** Despite the commitment to continue with the current licence, the exercise of sporting rights on the moor may be subject to change from time to time, dependent on whether the Council chooses to continue to licence them or not. In the event of the rights being let in the future, those elements of moorland management undertaken by the licensee as part of any licence agreement must reflect the approaches set out in this management plan. Any continuation of licenced grouse shooting on Ilkley Moor will only be allowed on the basis that it, or any associated management work that goes with it, can be accommodated without any detriment to the objectives set out in this management plan.

CLIMATE CHANGE AND ILKLEY MOOR

- 4.74** Most climate change models predict milder, wetter winters coupled with drier and hotter summers in the UK. This trend has clear implications for management on Ilkley Moor – climatic conditions and local weather patterns being a significant influence on the landform and the species and habitats which thrive there. Management actions in this plan relating to restoration of blanket bog, drainage reversal, avoidance of wildfire and reduction of erosion should ensure that the moor is able to withstand these predicted swings between wetter and drier conditions. It should play its part in mitigating the effects of flooding from the uplands and, at a more fundamental level, assist in addressing the causes of climate change itself by continuing to be an efficient carbon store. Release of carbon produces the greenhouse gases which contribute to global warming and climate change – so the moor, if managed correctly, can assist in reversing, or at least slowing this trend.

- 4.75 Climate scientists are beginning to look at climate change impacts in terms of increasing climate destabilisation a consequence of which is an anticipated increase in extreme weather events. The flooding on the Somerset levels in winter 2013/14 and more recently in northern England in winter 2015/16 are good examples of this.
- 4.76 The wider impacts of these events can be influenced by and help shape upland management regimes. Moorland soil erosion and rates of surface water run off can have significant effects on downstream water quality including potable supply.
- 4.77 The 2015 Boxing Day floods have stimulated a discussion across environmental agencies on opportunities to hold water in the uplands. Management techniques like blocking moorland drains or developing upland tree cover could become widespread as climate change impacts become more pronounced.
- 4.78 There are likely to be changes in upland grazing practices as land managers take advantage of longer hill vegetation growing and associated extended grazing seasons. 2015/16 has been a relatively benign winter in the uplands in terms of snow cover.
- 4.79 The land management community is also beginning to see climate impacts in terms of changing disease and pest infection patterns. The infection patterns of the midge borne Schmallenberg virus in sheep and Blue-tongue in sheep and other ruminants are changing in the UK. These may impact on land management decisions in terms of grazing regimes and use of insecticides in the environment.
- 4.80 In addition to the weather related impacts, climate change is expected to result in significant shifts in the distribution of species and habitat through time – indeed some of these shifts are already occurring. This inevitably raises questions about the long-term effectiveness of protecting areas as they are, as species for which a particular site is designated may no-longer occur there in the future. Designations such as The Special Protection Area (SPA) network have been proven to have successfully improved the conservation status of the species for which it was created, but recent analysis suggests is vulnerable to future climate change.
- 4.81 Impact modeling has been undertaken by the British Trust for Ornithology⁷ of the impacts of future climate change on the abundance of Annex I and migratory bird species protected by SPAs in the UK. Results suggest that the most vulnerable species groups to climate change are likely to be northern breeding species. Many wintering waterbirds were projected to increase in abundance in the UK as a result of milder winters, although the potential for such patterns to be realised may be

⁷ Climate Change Impacts on Avian Interests of the SPA Network (BTO, 2013)

limited by ecological changes on the breeding grounds. Diving wintering waterfowl were more likely to decline in abundance, potentially as milder winters enable them to winter in Scandinavia and central Europe. Southerly distributed heathland species were projected to benefit from climate change. Significant latitudinal shifts in species composition were projected, which means that site managers can consider species present on more southerly sites to identify potential future changes in bird communities that may occur. In the case of Ilkley Moor it seems likely that species such as curlew, golden plover and lapwing will move further to the north and east, whilst nightjar and Dartford warbler may colonise the South Pennines.

- 4.82 Even in a changing climate, large sites which currently support internationally important bird populations, (such as Ilkley Moor) will continue to do so in the future. The continued protection of the SPA network, and Ilkley Moor as part of this, is therefore required in the face of climate change. Adaptation should also involve improved SPA management, as this should increase the resilience of sites to climate change, as well as boosting populations now. Such management should balance the needs of species currently supported by an SPA and those which may colonise in response to climate change.
- 4.83 The BTO report recommends that land management should seek to increase the resistance of existing populations to climate change by improving habitat condition. Priorities should include minimising the impacts of artificial drainage, poor burning and grazing management, afforestation adjacent to open-ground SPA's, recreational disturbance and illegal persecution as well as detrimental changes in land-use on surrounding agricultural land used by birds nesting in the SPA. All of these management priorities are included in this plan.

SUPPORTING HABITAT

- 4.84 Although not included in the scope of this management plan, it is important to note that areas adjacent to the moor, but not within it, play a part in supporting bird species for which the moor is designated. Birds which breed on the moor, such as Curlew, Lapwing and particularly Golden plover also use surrounding farmland or "in-by" for foraging and feeding. In addition, young birds, whilst nesting on the moor can also wander off into surrounding areas to feed– the ornithological term for such behaviour being "nidifugious" – ie. leaving the nest after hatching. For these reasons, land immediately adjacent to the moor and further afield (on average, within 2.5kms) can be described as supporting habitat, or "functionally linked" to the SPA.

4.85 In response to this, the Council, in its Development Plan for the District (currently in Publication Draft), has identified zones around the moor within which development which may affect the nidifugious element, or the feeding and foraging resource, will be resisted or re-located so that the supporting habitat is not reduced.

4.86 Whilst having no direct influence on land management practices off the moor, on land mostly in private ownership, the Council will seek to work with farmers and landowners, plus agencies such as Natural England, to try and encourage beneficial land management approaches off the moor for the benefit of species on the moor. Where farmers have signed up to agri-environment schemes such as Stewardship, such management can be prioritised within these because land use is important in maintaining the quality of off-site feeding habitat, most importantly, in maintaining short swards rich in soil invertebrates. This depends on continued mixed farming practices involving livestock grazing and hay/silage cutting. Development that reduces the viability of the agricultural economy of an area and a change in land-use is liable to reduce the value of land for feeding waders from the South Pennine Moors Phase 2 SPA.

4.87 Bradford Council commissioned a Habitats Regulations Assessment of its Development Plan in 2014 and this states:

“Curlew and Lapwing also frequently utilise wet meadows to feed both during the breeding season and in periods of migration when flocks of birds congregate in in-bye fields. Curlew and Lapwing form part of the internationally important breeding bird assemblage within the South Pennine Moors Phase 2 SPA. Hence the conservation of these off-site in-bye meadows is important to the maintenance of favourable condition (conservation status) of the South Pennine Moors Phase 2 SPA. Other breeding wading birds in the assemblage such as Redshank and Snipe may also utilise in-bye land for feeding and in some instances for breeding”⁸.

⁸ Habitats Regulations Assessment of the Bradford District Core Strategy. Bradford MDC 2015

5: RECREATION AND ACCESS

5.1 Ilkley Moor is extensively used for a variety of formal and informal recreational activities, some exercised by right (eg. walking, horse riding), and others by permission or agreement with the Council as landowner (eg. cycling, one-off events). It is probably one of the most well-known moors in the country, if not the world. Its role in attracting visitors and tourists to Ilkley, and therefore in boosting the local economy, should not be underestimated. The fame and attraction of the moor itself also generates significant numbers of visitors which, whilst welcome, poses sizeable management issues. The proximity of the moor to some of West and North Yorkshire's major centres of population also generates significant visitor pressure. The urban centres of Bradford, Leeds, Keighley, Skipton and Harrogate are all within short distances of the moor, with combined populations of over one million. Given the moor's conservation status, the basis of the management of recreational use has to be one which seeks to balance the recreational impacts with the nature conservation interest to avoid the one adversely impacting on the other. This balance is sought through a range of access management measures (eg surfacing paths), wardening, provision of facilities, control of events and activities and information and interpretation; the details of which are set out in this section.

5.2 Rights of Access

The majority of Ilkley Moor is registered urban common. There are parts of the moor which are not common but have a tradition of open access similar to that enjoyed on urban commons. Rights of public access on urban commons are regulated by Section 194 of the Law of Property Act 1925 which states that the public have a right of access for "air and exercise". It has long been assumed that this right included rights to ride horses and a legal ruling in February 1998 relating to Ranmore Common in Surrey confirmed this view by ruling that the right of access for air and exercise extended to access on horseback (*R v Secretary of State for the Environment ex parte Robert Billson*).

5.3 In addition to this general right of access, definitive public rights of way also exist on Ilkley Moor. These routes also afford access to certain classes of users - walkers on public footpaths. There are no public bridleways on Ilkley Moor, but access on horseback is permitted as outlined above.

- 5.4 Further provision for public access, on foot, came about in 2004 when the Countryside and Rights of Way Act 2000 was enacted (in this part of the country) in terms of the “right to roam” legislation contained therein. Here the public are entitled to a right of access to “open country” (defined in the Act as “mountain, moor, heath and downland”). As most of the moor was already dedicated as urban common (referred to as Section 15 land in the Act), and pre-existing access rights applied, the Act did not particularly affect Ilkley Moor, apart from those parts of the moor which were excluded from common land status. The most significant effect on Ilkley Moor was that the surrounding moors, particularly those to the south and west (Bingley, Hawksworth, Addingham and Morton Moor) became “open country” and people could then access Ilkley Moor from any part of those moors. In effect, however, the majority of additional visitors used pre-existing rights of way and other paths – so the need to provide additional access points did not arise.
- 5.5 The Law of Property Act also states that, on urban commons, the driving of vehicles is not permitted - this definition includes bicycles. The use of Ilkley Moor by cycles is, therefore, strictly illegal without the landowner’s lawful authority although at present cycling is allowed as long as routes can sustain this use (see section 5.68)
- 5.6 The status of urban common also affects some of the management approaches on the moor – for example it is illegal without consent from the Secretary of State to erect fencing on commons. This can have implications if new tree planting schemes are proposed for example, which may require fencing to assist in establishment, although the SoS can, and often does grant permission for temporary fencing in the interests of nature conservation. It also can raise issues, particularly on the edges of the moor where neighbouring properties occasionally encroach, by extending gardens, or attempting to erect structures on the moor. This requires vigilance and a commitment to take enforcement action should the need arise. Much of the legislation relating to the management of commons has been updated and is set out in the Commons Act 2006.
- 5.7 **Other legal and statutory obligations in relation to management:** In addition to the legal restrictions in relation to access set out above, current management approaches need to take account of other legal provisions, particularly in respect of protected habitats and species. Section 28G of the Wildlife and Countryside Act 1981 (as amended) imposes a duty on local authorities to “take reasonable steps, consistent with the proper exercise of the authority’s functions, to further the conservation and enhancement of the flora, fauna or geological or physiographical features by reason of which the site is of special scientific interest.”

- 5.8 Similarly, the European Habitats Directive, which operates at EU level, designates the whole of the South Pennine Moors as Special Protection Area (SPA) and Special Area of Conservation (SAC). Rombalds Moor, including Ilkley Moor, forms the northernmost outlier of this upland block and as such is protected under these designations. In this regard, the EU Habitats Regulations require “appropriate assessments” to be made of any plan or project which, either alone or in combination with others, may have a detrimental effect upon the SPA or SAC features.
- 5.9 **Population increase and recreational pressure:** Bradford is one of the UK’s fastest growing cities – with a projected population increase from 522,500 in 2011 to 595,799 by 2028 – an increase of 73,299⁹. This translates into a need to accommodate at least 42,100 new homes across the District between 2013 and 2030.¹⁰ Even excluding the additional predicted population growth and demand for new housing from nearby cities and towns outside the Bradford District (notably Leeds, Harrogate and Skipton); this will inevitably result in increases in recreational visits to Ilkley Moor.
- 5.10 The effective management of access and recreation on the moor is therefore critical to ensuring a sustainable future for the habitats and species which thrive there. This also extends beyond the management plan into strategic planning documents which will influence where the new housing is located. A Habitats Regulations Assessment undertaken of Bradford Core Strategy of the Development Plan 2015-2030 identified this issue and proposes policies and mitigation measures to try and avoid or at least reduce the potential impacts on the South Pennine Moors SPA/SAC, including Ilkley Moor. This is achieved through the inclusion of policies which identify zones of influence around the moors, where new housing may impact upon “supporting habitat” – used by moorland breeding birds for foraging and feeding (see 4.79 -4.82). These policies seek to avoid development on such habitat, and/or secure developer contributions which will fund management and mitigation measures to avoid additional erosion, disturbance, wildfire, fly-tipping etc which can adversely affect the moor. The management measures could include wardening, path improvement and provision of information to influence visitor behaviour whilst on the moor.
- 5.11 **Promotion and Information:** The need to avoid detrimental impacts to the SPA/SAC also affects how the Council itself promotes the moor as a tourism or recreational resource. No longer is this simply a question of encouraging as many visitors as

⁹ Bradford Housing Requirement Study Feb 2013

¹⁰ Bradford Core Strategy Development Plan, Publication Draft 2015

possible, but more about encouraging those who visit to do so responsibly. This is mainly achieved through increased information both on and off-site about the moor and its protected habitats and species, and how visitor behaviour can be altered to avoid or lessen impacts. To this end, the information produced by the Council and the Friends of Ilkley Moor aims to reflect this message. In terms of on-site information, it is intended that all key access points onto Ilkley Moor and the wider Rombalds Moor will have information panels showing location maps and information about habitats and species – many of these will be funded through developer contributions provided to mitigate impacts on the moor (see Section 5.10). The continued presence of suitable trained and experienced Council staff, those employed by other partners (eg Friends of Ilkley Moor) and volunteers is vital in re-inforcing these messages – as are events and activity programmes aimed at interpreting and discovering the natural and human heritage on the moor.

5.12 **Patterns of use:** In attempting to set out management approaches for recreational use, it is useful to try and understand the patterns of behaviour of the people who enjoy the moor. Visitor surveys undertaken in 2013 on Ilkley Moor gave an indication of the range of activity which takes place on the moor:

Dog walking	39%
Walking	39%
Running/jogging	9%
Cycling	4%
Picnicking	1%
Other*	8%

* “other” category includes sight seeing, children playing, nature project, sitting in car, rock climbing, visiting café, reminiscing, filming, commuting and working.

5.13 The survey underlined how important the network of paths and tracks on the moor is in this respect, as 76% of people surveyed said they stuck to paths and tracks, whilst a further 20% did this “most of the time”. Only 4% exercised their true “right to roam” by venturing mostly off the main tracks. Although such existing tracks tend to focus use, they are vulnerable to widening and braiding – thus causing additional lateral erosion and habitat loss alongside such route. This occurs particularly where drainage problems may cause walkers to skirt around wet patches, thus widening existing paths to many times their original width.

The logical conclusion to draw from this is that the patterns of access and, potentially behaviour, of the vast majority of users can be partly managed by providing a well-surfaced, well developed network of paths.

- 5.14 The absence of horse riders in the survey results is most probably more a consequence of the difficulty of stopping and interviewing someone on horseback, than a complete lack of equestrian use of the moor. Similarly, the relatively low level of cycling is probably an under-representation as, anecdotally, cycling on the moor appears to be on the increase. It is true to say, however, that Ilkley Moor has a lower level of equestrian use than many other countryside assets in Bradford (eg Baildon Moor). This is possibly a result if the moor’s relative inaccessibility from surrounding moors and the local road and bridleway network.
- 5.15 It is interesting to compare variations between access points in relation to recreational activity, where it becomes clear that certain access points serve higher percentages of certain activities than others. For example, if the access point at the end of the Panorama path on Keighley Road is compared with the Cow and Calf car park, we can see marked differences in uses:

Primary activity	Panorama	Cow and Calf
Dog walking	59%	20%
Walking	22%	56%
Running	16%	2%
Cycling	3%	4%
Picnic		2%
Other		14%

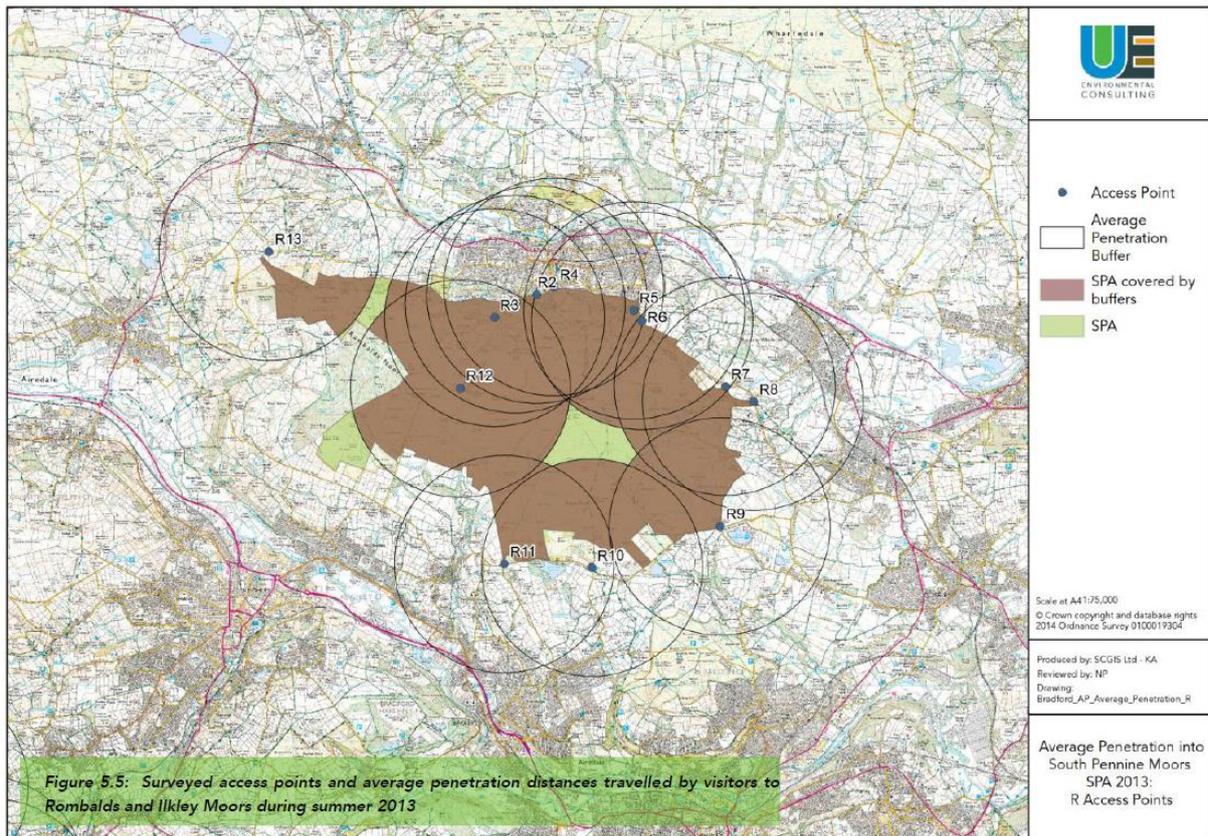
- 5.16 This kind of information helps in targeting management activity. For example, it would make sense, if we wished to relay certain information or make special provision for dog walkers or runners, to prioritise access points such as Panorama for this purpose.
- 5.17 Analysis of this visitor survey information by consultants focused on patterns of use of the moor¹¹. Their report quotes:

“An approach to assessing potential impact of recreational access is to consider the distance that walkers and dog walkers penetrate into a site from an access point i.e.

¹¹ Habitats Regulations Assessment of Bradford Core Strategy 2014. Urban Edge Environmental Consultants

the average straight line distance between the point of access and the furthest part of the SPA visited during their walk. Access points are often car parks but in sub-urban locations may be the start of a footpath or bridleway. Visitor surveys were undertaken within Bradford's South Pennine sites to establish how far visitors penetrate into the site, broadly in line with the methods of similar surveys undertaken at a number of lowland heathland sites in Dorset, the Thames Basin, Wealden Heaths and Ashdown Forest. Combining the data for Dorset and Thames Basin Heaths, approximately half of visitors penetrate into a site by up to around 700m (Liley et al., 2006). Other surveys show penetration distances for walkers and dog-walkers on Ashdown Forest of 867m and 872m respectively, and Wealden Heaths of 920m and 784m respectively (mean of the latter four distances = 860m).

Similar analysis was undertaken using walked route data collected during the Bradford South Pennines visitor survey of summer 2013. This shows that the average penetration distance recorded by visitors to the moorlands to the south and west of Haworth was 1,856m, while the average penetration distance at Rombalds and Ilkely Moors was recorded as 1,951m. Map (see below) illustrates the extent of these penetration distances as buffers around each of the access points included in the survey, and demonstrate that a significant area of the SPA may be subject to the effects of recreation by the average visitor, especially within Rombalds and Ilkely Moors. These buffer zones cover an area of 2,336ha on Rombalds/Ilkley Moor and 2,035ha within the moorlands south and west of Haworth. It is interesting to note that the possible 'gap' in disturbance suggested by (the figure below) actually includes one of the more heavily walked routes from access point R10 towards Ilkley along which upwards of 40 people were recorded during the course of the survey."



5.18 In terms of dogs in general, this is a major issue and one of the key areas where influencing visitor behaviour can assist in limiting negative impacts. To quote again from the consultants report:

“Dogs have been recorded preying on ground nesting birds and studies have shown a variety of bird species being flushed from their nest by dogs. Studies have also shown birds to be warier of dogs and people with dogs than people alone, with birds flushing (flying away) more readily, more frequently and at greater distances, and staying longer off the nest when disturbed (Murison, 2002). Other studies have shown dog fouling to cause changes in heathland vegetation with a reduction in heather and increase in grass abundance due to the effects of nutrient enrichment (eutrophication). Dogs also chase and worry livestock. As a consequence, conservation grazing schemes can be affected due to graziers not being prepared to graze sites with open access to dog walkers (Underhill-Day, 2005).”

5.19 The survey showed that of the people surveyed, 40% had at least one dog. This is lower than the national picture – where the “Monitor of Engagement with the Natural Environment” surveys commissioned by Natural England show that 58% of countryside walks involve a dog. On Ilkley Moor nonetheless, the impact is potentially significant as 82% those who take dogs onto the moor let at least one or all of their dogs off the lead, only 12% kept their dogs on leads at all times. The surveys were conducted close to the end of the breeding season in July and into early August – so this figure may be lower if a re-survey were conducted entirely within the nesting season (March-July). It does, however, show that there is more work to do in getting one of the key messages across about disturbance to ground nesting birds by dogs.

5.20 This is further backed up by the response to survey questions which explored factors which people felt would make the Moor less appealing. Second only to charging for parking, came the view that a requirement to keep dogs on leads would have a detrimental effect on people’s enjoyment of the moor. The table below sets out the full range of responses to this question.

Factors which would make the moor less attractive	Number of responses	%
Charging for parking	70	21.34
Requirement to keep dogs on lead	63	19.21
More development/changes	49	14.94
Litter	19	5.79
Less wardening	19	5.79
More/too many people/visitors	15	4.57
More formal paths/access provision	14	4.27
Dog mess	12	3.66
Lack of or reduced maintenance	11	3.35
Access restrictions - vehicles	10	3.05
More vehicles allowed	8	2.44
Windmills	8	2.44
Access restrictions - people	7	2.13
Increased cycling	5	1.52
Restrictions on dogs	4	1.22
Removal of car parks	4	1.22
More traffic	3	0.91
Potholes in car park	2	0.61
Removal of facilities/café	2	0.61
Access restrictions - cyclists	1	0.30
Gamekeepers	1	0.30
Too many dogs off lead	1	0.30
	328	100

- 5.21 The survey responses show that there is also a strong feeling amongst a significant proportion of visitors that any changes or moves to over-develop or commercialise the moor would not be popular. The responses highlighted can also be grouped as management or maintenance related – showing that an equally significant proportion of people want to see levels of maintenance maintained or improved across a range of activity.
- 5.22 A further outcome from the survey of note was that the moor plays a significant role in supporting the town of Ilkley itself. We asked visitors if, as part of their visit to the moor, they also intended to go into Ilkley and if so, how much they would spend. Of the people surveyed on Ilkley Moor, 38% of them said they would go on to visit Ilkley. Calculations based on amounts spent on these trips indicate that an estimated £1.5m could be generated annually in town from people who visit the moor.

5.23 Formal recreation and events

Formal recreation generally involves a group, club or society and usually in larger numbers than informal recreation and mostly in an organised manner. In management terms, organisers of formal events are more likely to be known or to have previous contact with the Countryside Service, but this is not always the case. This allows for a higher level of management influence over the events than with most informal activity. Such influence can cover the timing of such events, the numbers of participants, the areas where they are permitted plus additional requirements such as car parking, marshalling, the need for temporary shelters and additional consents (from Natural England) etc. A greater degree of control is therefore possible with such formal events.

- 5.24 Examples of formal recreational activities would be: challenge/long distance or sponsored walks (Baht 'at Challenge walk; Rombalds Stride; Heart Research walk); organised orienteering events; outdoor pursuits groups, military training at the Cow and Calf rocks etc.
- 5.25 Prior notification of such events is not always forthcoming from the organisers but where possible, they will be encouraged to notify in the Council well in advance of their plans. In some cases consent from Natural England will be required, as will the completion of Council event management documents. As such, event organisers will

need to contact the Council in a timely manner. In some case, for example where the event will potentially damage or disturb protected areas or sensitive species, permission may be withheld, or alterations made to plans (eg. timing out of bird nesting season). All such requests will be evaluated in terms of their appropriateness, potential impact and conflict with other users. Where necessary alterations in scale, location and timing will be required in order to reduce or mitigate impacts. Where this is not possible, permission for the event may be withheld.

5.26 **Filming**

The use of Ilkley Moor by film crews – from Hollywood to Bradford College - is becoming a regular occurrence and one which will be accommodated wherever possible. The benefits that filming brings in terms of economic boost and promotional/PR exposure are often significant. Bradford Council is keen to promote the use of the District for these reasons and its efforts have been recognised through its accreditation as the world's first UNESCO City of Film.

5.27 In making the moor available to film crews there is of course a need to ensure that this does not impact on the conservation priorities of the moor, nor conflict too significantly on other users. Film crews are often directed to the Countyside Service via the Council's film office and the Friends of Ilkley Moor – and they can make the crews aware in advance of the need for consents, sufficient notice and other constraints. This is helpful and most filming events go ahead without problems

5.28 The other factor is that filming is a source of income for the Service, as the facility fees charged go into the Service budget as income and so eventually work their way through to support the work carried out on the moor.

5.29 The guiding principle in allowing filming is that they do no long-term damage and pre-permission discussions with crews make this very clear from the start.

5.30 **FACILITIES**

It is useful to outline the range of facilities which exist for recreational purposes on Ilkley Moor as distinct from the moor itself and the natural resources it contains.

- 5.31 **Car parks:** There are a number of areas where parking is catered for on the moor, mainly concentrated along the front edge of the moor on Hangingstones Road and Wells Road.
- 5.32 **Cow and Calf:** this car park is the largest and most popular parking spot for visitors to Ilkley Moor. It is situated beneath the Cow and Calf Rocks on Ilkley Moor and was improved in the early 1990's with a tarmac surface, stone kerb edging and improvements to surface drainage. More recently a visitor information/interpretive panel has been installed on the edge of the car park by Friends of Ilkley Moor. The main route between the car park and the Cow and Calf quarry has been surfaced with stone flags. A privately owned refreshment concession is also located on site.
- 5.33 **White Wells:** a small car park at the foot of the track which leads from Wells Road up to White Wells Spa Cottage. The car park has a loose limestone surface and can cater for approximately 12 cars
- 5.34 **Wells Road:** a large tarmac car park at the top of Wells Road. This car park is managed by the Councils' Parks and Landscape Service and forms part of the Darwin Gardens Millennium Green.
- 5.35 **Hangingstones Road:** a loose surfaced "lay-by" type car park on Hangingstones Road beyond the Cow and Calf Hotel. This is maintained by the Councils' Highways section and is bisected by the Ilkley Moor/Burley Moor boundary line.
- 5.36 **Whetstone (or Keighley) Gate:** situated at the top of Ilkley Moor on the Keighley Road which crosses the moor, this small tarmac parking area lies at the head of the road leading up from Riddlesden on the Airedale side of the moor. It is maintained by the Council's Highways department and lies outside the moor boundary but affords good access to the top level of Ilkley and Morton Moors.
- 5.37 **Informal parking areas:** years of car-borne visits to the moor have resulted in the development of a number of informal parking areas which have become well established.
- A small parking area has developed opposite the Cow and Calf Hotel on the southern side of Hangingstones Road. This is unsurfaced and can become muddy and rutted in wet weather

- the sides of Wells Road itself above the cattle grid are popular parking spots
- two areas adjacent to the small bridge over Spicey Gill on Keighley Road have developed into parking areas on predominantly grass surfaces
- an area at the end of the track to Silver Wells cottage off the Keighley Road is a popular stopping point - at this point the Keighley Road becomes very rough and normal cars cannot proceed any further

5.38 There are no plans to create any further parking areas on the moor and those informal areas outlined above will be monitored to ensure that they do not encroach or expand any further into the moor.

5.39 **Keighley Road:** the road which runs across Ilkley Moor from Wells Road in the north across the watershed and into Airedale on the southern side is a full status public highway. It is adopted for maintenance purposes by the Councils' Highway Authority on the southern side from Riddlesden up to Whetstone Gate and is tarmac to this point. Once through the gate at the Ilkley Moor boundary heading northwards the road, whilst still classed as full status public highway, is adopted and maintained "in character" ie. an unsurfaced rough track until it reaches the Silver Wells access track where it is surfaced down to Wells Road, Ilkley.

5.40 The road from the Keighley side gives easy access to the top of Ilkley Moor and some parking is possible at this point (see previous section). On the Ilkley side, the road provides a useful route across the moor for off-road type vehicles and for management purposes. The fact that off-road type vehicles use this road does occasionally cause problems as they are tempted to stray off-road and onto the moor itself. This is actively discouraged and is, indeed, an offence under the Law of Property Act 1925.

5.41 **Shelters:** the lower front edge of Ilkley Moor has a range of formal facilities and remnants from Victorian times. Part of this legacy are the wooden shelters which are situated on Ilkley Tarn and above the paddling pool at Wells Road. They take the form of "pagoda" type timber shelters incorporating benches. The Ilkley Tarn shelter was renovated and re-roofed in the early 1990's and again in 2009. The paddling pool shelter was also demolished in the early 1990's because it was in a dangerous

condition following repeated vandalism. In 1993 the shelter was completely re-built by the Countryside Service. In 2013, the upright pillars were replaced by the Countryside Service plus volunteers.

- 5.42 Paddling pool/boating pond:** a small formal pond is situated next to Wells Road on the bottom edge of the moor. It is fed directly by becks running from the moor. The pond is a feature retained from previous times when the lower edges of the moor nearest to Illkey were more formally set out in the style of a park. Problems with its use have arisen from a safety point of view as the floor of the pool becomes slippery when a build up of algae is allowed. This requires labour intensive cleaning operations from time to time. Another factor is that glass and litter is sometimes thrown into the pool which can also be a public safety issue. The Service will continue to clean out the pool on a regular basis in summer.
- 5.43** In 2012, the Friends of Ilkley Moor provided funds to renovate the inlet to the paddling pool so that silt was trapped before entering the pool itself.
- 5.44 Ilkley Tarn and surrounds:** as with the boating pond, the area around Ilkley Tarn contains many remnants of a more formal landscape from times past. The base of an old bandstand, lighting and tarmac walkways are still visible around the Tarn.
- 5.45** The Tarn itself with its central island is a popular venue for short walks and visits. A substantial amount of clearance work has been carried out in recent years to push back the vegetation (mainly small trees and gorse bushes) which had encroached across and alongside the paths around the Tarn. Trees growing in the sides of the Tarn also pose a problem to the long term effectiveness of the banks.
- 5.46** A small island in the centre of the Tarn is a well-known feature that supports a number of small trees. In view of the fact that breeding on the island by water fowl is to be encouraged, cover is important and so the trees will remain. Stepping stones which allow access onto the island will be removed and access by dogs onto the island will be discouraged.
- 5.47** In 2009 an improvement project was completed around the Tarn which included renovation of the main shelter, path repair, renovation of Victorian style lighting columns and drainage improvements.

- 5.48 White Wells Spa Cottage:** one of the main formal visitor attractions on the moor is White Wells Spa Cottage. The property has been extensively renovated in the past such that it now has mains services, telephone and an updated display in the bath house. Work has also been undertaken on the tanks and pipes feeding the spring water supply to the cottage.
- 5.49 In addition to the renovations, a tenancy agreement was reached in 1995 when the refreshment concession and residency at White Wells was let. The property continues to be a visitor attraction and useful outlet for information.
- 5.50 A separate public toilet facility housed in an old bath house adjacent to White Wells is also present. The management and responsibility for cleaning this has passed from Bradford Council to Ilkley Parish Council. This is a welcome development and ensures the availability of this facility for users of the moor.
- 5.51 Cow and Calf café:** A privately owned café at the Cow and Calf car park provides a well-known facility for visitors to the moor. In 2011 the Council, in partnership with the café owner, provided funding for public toilets to be included in a refurbished café building at the site. These continue to be welcome facilities for visitors and are open to users of the moor, not just customers of the café.
- 5.52 Benches and other memorials:** The moor contains a sizeable number of memorials donated by families in memory of loved ones. These are usually benches with dedications inscribed on plaques, but there are also a number of memorial trees planted, particularly on the lower edges of the moor.
- 5.53 Whilst it is recognised that people do wish to remember loved ones in the places that they are associated with, and whilst most requests for such memorials have to date been accommodated, further request will need to be managed. This is partly because current feedback from users of the moor, and interest groups (including the Friends) tells us that there is a feeling that too many memorials can detract from the “natural” feel of the place and create a more formal atmosphere. Some people have reported that they find such memorials intrusive.
- 5.54 It is recognised that on some parts of the moor, the presence of large numbers of benches (around the Lower Tarn for example, or at the Cow and Calf), whilst providing useful facilities, can add to the formalisation of the landscape. It is

intended therefore to limit the numbers of new benches at these locations – as part of a District –wide policy on memorials which has been adopted by the Council. Consultation on the need for such a policy showed a high level of support.

- 5.55 The other factor in looking to limit or manage memorials is the ongoing cost of maintaining and replacing them. Although the initial purchase and installation costs are generally borne by the people who make the request, there has not been any clarity on whether the Council would replace or repair the memorial if it fell into disrepair or needed replacement. This can add up to a not insignificant amount per annum, and so the new District-wide policy also clarifies maintenance arrangements.
- 5.56 A schedule accompanies the policy statement - which includes Ilkley Moor - and sets out where, and what type of memorial will be permitted on the moor (including memorial trees). Broadly, with the exception of the areas outlined above where no more memorials will be permitted, additional memorial trees or benches will only be considered where there is a demonstrable need and after consultation with the Friends.

5.57 INFORMAL RECREATION

Ilkley Moor is the venue for a wide range of informal recreational activities which require sensitive management to ensure that the public use of the moor is sustainable.

- 5.58 There are a number of issues relating to informal recreation which are considered in this management plan.

5.59 Access

As outlined previously, there is a right of access to all of Ilkley Moor. The majority of the moor is registered urban common and those parts of the moor which fall outside the common boundary are managed for public access. This right of access extends to people on foot and on horseback.

- 5.60 In essence, a “right to roam” exists on the moor although superimposed on this is a well developed network of definitive rights of way and other routes. As a general point, the moor can be zoned in terms of the levels and intensity of use. The lower, northern edge of the moor, generally below the 300m contour is the most

intensively used sector, particularly in the section between the Cow and Calf to the east and Keighley Road in the west. Above this contour on the upper terraces of the moor, use decreases relative to the lower slope although linear routes across this sector (eg. Dick Hudson's footpath and Keighley Road) are well used and act as channels of use extending north/south towards the Wharfedale/Airedale watershed.

5.61 Trampling and erosion

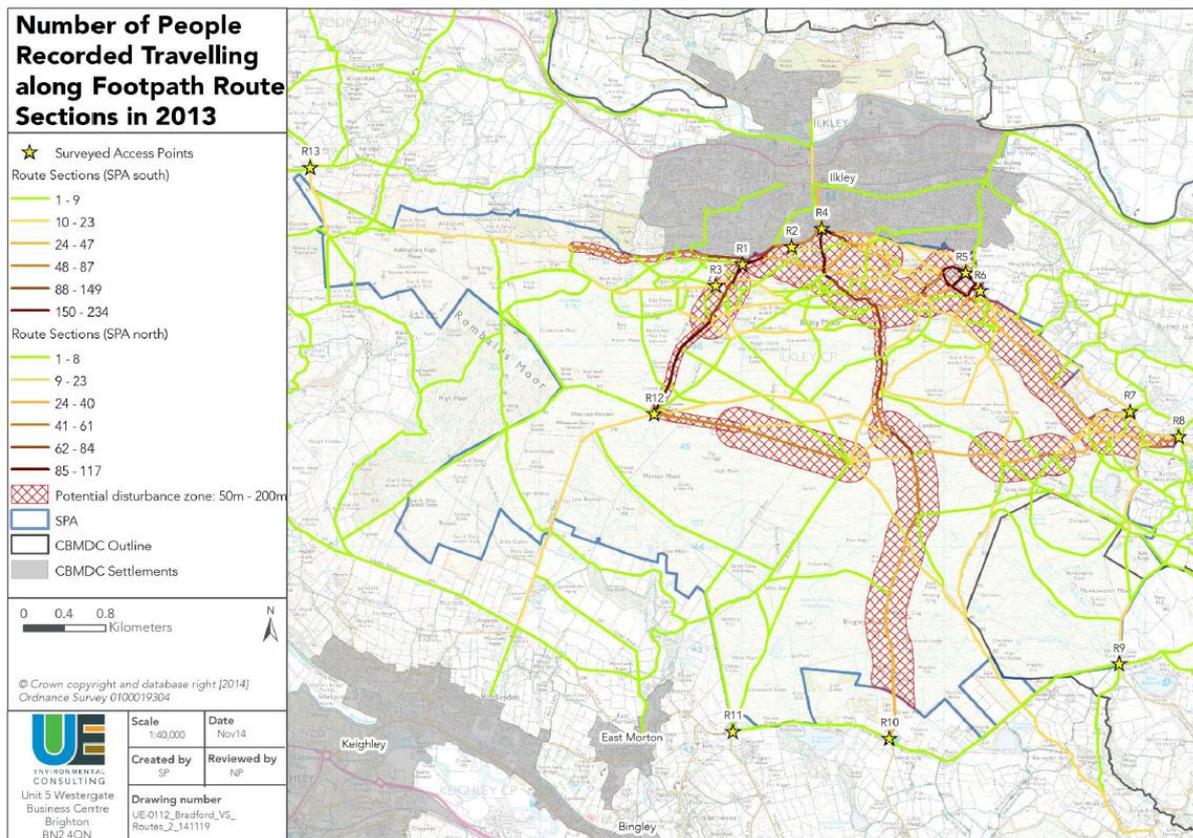
The Habitats Regulations Assessment document referred to in previous sections looked at the issue of trampling and erosion in relation to Rombalds and Ilkley Moors, as follows:

"A comprehensive review of the effects of trampling and erosion on moorland heath and blanket bog was undertaken as part of the implementation of the CRoW Act (Anderson ed., 2001). The main findings were:

- Off-path use can be as high as 30% where adjacent vegetation is amenable to walking
- Paths can have very substantial trampling widths in popular areas
- Path networks and density can increase significantly with increasing use
- People walk extensively in the uplands
- Lichen-rich and Sphagna-rich communities are destroyed after c.50-80 passages
- Wet vegetation on peat is very sensitive
- Acid grassland and young heather less vulnerable
- Heather in montane situations more sensitive than at lower altitudes
- Crowberry and Vaccinium species are sensitive to trampling; and
- Vegetation recovery may not be to pre-existing communities

5.62 The work by Anderson (1990), which involved counting visitors on and off paths in large areas of open access (or de facto access) moorland in the Peak District, showed that across all the vegetation types, on average, 23.4% of people were off the path. This was accentuated beside small rivers and on blanket bog. A survey undertaken during 2013 of public use of Ilkley Moor showed that the majority of people (76%) stuck to pathways, whilst a further 20% used paths "most of the time". It would appear that a lower proportion of people on Ilkley Moor stray off the path on a regular basis and so the impact on adjacent habitat may be less than in Anderson's survey. In the Peak District this habitat is mostly M19 *Eriophorum vaginatum* mire with minimal *Sphagnum* cover, or eroding, dissected blanket mire with cottongrass, crowberry and bilberry, and in this respect it is similar to much of the vegetation within the two SAC adjacent to the Bradford area.

- 5.63 There is a long tradition of fell or hill walking involving direction finding and off-path use, especially in the South Pennines. Even where there are primary footpath routes like the Pennine Way, the intensity of use has resulted in eroding, boggy ground which pedestrians avoid as far as possible, resulting in an extension of the path widths. Research has shown that similar effects arise from use of such areas by mountain bikers. South Pennine Moors sites within Bradford, notably Rombalds Moor, have seen a significant increase in mountain biking in recent years.
- 5.64 In addition to off-path use, path networks have increased in extent and density, and have deteriorated in condition, with a proliferation of routes developing (Bayfield & Aitken, 1992). Research has also shown how, if the path surface becomes difficult to walk on due to erosion, a new path forms alongside, thus increasing the impact width. Bayfield (1985) notes that path width can continue increasing for some time: at least 12 years on Stac Polly, 14 years on the Cairngorms, and longer on the Pennine Way in the Peak District.
- 5.65 In many upland areas, unlike some lowland sites, a significant proportion of visitors typically walk more than two miles probably in areas where repeat visits and a general familiarity is greater, as in the South Pennines near the large conurbations where weekend rather than holiday visitors predominate. For example, the Peak Park Joint Planning Board Recreation Survey (1988) found that on average 22% of 18.5 million visitors walked more than two miles (more in winter, and fewer in summer).”



5.66 Lower Moor Access

Access within this part of the moor is characterised by relatively short routes which link parking areas with main facilities and circular routes on the lower slopes (eg. Wells Road to White Wells, Cow and Calf area, White Wells to Cow and Calf, Ilkley Tarn area, Wells Road to Panorama Reservoir/Swastika Stone/Hebers Ghyll/Addingham Moorside, Rocky Valley/Backstone Beck)

5.67 A dense network of routes exists in this sector, some of which are definitive footpaths, but the majority are not. A number of management issues can be identified for these routes:

5.68 Erosion: an obvious issue is the ability of the routes in this sector to withstand levels of use in a sustainable manner so that they do not deteriorate and extend too far into surrounding vegetation. The gritstone and shale geology of the moor give rise to a relatively sandy soil where outcrops of bedrock and boulders are common. These conditions are interspersed with relatively small wet areas where drainage has been impeded.

- 5.69 Where levels of use have caused routes to deepen, water has scoured the surface and, in many cases left walking routes as water courses. Depth of erosion is evident along many of such routes where the original ground level stands up to 0.5m above the level of the walking surface. This causes a braiding effect which characterises many routes in this sector - where numerous walked lines around tussocks or projecting boulders have developed leaving a braided appearance. The key to containment of such a process is to ensure that water is allowed to run off the surface of routes as soon as possible and requires a sufficient network of cross-drains and other drainage features.
- 5.70 Where such situations have arisen, remedial work is centred around restoring eroded sections of routes by infilling braids and encouraging walkers to use one route which has been adequately drained. Vegetation is then restored alongside the chosen route, often assisted by the use of coir matting which contains the mineral layer and protects the roots of young plants whilst re-seeding. Explanatory notices are erected which inform the public of the work and request that they avoid re-vegetating areas.
- 5.71 In specific parts of this sector, paths leading to features or on steeper slopes have become particularly badly eroded for example close to the wooden bridge across Backstone Beck, the stone steps leading up Rocky Valley and the route from the paddling pool at Wells Road to White Wells Spa Cottage. Restoration work has been completed on these routes but there may be a need for future intervention .
- 5.72 Certain routes in this sector cross small areas of mire and wetland which are important habitats in themselves and are very sensitive to erosion. Here, consideration will be given to developing routes which avoid these wet areas altogether or, if this is not practical, to provide adequate crossings so that the wetland is not damaged.
- 5.73 Approach to path maintenance:
The overall objective is to maintain and improve the existing network of paths for a range of users, whilst preserving adjacent habitats. Techniques employed will aim to minimise and repair erosion caused by all forms of legitimate public access and the effects of water or other weather related damage. The approach should usually result in a net gain of habitat over the eroded area/hard surfacing.

5.74 The scope of this work will include public rights of way (for which the Council as Highway Authority has responsibility) and informal paths and tracks which have developed as a result of years of blanket public access (including horse back).

Construction techniques to be adopted will include:

- Maintenance without importation of materials – using materials already on-site and grading by use of hand tools and/or small plant. This could include small scale local drainage works to take water away from path surfaces via small pipes, ditches or cut-offs and divert into existing wetland areas or drainage systems.
- Where there is insufficient on-site material and where damage is of a larger scale, it will be necessary to import materials for surfacing and drainage. Surfacing material will be restricted to locally sourced sandstone, either solid or crushed in most cases. Small plant will be used to transport the material and any collateral damage will be kept to a minimum and repaired after the works.
- In exceptional cases there may be a need to use other material as a sub-base (eg alternative rock type), or base layer (eg textile) for example, or alternative or larger plant for transport (eg helicopter, JCB). In these cases separate consent will be sought which details the specific requirements for that project.
- Where routes cross soft peat areas and erosion is undermining the integrity of such, use of flagstone paths, boardwalks or geo-textile will be considered, depending upon location and cost.
- Existing bridges and crossing structures will be maintained in character using appropriate materials.
- Where reinstatement of vegetation is necessary – either after works or as a result of erosion – the approach will include either natural revegetation (with associated restriction of public access to facilitate repair), or re-seeding using an appropriate and approved seed mix (to be agreed with Natural England).
- Occasionally, user management will be required to restrict access to recently completed work, or to avoid further erosion to sensitive areas and allow natural regeneration. In these cases, notices and/or temporary barriers will be erected to direct people away and waymark alternative routes. This will also provide an opportunity to include explanatory notices to increase general understanding.

- 5.75 Horse riding:** Horse riders have a right to use Ilkley Moor, mainly utilising established paths and tracks. There are some issues with regards ease of access onto the moor, particularly from the east (Burley Moor) and from Airedale to the south, across Bingley Moor. At present there are no recorded bridleways which link onto Rombalds Moor from the network in Airedale. The only direct route for horses from the south is the Keighley/Ilkley Road across Morton Moor which is a full-status highway. Similarly, from the east, although Burley Moor is registered urban common, it is subject to an Order of Limitation which excludes horses at all times. Whilst these issues relate to privately owned land off Ilkley Moor, and are therefore beyond the scope of this management plan, the Council will pursue opportunities to secure access for horses to Ilkley Moor should they arise.
- 5.76 On the moor itself, routes have become established as horse routes. In particular the route leading up onto the moor from Wheatley Rakes and routes along the front edge of the moor along Hangingstones Road. Horse routes can, in some instances, suffer from increased erosion because of the action of hoofs on certain soils. Where this occurs, conditions can be improved by adequate drainage and provision of suitable surface material. The route up Wheatley Rakes has recently been cleared, drained and re-surfaced so that access on horse back is easier. It is not thought necessary to designate routes specifically for horses, this would be difficult to enforce as they have a right of access over the whole moor.
- 5.77 Mountain Biking:** As stated earlier in the Management Plan, use of the moor by mountain bikes has increased over the last 10 years or so. Whilst prohibited by virtue of the Law of Property Act 1925, there is a provision within the Act for the Council as landowner to grant “lawful authority” for this activity.
- 5.78 This provision was taken up in 2008 when, through consultation with the Rombalds Forum (now disbanded) and latterly with the Friends of Ilkley Moor, a protocol was drafted which set out the terms upon which use of the moor by mountain bikes would be allowed. The protocol was also developed with the input of mountain biking representative groups and includes the International Mountain Biking Association’s (IMBA) Code of Conduct.
- 5.79 The protocol essentially allows cycling on the moor as long as riders are responsible about how they interact with other users and when and where they cycle – in order to avoid damage to routes and, in particular, sensitive wetland areas. The protocol states that the Council reserves the right to close off specific routes to cyclists should

the need arise. To date this has not proven necessary – apart from some localised damage close to Backstone Beck, caused by a specific group who where repeatedly “downhilling” on the same slope, resulting in loss of vegetation. This was closed off and restored and the problem disappeared.

- 5.80 The erosive effects of cycling compared with those of walkers is often regarded as being more impactful, although objective analysis of this has not always been quite as conclusive. One study from New Zealand¹² suggested that the erosive effects of mountain biking can be very similar if not less impactful, to that of walkers in some situations, depending on the terrain and local conditions. In other circumstances damage caused by biking can be more significant than other uses (notably on downhill routes where brakes may be applied and skidding results in vegetation loss and erosion). Cycling can certainly compact routes in a linear manner, which in turn act as drains and increase surface water run-off. There are a number of downhill routes which have been identified, mainly on the front slope of the moor, which require some intervention to avoid conflict and erosion. Working with local mountain biking representatives, a programme of re-profiling these routes has commenced. This aims to make the routes less obtrusive, remove jumps and fast straight sections and generally slow down cyclists and avoid potential conflict with other users. Signage of some sections will also be considered to remind users that these are shared routes and that the “share with care” philosophy applies.
- 5.81 The effects of mountain biking on the moor – in terms of erosion, disturbance and conflict with other users will continue to be monitored. Intervention, as outlined above, in consultation with Natural England at certain key crossing points may be necessary to avoid conflict between users. Working with local mountain biking representatives, the Council will also encourage cyclists to “give the moor a break” so that they avoid using the moor, or parts of it, when conditions are particularly bad. If erosion or conflict reaches significant levels and cannot be managed by the means outlined above, access along specific routes for mountain bikes can be withdrawn.

5.82 Upper Moor Access

¹² SCIENCE & RESEARCH SERIES NO.92: OFF-ROAD IMPACTS OF MOUNTAIN BIKES: A REVIEW AND DISCUSSION (Gordon R Cessford) 1995, Wellington Dept of Conservation NZ.

For the purposes of this management plan, the upper access sector is defined as those parts of Ilkley Moor which extends southwards of the 300m contour to the southern boundary of the moor. This includes the upper terraces as far as the watershed.

- 5.83 The general levels of use within this sector are lower than those outlined in the previous section but this sector does include linear routes which display similar management issues to those outlined previously (see footpath use map)
- 5.84 Within this upper sector, the landscape takes on the character of open moorland. There is more scope for the exercising of a right to roam within this sector but again, a well-developed network of routes does exist and the majority of walkers tend to use these linear routes.
- 5.85 Of particular significance in this sector is the nature of the habitats across which these routes pass. They are typical moorland habitats and contain important populations of upland nesting birds. The uppermost terrace towards the southern boundary wall contains fragile peat and wetland habitats which are particularly vulnerable to damage by erosion. The consequences of extensive erosion and disturbance are, therefore, more intense on these upper levels. In addition, disturbance at particular times of year to breeding birds may affect populations and so this must inform the management of access in these upper parts of the moor.
- 5.86 The main linear routes which extend across this sector are the Dick Hudsons footpath, a route which follows the southern boundary wall from the Dick Hudsons path to Buck Stones and Crawshaw Moss via Thimble Stones and Whetstone Gate. This route then extends across Crawshaw Moss alongside Rivock Edge plantation towards Addingham Moorside. This route crosses important peat and blanket mire areas.
- 5.87 Another route follows the front edge of the scarp slope between the second and third terrace and links Keighley Road with the Dick Hudsons path at White Crag Moss.
- 5.88 In the past five years a significant programme of path surfacing on these strategic routes has been completed. This was done in partnership with Pennine Prospects, Heritage Lottery Fund (as part of the Watershed landscapes project) and the Friends of Ilkley Moor. As a result, all the routes outlined above, with the exception of the section between Whetstone Gate and Buck Stones, have been surfaced using recycled stone flags. This will provide a long-term, sustainable surface and allow

eroded adjacent vegetation to recover, whilst protecting the peat and blanket bog over which they cross.

- 5.89 The section of strategic route which extends between Whetstone Gate and Buck Stones crosses areas of wet peat and is suffering from erosion. It is not proposed to flag this section, but consideration will be given to encouraging and diverting use away from this route and onto a more sustainable and drier route which extends from Cowper Cross to Buck Stone. This could be achieved through signage and waymarking of the alternative route.

5.90 Boundaries, Access Points and Furniture

Despite Ilkley Moor's essentially open aspect there are physical boundaries on the moor which require the provision of gates, stiles and other furniture in order to gain access to or from the moor. There are post and rail fenced sections alongside Hangingstones Road on the northern boundary of the moor. These extend to the private housing which fronts the moor between Backstone Beck and the Ilkley College Annexe at the end of Cowpasture Road. Gates and fencing then run from this point as far as the cattle grid on Wells Road. The remaining boundaries of the moor consist of either drystone walls (along the watershed with Morton/Bingley Moor) or stone garden walls (along the northern boundary to the rear of properties along Panorama Drive). The private dwelling at Silver Wells is enclosed within its own dry-walled boundary and this, in turn, lies within an area of allotments or enclosures bounded by dry-stone walls.

- 5.91 Timber stiles have been erected in the past over these walls, particularly those which extend across the route between Hebers Ghyll and Addingham Moorside. Along fenced sections of the moor, access is via swing gates, kissing gates and field gates - all of which are sprung to prevent sheep from straying off the moor. The gates associated with the cattle grid at Wells Road are maintained by the Highways section.
- 5.92 It is essential that fences and gates are maintained in good order so that sheep do not stray from the moor. Similarly, timber stiles and gap stiles which allow access to or across the moor will be maintained except where a ladder stile could be replaced by a gate - this would make access for less agile or wheelchair users easier.

- 5.93 The walling around the two enclosures nearest to Panorama Reservoir (containing Silver Wells cottage) has been restored under a Countryside Stewardship Scheme, thus ensuring that these drystone walls are retained as landscape features. The remaining enclosures towards Addingham Moorside are in private ownership as is the southern boundary wall between Ilkley Moor and Bingley and Morton Moors. Similarly, responsibility for maintenance of walls/fences and access onto the moor from private dwellings lies with the private householders or neighbouring landowners.
- 5.94 There are a number of small bridges on Ilkley Moor, notably timber bridges across Backstone Beck which are the responsibility of the Council. There are also stone culverts at Spicey Gill and Willy Hall Spout. Spicey Gill culvert forms part of the Highways and as such is the responsibility of the Highways Department .

SECTION 6: ARCHAEOLOGY

6.1 There is significant and well documented archaeological interest on Ilkley Moor much of which is legally protected (or scheduled). After the fire which damaged a part of the moor in 2006, West Yorkshire Archaeological Services (WYAS) undertook a survey of the area¹³ and produced a report to inform the emerging HLS scheme. In this report, they set out a useful summary:

“Ilkley Moor contains one of the most significant concentrations of prehistoric rock art in Britain, consisting of various forms of rock carvings probably dating to the late Neolithic period. Rock carvings vary widely in form, from small circular hollows known as ‘cups’, to patterns of rings, spirals and linear grooves, sometimes combined to make complex designs such as those found on the Badger Stone and the Swastika Stone on Ilkley Moor. It is unclear why these designs were originally carved and what function they may have had, although a number of functions have been suggested, including ritual or religious uses, a form of early symbolic code, maps to guide people to resources or settlements, or of the night sky, and marks relating to personal or tribal identity (see Boughey and Vickerman 2003, 43-44). Ilkley was the site of a Roman fort by the late 1st century AD, adjacent to which developed a small civil settlement. The line of the Roman road which connected Ilkley with the fort at Littleborough, Lancashire probably followed closely that of the present Keighley Road (Margary 1973, 405; road no. 720a)”.

6.2 The importance of Ilkey and surrounding moors in terms of carved rock density is further underlined in a “Yorkshire Moorlands Assessment Project” report, commissioned by Yorkshire Dales National Park, which states that *“some 12.5% of the total number of scheduled monuments occur on just two relatively small moors in West Yorkshire (Rombalds Moor and Baildon Moor)”*¹⁴. The map overleaf illustrates this concentration – especially on Ilkley Moor. These features are key cultural assets and future land management should take account of them so that they are protected from damage and remain available for public and academic interest, education and interpretation.

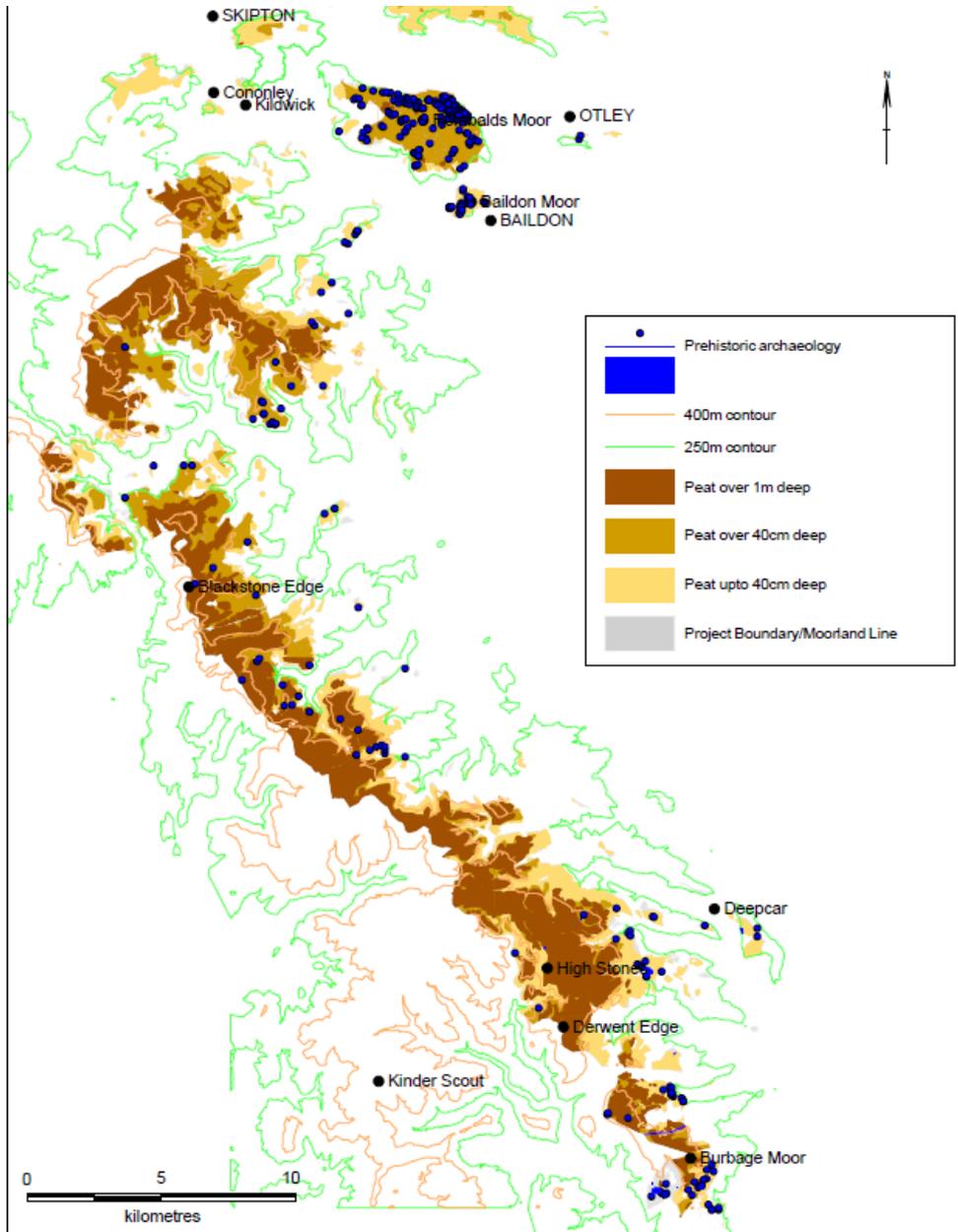
6.3 In 2013, as part of the Heritage Lottery funded Watershed Landscape project a community archaeology initiative named CSI Rombalds, carried out extensive analysis and recording of features over the whole of Rombalds Moor and beyond. Their report published in 2013¹⁵ contained useful information about potential threats to the features which has been used to inform the management approach set out in this plan. It should be pointed out the the scope of this survey included

¹³ Level II Archaeological Survey WYAS 2009

¹⁴ Yorkshire Moorlands Assessment Project, Northern Archaeological Associates Ltd. 2012

¹⁵ Carved Stone Investigations: Rombalds Moor. Condition and Threat Report, Kate Sharpe et al, Oct 2013

the whole of Rombalds Moor and Baildon Moor, so data specific to Ilkley Moor only has not been separated out. Nonetheless, it does give a very useful indication of general condition, threats and recommended management approaches that can be applied to Ilkley Moor.



Archaeology in West and South Yorkshire in relation to peat depth (from Yorkshire Moorlands Assessment Project, Northern Archaeological Associates Ltd. 2012)

6.4 The main factors influencing the condition of preserved rock features set out in the report were:

- Physical and chemical erosion
- Biological growth
- Animal and human impact
- Proximity to paths and routeways

- 6.5 The report concluded that 80% of the artefacts (or “panels”) in the survey area were judged to be in their original location in the landscape. Of the remainder, a number have relocated (some to museums) or re-used in other structures and 17 panels previously documented have been lost.
- 6.6 The way in which the land around these features is used and managed has a key impact on their survival in the landscape. The potential impacts of land management activities such as heather burning, use of machinery, presence of livestock, extent of tree cover and access management must therefore be considered as part of the overall management of Ilkley Moor.
- 6.7 It is useful to understand the current condition and key threats to features before determining land management approaches. Surveys showed that one of the most prevalent biological factors on the rock art was algal growth, which affected 90% of the panels – with 12% having algae covering more than 2/3rds of the carved area. Cructose lichen has also compromised the appearance of many panels with 36 being significantly affected. Grass and turf cover has only a small impact on very few panels.
- 6.8 Animal and human impacts can affect the appearance of rock art panels. For example, rubbing by livestock can polish the rock surface, trampling can wear, scratch and damage the surface. Access by people – either walking, cycling or horse riding – is another potentially significant factor. Deliberate vandalism, such as graffiti (carving or paint) is also a people-related threat – 10 panels overall were damaged by paint, with just four affected in the carved area, whereas 37 panels showed evidence of carved graffiti, 8 within the carved area. The survey work showed that despite the heavy use of the moor, the majority of panels are, in general, remarkably undamaged by animal or human activity.
- 6.9 In considering future management approaches designed to preserve the archaeological interest on the moor, the report provides some useful pointers. It concludes that the most prevalent risks to the panels are moss, algae, cructose lichen and people – which threaten at least 60% of panels to some degree. When risks are graded into categories (“none”, “slight”, “moderate” and “severe”) the greatest

Panels with 4 severe threats	Severe threats identified
Panorama Woods 01	Foliose lichen, moss, algae, tree canopy
Panorama Woods 02	Foliose lichen, moss, algae, tree canopy
Panorama Rocks 02	Crustose lichen, moss, algae, detritus
Green Crag 13	Pooling water, crustose lichen, foliose lichen, algae
Rivock 01	Tree canopy, detritus, land management, tree roots

threat is algae – which scored moderate or severe on 138 panels. Five panels were highlighted as the ones which scored four severe threats as follows:

- 6.10 To some degree, whatever management activity takes place on the moor, certain threats are the result of other factors, such as climatic conditions, which cannot be influenced through a plan such as this. For example, algal growth was prevalent on much of the rock art, most of which is located on open moorland with good air circulation. Normally algae thrive better in moist, confined conditions (eg. woodland), so this prevalence on the open moor is perhaps surprising. One explanation could be the unusually wet weather during the survey period - when rainfall was greater than average for eight months of the year. This could indicate that the threat from algal growth is a product of atmospheric and climatic condition rather than any land management practices.
- 6.11 Of those management activities that may have the most profound effect, one is vegetation management – particularly heather – which can damage rock art. In terms of rotational burning, evidence from the survey showed that many panels lie in areas which are subject to burns, and that 12 had suffered visible damage as a result. Natural England, as part of their Higher Level Stewardship prescriptions have guided the location of permitted burns, taking account of the historic environment record, and any additional burns requested outside of this agreement would require their consent – again providing an opportunity to check that no damage to the historic environment is likely. Clearly, this level of protection only influences managed, planned burns. Accidental or deliberate illegal “wildfire” burns can threaten rock art and so further education and partnership working (such as through the South Pennine Fire Operations Group) to reduce the incidence of wildfire, will continue. Burning is, however, not regarded as the main threat if properly controlled and compliant with codes of practice. Potentially much more damaging is heather management by flailing or cutting with machinery. Increasingly, cutting is being considered as a more environmentally friendly alternative to burning but care must be taken to ensure that areas to be cut are properly surveyed prior to commencement so that damage by machinery and tractors etc can be avoided.

6.12 Similarly, the control of areas of bracken needs to take account of rock art location, particularly where mechanical means are employed in the control. For this reason, bracken control in the vicinity of known rock art has been carried out using hand-held spray equipment, rather than scythes, mechanical cutters or rollers. This will continue as the general approach to avoid damage to panels. In particular, two areas where bracken has encroached near to scheduled monuments and is threatening them, will be addressed – these are :

- Cairnfield, carved rocks and associated curved bank at north west end of Green Crag Slack, east of Gill Head Reservoir -including an area of c.20m x 60m bracken infestation to the south-west of Haystacks Rock
- Enclosed settlement containing three carved rocks known as Backstone Beck Enclosure.

In these locations, bracken control will be undertaken by either “bashing” – breaking of bracken stems with sticks (or feet) and /or chemical spraying with hand-held equipment.

6.13 Trees and woodland can also affect the condition of rock art panels and the management plan can influence this to some extent. Clearly, if woodland is allowed to colonise, or be planted over key locations, the rock art can be lost from view or at worst, damaged – by tree cover creating moist conditions which promote moss, algae, detritus and potentially dripping water – all of which can threaten the condition. Similarly, tree roots can physically break up rock and pose a further threat. Consideration will therefore be taken of the historic environment in considering parts of the moor where trees will be allowed to colonise. It may also prove beneficial at some sites to actively clear trees from around rock art. Such clearance in the plantation at Rivock Edge has been shown to have beneficial effects. Rock art in an area of the plantation was assessed before and after clear felling. During the pre-felling stage, almost all the panels under canopy were covered in green algae, moss and detritus. A year later, after felling, the stones appeared clean and completely free of biological growth. There are only limited parts of the moor where rock art is currently under existing trees, but it may be worth considering some sensitive felling at certain locations if such a threat exists.

6.14 Another relevant factor that can be influenced through the management plan is access in general. Again proximity of rock art to footpaths and other routes can be a threat. Given the widespread network of paths on the moor, and the general interest in archaeology (since Victorian times) , it is perhaps unsurprising that a high

proportion of panels are close to routes –or even, in some cases, parking areas and roadsides. Over 63% of the panels across Rombalds Moors lie within 50m of a path – the majority being within 5m, 49 individual panels within 1m and 12 actually on the path.

- 6.15 Given the right of access across the moor, it is difficult to control where people can and cannot go. Some intervention is possible in re-routing paths away from sensitive panels, in the same way as routing away from sensitive habitats. Walkers, horse riders and particularly mountain bikes can damage and chip stone artefacts, so it is sometimes beneficial to direct use away from the immediate vicinity of the panel. This has been implemented, under the guidance of Historic England (English Heritage), around the trig cairn on the very top of the moor. Here, as part of a wider footpath flagging project, the main path past this location was surfaced so it arced around it rather than directly over it. This principle can be applied to other sensitive locations where path surfacing projects are underway.
- 6.16 The construction of cairns using locally found stone is apparent on the moor. This is generally undertaken as an attempt to assist fellow walkers by creating landmarks to aid navigation, or sometimes simply in response to the urge to mark where one has been – often building upon a structure already in place. This can be damaging to archaeology as the stones used in these constructions could be part of other historic structures and therefore effectively destroyed. Building of cairns will be discouraged and the structures themselves dismantled where possible and practical.
- 6.17 Another result of public access is vandalism. In 2011 the well-known Badger Stone was vandalised with a black substance, around the same time new graffiti was carved into a cup and ring marked rock in Hangingstones Quarry. Finding the best way to deal with and repair such damage is still subject of debate and management approaches will be informed by advice from key agencies in this regard. Needless to say, both deliberate and unintentional damage can be reduced to some extent, by better public information which raises awareness and understanding of rock art. In this regard, valuable material has been produced through the CSI project and via its parent organisation, Pennine Prospects. Similarly the Friends of Ilkley Moor’s events and learning programmes contribute to a better awareness. It is intended that such approaches will continue to be used to increase public understanding of the archaeology across Ilkley Moor and beyond. Consideration will also be given to providing an information panel specifically relating to archaeology at a key access point (probably Cow and Calf car park).

7: WORKING WITH PARTNERS AND FUNDING

- 7.1 There are a number of key partners who are vital to the ongoing success of the management plan. These partners either provide advice, support, act as a sounding board or represent those with an interest in the moor – residents, visitors and users. A number of partners also provide funding for the work which is undertaken on the moor. It is the Council’s intention to continue to work with and engender good working relations with these partners, specifically:-
- 7.2 **Friends of Ilkley Moor (FOIM):** FOIM are the key representative body for local residents and users of the moor. Staff members from the Countryside and Rights of Way team attend regular meetings as ex-officio members and members of the Friends assist with practical conservation and access tasks on the moor on a weekly basis. There is a good relationship with the FOIM and this will continue.
- 7.3 Since forming in 2008, the FOIM have also contributed significant funding and resources to assist with the management of the moor. To date this totals in excess of £190,000 generated from their own membership revenues or from successful grant bids. These have been used to fund a successful Project Officer post, employed by FOIM, who delivers an annual Events and Learning Programme focused on the moor. In addition to this, FOIM have funded footpath improvements, information signage, degradable dog- waste bags and additional bracken spraying over and above the HLS provision. It is clear that FOIM is a key funding source as well as the principle advisory and consultative body.
- 7.4 **Natural England (NE):** As highlighted earlier in the plan, Natural England is the key statutory consultative and advisory organisation responsible for monitoring condition and regulating management of SSSI’s and European designated sites. As such it is vital to maintain a constructive working relationship as the consent of NE is required for management work on the moor. They also coordinate and manage the Higher Level Stewardship agreements from which the moor benefits. The CROW team is in regular contact and communication with NE – not just to seek consent for operations as required but also to seek advice and support for access and habitat related activity. NE, through their parent government department (DEFRA) have recently announced details of the new agri-environment stewardship regime which will replace HLS as from 2015 (to be called Countryside Stewardship). The Council will be applying for inclusion in this replacement scheme when the current agreement ends in 2017.
- 7.5 **District Councillors and Ilkley Parish Council:** In addition to the District Ward Councillors, Ilkley is represented by a local Parish Council. Councillors are kept informed about developments on the moor. The Parish Council has provided funding

in the past – notably for remote imaging after the wildfire in 2006, which assisted in estimating the extent of the damage. They have also recently taken on responsibility for cleaning of the public toilets at White Wells and so have an ongoing practical interest in the moor. An elected Member from the Parish Council sits on the Friends of Ilkley Moor Committee so this too provides a useful link.

7.6 The Bingley Moor Partnership: The sporting rights for Ilkley Moor are currently held (until 2018) by the Bingley Moor Partnership. Their activities clearly have an impact on the moor and the sporting rights deed requires a certain amount of management input from them – inline with the HLS agreement and Management Plan. The income generated from the letting of sporting rights, whilst not directly ring-fenced to the moor, does contribute to the CROW Service’s overall budget and thus is, at least in part, spent on moorland management.

7.7 Pennine Prospects (PP): The South Pennine Rural Regeneration Company is a partnership of a variety of public and private sector organisations seeking to conserve and enhance the natural and built heritage of the South Pennines. Bradford Council is a member of PP and has worked closely and successfully with them for many years. A significant amount of grant funding secured through PP has been invested on the moor in the last 20 years. Notably the EU LIFE programme and more recently, National Heritage Lottery Fund (HLF) Watershed Landscapes project, between them provided around £300,000 for access and habitat improvements on the moor. An additional significant HLF project was the Rombalds CSI project which trained volunteers in surveying and recording stone carvings on the moor and added substantially to the knowledge and understanding of the neolithic landscape on the moor. The Council continues its membership and support for PP and will seek further opportunities for investing in the moor through this organisation.

APPENDICES:

APPENDIX 1: Extracts form Natural England’s Upland Evidence Review

Extract from Natural England Upland evidence review relating to grazing:

Effects of stocking rate

- *There is an association between sheep stocking rates at the landscape scale, and the extent and condition of dwarf-shrub communities.*
- *Where heather is present its condition, in terms of structure and canopy cover/frequency, can improve through reduced grazing pressure.*
- *Sheep may provide a degree of Molinia control where dead material is reduced through cutting or burning.*
- *Grazing preferences of livestock vary seasonally.*
- *Grazing levels affects the structure of moorland food webs.*
- *Atmospheric nitrogen (N) deposition is likely to influence the effects of grazing.*

Effects of recent changes in livestock numbers on moorland

- *Expansion of dwarf shrub habitat can be slow or lacking under ESA stocking rates.*
- *Change in vegetation community type and broad character through grazing reduction or removal may take several decades.*
- *Low productivity or climatically stressed habitats may respond relatively quickly to changes in grazing pressure.*

Spatial factors

- *The overall impact of a given stocking rate is influenced by the size and distribution of patches of preferred grazing.*
- *Grazing livestock do not range evenly over a moorland grazing unit.*
- *Livestock influence vegetation change by mechanisms in addition to grazing defoliation.*

Grazing removal and low intensity regimes

- *Low intensity mixed grazing regimes can have biodiversity benefits.*
- *Moderate grazing can maintain plant species-diversity.*
- *Periods of summer grazing reduction or removal can benefit populations of key plant species.*
- *Relatively light grazing by sheep can affect the vegetation composition and condition of blanket bog.*

Grazing impacts on soils, water and carbon

- *There is a link between grazing and soil erosion and loss.*
- *The impact of grazing on carbon sequestration and storage within moorland is variable, as it effects the relative contribution of different mechanisms.*
- *Grazing may have little effect on water quality, at least at relatively low stocking rates.*

Extract from Natural England Upland Evidence Review: The effects of managed burning on upland peatland biodiversity, carbon and water

There is strong evidence that managed, rotational burning results in a change in the species composition of blanket bog and upland wet heath vegetation, at least for a period of time. This included strong evidence that:

- *Burning of blanket bog and wet heath typically leads to an initial period of graminoid (grass) dominance, in particular of hares-tail cottongrass, purple moor-grass or deergrass, typically lasting 10-20 years, and with an initial decline in dwarf-shrub cover and in some cases diversity.*
- *Heather and some other dwarf shrubs tend to decline during the initial graminoid dominant phase, but typically then increase, especially on drier sites, and may become dominant. This may take 15-20 years or longer on less-modified, wetter blanket bog and may not occur, for example, with too frequent or severe burning and/or heavy grazing.*
- *Bryophytes as a group tend to decline initially after burning of blanket bog. Sphagnum bog-mosses as a group have shown mixed responses, in some cases increasing in the early post-burn stages, sometimes declining or being killed and sometimes then increasing or recolonising after varying periods.*

There is strong evidence of correlations between moorland habitat types, their vegetation composition and structure, and densities of some moorland breeding birds, particularly waders. In few studies has this been related directly to peatlands rather than moorland in general or specifically to burning practice. We can however say that there is strong evidence that:

- *Certain species are associated with particular moorland vegetation characteristics. Red grouse and stonechat are associated with increasing heather cover; snipe and curlew with heterogeneity in vegetation structure; golden plover and skylark with short vegetation; waders with wet conditions; whinchat with dense vegetation; stonechat with tall vegetation; and meadow pipit with grass-heather mixes.*
- *There are correlations between burning and/or predator control intensity and densities of some moorland breeding birds. Higher densities of red grouse, golden plover and curlew with increased burning/predator control were each shown in two studies; and higher densities of lapwing, redshank and ring ouzel each in single studies. Two studies showed lower densities of meadow pipit and single studies showed lower densities of skylark, wheatear and twite with increasing intensity of burning/predator control.*

Extract from Natural England Upland evidence review: Restoration of degraded blanket bog

The review found that undamaged blanket bogs have high water tables which fluctuate in a layer overlying a permanently waterlogged layer of peat. They accumulate peat and are a carbon (C) sink, but emit methane. They have rapid stream responses to rainfall, slowed by any areas of Sphagnum, and have low export of dissolved organic carbon (DOC), but also contain some peat pipes.

Peat is formed due to waterlogging, therefore peat-forming plants are those adapted to wet environments. Several studies show that English and Welsh blanket peat is made up mainly of Sphagnum and Eriophorum remains, along with some remains of dwarf shrubs, but these do not form peat on their own. In some areas and layers there is a large component of unidentifiable grasses/graminoids that may represent Molinia remains.

Studies from Scotland show that ploughing and planting trees lowers water tables and causes subsidence of the peat. The topic review found evidence that ploughing and planting trees changes the ground flora, but may reduce methane, and there may be short term gains in carbon capture.

Peat cutting can affect bog vegetation and peat left bare dries out on its surface, but not lower down in the peat mass. Cutting drains through blanket peat lowers the water table and discourages Sphagnum, while encouraging plants that like drier environments, especially downslope of the drain.

Individual studies report different impacts of drainage on catchment flow characteristics, but widespread surveys show that drainage is associated with more peat pipes. These surveys show that drainage can also accelerate erosion, especially on steep ground, although a recent meta-analysis suggests it is likely to reduce methane emissions. Experimental studies suggest that atmospheric deposition of pollutants may be damaging Sphagnum, but there is much evidence of recent Sphagnum recovery from across the country.

*Land management practice such as drainage, grazing or burning often causes changes in seminatural vegetation, and is often focused on increasing palatable species or encouraging vegetation dominated by ling (*Calluna vulgaris*). The evidence indicates that areas with more *Calluna* have more peat pipes and more dissolved organic carbon (DOC). Laboratory study suggests this vegetation has higher methane (CH₄) and carbon dioxide (CO₂) emissions than areas with *Sphagnum* or *Eriophorum*. There is some evidence that gullying and haggging, resulting from the development of small stream channels, also lowers the water table in some bogs. Further surveys show that this is most associated with high flat areas of bog, while linear gullies can also form in peat located on steeper slopes. Some palaeoecological*

studies suggest that gullies may represent channels formed over 200 years ago, and surveys and case studies indicate that they mostly erode slowly. However, other case studies in bare peat areas show more rapid erosion of up to 6 centimetres (cm) loss each year, losing peat into watercourses and by wind erosion.

Studies in Scotland and Ireland show that felling trees can encourage blanket bog vegetation to recover, especially if the plantation is young, or where disposal of waste wood on site by chipping is practised. Many studies demonstrate that bare eroding peat can be re-vegetated and stabilised using nurse grasses or heather. The success rate of this re-vegetation is helped by applications of lime, fertiliser, and stabilising treatments such as geojute. The evidence suggests this will help prevent loss of particulate organic carbon (POC), but will not prevent ongoing loss of peat as dissolved organic carbon (DOC) or as carbon dioxide (CO₂). Much research from Canada and elsewhere proves that cut-over peatlands can be managed to restore Sphagnum, provided the right combinations of water table, chemistry, species, mulches and/or nurse species are used. The evidence suggests that establishment of Sphagnum in English blanket peats would seem possible, but has not yet been fully demonstrated. Several studies show that the dominance of Molinia can be reduced with intensive application of grazing, cutting and or herbicides. There is some evidence that gully blocking will trap eroding peat sediment which will become re-vegetated.

Most studies show that blocking grips raises water tables, increases abundance and diversity of invertebrates, and there is some evidence that it encourages wetland plants over relatively short timescales. However, studies also indicate that the catchment flow properties and DOC export of grip-blocked peatlands differ between studies, suggesting that they do not rapidly recover to resemble those of undamaged peatlands or that other factors such as topography or vegetation may be more influential. Meta-analysis shows that grip blocking will probably decrease CO₂ emissions but increase methane emissions. A laboratory study suggests that methane may be reduced through leaving grip pools open, not infilling or reprofiling grips and by encouraging Sphagnum vegetation, rather than Calluna or Eriophorum, across the rewetted moor. A survey indicated that not all grips need to be blocked: those on shallow slopes will re-vegetate naturally, and may infill (though may still have a drainage impact).

The topic review found no evidence that any of our blanket peatlands are unrestorable, although costs of restoration effort may not be repaid rapidly by improvements in function, and the timescales for full recovery to approximate undamaged function may be long.

Extract from Natural England's Upland evidence review: impacts of tracks and vehicle use upon the structure and hydrology of blanket peat

- *Tracks alter the structural integrity of blanket peat. Building upon peat compresses the*

peat and alters the drainage patterns on and around the peat, both within the peat body and over its surface. The level of compression and disruption depends upon the structure and wetness of the peat in question. Peat that is loaded (for example, by being built on) will consolidate, the permeability will reduce (affecting natural sub-surface drainage) and the level of surfaces and any structures will settle. Drier peat has a stronger surface layer than very wet or saturated peat, and therefore tracks on dry peat are less likely to cause damage. Drainage ditches can feed or focus water into areas of weak peat, thereby potentially creating instability. Similarly, the cutting of drainage ditches across slopes removes support for the slope above and damages the structural integrity of the peat deposit. This may also lead to instability.

- *Tracks alter the hydrological system of blanket peat at either surface or sub-surface level. The artificial drainage of peat results in the settlement of the peat, which disrupts the hydrology both within the sub-surface peat body and over its surface. Drainage channels are damaging as they result in drying of the peat and may lead to instability of the peat depending upon their position within the slope or by channelling water into areas of structural weakness. Constructed tracks result in the settlement of peat and the reduction of sub-surface flow through the peat because of the consolidation process. Compression of the peat through track construction may lead to accumulations of surface runoff water (ponding), which may lead to erosion and/or instability of the track and adjacent peat. Constructed tracks usually require ditches to be made to manage runoff, but these ditches are normally damaging because they result in drying and possibly instability of the peat. Drainage of peat results in deformation (in the form of settlement) of the peat.*
- *The type of vehicle, loading and usage influences the impact of unmade tracks upon the structural integrity and hydrology of the blanket peat. Vehicle use on unmade tracks is damaging to the surface vegetation. The level of damage depends upon the type of & weight of the vehicle, the number of journeys made and the type and wetness of the peat in question. The number of vehicle movements, the weight and the type of tyre or „caterpillar“ track used by the vehicle are relevant, with weak evidence to indicate that rubber „caterpillar tracks may reduce the level of impact. One study showed that vehicle use on unmade tracks damages vegetation in ways that may be irreversible. We found that the evidence is insufficient for any meaningful comparisons to be made relating to the impacts of vehicles moving across constructed tracks.*
- *The disruption of blanket peat by tracks (both constructed and unmade) at surface and sub-surface level results in erosion and this erosion is ongoing. The science does not allow the separation and quantification of this erosion. From the available evidence we have not been able to quantify levels of erosion derived from a constructed track as there is no research that has addressed this subject in isolation.*

