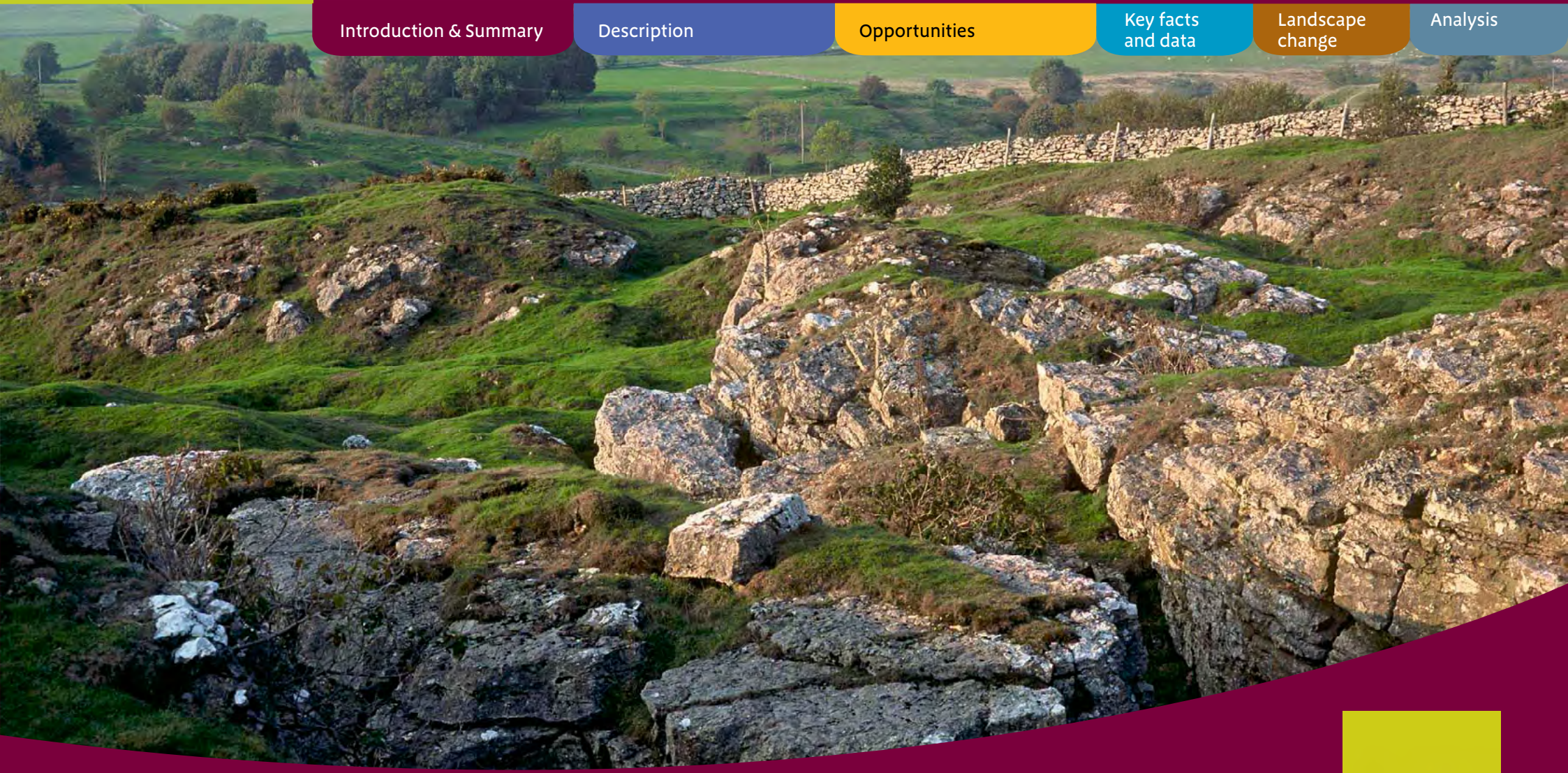
National Character Area profile:

141. Mendip Hills

Supporting documents



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Introduction

As part of Natural England's responsibilities as set out in the Natural Environment White Paper[1], Biodiversity 2020[2] and the European Landscape Convention[3], we are revising profiles for England's 159 National Character Areas (NCAs). These are areas that share similar landscape characteristics, and which follow natural lines in the landscape rather than administrative boundaries, making them a good decision-making framework for the natural environment.

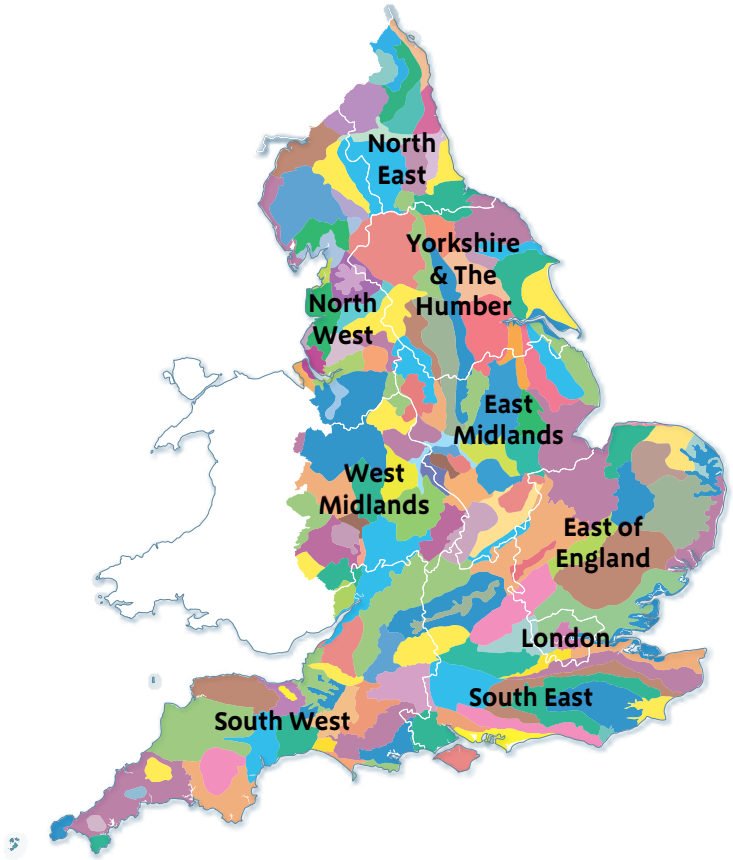
NCA profiles are guidance documents which can help communities to inform their decision-making about the places that they live in and care for. The information they contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and encourage broader partnership working through Local Nature Partnerships. The profiles will also help to inform choices about how land is managed and can change.

Each profile includes a description of the natural and cultural features that shape our landscapes, how the landscape has changed over time, the current key drivers for ongoing change, and a broad analysis of each area's characteristics and ecosystem services. Statements of Environmental Opportunity (SEOs) are suggested, which draw on this integrated information. The SEOs offer guidance on the critical issues, which could help to achieve sustainable growth and a more secure environmental future.

NCA profiles are working documents which draw on current evidence and knowledge. We will aim to refresh and update them periodically as new information becomes available to us.

We would like to hear how useful the NCA profiles are to you. You can contact the NCA team by emailing **ncaprofiles@naturalengland.org.uk**

National Character Areas map



[1] The Natural Choice: Securing the Value of Nature, Defra (2011; URL: www.official-documents.gov.uk/document/cm80/8082/8082.pdf)

[2] Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services, Defra (2011; URL: www.defra.gov.uk/publications/files/pb13583-biodiversity-strategy-2020-111111.pdf)

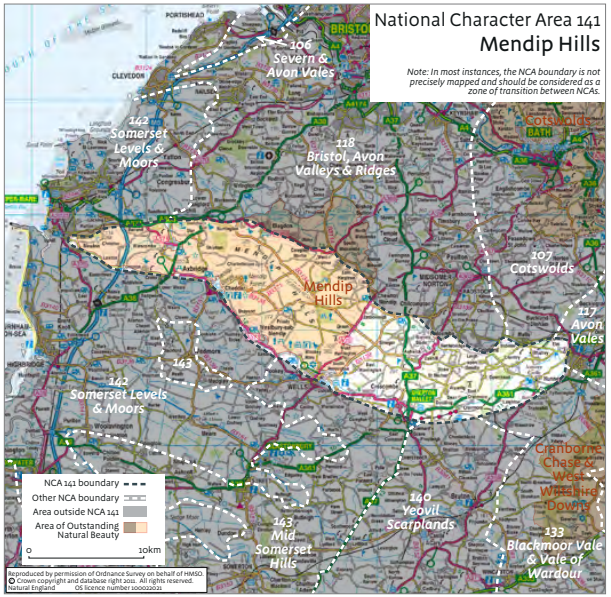
[3] European Landscape Convention, Council of Europe (2000; URL: http://conventions.coe.int/Treaty/en/Treaties/Html/176.htm)

Summary

The striking landform of the Mendip Hills rises abruptly from the flat landscape of the Somerset Levels and Moors to the south. This Carboniferous Limestone ridge, with its more weather-resistant sandstone peaks, illustrates the classic features of a karst landscape, the result of the response of the soluble limestone to water and weathering, creating surface features, complex underground cave and river systems, gorges, dry valleys, surface depressions, swallets, sink holes and fast-flowing springs. Such natural features have interacted with human influences to result in complex ritual, industrial and agricultural landscapes extending from the prehistoric period to modern times.

This is a rural area, with only 2 per cent of the land being classified as urban. Around 53 per cent of the area lies within the Mendip Hills Area of Outstanding Natural Beauty. There are four Special Area of Conservation designations and two National Nature Reserves. The concentration of 29 geological and mixed-interest Sites of Special Scientific Interest demonstrates the geological importance of this relatively small National Character Area (NCA). The area is renowned for its tranquillity and inspirational qualities, offering views right across Somerset to Dorset on a good day and to the Isle of Avalon – Glastonbury Tor. The NCA is a net contributor of water, the Mendip aquifer supplying water to Cheddar, Blagdon and Chew Valley lakes, which provide much of the water supply for the Bristol area, and also to the hot springs in Bath. The NCA provides many recreational opportunities and is particularly of interest to cavers and potholers. Cheddar Gorge and Wookey Hole are key tourist attractions.

Large-scale quarrying continues, particularly in the eastern part of the NCA, and there is continuing pressure for expansion, with associated impacts on landscape, tranquillity and hydrology. Lack of, or inappropriate, management threatens areas of habitat and geological and historical interest. Light pollution from development threatens the extent of the recognised dark skies and out-of-character development is a continuing risk to the essential nature of the area.



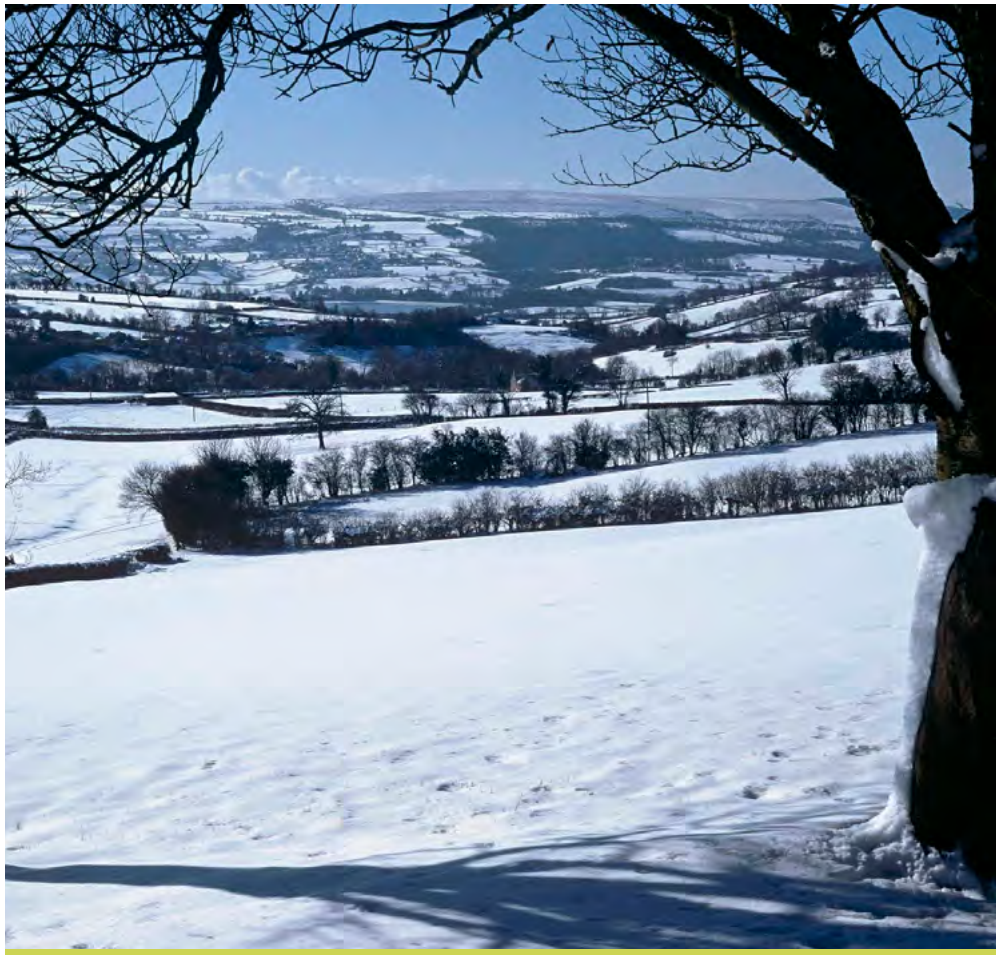
Click map to enlarge; click again to reduce.

Statements of Environmental Opportunity

- **SEO 1**: Conserve the distinctive combination of historic field boundaries, field and settlement patterns and land uses that have shaped the landscape of the Mendip Hills. Safeguard inward and outward views of and to the distinctive hill line and conserve and enhance the special qualities, tranquillity, sense of remoteness and naturalness of the area.

- **SEO 2**:Safeguard the rich geological features of this renowned karst landscape, the many archaeological features associated with the upland ridge and the historical mining legacy, enabling access, continued research, interpretation, understanding and enjoyment of the extensive geological and historical resource.

- **SEO 3**: Conserve and sustainably manage the rural agricultural landscape and enhance the network of nationally and internationally important sites and semi-natural habitats associated with the distinctive geology and topography to create a coherent and resilient ecological network, enabling ecosystems to adapt to climate change and for the benefits to biodiversity, water flow, water quality and protection of the aquifer, soil quality, regulating soil erosion, rural heritage and culture.



View from Butcombe towards Black Down in winter, instilling characteristic sense of remotemess and tranquillity.

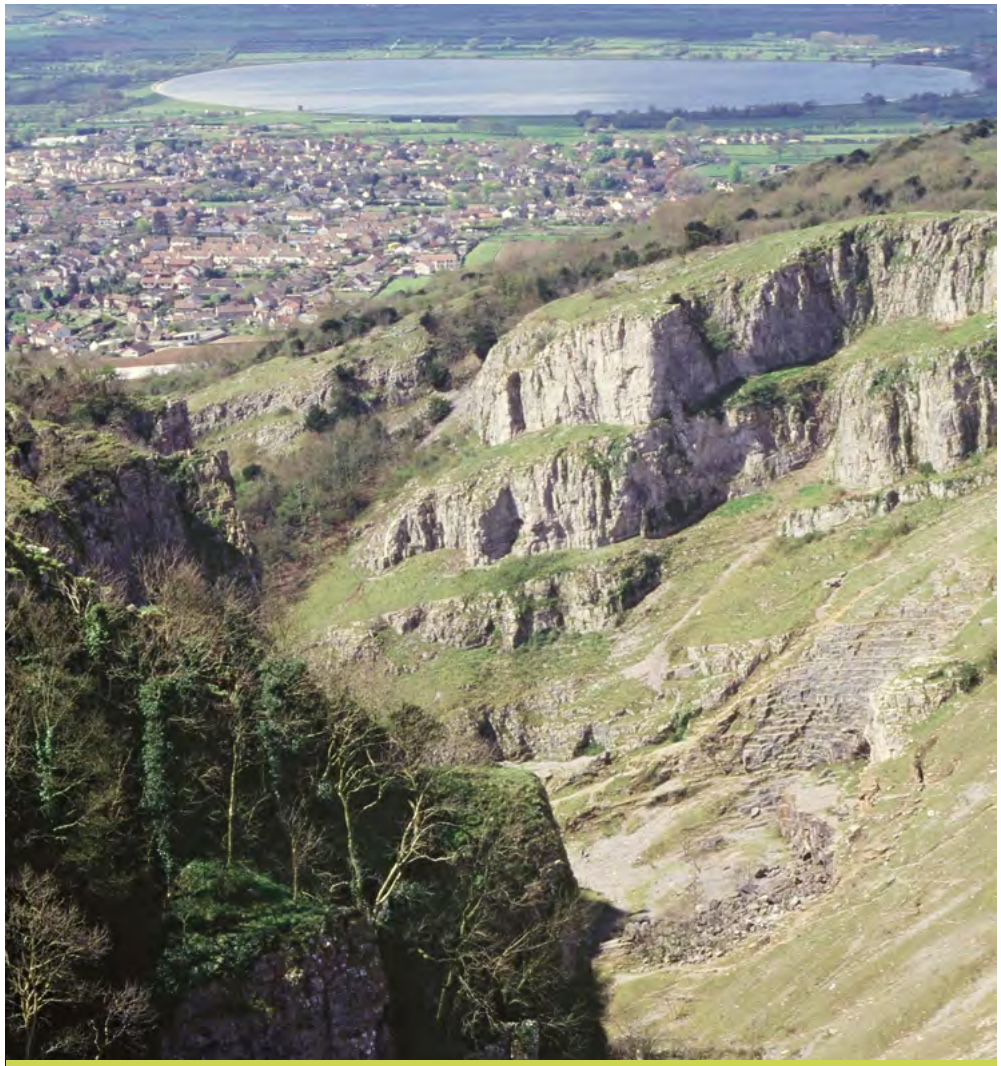
Description

Physical and functional links to other National Character Areas

The Carboniferous Limestone hills of the Mendips are in sharp contrast to the Mid Somerset Hills and the low-lying, flat landscape of the Somerset Levels and Moors National Character Areas (NCAs) to the south and the gentle, rolling farmland of the Bristol, Avon Valleys and Ridges NCA to the north. The eastern end merges gradually with the southern end of the Cotswolds, the Yeovil Scarplands, the Blackmoor Vale and Vale of Wardour, and the Avon Vales NCAs.

There are significant views outwards in all directions: across the Severn Estuary to Wales, or the Somerset Levels to Glastonbury Tor, Hinkley Point and the Quantock Hills, and on clear days distant views of Dorset are possible. Equally important are the views of the Mendip Hills from the surrounding land, particularly the rapid ascent of the southern scarp from the Levels and Moors.

There are no rivers rising on the limestone hills, the karst landscape draining water down through the rocks which then emerges at the springline at the base of the hills. These springs feed the headwaters of the rivers Sheppey, Axe and Cheddar Yeo which in turn feed into the Blagdon Lake Reservoir (Cheddar Yeo), Chew Valley Lake Reservoir (River Chew) and the Cheddar Reservoir (Cheddar Yeo), each of which lies just outside this NCA.



Cheddar Gorge looking out across Cheddar Reservoir and the Somerset Levels and Moors NCA.

Key characteristics

- A chain of prominent limestone hills, cored by Devonian and Silurian rocks, extending inland from the coast and rising up sharply from the surrounding lowlands. An open limestone plateau with karst features including complex underground caves and river systems gives the area a unique character. Sandstone outcrops form the highest features. Dramatic gorges, cliffs and escarpment slopes surround the plateau. To the west the land breaks into individual hills.

- The plateau and hill tops are largely treeless, except for a few old ash pollards, wind-shaped shelterbelts and conifer plantations. The slopes and valleys surrounding the plateau have a wide range of woodlands forming an attractive mosaic with calcareous grassland and agriculture. There is a more wooded nature to the eastern Mendips.

- Variable enclosure patterns with larger, rectangular 18th-century field patterns bounded by drystone walls on the plateau and smaller, irregular fields with hedgerows on the scarp slopes and eastern Mendips.

- The majority of the NCA is under improved pasture for dairying, with some horticulture in the south-west.

- The centre and west of the area is characterised by unimproved neutral meadows or calcareous grassland on the plateau, contrasting with acid heathland on the sandstone hill tops, unimproved calcareous grassland particularly on the southern slopes, and 'gruffy ground' (broken and undulating ground resulting from the lead industry which has re-vegetated to form important semi-natural habitats such as calaminarian grassland – grassland found on soils with high metallic content).

- The caves, woodland, hedgerows and grazed fields provide excellent conditions for greater horseshoe bats which are recognised in two Special Area of Conservation (SAC) designations.

- Natural surface water is almost absent on the plateau owing to the permeability of the karst landscape, aside from where abandoned mine workings have retained, or created over time, areas of water. At the foot of the plateau springs emerge as the source of the Cheddar Yeo and Axe.

- Many industrial archaeological sites, reflecting the past lead, coal and cloth industries. The plateau has an outstanding assemblage of heritage assets from prehistoric features, such as burial mounds and hill forts, through to Second World War remains.

Continued on next page ...

Key characteristics continued

- Large-scale quarrying of limestone is particularly active in the eastern Mendips with super-quarries such as Whatley and Torr Works, though two smaller quarries, Callow and Batts Combe, remain active in the western Mendips.
- Buildings are constructed of red conglomerate, grey limestone and pale grey Doulting Stone. Older buildings in the Mendips are modest cottages in rough, exposed stone with almost no detailing of windows and doorways.
- Villages are concentrated along the springline at the foot of the scarp slopes. Elsewhere, settlement is scattered. Characteristic church towers are visible from great distances and designed landscapes of country houses with wooded parks are prominent in the east.
- Roman roads cross the hills contrasting with narrow sunken lanes which negotiate the scarp slopes. Major transport routes such as the M5 and A38 cut through the area using natural valleys. The A37 and A39 cut across the centre.

Cottages in local red dolomitic conglomerate.

Mendip Hills today

The predominantly Carboniferous Limestone landform of the Mendip Hills rises abruptly out of the flat landscape of the Somerset Levels and Moors to the south. To the north the land falls rapidly towards Blagdon and Chew Valley lakes and the undulating farmland of the Bristol, Avon Valleys and Ridges NCA. In the east, it descends into a complex pattern of low ridges as it gradually merges with the southern end of the Cotswolds, the Yeovil Scarplands and the Avon Vales. More resistant Devonian Sandstone forms some of the highest points on the hills including Black Down (the highest point at 322 m), Beacon Hill and North Hill near Priddy. There are extensive views from the edge of the plateau in all directions. Dramatic views of the Mendip Hills, particularly the southern scarp and western peaks, are gained from the surrounding lowland areas. The special qualities of the area are reflected in the designation of the western and central Mendips as an Area of Outstanding Natural Beauty (AONB), the designation extending into the adjoining Bristol, Avon Valleys and Ridges NCA incorporating Blagdon and Chew Valley lakes.

The Mendips are renowned for their classic karst landscape features, resulting from the response of the soluble limestone to water and weathering, creating complex underground cave and river systems and surface features including gorges, dry valleys, surface depressions, swallets, sink holes and fast-flowing springs, a number of which deposit tufa on the eastern part of the hills. The significance of the geology is reflected in the high number of geological Site of Special Scientific Interest (SSSI) designations (18 geological and 11 mixed interest) for a comparatively small NCA. Woodland lying within narrow valleys or covering steep slopes emphasises the variety of slopes and landforms, the most spectacular being the gorges of Cheddar, Ebbor and Burrington Combe. Wookey Hole and Cheddar Gorge provide easy access to the cave systems and are long-established tourist attractions. Burrington Combe also has caves which are used by outdoor pursuits businesses and are suitable for novice cavers.

The relief of the area results from the resistance to weathering of the Devonian Sandstone and Carboniferous Limestone and has had a major influence on land use and the distribution of semi-natural habitats through the resulting soils. Calcareous grassland on the limestone contrasts abruptly with heathland formed on the sandstone peaks. The thinner soils of the escarpment and some areas of the plateau suffer significantly from drought in summer and are not easily capable of agricultural intensification, allowing semi-natural habitats to remain. The woodlands and calcareous grasslands are generally of high nature conservation interest and the varied textures of the semi-natural grasslands are a particular feature of the southern slopes. The rare Cheddar pink occurs only in the Mendips, mainly in Cheddar Gorge which also supports a number of whitebeam micro species including the Cheddar whitebeam. There are four SAC designations in the NCA, two of which are for greater horseshoe bats which benefit from the combination of natural caves, woodland, hedgerows and grazing livestock (the North Somerset and Mendip Bats SAC and the Mells Valley SAC). The Mendip Limestone Grasslands SAC and the Mendip Woodlands SAC, which includes the two National Nature Reserves (NNRs) of Rodney Stoke and Ebbor Gorge, are designated for their respective habitats.

In some areas the Carboniferous Limestone and the Dolomitic Conglomerate have been mineralised with lead and zinc ores. These areas have been the subject of major mining activity in the past. The resultant areas of contaminated rough ground, known locally as 'gruffy ground', have created areas of rare calaminarian grassland supporting specialist heavy metal and contaminant tolerant species such as lead moss and spring sandwort.

From Black Down views over Burrington Combe to Vale of Wrington demonstrating the contrast between the heathland on the sandstone (foreground) and the calcareous grassland and pasture on the limestone plateau beyond.

The limestone plateau, with its outstanding assemblage of features from the Neolithic period such as burial mounds, henges and hill forts, falls largely within the AONB. It consists of an open landscape of rectilinear, medium-sized fields of 18th-century enclosure, bounded by grey limestone drystone walls, broken only by occasional shelterbelts of trees and scrub, or very open areas with wire fences, particularly around Charterhouse. Hedgerows and hedgerow trees are largely absent, and where the soils of the plateau are deeper they are generally more intensively farmed as either arable or grass leys. Much of the plateau is grazed by dairy cattle, while beef or sheep rearing has tended to predominate on the small, irregular fields and the remnant sheepwalks (large open areas for sheep grazing) of the escarpments. Lead contamination often restricts the length of time permitted for grazing stock on parts of the plateau, particularly around Charterhouse. At the foot of the south-western slopes, from Axbridge to Rodney Stoke, there is an area of high-quality agricultural land: the Strawberry Belt. It is used for intensive horticulture but this has significantly declined since before the loss of the railway in the 1960s and has continued to do so owing to a change in markets. To the west of the plateau, the land breaks up into groups of individual hills such as Bleadon and Crook Peak. These western hills still retain much of the character of the 18th-century open sheepwalks. Crook Peak and Wavering Down remain open downland in contrast to the small, hedged fields at their foot. Conifer plantations are largely limited to Rowberrow, East Harptree and Stockhill in the western Mendips.

Settlement on the plateau and western slopes takes the form of scattered farmsteads, chiefly built in locally quarried grey limestone. Compact villages follow the edges of the slopes and larger villages and towns, such as Axbridge and Cheddar, lie close to watercourses. The older buildings are of limestone or red conglomerate, with some pale-grey Lias near the coast. Weathered dull orange-red pantile roofs are a typical feature. Cheddar has a long tradition of, and is internationally associated with, cheese production.

The eastern Mendips are a more complex landscape of wooded valleys and agricultural land on intervening ridges. Hedgerows of varying height with many hedgerow trees enclose improved pasture used for dairy cattle. Ancient woodland occurs in the valleys and out onto the less steep ground. There are a few small conifer plantations. Marshy land is common in the valley bottoms and the area includes some neutral unimproved meadows and damp woodlands of high nature conservation interest. Large parks around country houses are a feature of the eastern Mendips, including those at Ammerdown, Mells and Ston Easton. Smaller parks occur around manor houses and some larger rectories, for example at Nunney, The Priory and Harptree Court. The 19th-century Cranmore Tower is a conspicuous landmark as are the column in Ammerdown Park and the radio mast at Pen Hill above Wells. As well as the parks themselves, there are many places where parkland trees lie within pasture fields or close to roads. Settlement is denser, although still dispersed, with scatterings of farmsteads and nucleated villages and the larger settlements of Wells and Shepton Mallet around the edge. A greater variety of building materials is to be seen in this eastern area, including thatch, honey-coloured oolite, greyer Doulting Stone and White Lias. The fine, tall 15th- and 16th-century church towers of Chewton, Mells, Winscombe and Leigh upon Mendip are visible from great distances and form distinctive features in many views. The 19th-century church of Downside Abbey, a major landmark in the eastern Mendips, is in the style and tradition of these towers.

Quarrying has long been a feature of the Mendips; however, now in the eastern Mendip Hills it is a major industry with active super-quarries seeking to expand. There are no large developments currently planned in the NCA, but the expansion of Bristol Airport to the north and Hinkley Point nuclear power station to the south will have impacts on views and tranquillity. There is continuing pressure for the development of wind turbines, solar farms and new power lines and for the expansion of visitor attractions at Cheddar Gorge. Some interest has also been shown in the potential of shale gas extraction through fracking.

The M5 cuts through the NCA north–south along the valley between Crook Peak and Loxton Hill but provides no direct access to the Mendip Hills. Access from the M5 is gained via A roads from Highbridge or Weston-super-Mare. There are no public railway links to the NCA, only commercial links to the two super-quarries.

Wells Cathedral.

The landscape through time

The striking contrast between the Mendip Hills and the surrounding low-lying landscape is a result of the geology, the Mendips having formed as a result of squeezing and folding during the late Devonian Variscan Orogeny, and differential weathering of the various rocks. The oldest rocks in the Mendip Hills are Silurian volcanic and Old Red Sandstone (Devonian) rocks which outcrop in the cores of four periclinal folds creating the highest points along the ridge. The main mass of the Mendips is made up of Carboniferous Limestone which extends beneath the eastern part of the hills but is overlain by more recent rocks of late Carboniferous, Triassic and Jurassic ages. The Upper Carboniferous rocks include part of the Somerset Coal Measures. Triassic strata include red mudstones of Mercia Mudstone and red conglomerate of the Dolomitic Conglomerate. At the eastern end of the hills, Jurassic rocks, including limestones of the Inferior Oolite, overlie the older rocks unconformably. The varying geology has given rise to a wide range of ground conditions. Soils vary with the nature of the parent materials although in general there is a predominance of deeper, more fertile, loamy soils which have allowed more intensive agricultural use and influenced land use and settlement patterns over the centuries.

There is abundant evidence of prehistoric settlement and activity on the western Mendip Hills, especially in the caves and fissures of the plateau edge and on the high lands of the plateau itself. Human activity dating from the Middle and Upper Palaeolithic is largely represented by assemblages of flint and chert tools, reflecting hunting and animal butchery in a period dominated by climatic change. Around 12,000 years ago, after the last ice sheets receded, people once again returned to the Mendip Hills. Human remains recovered from Aveline's Hole represent one of the most important Early Mesolithic burial sites in Europe, the remains comparable with the famous Cheddar Man from Gough's Cave. Long barrows, earthwork enclosures and henge monuments of Gorsey Bigbury and Priddy Circles are evidence of extensive Neolithic activity. In the Bronze Age over 300 barrows were constructed across the Mendips plateau, forming a ritual landscape of national significance, and trees were felled to make way for blocks of planned fields. Large hill forts from the Iron Age such as Dolebury and smaller sites such as Banwell are evidence of a complex pattern of territories and lordship. A series of forts and settlements from this period also follow the ridge into the eastern Mendips. Mineralisation of the Carboniferous Limestone and Triassic conglomerates resulting in deposits of lead, silver and other minerals (iron, copper, barytes and calamine) probably drew the Romans to the area, and a major mining settlement and fort were established at Charterhouse.

View from Chancellor's Farm (Somerset Wildlife Trust) to Priddy Nine Barrows.

Several major Roman roads were constructed across the hills, linking settlements, industrial sites and military routes; the routes of these roads are still in use today. It is apparent that the Saxons came to a well-settled and substantially cleared landscape. They established or took over strong rule from central places such as Axbridge and Cheddar and this influenced much of the subsequent landscape pattern. Wells became a Bishop's See in the 8th century and has been an important centre ever since.

From the late Saxon period to the 14th century the plateau and much of the surrounding land was a royal forest. This status exerted less influence on the landscape than the exploitation of grassland, the vast sheepwalks which covered the higher ground, and the development of a prosperous textile industry in the surrounding villages and towns. Lead mining revived in the 12th century, if not before, but was insignificant as a source of wealth compared with wool. The prosperity of the wool industry is reflected in Abbot Selwood's attempt to lay out a new settlement at Mells in 1475, the many spectacular church towers and the fortified mansion of Nunney Castle.

Surrounding the sheepwalks, cultivation of the land around villages intensified with a complex pattern, partly in open fields locally extending up the hills as lynchets (unploughed strips forming a boundary between two areas of cultivation). Post-medieval industry also had a strong influence on the formation of the landscape. The cloth industry continued to flourish until the 18th century. The cores of the principal Mendip Hills towns and villages took their present form with clusters of roughly dressed or rubble stone cottages contrasting with the grander merchants' houses. The lead mining industry began to develop rapidly in the 16th century and reached its peak in the 17th century. Today the remains of mining activity, including gruffy ground, buddle pits and dams, reflect the piecemeal nature of many mining ventures. Landscapes such as the village of Shipham and its surroundings were formed in a flurry of chaotic excavations and piecemeal enclosure of small plots of land. After about 1670 the lead industry began to decline but revived in the mid-19th century when many tips were re-worked. Much of the present evidence of mining dates from that period.

Other industries developed in the post-medieval period such as paper making and edged tools, notably along the Mells Valley. The coal industry was a dominant influence on the eastern Mendips, only coming to an end in the 1970s. The sprawling villages, tips – now commonly covered with new woodlands – and remains of older bell pits are still evident in the east Mendip Hills landscape. Evidence of the wealth of post-medieval Mendip is present in numerous landscape parks such as Mells and Humphry Repton's Ston Easton. During the prosperity of the textile industry, there was only gradual change in the farming landscape but, at the end of the 18th century, the remaining open sheepwalks were enclosed with the present pattern of drystone walls and hedgerows. Reclamation of the land for agriculture was poorly managed and by the 1930s much of it was scrub and rough pasture, only to be agriculturally improved in the post-war period.

The Mendip woodlands were managed to provide products for local consumption. A wide range of timber sizes were required, together with charcoal for domestic use. Woods in the east of the area would have provided mining timber for the Somerset Coalfield. The dominant management in the Mendip woods was that of coppicing to provide poles of various sizes and other products such as hurdles and faggots. Standard trees of oak would provide larger section timbers for buildings. Very few trees of great age remain in the Mendip woods, although some coppice stools are, because of their immense size, considered to be several centuries old.

Quarrying of stone for building and in the case of limestone also for burning to produce lime has been a major feature of the Mendip Hills for centuries. In the 20th century the older Mendip Hills industries disappeared while quarrying expanded greatly, particularly in the eastern Mendips, with massive quarries such as Whatley and Torr Works being carved out of the hills. These enormous workings are remarkably well hidden in the landscape and can easily be passed 100 m from the edge without being seen. They can impact on tranquillity with the noise from warning sirens, explosives and heavy machinery and the movement of large haulage vehicles carrying stone along the Mendip roads. In addition to their direct effects quarries can also result in the lowering of the groundwater table in the surrounding area as they are pumped dry. This is known to cause the drying-up of springs in the eastern Mendips area.

Changes in agriculture since the 1940s have seen a dramatic increase in the productivity of better land together with a decline in the use of marginal land. However, much more marginal land is now being grazed, often supported by agri-environment schemes. Vast tracts of steeply sloping land remain either ungrazed or only sporadically grazed. Most of the traditional hay meadows have been lost and scrub and bracken have invaded substantial areas of herb-rich calcareous grassland. In recent years outdoor pig rearing had become a feature of the more marginal areas of the plateau leading to a loss of semi-natural grassland, but this has now significantly declined. More intensive grassland management has also led to the loss of karst landscape features by the filling of swallet holes on the Mendip plateau, together with some loss of drystone walls through deterioration, and localised hedgerow removal.

The designation of the Mendip Hills AONB in 1972 has contributed to increasing management of the land for landscape and nature conservation objectives.

Torr Works limestone super-quarry, east Mendips.

Ecosystem services

The Mendip Hills NCA provides a wide range of benefits to society. Each is derived from the attributes and processes (both natural and cultural features) within the area. These benefits are known collectively as 'ecosystem services'. The predominant services are summarised below. Further information on ecosystem services provided in the Mendip Hills NCA is contained in the 'Analysis' section of this document.

Provisioning services (food, fibre and water supply)

- **Food provision**: Cheddar has a long tradition of, and is internationally associated with, cheese production. Dairying is prevalent on the plateau, including land owned by the Yeo Valley dairy, a national food producer.

- **Water availability**: The entire NCA lies over an important Carboniferous Limestone aquifer which is designated as a Major Aquifer Unit, making a major contribution to public water supply and supplying Bristol and the surrounding area via Cheddar, Blagdon and Chew Valley lakes. The Mendip aquifer also supplies the hot springs in Bath; conditions at Whatley super-quarry require regular monitoring of the local water regime to assess any impacts on both the local hydrogeology and the Bath hot springs.

Regulating services (water purification, air quality maintenance and climate regulation)

- **Regulating soil erosion**: The vast majority of soils covering this NCA, in the region of 95 per cent, are at risk of erosion where management results in loss of stabilising vegetation. This is exacerbated by the steep slopes and high precipitation. Sustainable systems of arable cultivation and well-managed livestock to reduce poaching and soil exposure, particularly on steeper slopes, should be encouraged.

- **Regulating water quality**: A large part of the NCA is within a Groundwater Source Protection Zone due to its contribution to public water supply. Groundwater quality is generally good. The ecological quality of the emergent rivers is largely moderate, while the Mells River and Whatley Brook emerging at the far eastern end are of good ecological status. Parts of the Mendip Hills fall within the Congresbury Yeo catchment, part of the North Somerset Moors Catchment Sensitive Farming Priority Catchment.

Cultural services (inspiration, education and wellbeing)

- **Sense of place/inspiration**: The Mendip Hills have a very strong character defined by their geology and position rising abruptly from the Somerset Levels. The special character of the western Mendips is reflected by the AONB designation and includes species-rich woodlands, calcareous grassland and the sparsely settled open plateau defined by rectilinear drystone wall enclosures, contrasting with the valleys to the east, which are often well settled and wooded and have complex hedgerow patterns. The character of the eastern Mendips is most significantly impacted by the extensive quarrying in that part of the NCA, with implications for the landscape, tranquillity, habitats and hydrology of the area.

- **Sense of history**: The history of the landscape is evident in a strong influence which ranges from prehistoric settlement and activity to post-medieval industrial archaeology. There is abundant prehistoric evidence on the western Mendip Hills in particular, with the henges of Gorsey Bigbury and Priddy Circles forming, in combination with over 300 bronze-age barrows, a ritual landscape of national significance. Large hill forts from the Iron Age such as Dolebury and smaller sites such as Banwell are evidence of a complex pattern of territories and lordship. The hills' deposits of lead, silver and other metals were mined by the Romans and continued to be exploited until the 19th century. Quarries and pits are evidence of the area's importance to mining. The range of field patterns across the area reflects the various histories of enclosure and settlement.

- **Recreation**: This NCA is accessible to the large populations of Bristol, Bath and Weston-super-Mare and the smaller surrounding settlements. Tourism is important to the area, Wookey Hole and Cheddar Gorge drawing in large numbers of visitors. Caving and potholing are significant activities within the many cave features of the hills, and new features continue to be discovered. Cycling and walking are also popular activities.

- **Biodiversity:** Two thousand hectares of the area is designated as SSSI, 7 per cent of the NCA area, and there are four SAC and 2 NNRs within the NCA. Ash woodland and calcareous grasslands are internationally designated as well as sites for greater horseshoe bats.

- **Geodiversity:** There are 18 nationally designated geological SSSI in this NCA, plus 11 of mixed interest and 37 Local Geological Sites, reflecting the importance of the geological interest within this comparatively small NCA. The geological interest ranges from the natural features of exposed rocks, dry gorges, sink holes, areas of sunken ground and cave systems of the classic Carboniferous Limestone karst landscape to sandstone peaks and a long history of quarrying and mining which ties it closely to the history and culture of the area.

Rock climbing, abseiling and caving are popular recreational pursuits well catered for by the geology of the Mendip Hills.

Statements of Environmental Opportunity

SEO 1: Conserve the distinctive combination of historic field boundaries, field and settlement patterns and land uses that have shaped the landscape of the Mendip Hills. Safeguard inward and outward views of and to the distinctive hill line and conserve and enhance the special qualities, tranquillity, and sense of remoteness and naturalness of the area.

For example, by:

- Conserving and restoring drystone walls, characteristic of the plateau, western and central hills, which are in long-term decline as they collapse with age and require regular maintenance, which is labour intensive and expensive.
- Considering hedgerow restoration and replacement tree planting in some of the eastern parts of the area where hedgerow removal and tree loss have produced an open landscape that is out of character.
- Conserving historic parkland and protecting and replacing parkland trees, an important feature of the landscapes of the southern and eastern sides of the National Character Area (NCA).
- Ensuring that new development respects local settlement patterns and local vernacular architecture and building materials in keeping with the character of the whole of the NCA, particularly in the east which is not provided with the extra protection of the Area of Outstanding Natural Beauty (AONB).
- Contributing to consultations on the impacts of proposed developments that will impact on the views and tranquillity of the NCA, such as the further development of Bristol Airport which will affect the AONB in terms of noise, light and air pollution.
- Minimising the impact of road traffic and road signs, particularly within the AONB.
- Minimising light pollution sources where possible to retain the dark skies quality of the area.
- Controlling and minimising the visual impact of radio and telecommunication masts, overhead power lines and wind turbines, both inside and outside the area.
- Maintaining the appropriate balance of grassland and heath, limestone exposures and farmed land in keeping with the landscape character of the area.
- Maintaining the diversity of geology and traditional buildings that contributes to the NCA by using, promoting and encouraging locally sourced materials and skills for walling and building repair and construction.
- Improving the condition of heritage assets through appropriate measures and seeking to reduce conflicting or unsympathetic management regimes.
- Conserving and interpreting archaeological earthworks and sub-surface archaeology, while recognising the potential for undiscovered remains.

SEO 2: Safeguard the rich geological features of this renowned karst landscape, the many archaeological features associated with the upland ridge and the historical mining legacy, enabling access, continued research, interpretation, understanding and enjoyment of the extensive geological and historical resource.

For example, by:

- Conserving and protecting the archaeological features of the plateau and the industrial archaeology features of the whole NCA, which are vulnerable to damage and neglect, scrub invasion and, to a lesser extent, arable expansion, through management agreements and advice to owners and tenants.
- Protecting areas of 'gruffy ground' and other former lead mining features that can be lost through agricultural improvement or ploughing, through management agreements and advice to owners and tenants.
- Ensuring that, in undertaking land management activities, care is taken to identify important archaeological features and minimise adverse impacts of machinery or drainage.
- Encouraging greater understanding and awareness of the importance and value of the heritage assets of the AONB.
- Encouraging the uptake of agri-environment agreements which incorporate the protection of historic features and field boundary maintenance and restoration using appropriate materials.
- Maintaining the largely good condition of geological Sites of Special Scientific Interest and other geological sites in this area and working with landowners to improve the condition where required, for example controlling scrub encroachment on rockfaces and other geological and archaeological features.
- Recognising, conserving and enhancing significant geological sites and features by advising landowners and users, for example climbers and cavers, about management issues.
- Promoting and ensuring responsible recreational use of geological and archaeological sites through provision of information and well-designed visitor infrastructure.
- Maintaining views of geological features and exposures and where appropriate improving access to cuttings, quarries and other exposures of geological features including soils to enable improved understanding and enjoyment of geodiversity and sense of history.
- Enhancing and promoting the research interest of the geology and conserving geological heritage such as mining and quarrying history.
- Realising opportunities for enhancements to the public rights of way network through rights of way management plans. Improved access opportunities should incorporate enhanced interpretation, particularly of heritage assets and features.
- Conserving and appropriately managing the historic environment, including heritage assets, for its contribution to local character and sense of identity and as a framework for habitat restoration and sustainable development.

SEO 3: Conserve and sustainably manage the rural agricultural landscape and enhance the network of nationally and internationally important sites and semi-natural habitats associated with the distinctive geology and topography to create a coherent and resilient ecological network, enabling ecosystems to adapt to climate change and for the benefits to biodiversity, water flow, water quality and protection of the aquifer, soil quality, regulating soil erosion, rural heritage and culture.

For example, by:

- Ensuring that quarrying is carried out in the least environmentally damaging manner until the consents expire, and that proper consideration is given to after-use and restoration to enhance the ecological network.
- Bringing neglected woodlands back into appropriate management for biodiversity and landscape value, for example through coppicing, providing a source of local wood fuel, while maintaining the retention of the important deadwood component for biodiversity benefit.

Bluebells in Cheddar Woods SSSI.

- Encouraging the formation of a local Woodland Association for the Mendips, as seen in the Blackdowns and in West Somerset, bringing together owners, agents, contractors and other interested parties to support each other and encourage woodland management.
- Encouraging community management of key woodland habitats where possible and promoting the importance of woodland habitats in neighbourhood planning activities throughout Mendip.
- Restoring, expanding and linking existing fragmented areas of broadleaved woodland to create coherent, resilient ecological networks. Ensuring that new woodlands are created in suitable locations and include native species that are suitable for the physical location, thus contributing to the biodiversity resource, making the habitats more resilient to climate change, avoiding damage to historic features and strengthening landscape character.
- Protecting and managing the ash woodlands which make up the majority of ancient semi-natural woodlands on the Mendip Hills to maximise benefit for the landscape and wildlife, and encouraging research and field trials for appropriate best alternatives to ash, in the face of extensive chalara ash die-back in Mendip woodlands.
- Managing and protecting heathland areas of the central plateau and northern slopes which are at risk from fire, leading to invasion by bracken and erosion.

Continued on next page...

SEO 3: Conserve and sustainably manage the rural agricultural landscape and enhance the network of nationally and internationally important sites and semi-natural habitats associated with the distinctive geology and topography to create a coherent and resilient ecological network, enabling ecosystems to adapt to climate change and for the benefits to biodiversity, water flow, water quality and protection of the aquifer, soil quality, regulating soil erosion, rural heritage and culture.

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- Enhancing signage, paths, parking and other facilities to minimise congestion, erosion and other problems in key heathland areas, as well as continuing to provide information to help visitors to understand the importance and vulnerability of the heathland areas, especially the Blackdown, Charterhouse and Priddy Mineries areas.
- Encouraging the conversion of suitable plantation and marginal grassland areas to heathland to strengthen the currently very fragmented heathland network.
- Protecting, managing and expanding the lowland calcareous grassland network throughout the NCA which has declined under agricultural improvement, or has been prone to neglect, undergrazing and scrub encroachment, managing and consolidating through controlled grazing regimes and scrub control.
- Enhancing the ecological permeability of the landscape through maintaining and encouraging areas of semi-natural grassland within designed parkland, promoting sympathetic management of species-rich grassland on road verges and tracks, and encouraging the targeted uptake of agri-environment scheme options that promote legume and herb-rich swards for silage production on temporary grasslands on the plateau as a means of increasing the permeability of intensive agricultural land for wildlife.
- Encouraging continuation of traditional hay meadow management while preserving traditional breeds, rare species and characteristic habitats; protecting soil structure, carbon content and permeability; maintaining the purpose and function of typical landscape features such as walls, hedges, traditional farmsteads and field barns; and protecting water quality. Environmental schemes and support for marketing of local farm produce could play an important role.
- Working with farmers to reduce sources of diffuse agricultural pollution into the groundwater and watercourses, and run-off and soil erosion into watercourses, for example by ensuring that they have adequate access to soil analysis to enable the calculation of appropriate levels of fertiliser inputs to reduce energy wastage and benefit water quality, and maintaining appropriate stocking levels and tillage regimes.
- Encouraging the maintenance and restoration of drystone walls and hedgerows across slopes to slow run-off and reduce soil erosion.
- Encouraging farmers to maintain or improve soil condition of cultivated soils through incorporation of appropriate levels of organic matter, increasing water retention and infiltration but not causing groundwater pollution.
- Continuing to ensure that conditions are applied to quarrying and any other mineral or gas extraction, such as fracking, to minimise impacts on groundwater hydrology, including that of the Bath hot springs, a significant tourist attraction in the neighbouring Cotswolds NCA.

Supporting document 1: Key facts and data

Area of Mendip Hills National Character Area (NCA): 30,300 ha

1. Landscape and nature conservation designations

Much of the Mendip Hills Area of Outstanding Natural Beauty (15,942 ha) lies within the boundaries of the NCA and comprises 53 per cent of the total NCA area.

- Management plans for the protected landscape can be found at: www.mendiphillsaonb.org.uk/

Source: Natural England (2011)

1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

Tier	Designation	Name	Area (ha)	% of NCA
International	n/a	n/a	0	0
European	Special Protection Area (SPA)	n/a	0	0
	Special Area of Conservation (SAC)	North Somerset & Mendip Bats SAC, Mendip Limestone Grasslands SAC, Mendip Woodlands SAC, Mells Valley SAC	1,046	3
National	National Nature Reserve (NNR)	Rodney Stoke NNR, Ebbor Gorge NNR	98	<1
	Site of Special Scientific Interest (SSSI)	A total of 46 sites wholly or partly within the NCA	2,187	7

Source: Natural England (2011)

Please Note: (i) Designated areas may overlap (ii) all figures are cut to Mean High Water Line, designations that span coastal areas/views below this line will not be included.

There are 158 Local sites in the Mendip Hills NCA covering 2,062 ha which is 7 per cent of the NCA.

Source: Natural England (2011)

- Details of individual Sites of Special Scientific Interest can be searched at: http://www.sssi.naturalengland.org.uk/Special/sssi/search.cfm
- Details of Local Nature Reserves (LNR) can be searched at: http://www.lnr.naturalengland.org.uk/Special/lnr/lnr_search.asp
- Maps showing locations of Statutory sites can be found at: http://magic.defra.gov.uk/website/magic/ – select 'Rural Designations Statutory'

1.1.1 Condition of designated sites

SSSI Condition Category	Area (ha)	Percentage of NCA SSSI Resource
Unfavourable declining	108	5
Favourable	983	45
Unfavourable no change	157	7
Unfavourable recovering	843	39

Source: Natural England (March 2011)

- Details of SSSI condition can be searched at: http://www.sssi.naturalengland.org.uk/Special/sssi/reportIndex.cfm

2. Landform, geology and soils

2.1 Elevation

The Mendip Hills lie to the south of Bristol, rising dramatically out of the flat Somerset Levels and Moors landscape to the south and west, ranging from a minimum elevation of 0.8 m above sea level to 322 m across the NCA.

Source: Mendip Hills Countryside Character area description

2.2 Landform and process

The response of the limestone to weathering has resulted in a range of surface features, including gorges, dry valleys, screes and dolines. These are complemented underground by a large number of caves both beneath the plateau and at the base of the southern escarpment. The Devonian and Silurian rocks are generally more resistant to weathering and form some of the highest points on the hills.

Source: Mendip Hills Countryside Character area description, Mendip Hills Natural Area Profile

2.3 Bedrock geology

The Mendips are a classic Carboniferous limestone karst landscape with exposed rocks, dry gorges, sink-holes, areas of sunken ground and cave systems. The Cheddar Gorge is one of the finest limestone gorges in England. The Mendips were subject to folding during the Variscan Orogeny (mountain-building episode), forming a system of four periclines with Devonian Old Red Sandstones and Silurian volcanics exposed at the cores. More recent rocks of late Carboniferous, Triassic and Jurassic ages are present here, including the Upper Carboniferous part of the Somerset Coal Measures. Triassic strata include red mudstones of Mercia Mudstone and red conglomerate of the Dolomitic Conglomerate. At the eastern end of the Hills, Jurassic rocks, including limestones of the Inferior Oolite, overlie the older rocks unconformably. In some areas the Carboniferous Limestone and the Dolomitic Conglomerate have been mineralised with lead and zinc ores.

Source: Mendip Hills Countryside Character area description, Mendip Hills Natural Area Profile, British Geological Survey maps

2.4 Superficial deposits

There is a small area of alluvium in the west of the Character Area, roughly following the path of the River Lox Yeo.

Source: Mendip Hills Countryside Character area description, Mendip Hills Natural Area Profile, British Geological Survey maps

2.5 Designated geological sites

Tier	Designation	Number
National	Geological Site of Special Scientific Interest (SSSI)	18
National	Mixed Interest SSSIs	11
Local	Local Geological Sites	37

Source: Natural England (2011)

- Details of individual Sites of Special Scientific Interest can be searched at: http://www.sssi.naturalengland.org.uk/Special/sssi/search.cfm

2.6 Soils and Agricultural Land Classification

This NCA is underlain by limestone and supports characteristically species-rich grasslands and woodlands on thin soils. Soil conditions vary with the nature of the parent materials although in general there is a predominance of deeper, more fertile, loamy soils. These have allowed more intensive agricultural use.

Source: Mendip Hills Countryside Character area description

The main grades of agricultural land in the NCA are broken down as follows (as a proportion of total land area):

Grade	Area (ha)	% of NCA
Grade 1	755	2
Grade 2	723	2
Grade 3	19,203	63
Grade 4	7,129	24
Grade 5	1,318	4
Non-agricultural	670	2
Urban	496	2

Source: Natural England (2010)

- Maps showing locations of Statutory sites can be found at: http://magic.defra.gov.uk/website/magic/ – select 'Landscape' (shows ALC classification and 27 types of soils).

3. Key water bodies and catchments

3.1 Major rivers/canals

The following major rivers/canals (by length) have been identified in this NCA:

- No major rivers/canals are present in this NCA

Source: Natural England (2010)

Please note: Other significant rivers (by volume) may also occur. These are not listed where the length within the NCA is short.

3.2 Water quality

The total area of Nitrate Vulnerable Zone (NVZ) is 14,434 ha, 48 per cent of NCA.

Source: Natural England (2010)

3.3 Water Framework Directive

Maps are available from the Environment Agency showing current and projected future status of water bodies at:

http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e

4. Trees and woodlands

4.1 Total woodland cover

The NCA contains 4,034 ha of woodland (13.3 per cent of the total area), of which 963 ha is ancient woodland.

Source: Natural England (2010),

4.2 Distribution and size of woodland and trees in the landscape

The plateau and hilltops are largely treeless, except for a few old ash pollards and wind-shaped shelterbelts and conifer plantations. The slopes and valleys surrounding the plateau have a wide range of woodlands forming an attractive mosaic with open land and other land uses.

Source: Countryside Quality Counts, Natural England (Countryside Agency 2003)

4.3 Woodland types

A statistical breakdown of the area and type of woodland found across the NCA is detailed below.

Area and proportion of different woodland types in the NCA (over 2 ha)

Woodland type	Area (ha)	% of NCA
Broadleaved	2,994	9.9
Coniferous	506	1.7
Mixed	4	0
Other	530	1.7

Source: Forestry Commission (2011)

Area and proportion of Ancient Woodland and Plantations on Ancient Woodland Sites (PAWS) within the NCA

Type	Area (ha)	% of NCA
Ancient semi-natural woodland	831	3
Planted Ancient Woodland (PAWS)	132	<1

Source: Natural England (2004)

5. Boundary features and patterns

5.1 Boundary features

There is a mixture of enclosure. Hedgerows are the dominant field boundary of the NCA but dry stone walls dominate the plateau and are present on some of the eastern slopes.

Source: Mendip Hills Countryside Character Area description; Countryside Quality Counts (2003)

5.2 Field patterns

The plateau comprises mainly pasture in medium-size fields divided primarily by dry stone walls, with few hedges and trees. Unimproved limestone grassland is found on steep southern slopes. Fields on these slopes are generally smaller and irregular, especially near the base. The eastern part of the area comprises mainly improved pasture for cattle and dairying.

Source: Mendip Hills Countryside Character Area description; Countryside Quality Counts (2003)

6. Agriculture

The following data has been taken from the Agricultural Census linked to this NCA.

6.1 Farm type

The most notable change is the decline in number of dairy farms, which have fallen from 101 in 2000 to 60 in 2009. Cereals and horticulture show slight increases and farms classed as "mixed" have also risen. Other farm numbers stayed relatively stable.

Source: Agricultural Census, Defra (2010)

6.2 Farm size

Numbers of all farm sizes fell between 2000 and 2009, apart from large (over 100 ha) farms which increased from 59 in 2000 to 67 in 2009.

Source: Agricultural Census, Defra (2010)

6.3 Farm ownership

2009: Total farm area = 21,744 ha; owned land = 14,173 ha

2000: Total farm area = 19,584 ha; owned land = 13,110 ha

Source: Agricultural Census, Defra (2010)

6.4 Land use

The majority of the character area is under improved pasture, with some horticulture in the south west. Pig rearing is becoming more apparent on the plateau despite an overall fall in numbers.

Source: : Agricultural Census, Defra (2010)

6.5 Livestock numbers

Numbers of all livestock fell between 2000 and 2009. Sheep numbers fell by 21 per cent, cattle by 16 per cent and pigs by 12 per cent.

Source: Agricultural Census, Defra (2010)

6.6 Farm labour

The number of salaried managers increased threefold between 2000 and 2009 and part time numbers also rose. Casual or gang workers dropped in number by about a third while full time numbers remained relatively stable with only a slight decrease.

Source: Agricultural Census, Defra (2010)

Please Note: (i) Some of the Census data is estimated by Defra so will not be accurate for every holding (ii) Data refers to Commercial Holdings only (iii) Data includes land outside of the NCA belonging to holdings whose centre point is within the NCA listed.

7. Key habitats and species

7.1 Habitat distribution/coverage

Mixed deciduous woodland, with species particularly associated with limestone, is found along the southern scarp slope and is of international importance. Lowland meadow tends to be found on the central plateau, while Lowland calcareous grassland is characteristic of the southern scarp. Small areas of heath are also found on the higher parts of the plateau. Caves and

areas of exposed limestone are of considerable importance; the former an essential habitat supporting the internationally important numbers of bats to be found in the area.

Source: Mendips Natural Area Profile

7.2 Biodiversity Action Plan (BAP) priority habitats

The Government's new strategy for biodiversity in England, Biodiversity 2020, replaces the previous Biodiversity Action Plan (BAP) led approach. Priority habitats and species are identified in Biodiversity 2020, but references to BAP priority habitats and species, and previous national targets have been removed. Biodiversity Action Plans remain a useful source of guidance and information. More information about Biodiversity 2020 can be found at:

http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/englandsbiodiversitystrategy2011.aspx

The NCA contains the following areas of mapped priority habitats (as mapped by National Inventories). Footnotes denote local/expert interpretation. This will be used to inform future national inventory updates.

Habitat	Area (ha)	% of NCA
Lowland calcareous grassland	763	3
Lowland heathland	397	1
Lowland dry acid grassland	356	0
Lowland meadows	352	1
Floodplain grazing marsh	163	<1
Upland heath	142	<1
Reedbeds	53	<1
Purple moor grass	7	<1

Source: Natural England (2011)

- Maps showing locations of UK BAP priority habitats are available at: http://magic.defra.gov.uk/website/magic/ select 'Habitat Inventories'

7.3 Key species and assemblages of species

- Maps showing locations of UK BAP priority habitats are available at: http://magic.defra.gov.uk/website/magic/
- Maps showing locations of S41 species are available at: http://data.nbn.org.uk/

8. Settlement and development patterns

8.1 Settlement pattern

Villages are concentrated at the foot of the plateau slopes. Elsewhere, settlement is scattered. Major transport routes such as the M5 and A38 cut through the area.

Source: Mendip Hills Countryside Character Area description; Countryside Quality Counts (2003)

8.2 Main settlements

The main settlements within the Mendips NCA are: Wells; Shepton Mallet and Cheddar.

Source: Mendip Hills Countryside Character Area description; Countryside Quality Counts (2003)

8.3 Local vernacular and building materials

Buildings are constructed of red conglomerate, grey limestone and pale grey Doulting Stone. Most older Mendip buildings are modest cottages in rough, exposed stone with almost no detailing of windows and doorways. Stone is the predominant building material with pantile roofs. Limestone, red conglomerate and honey-coloured oolite are favoured to the east of area. White Lias is found around Stone Easton and Chilcompton.

Source: Mendip Hills Countryside Character Area description; Countryside Quality Counts (2003)

9. Key historic sites and features

9.1 Origin of historic features

Abundance of evidence for prehistoric settlement. The plateau has an outstanding assemblage of bronze- and iron-age features such as burial mounds and hill forts. There are many industrial archaeological sites, reflecting the past lead, coal and cloth industries. The landscape is marked by continuous mining activity – lead from pre-Roman times until early 20th century; zinc from mid-16th to mid 19th centuries; and coal until the 1970s. There are numerous churches with fine towers dating mostly from 15th and 16th centuries. Quarrying is a prominent characteristic of this landscape with visible remains of ancient quarries and large scale quarrying continuing to present day. Nearly 2 per cent of the area is actively or has been recently worked for stone.

Source: Countryside Quality Counts; Draft Historic Profile, Countryside Character Area description

9.2 Designated historic assets

This NCA has the following historic designations:

- 5 Registered Parks and Gardens covering 244 ha
- 0 Registered Battlefields
- 238 Scheduled Monuments
- 1,204 Listed Buildings

Source: Natural England (2010)

More information is available at the following address:

- http://www.english-heritage.org.uk/caring/heritage-at-risk/
- http://www.english-heritage.org.uk/professional/protection/process/national-heritage-list-for-england/

10. Recreation and access

10.1 Public access

- 7 per cent of the NCA 2,000 ha is classified as being publically accessible.
- There are 686 km of public rights of way at a density of 2.3 km per km^2.
- There are 0 national trails within the Mendips NCA.

The following table shows the breakdown of land which is publically accessible in perpetuity:

Access designation	Area (ha)	% of NCA
National Trust (Accessible all year)	474	2
Common Land	747	2
Country Parks	0	0
CROW Access Land (OC and RCL)	1,566	5
CROW Section 15	722	2
CROW Access Land (Section 16 Dedicated)	69	<1
Village Greens	4	<1
Doorstep Greens	0	0
Forestry Commission Walkers Welcome Grants	61	<1
Local Nature Reserves (LNRs)	8	<1
Millennium Greens	1	<1
Accessible National Nature Reserves (NNRs)	47	<1
Agri-environment Scheme Access	41	<1
Woods for People	323	1

Sources: Natural England (2011)

Please Note: Common Land refers to land included in the 1965 commons register; CROW = Countryside and Rights of Way Act 2000; OC and RCL = Open Country and Registered Common Land.

11. Experiential qualities

11.1 Tranquillity

Based on the CPRE map of Tranquillity (2006) much of the area is relatively tranquil. Weston-super-Mare and the M5 affect tranquillity to the west of the area, as does the most active area of quarrying, the A39 and the A367 to the east.

A breakdown of tranquillity values for this NCA are detailed in the table below:

Category of tranquillity	Score
Highest value within NCA	33
Lowest value within NCA	-58
Mean value within NCA	-3

Sources: CPRE (2006)

- More information is available at the following address: http://www.cpre.org.uk/what-we-do/countryside/tranquil-places/in-depth/item/1688-how-we-mapped-tranquillity?highlight=YToxOntpOjA7czoxMjoidHJhbnF1aWxsaXR5Ijt9

11.2 Intrusion

The 2007 Intrusion Map (CPRE) shows the extent to which rural landscapes are 'intruded on' from urban development, noise (primarily traffic noise), and other sources of visual and auditory intrusion. This shows that while the western tip of the NCA is entirely disturbed or urban, there are large patches of undisturbed areas throughout the remainder, with few major roads and a couple of small settlements. A breakdown of intrusion values for this NCA are detailed in the table below.

Category of intrusion	1960s (%)	1990s (%)	2007 (%)	% change (1960s-2007)
Disturbed	10	30	42	32
Undisturbed	89	69	55	-34
Urban	<1	<1	2	1

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are a loss of undisturbed land and an increase of that classed as urban.

- More information is available at the following address: http://www.cpre.org.uk/resources/countryside/tranquil-places/item/1790-developing-an-intrusion-map-of-england?highlight=YToxOntpOjA7czo5OiJpbnRydXNpb24iO30=

From Draycott Sleights the arc of hills can be seen rising abruptly from the levels, extending past Cheddar to Bleadon Hill.

12. Data sources

- British Geological Survey (2006)
- Natural Area Profiles, Natural England (published by English Nature 1993-1998)
- Countryside Character Descriptions, Natural England (regional volumes published by Countryside Commission/Countryside Agency 1998/1999)
- Joint Character Area GIS boundaries, Natural England (data created 2001)
- National Parks and AONBs GIS boundaries, Natural England (2006)
- Heritage Coast Boundaries, Natural England (2006)
- Agricultural Census June Survey, Defra (2000,2009)
- National Forest Inventory, Forestry Commission (2011)
- Countryside Quality Counts Draft Historic Profiles, English Heritage (2004)*
- Ancient Woodland Inventory, Natural England (2003)
- BAP Priority Habitats GIS data, Natural England (March 2011)
- Special Areas of Conservation data, Natural England (data accessed in March 2011)
- Special Protection Areas data, Natural England (data accessed in March 2011)
- Ramsar sites data, Natural England (data accessed in March 2011)
- Sites of Special Scientific Interest, Natural England (data accessed in March 2011)
- Detailed River Network, Environment Agency (2008)
- Source protection zones, Environment Agency (2005)
- Registered Common Land GIS data, Natural England (2004)
- Open Country GIS data, Natural England (2004)
- Public Rights of Way Density, Defra (2011)
- National Trails, Natural England (2006)
- National Tranquillity Mapping data, CPRE (2007)
- Intrusion map data, CPRE (2007)
- Registered Battlefields, English Heritage (2005)
- Record of Scheduled Monuments, English Heritage (2006)
- Registered Parks and Gardens, English Heritage (2006)
- World Heritage Sites, English Heritage (2006)
- Incorporates Historic Landscape Characterisation and work for preliminary Historic Farmstead Character Statements (English Heritage/Countryside Agency 2006)

Please note all figures contained within the report have been rounded to the nearest unit. For this reason proportion figures will not (in all) cases add up to 100%.
The convention <1 has been used to denote values less than a whole unit.

Supporting document 2: Landscape change

Recent changes

Trees and woodlands

- Between 1999 and 2003 an area equivalent to 8 per cent of the 1999 total stock was planted (239 ha). New woodland through Woodland Grant Scheme planting has occurred mostly in the form of small blocks concentrated in a limited number of locations, such as west of Frome and north of Wells, or in a major block on the north slope of the central plateau area. The latter represent woodland creation on farmland purchased by the Will Woodlands Charitable Trust. Opportunities for further woodland expansion have been relatively limited and have had to be examined on a case-by-case basis.

Boundary features

- Between 1999 and 2003 Countryside Stewardship capital agreements were made for linear features included fencing (42 km), hedgerow management (16 km), hedgerow planting and restoration (14 km), restored boundary protection (15 km), and stone wall restoration (10 km). The estimated boundary length for the NCA is about 2,696 km. Total length of agreements between 1999 and 2003 is equivalent to about 4 per cent of this total suggesting the resource had been widely neglected[4].

- Between 2005 and 2008 the AONB 'Lifelines' project surveyed walls and undertook training in stone wall maintenance and repair and in 2006 the hedgerows within the Bath and north-east Somerset area parishes were surveyed and records added to the Bristol Regional Environmental Record Centre (BRERC) data base.

- In 2011, 442 km, or 16 per cent of boundary features were under Environmental Stewardship options including: 346 km of hedgerow, 58 km of stone wall and 4.5 km of ditches showing an improvement in the management of this resource.

- Private landowners have also contributed significantly to walling restoration, for example alongside the A39.

Agriculture

- Research showed that by 2003, loss of total agricultural area had been arrested, but the area of grassland had not returned to 1990 levels. The mix of holding types had been stable. Countryside Stewardship uptake in this NCA featured consistently above national average. The most extensive annual Countryside Stewardship agreements in 2003 were for calcareous grassland (1,022 ha), lowland pastures on neutral/acid soils (682 ha), and lowland hay meadows (210 ha). Given the area of rough and permanent grass, the extent of Countryside Stewardship uptake was significant.

- Livestock grazing was the predominant farm type in this NCA in both 2000 and 2009 with 41 per cent of holdings under this classification in both years. In 2009 dairy accounted for 14 per cent of holdings, lower than the 2000 figure of 24 per cent, though this may reflect a change to fewer larger holdings. In 2009, 29 per cent of holdings were classified as "other types" which includes holdings with only horses, grass or fodder crops, fallow land or buildings or holdings of unknown activity. Total holding numbers remain steady.

[4] Countryside Quality Counts, Natural England (2003) http://www.naturalengland.org.uk/ourwork/landscape/englands/character/cqc/default.aspx

- In 2012 the highest uptake of options under Environmental stewardship was for semi-natural grassland maintenance and restoration, a total of 1,625 ha, maintaining the trend from the previous scheme (Countryside Stewardship).

Settlement and development

- The rate of conversion to urban and proportion of build outside urban and urban-fringe areas is low for this NCA. There are some significant concentrations of development, such as in the peri-urban zones around Weston-super-Mare on the fringe of the NCA, Wells and Shepton Mallet, and in the open countryside and smaller settlements east of the A37.

- Agricultural developments and diversification particularly into equestrian use continue to place pressure on the landscape. Proposals for renewable energy, especially solar and wind are increasing. Bristol Water is expected to build a new reservoir just beyond the NCA at Cheddar.

- Development relating to economic development, tourism and recreation is also placing pressure on the NCA with the Cheddar area in the AONB providing a particular focus. Bristol Airport is expanding with associated impacts on tranquillity from increased air and road traffic in surrounding areas. There is also development along the M5. National Grid proposes a major upgrade of powerlines although mainly underground for the NCA and there remains the issue of sealing towers.

- These developments are significant locally, and are transforming the character of the area in some locations.

Semi-natural habitat

- The NCA contains approximately 2,233 ha of semi-natural (BAP) priority habitat (not including woodland) and 931 ha of ancient semi-natural woodland within a total of 2,095 ha of broadleaf woodland. A total of 2,091 ha are designated as SSSI of which 5 per cent were recorded as unfavourable declining, 45 per cent favourable, 7 per cent unfavourable or no change and 39 per cent were unfavourable recovering in March 2011.

- The predominant priority habitat is lowland calcareous grassland at 763 ha or 3 per cent of the NCA. The most extensive annual Countryside Stewardship agreements in 2003 were for calcareous grassland (1,022 ha) and lowland pastures on neutral/acid soils (682 ha). In 2012, options for semi-natural grassland remain those of highest uptake.

Historic features

- In 1918 about 2 per cent of the NCA was historic parkland. By 1995 it is estimated that 37 per cent of the 1918 area had been lost. In 2003 about 39 per cent of the remaining parkland was covered by a Historic Parkland Grant, and 55 per cent was included in an agri-environmental scheme. In 2012 53.33 ha were under woodpasture and parkland options through Environmental Stewardship.

- In 2003 about 72 per cent of listed historic farm buildings remained unconverted. Most were intact structurally.

- Environmental Stewardship options relating to management of archaeological features covered 264 ha in 2012.

- There were 16 buildings or sites on the 2011 Heritage at Risk Register.

Rivers

- Due to the karst nature of the landscape there are no surface rivers on the Mendips Limestone rather they are underground. Both the biological river water quality and chemical water quality in 1995, of rivers emerging from the Mendips, was predominantly good. The chemical water quality in 1995 was predominantly good and it has been maintained.

- Although direct comparison with 1995 data is not possible due to the changes in the type of measurement, the theme of continuing good water quality continues with the current ecological status of the majority of rivers emerging from the Mendips being moderate, while the Mells River and Whatley Brook emerging at the far eastern end are of good ecological status.

Minerals

- Quarrying has long been a feature of the Mendip Hills historically taking a variety of rock types. More recently quarrying has concentrated on the extraction of Carboniferous Limestone. The largest quarries are concentrated in the eastern part of the hills though two remain active in the west Mendips.

- Research for Somerset County Council in 2009[5] reported that active permissions in the Mendips account for just under 9 km2 (less than 3 per cent of the total Mendips NCA), however, these super-quarries were producing over 93 per cent of Somerset's total crushed rock aggregates and around half of the total crushed rock production in the whole of the south-west region.

- The Somerset County Council Minerals Local Plan recorded 9 of the 17 quarry sites in the NCA as dormant. Though many of the current permissions extend until 2042 they would require various conditions to be agreed before reactivation could be implemented. Of the 9 active quarries, Torr Works and Whatley, the two largest, are linked directly to the rail network; the others export their material by road. Future expansion of the largest quarries is likely to be through depth rather than area with resulting potential impacts on hydrology.

Dolebury hill fort.

[5] Ecosystems Approach to Long Term Minerals Planning in the Mendip Hills, Phase II Report, May 2010: http://www.sustainableaggregates.com/library/docs/asrp/l0151_ma_1_s_3_04_final_report.pdf

Drivers of change

Climate change

- Under climate change the Mendip Hills are likely to get warmer; summers will continue to get hotter and drier and winters will continue to get milder and wetter, with inevitable exceptions.
- Climate change is likely to result in periods of heavy rain that may cause more frequent flood events from surface water runoff, increased flooding of settlements and transport infrastructure at the foot of the hills, rock fall, soil erosion and associated impacts on water quality and also on tourism due to closing of the tourist caves and Cheddar Gorge road.
- Increased storminess, drought and prevalence of pests and diseases, for example phytophthora and chalara, may result in the damage or loss of ancient woodlands and mature, ancient and veteran trees, especially parkland trees.
- Climate change poses particular threats to the historic environment. Intense rainfall causes erosion of archaeological sites and increased extremes of soaking and drying heighten risk of ground subsidence and accelerate the decay of stone work. Changes in vegetation patterns may cover and damage archaeological remains[6] and leave other exposed and desiccated.
- Changes to seasonal temperature and rainfall may result in changes to tree productivity. The suitability of the climate for new non-native species could alter woodland composition.
- Increased carbon dioxide and a longer growing season could potentially lead to double cropping with impacts on soil condition due to increased cultivation. There may be potential for growing different crops suited to a warmer climate.
- Increasing occurrences of droughts would lead to increases in water demand for crop growth, business and domestic use, and drying out and erosion of soils.
- Species migration and loss of small or isolated habitats and populations.

[6] Mendip Hills AONB Management Plan 2009–2014, Mendip Hills AONB Partnership http://www.mendiphillsaonb.org.uk/wp-

Other key drivers

- Increasing demand for communication infrastructure and wind, solar and other energy generation schemes with potential impacts on landscape character.
- Changes in agricultural practices leading to degradation or loss of semi-natural habitats, archaeological and karst features.
- Increases in horse related development impacting on the management of semi-natural grasslands and an increase in post and rail fencing affecting landscape character.
- The expansion of Bristol Airport will affect the tranquillity of the surrounding area, including the Mendips.
- Carboniferous Limestone continues to be quarried on a large scale particularly in the east of the area and there is continuing pressure for expansion with knock on effects on tranquillity and the amount of heavy lorry traffic on the small lanes of the area.
- Increased access and tourism from nearby high urban populations puts pressure on sensitive sites in the AONB such as Black Down, which suffer from a combination of high rainfall, soil type and visitor pressure. Projects are being proposed to tackle this.
- Major expansion of Weston-super-Mare will bring increased pressure from residents seeking recreation in the countryside, additional road traffic and suburbanisation of the edge of the NCA. Increased pressure for affordable housing and other development to support rural economy growth (such as rural business development and re-use of old buildings promoted by the National Planning Policy Framework) in settlements may potentially impact on landscape character.

Traditional hay meadow at Chancellor's Farm, Priddy.

Supporting document 3: Analysis supporting Statements of Environmental Opportunity

The following analysis section focuses on a selection of the key provisioning, regulating and cultural ecosystem goods and services for this NCA. These are underpinned by supporting services such as photosynthesis, nutrient cycling, soil formation and evapo-transpiration. Supporting services perform an essential role in ensuring the availability of all ecosystem services.

Biodiversity and geodiversity are crucial in supporting the full range of ecosystem services provided by this landscape. Wildlife and geologically-rich landscapes are also of cultural value and are included in this section of the analysis. This analysis shows the projected impact of Statements of Environmental Opportunity on the value of nominated ecosystem services within this landscape.

The Cheddar pink, endemic to the Mendip Hills, predominantly Cheddar Gorge.

Statement of Environmental Opportunity	Ecosystem Service: Food provision	Timber provision	Water availability	Genetic diversity	Biomass provision	Climate regulation	Regulating water quality	Regulating water flow	Regulating soil quality	Regulating soil erosion	Pollination	Pest regulation	Regulating coastal erosion	Sense of place/inspiration	Sense of history	Tranquility	Recreation	Biodiversity	Geodiversity
SEO 1: Conserve the distinctive combination of historic field boundaries, field and settlement patterns and land uses that have shaped the landscape of the Mendip Hills. Safeguard inward and outward views of and to the distinctive hill line and conserve and enhance the special qualities, tranquillity, sense of remoteness and naturalness of the area.	o *	↗ *	↗ **	n/a	↗ *	↗ **	↗ ***	↗ ***	↗ ***	↗ ***	↗ **	↗ **	n/a	↑ ***	↑ ***	↑ ***	↑ **	↗ **	↗ **
SEO 2: Safeguard the rich geological features of this renowned karst landscape, the many archaeological features associated with the upland ridge and the historical mining legacy, enabling access, continued research, interpretation, understanding and enjoyment of the extensive geological and historical resource.	o *	o *	↑ ***	n/a	o *	↔ *	↗ **	↑ ***	↗ **	↗ **	↑ **	↑ **	n/a	↑ ***	↑ ***	↑ **	↗ **	↗ **	↑ ***
SEO 3: Conserve and sustainably manage the rural agricultural landscape and enhance the network of nationally and internationally important sites and semi-natural habitats associated with the distinctive geology and topography to create a coherent and resilient ecological network, enabling ecosystems to adapt to climate change and for the benefits to biodiversity, water flow, water quality and protection of the aquifer, soil quality, regulating soil erosion, rural heritage and culture.	↗ *	↗ *	↑ **	n/a	↗ *	↑ **	↑ **	↑ **	↑ **	↑ **	↑ ***	↑ ***	n/a	↑ **	↗ **	↗ **	↗ **	↑ ***	↗ **

Note: Arrows shown in the table above indicate anticipated impact on service delivery: ↑ = Increase ↗ = Slight Increase ↔ = No change ↘ = Slight Decrease ↓ = Decrease. Asterisks denote confidence in projection (*low **medium***high) ° symbol denotes where insufficient information on the likely impact is available.

Dark plum = National Importance; Mid plum = Regional Importance; Light plum = Local Importance

Landscape attribute	Justification for selection
Dramatic limestone scarp and sandstone peaks rising abruptly from the surrounding low-lying landscape. Particularly distinctive south-facing scarp and undulating plateau.	■ A chain of prominent limestone hills extending inland from the Severn Estuary and rising up sharply from the surrounding lowlands. ■ Devonian Sandstone forms some of the highest points on the hills including Black Down, the highest point at 322 m, Beacon Hill and North Hill near Priddy. ■ Far-reaching views outwards across the Severn Estuary to Wales or out across the Somerset Levels to Glastonbury Tor and Hinkley Point, even as far as Dorset on a clear day. ■ Many viewpoints provide the experience of tranquillity and dark skies. ■ There are 686 km of public rights of way and 2,000 ha of land are classified as being publically accessible.
Rich karst and historic landscape.	■ Karst landscape created by the response of soluble limestone to water and weathering. ■ Rich karst features include complex underground cave and river systems, gorges, dry valleys, surface depressions, swallets, sink holes and fast-flowing springs, a number of which deposit tufa on the eastern part of the hills. ■ Cheddar Gorge is one of the finest limestone gorges in England, and Wookey Hole provides tourist access to the caves. ■ The many underground caves provide interest and challenge for cavers and cave divers. ■ No surface rivers on limestone due to the permeability of the rock, but underground rivers emerge at the base of the hills. ■ The limestone plateau holds an outstanding assemblage of features from the Bronze and Iron Ages, such as burial mounds and hill forts. ■ Many industrial archaeological sites reflecting the past lead, coal and textile industries. ■ Evidence of continuous mining of lead, zinc and coal since at least the Roman period. ■ Long history of limestone quarrying; super-quarries still active in the east, two smaller quarries in the west. ■ Numerous churches with fine towers dating mostly from 15th and 16th centuries. ■ Landscape crossed by Roman roads. ■ Five Registered Parks and Gardens, 238 Scheduled Monuments and 1,204 Listed Buildings.

Landscape attribute	Justification for selection
Open plateau contrasting with well-wooded scarp slopes and wooded valleys with parkland in the east.	■ The area contains woodland of high conservation value; of the 4,034 ha of woodland or 13.3 per cent of the NCA, 963 ha is ancient woodland. ■ The wooded scarp slopes in the west particularly add to the landscape character of the AONB. ■ Internationally important woodlands, for example Asham Wood in the east Mendips or Ebbor Gorge, Rodney Stoke and Cheddar Wood within the Mendip Woods SAC designation as a Tilio-Acerion forest (ash, elm and lime woodlands) feature with ground rich in flora including lily-of-the-valley, columbine, Solomon's-seal and purple gromwell. ■ Rodney Stoke and Ebbor Gorge are designated National Nature Reserves. ■ Greater horseshoe bats benefit from the combination of natural caves, woodland, hedgerows and grazing; they are internationally recognised through SAC designations. ■ In the east, large parks around country houses or smaller parks around manor and gentry houses and even the larger rectories, for example at Nunney, are a feature.
Contrasting field patterns and land use between east and west Mendip landscapes.	■ Character of the 18th-century open sheepwalks remains in the west of the NCA. ■ A more open landscape of rectilinear medium sized pasture fields of 18th century enclosure, bounded by grey limestone drystone walls dominates the centre and west of the area. ■ The deeper soils of the plateau are generally more intensively farmed as either arable or grass leys. ■ Sheep rearing predominates on the small irregular fields and the remnant sheepwalks of the escarpments. ■ An area of high quality agricultural land, the Strawberry Belt, has been used for intensive horticulture. ■ The eastern Mendips consist of a more complex landscape of wooded valleys and agricultural land on the intervening ridges. Hedgerows of varying height and frequency of hedgerow trees enclose much of the improved pasture used for dairy cattle.

Landscape attribute	Justification for selection
Semi-natural habitats including calcareous grassland, acid heath, and calaminarian grassland reflecting the contrasting geology and mining history.	■ There are four SAC, two NNRs and 46 SSSI wholly or partly within the NCA. ■ Species rich calcareous grassland priority habitat found on Limestone areas, particularly the steeper slopes of the southern scarp where more intensive agriculture is not feasible. ■ Mendip Limestone Grasslands SAC supports the largest area of Festuca ovina – Carlina vulgaris (NVC CG1) grassland in England, including scarce plants such as white rock-rose, Somerset hair-grass and honewort. ■ A range of scarce butterflies such as the Chalkhill blue, Duke of Burgundy fritillary, Adonis blue and a wide range of important plants such as bee orchids, green-winged orchid and Cheddar pink are associated with the grasslands of the Mendips. ■ Due to the underlying geology, calcareous grassland on the Carboniferous Limestone contrasts abruptly with heathland formed on the sandstone peaks. ■ "Gruffy ground" formed by historic lead and zinc mining has created opportunities for calaminarian grassland supporting specialist heavy metal and contaminant tolerant species such as lead moss and spring sandwort.
Scattered farmsteads on the plateau contrast with denser though still dispersed settlements in the eastern Mendips. Larger settlements around the edge of the hills lie close to emerging water courses.	■ Wells, Shepton Mallet and Cheddar are the largest settlements within the Mendips NCA. ■ Scattered farmsteads, chiefly built in locally quarried grey limestone, are found on the plateau and western slopes. ■ Villages and larger towns are found along the springline. ■ The older buildings of the western Mendips are of limestone or red conglomerate, with some pale grey Lias near the coast, with weathered dull orange-red pantile roofs a typical feature. ■ Settlement is denser in the east, although still dispersed; scatterings of farmsteads and nucleated villages with the larger towns of Wells and Shepton Mallet around the edge. ■ A greater variety of building materials are used in the eastern area, including thatch, honey-coloured oolite, greyer Doulting Stone and White Lias.

Landscape opportunities

- Large post-war quarries offering opportunities for restoration on completion of quarrying activity. Bunding or mass woodland planting have been the accepted way of mitigating the impacts of quarrying, however consideration should also be given to measures over a wider area, including hedgerow renewal and enlargement, and copse and shelterbelt planting.
- Manage the many woodlands, particularly secondary woodlands, which are currently unmanaged and neglected, especially on the Bleadon Hills and the south-western and northern slopes.
- Management of trees, woodland and copses as important features of the landscape is required. The management of the visually important woodlands especially needs to be considered.
- Protect and manage the ash woodlands which make up the majority of ancient semi-natural woodlands on the Mendip Hills to maximise benefit for landscape and wildlife.
- Conserve and restore drystone walls, characteristic of the plateau and eastern slopes, which are in long term decline. They collapse with age and require regular maintenance, which is labour intensive and expensive.
- Hedgerow restoration and replacement tree planting should be considered in some of the eastern parts of the area where hedgerow removal and tree loss have produced a more open landscape that is out of character.
- Protect, manage and enhance the unimproved limestone grassland throughout the NCA which has declined as a result of past agricultural improvement, or has been prone to neglect, undergrazing and scrub-encroachment. Manage and consolidate through controlled grazing regimes and scrub control.
- Maintain and encourage areas of semi-natural grassland within designed parkland.
- Improve and maintain the condition of geological sites and other exposures; scrub encroachment on rock faces and other geological outcrops and archaeological features needs to be controlled.
- Protect heathland areas of the central plateau and northern slopes which are at risk from fire, leading to invasion by bracken and erosion.
- The key landscape and biodiversity interests of cliffs, caves and rock outcrops should be protected and enhanced.

Continued on next page...

Traditional breed ruby red Devon cattle at Chancellor's Farm, Priddy, showing field boundaries of drystone walls on the plateau.

Landscape opportunities continued

- The archaeological features of the plateau and the industrial archaeology features of the whole NCA are vulnerable to damage and neglect, scrub invasion and to a lesser extent, arable expansion. Protection of these features needs to be addressed through management agreements and advice to owners and tenants.
- Protect former lead-mining features, for example 'gruffy ground', other archaeological site and karst features which are being degraded or lost through agricultural improvement, ploughing and landfill, protecting the clear links between land use and underlying geology.
- Insensitive development and alterations in villages have affected rural character. Residential development pressure on all market towns has also had an impact. New development should be encouraged to be in keeping with the landscape character of the area.

Ecosystem service analysis

The following section shows the analysis used to determine key ecosystem service opportunities within the area. These opportunities have been combined with the analysis of landscape opportunities to create Statements of Environmental Opportunity.

Please note that the following analysis is based upon available data and current understanding of ecosystem services. It does not represent a comprehensive local assessment. Quality and quantity of data for each service is variable locally and many of the services listed are not yet fully researched or understood. Therefore the analysis and opportunities may change upon publication of further evidence and better understanding of the inter-relationship between services at a local level.

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Food provision	Agri-environment schemes Naturally fertile soils Large flat fields of the plateau Grassland	Farming is the major land use with the Mendip Hills NCA, 71 per cent of the land being farmed. Of this farmed area 82 per cent is grass or uncropped land and only 12 per cent is arable (2009 figures). Grazing livestock is the predominant holding type; 41 per cent of holdings in 2009. There is also some dairy and arable farming concentrated on the plateau and a lesser number of pigs. Total numbers of cattle, sheep and pigs in 2009 were around 27,000, 26,500, and 12,500 animals respectively. **Continued on next page...**	Regional	The predominance of deeper more fertile loamy soils on the Limestone plateau have enabled more intensive agriculture, mostly arable or grass leys. Much of the plateau is grazed by dairy cattle including by Yeo Valley foods, a national dairy producer whose land also extends into the neighbouring Bristol, Avon Valleys and Ridges NCA. Beef and sheep grazing are concentrated on the small irregular fields and the remnant sheepwalks of the escarpments where the soils are thinner.	Work with the local farming community to safeguard future food production while enhancing key ecosystem services such as biodiversity, water quality, water regulation (flooding), regulating soil erosion and quality, pollination services and genetic diversity, geological and historic features. Encourage the continuing purchasing of local produce direct from farms or to local businesses to benefit climate regulation and local culture.	**Food provision** **Regulating soil erosion** **Regulating soil quality** **Regulating water quality** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Food provision		**... continued from previous page** Horticulture is focussed on the area of high quality agricultural land between Axbridge and Rodney Stoke; the Strawberry Belt. Cheddar is internationally associated with cheese production.		The topography and associated nature of the soils dictates the intensity of farming enabling the survival of more semi-natural habitat on the steeper slopes. Intensive farming on the plateau has resulted in some cases in negative impacts on the karst and archaeological features.		

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Timber provision	Forestry Commission plantations Privately owned woodland	Forestry Commission (FC) woodland (Rowberrow Warren Plantation, Stockhill Plantation and East Hartree Plantation) are predominately conifer and are all managed by FC under long term multi-purpose plans being accordingly thinned or felled/replanted as necessary to maximise both timber production and public benefits. Privately owned woodlands vary from being well managed under a plan (normally mainly for timber and often shooting purposes) to not being managed at all, often to the detriment of the habitat.	Local	The opportunities for new woodland planting are limited as particularly on the plateau it needs to be in keeping with the open landscape character and historically open landscape. Expansion on other areas, such as the southern scarp, is restricted by the presence of important calcareous grasslands and skylark nesting areas. Consequently few proposals come forward, and those that do have to be looked at carefully on a case by case basis. The management of private woodland depends on the priorities of their owners; some employ a professional forestry agent/ consultant, but many do not realise that woodlands deteriorate over time if not properly managed. In addition, there has been a period of 20 years or more when prices for timber and wood products have been so poor that working woods with poor access and lower value produce has been uneconomic, though that has now improved with the increase in firewood values.	Seek opportunities to form a local "Woodland Association" for the Mendips similar to the initiative seen on the nearby Blackdown Hills or in West Somerset, bringing together owners, agents and contractors to support each other. Raise awareness of the current economic value of timber or wood fuel together with examples of sustainable management which also benefits the landscape and biodiversity.	**Timber provision** **Biodiversity** **Biomass energy** **Regulating soil quality** **Regulating soil erosion** **Climate regulation**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Water availability	Permeable geology Limestone aquifer High local precipitation	The entire NCA lies over an important Carboniferous Limestone aquifer which, with associated permeable deposits, is designated as a Major Aquifer Unit making a major contribution to public water supply throughout the NCA and the Brue and Axe catchment areas. The limestone aquifer is the source rock from which drain the headwaters of the rivers Sheppey, Axe and the Cheddar Yeo. The main rivers in the NCA and some smaller north Somerset streams feed into the Blagdon Lake Reservoir (Cheddar Yeo), Chew Valley Lake Reservoir (River Chew) and the Cheddar Reservoir (Cheddar Yeo), each of which lies just outside this NCA, managed by Bristol Water and supplying 1.1 million people and businesses in the surrounding local area, mainly the City of Bristol. The elevated landform and location in direct line of prevailing south-westerly winds results in high levels of precipitation across this NCA.	Regional	Most of the NCA is classed as having 'no further water available for abstraction' apart from a small area to the south around Wells where there is 'water available'. Hydropower abstracts significant quantities of water but returns it to the river system and so does not affect net river flows[7]. Limestone quarrying in the Mendips extracts significant quantities of water in the process of dewatering active quarries, depleting the natural water resources; this has already impacted on groundwater levels and may threaten water availability further. Modern planning conditions place controls on quarrying activity to reduce the impact on groundwater. Groundwater may be used to enhance river flows during low flow conditions. A "hands off" policy (limits abstraction during low flows) applies throughout the area[8]. The Mendip aquifer also supplies the hot springs at Bath; conditions on Whatley super-quarry require regular monitoring of the local water regime, to assess any impacts on both the local hydrogeology and the Bath Hot Springs, part of the Bath World Heritage Site.	Continue to ensure conditions are applied to quarrying to minimise impacts on groundwater hydrology including that of the Bath Hot springs; a significant tourist attraction in the neighbouring Cotswolds NCA. Ensure aquifer recharge and avoid excessive runoff by encouraging farmers to maintain or improve soil condition of cultivated soils through incorporation of appropriate levels of organic matter increasing water retention and infiltration while avoiding groundwater pollution.	**Water availability** **Regulating water quality** **Regulating water flow**

[7] The Brue, Axe and North Somerset Streams Catchment Abstraction Management Strategy, Environment Agency (May 2006; URL: http://publications.environment-agency.gov.uk/pdf/GESW0506BKVI-E-E.pdf) [8] The Bristol Avon Catchment Abstraction Management Strategy, Environment Agency (April 2005; URL: http://publications.environment-agency.gov.uk/pdf/GESW1004BIJV-E-E.pdf)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Genetic diversity	N/A	N/A		N/A	N/A	
Biomass energy	Existing miscanthus Existing woodland	Existing woodland cover at 13.3 per cent of the NCA offers considerable potential for the production of biomass by bringing existing woodland under management and as a by-product of commercial timber production. There is some existing miscanthus production on the plateau. Short rotation coppice has a potential medium yield throughout apart from one small are of low yield just north-east of Wells[9].	Local	There is some potential for the provision of biomass through bringing some areas of unmanaged woodland back under small scale coppice management, particularly the secondary woodland which is largely of landscape rather than conservation value. This may also locally extend to coppiced wood from hedgerow management in the east of the area. Miscanthus production could potentially be expanded, though it's siting is critical in terms of being in keeping with the landscape character particularly within the AONB.	Opportunities for short rotation coppice and miscanthus exist in the NCA and should be realised if not in conflict with nature conservation, heritage and landscape interests. Opportunities for beneficial soil management during planting and harvesting of biomass should be maximised. There is scope to bring areas of woodland back into traditional coppice for small-scale wood fuel production and benefits to biodiversity. Some hedgerow management could also be included in this.	**Biomass energy** **Biodiversity** **Climate Regulation** **Sense of place / inspiration**

[9] Information on the potential landscape impacts of biomass plantings: www.naturalengland.org.uk/ourwork/farming/funding/ecs/sitings/areas/default.aspx

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Climate regulation	Small areas of peaty soils Existing woodland, parkland and hedgerows Permanent pasture	Carbon storage in the soils of the Mendip Hills is low, primarily in the range 0 to 5 per cent, with some areas of up to 10 per cent soil carbon. There are very small areas of 20 to 50 per cent carbon content in the surface soil horizons in the centre and towards the east of the NCA. These areas of higher carbon content are likely to be associated with freely draining very acid sandy and loamy soils which include some organic and peaty topsoils, in further association with areas of remnant heathland and possibly areas under long-established permanent grassland. Some of the loamy and clayey flood plain soils with naturally high groundwater are peaty at depth or include small areas of peaty soils, potentially providing a further carbon store. **Continued on next page...**	Local	The potential for soil carbon sequestration in this NCA is low as there is no active peat deposition. The low levels of carbon storage in the soils of the Mendip Hills reflect the predominance of mineral soils that are generally lower in organic matter where under continuous arable cultivation. Carbon sequestration can be increased in the majority of the area's cultivated mineral soils by increasing organic matter inputs, and by reducing the frequency and area of cultivation. This could also benefit soil condition and water retention. High concentrations of permanent pasture also retain carbon, an increased proportion of which would be released through microbial action if the soil was ploughed and exposed to air. However, where permanent pasture is grazed by cattle, it can result in release of methane by the animals themselves, other ruminants such as sheep also release methane but to a lesser extent per animal.	Maintain levels of carbon sequestration through sustainably managing the woodland, trees and hedgerows of the area. Prevent CO^2 release by maintaining permanent pasture and ensuring it is managed within a sustainable regime. Encourage incorporation of organic matter into cultivated mineral soils to appropriate levels, avoiding overloading that might cause pollution of the aquifer and seek opportunities to inform land managers of the importance of soil for the retention of carbon. Work with the farming community to ensure they have adequate access to soil analysis to enable the calculation of appropriate levels of fertilizer inputs to reduce energy wastage and benefit water quality.	**Climate regulation** **Regulating water flow** **Regulating water quality** **Regulating soil quality** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Climate regulation		**... continued from previous page** The concentration of permanent pasture contributes through soil carbon storage which would otherwise be released by aerobic microbial activity on exposure of the soil to air through activity such as ploughing. The woodland cover of the NCA – 13.3 per cent of the area – also contributes to the sequestration and storage of atmospheric CO2, including through the creation of humus-rich soils. A small contribution is also made by parkland trees and hedgerows in the east.		Production of inorganic fertilizer is particularly energy intensive and large volumes of greenhouse gases emitted during production, soil testing enables the calculation of optimal fertilise application rates, so reducing excessive use of fertiliser, saving energy, money and benefiting water quality. Carbon sequestration and storage through trees and woodland soils should be maintained through the sustainable management of both resources.		

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water quality	Limestone geology Permanent grassland particularly with low inputs Semi-natural habitats Appropriate tillage Good livestock management	A large part of the NCA is within a Groundwater Source Protection Zone due to its contribution to the public water supply. Ground water quality is generally good overall, apart from small areas to the north-east. Due to the karst nature of the landscape there are no surface rivers on the Mendips Limestone rather they are underground, the ecological quality of the emergent rivers is largely moderate, while the Mells River and Whatley Brook emerging at the far eastern end are of good ecological status[10]. Parts of the Mendip Hills fall within the Congresbury Yeo catchment (part of the North Somerset Moors Catchment Sensitive Farming Priority Catchment), which has problems of sedimentation, phosphates, nitrogen enrichment and low dissolved oxygen which have resulted, in part, from downwash off the steep slopes of the Mendip Hills[11]. Areas of intensive dairy, pigs, poultry and maize farming exacerbate the problem, but may lie further downstream outside this NCA.	Regional	Priorities, under the catchment sensitive farming initiative for the North Somerset Moors Priority Catchment are: to protect drinking water supply and reduce levels of nutrients and pesticides in catch-waters of Chew Valley Lake; reduce levels of diffuse agricultural pollution arising from livestock and arable farming; minimise sources of run-off and soil-wash entering watercourses; prevent pathways for run-off; and protect receiver watercourses. Although there is some scope for work within the NCA, some of the water quality issues rely on catchment sensitive farming in the part of the catchment outside of this NCA. Maintaining and expanding semi-natural habitat will help to reduce and slow the flow of water across the landscape, reducing soil erosion and particulates reaching watercourses. Semi-natural habitat also limits the amount of diffuse pollution as it covers low or no input areas, protecting aquifers and watercourses.	Work with farmers to reduce sources of diffuse agricultural pollution into the groundwater and watercourses, and runoff and soil erosion into watercourses, for example by ensuring they have adequate access to soil analysis to enable the calculation of appropriate levels of fertilizer inputs to reduce energy wastage and benefit water quality, and maintaining appropriate stocking levels and tillage regimes. Maintain and expand areas of semi-natural habitat, benefitting biodiversity and limiting soil erosion and inputs of fertiliser and pesticides that might contaminate the aquifer and watercourses.	**Regulating water quality** **Regulating soil erosion** **Biodiversity** **Regulating water flow**

[10] Water for life and livelihoods, Environment Agency (URL: http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/southwest/Intro.aspx)

[11] Defra catchment priorities identified under the England Catchment Sensitive Farming Delivery Initiative: (URL: http://archive.defra.gov.uk/foodfarm/landmanage/water/csf/documents/catchment-priorities.pdf)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water flow	Permeable limestone karst landscape Semi-natural habitats Well managed soils Hedgerows and drystone walls across slopes	There is little or no risk of fluvial flooding within the NCA with the rivers flowing partially underground in this limestone landscape of permeable geology. The percentage run-off from land in this upland area is generally low, although steep slopes in some areas can increase run-off rates locally and under extreme weather conditions may result in local flooding and landslip. The main fluvial flood risks are in Wells at the foot of the Mendips drained by the Kenward Brook, and from the Cheddar Yeo in Cheddar and the River Sheppey in Shepton Mallet. There is a small risk from tidally influenced river flooding during tide-locked conditions and overtopping of flood embankments on the River Axe just south of Weston-super-Mare, including risk of breach, but the risk is mainly just outside of the NCA[12].	Local	Due to the karst nature of the landscape and the resultant hydrology there is little that can be done within the NCA to reduce fluvial flooding from the emergent watercourses. Runoff from extreme rain may be reduced by expanding and maintaining semi-natural habitat, particularly woodland on steep slopes or boundary features (walls or hedgerows) across cultivated slopes. The incorporation of organic matter into cultivated soils to improve water retention and porosity may have a small contributory affect.	Maintain and expand areas of semi-natural habitat particularly on steep slopes to slow run-off during heavy rainfall. Encourage the maintenance and restoration of drystone walls and hedgerows across slopes to slow runoff and reduce soil erosion. Encourage farmers to maintain or improve soil condition of cultivated soils through incorporation of appropriate levels of organic matter increasing water retention and infiltration but not causing groundwater pollution.	**Regulating water flow** **Regulating soil erosion** **Regulating water quality** **Sense of place / inspiration**

[12] North and Mid Somerset Catchment Flood Management Plan, Environment Agency (December 2009; URL: http://publications.environment-agency.gov.uk/pdf/GESW1109BOUM-e-e.pdf)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil quality	Unimproved pastures Appropriate tillage Appropriate stocking levels	This NCA has 8 main soilscape types: freely draining slightly acid but base-rich soils, covering 55 per cent of the NCA; freely draining slightly acid loamy soils (16 per cent); slightly acid loamy and clayey soils with impeded drainage (10 per cent); shallow lime-rich soils over limestone (9 per cent); lime-rich loamy and clayey soils with impeded drainage (3 per cent); freely draining very acid sandy and loamy soils (2 per cent); slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (2 per cent); and loamy and clayey flood plain soils with naturally high groundwater (1 per cent).	Local	In the case of the freely draining slightly acid but base-rich soils, where calcareous layers (horizons) are near the surface, these help provide some natural resilience and enhanced workability. Some component soils are at risk from topsoil compaction and poaching, while development of iron pans can also occur. Increasing organic matter inputs to cultivated soils can help improve soil structure, while careful management of weak topsoils will help to maintain a good soil structure; minimum tillage such as direct drilling can work well on some of these soils. The freely draining slightly acid loamy soils may be valuable for aquifer recharge, requiring the maintenance of good structural conditions to aid water infiltration and requiring the matching of nutrients to needs to prevent pollution of the underlying aquifer. They also have potential for increased organic matter levels in cultivated soils through management interventions. The slightly acid loamy and clayey soils with impeded drainage are easily poached by livestock and compacted by machinery when the soil is wet, with weak topsoil structures easily damaged. Careful timing of activities is required to reduce the likelihood of soil compaction.	Support measures which employ minimal tillage and organic matter incorporation into cultivated soils to increase soil organic matter and also relieve soil compaction on a landscape scale Work with the farming community to achieve appropriate stocking rates and regimes which avoid poaching and reduce erosion. Support measures which increase the volume of organic matter within cultivated soils, within levels preventing pollution of the underlying aquifer, to improve soil structure and conditions for soil fauna, increasing water infiltration.	**Regulating soil quality** **Regulating water flow** **Regulating water quality** **Biodiversity** **Regulating soil erosion** **Climate regulation**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil erosion	Permanent grassland Semi-natural habitats Sustainable systems of arable cultivation Well managed livestock systems	The vast majority of soils covering this NCA, 95 per cent, are types at risk of soil erosion where management results in loss of stabilising vegetation. Some of the freely draining slightly acid but base-rich soils (55 per cent) which cover much of the limestone and many of the slightly acid loamy and clayey soils with impeded drainage (10 per cent) which are found largely around Winscombe and the scarp slope between Axbridge and Wells are prone to capping and slaking, leading to increased risk of erosion. The latter soils and the lime-rich loamy and clayey soils with impeded drainage (3 per cent) around the scarp at the south-eastern end of the NCA are easily compacted by machinery or livestock if accessed when wet, increasing the risks of soil erosion by surface water run-off, especially on steeper slopes. The shallow lime-rich soils over limestone (9%) towards Frome and around Shepton Mallet and Litton are sometimes unstable and prone to loss through erosion. They are particularly at risk on sloping cultivated ground or where bare soil is exposed along footpaths and tracks or as a result of outdoor pig rearing. **Continued on next page...**	Regional	The permanent pasture across much of the landscape reduces the risk of soil erosion, although inappropriate stocking may cause compaction and result in increase overland water flow and subsequent increased erosion particularly on the steep scarp slopes. Soil erosion with the North Somerset Moors Priority Catchment causes sedimentation of the River Chew and affects the water quality of Chew Valley Lake which supplies much of Bristol's water. The soil types in the priority catchment target area are freely draining slightly acid but base-rich soils prone to capping and slaking and shallow lime-rich soils over limestone are prone to loss through erosion particularly on sloping cultivated land. These soils need to be managed carefully to reduce risks with careful timing of cultivations and maintenance of vegetation cover.	Work with farmers to produce sustainable systems of arable cultivation and well-managed livestock to reduce poaching and soil exposure, particularly on steeper slopes using measures such as expanding areas of permanent grassland, woodland, dense hedgerows and drystone walls across steeper slopes Plant or restore hedgerows, or drystone walls, in keeping with landscape character to impede cross land water flow particularly during heavy rain. Maintain and create areas of semi-natural habitat and permanent grasslands to minimise soil compaction to improve water retention and reduce soil run-off across the NCA. Encourage landowners to make use of the Catchment Sensitive Farming capital payments for the North Somerset Moors priority catchment.	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil erosion		**... continued from previous page** The freely draining slightly acid loamy soils (16%) and the freely draining very acid sandy and loamy soils (2%) over the sandstone peaks also have enhanced risk of soil erosion on moderately or steeply sloping land where cultivated or bare soil is exposed, often exacerbated where organic matter levels are low after continuous arable cultivation or where soils are compacted. There is also potential for wind erosion on these soils, as well as capping (very acid sand/loamy soils). Tributaries of the Congresbury Yeo flow down the steep hills of the Mendips just inside the north-west point of the NCA. The Congresbury Yeo is a Defra Priority Catchment and has high levels of sediments, which has resulted in part from areas of intensive dairy, pigs, poultry and maize farming, although these are likely to be largely outside this NCA[13].			Increase awareness of soil erosion during timber production in woodland and encourage soil management techniques to reduce risks, particularly during felling and planting.	

[13] Defra catchment priorities identified under the England Catchment Sensitive Farming Delivery Initiative: (URL: http://archive.defra.gov.uk/foodfarm/landmanage/water/csf/documents/catchment-priorities.pdf)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Pollination	Woodlands Species-rich grasslands Heathland Species-rich road verges	There are large areas of grassland and heathland, making up 1,300ha together, which provide important nectar sources for pollinating insects and are in close proximity to the arable farming of the plateau. Pollinators are critically important to the soft fruit and the horticulture of the Strawberry Belt which also benefits from pollinators supported by the adjacent Somerset Levels and Moors NCA.	Local	A strong pollinator population supports production of a wider variety of food products and supports food production in the future. Although there is a reasonable spread of flower-rich semi-natural habitat across the NCA, some of which are NNR or SSSI, there is scope to improve the condition of this habitat through appropriate management and to extend it where possible, including through environmental stewardship.	Improve the condition of and increase the area and connectivity of semi-natural habitats, with particular emphasis on unimproved flower-rich grasslands, heathlands and native woodlands. Encourage the use of nectar and forage mixes in arable land, and appropriate management of species-rich hedgerows, to increase the availability of nectar sources in close proximity to food crops requiring pollination.	**Pollination** **Pest regulation** **Biodiversity** **Food provision** **Sense of place / inspiration**
Pest regulation	Existing semi-natural habitat especially grassland and heathland Agricultural field margins Species rich hedgerows Woodland	There are large areas of semi-natural habitats such as grassland, heathland and woodland that provide important niches for many pest-regulating species and are in close proximity to the arable farming of the plateau.	Local	There is scope to improve the condition of, and extend the amount and connectivity of semi-natural habitat across the area. Linking semi-natural habitat to provide a sustainable, functional network will help support populations of pest regulating species and enable them to move around the landscape. Increasing diversity in species and structure of field margins will increase the ability for these areas to support populations of pest regulating species such as invertebrates, birds and mammals.	Maintain and expand the area of semi-natural habitats, throughout the NCA to provide a range of niches to support pest regulating species including invertebrates, birds and mammals. In addition, through mechanisms such as agri-environment schemes, encourage the use of field margins, beetle banks and headlands in arable land, to encourage pest regulating species in close proximity to food crop.	**Pest regulation** **Pollination** **Biodiversity** **Food provision**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
A sense of place/ inspiration	Landscape Geological features, particularly the gorges and caves Views of and outwards from the Cotswold Hills Attractive settlements built in traditional materials Fine church towers	Sense of place is provided by the prominent limestone landform that rises abruptly as a series of hills from surrounding areas and is characterised by distinctive karst features such as caves, gorges and swallets, including Cheddar Gorge, one of the finest limestone gorges in England, and Wookey Hole. The sparsely-settled, open plateau defined by rectilinear drystone wall enclosures contrasts with the valleys to the east, which are often well settled and wooded and have complex hedgerow patterns. Fragments of species-rich calcareous grassland are now confined to the steeper scarp slopes rich with ancient woodland, while four major domes of acid sandstone interrupt the limestone plateau and provide further variation through the presence of dry acid grassland and heathland. Local quarries, parkland, fine stone church towers, and the local stone-built paper and woollen mills are all prominent features in the landscape. Cheddar has further distinctive associations through its traditional association with cheese production. **Continued on next page...**	National	The Mendip Hills have a very strong character defined by their geology and position rising abruptly from the Somerset Levels. The character of the western Mendips is protected by the AONB designation which provides tighter protection against inappropriate development, though the development of the M5 motorway and the A38 which cut through the AONB have impacted the character and tranquillity. Further development of Weston-super-Mare just outside the NCA at the far western end does potentially impact the setting of the hills. The character of the eastern Mendips is most significantly impacted by the extensive quarrying in that part of the NCA with implications on the landscape, tranquillity, habitats and hydrology of the area.	Seek opportunities to ensure that development respects local settlement patterns and local vernacular architecture and building materials are in keeping with the character of the whole of the NCA. Maintain, restore and conserve the characteristic field patterns with associated drystone walling of the plateau and the many historical and geological features. Maintain, restore and manage for biodiversity and recreation, the historic parklands with their veteran trees and landscape design that are key features of the eastern landscape of this NCA. Seek to maintain the inspirational views both inwards, outwards and of the hills from the surrounding land, through planning policy in keeping with landscape character.	**Sense of place / inspiration** **Sense of history** **Geology** **Biodiversity** **Tranquillity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
A sense of place/ inspiration		**... continued from previous page** The landscape of the western Mendips is recognised nationally through its designation as an AONB. The high limestone plateau and extensive views outwards provides strong senses of inspiration and escapism. Further inspiration is provided by local elements such as fine church towers, impressive parkland landscapes, numerous prehistoric and historic features, and the stunning Wells Cathedral.		Increasing demand for communication masts within the area and wind power generation within and outside the area could potentially impact on the landscape character.		

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of history	Distinctive geological features Prehistoric features Features from the Bronze and Iron Ages Long history of settlement Range of historical field patterns Industrial archaeology Distinctive church towers and Wells Cathedral Manor houses, rectories and associated parkland	The history of the landscape is evident in a strong influence that ranges from prehistoric settlement and activity to post-medieval industrial archaeology. There is abundant prehistoric evidence on the western Mendip Hills in particular, with the henges of Gorsey Bigbury and Priddy Circles forming, in combination with over 300 barrows from the Bronze Age, a ritual landscape of national significance. Large hill forts such as Dolebury and smaller sites such as Banwell originating in the Iron Age are evidence of a complex pattern of territories and lordship, while the hills' deposits of lead, silver and other metals were mined by the Romans, with a major settlement and fort at Charterhouse. Quarries and pits are evidence of the area's importance for mined minerals until the 20th century. Other industries that developed in the post-medieval period have also left their mark, such as distinctive paper mills along the Mells Valley and coal-mining tips in the east Mendips. **Continued on next page...**	National	The Mendips landscape is rich with important historical features many of which are visible and accessible. Interest in the history of the area is high and therefore many sites are well recorded, though there are others that are not and further research could be carried out to ensure the protection of unrecorded features[14]. Drystone walls connect human occupation of the landscape with the underlying geology, reflect changes in settlement and agriculture and provide wildlife corridors, yet they are unprotected; depending on individual landowners to maintain and restore them. Ploughing and other agricultural practices continue to damage and threaten some sites and buried remain, including 'gruffy ground', a remnant of mining activity. Karst features are in some cases being degraded or lost through agricultural improvement, ploughing and landfill, though some sites have benefitted from the inclusion of historic sites within Agri-Environment schemes[15].	There are opportunities to further record and protect the historic and cultural heritage through additional research and survey. The protection of heritage assets should be ensured at every opportunity. Address the protection of above and below ground features through management agreements and advice to owners and tenants. Encourage the uptake of agri-environment agreements which incorporate the protection of historic features including mining activity and boundary (drystone wall) maintenance and restoration.	**Sense of history** **Sense of place / inspiration** **Geodiversity** **Recreation**

[14] Mendip Hills AONB Management Plan 2009–2014, Mendip Hills AONB Partnership (URL: http://www.mendiphillsaonb.org.uk/wp-content/uploads/2010/11/up_161122_management_plan_final_word_version_nov_08.pdf) [15] The Bristol Avon Catchment Abstraction Management Strategy, Environment Agency (April 2005; URL: http://publications.environment-agency.gov.uk/pdf/GESW1004BIJV-E-E.pdf)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of history		**... continued from previous page** Field patterns on the plateau reflect large-scale enclosure from the late-18th century, with more irregular patterns on slopes and in valleys representing earlier enclosure. Aspects of history that are particularly evident include the area's distinctive buildings and parklands, including prominent church towers, the fortified mansion of Nunney Castle, the cathedral at Wells, and landscape parks like Mells and Humphry Repton's Ston Easton, as well as the varied traditional building materials that include red conglomerate, grey limestone and pale grey Doulting Stone. The distinctive geological features, such as Cheddar Gorge and Wookey Hole, further contribute, illustrating the history and formation of the earth.		Lack of grazing has resulted in increased scrub and some sites being obscured from view and suffering damage from tree roots. Burrowing animals, unmanaged recreational use of sites and new development also threaten the historic environment and individual sites.[15] Village Design Statements, Parish Plans and Historic Landscape Characterisation Assessments identify and raise awareness of characteristic features, contributing to the planning decision-making process.[15] Activities that have important cultural associations with the history of the landscape include Mendip cave exploration begun in the late nineteenth century, the Rock of Ages service to mark the origin of the famous hymn, Priddy Sheep Fair dating back 650 years, the hedging and ploughing matches promoting rural skills and village strawberry fairs.[15]	Promote responsible recreational use of sites through the provision of information and well designed visitor infrastructure. Support the provision of training to build up skills in the local community that cares for the local heritage. Encourage and support the production of Village Design Statements. Promote the continued use of local vernacular architecture and traditional building materials in new developments where appropriate.	

[15] The Bristol Avon Catchment Abstraction Management Strategy, Environment Agency (April 2005; URL: http://publications.environment-agency.gov.uk/pdf/GESW1004BIJV-E-E.pdf)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Tranquillity	Undeveloped rural character Areas with few major roads Intimate valleys Extensive views across rural counties	Tranquillity levels have declined sharply in the past 50 years, although tranquillity remains an important feature of the area – 'undisturbed' areas have decreased from 89 per cent in the 1960s to 55 per cent in 2007. [16] The largest area of 'undisturbed' land occurs within the centre of the NCA, away from the main settlements in the south and the M5 in the west. A sense of tranquillity is most likely to be associated with the undeveloped limestone plateau area, as well as within the more intimate valleys to the east, away from the settlements and major road corridors.	Regional	The increasing traffic on the M5 motorway and A38, and also expansion of Weston-super-Mare impact the tranquillity of the western end of the NCA. Quarrying of the limestone impacts the tranquillity of the area both through the resultant heavy lorries or railway links and the noise of blasting and warning sirens. Proposed plans to expand Bristol Airport will affect the tranquillity of the surrounding area including the Mendips through increased traffic, noise, and light pollution and will affect the outward views. Other large scale development such as at Hinkley Point Power Station will also impact the outward views. Mapping of light pollution has shown that the area of dark skies in the Mendips is shrinking.[17]	The undeveloped character of the area should be protected and intrusion into the most rural areas avoided. Light pollution from any new development should be prevented or minimised.	**Tranquillity** **Sense of history** **Sense of place / inspiration**

[16] CPRE Intrusion Map 2007 (URL: http://www.cpre.org.uk/resources/countryside/tranquil-places/item/1783-)

[17] The Bristol Avon Catchment Abstraction Management Strategy, Environment Agency (April 2005; URL: http://publications.environment-agency.gov.uk/pdf/GESW1004BIJV-E-E.pdf)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Recreation	Rights of way network Open access land Stunning geological features Wealth of historical features Stunning views	Recreation is well supported by a 690 km network of rights of way (at a density of 2.26 km per km^2), including the Mendip Way, Monarch's Way, Strawberry Line and the National Cycle Network, and around 1,600 ha of open access land covering 5 per cent of the NCA. Black Down provides the largest area of open access on the Mendip Hills at over 400 ha. The karst landscape offers significant opportunities for tourism and outdoor pursuits, most notably at Cheddar Gorge and Wookey Hole and much of the area is a major centre for potholing and rock climbing. The area is particularly popular with road cyclists, presenting many uphill challenges. The cathedral at Wells also attracts significant numbers of visitors as do many of the towns and villages throughout the area.	Regional	This NCA is accessible by the large populations of Bristol, Bath, Weston-super-Mare and the surrounding settlements. Tourism is important to the area; Wookey Hole and Cheddar Gorge drawing in large numbers of visitors. Caving and potholing is a significant activity within the many cave features of the Hills, and new features continue to be discovered. Cycling and walking is also prevalent, though cycling may be impacted by increasing traffic. Outdoor recreation reconnects or maintains people connection with the landscape and ecosystems that supports them and encourages a valuing of their surroundings.	Further opportunities for enhancements to the public rights of way network through rights of way management plans should be realised. Improved access opportunities should incorporate enhanced interpretation, particularly of heritage assets and features. Ensure access balances recreational enjoyment, with the protection of biodiversity, geomorphological and historic features and an inherent sense of remoteness.	**Recreation** **Sense of place / inspiration** **Sense of history** **Tranquillity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biodiversity	Internationally designated sites Nationally designated sites, SSSIs and NNRs Local wildlife sites and nature reserves	BAP priority habitats cover 10 per cent of this NCA. Lowland calcareous grassland and lowland mixed deciduous woodland cover 800 ha and 700 ha, respectively, with lowland heathland and lowland meadows covering a further 400 ha each. There are also small areas flood plain grazing marsh, 160 ha, and upland heathland, 140 ha, 2,000 ha of the area are designated as SSSI (7 per cent of the NCA area) and there are 4 SAC and 2 NNRs within the NCA. The area is particularly important for greater horseshoe bats due to the mosaic of woodland, hedgerows and grazed areas. The old lead mining activities have also resulted in rare calaminarian grassland exploited by rare metal tolerant species. Scarce butterflies and plants are found in the calcareous grassland and heathland. The majority of SSSI (84 per cent) in the NCA are in favourable or unfavourable recovering condition.	International	The area contains particularly important areas of ancient woodland and calcareous grassland associated with the limestone scarp, the steepness of the scarp slope having prevented improvement of the pasture. However, undergrazing of grassland resulting in scrub encroachment is a problem as is the lack of management in much of the woodland. Many of the biological SSSI across the NCA are designated for woodland or species-rich grassland. Appropriate land management will help to maintain and improve the condition of these sites in addition to benefiting a range of other ecosystem services. Small areas of Crook Peak to Shute Shelve Hill, St Dunstan's Well Catchment, Rodney Stoke, Cheddar Wood and Shiplate Slait SSSI are currently in unfavourable condition.	Maintain and improve the condition of protected sites by working with landowners both of the sites and surrounding land to protect sites and increase buffering and connectivity. Seek opportunities to reconnect the ecological network across the NCA and ensure connections with neighbouring NCAs as appropriate to the network. Encourage appropriate restoration of quarries to produce optimal outcomes for the ecological network. Encourage appropriate management of priority habitats by land owners/managers and promote support through agri-environment schemes where appropriate. Support the internationally important populations of horseshoe bats through bringing the surrounding farmland under appropriate management through environmental stewardship, ensuring flightlines and feeding grounds are protected.	**Biodiversity** **Geodiversity** **Regulating water quality** **Regulating water flow** **Regulating soil erosion** **Recreation** **Sense of place / inspiration**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Geodiversity	Geological SSSI Local geological sites Local building stone Karst surface features Caves and gorges Quarries and mines Variety of soils	There are 18 nationally designated geological SSSI in this NCA, plus 11 of mixed interest and 37 Local Geological Sites reflecting the importance of the geological interest within this comparatively small NCA. The geological interest ranges from the natural features of exposed rocks, dry gorges, sink-holes, areas of sunken ground and cave systems of the classic Carboniferous Limestone karst landscape to sandstone peaks and a long history of quarrying and mining which ties it closely to the history and culture of the area. Moons Hill Quarry SSSI supports exposures of clastic and volcaniclastic sediments which have yielded a fairly rich, shelly fauna referable to the Lower Wenlock Series (Sheinwoodian Stage). This igneous suite represents the sole example of Wenlock-aged volcanic rocks (other than bentonites) in England. The local stones are used in the vernacular architecture of the area and the distinctive drystone walls of the plateau. The permeable limestone geology results in an aquifer containing high quality water, feeding rivers and watercourses and supplying drinking water to a large nearby population of Bristol and the surrounding area.	National	The geological sites of this NCA provide important access to geodiversity, enabling the interpretation, understanding and continued research into the geodiversity of the NCA and earth science generally. Surface feature provide easy access for education and the less accessible cave systems provide an ongoing challenge and potential new discoveries for more specialist cavers. Exposure of these features also makes a positive contribution toward sense of place and sense of history, both geological history and the industrial history of the area. Exploitation of the mineral reserves is now largely through limestone quarrying although some interest has been shown in the potential of shale gas.	Recognise, conserve and enhance significant geological sites and features. Advise landowners and users, for example, climbers and cavers, about management issues. Promote accessible sites and provide appropriate information. Maintain the largely good condition of geological SSSIs in this area and work with landowners to improve the condition where required. Maintain views of geological features and exposures and where appropriate, improve access to cuttings, quarries and other exposures of geological features including soils to enable improving understanding and enjoyment of geodiversity and sense of history. Support the use of local stone as a building material to help maintain local distinctiveness.	**Geodiversity** **Biodiversity** **Sense of place / inspiration** **Sense of history** **Regulating water quality** **Water availability**

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