National Character Area profile:

153. Bodmin Moor

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.

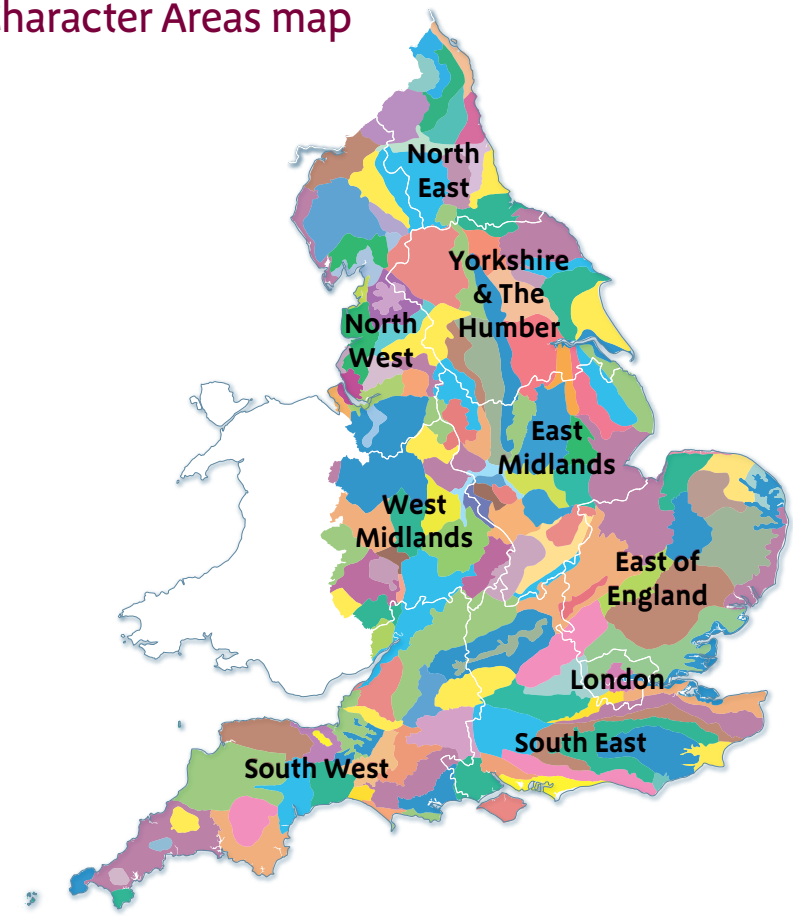
NCA profiles are guidance documents which can help communities to inform their decision-making about the places that they live in and care for. The information they contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and 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**)

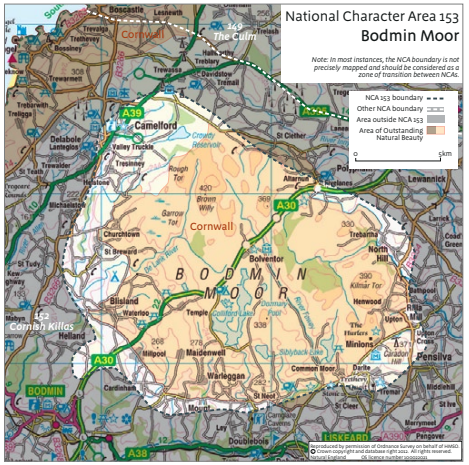
Summary

The remote, open upland moorland landscape of Bodmin Moor provides a stark contrast to the more productive landscape of the surrounding area. The edge of the moor is fringed with deciduous damp wooded valleys, which contain dispersed farmsteads that are linked to the larger areas of common land on the higher granite-strewn moorland.

Nearly 71 per cent of the National Character Area (NCA) is included within the Cornwall Area of Outstanding Natural Beauty. There are important mining areas forming part of the Cornwall and West Devon Mining Landscape World Heritage Site. A third of the NCA is registered common land, with a higher proportion being declared open access under the Countryside and Rights of Way Act 2000. The area includes three Special Areas of Conservation (Crowdy Marsh, Phoenix United Mine and Crow's Nest, and River Camel) and nearly 5,400 ha of land designated as Sites of Special Scientific Interest covering habitats from upland heathland to wet woodland, species such as marsh fritillary and golden plover, and geologically important areas and features. The geology and formation of the area illustrate many aspects of earth science and human history. It is dominated by the Bodmin Granite and its associated tors and mineral deposits. The concentration of these elements in the south-east corner of the moor makes it an internationally important site for geological study.

The area's wealth of historic features and sites (including 358 prehistoric burial cairns, 211 prehistoric settlements, 1,600 round houses, 37 deserted medieval settlements and over 544 km of prehistoric and medieval boundaries alone) and the overall historical environment illustrate the evolution of farming on a high moor and provide a backdrop for the current recreational and cultural uses of the moor. The agricultural use of the moor, its vegetation and landform reduce the flood risk to the surrounding settlements. Many people visit the moor to take part in walking, mountain biking and horse riding. It is a source of inspiration for artists and writers, who are drawn by the contrast of light and the hues of the vegetation.

Future challenges to the area's tranquillity may come from the development of renewable energy (wind and solar farms) and the need to remove the bottleneck on the A30 at Temple.



Click map to enlarge; click again to reduce

Statements of Environmental Opportunities:

- **SEO 1:** Protect and appropriately manage the nationally important historic landscape of Bodmin Moor; retaining the open character of the moorland, the strong sense of remoteness and tranquillity, the distinctive moorland valleys on the fringe and the links to the historical agricultural use and associated settlement patterns.

- **SEO 2:** Manage, restore and enhance the mosaic of important wildlife habitats allowing enhanced connection between the upland and the valleys which will provide space for species and habitats to react to changes in climate and contribute to improvements in water and soil quality and flood prevention.

- **SEO 3:** Protect and interpret the distinctive geology and features of the landscape, including its granite tors, boulders and clitter slopes, to promote wider understanding of geodiversity and its contribution to the sense of place and history of the area.

Ancient clapper bridge over Penpont Water

Description

Physical and functional links to other National Character Areas

Located in central Cornwall, Bodmin Moor is surrounded by the Cornish Killas National Character Area (NCA). It is linked to the surrounding area principally as the source of the rivers Fowey, Tiddy, Lyhner, Inny and Camel which flow from the high moor forming deep gorges and cascades as they pass over the edge of the granite. Rainfall on the moor is also collected in Siblyback Lake, Crowdy and Colliford Lake reservoirs and used to supply drinking water to much of Cornwall and Plymouth.

Bodmin Moor is visible from many parts of Cornwall and its rugged, treeless form provides the backdrop to many typical Cornish views; in particular Brown Willy, Cornwall's highest point, and Rough Tor.

Cornwall's main transport links – the A30, A38 and A39 roads and the Penzance to London railway line – either cross the moor or skirt the periphery, meaning that the area is highly visible.

The entire area is underpinned and influenced by granite geology. The Bodmin Granite is one of a series of granite intrusions which are linked at depth as the Cornubian Batholith. This links the NCA with a chain of intrusions that are seen in the Isles of Scilly, West Penwith and Carnmenellis to the west and Dartmoor to the east. The granite defines the area, forming the tors, clitter slopes and the thin moorlands soils. It hosts mineral veins of copper and tin.

Links to the surrounding countryside are emphasised through the pattern of farmsteads and settlements connected to the moor by trackways, allowing the movement of grazing livestock to the moor in summer and back to the lower valley pastures in the winter.

A30 trunk road bisecting the Moor

Key characteristics

- High exposed wind-swept moorland, strewn with granite boulders, tors and clitter slopes, with extensive mire systems providing the source of many Cornish rivers.
- The granite exposure is the underpinning feature of the area, creating the distinctive landform and resulting poor acid soils.
- Shallow high-level river valleys that steepen on leaving the granite containing fast-flowing rivers with rapids and waterfalls.
- Some 280 ha of the area designated as a Special Area of Conservation (SAC) for a combination of oak woodland, upland mires and bog communities and providing habitat for species such as otter and salmon. This is complemented by a mosaic of Biodiversity Action Plan (BAP) priority habitats including lowland and upland heathland, and small areas of purple moor grass and rush pasture.
- A rich and important historic environment tracing the occupation of the land from 4,000 years ago to the present day, underpinned by a high concentration of prehistoric monuments and features of international importance.
- Dispersed settlements and farmsteads built from local stone and slate nestled in the sheltered valleys, established around both agricultural and mining sites.
- The moor is bisected by the A30 trunk road which carries the majority of traffic into and out of Cornwall, along an ancient prehistoric ridgeway.

Crowdy Reservoir across the Second World War airfield at Davidstow

Bodmin Moor today

The granite uplands of Bodmin Moor are exposed; this is open, typically treeless moorland with extensive peat bogs and mires. The wild landscape is topped by granite tors and clitter slopes, where Neolithic and bronze-age ritual monuments and enclosures testify to the retreat of settlement from the moorlands after about 1000 bc. The wildness of the landscape is thrown into relief by small pockets of enclosed pasture. Shallow valleys, dominated by scrub woodland and bogs, in which abandoned prehistoric and medieval hamlets lie alongside modern ones, cut through the higher ground. The central part of the moor is lower, rolling and gentler in aspect. It is also less remote, being crossed by the main A30 road from Launceston to Bodmin,

The high tors of Brown Willy (the highest point in Cornwall), Rough Tor and the Cheesewring give way to shallow valleys. The high ground consists of damp grass moorland, blanket bog and purple moor grass. Much of the land is registered as common, and grazed by sheep, ponies and cattle. Modern enclosure is rare on the high moorland. Where it does occur it tends to be in the form of regimented wire fences, enclosed forestry plantations and occasional shelterbelts providing cover from the harsh weather. Many enclosures follow historical boundary features that have been used since the Bronze Age.

The Atlantic coastal climate and underpinning granite geology dictate land use. High rainfall and hard rock combine to give rise to thin and peaty-topped soils, shallow, fast-flowing streams and wet grass heathland. A complex pattern of vegetation types provides a distinctive colour mosaic. This extends into the more intensive areas of grassland found on the lower slopes and close to the widely scattered farmsteads. Towards the outer edges of the moor are located small hamlets and villages, smaller commons and a contrasting landscape of enclosed fields, many dating from the medieval period, fringed by Cornish hedgebanks. Pasture now predominates, with some small areas of arable. This creates a more intimate landscape, reinforcing the transition between upland and lowland.

Bodmin links with the surrounding areas through five main rivers that rise in shallow bogs on the high moor. They flow into wooded valleys, for example at Golitha Falls – a National Nature Reserve (NNR) – and plunge off the moor flowing either directly to the sea or into the larger River Tamar.

A derelict mining chimney at Furhouse

Ancient woodlands can be found in the shelter of steep-sided valleys and are widespread in the south of the area. They support a wide variety of Atlantic lichens and important assemblages of bryophytes due to unpolluted air, a mild climate and high levels of rainfall and humidity.

Bodmin Moor has a rich biodiversity, recognised through the designation of 20 per cent of the moor as Sites of Special Scientific Interest (SSSI) and SAC. It provides a winter feeding area for more than 10,000 golden plover, while the conifer woodland around Davidstow provides winter protection for a flock of nearly 1 million starlings. The starling roost and associated swirling massed murmurations of so many birds has become a tourist spectacle bringing people to the moor during the early winter months. Wet bogs support small populations of marsh fritillary butterfly and breeding waders including snipe. The mineral spoil heaps of the south-eastern moor also provide the last known location for Cornish path moss due to the heavy metal composition of the spoil heaps.

The high moor of Bodmin is a sparsely settled landscape where only a few lonely farmsteads occur huddled together in sheltered locations. In contrast, the moorland edge contains clusters of farmsteads and the nucleated settlements of St Breward, St Neot and St Cleer. Buildings are constructed from locally quarried granite walls and slate roofs and often include hanging slates to provide further protect from the elements.

Mining has played an important role in the formation of the landscape. Tin and copper mining began in the Bronze Age and intensified from the mid-18th century. China clay and granite extraction also developed from this period and all industrial activities peaked in the mid-19th century. Many of the features associated with this mining heritage have been included within the Cornwall and West Devon Mining Landscape World Heritage Site.

The remote and bleak nature of Bodmin Moor makes it an important location for outdoor pursuits, with many people enjoying walking and mountain biking across the area. This is complemented by the lakes and reservoirs, notably Colliford Lake, that provide opportunities for watersports such as sailing and windsurfing. Many areas of the moor are used for field studies by international educational establishments, in recognition of the special landscape.

Ruins of tin mine near Minions, Bodmin Moor

The landscape through time

The Bodmin Granite that underpins Bodmin Moor is one of a series of intrusions stretching from the Isles of Scilly in the west to Dartmoor in the east. During the Carboniferous–Permian Variscan Orogeny, the mountain-building period from 320 to 280 million years ago, burial, compression, folding and the propagation of low-angle faults resulted in the formation of slates from the Devonian age, sandstones and siltstones and allowed the intrusion of granite. At the margins of the granite intrusion, the heat generated produced mineral veins principally of tin and copper, with some lead and silver. Today the granite forms a high plateau and boulder-strewn moorlands; it is widely used as a building material throughout the area.

In the geologically recent past, the ice sheets of the Quaternary Period, did not reach as far south as Cornwall, which instead experienced cold, dry, tundra-like conditions. Some of the moors are topped with granite tors and strewn with half-buried granite boulders, or clitter, which were produced by seasonal freezing and thawing. The naturally formed Cheesewring on the south-west corner of the moor has given its name to an internationally recognised geological category of tor. Deposits of granitic sand and gravel moved down the slopes and collected in gullies between the hills, resulting in a gently rounded topography.

The predominant settlement pattern is based around scattered farmsteads and small hamlets nestled into folds in the high moorland. This mostly results from medieval and later change; earlier settlement remains are largely confined to the moorlands.

Early settlers were involved in the clearance of trees from the moor. Flint scatters can be found across the area suggesting a transition from hunting to settled agriculture. Bronze-age settlers continued the domestication of the area, adding to the already abundant remains of Neolithic ritual and funerary monuments, including barrows, cairns and standing stones with notable concentrations in the Rough Tor and Stowes Pound areas. From around 1000 bc, a cooling climate and wetter conditions brought about the steady abandonment of the high moor.

Remains of ancient settlements on Bodmin Moor

During the late Iron Age and the Romano-British transition, hill forts and distinctive defended farmsteads and hamlets became limited to clusters around the edge of the moor. A period of slow re-colonisation of the moor started in the 11th century, following the original widely dispersed settlement patterns. Cultivation of the moorland resumed and continued through the medieval period, leaving a legacy of ancient abandoned field enclosures with a particularly good example of medieval field systems and cultivation ridges on Garrow Tor. Extensive areas of irregular fields with scattered hamlets and farmsteads represent the range of ages of enclosure, the older settlements being characterised by the place name element tre. They contrast with the 18th- and 19th-century enclosures with rectilinear boundaries associated with larger farmsteads.

Mining has played an important role in the formation of the landscape. Tin and copper mining began in the Bronze Age and intensified from the mid-18th century. The majority of valley bottoms display evidence of tin streaming (extracting tin where it has accumulated in streams and alluvial deposits). China clay and granite extraction also developed from this period and all industrial activities peaked in the mid-19th century.

The expansion of mining and associated industrial activities, especially within the Caradon area, resulted in the growth and extension of earlier settlements, with the addition of sturdy, terraced miners' cottages on the unimproved moorland abutting towns and villages. The mining economy remained dependent on and combined with versatile and productive agricultural activity – particularly miner-farmer smallholdings. The significant impact of the area's importance for mineral extraction can be seen in the industrialised mining and quarrying areas of Caradon, for example Houseman's Shaft at the South Phoenix mine. This has now been recognised through the designation in 2006 of the Cornwall and West Devon Mining Landscape World Heritage Site by UNESCO particularly for its important role in the development of the copper and tin mining industries.

Cattle rearing has long formed a major element of the area's agricultural economy. This has led to the intensification of grass production with any suitable areas being used to provide winter fodder crops. While cattle are still a component of Bodmin Moor, the area is now dominated by sheep grazing with an average of 74,000 sheep being grazed within the NCA. Ponies have historically and culturally played a significant part in the development and management of the moor and many ponies still graze on the moor.

Sheep sheltering by a hedge

Bodmin has benefited from a number of agricultural initiatives which provided funding to encourage farmers to protect the most important wildlife, heritage and landscape features. These have evolved over time and have been replaced by Environmental Stewardship. Recent changes in the structure of agricultural payments have had an impact on the way the moor is used, which in turn affects the vegetation of the moor and has lead to the neglect of many boundary features. These changes can also been seen in the adjoining areas with moves to intensive strip dairy farming and on-site bale storage.

The area around Davidstow was developed as a military airfield in 1941 and used for active service until the end of the Second World War. Since then the infrastructure has degraded but this use is still obvious in the vicinity. Slightly later, in the 1950s, the Davidstow cheese factory was developed; as the factory has expanded, the impact of the complex has increased, creating a prominent feature in the landscape.

Following the Second World War a number of large blocks of conifer were planted on the north and south moors. These have developed over time, in stark contrast to the surrounding open moorland, and provide important roosting habitats for birds and shelter for moorland mammals.

In the 20th century, three reservoirs were constructed on the moor: Colliford Lake, Siblyback Lake and Crowdy Reservoir. They supply drinking water to much of Cornwall and Plymouth.

The dramatic scenery has attracted many writers, poets and artists who have used the landscape to develop and set stories, myths and legends. The best known of these is Daphne du Maurier who used a hostelry in the centre of the moor as the setting for her book "Jamaica Inn".

This NCA includes the Bodmin Moor section of the Cornwall Area of Outstanding Natural Beauty – one of 12 areas of Cornwall designated in 1959 for their special scenic beauty and qualities. More recently the area has attracted a number of funding initiatives, including the Bodmin Moor Project and the more recent Bodmin Moor Livestock Initiative, which provides funding to encourage farmers to protect the most important wildlife, heritage and landscape features. Twelve areas of the moorland have been locally identified as Premier Archaeological Landscapes, demonstrating their excellent survival as coherent archaeological landscapes.

In recent years the landscape of Bodmin Moor has been changed by the dualling of the A30 for three-quarters of its journey across the moor. This has made the area much more accessible for recreation including walking, cycling and horse riding. The landscape looking out from Bodmin Moor has altered over the last 20 years with the addition of a number of renewable energy developments, principally wind farms, single wind turbines and, more recently, solar farms.

Ecosystem services

The Bodmin Moor 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 Bodmin Moor NCA is contained in the 'Analysis' section of this document.

Provisioning services (food, fibre and water supply)

- **Food provision**: Cattle and sheep rearing dominate agricultural production, supplying meat to a regional market, with much of the milk being processed at the Davidstow cheese factory just outside the area to the north-west.

- **Timber provision:** There are 2,135 ha of woodland covering 7.5% of the NCA . 955 ha of conifer plantation is present on the Moor, with most being located in a few small Forestry Commission plantations including Davidstow and Siblyback. These plantations are starting to reach maturity and the wood will be used for low-grade timber and wood fuel.

- **Water availability:** Colliford Lake, Siblyback Lake and Crowdy reservoirs fall within the NCA, storing more than 33,000 Ml of water and providing drinking water to much of Cornwall and Plymouth.

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

- **Climate regulation:** The peaty soils of the NCA have a high carbon content and provide a significant carbon store. Carbon sequestration is sub-optimal due to past and some current management of much of the moorland area. Two thousand hectares of woodland and substantial areas of permanent pasture also protect organic matter with higher carbon content and contribute to carbon sequestration.

- **Regulating soil erosion:** The moorland soils within both the high moor and the wet shallow valleys are at risk from soil erosion. This can be reduced in areas with good vegetation cover and extensive grazing regimes which benefit the adjoining watercourses.

- **Regulating water quality:** Degradation of the peat soils and the history of mining across the area have both resulted in moderate water quality. This is exacerbated in the mid-sections of rivers by the higher level of nitrates associated with dairy farming in the NCA.

- **Regulating water flow:** The 'flashy' nature of the streams tumbling from the granite core makes downstream flooding a significant issue for the communities of Lostwithiel, Camelford and Bodmin. Water retention opportunities have been identified on the moor, employing grip blocking (filling ditches) to increase the size of the blanket bogs and wetland creation associated with the redundant quarrying activity.

Cultural services (inspiration, education and wellbeing)

- **Sense of place/inspiration**: The remote, open upland moorland landscape of Bodmin Moor provides a stark contrast to the intimate enclosed landscape of the surrounding area. The edge of the moor is fringed with deciduous damp wooded valleys which contain dispersed farmsteads linked to the larger areas of common land on the higher granite-strewn moorland. This harsh environment is a complex and contrasting landscape of natural and cultural assets. Often rapidly changing weather, clearly visible in this elevated place, squat granite cottages, brooding boulder-strewn moors and small enclosed fields make it a landscape that has and continues to inspire artists, writers, poets and photographers.

- **Sense of history**: Humans have lived on, shaped and attempted to tame Bodmin Moor since Neolithic times. Standing stones and defended enclosures, stone circles, burial cairns, round house and longhouse settlements, relic field systems, wayside crosses and evidence of mining still feature prominently in the landscape.

- **Tranquillity:** The tranquillity of the area is degraded by the presence of the A30 running through the centre of the NCA. The impact of this has increased over the last 50 years due to road improvements and higher volumes of traffic.

- **Recreation:** The NCA includes nearly 10,000 ha of open access and common land and 211 km of public rights of way which provide opportunities for many types of outdoor recreation, including birdwatching, walking, horse riding and mountain biking.

- **Biodiversity:** The area includes ten SSSI and three SAC covering 5,361ha, and a further 1,000 ha of BAP priority habitats cover 16 per cent of the NCA – the main areas being examples of upland and lowland heath, broadleaved woodland and blanket bog. The woodlands provide excellent habitat for lichens and mosses which are supported by the clean air of the moor.

- **Geodiversity:** The granite-strewn slopes of the high points of Brown Willy and Rough Tor combined with the industrial mining heritage of the south-eastern corner of the area, around Minions, make this an important area for geodiversity. The area contains three SSSI which are notified for their important geology. The Cheesewring granite tor, located near Minions, symbolises the unique geology of Cornwall. It also highlights a long history of geo-conservation in the county.

Pack horse bridge

Statements of Environmental Opportunity

SEO 1: Protect and appropriately manage the nationally important historic landscape of Bodmin Moor, retaining the open character of the moorland, the strong sense of remoteness and tranquillity, the distinctive moorland valleys on the fringe and the links to the historical agricultural use and associated settlement patterns.

For example, by:

- Identifying and realising opportunities to conserve and enhance the outstanding natural and scenic beauty of the area in line with the aims and aspirations of the Cornwall Area of Outstanding Natural Beauty (AONB) Management Plan.
- Removing scrub and woodland which would affect the character and setting of significant archaeological sites.
- Conserving through careful management, including the right balance of grazing in its commons, the historic environment of this area and the landscape's potential to reveal the prehistoric and later archaeology of land use and settlement.
- Maintaining and enhancing the distinctive settlement pattern of small villages, dispersed and common-edge settlements, and their diverse architectural character, ensuring that future development recognises and retains the value of the area's biodiversity, access and heritage.
- Where the restoration of previous mining areas occurs, ensuring that biodiversity is enhanced while maintaining links with previous land use and heritage assets, for example at former china clay extraction sites.
- Protecting and interpreting built features which illustrate and preserve the history of past mining and quarrying activities, such as the consolidation of mine buildings within the Cornwall and West Devon Mining Landscape World Heritage Site.
- Ensuring that any proposals for 'energy generation' developments are sited in locations where impacts on the landscape, the historic environment and biodiversity are avoided, minimised or mitigated through enhancement.
- Contributing to the management of the Cornwall and West Devon Mining Landscape World Heritage Site by recognising and responding to UNESCO's definition of outstanding universal value in planning decisions that may affect the site or its setting.
- Maintaining the varying pattern of irregular and ancient fields and more recent rectilinear fields enclosing agricultural land surrounding the moor to allow understanding of the evolution of these features.
- Ensuring that Cornish hedgebanks are maintained, reflecting local variations of construction and topping vegetation especially in the river valleys where these reduce the amount of sediment reaching the main rivers.

SEO 2: Manage, restore and enhance the mosaic of important wildlife habitats allowing enhanced connection between the upland and the valleys which will provide space for species and habitats to react to changes in climate and contribute to improvements in water and soil quality and flood prevention.

For example, by:

- Linking existing semi-natural habitats such as peat bog, mires and flushes, and wet and dry heathland to provide habitat corridors to allow species the opportunity to move in response to climate change.
- Enhancing the links between the existing moorland and the valleys by establishing and restoring Cornish hedgebanks; correctly positioned, these can reduce soil run-off and improve the flow of water into the area's valleys.
- Managing existing habitats through a combination of extensive grazing, scrub and bracken control, and cutting to increase the diversity of species present. This may require the establishment of viable populations of hardy livestock which will further enhance the sense of place and potentially generate a premium product for use in local catering establishments.
- Allowing natural regeneration of scrub and woodland, including on the sides of river valleys, and where appropriate undertaking limited new planting and re-introduction of coppicing to enhance biodiversity. Any wood removed in this process can be used for the local wood fuel industry.
- Planning the removal of the conifer plantations and considering and realising opportunities for reversion to moorland as appropriate and integrating proposals for replanting into landscape management proposals.

The River Fowey at Golitha Falls National Nature Reserve

SEO 3: Protect and interpret the distinctive geology and features of the landscape, including its granite tors, boulders and clitter slopes, to promote wider understanding of geodiversity and its contribution to the sense of place and history of the area.

For example, by:

- Protecting and enhancing the visibility of geological features by clearing scrub from clitter slopes and ensuring quarry exposures are visible and appropriately interpreted.
- Increasing and encouraging access to geological sites to increase understanding of the formation of the landscape and the importance it played in the history of human occupation and land use and in the development of mining techniques.
- Continuing the work of the World Heritage Site and AONB to provide guidance and interpretation to enhance public understanding and reduce damage to features as a result of recreational pressures.
- Promoting the continuation of natural geological and geomorphological processes to maintain a sense of place and wider geodiversity and biodiversity benefits.

Additional opportunity

1. Engage and support the land-based industry to enhance the management of important wildlife and landscape and recreational assets.

For example by:

- Ensuring that future decisions on management of the moor are taken in a holistic way and include the views of the local community and that this area is promoted through the new neighbourhood planning approach.
- Continuing to produce high-quality food and supporting farming at a sustainable level with grazing and cultivation regimes that lead to improved soil quality, reduced soil erosion and benefits to biodiversity.
- Identifying and realising opportunities for expanding and diversifying leisure, recreational and access activities and opportunities, such that they do not have a negative impact on the special qualities, tranquillity and distinctiveness of the area.
- Sympathetically managing the finite soil and water resources of the area for viable farm businesses which deliver multiple public benefits in addition to food, while being aware that this may need to change due to climate pressures; for example, greater fluctuations in rainfall and temperature.

Supporting document 1: Key facts and data

Bodmin Moor National Character Area (NCA): 28,579 ha

1. Landscape and nature conservation designations

Seventy-one per cent of the Bodmin Moor NCA is within the Cornwall Area of Outstanding Natural Beauty (AONB). Four per cent of the NCA is within the Caradon Mining District part of Cornwall and West Devon Mining Landscape World Heritage Site.

Management Plans for the protected landscape can be found by following the link below:

- www.arnsidesilverdaleaonb.org.uk

Source: Natural England (2011)

1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

Tier	Designation	Site(s)	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)	Crowdy Marsh SAC; Phoenix United Mine and Crow's Nest SAC; River Camel SAC	279	1
National	National Nature Reserve (NNR)	Golitha Falls NNR	17	<1
National	Site of Special Scientific Interest (SSSI)	A total of 10 sites wholly or partly within the NCA	5,361	19

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.

The total land covered by International and European nature conservation designations is 279 ha (1 per cent of the total land area); national designations cover 5,361 (19 per cent). All the European designated sites (SAC) as well as the NNR lie within the SSSI area.

There are 28 local sites in Bodmin Moor covering 7,824 ha which is 28 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

Condition category	Area (ha)	% of SSSI land in category condition
Unfavourable declining	75	<1
Favourable	198	4
Unfavourable no change	166	3
Unfavourable recovering	4,821	92

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

Elevation within Bodmin Moor NCA ranges from 52 m above sea level to a maximum height of around 402 m at Brown Willy, the highest place in Cornwall. The mean elevation is approximately 239 m.

Source: Natural England 2010, Bodmin Moor Countryside Character Area description

2.2 Landform and process

The granite uplands of Bodmin Moor are exposed and desolate, an open, traditionally treeless, moorland containing peat bogs and mires. Relatively less-resistant overlying rocks have been eroded to expose the granite. Periglacial action has shaped the outcrops of the higher ground which are also cut through by shallow valleys. The centre of the granite mass is an irregular plateau with poor surface drainage, where water collects in bogs and mires.

Source: Bodmin Moor Natural Area Profile, Bodmin Moor Countryside Character Area description

2.3 Bedrock geology

The granite rock of Bodmin Moor is part of the Cornubian Batholith, a pluton of igneous magma which was intruded after the Devonian/Carboniferous Variscan Orogeny (mountain-building episode). Mineral veins were emplaced by circulating fluids within the granite and surrounding rocks. Around the granite, the Devonian slates and sandstones were metamorphosed by the heat of the granite.

Source: Bodmin Moor Natural Area Profile, Bodmin Moor Countryside Character Area description, British Geological Survey maps.

2.4 Superficial deposits

Less resistant overlying rocks have been eroded to expose the granite and periglacial action has exposed and shaped the tors and clitter slopes of the higher ground.

Source: Bodmin Moor Natural Area Profile, Bodmin Moor Countryside Character Area description

2.5 Designated geological sites

Designation	Number
Geological Site of Special Scientific Interest (SSSI)	2
Mixed interest SSSIs	1

There are 6 Local Geological Sites within 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

2.6 Soils and Agricultural Land Classification

The acidic soils are predominantly gravelly and peaty but with patches of brown earths capable of cultivation in the lower lying areas.

Source: Bodmin Moor 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):

Agricultural Land Classification	Area	% of NCA
Grade 1	0	0
Grade 2	0	0
Grade 3	5,094	18
Grade 4	9,406	33
Grade 5	13,871	49
Non-agricultural	208	<1
Urban	0	0

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.

Name	Length (km)
River Fowey	17
River Camel	14
River De Lank	13

Name	Length (km)
River Lynher	13
St Neot (Loveny)	5
River Seaton	<1

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.

Streams and rivers, flowing off the moor form cut valleys that deepen as they spread out into the surrounding countryside, in places forming gorges and waterfalls such as Golitha Falls. In the south and east where the streams leave the granite, they cut steep, narrow valleys which are clad in ancient woodland. The River Lynher skirts the edge of the moor to the east in valleys with steeply wooded slopes, while the River Camel flows around the north-west of the moor. Drainage off the Moor is generally radial with valleys that steepen abruptly as they pass over the lip of the granite and cut through the less resistant shales.

3.2 Water quality

The total area of Nitrate Vulnerable Zone is 8 ha, <1 per cent of the 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 2,135 ha of woodlands over 2 ha (7.5 per cent of the total area), of which 231 ha is ancient woodland.

Source: Natural England (2010) & Forestry Commission (2011)

4.2 Distribution and size of woodland and trees in the landscape

The landscape was cleared of most woodland cover at an early date. On the higher ground, the banks are generally treeless, but trees become more common on the lower and more sheltered ground as both forestry plantations and as clumps and shelterbelts around farmsteads. Forestry plantations break up the moorland, especially on the north-western side around Davidstow. The river valleys become wooded as they leave the granite plateau.

Source: Bodmin Moor Natural Area Profile, Bodmin Moor Countryside Character Area description

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).

Type	Area (ha)	% of NCA
Broadleaved	1,000	4
Coniferous	955	3
Mixed	24	<1
Other	156	<1

Source: Forestry Commission (2011)

Area & proportion of Ancient Woodland & Planted Ancient Woodland within the NCA:

Type	Area (ha)	% of NCA
Ancient semi-natural woodland	130	<1
Ancient re-planted woodland (PAWS)	101	<1

Source: Natural England (2004)

5. Boundary features and patterns

5.1 Boundary features

Around the edges of the upland are enclosures which have now partly reverted to moorland but are still marked by stone boundary banks.

Source: Bodmin Moor Countryside Character Area description; Countryside Quality Counts (2003)

5.2 Field patterns

Small enclosures within the moorlands and around their edges contain pasture or rough grassland, with a striking difference between the irregular shape of ancient enclosure and the regular pattern of parliamentary enclosure. The extensive areas of irregular fields with scattered hamlets and farmsteads represent a range of ages of enclosure, the older settlements being characterised by the place name element 'tre'. They contrast with the 18th and 19th century enclosures with rectilinear boundaries and larger farmsteads.

Source: Bodmin Moor Countryside Character Area description; Countryside Quality Counts (2003)

Brown Willy from Davidstow Airfield

6. Agriculture

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

6.1 Farm type

Grazing livestock (mainly sheep) is the dominant farm type with 178 holdings (61 per cent). The NCA is mainly pastoral and does not have a wide range of farm types. Other holding types include; 14 dairy holdings (5 per cent); 8 mixed (3 per cent); and 5 horticulture (2 per cent). The number of holding types has declined apart from grazing livestock which increased by 70 holdings and specialist pigs which showed no change. Lowland livestock grazing holding type lost the most proportionately; by 73 holdings or 77 per cent.

Source: Agricultural Census, Defra (2010)

6.2 Farm size

Farms between 5 and 20 ha are the most common with 91 holdings (31 per cent of the total holdings) covering just 5 per cent of the farmed area. Farms sized between 20 and 50 ha accounted for 23 per cent of holding and 2,143 ha, or 11 per cent of the farmed area. There were 50 holdings of 50 to 100 ha size covering 3,661 ha or 18 per cent of the farmed area. Sixty-one per cent of the farmed area, 13,021 ha is occupied by holdings larger than 100 ha total. Between 2000 and 2009, farms in the size brackets 20 to 50 ha increased by 8 holdings as did those over 100 ha by 5 holdings. Smaller holdings, those under 5 ha and between 5 and 20 ha, decreased by 4 and 7 holdings respectively. Farms between 50 and 100 ha also showed a decrease of 6 holdings.

Source: Agricultural Census, Defra (2010)

6.3 Farm ownership

Owned land makes up 74 per cent of the total farm area, while the remainder is tenanted. There has been a decrease in owned land of 5 per cent over the 2000 to 2009 period, while tenanted land has increased by 20 per cent.

The total farm area has increased by 1,512 ha since 2000.
2009: Total farm area = 19,821 ha; owned land = 14,681 ha.
2000: Total farm area = 18,309 ha; owned land = 14,021 ha.

Source: Agricultural Census, Defra (2010)

Camelford water treatment works

6.4 Land use

Grass and uncropped land have by far the highest land use cover in hectares (18,996 ha covering 96 per cent of the farmed area), followed by cereals (330 ha covering 2 per cent of the farmed area). The only other land use of any significance is fruit (3 ha covering 4 per cent). Between 2000 and 2009 there was a significant increase in the area of grass and uncropped land, (1,445 ha or 8 per cent of the farmed area).

Source: Agricultural Census, Defra (2010)

6.5 Livestock numbers

Sheep are the most numerous (74,000), followed by cattle (22,800) then pigs (200). The numbers of livestock have fallen; cattle by 3,300 or 13 per cent, sheep by 17,300 or 23 per cent and pigs by 100 or 37 per cent.

Source: Agricultural Census, Defra (2010)

6.6 Farm labour

The majority of holdings are run by dedicated principal farmers (364) with 6 salaried managers. Part time workers make up the majority of the workforce at 46 with the numbers of casual/ gang workers at 41 and full time workers at 31. Trends from 2000 to 2009 show a decrease in the number of principal farmers (down by 64) and a very slight increase in the number of salaried managers (from under 5 to 6). The number of casual/ gang workers has decreased by 30 and full-time workers by 3 in contrast to the number of part-time workers which has increased by 5.

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

Bodmin Moor contains large areas of un-improved rough grassland which includes a mosaic of blanket bog, heathland and mire communities. Woodland nestles in the sheltered river valleys and this provides habitat for a wide variety of plant and animal species.

Source: Bodmin 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; **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.

UK BAP priority habitat	Area (ha)	% of NCA
Lowland heathland	2,545	9
Upland heathland	2,100	7
Broadleaved mixed and yew woodland (broad habitat)	845	3
Blanket bog	677	2
Upland calcareous grassland	9	<1
Purple moor grass and rush pasture	2	<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

The underlying settlement pattern is one of dispersed hamlets and farmsteads. There are hardly any settlements on the open moorland. At the edges of the moors, the farms and hamlets occupy the most sheltered sites so that the land can appear to be very sparsely populated. On these more sheltered sites and better land, large modern farm buildings tend to dominate the older dwellings. Settlements are linked by narrow, winding lanes, sunken in the lower ground, but forming open, unenclosed tracks across the moors. The farming pattern is overlaid by groups of miners' cottages and small villages, some recent and rather shapeless, others of medieval origin with buildings clustered around the square-towered granite churches.

Source: Bodmin Moor Countryside Character Area description; Countryside Quality Counts (2003)

8.2 Main settlements

The main settlement in Bodmin NCA is Camelford. The total estimated population for this NCA (derived from ONS 2001 census data) is: 9,111.

Source: Bodmin Moor Countryside Character Area description; Countryside Quality Counts (2003)

8.3 Local vernacular and building materials

Older buildings are almost universally of granite with slate roofs and some slate-hanging. The granite occurs throughout the landscape in walls, clapper bridges, wayside crosses, standing stones, stone stiles and rock exposures.

Source: Bodmin Moor Countryside Character Area description; Countryside Quality Counts (2003)

9. Key historic sites and features

9.1 Origin of historic features

A wealth of prehistoric remains and the numerous myths and legends associated with the area combine with the wildness and hostility of the moorland and its harsh weather to create a mysterious landscape of ancient character.

Bodmin Moor is an exceedingly rich and important historic landscape which has been occupied since prehistoric times. In the Bronze Age, when the climate was warmer and soils more fertile, hundreds of thatched stone round houses stood on the lower slopes of Rough Tor. The remains of these settlements and their ancient fields can still be seen today, as can ancient remains of ritual, ceremonial and burial sites, such as the henge at Castilly. Cultivation of the moorland took place in prehistoric and medieval times, leaving a legacy of ancient and abandoned field enclosure as a reminder of the days when the moors were full of people.

The landscape was cleared of most woodland cover at an early date. The high ground was covered in megalithic tombs, cairns, standing stones and other monuments which today form a 4,000-year-old ritual landscape. Bodmin Moor had quite dense occupation during the Bronze Age; a time when the climate was much milder than it is today. Settlements were probably abandoned about 1,000 BC. Although there are many prehistoric field systems, most of the area was open grazing land and the history of the landscape since the later prehistoric times has been one of piecemeal enclosure and the exploitation of mineral resources.

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

9.2 Designated historic assets

This NCA has the following historic designations:

- 0 Registered Parks and Gardens covering 0 ha
- 0 Registered Battlefields covering 0 ha
- 407 Scheduled Monuments
- 460 Listed Buildings

Source: Natural England (2010)

- More information is available at the following address: **www.english-heritage.org.uk/caring/heritage-at-risk/**
- **www.english-heritage.org.uk/professional/protection/process/national-heritage-list-for-england/**

Temple Church, Bodmin Moor

10. Recreation and access

10.1 Public access

- 34 per cent of the NCA, 9,583 ha, is classified as being publically accessible.
- There are 212 km of public rights of way at a density of 0.7 km per km2.
- There are no National Trails within Bodmin Moor NCA.

Sources: Natural England (2010)

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)	66	<1
Common Land	6,265	22
Country Parks	0	0
CROW Access Land (Section 4 and 16)	9,944	35
CROW Section 15	72	<1
Village Greens	1	<1
Doorstep Greens	<1	<1
Forestry Commission Walkers Welcome Grants	10	<1
Local Nature Reserves (LNR)	0	0
Millennium Greens	0	0
Accessible National Nature Reserves (NNR)	17	<1
Agri-environment Scheme Access	50	<1
Woods for People	388	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.

Pony trekking on the moor

11. Experiential qualities

11.1 Tranquillity

Based on the CPRE map of Tranquillity (2006) it can be seen that much of the NCA is quite tranquil with the most tranquil areas being those away from the edges of the moor and the centre. The greatest disturbance comes from the A30 which bisects the moor and the A39 which skirts around its western edge.

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

Category of tranquillity	Score
Highest	130
Lowest	-43
Mean	19

Sources: CPRE (2006)

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

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. A breakdown of intrusion values for this NCA is detailed in the table below.

Intrusion category	1960s (%)	1990s (%)	2007 (%)	Percentage change (1960s-2007)
Disturbed	2	15	16	14
Undisturbed	98	85	84	-14
Urban	0	0	0	0

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are an increase in disturbance but none in urbanisation as with the tranquillity this intrusion is associated with increased traffic numbers associated with the A30 which bisects the moorland.

- More information is available at the following address: **www.cpre.org.uk/resources/countryside/tranquil-places**

Tin mine near Minions

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

- While woodland is not currently a significant part of land cover, 7.5 per cent of the NCA (3.3 per cent conifer, 3.5 per cent broadleaved), it has an important role locally in landscape character and habitat connectivity. Thirty per cent of the woodland falls within the Forestry Commission Estate and is located in large blocks around Crowdy Reservoir and Colliford Lake. Since 1999 a very small area of new planting has occurred, less than 2 ha, with a similar amount of felling and restocking occurring, none on plantations on ancient woodland sites (PAWS).

Boundary features

- Granites walls, Cornish hedges and stone-faced hedgebanks form the significant boundary features in this landscape, many have remained in use for over 4,000 years. These have been restored and managed through agri-environment schemes with a peak in 2003 during the Bodmin Moor Initiative with 11 km of protection and enhancement being carried out. The estimated boundary length for the NCA is around 3,256 km. Total length of agreements between 1999 and 2003 is equivalent to 100 km.

Agriculture

- Agriculture has remained static during the last decade, with no new enterprise types or uses being developed. Rough and temporary grassland still dominates the area supporting 74,000 sheep and 23,000 cattle. Between 2000 and 2009 there was a decrease in livestock numbers and this has led to an average grazing rate of 2 livestock units per hectare across the complete agricultural area.

Settlement and development

- Development pressure on the Moor has been low with development focused in and around the surrounding towns and villages of Bodmin, Camelford and Liskeard.

Semi-natural habitat

- Designated sites, including 3 SAC, 10 SSSI and one NNR, make up approximately 20 per cent of the NCA and include internationally important wet heath and mire habitats and habitat for internationally important populations of marsh fritillary. These international sites are linked with areas of BAP priority habitat which includes rough grassland, purple moor grass and rush pasture and wet woodland. Nationally important populations of pearl-bordered fritillary and small pearl-bordered fritillary butterflies are also present on the Moor but these are declining due to habitat loss and fragmentation. The area includes the last known location of Cornish path moss which is an early colonist of old mining waste heaps and tracks.

- While much of the upland habitat has benefited from a period of positive management through Higher Level Stewardship and Countryside Stewardship promoted through the Bodmin Moor Initiative, the quality of many of the areas is sub-optimal but improving.

Historic features

- The many historic features which form a key part of the character of the moor have not changed significantly in recent years, although changes in stocking levels have resulted in an increase in vegetation, particularly bracken, which is visibly masking these sites and causing root damage to the below ground archaeological layers . Some neglect of ancient field boundaries has occurred. The notification in 2006 of the Cornwall and West Devon Mining Landscape World Heritage Site has positively enhanced the physical condition and understanding of the mining heritage of the south-west corner of the Moor through consolidation and interpretation of the former industrial sites around Minions. Recent work has been carried out to consolidate the engine houses and interpret the area's importance to copper mining technology, which brought wealth to the district in the 18th century.

Rivers

- The water quality within the main rivers that rise on the Moor has been maintained with most currently being in good condition under Water Framework Directive (WFD) and expected to remain in a moderate condition by 2015. The Seaton river is the only river currently assessed as being in a poor condition. The rivers have not suffered from canalisation and intervention for flood alleviation within the NCA although some engineering has occurred in the lower reaches.

Minerals

- The extraction of china clay within the area has recently ceased and over the last two decades plant and machinery have been removed. These areas are currently undergoing reversion to a combination of moorland habitats and areas of open water for recreation.
- Historically, the south-east corner of the Moor saw heavy mining and extraction associated with tin and cooper mining. These areas are now important from a social and geological perspective, which has drawn interest from tourists and experts.

Drivers of change

Climate change

- Prolonged periods of drought are likely to have adverse affects on peat soils and habitats, making soils more prone to exposure, desiccation and subsequent wind and water erosion, and habitats prone to wildfire events with significant changes in flora and fauna resulting. Marshy grassland and rush-pasture may similarly be affected by prolonged periods of drought. Desiccation of peat soils could also result in damage to buried organic archaeological remains and loss of palaeo-environmental records.
- Increased storminess, periods of drought and the prevalence of pests and diseases may have an impact upon the area's characteristic semi-natural woodlands and plantations.
- The ability of soils on the Moor to retain and slow the flow of water, providing reduced flood risk in surrounding towns and villages, may be impaired as a result of desiccation following drought.
- A change in climate may lead to the development and use of novel / unusual crops such as olives and vineyards, especially on the southern facing slopes of the Moor's edge.

Other key drivers

- Initiatives to re-wet upland and peat soils will provide significant opportunities for biodiversity, carbon storage and reduced flood risk in lower-lying areas. Management of upland areas to withhold water for prolonged periods and reducing the velocity of sporadic peak flow events have the potential to be highly beneficial.
- Maintaining, or establishing a balance in farming activity between the open moor and in by-land.
- Development of a more holistic approach to moorland management to include increasing the Moor's water retention potential and using this to develop further economic benefits for the Moor. It is important that this includes appropriate management for historic and geological features.
- The vision for Bodmin Moor seeks to establish a plan based upon shared agreement between agencies and with landowners and farmers regarding the management of habitats and historic landscapes.
- Restoring and enhancing the natural beauty of the area through appropriate extensive habitat management and long-term restructuring, and removal if appropriate, of woodland plantations on the Moor.
- The development of a place based approach by the Area of Outstanding Natural Beauty, outlined in their Management Plan 2011 to 2016, and the inclusion of Bodmin within the Cornwall Green Infrastructure Strategy should act as a catalyst for integrated delivery on the Moor.
- Given the generally sparse population and exposed nature of the area, pressure to erect further wind farms is very likely. These will either be on the Moor itself or in adjoining areas. There will be an ongoing need to continue to conserve and enhance the character and special qualities of the designated landscapes and the species they support.
- Maintaining an agricultural economy to sustain a labour force sufficient to manage the farmed landscape remains a challenge, and continuing to provide food locally and regionally.
- Emerging planning policy suggests an increase in new homes over the next 20 years, across the county, with a proportion of these being located in the existing small towns and villages surrounding the Moor including Bodmin and Camelford. Some of these will be linked to small business developments.

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.

Granite outcrops at Rough Tor with Brown Willy behind, Bodmin Moor

Statement of Environmental Opportunity	Ecosystem Service: Food provision	Timber provision	Water availability	Biomass provision	Climate regulation	Regulating water quality	Regulating water flow	Regulating soil quality	Sense of place / Inspiration	Sense of history	Tranquillity	Recreation	Biodiversity	Geodiversity
SEO 1: Protect and appropriately manage the nationally important historic landscape of Bodmin Moor; retaining the open character of the moorland, the strong sense of remoteness and tranquillity, the distinctive moorland valleys on the fringe and the links to the historical agricultural use and associated settlement patterns.	↔ **	↘ *	↔ *	↔ **	↔ **	↔ **	↔ *	↔ *	↗ **	↗ **	↔ **	↔ **	↗ **	↗ **
SEO 2: Manage, restore and enhance the mosaic of important wildlife habitats allowing enhanced connection between the upland and the valleys which will provide space for species and habitats to react to changes in climate and contribute to improvements in water and soil quality and flood prevention.	↗ **	↗ *	↗ **	↗ *	↗ *	↗ **	↗ **	↗ *	↔ **	↔ **	↔ **	↔ **	↗	↔ **
SEO 3: Protect and interpret the distinctive geology and features of the landscape, including its granite tors, boulders and clitter slopes, to promote wider understanding of geodiversity and its contribution to the sense of place and history of the area.	↔ **	↔ **	↔ *	↔ *	↔ *	↔ *	↔ *	↔ *	↗ *	↗ *	↔ *	↗ *	↗ *	↗ *

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.
National Importance; Regional Importance; Local Importance

Landscape attributes

Landscape attribute	Justification for selection
A diverse landscape of uplands often contrasting dramatically from surrounding lowlands.	■ The upland landscape is particularly distinctive for its granite tors, clitter slopes, windswept moorland, and wooded valleys and combes all of which are highly recognisable by residents and visitors alike. ■ The valley landscape around the fringes of the area is equally distinctive and complementary to the windswept uplands. ■ A landscape of special scenic qualities and beauty; Cornwall AONB comprises 71 per cent of the NCA.
An open, mainly treeless moorland, with extensive tracts of heather, blanket bog, mire, grass heath and bracken traditionally grazed by cattle.	■ Important deposits of peat and blanket bog, heaths and moors, much with SSSI status. Many areas are comprised of a mosaic of several BAP priority habitats including; heath, blanket bog, purple moor grass and rush pasture. ■ The openness of the area enables long views reinforcing a sense of elevation, remoteness, freedom, and removal from modern bustle. ■ Cattle and ponies are traditionally a feature of the grazed moorland although sheep are dominant in number, with hardy breeds being favoured due to their ability to survive in this harsh environment. ■ These open habitats support populations of marsh fritillary butterflies and large over wintering populations of golden plover.
A long history of human occupation is evident in the numerous heritage assets to be found across the landscape.	■ The story of human occupation is told by many, often protected, heritage assets to be found including prehistoric barrows, stone circles, hill-top enclosures and early settlements. ■ The south-eastern corner of the NCA contains the Caradon Mining District part of the Cornwall and West Devon Mining Landscape World Heritage Site. There are 407 Scheduled Monuments, a wealth of Listed Buildings, and historical remains illustrating continuous human occupation since Neolithic times. ■ Cornish hedges are a distinctive feature contributing to the sense of place, as well as being important historical features and wildlife corridors allowing species movement and migration.
A distinct and varied pattern of fields, enclosures and settlements reflecting a long and ongoing history of agricultural activity and dispersed settlement.	■ Ancient, irregular fields surrounding the moor, enclosed by hedgebanks, occasional stone faced. ■ The scarcity of settlement in the open high moorland contributes to the area's sense of peace and tranquillity, but where it occurs, provides testimony to the long history of human endeavour. ■ A unifying vernacular architecture of local stone and simple white-washed dwellings reinforces an historic and traditional sense of place, closely linked to the evolution of the landscape.
A landscape of great tranquillity particularly on the high moorland plateau.	■ Some 84 per cent of the area is classified as undisturbed in CPRE's Intrusion Map, with the moors away from the A30 being the most tranquil places. ■ Some of the steep-sided, wooded valleys around the fringe of the Moor also provide undisturbed and tranquil places

Landscape attribute	Justification for selection
An extensive network of rights of way and open access land exists.	■ Open access land and the extensive public rights of way network provide opportunities for exploration of the landscape by foot or on horseback. ■ The accessibility of the landscape enables the study and interpretation of the wealth of geodiversity, historic environment and natural history.
A network of small streams feeding into five main rivers that then plunge off the Moor.	■ Many streams rise on the Moor and then meander through areas of mire and bog before descending over waterfalls and through steep-sided wooded valleys before leaving the NCA for the sea.
Areas of broadleaved woodland and conifer plantation, mainly around the fringe of the Moor, contrast with the open, windswept high ground.	■ Although only making up less than 3.3 per cent of the area the dark green conifer plantations are prominent landscape features that contrast with the open moorland of the surrounding area. ■ Scattered stunted broadleaved woodlands, provide the transition between the open moorland and the more fertile rives valleys that lead off the Moor.

Landscape opportunities

- Conserve the landscape's local distinctiveness and high levels of tranquillity, with exposed high open moorland and with more intimate wooded valleys, ancient pasture fields, and historic settlements.
- Manage through continued extensive grazing the open heather moor, re-linking remnant areas of heather moorland and maintaining the open character of the landscape. Further extend connectivity by the reversion, where appropriate, of areas of conifer plantation to open moorland when plantations reach maturity.
- Manage and extend the internationally important wetland habitats – blanket bog, valley mire, wet heath and rush pasture – of North and South Moor, to form a strengthened and more climate change-resilient resource.
- Protect from damage and appropriately manage the area's rich cultural heritage, most notably prehistoric and bronze-age remains, hilltop enclosures and earthworks, and the significant industrial heritage linked to the history of tin and copper mining.
- Sympathetic management practices should be adhered to within the World Heritage Site particularly where they also benefit biodiversity, landscape, culture and economic prosperity complementary to the heritage features and assets.
- Actively manage and expand areas of semi-natural habitat including mire, bog and open moorland communities to re-connect fragmented habitats for the benefit of both common and rare and threatened species.
- Expand the links provided by semi-natural habitats, hedgebanks, walls and valley woodlands to form a connected and resilient network of habitat that can allow species and habitat space to adapt to a changing climate.
- Sympathetically manage any future increases in settlement to ensure that these are complimentary both to the existing settlement pattern and the character of the landscape.
- Increase the opportunities presented through the use of technology, for users of the area to understand and appreciate the unique scenic beauty and special qualities.

Ecosystem service analysis

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Food provision	Grazing livestock Agricultural land	Nearly 100,000 grazing animals are farmed within the NCA producing lamb and beef with some dairy products from a combination of high, rough common land and lower-lying, improved in-bye land. Poor, wet soils limit arable cropping with some fodder crops grown for winter feed. 50 per cent of NCA is Grade 5 agricultural land with the remainder as either Grade 3 or 4	Regional	The wet and warm Atlantic climate is conducive to a long growing season which is reflected in the stock husbandry regime of animals being 'out' for a much greater proportion of the year. On Bodmin rough common grazing is intrinsically linked to the availability of improved and semi-improved in-bye land around the fringe of the moor, extending outdoor grazing periods. A relatively small farm size and mixed livestock systems (beef, dairy and sheep) means that margins are very low and expansion is difficult. Food production, based on a rough pastoral farming landscape, is a key service in this area. Extensive, slow-reared beef and sheep dominate quality food products. Historically agri-environment schemes have been used in some sections of the Moor to enhance landscape and biodiversity in conjunction with enhanced livestock production, especially in introducing extensive grazing schemes in wet habitats. Maintaining soil structure and condition will also be necessary to maximise the response from agriculture to a changing climate.	An opportunity exists to develop a way of supporting the marginal farming of Bodmin Moor by developing a payment structure that recognises all the public benefits that the area's farmers can provide in addition to food continuing to provide a high-quality product from this challenging area. This should consider the important roles that soil management has to play in ecosystem service provision. Working with the Bodmin Farming Initiative to develop appropriate opportunities and markets for 'Bodmin Cattle' ensuring the links to the area's sense of place are maximised. Opportunities may exist for diversification into novel crops on the sloping edges of the moor, for example vineyards.	**Food provision** **Biodiversity** **Regulating soil erosion** **Regulating soil quality** **Regulating water quality** **Sense of place**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Timber provision	955 ha of conifer plantations Existing, small broadleaved woodlands.	The main source of commercial timber is predominantly located on the fringes of the area in the form of conifer plantations. Some steeper slopes and valley sides support small semi-natural woodlands.	Local	The concentration of conifer plantations and wooded valleys are remnants of attempts to produce timber during the post-war period. The quality of timber produced within these plantations is low due to the wet nature of the ground the harsh climatic conditions and the nutrient-poor soils. Many of the locations chosen for planting were in the poorest locations. These areas were often previously rich in biodiversity and contain extensive archaeological features. Pockets of habitats still survive within plantations and show potential for restoration.	Clearance of conifer plantation at maturity provides opportunities for; the restoration of semi-natural habitats; the enhancement of landscape character; and increased connectivity with existing semi-natural habitats, benefitting species such as the marsh fritillary butterfly. Increased and enhanced management of coombe woodlands would release small volumes of timber suitable for local use (predominantly as wood fuel), improve habitats, help to regulate water flow and increase the stability and quality of soils.	**Timber provision** **Regulating water flow** **Regulating soil erosion** **Regulating soil quality** **Climate regulation** **Sense of place/ inspiration** **Biodiversity**
Water availability	Blanket bog and heather and grass moor Upland streams and rivers Reservoirs High levels of precipitation	The peaty soils of the open moorland store water and feed the headwaters of a radial pattern of rivers. Much of the southern upland plateau forms part of the River Fowey catchment. On the northern side of the NCA the rivers De Lank and Camel drain into the Camel estuary at Padstow. The area is a key source of water for the region, with the Crowdy and Siblyback reservoirs and the much larger Colliford Lake supplying much of Cornwall's water. The Atlantic climate and elevated nature of the area result in high levels of precipitation all year round.	Regional	Relief type rainfall predominates and average totals are high, often between 1,500 and 1,600 mm per annum but past degradation of peaty soils, bogs, wet heath and valley mires in the central moorland through overgrazing and drainage has reduced their ability to store water. Colliford Lake stores 28,000 megalitres and supplies north and south-east Cornwall directly and releases water into the Fowey system for abstraction and treatment at Restormel, Siblyback more than 3,000 megalitres and Crowdy just over 1,000 megalitres	Seek opportunities to increase the availability of water by reducing the rate of flow from moorland areas through the repair of damaged areas of moorland and the expansion of suitable habitats, particularly mire and blanket bog. Reinstate natural, meandering drainage patterns and channels and reconnect watercourses with functional flood plains. Seek opportunities to realise the energy producing potential of fast flowing streams and rivers, particularly where this coincides with the restoration and maintenance of historic structures, features and management practices. The location of these will need to be carefully considered due to the designation of some rivers and the species reliance on river flows. Encourage good environmental management of moorland habitats, especially blanket bog, increasing the capacity of habitats to retain water.	**Water availability** **Water quality** **Biodiversity** **Climate regulation** **Regulating soil erosion**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biomass energy	Secondary woodland and areas of scrub associated with river valleys	There is little standing, accessible biomass in the area with woodland restricted to mainly inaccessible areas.	Local	Opportunity for specific energy crops is small within the NCA but local wood fuel may be available in the form of small section wood from hedgerow and woodland management and the arisings from scrub and management associated with good agricultural practice and habitat enhancements. Clearance of areas of scrub and secondary woodland to expose BAP quality grassland habitats and the management of hedgerows may generate some material suitable for local wood fuel, and would enhance the ecological network and connectivity of the area. Further material may be obtained through the felling of conifer plantations on the moor particularly wood that cannot be used as marketable timber. This area has not been identified as a potential area for the production of miscanthus and short rotation coppice due to crop requirements an climatic conditions.	Ensure that opportunities are pursued which enhance the biodiversity of the area through appropriate management of scrub and that arisings from this are considered as an economic resource in the form of wood fuel. Consideration should be given to the impact of extraction on the soil and buried archaeology within any area. Management of vegetated Cornish hedgerows can supply a small amount of wood for local use while enhancing the longevity of these key features in the landscape.	**Biomass energy** **Biodiversity** **Sense of place/ inspiration** **Sense of history**
Climate regulation	Carbon-rich peaty soils 2,135 ha of woodland split between conifer plantation and broadleaf 19,000 ha of Permanent grassland	Extensive areas of carbon rich (20 to 50 per cent) peaty soils are present across the NCA's moorlands; more than 50 per cent of the area. Through historical intensive management, such as grazing burning, these areas have released carbon. Valleys contain many pockets of permanent woodland and wet grassland habitat. These features contribute to the regulation of climate through both carbon storage and carbon sequestration.	Regional	Peat-rich soils have an important role to play in the storage of carbon although this may not have been explored fully as yet. Historic degradation of peaty soils, bogs, wet heath and valley mires in the central moorland through overgrazing and drainage reduced their ability to sequester and store carbon. Wet heath habitats and particularly mire and blanket bog, play an important role in sequestering carbon. The management of these habitats should be considered in light of this additional important role. Areas of permanent grassland and woodland found primarily around the fringe of Bodmin and on deeper soils maintain higher levels of carbon storage than regularly cultivated soils. Where permanent grassland or long leys occurs, appropriate application of organic matter will result in higher levels of carbon storage and improved soil condition. The use of nitrogen fertilisers on poorly structured soils is likely to result in the release nitrous oxide gases. Similarly, areas of secondary and ancient semi-natural woodland, again found around the fringes of the area, support soils with higher carbon levels and contribute to the storage and sequestration of carbon.	Encourage sustainable grazing regimes on permanent pasture and rough land, particularly in areas with peaty soils within moorland habitats. Careful management of existing habitats and development of new habitats that can both provide links to the ecological network and play a role in climate regulation should be considered and implemented. These changes may also provide economic benefits resulting from reduced inputs of inorganic fertiliser. Maintain areas of secondary woodland and ancient semi-natural woodland through positive, traditional management keeping disturbance of soils to a minimum.	**Climate regulation** **Regulating soil quality** **Regulating soil erosion** **Regulating water flow** **Biodiversity**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water quality	Large areas of un-improved and semi-improved habitats beneficial to good water quality High levels of precipitation Fast flowing rivers over granite Slowly permeable, wet, acid upland soils with a peaty surface in places	Rivers with good ecological status – Fowey, Upper Lynher and Camel; with moderate status – De Lank, St Neot, Penpont and Warleggan and predicted to remain moderate by 2015.	Regional	Water quality is important to this area in support of much of the biodiversity resource found in the area. Particularly the quality of the Camel and its tributaries is significantly and directly influenced by the management of the surrounding moor and farm land. Careful management of livestock, particularly controlling access to watercourses and waste management, is essential to maintaining good water quality. Moorland burning increases levels of dissolved organic carbon (DOC), acidity, colouration and sediment transfer.	Seek opportunities to establish extensively managed permanent grassland, and areas of scrub and woodland along coombes, steep valley sides and near watercourses. Increase the amount of farmland managed under principles established by the Catchment Sensitive Farming initiative. Fencing watercourses, where appropriate will reduce sedimentation and nutrient loading.	**Regulating water quality** **Water availability** **Soil quality** **Soil erosion** **Biodiversity** **Food provision**
Regulating water flow	Semi-natural habitats An area of high rainfall.	Extensive areas of semi-natural habitats including moor, rush pasture, semi-improved grassland and woodland many with areas underlain with peaty soils. Rivers and streams collect water on the moorland core and gather momentum in their courses off the granite plateau, which gives the rivers and streams a "flashy" nature. The existing areas of blanket bog and wet grassland act as a sponge to absorb and regulate the substantial rainfall that the NCA receives.	Regional	Historic drainage practices on the Moor have reduced its capacity to store water. As a result, floodwater enters the Camel tributaries and Fowey River more quickly and makes flooding worse downstream. Lowland communities can be susceptible to flooding after prolonged or intense periods of rainfall (including outside the NCA)[1] as demonstrated by the dramatic flooding of Lostwithiel on the Fowey in November 2010. Key areas at risk of flooding from rivers with their source on Bodmin Moor include Rilla Mill and parts of the A390 (River Lynher); Camelford, Wadebridge and Bodmin (River Camel); and Lostwithiel (River Fowey). Rapid and dynamic responses to high rainfall can also result in very significant areas of localised soil erosion, on both steep slopes and in more intensively cultivated areas.	Increase amount of farmland managed under principles established by the Catchment Sensitive Farming initiative. Fencing watercourse and introducing cross-field hedge and tree planting, where appropriate. Landscape and visual impacts from such activities could be minimised by reference to local Landscape Character Assessment. Further opportunities may exist on the Moor through blocking grips and allowing streams to naturally revert, which will enhance the ability of the moorland to regulate the water flow.	**Regulating water flow** **Regulating water quality** **Biodiversity** **Sense of place/ inspiration** **Food provision** **Regulating soil erosion**
Pollination	Heathland and moorland Species-rich damp grasslands Species-rich ancient woodlands	There are substantial areas of heathland (45,000 ha), with species-rich grassland and meadows in the valleys that provide an important nectar source for pollinating insects. The network of flower-rich hedgebanks and sunken lanes on the edges of the area also provides a valuable nectar source and movement corridor for pollinating insects.	Local	A range of habitats support a significant number and variety of important plants, providing an important and widespread base for pollination. Pollination opportunities can be enhanced through increasing the diversity of vegetation and habitats.	Increase area of land covered by semi-natural habitats, to increase the diversity and number of flowering plants and increase the area and range of habitat mosaics where different habitats lie in close proximity.	**Pollination** **Biodiversity** **Food provision**

[1] East Cornwall Flood Management Plan (URL: http://publications.environment-agency.gov.uk/pdf/GESW1109BOUH-e-e.pdf)

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil erosion	Rough grassland permanent improved pastures and woodlands and hedgebanks located on slopes combined with mire systems in the upper reaches of the rivers	All soils across the area are prone to some degree of erosion or have historically suffered degrees of erosion. Soil erosion occurs principally locally in association with livestock regimes such as over-wintering stock and fodder production.	Local	The very acid loamy upland soils with a wet peaty surface (40 per cent) suffer from a combination of rapid runoff, easily damaged peat layers and steep slopes, while the freely draining acid loamy soils over rock (28 per cent) are often found on steep land over which rainfall will flow, with inherent risk of erosion. The freely draining slightly acid loamy soils (15 per cent) have an enhanced risk of soil erosion on moderately or steeply sloping land where cultivated or bare soil is exposed. This is exacerbated where organic matter levels are low after continuous arable cultivation or where soils are compacted. There is also the potential for wind erosion on some coarse-textured cultivated variants. The slowly permeable wet very acid upland soils with a peaty surface (7 per cent) and blanket bog peat soils (6 per cent) are at risk of gullying / hagging (and loss of particulate organic matter) from rapid runoff and / or where surface vegetation is damaged or lost. They are vulnerable to occasional mass flow events and can be affected by wind erosion where the soil is bare. Drainage of the blanket bog soils (for example through gripping) may also result in increased oxidation of carbon and soil wastage. Some of the freely draining slightly acid but base-rich soils (2 per cent) may be susceptible to capping and slaking, increasing the risk of soil erosion. These soils need to be managed carefully to reduce erosion risks with careful timing of cultivations and maintenance of vegetation cover. The intensive management of stock (dairy and beef) leads to soil compaction which provides a higher risk of soil erosion.	Increase and extend areas of habitat – mires and blanket bog, heath and upland grassland. Reverse or remove drainage in appropriate areas to re-wet peaty soils making them less prone to desiccation, oxidation and subsequent wind and water erosion. Increase sward diversity to increase laying down of organic matter on improved grasslands and a wider variety of species to help knit together substrate. Manage grazing regimes to reduce or minimise soil compaction and poaching. Retain and enhance the network of Cornish hedges and give careful consideration to the relocation of gateways to ensure soil is not lost from fields into water courses. Promote good management of top soils and employ minimum tillage techniques in locations where it may help to maintain good soil structure. Introduce, where appropriate buffer strips across fields to help reduce soil migration on slopes. Where organic matter is low, increase organic matter inputs to improve soil structure. Measures will be beneficial that retain water in situ, ensure good vegetative cover, and avoid over grazing / trampling or damage by mechanised activities.	**Regulating soil erosion** **Regulating soil quality** **Regulating water quality** **Regulating water flow**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulation of soil quality	Slowly permeable wet, acidic, peaty upland soils Free and poor draining soils, affected by high rainfall Permanent pasture Semi-natural habitats.	The main soilscape types in this NCA include; very acid loamy upland soils; freely draining acid loamy soils over rock; freely draining slightly acid loamy soils; slowly permeable wet very acid upland soils with a peaty surface; blanket bog peat soils; and freely draining slightly acid but base-rich soils.	Regional	Peaty soils have low strength when wet and are easily damaged by unsustainable burning practices, overgrazing, compaction and loss of vegetation. The peat soils on the moorland plateau suffer from localised deterioration in soil quality. Management of the freely draining acid loamy soils over rock is difficult on what is steep, often very stony land. There is generally low risk of poaching, but organic topsoil can poach when wet. The freely draining slightly acid loamy soils have potential for increased organic matter levels through management interventions Organic matter may be being lost through tillage across more intensively farmed areas away from the open moorland. Lack of organic matter makes soils more susceptible to compaction and erosion. Improving soil quality through increasing organic matter will have potential benefits in regulating soil erosion by making it more stable and able to withstand heavy rainfall. It may also contribute towards climate change regulation, storing more $CO^{"}$, though the capacity of these soils to make a significant contribution is limited.	'Re-wetting' of areas of degraded peat soils can improve structure and stability of the soils, particularly when combined with careful and appropriate stock management. Exposed and bare areas of peat soil would be improved through re-vegetation. Ensure levels of organic matter are maintained in all soils, minimising tillage operations where possible. Identify and apply grazing regimes that increase sward diversity and increase levels of organic matter. Manage with extensive, and where appropriate, mixed grazing regimes to reduce stocking densities and avoid soil compaction.	**Regulating soil quality** **Regulating water quality** **Climate regulation** **Regulating water flow** **Regulating soil erosion**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of place/ inspiration	Dominant granite upland plateau Granite tors and clitter slopes, stone walls and Cornish hedgebanks Peat bogs, mires and grass moorland Fast-flowing streams and rivers falling through shallow, steep-sided wooded valleys Open and expansive area of undeveloped, farmed land punctuated with simple settlements Uninterrupted views	The granite outcrop of Bodmin Moor forms the highest part of Cornwall. It is an area of outstanding natural and scenic beauty; two-thirds of the area is designated as AONB. Granite tors and clitter slopes define the highest points in the landscape and often create distinctive skyline features. A landscape defined by a combination of simplicity, wildness and ruggedness and a long history of human occupation. Moorland habitats, particularly blanket bog, mire and grass moorland, dominate the higher plateau. Water features in the landscape with three sizeable reservoirs and many fast-flowing streams and rivers. The intimate valleys with wooded sides clothed in lichen-rich woodlands and the quiet, intensely rural quality contrast with past industrial heritage and ancient features.	National	The area has a distinct upland character and a strong sense of place resulting from the bleak and remote feel of the uplands, the ever-changing palette of colours, the extensive land use and occasional regimented conifer plantations. This rugged natural environment is contrasted and complemented by the squat granite farmsteads, villages and hamlets. While the landscape appears stable erosion of many of the features of intrinsic value is occurring with the increased disturbance from the A30, the development pressure associated with the generation of renewable energy and the enlargement of buildings associated with agriculture.	Ensure that the important aspects and features that make up the unique character of the place are conserved and enhanced, while maintaining vibrant, viable future uses and occupation of the landscape Identifying, protecting and reinforcing the distinctive elements and features of the landscape are essential to maintaining the distinctiveness and inspirational character of the area. Of particular importance is the maintenance of a 'wild', open, uncluttered, and generally undeveloped character.	**Sense of place/ inspiration** **Biodiversity** **Sense of history** **Tranquillity**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of history	Burial mounds, hut circles and ancient village sites, stone circles and ancient field boundaries Internationally important mining heritage	Continued human occupation of the area since the Bronze Age provides a wealth of important information and records about how people have occupied and used the landscape and adapted to changes in climate. The mining heritage in the south-east of the Moor illustrates technological evolution and the exploitation of natural resources, which had wide-reaching implications, and is now recognised as part of a World Heritage Site.	National	The upland nature of the area has contributed to the preservation of a rich cultural heritage stretching back over 4,000 years, which survives as coherent archaeological landscapes of international note. 407 Scheduled Ancient Monuments and many other non-designated sites represent one of the highest densities of archaeological interest in the uplands. World Heritage Site status conferred on the mining heritage and landscapes of the area seeks to enhance the conservation, access and interpretation of the surviving assets. The heritage assets within the area contribute significantly to the visitor and tourism-based business within the area. Continued protection and enhanced interpretation of the wealth of heritage present is essential.	Continuing to conserve and enhance both the physical remains and access and interpretation of the internationally important historic environment will further complement and contribute to the diversification of business opportunities across the area. It provides opportunities for increased access and recreation, learning and research and, appropriately managed, enhanced biodiversity interest. Using traditional, locally sourced materials and vernacular design to inform new development will reinforce the character and locally distinctive nature of the area.	**Sense of history** **Sense of place/ inspiration** **Recreation** **Biodiversity** **Tranquillity**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Tranquillity	A remote and isolated place free from major development and infrastructure Dark skies and views to the north and south Cornish coasts and towards Penzance to the west	While Bodmin Moor currently lacks major modern infrastructure and development (with the exception of the A30), this preserves the tranquil and undisturbed character. Views towards the adjoining NCA include recent development including wind farms, quarrying and intensive agriculture which can detract from the areas tranquillity.	Regional	The remoteness of the northern and southern sections of the NCA ensures a high level of tranquillity enhanced by the valleys leading from the moor which provide further isolation from neighbouring development and intrusion. Principally the greatest impact on tranquillity results from the improvements to A30 and increased traffic volume and noise.	Ensure that the sense of tranquillity is maintained by encouraging only appropriate levels of development. Enhancement of the natural environment around the periphery of the Moor should be considered to minimise impacts on tranquillity and light pollution. Improving access to the wealth of natural and historic assets to help disperse concentrations of visitors to the area to help maintain levels of tranquillity and overall visitor enjoyment.	**Tranquillity** **Sense of place/ inspiration** **Sense of history**
Recreation	Open access land Public rights of way Reservoirs	Thirty-five per cent of the area is open access land and there are 212 km of the public rights of way within the NCA Three large water bodies, Crowdy, Siblyback and Colliford reservoirs provide opportunities for water-based activities including sailing, fishing and birdwatching	Regional	Despite being bisected by the A30 a large portion of this area remains generally less well known and visited than similar places such as Dartmoor. While this contributes to the general sense of tranquillity and remoteness, opportunities for increased levels of access and recreation do exist. The vast range of experiences are available to visitors and residents (such as walking, mount biking, cycling, birdwatching) allowing for a dispersal of activities across much of the area. The impact of these activities on the protection of soils should always be considered. The large water bodies within the area provide a wide range of recreation opportunities with the majority focusing on quiet enjoyment including provision for fishing, birdwatching and walking.	Maintain and improve the quality of recreational assets and other quiet recreational routes by supporting opportunities to connect and link with new multi-user routes, and sustainable transport schemes, particularly in areas close to where people live such as Bodmin and Liskeard, to give more opportunities to more people to access the environment. Further opportunities should be considered in association with 3 main reservoirs in the area.	**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 and nationally designated sites and habitats Range and wealth of species associated with upland and upland fringe habitats including golden plover and marsh fritillary	The area includes 3 SAC and over 6,000 ha of recognised BAP priority habitats made up of upland heathland, mainly grass heath, broadleaved woodlands and wet heathland habitats.	International	The condition of many of the designated areas (SSSI) is favourable. Much of this area has agreements in place to ensure that enhancements and protection are achieved. However, areas of BAP priority habitats without designation are often degraded due to past attempts to improve the area for agricultural production such as the installation of drainage and improvement through fertilisers.	Explore opportunities to improve the condition of all important sites and habitats. Further action should be taken to increase the area of important habitats where possible, increase the connectivity of sites and habitats, and create more habitat where appropriate.	**Biodiversity** **Sense of place/ inspiration** **Regulating water quality** **Regulating water flow** **Climate regulation** **Pollination**
Geodiversity	Nationally designated sites Historic, localised tin and copper mining Quarrying Local stone often used in vernacular buildings World Heritage Site	The predominantly granite geology underpins all aspects of the landscape of this area. It contributes significantly to the sense of place, history, recreation and is a major attraction for visitors to the area. The geology is expressed in the tors and clitter slopes and through its use as a building material. There are two geological SSSI and one other with designated geological interest. The south–east corner of the Moor includes the Caradon Mining District section of the Cornwall and West Devon Mining Landscape World Heritage Site.	International	The range and variety of geology and geodiversity across the area has been widely studied and continues to allow for the study and interpretation of earth sciences. The area provides a record of the earliest occupation of the landscape by man, the use of and response to natural resources, particularly mineral deposits, stone and soils. The area provides examples of how mineral deposits have been won (streaming, mining and open cast) and their impact globally, now recognised as a World Heritage Site.	Identify and realise opportunities for enhanced access to, study and increased understanding of the internationally important geodiversity across the area to allow further information to be gained. Opportunities should be explored to continue to use local stone in building development.	**Geodiversity** **Biodiversity** **Regulating soil quality** **Sense of place/ inspiration** **Sense of history**

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