



Introduction

As part of Natural England's responsibilities as set out in the Natural Environment White Paper¹, Biodiversity 2020² and the European Landscape Convention³, 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.

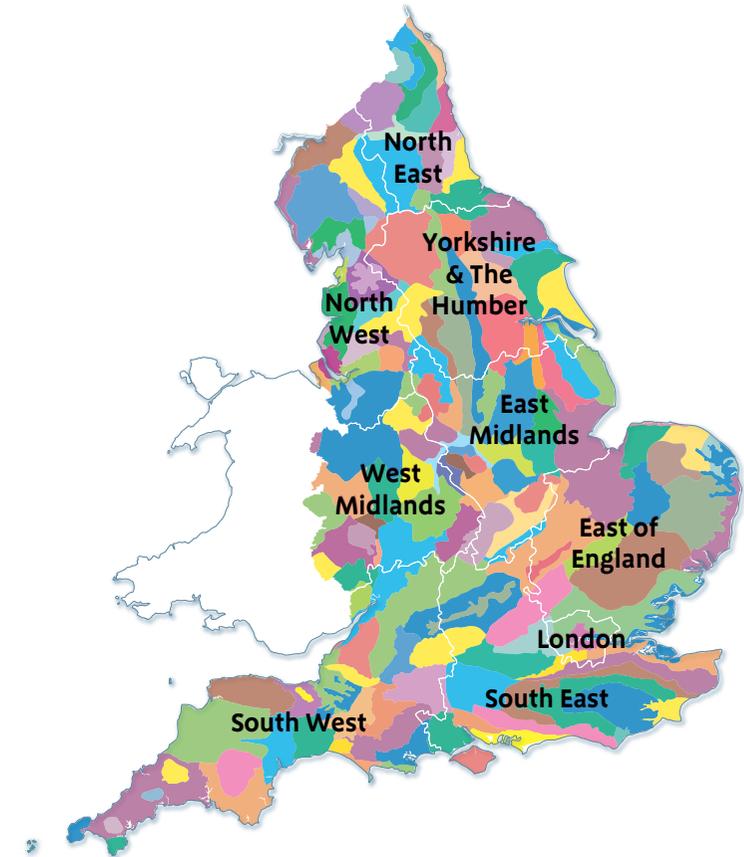
NCA profiles are guidance documents which can help communities to inform their decision-making about the places that they live in and care for. The information they contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and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

Dartmoor's extensive upland moorland core rises above the surrounding small-scale, enclosed, predominantly pastoral landscape. Granite unites and characterises the entire National Character Area (NCA). On the moors the distinctive tors create key landscape features, interrupting otherwise unbroken skylines and ridges, and provide focal points for visitors. Isolated farmsteads and scattered villages utilise granite for buildings and walls; and the area's strong time depth and rich cultural heritage are visually evident because of the granite, which includes the largest concentration of prehistoric stone rows in Britain.

The high moors are overlaid with thick deposits of peat and support internationally important blanket bogs surrounded by large expanses of upland heathland and grass moorland. The bogs and valley mires absorb and store significant amounts of water, as well as carbon, released into the 16 rivers and 8 reservoirs that supply the surrounding urban and rural populations and industry. As rivers leave the high moor they flow through deep-cut valleys steeped in woodland – both semi-natural broadleaved and coniferous plantation. The fast-flowing rivers, strewn with granite boulders, are popular for recreation, both passive and active.

Agriculture continues to shape the landscape, as it has for thousands of years. Extensive grazing of the moorland commons by cattle, sheep and Dartmoor Ponies helps to manage the habitats and the large tracts of open access land. The surrounding enclosed land is an integral part of the upland farming system, providing ground for overwintering stock, hay meadows and winter feed crops.

Dartmoor provides a wealth of natural services, fresh water, carbon storage and food, as well as significant opportunity for recreation and access to areas with a high level of tranquillity. The challenge is to sustainably manage and enhance the natural assets that provide the services and opportunities. With 97 per cent of the NCA designated as a National Park, Dartmoor is well positioned to balance and manage these challenges and opportunities.

[Click map to enlarge; click again to reduce.](#)



Vertical granite exposures of Holwell Quarry below Haytor.

Statements of Environmental Opportunity

- **SEO 1:** Protect, manage and enhance Dartmoor's extensive open moor, its sense of wildness and remoteness, the internationally important habitats and species it supports, and the carbon and water stored in its deep peat.
- **SEO 2:** Protect, manage and enhance Dartmoor's rich cultural heritage and its strong connection with granite and associated minerals, providing inspiring information to promote understanding of the landscape.
- **SEO 3:** Protect, manage and enhance the enclosed, tranquil character of the pastoral landscape, encouraging the management of boundary features, including granite walls, and of semi-natural features to strengthen local distinctiveness and connectivity. Create opportunities for quiet, informal recreation, particularly around settlements.
- **SEO 4:** Protect and manage Dartmoor's network of streams, leats and rivers; and enhance the contribution they make to landscape character, recreation and biodiversity, while managing water flows, quality and supply.

Description

Physical and functional links to other National Character Areas

The granite mass of Dartmoor stands proud above the softer surrounding landscapes. It provides a dramatic visual backdrop to many views from the adjoining South Devon, Devon Redlands and The Culm National Character Areas (NCAs) and forms the distant skyline from NCAs further away, including Exmoor, Bodmin Moor and Cornish Killas. Similarly these NCAs provide a distant skyline for views from Dartmoor. Panoramic views across the adjoining NCAs reach as far as the coast, with the sea visible on clear days. The Teign Estuary and Plymouth Sound form key focal points in distant views, and physically and functionally link to Dartmoor.

Being the highest area in southern England, and one of the wettest, Dartmoor is the source of many of Devon and east Cornwall's rivers. The moorland blanket bog and valley mires act as a giant sponge, storing water and regulating flow. Most of the 16 rivers flow to the south coast, across the South Devon NCA. Dartmoor's water, captured and stored in eight reservoirs, supplies the surrounding populations, including the urban areas of Plymouth and Torbay, and industry. This water supply function has historically linked Dartmoor to Plymouth since the 16th century with the construction of the Devonport and Drake's leats; significant lengths of these leats exist today.

Many of the historical infrastructure links between Dartmoor and the surrounding NCAs relate to the transportation of granite and minerals. The most notable form of transport is the Haytor granite railway, linking Haytor quarries with the docks at Teignmouth via the Stover Canal. Cultural links also exist between Dartmoor and the surrounding NCAs. Henry Williamson's classic *Tarka the Otter* connects Dartmoor with Exmoor through The Culm NCA along the River Taw corridor. It depicts the obvious biodiversity connectivity along the numerous river corridors.



The River Dart meanders through steep, wooded valleys to the adjoining South Devon NCA.

Key characteristics

- Extensive unsettled moorland with broad ridges, expansive panoramic views and an overwhelming sense of remoteness and wildness. Hardy sheep, cattle and ponies, including the Dartmoor Pony, freely graze.
- Granite tors forming characteristic silhouettes on otherwise smooth, uninterrupted skylines, and granite boulders and 'clitter' punctuating smooth moorland slopes.
- Large tracts of internationally important blanket bog and valley mires overlying thick deposits of peat; home of hare's-tail cotton grass and the breeding ground for golden plover and dunlin.
- A major water catchment, with an extensive network of small streams and mires radiating off the high moor, feeding into fast-flowing rivers with white water, small waterfalls and gushing torrents occupying steep-sided, woodland-clad valleys.
- A cultural landscape with a strong time depth, including extensive remains dating from the Bronze Age, and farmsteads as well as a mining industry from the medieval period.
- A landscape unified by granite, reflected in ancient monuments, stone walls, bridges and settlements.

Continued on next page...



Streams radiate from the extensive moorland, often crossed by ancient granite clapper bridges.

Key characteristics continued...

- A relatively sparsely settled landscape, with isolated farmsteads dotted across the moorland, small settlements clustered around bridging points or crossroads, and small market towns scattered around the periphery. Church towers form prominent vertical elements.
- A small-scale pastoral landscape – with a strong field pattern defined by granite walls, granite-faced banks or hedgebanks – which surrounds the open moorland.
- Mature hedgerow trees, valley floors fringed with wet woodland, and valley sides often cloaked in extensive areas of ancient semi-natural woodland, which create a sense of enclosure – a stark contrast to the central moorland.
- Open and straight roads that cross the moorland and contrast with the narrow, winding myriad of lanes that thread through the enclosed pastoral landscape linking farmsteads, hamlets and villages.
- An area with a high level of tranquillity, with dark night skies. As a National Park, the area offers opportunities to experience peace and solitude in open ‘wilderness’ or in intimate enclosed areas.

Dartmoor today

Granite has shaped, influenced and framed Dartmoor for millennia: it unites the upland moorland and the surrounding pastoral landscape; it characterises historic features, walls and settlements; and it has influenced man's activities since at least the Bronze Age. Dramatically shaped granite tors and outcrops punctuate large, open skylines, and clitter or boulder-strewn slopes interrupt otherwise smooth hillsides.



Dartmoor's internationally important blanket bogs provide breeding ground for the dunlin.

Britain's most southerly distribution of blanket bog, found on Dartmoor's high moor, absorbs and stores significant amounts of water, as well as carbon. This designated Special Area of Conservation (SAC), with abundant bog mosses and characteristic hare's-tail cotton grass is the breeding ground for the rare golden plover and dunlin. Surrounding the blanket bogs are large expanses of upland heathland and grass moorland, including wet and dry heathland, purple moor-grass, bilberry and western gorse, with its distinctive summer smell and bright colour. This landscape is often considered wild, bleak and remote, with a sense of isolation and exposure. Hardy cattle, sheep and ponies, including the symbolic Dartmoor Pony, extensively graze the moors, which are predominantly registered common land.

The high moor is a mass of small streams and boggy ditches that drain into rivers radiating outwards. As the rivers flow off the moor through steep-sided valleys, they gain momentum; the water tumbles over the boulders and small waterfalls, creating stretches of white water. Through the pastoral landscape the rivers become 'calmer', widening and slowing down; they are often fringed by wet woodland or species-rich pasture. A national stronghold of otters resides in the clean, clear rivers, alongside freshwater salmon and sea trout. Reservoirs create flat, smooth elements in an otherwise undulating or hilly landscape. Some nestle directly into the moor, while others are framed by woodland.

Dartmoor is not a highly wooded landscape, but woodlands are significant elements. Dark, regular-shaped blocks of coniferous plantation are prominent, incongruous features on the moors. Valley sides are clad in coniferous or broadleaved woodlands, including large areas of semi-natural woodland and patches of ancient oak woodland; Black-a-Tor copse is one of Britain's best examples of high-altitude oak woodland. Lichens and mosses, including string-of-sausages lichen, drench some woods, while wild daffodils and bluebells carpet the floor of others. Mature hedgerow trees, including oak and ash, and small broadleaved copses, often once coppiced, give a wooded feel to the

pastoral landscape, providing a sense of enclosure. Enclosure is reinforced by a pattern of small fields bounded by granite walls, hedgebanks or hedgerows. At the moorland fringe granite walls, supporting rare lichens, enclose 'newtakes'; walls give way to stone-faced banks, often topped with gorse, bracken and heather, creating a visual connection back to the moor. At lower altitudes where the soil becomes more fertile with higher organic matter, Devon hedgebanks topped with hedgerows and hedgerow trees enclose pastures, hay meadows and occasional arable fields.

Dartmoor, while now considered unsettled, is a rich cultural landscape. Prehistoric granite stone rows and circles are found across the moors; some are hard to see but others are visually prominent, often associated with a change in vegetation. Bronze-age fields, bounded by 'reaves' (low stony banks), are still in use today, and the granite walls of around 5,000 hut circles form the root of today's settlement pattern. The medieval period reinforced the basic settlement and parish pattern of isolated farmsteads and hamlets linked by a dense network of narrow sunken lanes and tracks crossing streams on hump-backed granite bridges or clapper bridges. Larger villages grew in sheltered locations, while gateway towns, often with prominent churches, developed around Dartmoor on the wealth of the wool and tin industries. This growth was in parallel with infrastructure developments including the turnpiking of the Exeter to Tavistock road (1772) that cuts across the moors in a long straight line, creating a distinct linear corridor. Granite and slate were widely used building materials, although cob, thatch and other materials are present in some buildings. Twentieth-century infrastructure developments, while predominantly outside the NCA, have increased accessibility and resulted in considerable expansion of 'gateway' towns such as Ashburton, Buckfastleigh, Moretonhampstead and Chagford. The duelling of the A38 parallel to the southern boundary has created a hard edge, and the duelling of the A30 has enclosed the highest northerly fringes of Dartmoor, causing an abrupt change in

tranquillity and dark night skies. The North Hessary Tor transmitter mast also impacts on dark night skies; at just under 200 m in height and illuminated at night it is a significant modern feature.



Dartmoor ponies graze the moors and clutter-strewn tors.

In the moorland valleys where tin was streamed, spoil heaps blend into the 'wild' landscape, while remnant tinner's buildings capture the harsh reality of life on the moors. The mining of other minerals found around the periphery of the moor has left a similar legacy, including prominent engine houses. Quarrying has also shaped the landscape, especially around Haytor and Princetown where granite has been worked, creating tall 'cliff-like' exposures. Remnant infrastructure, such as the Haytor granite railway, now provides popular access routes. The current large-scale china clay working in the south-west, with deep pits, mica lakes and spoil heaps creates a landscape with its own character.

The open and exposed character of Dartmoor has made it a favoured military training area over a century. Current exercises can interrupt tranquillity and dark night skies, and structures such as range marker poles and flagpoles introduce vertical elements. However, some military structures provide historical and cultural interest, including the iconic Dartmoor prison in Princetown.

Since 1951, landscape change and land use on Dartmoor have been influenced in extent and nature by its designation as a National Park. There is significant recreational use by both tourists and day visitors from the surrounding towns and cities. While nearly 50 per cent of the NCA is publicly accessible, much recreation is concentrated around 'honeypot' sites – riverside beauty spots such as Dartmeet, prominent and accessible tors such as Haytor and iconic villages such as Widedcombe-in-the-Moor. Dartmoor provides visitors with a sense of wellbeing; it has inspired people for generations, as reflected in its artistic and cultural associations. William Widgey was a prolific landscape painter renowned for 'capturing the mood'; Arthur Conan Doyle used Dartmoor as the setting for *The Hound of the Baskervilles*; and, more recently, Dartmoor was the setting for the Stephen Spielberg-directed film *War Horse*, based on the book of the same name by Michael Morpurgo.

The landscape through time

Dartmoor's granite massif is the largest of six domed outcrops in the south-west, linked within the Earth's crust to form the Cornubian batholith. During the late Carboniferous/early Permian mountain-building period, Dartmoor rose in molten form, intruding into the surrounding rocks of shales, sandstones, limestones and lavas, which metamorphosed to form an aureole surrounding the granite core. Igneous rocks surrounding the granite include dolerite dykes and sills and some lavas, notably the steep-sided mass of Brent Tor. Hydrothermal activity led to the local concentration of minerals such as tin and copper ore veins and arsenic and lead ores in both the granite and the surrounding aureole. Hydrothermal activity also led to the formation of the china clay.

The basic outline of Dartmoor was weathered and shaped under the hot conditions of the Tertiary Period. However, a unique and remarkably complex range of periglacial features was created during the Pleistocene. These include tors, stone stripes, boulder runs and clitter slopes. Following the Pleistocene, torrential rivers incised their valleys to produce deep, steep-sided, boulder-filled gorges.

A variety of burial and ritual monuments from the Early Bronze Age evidence Dartmoor's strong time depth: about 75 stone rows, the greatest concentration in Britain, and 18 stone circles remain. The Stall Moor–Greenhill stone row, measuring 3.1 km, may be the world's longest prehistoric stone row. By the Late Bronze Age much of the tree cover on the high slopes had been cleared to maximise grazing opportunities. Reaves (low stony banks) were created on the lower slopes, forming the boundaries of long, rectangular fields; many are still in use today. Within and beyond the field systems are the remains of around 5,000 round houses (hut circles), forming the root of today's settlement pattern.

The medieval period saw further establishment of the agricultural landscape and basic settlement pattern. Intensive common grazing maintained central Dartmoor's open character, with sheep grazing expanding to serve the growing wool trade. Both on and off the moor, fields were created for cereal cultivation and pasture, often taking the form of open strip fields and later enclosed, resulting in a legacy of small, irregular fields enclosed by Devon hedgebanks, with traces of ridge and furrow. Isolated farmsteads and hamlets were established, linked by a dense network of narrow sunken lanes and tracks crossing streams on hump-backed granite bridges. These farmsteads include some of Europe's best-preserved longhouses for housing farmers and their cattle, and high densities of 16th-century and earlier buildings set within medieval enclosed fields. Larger villages grew in sheltered locations, while gateway towns, often with prominent churches, developed around the fringes of the moor on the wealth of the wool and tin industries.

From the late 12th century, tin was a major economic stimulus, with the upper reaches and valleys of most rivers and streams worked for tin ore. Spoil heaps, water-powered mills, processing areas, tramways and a network of leats are strong reminders of Dartmoor's industrial past; tin mining continued until the early 20th century. Exploitation of other minerals such as copper, lead and silver around the periphery of the moor left a similar legacy, including prominent engine houses that stand out in the bleak landscape. Quarrying shaped Dartmoor from the early 19th century, especially around Princetown and Haytor for granite and around Lee, Brent and Harford moors for china clay.

From the medieval period, Dartmoor's peat was an important source of industrial and domestic fuel, with large-scale commercial cuttings characterised by long trenches or 'ties', for example around Rattlebrook/Amicombe Hill. Agricultural improvement prevailed at the end of the 18th century and during the early 19th century, seeing the introduction of drystone walls (c.1780) and enclosure of large areas of moorland, forming rectilinear 'newtakes'.

Infrastructure developments from the late 18th century made Dartmoor more accessible and spurred the prosperity of the quarrying, mining and farming industries. Major roads were turnpiked, stimulating further development of the larger settlements and the introduction of 'universal' architecture and non-local materials such as Welsh slate and brick.



Scorhill stone circle. A significant concentration of stone rows and circles create a strong time depth on Dartmoor.



Widcombe-in-the-Moor, an iconic village nestled in a sheltered location with a prominent church tower.

Exploitation of Dartmoor's natural resources to supply expanding urban populations continued with the construction of eight reservoirs. The first was completed in 1861 at Tottiford, and the last at Meldon in 1972. Afforestation of the open moorland for timber production began in earnest after the First World War and several plantations were associated with the newly created reservoirs. The plantations still represent a major source of timber in south-west England. Military training on Dartmoor began in the late 19th century and brought the construction of structures in previously undeveloped areas, although restrictions on access and agricultural uses have helped to preserve many of Dartmoor's internationally important habitats and archaeological features.

Since the designation of Dartmoor as a National Park in 1951, change has generally been gradual. This is reinforced by the 2003 Countryside Quality Counts assessment, which stated that the overall character of the area has been sustained. However, there has been significant incursion in some areas, such as the A30 Okehampton bypass and china clay extraction in the south-west. There has also been considerable expansion of the more accessible settlements, including Ashburton, Buckfastleigh, South Brent, Moretonhampstead and Horrabridge. The 20th-century increase in leisure time and pursuit of fresh air and exercise has led to recreational pressure at honeypot sites, in picturesque villages and on some parts of the moor such as Haytor; impacts include erosion, damage to archaeological sites and traffic congestion. The National Park Authority's Moor Care campaign seeks to educate visitors and users about how to enjoy their visit while minimising their impacts on the environment, including through encouraging the use of public transport.

Perhaps the most significant landscape changes in the 20th and 21st centuries have resulted from agricultural policies. Initially, a drive for food production led to overgrazing of the moors at the expense of natural habitats, and field enlargement with a spread of arable off the moor. This changed with the

introduction of the Environmentally Sensitive Areas Scheme in 1992, which encouraged the adoption of agricultural practices that safeguarded and enhanced the high landscape, wildlife and historic value of the National Park. The introduction of Environmental Stewardship in the mid-2000s further aimed to tailor grazing levels to the needs of the moorland habitats. In some locations, previous grazing pressures have been reversed.

Ecosystem services

Dartmoor 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 Dartmoor NCA is contained in the 'Analysis' section of this document.

Provisioning services (food, fibre and water supply)

- **Food provision:** Over 40 per cent of the NCA is common land, which is almost entirely rough grazing for sheep, cattle and ponies. The remaining area is predominately pastoral (92 per cent of the farmed area is under grass), with grazing livestock – particularly sheep – the most significant farm type. While the productivity and profitability of hill farming is marginal, it is important for the management of land for biodiversity, water storage and regulation, climate regulation, recreation and sense of place.
- **Water availability:** Dartmoor is a major area for water catchment in the south-west region, forming the source of many of Devon and east Cornwall's rivers and supporting eight reservoirs. Dartmoor's water supplies most of the surrounding populations, including Plymouth and Torbay and industry. The peat and blanket bogs that cover significant areas of the moors provide an important natural storage function, as well as regulating water flow and contributing to sense of place and biodiversity.

- **Genetic diversity:** Dartmoor has three notable indigenous breeds: the Whiteface Dartmoor sheep, classified as at risk (900–1,500 breeding ewes); the Greyface Dartmoor sheep, classified as a minority breed (1,500–3,000 breeding ewes); and the Dartmoor Pony, classed as vulnerable (500–900 breeding mares). All three breeds are well adapted for surviving Dartmoor's upland climate, and their grazing habits play a vital conservation role.



Meldon Reservoir. Dartmoor supports eight reservoirs, providing water for most surrounding areas.

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

- **Climate regulation:** It is estimated that there is 9.7 Mt of carbon stored within the peat soils of Dartmoor (equivalent to one year's carbon emissions from UK industry). Carbon storage is also provided by the woodlands (12 per cent of area). Appropriate management of the moorland area, preventing overgrazing, uncontrolled burns, drainage and erosion, can improve carbon capture, as can extending woodland cover where appropriate.
- **Regulating soil erosion:** More than 30 per cent of the soils are peat based and prone to wind and water erosion, with risks of gully/hagging. Old peat workings that have left significant areas of exposed peat in the central high moor are particularly prone to erosion. Erosion of peat reduces the area's ability to store carbon and water and to support internationally important habitats. With the freely draining acid loamy soils over rock there is an enhanced risk of erosion on the 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 soil compaction. Severe weather – either unusually high levels of rainfall/high winds or drought – can increase the rate of soil erosion. Saturated soils result in increased run-off and, in extreme cases, gully/hagging. Drought can lead to increased rates of poaching.
- **Regulating water quality:** The majority of water in the NCA is classified as moderate or good quality. Degradation of peat soils and blanket bogs in the central moorland will reduce their ability to regulate water quality, impacting on river life downstream, including species such as salmon. The main threat to the quality of the water entering the reservoirs or at abstraction points is fire (especially wildfire). Appropriate vegetation management is essential to reduce this threat and to ensure effective and efficient capture of rain. Within the agricultural land surrounding the open moorland, key issues affecting water quality include soil and nutrient run-off, faecal contamination and pollution pathways on holdings. The woodlands, particularly the semi-natural woodlands on the steep valley sides, perform an important role in maintaining water quality by reducing soil and nutrient run-off.

- **Regulating water flow:** The hard, steep and impermeable granite geology of the upper catchments means that river systems are very responsive to heavy rainfall (particularly in the winter months), affecting downstream locations in and outside the NCA⁴. Numerous key settlements are at risk of flooding within or on the periphery of the NCA. While Dartmoor's granite is impermeable, the blanket bog that overlies it and surrounds the headwaters of all the river systems can hold water. A healthy blanket bog is able to store a large volume of water within saturated peat, releasing it slowly into rivers and streams and having a significant effect on reducing peak flows downstream. Blanket bog vegetation, when in good condition, can absorb significant quantities of water, which regulates run-off from the moor.

Cultural services (inspiration, education and wellbeing)

- **Sense of place/inspiration:** Feelings of inspiration and escapism are popularly associated with the strong and varied landscape, one of sharp contrasts ranging from the wild, wind-swept moors with panoramic views to the sheltered, enclosed valleys and fringes of the NCA. The colours of the landscape, strong sense of remoteness within the heart of the NCA and views of prehistoric monuments all contribute to an inspiring and dramatic landscape. Dartmoor has been the inspiration for much art and literature over the centuries, including providing the settings for *The Hound of the Baskervilles* by Sir Arthur Conan Doyle and more recently the filming of *War Horse*, based on the book by Michael Morpurgo.
- **Sense of history:** The landscape has a strong time connection, reflected in the abundance of sites and features: from bronze-age round houses and less regular boundary banks or 'reaves' and ceremonial stone rows, circles and burial chambers to industrial landscapes of spoil heaps and mine buildings. The history of upland farming can be traced in the pattern of lynchets, strong irregular field patterns characterised by drystone walls, stone-faced

⁴ South Devon Catchment Flood Management Plan, Environment Agency (2009: [URL: http://publications.environment-agency.gov.uk/pdf/GESW1109BOUO-e-e.pdf](http://publications.environment-agency.gov.uk/pdf/GESW1109BOUO-e-e.pdf))

hedgebanks and hedges and larger rectilinear fields or 'newtakes'. The historical character is further reinforced by a network of ancient roads and sunken lanes with hump-backed bridges connecting the moor to the villages and towns beyond, unified by the characteristic use of slate and granite. Dartmoor's history is told through many myths and legends, as well as through the traditional fairs that still take place today, for example Widecombe Fair.

- **Tranquillity:** The area is largely tranquil, a reflection of the sparsely settled upland landscape with few roads. Small areas of low tranquillity exist around the edge of the NCA, notably near main routes such as the A386, A38 and A30. Light pollution within the pastoral landscape is relatively low, particularly in the valleys and the narrow, high-hedged lanes away from towns and villages. Light pollution is also low on the moorland; however, the glow of more distant towns and cities is prominent from high ground.
- **Recreation:** Dartmoor offers a huge recreational resource, used by significant numbers of people (2.3 million visitors per year). Some 97 per cent of the NCA is designated as a National Park; over 40 per cent is designated open access or common land; and there are more than 730 km of public rights of way (a density of 0.73 km per km²) and an additional 127 km of permissive paths. For cyclists there is the National Cycle Route around the western boundary, numerous offroad routes using tracks and disused railways, and a network of country lanes. The fast-flowing rivers provide challenges for kayakers, notably the Dart Loop, which attracts kayakers from across the UK. The rivers are also an important asset for fishing, walkers and families picnicking.
- **Biodiversity:** Dartmoor is of European importance for its biodiversity, with 29 per cent of the area designated an SAC. Blanket bog covers 18 per cent of the NCA, the largest distribution in southern England; upland heathland accounts for 13 per cent and broadleaved woodland (broad habitat) 6 per cent. There are also relatively significant areas of species-rich neutral grassland. Dartmoor is notable for upland bird species, including the shrike and ring

ouzel, which are at the extreme southern edge of their European range. The red-backed shrike returned to Dartmoor in 2010 having been lost since 1970; it is on the International Union for Conservation of Nature Red List as a bird of top conservation concern. Many other priority species are present in the NCA, such as the bog hoverfly, marsh fritillary, Deptford pink and string-of-sausages lichen.

- **Geodiversity:** Dartmoor granite has shaped the historic landscape locally for several thousand years. Granite structures such as burial chambers are believed to date back to the early Neolithic (4000–2000 BC). The granite has been exploited commercially and used to build nationally important structures, for example Nelson's Column in London. Metals such as tin, copper, lead and silver have all been mined on Dartmoor and have significantly contributed to the local economy. The china clay works in the south-western part of the NCA continue to be important in the local economy and in both national and international markets. China clays supply the paper, ceramics, plastics and numerous other industries that are now essential parts of our modern society. A large-scale tungsten and tin mine is due to open at Hemerdon.

Statements of Environmental Opportunity

SEO 1: Protect, manage and enhance Dartmoor's extensive open moor, its sense of wildness and remoteness, the internationally important habitats and species it supports, and the carbon and water stored in its deep peat.

For example, by:

- Protecting and managing the unique landscape character of the open moorland through land management practices, by working jointly with landowners, commoners and relevant organisations, producing statements of intent and the land use decision-making process.
- Considering the importance of landscape character and promoting the use of landscape character guidance in decision making.
- Avoiding the development of vertical structures, including the planting of trees and woodland on the open moor; the intrusion of light that affects dark night skies; and other inappropriate development that affects the character of the area and its setting.
- Promoting and supporting sympathetic management of Dartmoor's blanket bogs, peat and upland habitats by working jointly with landowners, commoners, relevant organisations and initiatives to maintain and enhance their water and carbon storage capacity, as well as their biodiversity value.
- Restoring the hydrological function of blanket bog through a re-wetting programme.
- Creating, extending and linking upland habitats, particularly blanket bog, valley mire, western heath and heather moorland. Reduce the overall area of acid grassland through encouraging heather regeneration while retaining areas of importance for species diversity and as habitats for ground nesting birds.
- Working with farmers and local communities to ensure that the necessary skills and knowledge are maintained, shared and enhanced to secure a future for Dartmoor hill farming and moorland management.
- Promoting sensitive vegetation management that reduces the threat of wildfires in the long term.
- Encouraging the use of hardy breeds to appropriately graze the moors. Support and work with farmers, local communities, breed associations and relevant groups to ensure that the necessary skills and knowledge are maintained, shared and enhanced to secure a future for Dartmoor's rare breeds.

Continued on next page...

Statements of Environmental Opportunity

SEO 1: Protect, manage and enhance Dartmoor's extensive open moor, its sense of wildness and remoteness, the internationally important habitats and species it supports, and the carbon and water stored in its deep peat.

... continued from previous page

- Supporting and encouraging initiatives that add value to local food products and foster a strong Dartmoor brand, reinforcing the distinctiveness of the area and assisting the future of Dartmoor hill farming.
- Promoting and developing understanding and awareness of the importance of Dartmoor's blanket bog and peat for carbon and water storage and the issues that affect these functions, including the consequences of erosion caused by recreational pressure.
- Promoting and managing sustainable recreation to ensure that experiential qualities such as sense of isolation, remoteness and wilderness are maintained.
- Encouraging exemplary management of the military training areas and camps, with consideration given to the impacts of external lighting, structures and signs.
- Working with landowners, communities and user groups to manage recreational activity, both active and passive, while maintaining a sense of tranquillity and remoteness. This includes the use of sustainable transport and enhancement and promotion of less sensitive areas.

SEO 2: Protect, manage and enhance Dartmoor's rich cultural heritage and its strong connection with granite and associated minerals, providing inspiring information to promote understanding of the landscape.

For example, by:

- Protecting and appropriately managing the rich and internationally important cultural heritage of Dartmoor, including prehistoric and medieval sites and landscapes, historical tin and other industrial workings, ancient trackways, historical farmsteads and vernacular buildings.
- Promoting understanding and appreciation of the landscape's archaeology to ensure that public access and recreation respect the presence of valued sites and features. Support opportunities to enhance understanding of the historic environment resource through research and conservation.
- Protecting the distinctive geological features, including the tors and clitter slopes. Remove scrub and secondary woodland on clitter and boulder-strewn slopes through extensive grazing.
- Managing geological exposures, including disused quarries, and where appropriate making them accessible for the public to enjoy and explore.
- Providing guidance and inspiring interpretation to enhance public understanding and enjoyment of the area's geodiversity and how it has shaped the landscape, and manage recreational activities (for example, climbing) to reduce damage.
- Protecting the distinctive field patterns of the moorland fringe (newtakes) and surrounding farmland by managing the hedgebanks and walls that define them, using local granite, vernacular building styles and local topping hedgerow species and trees.
- Protecting and managing historical settlement patterns, the scale of new buildings in the landscape and the strong unifying local vernacular of granite and slate, also reflected in walls and bridges. Maintain views to granite church towers as important local landmarks and resist new development on prominent slopes and ridgelines.
- Encouraging and supporting initiatives that develop and enhance the traditional skills involved in the use of local materials and the understanding required to maintain and manage historic features.
- Promoting the significance of historic landscape character in development management.
- Supporting audits of roadside signage, encouraging de-cluttering and opportunities to bury cables underground, where there is no damage to the historic environment. This will protect and

SEO 3: Protect, manage and enhance the enclosed, tranquil character of the pastoral landscape, encouraging the management of boundary features, including granite walls, and of semi-natural features to strengthen local distinctiveness and connectivity. Create opportunities for quiet, informal recreation, particularly around settlements.

For example, by:

- Planning and managing the extension and connection of areas of semi-natural woodland, particularly along the steep river valleys.
- Managing, enhancing and linking important wetland habitats, particularly species-rich Rhôs pasture and wet woodland, through preserving and managing water flows, controlling invasive vegetation and resisting agricultural improvement.
- Managing the area's species-rich neutral grasslands through extensive grazing and hay cutting. Seek to extend and link fragmented sites.
- Protecting the distinctive field patterns by managing the hedgebanks and walls that define them, using local granite, vernacular building styles and local topping hedgerow species and trees.
- Improving the condition of heritage assets, including historic parks, through appropriate measures and seeking to reduce conflicting or unsympathetic management regimes, while recognising the high potential in this landscape for undiscovered remains.
- Protecting the small and enclosed character of the pastoral landscape through development management, resisting inappropriate development and an increase in equine use. Give consideration to the scale and setting of development and use of the local vernacular.
- Considering the landscape character type and the interrelationship of the various landscape types in decision making and promoting the use of landscape character guidance.
- Supporting and encouraging local initiatives that promote the sustainable management of woodlands and hedgerows for wood fuel production. Encourage join-up between landowners and local communities and knowledge and skills sharing and enhancement.
- Supporting initiatives that promote awareness and understanding of soil structure and management. Encourage the build-up of organic matter, for example through extensive grazing.
- Supporting and promoting sustainable management and planting of traditional orchards that include local varieties. Encourage and support initiatives that provide new markets for apples.
- Planning and managing the development of recreation opportunities for all. This includes the use of sustainable transport and enhancement and promotion of less sensitive areas. Encourage the provision of green infrastructure in and around settlements.

SEO 4: Protect and manage Dartmoor's network of streams, leats and rivers; and enhance the contribution they make to landscape character, recreation and biodiversity, while managing water flows, quality and supply.

For example, by:

- Promoting and supporting the principles of catchment sensitive farming to minimise pollution and manage river banks and valleys, to maintain both water quality for biodiversity and the character of key landscape features.
- Promoting management at a catchment scale, encouraging good environmental management of semi-natural habitats to aid water retention and connectivity.
- Maintaining leats and associated features as landscape and functional features where appropriate.
- Considering opportunities for micro hydro electricity-generating schemes where appropriate.
- Planning and managing the development of water-based recreation opportunities (both active and passive), including the use of sustainable transport and enhancement and promotion of less sensitive areas.
- Supporting collaboration and co-operation between businesses, activity and event organisers, and governing bodies to promote best practice and, where appropriate, to develop codes of conduct to ensure that the area's sense of place, history and tranquillity are maintained.

Additional Opportunity

1: Protect and restore ancient and important woodland, managing and enhancing its contribution to landscape character, biodiversity and recreation. Seek opportunities to support the local economy through wood products.

For example, by:

- Planning for the long-term restructuring of conifer plantations on the open moor, softening hard visual edges and undertaking a phased removal programme and reversion to heather moorland.
- Planning and managing the extension and connection of semi-natural woodland, particularly along the steep river valleys.
- Encouraging initiatives that promote the use of local timber and wood products and facilitate communication and greater understanding between wood producers (large and small), processors and users.
- Working with the local forestry industry and timber processors to ensure that the necessary skills and knowledge are maintained, shared and enhanced to enable sustainable woodland management.
- Encouraging management practices that ensure well-structured woodland with high-quality timber and, where appropriate, that achieve multipurpose objectives.
- Supporting community schemes that promote positive woodland management and the use of wood products.
- Supporting and encouraging local initiatives that promote the sustainable management of woodlands and hedgerows for wood fuel production. Encourage join-up between landowners and local communities and knowledge and skills sharing and enhancement.
- Encouraging the consideration of carbon storage as an integral part of woodland management, and promoting the sustainable management of woodlands not currently under a management regime.
- Supporting, planning and managing the use of forests and woodlands for both active and passive recreation.
- Supporting the restoration of ancient woodland sites by removing conifer plantations and managing sites for the benefit of biodiversity and a range of ecosystem services.

Supporting document 1: Key facts and data

Area of Dartmoor National Character Area (NCA): 87,407 ha

1. Landscape and nature conservation designations

The Dartmoor NCA contains 84,456 ha of the Dartmoor National Park covering 97 per cent of the NCA.

Management plans for the protected landscape can be found at:

- www.dartmoor-npa.gov.uk/

Source: Natural England (2011)

1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

Tier	Designation	Name	Area (ha)	% of NCA
International	Ramsar	n/a	0	0
European	Special Protection Area (SPA)	n/a	0	0
	Special Area of Conservation (SAC)	Dartmoor SAC; South Dartmoor Woods SAC; South Hams SAC	25,186	29
National	National Nature Reserve (NNR)	East Dartmoor Woods and Heaths NNR; Wistman's Wood NNR; Dendles Wood NNR; Black-a-Tor copse NNR	607	<1
	Site of Special Scientific Interest (SSSI)	A total of 38 sites wholly or partly within the NCA	26,014	30

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.

Land covered by international and European nature conservation designations totals 25,186 ha (29 per cent of the total land area); national designations cover 26,615 ha (32 per cent of the total land area).

There are 148 local sites in the Dartmoor NCA covering 2,064 ha which is 2 per cent of the NCA.

Source: Natural England (2011)

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

1.1.1 Condition of designated sites

SSSI condition category	Area (ha)	Percentage of NCA SSSI resource
Unfavourable declining	69	<1
Favourable	7,264	28
Unfavourable no change	60	<1
Unfavourable recovering	18,621	72

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 ranges from 30 m to 621 m. The highest summit, High Willhays is on the northern plateau. The lowest place, Doghole Bridge is on the eastern fringe.

Source: Natural England (2010), Dartmoor Countryside Character area description

2.2 Landform and process

Dartmoor is the largest area of exposed granite in southern England; it dominates the surrounding countryside. Because of its southerly location, Dartmoor was never glaciated; however, it hosts a unique landform with prominent geological features associated with periglacial conditions. These features include tors, clitter, head deposits, stone stripes, nets and other patterned ground features. Alpine earth movements left Dartmoor gently tilting downwards, from north to south, with the highest summit, High Willhays at 621 m, on the most northern fringe. There are two prominent plateaus, one in

the north and one in the south. The main headwaters of the River Dart and the rivers Tavy and Walkham drain the northern plateau in a generally southerly direction. The rivers Plym, Yealm, Erme and Avon drain the southern plateau similarly. The River Dart collects its headwaters between the two plateaux and leaves the granite through the most spectacular of the fringe gorges. Only the River Tavy and the East and West Okement rivers leave towards the north after relatively short moorland courses. The River Teign drains the eastern edge of the northern plateau but turns south on leaving the granite, passing through the lowest point at Doghole Bridge (30 m). The River Lyd leaves Dartmoor through Lydford Gorge. This is a classic site for the study of gorge formation and river capture.

Source: Dartmoor Countryside Character area description, Dartmoor Natural Area Profile, Dartmoor NPA fact sheet

2.3 Bedrock geology

The Dartmoor Granite was intruded during late Carboniferous/early Permian about 280 million years ago into Devonian and Carboniferous shales, sandstones, limestones and lavas. The surrounding 'country rocks' were altered by the great heat and pressure that accompanied the granite intrusion, resulting in development of many types of metamorphic rocks which form an aureole around the granite. The junction between the granite and country rocks is of great geological significance. As the granite cooled, hydrothermal activity led to the local concentration of minerals in both the granite and country rocks. The mineralization resulted in tin and copper ore veins, as well as arsenic and lead ores. The same hydrothermal activity also led to the formation at depth of china clay, through kaolinisation of the granite. The ball clay deposits in the Bovey Basin are sediments produced from the weathering of the Dartmoor Granite and surrounding rocks after its exposure to the atmosphere some 200 million years later. Igneous rocks other than granite occur, notably dolerite dykes and sills and some lavas among the surrounding rocks.

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

2.4 Superficial deposits

Periglacial conditions during the Quaternary ice ages resulted in the removal of weather rock to reveal the tors and formation of clitter, head deposits and other 'patterned ground' features. The tors and clitter slopes are concentrated where the effects of weathering and erosion have been greatest for example on summits, valley lips, spur ends and steep valley sides – particularly on the edges of the two Dartmoor plateaux. Weathering eventually causes the disintegration of the granite to individual crystal level. The resultant gravel became very mobile during the periglacial periods and accumulated on flat ground as 'head' deposits. It is parent material for a number of Dartmoor soil types. Just over a third of all the unenclosed moorland on Dartmoor is covered by peat that is more than 50 cm thick; in places it is more than 7 m thick. It is thought that the peat formed under wetter conditions than those of today.

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

2.5 Designated geological sites

Tier	Designation	Number
National	Geological Site of Special Scientific Interest (SSSI)	14
National	Mixed Interest SSSI	7
Local	Local Geological Sites	39

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

Just over a third of all the unenclosed moorland on Dartmoor is covered by peat that is more than 500 mm thick; in places it is over 7 m thick. Peat forms the blanket bogs at the heart of the two plateaux as well as the valley mires

of the area. The peat of the blanket bogs is no longer accumulating and is thought to have been formed under wetter conditions than those of today. In geological terms, peat is especially important for what it can tell us about the environment and vegetation of Dartmoor since the last ice age through studies of preserved pollen. It also provides an important water-holding resource for the whole of Devon. The lower slopes are characterised by thinner gleyed soils and podzols. Off the moor, particularly in the east, are gritty brown loams with a high content of organic matter in their upper layers; acidic but fertile. These support mainly pastoral farming with some fields of arable cultivation.

Source: Dartmoor NPA Fact Sheets

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

Grade	Area (ha)	% of NCA
Grade 1	0	0
Grade 2	0	0
Grade 3	14,799	17
Grade 4	18,174	21
Grade 5	51,624	59
Non-agricultural	2,783	3
Urban	26	<1

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.

■ River Teign	32 km
■ River Bovey	18 km
■ River Dart	17 km
■ East Dart	17 km
■ West Dart	17 km
■ River Tavy	16 km
■ River Walkham	14 km
■ River Erme	13 km
■ River Avon	11 km
■ River Plym	11 km
■ River Taw	10 km
■ River Yealm	8 km
■ West Okement	8 km
■ East Okement	6 km
■ River Lyd	6 km
■ River Meavy	3 km

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.

As the icy conditions of the Pleistocene thawed, torrential rivers incised deep, steep-sided, boulder-filled gorges through the Dartmoor granite. Dartmoor is a source of many of the main rivers of Devon. The main headstreams of the rivers Dart, Tavy and Walkham drain the northern plateau and the rivers Plym, Yealm, Erme and Avon drain the southern plateau. The River Teign drains the eastern edge of the northern plateau, but turns south upon leaving the granite. Only the River Taw and the East and West Okemont rivers drain northwards.

3.2 Water quality

The total area of Nitrate Vulnerable Zone is 4,133 ha, or 5 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=maptopic&lang=_e

4. Trees and woodlands

4.1 Total woodland cover

The NCA contains 10,431 ha of woodland (12 per cent of the total area), of which 2,749 ha is ancient woodland.

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

4.2 Distribution and size of woodland and trees in the landscape

Woodland occurs in steep river valleys, around the fringe of the high moor, with biodiverse, rich ancient broadleaved oak woodlands. However, on the high moor there are two ancient woodlands, including one of the best examples of high altitude oak woodland in Britain. Woodland floors are often clothed in ferns and wildflowers, including wild daffodils and bluebells. Plantations also occur.

Source: Dartmoor Natural Area Profile, Dartmoor 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)

Woodland type	Area (ha)	% of NCA
Broadleaved	6,089	7
Coniferous	3,318	4
Mixed	271	<1
Other	753	1

Source: Forestry Commission (2011)

Area and proportion of ancient woodland and planted ancient woodland within the NCA.

Type	Area (ha)	% of NCA
Ancient semi-natural woodland	2,012	2
Planted Ancient Woodland (PAWS)	736	1

Source: Natural England (2004)

5. Boundary features and patterns

5.1 Boundary features

Relic boundaries dating to the Bronze Age lie abandoned on the open moor. Within the present day enclosed land, fields are bounded by the traditional Devon hedgebank, thought to date from the late medieval period but sometimes built on much earlier foundations. By contrast, the vast central 'newtakes' created mainly between about 1780 and 1820, enclose once open moorland, and have distinctive drystone walls.

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

5.2 Field patterns

Strong, small irregular field patterns, characterised by drystone walls, stone-faced hedgebanks and hedgerows represent a mix of piecemeal enclosure of medieval strips, generally completed by 16th century, to the home closes of ring-fenced medieval farms on the moorland edge. There are larger and more rectilinear fields of late 18th and 19th century date (newtakes) on some higher ground, especially in the south and west.

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

6. Agriculture

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

6.1 Farm type

The NCA is predominately pastoral. By far the most significant farm types are grazing livestock (especially sheep) and other types. However, the area also supports a range of other farm types: 400 grazing livestock LFA (52 per cent); 257 other types (33 per cent); 35 mixed (5 per cent); 31 grazing livestock lowland (4 per cent); 19 horticulture (2 per cent); 9 cereals (1 per cent); 13 dairy (2 per cent); and 7 specialist poultry (1 per cent). During the period 2000 to 2009 most

farm types saw a decrease in numbers of holdings including lowland grazing livestock, dairy, cereals, specialist poultry, horticulture and specialist pigs. Lowland grazing livestock lost the most proportionately (73 per cent) as well as the most holdings (83) followed by dairy which lost 54 per cent or 15 holdings. Grazing livestock LFA and mixed farms increased in numbers (68 holdings, 20 per cent and 5 holdings, 17 per cent respectively).

Source: Agricultural Census, Defra (2010)

6.2 Farm size

Farms sized 5 to 20 ha are the most common in the NCA (by number of holdings) with 245 holdings. Farms between 20 and 50 ha are the next most common with 185 holdings. Although they have the least number of holdings (110), farms over 100 ha are the most significant by area, covering around 59 per cent (24,940 ha) of the total farmed area, followed by farms between 50 and 100 ha which cover 19 per cent (7,894 ha). Between 2000 and 2009 farms over 100 ha saw an increase in their numbers by 23 holdings as did those between 5 and 20 ha and those under 5 ha both by 8. Farms between 20 and 50 ha saw a decrease in the number of holdings (down by 14) as did farms between 50 and 100 ha (down by 5).

Source: Agricultural Census, Defra (2010)

6.3 Farm ownership

Owned land makes up 58 per cent of the total farm area, while the remainder is tenanted. There has been an increase in both owned land (5 per cent) and tenanted land (17 per cent) over the 2000 to 2009 period.

2009: Total farm area = 41,979 ha; owned land = 24,448 ha

2000: Total farm area = 38,283 ha; owned land = 23,353 ha

Source: Agricultural Census, Defra (2010)

6.4 Land use

The vast majority of land cover of the farmed area by hectareage is grass and uncropped land at 38,562 ha or 92 per cent followed by cereals at 843 ha or 2 per cent. Over the period from 2000 to 2009 there was an increase in land cover of

grass and uncropped land by 3,443 ha or 10 per cent and vegetables by 30 ha or 199 per cent. Cereals and other arable crops experienced a slight decrease of 1 per cent (10 and 2 ha respectively) while cash roots fell by 38 per cent or 9 ha.

Source: Agricultural Census, Defra (2010)

6.5 Livestock numbers

Sheep are the most numerous livestock in the area with around 146,500 animals, followed by cattle with 38,300, and then pigs with 1,300. There was a decline in the number of all livestock between 2000 and 2009. The largest percentage fall was in pigs by 2,000 or 60 per cent, then sheep by 46,100 or 24 per cent and cattle by 3,800 or 9 per cent.

Source: Agricultural Census, Defra (2010)

6.6 Farm labour

Most farms in the NCA are managed by owner farmers (980) with only 20 salaried managers. Over the period 2000 to 2009 the number of owner-farmers decreased by 72, while that of salaried managers increased by 7. Over the same period the number of full time workers decreased by 24 as did the number of casual/gang workers by 1. The number of part-time workers increased by 20 over the same period.

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

The upland blanket bogs and upland heathlands of the open moor and the upland oak woods of the river valleys are the three habitats of international importance on Dartmoor. Areas of blanket bog are the most southerly in England and support some of the best areas of this habitat in the UK covering no less than a third of the open moorland (some 8,500 ha). Surrounding the blanket bogs are areas of upland heathland and valley mires. The upland heathland, covering some 7,300 ha, is dominated by heather and western gorse with plant communities that are extremely rare outside Britain.

The valley mires – areas of water-logged peat with characteristic acid wetland plant communities – are found wherever drainage is impeded within the river valleys. Most of the semi-natural woodland on Dartmoor is of ancient origin and is concentrated in the river valleys on the east side of the National Park. Classified as upland oak wood, Dartmoor holds one of the main concentrations of these woodlands in the UK with the most isolated examples including Wistman's Wood and Black-a-Tor Copse. In total there are 2,750 ha of ancient semi-natural woodland on Dartmoor of which 70 per cent is notified as SSSI. Within the farmland there are also areas of great wildlife value.

The hedgebanks, small woodlands and rough valley bottoms form wildlife corridors connecting areas of particular nature conservation interest. Among these are Dartmoor's 1,100 ha of Rhôs pasture – species-rich, wet, often heath-like, grazing pasture (representing 20 per cent of the English resource of this now very rare habitat) – and around 20 ha of upland-type hay meadows of national importance.

Source: Dartmoor Natural Area Profile

7.2 Priority habitats

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

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

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

Priority habitat	Area (ha)	% of NCA
Blanket bog	16,163	18
Upland heathland	11,354	13
Broadleaved mixed and yew woodland (broad habitat)	5,067	6
Lowland heathland	373	<1
Lowland dry acid grassland	364	<1
Lowland meadows	245	<1
Upland calcareous grassland	33	<1
Purple moor grass and rush pasture	13	<1

Source: Natural England (2011)

Maps showing locations of 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 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

Mainly isolated farms and small hamlets connected by sunken lanes. There are few villages that usually have prominent churches. The pattern of settlement if ancient comprising scattered farmsteads and hamlets intermixed with some nucleated settlements evident by the late 11th century, but continuing to develop in 12th and 13th centuries. Villages and towns found around the edge of the moor are generally compact, the smaller villages in particular having dense settlement and narrow streets, while towns such as Buckfastleigh, Tavistock, Okehampton and Ashburton have a more spacious character inherited from their medieval and later planned layouts.

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

8.2 Main settlements

The main settlements associated with the NCA, but outside the actual boundary, are; Okehampton, Ashburton and Buckfastleigh. The total estimated population for this NCA (derived from ONS 2001 census data) is: 21,319.

Source: Dartmoor Countryside Character Area description; Countryside Quality Counts (2003), Natural England (2012)

8.3 Local vernacular and building materials

Granite and slate is widely used, but cob, thatch and other materials are present in older buildings.

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

9. Key historic sites and features

9.1 Origin of historic features

There is widespread evidence of Mesolithic activity, Neolithic rubble banks and bronze-age settlement with many standing stones and stone circles. There are many wayside crosses dating from the medieval period believed to mark routes between religious sites. Some medieval buildings also survive, notably "longhouses", some of which remain in use either incorporated into later homes or converted to farm buildings. Evidence of mining and quarrying industries, including remains of associated gunpowder mills, abound in this NCA and both the Tavistock Canal and a number of surviving coaching inns testify to the amount of traffic that crossed this area in the pre-railway era. The area has been used for military purposes for at least 200 years and the imposing landmark of Dartmoor Prison was constructed by and for Napoleonic prisoners of war. During the late 19th and 20th centuries, reservoirs and dams were constructed within Dartmoor to provide water for the growing populations in surrounding towns. The landmark buildings of Buckfast Abbey and Castle Drogo both date from the early 20th century with the former built on the site of the original monastery destroyed during the reformation and the latter started in 1910 to designs by Lutyens.

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

9.2 Designated historic assets

This NCA has the following historic designations:

- 1 Registered Park and Garden covering 66 ha
- No Registered Battlefields
- 1,322 Scheduled Monuments
- 1,644 Listed Buildings

Source: Natural England (2010)

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

10. Recreation and access

10.1 Public access

- 44 per cent of the NCA, 38,844 ha, is classified as being publically accessible.
- There are 637 km of public rights of way at a density of 0.7 km per km².
- There are no National Trails within the NCA.

Sources: Natural England (2010)

For those seeking physical and spiritual refreshment and a chance to be at one with nature, the opportunities offered by Dartmoor are unsurpassed in southern England. On offer are more than 38,000 ha of open access land available to roam at will, including 35,200 ha of registered common land. Furthermore, the 1985 Dartmoor Commons Act allows for unrestricted access on horseback to registered common land. Added to this are more than 630 km of public rights of way and a growing number of permissive footpaths and bridleways (currently 127 km) established by agreement with land owners. For cyclists there are country lanes and byways, bridleways, long-distance routes such as the Plym Valley Cycleway, the Devon Coast to Coast Cycleway (National Cycle Route 27) and cycle routes within the Forestry Commission plantations.

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)	1,935	2
Common Land	26,743	31
Country Parks	26	<1
CROW Access Land (Section 4 and 16)	37,323	43
CROW Section 15	30,597	35
Village Greens	3	<1
Doorstep Greens	0	<1
Forestry Commission Walkers Welcome Grants	413	<1
Local Nature Reserves (LNRs)	0	<1
Millennium Greens	0	<1
Accessible National Nature Reserves (NNRs)	613	<1
Agri-environment Scheme Access	0	<1
Woods for People	1,361	2

Sources: Natural England (2011)

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

11. Experiential qualities

11.1 Tranquillity

Based on the CPRE map of tranquillity (2006) shows that Dartmoor is the single largest unbroken area of tranquillity not only in the south-west of England but in southern England as a whole, followed by Exmoor. Seventy per cent of Dartmoor is classified as tranquil or very tranquil, with the most tranquil areas centred over the open moorland. Likewise, based on CPRE's mapping of dark night skies, more than 50 per cent of Dartmoor in 2000 enjoyed dark night skies unaffected by light pollution. Nevertheless, wildness, tranquillity and dark night skies are fragile resources easily diminished by noise, lighting and intrusive development both within and beyond Dartmoor's boundaries. Dartmoor is made more fragile by being bounded on all sides by major trunk roads. The A30 west of Whiddon Down on the northern boundary of the National Park is concrete surfaced and has particular noise impacts.

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

Category of tranquillity	Score
Highest value within NCA	136
Lowest value within NCA	-33
Mean value within NCA	32

Sources: CPRE (2006)

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

11.2 Intrusion

The 2007 Intrusion Map (CPRE) shows the extent to which rural landscapes are 'intruded on' from urban development, noise (primarily traffic noise), and other sources of visual and auditory intrusion. This shows that much of Dartmoor is undisturbed.

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

Category of intrusion	1960s (%)	1990s (%)	2007 (%)	% change (1960s-2007)
Disturbed	2	9	8	6
Undisturbed	98	91	92	-6
Urban	0	0	<1	<1

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are an increase in disturbance and a slight increase in urbanisation, a factor that appeared for the first time in 2007.

- More information is available at the following address:
<http://www.cpre.org.uk/resources/countryside/tranquil-place>

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)
- 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

- Results from Countryside Quality Counts data indicate that there was an increase in the amount of woodland under management agreements between 1999 and 2003. In 1999 about 11 per cent of the established eligible National Inventory of Woodlands and Trees stock was covered by a Woodland Grant Scheme management agreement, this increased to 17 per cent in 2003. About 30 per cent of the woodland cover is on an ancient woodland site. The proportion of these sites covered by a Woodland Grant Scheme has changed since 1999 from 19 per cent to 26 per cent in 2003. The majority of woodland Sites of Scientific Interest (SSSI) are in favourable condition. Thus the character of the resource has probably been maintained.
- Post Second World War coniferous plantations are reaching maturity and areas are being felled and forests restructured, changing their visual appearance, character and setting in the landscape.
- Increased demand for roads into and within woodlands, to accommodate larger machinery, has had an impact on the character of woodlands as has the demand for bigger stacking bays.
- The move to continuous cover forestry is reducing opportunities for boundary improvements and may be impacting on species reliant on clear fell areas within woodlands.

- Occurrence of pests and diseases, and invasive species is changing the character of woodlands. Rhododendron and Himalayan balsam are prolific in some woodlands and clear felling has begun to control Phytophthora.

Boundary features

- The estimated boundary length for the NCA is about 2,443 km. Results from Countryside Quality Counts data indicate that about 44 per cent of this total length was managed under agreement between 1999 and 2003, indicating an improvement in the quality and quantity of this feature.
- Grant aid for hedgerow management has led to extensive coppicing of mature hedgerows, which has had an impact on local landscape character.
- A decline in traditional skills including drystone walling and hedgelaying has impacted on landscape character, particularly noticeable with a change away from traditional succession ownership.

Agriculture

- The contribution of agriculture to economic output on Dartmoor has fallen from 10 per cent to 4.2 per cent between 1998 and 2008. This is not simply a result of agriculture being outrun by other sectors, or inflation, but a fall in economic output in real terms (- 1.9 per cent between 1998 and 2008). Nationally, output in this sector grew by 2.4 per cent over the same period, though it is only 0.9 per cent of the national economic output.

- Most of the open moor is common land that has long been used for extensive grazing by cattle, sheep and ponies, moorland grazing rights being an important part of many hill farm enterprises; resulting in little change in landscape character.
- There has been an overall decline in the number of agricultural units between 2000 and 2009; a significant decline in the number of lowland grazing livestock units (72 per cent) and a significant increase in 'other' units (257 per cent).
- Between 2000 and 2009 there has been a reduction in grazing livestock numbers, sheep have reduced in number by 24 per cent and cattle by 9 per cent.

Settlement and development

- There has been considerable expansion of the more accessible settlements such as Mortonhampstead and Buckfastleigh, incorporating new roads, housing and new schools.
- Growth of Plymouth to the south-west of the NCA has been significant over the last decade and while development, light industrial and residential, remains outside the NCA, it impacts on the setting, tranquillity and recreational pressure.
- Equine development has resulted in the splitting up of parcels of land, especially where they lie in close proximity to areas of common land such as around Yelverton. Menages and other facilities are resulting in the gradual encroachment of development into the landscape.

- The introduction of wind and solar energy systems is having an impact on the character of the landscape. Solar and wind energy around the boundary of the NCA has had an impact on the setting of the NCA.

Semi-natural habitat

- SSSI cover 30 per cent of the NCA; the percentage in favourable or unfavourable and recovering condition has increased from 92 per cent to 96 per cent between 2008 and 2010, largely due to targeting of land management through agri-environment schemes⁵.
- The number of marsh fritillary butterflies recorded on Dartmoor is at its highest for over a decade. This is the result of specific work through the 2 Moors Threatened Butterfly Project with agri-environment schemes targeting the management of Rhôs pasture habitat (most of which are County Wildlife Sites). The marsh fritillary is an indicator of habitat in good condition; habitat which supports a range of other important species on Dartmoor.

Historic features

- The number of Scheduled Monuments at Risk on Dartmoor has reduced by 60 to 424 (35 per cent of total) between 2008 and 2010. The main reasons for monuments being at risk are plant and scrub growth, and stock erosion. The reduction in the number at risk is considered a result of specific targeting of agri-environment schemes aimed at achieving land management which gives more favourable conditions for the archaeological sites.
- There are two additional listed structures on Dartmoor since 2008, these are important railway viaducts engineered by Brunel. The number of listed

⁵ http://www.dartmoor-npa.gov.uk/_data/assets/pdf_file/0012/70032/State-of-the-Park-Review-2010-V4.pdf

buildings at risk has been significantly reduced as a result of improved understanding through re-survey, established proactive engagement and action plans to reduce numbers further.

Coasts and rivers

- The majority (60 per cent) of river length in the NCA is in 'moderate' condition (2010), 23 per cent are in good condition and 7 per cent poor. The failing elements within these water bodies include fish, phosphate, high acidity, metals, phytobenthos and macro-invertebrates.

Minerals

- China clay quarrying around Lee Moor has continued with new spoil heaps and infrastructure.
- The dolerite quarry at Meldon closed in 2011 and there has been a subsequent removal of all mineral processing plant although a number of offices, workshops and associated railway infrastructure remain in-situ.

Drivers of change

Climate change

- An increased frequency of drought conditions in the summer months may result in the drying out of wet heath, blanket bog, valley mires, Rhôs pasture and wet woodland; affecting their functions for water and carbon storage. These conditions may also lead to more frequent and intensive moorland fires and erosion causing damage to archaeological sites.
- Increased autumn and winter precipitation levels could lead to higher water levels in upland streams, mires and tracts of blanket bog, resulting in more frequent downstream flooding. There could be an increase in poaching on river banks leading to waterlogged ground.
- Climate change could lead to a longer growing season and enhanced growth rates of vegetation including bracken, gorse and secondary woodland resulting in a decrease in the area of open heather moorland and a 'scrubbing up' of upland stream valleys.
- There might be increased pressure to plant further areas of coniferous plantation and woodland (impacting on open character); planted to enhance the landscape's roles in filtering water, minimising downstream flooding, storing and sequestering carbon dioxide and providing low-carbon fuel sources (through coppice management).
- Changing climate may also result in an increase in the prevalence of pests and diseases which may affect species such as heather and bilberry, and change woodland/tree species composition; there may be a spread of non-native and alien species.
- Climate change may result in increased demand for wind turbines within the open, exposed landscapes of the moorland, as well as outside the NCA visible in long views. There may be further demand for harnessing the power of Dartmoor's fast-flowing rivers through hydroelectric schemes and a demand for bioenergy planting, including short rotation coppice.
- Climate change may lead to more extreme or unseasonal weather events which may change farming and woodland practices, which in turn may have an impact on the character of the landscape.

Other key drivers

- An uncertain future for the agricultural economy; the profitability of hill farming and changes to the agri-environment schemes may result in a decline in hill farming, potentially impacting on moorland management and farming succession, with a consequent loss of traditional skills and knowledge.
- Rising food demands may result in the intensification of agriculture on the more fertile valley pastures, leading to an increased risk of diffuse pollution in watercourses and loss of semi-natural habitats.
- Changes to funding for woodland planting and management will impact on woodland creation and management. Reduced funding has led to a drop in woodland planting in recent years. Increase in funding for woodland infrastructure has increased the number of roads and tracks being constructed. Funding for rhododendron removal has increased the number of woodlands being actively managed to remove rhododendron. Any change to woodland grants will have a direct impact on the management of woodlands.
- Development pressure from within the NCA and beyond (such as expansion associated with Plymouth and the new town at Sherford) will put increased strain on water resources, affecting existing reservoirs and rivers and potentially incurring a demand for new reservoirs.
- Changes to Government policy on conversion of agricultural buildings to business use or housing and the resulting associated domestic infrastructure will change the character of traditional nucleated farmsteads.
- Pressure for development in and around the main settlements within and on the edge of the NCA, for example Tavistock, Okehampton, Buckfastleigh and South Brent, may impact on the historic shape and form of the settlements, levels of tranquillity and rural character.
- New quarrying activity such as the re-opening tungsten mine at Hemerdon and further quarrying at the Lee Moor china clay works, with the development of associated infrastructure will change the character of the south-western corner of the NCA. Opportunities to invest some of the economic benefits these developments will bring back into the natural environment and local communities should be sought.
- Recreational pressure is likely to increase with further demand from expanding urban centres close to Dartmoor, notably around Plymouth; a potential increase in UK based tourism; an increase in more active recreation such as mountain biking and kayaking and for more 'challenge' events. Green infrastructure and further sustainable transport options could be considered particularly connecting with Plymouth.

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.



An area of quiet enjoyment, extensive grazing and water catchment.

Statement of Environmental Opportunity	Ecosystem Service																		
	Food provision	Timber provision	Water availability	Genetic diversity	Biomass provision	Climate regulation	Regulating water quality	Regulating water flow	Regulating soil quality	Regulating soil erosion	Pollination	Pest regulation	Regulating coastal erosion	Sense of place/inspiration	Sense of history	Tranquility	Recreation	Biodiversity	Geodiversity
SEO 1: Protect, manage and enhance Dartmoor’s extensive open moor, its sense of wildness and remoteness, the internationally important habitats and species it supports, and the carbon and water stored in its deep peat.	↔ **	↔ ***	↑ ***	↗ **	↔ ***	↑ ***	↑ ***	↑ ***	↗ **	↑ ***	↗ ***	↔ ***	n/a	↑ ***	↑ ***	↑ ***	↗ **	↑ ***	↗ ***
SEO 2: Protect, manage and enhance Dartmoor’s rich cultural heritage and its strong connection with granite and associated minerals, providing inspiring information to promote understanding of the landscape.	↔ **	↔ ***	↔ **	↔ **	↔ ***	↔ **	↔ ***	↔ ***	↔ ***	↔ ***	↔ ***	↔ ***	n/a	↑ ***	↑ ***	↑ ***	↑ ***	↑ ***	↑ ***

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

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

Statement of Environmental Opportunity	Ecosystem Service																			
	Food provision	Timber provision	Water availability	Genetic diversity	Biomass provision	Climate regulation	Regulating water quality	Regulating water flow	Regulating soil quality	Regulating soil erosion	Pollination	Pest regulation	Regulating coastal erosion	Sense of place/inspiration	Sense of history	Tranquility	Recreation	Biodiversity	Geodiversity	
SEO 3: Protect, manage and enhance the enclosed, tranquil character of the pastoral landscape, encouraging the management of boundary features, including granite walls, and of semi-natural features to strengthen local distinctiveness and connectivity. Create opportunities for quiet, informal recreation, particularly around settlements.	↗ ***	↗ ***	↗ ***	↗ **	↗ ***	↗ ***	↗ ***	↗ ***	↗ **	↗ ***	↗ ***	↔ ***	n/a	↑ ***	↑ ***	↑ ***	↑ ***	↑ ***	↑ ***	↑ ***
SEO 4: Protect and manage Dartmoor's network of streams, leats and rivers; and enhance the contribution they make to landscape character, recreation and biodiversity, while managing water flows, quality and supply.	↔ **	↗ **	↑ ***	↔ **	↔ ***	↑ ***	↑ ***	↑ ***	↑ ***	↑ ***	↔ ***	↔ ***	n/a	↑ ***	↑ ***	↑ ***	↑ ***	↑ ***	↑ ***	↑ ***

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

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

Landscape attributes

Landscape attribute	Justification for selection
<p>Open, windswept upland moors with wide views and a sense of remoteness and wildness, where the skyline is broken only by the outline of granite tors, clitter and occasional blocks of coniferous plantation.</p>	<ul style="list-style-type: none"> ■ The essence of Dartmoor, and the reason many people visit, is the ability to escape modern infrastructure and find tranquillity and remoteness; a landscape of national importance reflected in its designation as a National Park. ■ Wide open views across common land extensively grazed by sheep, cattle and Dartmoor ponies, contrasting strongly with the busy urban areas of Torbay and Plymouth and the more gentle, mixed farming landscape which surrounds the NCA. ■ Geology is at the heart of the Dartmoor landscape and prominent in the landform and features, such as tors and clitter. They are landmarks and reference points that attract visitors and draw the eye to otherwise open views across the moors. ■ The granite massif that forms the core of Dartmoor overlain by peat deposits combined with high rainfall has led to the formation of large areas of internationally important blanket bog and valley mire. ■ The geological forces which formed the massif also led to the formation of rich mineral deposits, notably tin, that have been mined for centuries. The legacy of that activity is still prominent in the landscape. ■ Occasional but large conifer plantations create dark blocks with hard edges, contrasting with the smooth, muted backdrop.
<p>Sheltered valleys with steep wooded sides and wild, fast-flowing rivers descending at the moor fringes.</p>	<ul style="list-style-type: none"> ■ Contrasting with the open moors, sheltered, often deep cut, valleys radiate from the heart of Dartmoor. ■ Ancient broadleaved woodland, dominated by oak, often clothed by a rich assemblage of mosses and lichens. Dartmoor has some of the best examples of high altitude oak woodland in Britain, which are recognised as internationally important. In Spring the woodlands are enriched by broad swathes of wild daffodils and bluebells. ■ Four woodland areas have been designated as National Nature Reserves providing access to high-quality nature conservation sites. ■ The valley floors are fringed by wet woodland and Rhôs pasture, a habitat of rare flowers, rushes and purple moor grass. Valley mires and Rhôs pasture are of national importance. Characteristic bird species such as pied flycatcher, wood warbler and redstart can be found in these secluded places. ■ Cascades and gorges are frequent; their dynamism and vibrancy an attraction for visitors. ■ Water is one of the essential elements of the area, from bogs and mires, to fast-flowing rocky streams, cascades and wider, slower rivers in deep valleys. ■ The headwaters of some rivers are captured and stored in reservoirs, creating large expanses of open water and providing smooth and flat elements in an otherwise rugged landscape.

Landscape attribute	Justification for selection
<p>Large expanses of grass and heather moorland, interspersed with bilberry, gorse and bracken, and grazed by Dartmoor ponies, cattle and sheep.</p>	<ul style="list-style-type: none"> ■ The quintessential image of Dartmoor – ponies grazing on the open moors. ■ Broad, simple expanses and blocks of uniform colour, bright in summer and muted in autumn and winter. ■ The moorland supports populations of skylark, red grouse and ring ouzel, golden plover and dunlin. Their song, calls and glimpsed sightings are an inspiration and attraction. The grass moorland is important for fritillary butterflies including the rare high brown fritillary. ■ The expansive areas of blanket bog, raised bog and upland heath are all habitats of international importance. Dartmoor has the most southerly area of blanket bog in the country and the main plant community is very rare outside of Britain. ■ Dartmoor and South Dartmoor Special Areas for Conservation reflect the quality and quantity of nature that can be experienced on the moor.
<p>Surrounding the main moor a gentler landscape of small, irregular pasture fields, bounded by drystone walls and banks topped with hedges and mature trees.</p>	<ul style="list-style-type: none"> ■ A distinctive, undulating landform, in places intimate and enclosed, but retaining views onto the higher moorland. ■ An historic farmed landscape retaining medieval field patterns and post-medieval hedgebanks enclosing small fields of pasture. ■ Winding rural lanes linking nucleated hamlets and villages, with high hedgebanks and many hedgerow trees create a strong sense of enclosure. Sunken lanes form tunnels through pockets of woodland and mature hedgebanks. ■ At the fringes of the open moorland a strong pattern of late 18th- and 19th-century ‘newtakes’, bounded by granite drystone walls and low hedgebanks, and now enclosing rough grazing land.
<p>A landscape of great, national historic interest exhibiting evidence of human activity from prehistoric times, including the more recent impact of the quarrying and minerals industries.</p>	<ul style="list-style-type: none"> ■ The evidence of prehistoric occupation on Dartmoor is among the best preserved, most readily appreciated and important in England. There are ceremonial stone rows and circles, upstanding prehistoric hut circles, burial chambers, cairns, pounds and field systems. There are 1,322 Scheduled Monuments, many of them evidence of the prehistoric landscape. ■ There is not only evidence of prehistoric activity, but many phases of later human activity and influence set out in an easily interpretable historic sequence, unlike many other parts of England. ■ The quarrying and minerals industries have left a clear impact; there has been a long history of mineral exploitation, with evidence from the Middle Ages. Lead, copper, iron, arsenic and peat were all extracted from the landscape, along with tin. Granite was commercially quarried from the early 19th century until 1997. Remains include spoil heaps, engine houses and chimneys, cottages and granite tramways. China clay continues to be extracted, leaving a barren, ‘luna like’ landscape. ■ Surrounding towns are historically linked to the moor; gateways to the moor, market places for produce and the centres of Stannary activity.

Landscape attribute	Justification for selection
<p>Distinctive farmsteads, villages and towns, often comprised of robust vernacular buildings utilising locally occurring granite and slate, sometimes whitewashed, while towards the east, lime-washed cob and thatch broaden the vernacular.</p>	<ul style="list-style-type: none"> ■ Historic buildings and structures such as cottages, farmsteads, village and some town houses, and mining buildings, bridges and walls, seem to grow out of the landscape like manmade tors. Granite unites the high moor and surrounding farmland area. ■ Natural slate is the normal roofing material, shining silver after rainfall. There are, however, other materials used too. Cob and thatch, and whitewashed buildings are often simple in form and appearance. ■ The historic cores of villages and towns often have a dense settlement pattern with narrow streets and burgage plots, huddled for shelter in valleys, often clustered around bridging points or cross roads. ■ Square-towered medieval granite churches, some with ornate pinnacles, are prominent features within settlements, acting as focal points in long views.
<p>An inspirational landscape rich with evidence of past human activity, natural history and opportunities for vigorous, stimulating recreation or quiet introspection.</p>	<ul style="list-style-type: none"> ■ A wealth and variety of heritage sites and ancient monuments, SSSI, natural features and processes, and geological assets provide a huge range of learning and research opportunities. ■ An area of strong contrasts and bold forms which can provoke artistic, literary and spiritual creativity. An area steeped in ancient myths and legends, traditional fairs and activities, including Widecombe fair and the annual activity of pony drifts. ■ Open access, wild features and landforms, rocks and fast water allow for active and dynamic recreation; walking, riding and climbing all prominent activities in the landscape. ■ Tranquillity, remoteness and dark night skies, space and lack of modern clutter permit escapism and solitude when sought.

Landscape opportunities

- Protect the undeveloped open character of the moorland and thereby its sense of tranquillity, wildness and remoteness, by avoiding the development of vertical structures, including the planting of trees and woodland, and the intrusion of light, and also by managing and extending the upland heath and blanket bogs.
- Create, extend and link upland habitats, particularly blanket bog, valley mire, western heath and heather moorland. Reduce the overall area of acid grassland through encouraging heather regeneration while retaining areas of importance for species diversity and as habitat for ground nesting birds.
- Protect the distinctive geological features, including the tors and clitter slopes that punctuate and define the skyline of Dartmoor and are the focal points for visitors. Provide guidance and inspiring interpretation to enhance public understanding and manage recreational activities (such as rock climbing) to reduce damage.
- Plan for new landscapes, restructuring topography, filtering views and establishing appropriate vegetation cover around the china clay works and planned tungsten mine.
- Plan for the long-term restructuring and removal of conifer plantations on the open moor, softening hard visual edges and undertaking a phased removal programme and reversion to heather moorland.
- Plan and manage the extension and connection of areas of semi-natural woodland, particularly along the steep river valleys, using traditional coppicing techniques where appropriate.
- Manage, enhance and link important wetland habitats, particularly species-rich Rhôs pasture and wet woodland, through preserving and managing water flows, controlling invasive vegetation and resisting agricultural improvement.
- Protect and manage water catchments to minimise pollution and manage river banks and valleys to maintain water quality for biodiversity and the character of key landscape features.
- Protect and appropriately manage the rich and internationally important cultural heritage of Dartmoor, including bronze-age monuments, former tin workings, ancient trackways and deserted ancient settlements. Promote understanding and education of the landscape's archaeology to ensure public access and recreation respects the presence of valued sites and features.
- Protect the distinctive field patterns of the moorland fringe (newtakes) and surrounding farmland by managing the hedgerows and walls that define them, using local styles and materials, traditional building styles and topped by local hedgerow species and trees.
- Protect the small and enclosed character of the pastoral landscape surrounding the moorland. Manage the area's species-rich neutral grasslands through extensive grazing and hay cutting. Seek to extend and link fragmented sites.
- Protect and manage historic settlement patterns, the scale of new buildings in the landscape and the strong unifying local vernacular of granite and slate, also reflected in walls and bridges. Maintain views to granite church towers as important local landmarks and resist new development on prominent slopes and ridgelines.
- Protect the character of the landscape and setting of the NCA from inappropriate development.

Ecosystem service analysis

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

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

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Food provision	Meat products - speciality beef and lamb	<p>The NCA is predominately pastoral (92 per cent of farmed area is under grass), with grazing livestock, particularly sheep, as the most significant farm type. Over the period 2000–2009, there was an increase in land cover of grass and uncropped land by 3443 ha or 10 per cent and vegetables by 30 ha or 199 per cent. Cereals and other arable crops experienced a slight decrease of 1 per cent (10 and 2 ha respectively) while cash roots fell by 38 per cent or 9 ha.</p> <p>Over 40 per cent of the NCA is common land which is almost entirely rough grazing for sheep, cattle and ponies. Scottish Blackfaces are the commonest sheep breed although Dartmoor White and Grey Faces are kept, particularly on the moorland fringe. The main breed of cattle is Galloway, sometimes crossed with Herefords.</p>	Local	<p>The profitability of Dartmoor hill farms (average income in 2010/2011 for an upland farm was £31,000, whereas the average income for a lowland farm in the same period was £61,000)⁶ coupled with falling numbers of both stock and farmers with the necessary skills is threatening the future of moorland farming. This will not only impact on food production but on the management and conservation of the moorland and the benefits it provides for visitors and residents.</p> <p>Initiatives have been established to address these issues, for example the Dartmoor Hill Farm Project which facilitates training, apprenticeships and adding value to products. Although this type of initiative is highly successful, it is unfortunately dependent on external funding and doesn't benefit from a secure long-term future.</p> <p>Continued on next page...</p>	<p>Work with farmers and local communities to ensure the necessary skills and knowledge are maintained, shared and enhanced to secure a future for Dartmoor hill farming.</p> <p>Encourage the use of hardy breeds to appropriately graze the moors for the benefit of habitat management and biodiversity, soil management and water storage.</p> <p>Support and encourage initiatives that add value to local food products and foster a strong brand, securing a more viable farm business.</p> <p>Support community based schemes that provide affordable food for local communities.</p>	<p>Food provision</p> <p>Sense of place/ inspiration</p> <p>Biodiversity</p> <p>Regulating water quality</p> <p>Regulating soil erosion</p> <p>Climate regulation</p>

⁶ <http://www.nfuonline.com/assets/4815>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Food provision cont.				<p>... continued from previous page</p> <p>Other initiatives with a commercial basis, although supported by start-up funding, are potentially more self sustaining. An example is Dartmoor Farmers Ltd, a co-operative of hill farmers championing and supplying quality beef and lamb produced on the moor.</p>		
Timber provision	<p>Existing commercial plantation</p> <p>Accessible broadleaved woodland</p>	<p>Only 12 per cent of the NCA is woodland (10,431 ha) yet the river valley systems are dominated by upland oak wood of European ecological importance. There are 2,749 ha of ancient semi-natural woodland, of which 70 per cent is designated SSSI.</p> <p>In addition to the ancient woods, there are important areas of broadleaf woodland which have been planted or self sown within the last 200 years (in 2011 there were 6,089 ha of broadleaved woods in the NCA). There are 3,318 ha of coniferous plantation, predominantly planted since the 1920s. Some upland conifer plantations have undergone wide-scale restructuring and now achieve multi-purpose objectives.</p>	Local	<p>Many of the woodlands within the NCA have little value for quality timber because of poor management. This may be a consequence of poor access (for example on steep valley sides), cost, the timber market, public relations or lack of information/knowledge.</p> <p>Some of the plantations, particularly those planted on ancient woodland sites, are today some of the finest conifer stands in the country. However, many semi-natural species have survived and restoration of original habitats is a priority for these sites.</p> <p>Soft wood prices and mechanised harvesting are impacting on the management of plantations, with less thinning and creation of open spaces.</p> <p>Continued on next page...</p>	<p>Encourage initiatives that promote the use of local timber and wood products and facilitate communication/greater understanding between wood producers (large and small), processors and users.</p> <p>Work with the local forestry industry and timber processors to ensure the necessary skills and knowledge are maintained, shared and enhanced to enable sustainable woodland management.</p> <p>Encourage management practices that ensure well structured woodland with</p>	<p>Timber provision</p> <p>Biodiversity</p> <p>Sense of place/ inspiration</p> <p>Regulating water flow</p> <p>Tranquillity</p> <p>Regulating water quality</p> <p>Regulating soil erosion</p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Timber provision cont.				<p>... continued from previous page</p> <p>Change to continuous cover forestry means a reduced opportunity to create open space in conifer woods.</p> <p>Invasive species (notably rhododendron and laurel) are impacting on woodland productivity, by restricting natural regeneration or favouring regeneration of undesirable species. Pests and diseases are also affecting woodland productivity. Phytophthora pathogens have already led to clear felling within the NCA⁷.</p>	<p>quality timber and where appropriate achieve multipurpose objectives.</p> <p>Support community schemes that promote positive woodland management and the use of wood products.</p>	
Water availability	<p>Rivers</p> <p>Reservoirs</p> <p>Surface water catchments</p> <p>Blanket bogs</p>	<p>Dartmoor is the source of many of Devon and East Cornwall's rivers and supports eight reservoirs.</p> <p>The Catchment Area Management Strategies shows most areas of the NCA either have 'no water available', are 'over licensed' or 'over abstracted'. In the very north, there are two very small areas with 'water available'.</p> <p>Continued on next page...</p>	Regional	<p>Dartmoor's water has been used to supply local industry, tin mining and quarrying, agriculture and domestic use for centuries. Since the late 16th century, leats (man-made water channels) were constructed to supply water, not just locally but for industry and domestic use further afield, for example Devonport Leat supplied Plymouth's docks.</p> <p>Past degradation of peat soils and blanket bogs in the central moorland through uncontrolled burning, overgrazing and drainage has reduced their ability to store water. Climate change may result in less</p>	<p>Promote management of moorland areas ensuring the blanket bogs and peat maintain and enhance their water storage capacity.</p> <p>Restore the hydrological function of blanket bog through a re-wetting programme.</p> <p>Promote management at catchment scale, encouraging good environmental management of semi-natural habitats to aid water retention, increased storage and connectivity.</p>	<p>Water availability</p> <p>Biodiversity</p> <p>Regulating water quality</p> <p>Climate regulation</p> <p>Sense of place/ inspiration</p> <p>Recreation</p>

⁷ <http://www.dartmoor-npa.gov.uk/lookingafter/laf-naturalenv/laf-treeswoodlands/laf-woodlandsstrategy>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Water availability cont.		<p>... continued from previous page</p> <p>Most of the area has a “hands off” policy with licences; abstraction is often limited during times of low flow; or in some over abstracted areas (around the River Plym), abstractions are limited to times of higher flow (typically, winter months).^{8,9}</p> <p>The eight reservoirs within the NCA supply water to commercial and domestic customers throughout Devon. Dartmoor also drains to a number of important river intakes that make a significant contribution to public water supply. Agriculture accounts for a proportion of licensed abstraction on Dartmoor as does the extraction and processing of china clay from the Plym catchment.</p> <p>Throughout the NCA, there are a large number of water-dependent SSSI and SAC. The rivers of Dartmoor have wild salmon, sea trout and brown trout populations that are dependent on increases in flow conditions to reach spawning grounds.</p>		<p>predictable rain fall and drier summers, resulting in the drying out of the peats and blanket bogs.</p> <p>Growth of Plymouth, a planned new town, Sherford, in the adjoining NCA and the commencement of tungsten mining on the south west fringe of the NCA will place additional demands on the supply of water. This could affect water levels in the reservoirs and rivers and potentially the amount of water stored in the bogs and peat.</p>	<p>Maintain leats as landscape and functional features where appropriate.</p> <p>Encourage restoration plans of mining areas that incorporate habitats and management practises that enhance water retention.</p>	

⁸ Tamar Catchment Abstraction Management Strategy, December 2012, Environment Agency (URL: http://ao768b4a8a31e106d8bo-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/LIT_7638_2d8093.pdf) ⁹ The Teign, Torbay & South Hams Catchment Abstraction Management Strategy, October 2006, Environment Agency (URL: <https://publications.environment-agency.gov.uk/skeleton/publications/ViewPublication.aspx?id=210b905e-fd63-42be-9648-58830006a0a8>)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Genetic diversity	<p>Whiteface Dartmoor sheep</p> <p>Greyface Dartmoor sheep</p> <p>Dartmoor pony</p>	<p>Dartmoor Whiteface sheep are classified as 'at risk' (900–1,500 breeding ewes nationally) numbers having declined hugely since their heyday in the 17th and 18th centuries. Their ongoing story reflects the ups and downs of farming and a variety of pressures, internal and external, and changing market demands that can affect a geographical area and its people.</p> <p>The Greyface Dartmoor sheep are classified as a minority breed (1,500–3,000 breeding ewes nationally). Although they originate from Dartmoor the breed is now found across the country although mostly in small flocks.</p> <p>Dartmoor ponies are known to have been on Dartmoor since prehistoric times. However, the Dartmoor pony has been in decline for a number of years and their population is now classed as vulnerable (500–900 breeding mares nationally).</p>	Local	<p>The Whiteface Dartmoor sheep is one of Britain's most ancient breeds. They have an ability to withstand either very wet or hard winters, without detriment in the subsequent lambing season or to wool. Indigenous to Dartmoor, and well adapted to its upland pastures and moors, they are as much a part of its landscape as are the tors, heath and hill ponies. Efforts are being made to ensure the breed's survival into the future through the work of The Whiteface Dartmoor Sheep Breeders Association and the vigilance of individual farmers and their families who keep them.</p> <p>The Greyface Dartmoor is also known as the Dartmoor or "improved" Dartmoor, having descended from local breeds, which grazed the low ground in and around Dartmoor. The Dartmoor is a hardy breed suited to grazing uplands and able to cope with most weather conditions.</p> <p>Dartmoor Ponies are very hardy and actually thrive on the open moor despite the harsh weather and poor vegetation. The pony reflects a vital part of the human story of Dartmoor, initially used to transport goods and latterly, with their selective grazing of moorland, playing a vital conservation role.</p> <p>The economics of keeping ponies has been affected by changes in agri-environment payments, the vagaries of the market for riding ponies and changes in the legislation concerning export and transporting ponies. There is a concern about the consequences of fewer pony keepers on Dartmoor and the loss of skills and knowledge; particularly those required to manage the annual pony drift when ponies are brought off the moor for checking and branding. As well as the skills, there is an issue of quality. The reduction in sales of ponies has not been matched by a drop in the number of foals and some of the heritage herds are at risk.</p>	<p>Support and work with farmers, local communities, breed associations and relevant groups to ensure the necessary skills and knowledge are maintained, shared and enhanced to secure a future for Dartmoor's rare breeds.</p> <p>Encourage the use of local hardy breeds to appropriately graze the moors.</p> <p>Support and encourage initiatives that add value to local food and fibre products and foster a strong brand.</p>	<p>Genetic diversity</p> <p>Food provision</p> <p>Sense of place/ inspiration</p> <p>Biodiversity</p> <p>Sense of history</p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biomass energy	Existing woodland Hedgerows	<p>12 per cent of the NCA is woodland (10,431 ha), including 2,749 ha of ancient semi-natural woodland, of which 70 per cent is designated SSSI, 6,089 ha of broadleaved woods (2011) and 3,318 ha of coniferous plantation.</p> <p>Hedgerows are a key landscape feature around the moorland fringe, enclosing the small-scale pastoral landscape.</p>	Local	<p>Many of the woodlands, not currently under productive management are small scale, often located on steep valley sides and with poor access. However, across the NCA there is some potential for the provision of biomass from small woodlands for local use. Similarly there is potential of using by-products from commercial timber production for local use.</p> <p>With appropriate management it would be possible to produce wood fuel from hedges within the Dartmoor NCA for local use.</p>	<p>Support and encourage local initiatives that promote the sustainable management of woodlands and hedgerows for wood fuel production. Encourage join-up between landowners and local communities including skills sharing and knowledge transfer.</p>	<p>Biomass provision</p> <p>Biodiversity</p>
Climate regulation	<p>Peat soils and blanket bog</p> <p>Existing woodlands Other soils and semi-natural habitats</p>	<p>It is estimated there is 9.7 Mt of carbon stored within the peat soils of Dartmoor (equivalent to one year's carbon emissions from UK industry). The majority (7.22 Mt) is found within blanket peat, 1.71 Mt in shallow peat and 0.77 Mt in the peat to loam soils.</p> <p>Carbon storage is also provided by the woodlands (12 per cent of area).</p>	National	<p>England's most extensive peatlands are blanket bogs; Dartmoor has a significant area of such blanket bog. The amount of carbon stored in peat is reduced by both human and natural activities. Inappropriate burning practices and wildfire events, overgrazing and drainage all reduce the ability of peat to sequester and store carbon. As does water loss due to evaporation and erosion.</p> <p>Climate change could potentially result in the drying out of peat soils, making them more vulnerable to oxidation and less able to store carbon.</p> <p>Continued on next page...</p>	<p>Restore the hydrological function of blanket bog through a re-wetting programme.</p> <p>Promote and support sympathetic management of Dartmoor's blanket bogs and peat by working jointly with landowners, commoners and relevant organisations and initiatives.</p> <p>Promote and develop understanding and awareness of the importance of Dartmoor's blanket bog and peats for carbon storage.</p>	<p>Climate regulation</p> <p>Regulating water flow</p> <p>Regulating water quality</p> <p>Regulating soil erosion</p> <p>Regulating soil quality</p> <p>Biodiversity</p> <p>Sense of place/ inspiration</p> <p>Tranquillity</p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Climate regulation cont.				<p>... continued from previous page</p> <p>Woodlands also provide a significant carbon store on Dartmoor, with semi-natural woodland providing higher rates of storage than new plantations. Soils under woodland generally store more carbon than under grassland. It has been estimated that peat stores nearly a third less carbon when under trees than under grassland/ moorland management.</p>	<p>Encourage carbon storage to be an integral consideration of woodland management, and promote the sustainable management of woodlands not currently under a management regime.</p>	

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water quality	<p>Blanket bogs</p> <p>Soil</p> <p>Significant areas of semi-natural habitat across the catchment areas and on valley sides away from the central moorland core</p>	<p>All rivers on Dartmoor have good or moderate ecological status. However, there are a number of problems associated with historic metal mining, resulting in acidic metal-rich water draining into rivers and causing ecological impacts. The groundwater chemical status is poor across the NCA. This is likely to be due to acid conditions arising from the granite geology and peaty soils¹⁰.</p> <p>The South Devon Catchments, including the headwaters of the rivers Dart, Erme and Avon rising on Dartmoor are defined as Priority Catchments by Defra¹¹.</p>	Regional	<p>Past degradation of peat soils and blanket bogs in the central moorland through inappropriate burning and wildfire, overgrazing and drainage has reduced their ability to regulate water quality, impacting on river life downstream including species such as salmon. The main threat to the quality of the water entering the reservoirs or at abstraction points is fire (especially wild fire). Appropriate vegetation management is essential to reduce this threat and to ensure effective and efficient capture of rain.</p> <p>Mineral extraction, notably the china clay works in the south-west of the NCA has the potential to impact on water quality through either direct run-off or because of a change in land cover either during extraction or after restoration. Comprehensive monitoring around these sites is in place.</p> <p>Within the agricultural land surrounding the open moorland, key issues affecting water quality include soil and nutrient run-off, faecal contamination and pollution pathways on holdings.</p> <p>The woodlands, particularly the semi-natural woodlands on the steep valley sides perform an important role in maintaining water quality by reducing soil and nutrient run-off.</p>	<p>Promote and support sympathetic management of Dartmoor's blanket bogs and peat by working jointly with landowners, commoners and relevant organisations and initiatives.</p> <p>Promote sensitive vegetation management that reduces the threat of wild fires.</p> <p>Support and encourage mineral restoration plans that consider water quality issues as part of future vegetation cover and management planning.</p> <p>Promote and support and apply the principles of the Catchment Sensitive Farming Initiative.</p> <p>Encourage the maintenance of and an increase in semi-natural woodland (broadleaved) through natural regeneration along river valleys.</p>	<p>Regulating water quality</p> <p>Biodiversity</p> <p>Recreation</p> <p>Sense of place/ inspiration</p> <p>Regulating soil erosion</p> <p>Climate regulation</p> <p>Regulating water flow</p>

¹⁰ *Water for Life and Livelihoods: River basin management plan – South west river basin district*, Environment Agency (2009; URL: <http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/southwest/Intro.aspx>) ¹¹ DEFRA catchment priorities identified under the England Catchment Sensitive Farming Delivery Initiative

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water flow	<p>Geology</p> <p>Geomorphology</p> <p>Blanket bogs and peat</p> <p>Reservoirs</p>	<p>The hard, steep and impermeable granite geology of the upper catchments means that river systems are very responsive to heavy rainfall (particularly in the winter months) which affects downstream locations in and outside the NCA¹².</p> <p>The lower catchments have less severe gradients and wider more permeable valleys meaning that rivers reach flood peak in 12–24 hours. Key settlements at risk of flooding within or on the periphery of the NCA include Okehampton (East and West Okement Rivers) Ashburton and Buckfastleigh (River Dart), the eastern fringes of Plymouth (River Plym), Ivybridge (River Erme), South Brent (Devon Avon), Dunsford to Chudleigh (River Teign) and Tavistock (River Tavy)¹³.</p> <p>Reservoirs have a large impact on their surrounding area; with the Burrator Reservoir affecting the natural flow patterns of the River Meavy and River Plym. However, the Burrator and Meldon reservoirs (affecting the Okement catchment area) have comprehensive flow release systems that ensure there is sufficient river water throughout the year.</p>	Regional	<p>While Dartmoor's granite is impermeable, the blanket bog overlaying it and surrounding the headwaters of all the river systems can hold water. A healthy blanket bog is able to store a large volume of water within saturated peat, releasing it slowly into rivers and streams having a significant effect on reducing peak flows downstream. Blanket bog vegetation, when in good condition, can absorb significant quantities of water which regulates run-off from the moor.</p> <p>Management regimes on the agricultural land around the open moor can impact on water flow rate. Wet meadows in valley bottoms, grazing pasture and hedgerows can all reduce the amount and rate of run-off, reducing the magnitude of flood waters downstream. Woodlands perform similar 'reducing' functions, particularly semi-natural woodlands on the steep valley sides.</p> <p>Weirs are present on many Dartmoor rivers and while their removal may be beneficial for spawning fish, there are implications on water flow regulation and the historic environment.</p>	<p>Restore the hydrological function of blanket bog through a re-wetting programme.</p> <p>Promote and support sympathetic management of Dartmoor's blanket bogs and peat by working jointly with landowners, commoners and relevant organisations and initiatives.</p> <p>Promote and support the principles of Catchment Sensitive Farming. Encourage sustainable management of wet meadows and seek opportunities to create new wet meadows.</p> <p>Encourage and support the maintenance of and an increase in semi-natural woodland (broadleaved) through natural regeneration along river valleys to reduce run-off.</p>	<p>Regulating water flow</p> <p>Regulating water quality</p> <p>Biodiversity</p> <p>Recreation</p> <p>Sense of place/ inspiration</p> <p>Regulating soil erosion</p> <p>Climate regulation</p>

¹² South Devon Catchment Flood Management Plan, Environment Agency (2009; URL: <http://publications.environment-agency.gov.uk/pdf/GESW1109BOUO-e-e.pdf>)

¹³ Environment Agency flood warning mapping (URL: www.environment-agency.gov.uk/homeandleisure/37835.aspx)

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil quality	Underlying geology	There are six main soilscape types in this NCA:	Local	<p>In the case of the freely draining acid loamy soils over rock, management is often difficult on this steep often very stony land with a short grazing season. There is generally a low risk of poaching although organic topsoils can poach when wet.</p> <p>The slowly permeable wet very acid upland soils with a peaty surface and the blanket bog peat soils are at risk of loss of organic matter through overgrazing, inappropriate burning, climate change and soil erosion. Measures should be encouraged that retain water in situ and potentially raise water levels, ensure good vegetative cover and avoid over grazing/ trampling or damage by mechanised activities.</p> <p>The freely draining slightly acid loamy soils by comparison have good water infiltration that can help recharge groundwaters, with good soil structure and water infiltration aided by improving organic matter content.</p>	<p>Restore the hydrological function of blanket bog through a re-wetting programme.</p> <p>Promote and support sympathetic management of Dartmoor's blanket bogs and peat by working jointly with landowners, commoners and relevant organisations and initiatives.</p> <p>Support management of soils that encourage the build-up of organic matter, for example through extensive grazing.</p> <p>Support initiatives that promote awareness and understanding of soil structure and management.</p> <p>Consider the consequences of mechanised activity and soil compaction, particularly in wet weather.</p>	<p>Regulating soil quality</p> <p>Regulating water flow</p> <p>Regulating water quality</p> <p>Biodiversity</p> <p>Recreation</p> <p>Sense of place/ inspiration</p> <p>Regulating soil erosion</p> <p>Climate regulation</p> <p>Food provision</p>
	Soils	<ul style="list-style-type: none"> Freely draining acid loamy soils over rock, covering 46 per cent of the NCA. 				
	Blanket bog	<ul style="list-style-type: none"> Slowly permeable wet very acid upland soils with a peaty surface (17 per cent). 				
	Semi-natural habitats	<ul style="list-style-type: none"> Blanket bog peat soils (13 per cent). 				
	Woodland	<ul style="list-style-type: none"> Freely draining slightly acid loamy soils (10 per cent). 				
	Permanent pasture	<ul style="list-style-type: none"> Very acid loamy upland soils with a wet peaty surface (9 per cent). Freely draining slightly acid but base-rich soils (3 per cent). 				

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil erosion	Soils Blanket bog Semi-natural habitats Woodland Permanent pasture	<p>Over 30 per cent of the soils are peat based and prone to wind and water erosion with risks of gullying/hagging.</p> <p>With the freely draining acid loamy soils over rock there's an enhanced risk of erosion on the 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 soils compaction.</p> <p>The Devon Avon and rivers Erme and Dart are defined as priority catchments by Defra as part of the England Catchment Sensitive Farming Delivery Initiative partially as a result of sedimentation due to cattle accessing and eroding river banks in their lower stretches.</p>	Regional	<p>Old peat workings that have left significant areas of exposed peat in the central high moor are particularly prone to erosion. Over grazing, inappropriate burning practices and wildfire events have also resulted in exposed peat that is prone to more rapid erosion.</p> <p>Severe weather, both unusually high levels of rainfall, high winds and drought can increase the rate of soil erosion. Saturated soils result in increased run-off and in extreme cases gullyng. Drought can lead to increased rates of poaching.</p> <p>Recreational pressure – excessive footfall along popular routes wears away vegetation cover, mountain bikes can gouge wheel ruts that become water channels and horse hooves cut through wet vegetation.</p> <p>There are plans to fence off watercourses and introduce buffer strips, reducing sedimentation and encouraging bank stabilisation on the lower stretches¹⁴.</p>	<p>Promote and support sympathetic management of Dartmoor's blanket bogs and peat by working jointly with landowners, commoners and relevant organisations and initiatives.</p> <p>Promote land management practices that reduce soil erosion, by example managing grazing levels and access to water courses and seek opportunities to create new permanent pasture on steep slopes.</p> <p>Support initiatives that promote awareness and understanding of soil structure and management.</p> <p>Encourage the maintenance of and an increase in semi-natural woodland (broadleaved) through natural regeneration along river valleys.</p> <p>Raise public awareness of the consequences of erosion caused by recreational pressure and encourage 'sustainable' use of the moors.</p>	<p>Regulating soil erosion</p> <p>Regulating soil quality</p> <p>Regulating water flow</p> <p>Regulating water quality</p> <p>Biodiversity</p> <p>Recreation</p> <p>Sense of place/ inspiration</p> <p>Climate regulation</p> <p>Food provision</p>

¹⁴ DEFRA catchment priorities identified under the England Catchment Sensitive Farming Delivery Initiative

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Pollination	<p>Semi-natural habitats</p> <p>Orchards</p> <p>Hedgerows</p> <p>Meadows</p>	<p>Over 30 per cent of the NCA is covered by blanket bog and upland heath.</p> <p>Traditional orchards are still found within the NCA, often adjacent to settlements or farmsteads.</p> <p>Dense networks of species-rich hedgerows surround the moorland core and are regularly interspersed with meadows.</p>	Local	<p>The extensive area of semi-natural habitat, combined with species-rich hedgerows and meadows provide a large (and important) source of nectar for pollinating insects.</p> <p>Over the last 20 years there has been a renewed interest in traditional orchards, with both new orchards being planted and old orchards being restored. Several community orchards have been established.</p>	<p>Support sustainable management of semi-natural habitats, ensuring a diversity of species.</p> <p>Promote management of hay meadows and hedgerows to protect and enhance species diversity.</p> <p>Support and promote sustainable management and planting of traditional orchards, including the use of local varieties. Encourage and support initiatives that provide new markets for apples.</p>	<p>Pollination</p> <p>Biodiversity</p> <p>Sense of place/ inspiration</p>
Pest regulation	n/a	n/a	n/a	n/a	n/a	n/a
Regulating coastal erosion and flooding	n/a	n/a	n/a	n/a	n/a	n/a

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities				
A sense of place/ inspiration	Open moorland and granite tors	A nationally important landscape with a unique sense of place, particularly in southern England.	National	Dartmoor provides the most remote and 'wild' experience in southern England. The NCA is dominated by its upland moorland core which is inextricably linked with the surrounding farmland by the granite, the rivers and wooded valleys, as well as agricultural practises and communities.	Promote the use of landscape character guidance and other landscape tools to ensure the key characteristics of all landscape types are protected and reinforced through land management and development.	Sense of place/ inspiration				
	Granite walls	An area of extensive upland moorland and bog characterised with distinctive granite tors, pockets of ancient oak woodland, boulder-strewn rivers and a wealth of historic features and industrial archaeology. An area shaped and influenced by extensive grazing, including by Dartmoor ponies, and centuries of military training.					Sense of history			
	Buildings, villages and historic towns	Surrounding the open moorland lies an intricate, predominantly pastoral landscape enclosed by granite walls or granite-faced hedge banks. The granite characterises buildings, villages and structures across the NCA and has done since at least the Bronze Age.						Recreation		
	Fast-flowing rivers in steep-sided tree clad valleys	Feelings of inspiration and escapism are likely to be associated with the strong and varied landscape, one of sharp contrasts ranging from the wild, windswept moors with panoramic views to the sheltered, enclosed valleys and fringes of the NCA.							Tranquillity	
	Tranquillity and remoteness	Continued on next page...								Biodiversity
	Industrial archaeology									
	Reservoirs									
	Historic sites									
Intricate enclosed pastoral landscape										
Military use										

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<p>A sense of place/ inspiration cont.</p>		<p>... continued from previous page</p> <p>The colours of the landscape, strong sense of remoteness within the heart of the NCA and views of prehistoric monuments all contribute to its inspiring and dramatic nature.</p> <p>Dartmoor has been the inspiration for much art and literature over the centuries including providing the setting to <i>The Hound of the Baskervilles</i> by Sir Arthur Conan Doyle and more recently the filming of Michael Morpurgo's <i>War Horse</i>.</p>		<p>Changes to landscape character and consequently potential impacts on Dartmoor's strong sense of place, through development, mining and quarrying or agriculture, need to be monitored, planned and managed.</p> <p>The long tradition of upland farming has effectively created the landscape, and its viability needs to be maintained and supported to ensure environmentally sensitive land management.</p>		

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of history	<p>Historic settlements and buildings</p> <p>Industrial archaeology</p> <p>Military influence</p> <p>Farming practises</p> <p>Relics of human activity since prehistoric times</p>	<p>A landscape with a strong time connection reflected in the abundance of sites and features indicating a long history of human occupation; from bronze-age round houses and less regular boundary banks or “reaves”, hillforts such as Hembury, ceremonial stone rows, circles and burial chambers to industrial landscapes of spoil heaps and mine buildings, a legacy of past mining activity dating back to the 12th century.</p> <p>The history of upland farming can be traced in the pattern of lynchets, strong irregular field patterns characterised by drystone walls, stone-faced hedgebanks and hedges and larger rectilinear fields or “newtakes” some of which are reverting to moorland.</p> <p>Continued on next page...</p>	National	<p>Archaeological remains on the high moorland are at risk of decay and damage because of a lack of knowledge and awareness. Exposure following the erosion of peat is also damaging some asset, for example on Whitehorse Hill the peat hag that the cist is situated in was eroding so badly that the site was excavated before its condition deteriorated further.</p> <p>Some medieval buildings are at risk due to inappropriate maintenance techniques and lack of traditional skills, understanding, and knowledge.</p> <p>A decline in farming families has resulted in a change of use of some traditional farm buildings and farmsteads, impacting on the sense of history.</p> <p>Recreational pressure damages some archaeological and historic assets. Erosion, through heavy recreational use, causes some damage while lack of knowledge and understanding causes unintentional ‘vandalism’ – climbing on structures or removing stones.</p>	<p>Support opportunities to enhance understanding of the historic environment resource through research and conservation.</p> <p>Promote and support initiatives that provide educational and awareness opportunities for visitors and local communities.</p> <p>Encourage and support initiatives that develop and enhance the traditional skills and understanding required to maintain and manage historic features.</p> <p>Promote and support sympathetic management of Dartmoor’s blanket bogs and peat by working jointly with landowners, commoners and relevant organisations and initiatives which will help secure archaeological remains.</p>	<p>Sense of history</p> <p>Sense of place/ inspiration</p> <p>Recreation</p> <p>Biodiversity</p> <p>Climate regulation</p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<p>Sense of history cont.</p>		<p>... continued from previous page</p> <p>A military history, dating back to the 1800s has left many prominent features and buildings across the landscape including Dartmoor Prison at Princetown built for Napoleonic prisoners of war and a target railway and observation posts on the Okehampton range.</p> <p>The historic character is further reinforced by a network of ancient roads, sunken lanes with hump-backed bridges connecting the moor to the villages and towns beyond, unified by the characteristic use of slate and granite.</p> <p>Other notable historic landmarks include Castle Drogo, the last castle built in England.</p> <p>Dartmoor's history is told through many myths and legends as well as traditional fairs that still take place today such as the Widecombe Fair.</p>		<p>A change in farming practises with a decline of overwintering stock on the open moors has resulted in an increase of large sheds being built, sometimes out of scale with adjoining historic farmsteads.</p> <p>Overhead cables and a jumble of road signs can impact on the sense of history in towns and villages.</p>	<p>Support audits of roadside signage and encourage a 'de-cluttering' where possible. Support opportunities to put cables underground where there is no damage to the historic environment.</p> <p>Promote and support the significance of historic landscape character in development management.</p>	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Tranquillity	<p>Expansive, open moorlands with a sense of 'wildness' and remoteness</p> <p>Boulder-strewn, fast-flowing rivers in deep secluded valleys</p> <p>Relatively few settlements and roads</p> <p>Ancient oak woodlands</p> <p>Narrow winding lanes enclosed by hedgebanks</p> <p>A small-scale pastoral landscape</p> <p>Large and dark night skies</p>	<p>The NCA has experienced a slight decline in tranquillity since the 1960s with undisturbed areas having decreased from 98 per cent to 92 per cent in 2007 (CPRE Intrusion Map, 2007). Most of the NCA is classified as tranquil; however, there are very small areas of low tranquillity around the edge of the NCA, along main routes such as the A386 and the A38.</p> <p>Light pollution within the pastoral landscape is relatively low, particularly in valleys and narrow high-hedged lanes away from towns or villages. Light pollution is also low on the moorland core however the glow of more distant towns and cities is prominent from high ground.</p> <p>Military activity can have an influence on tranquillity. Night skies are disrupted by external lighting from training camps on the fringes of the high moor; day and night exercises and the use of helicopters can create out of character noise and light pollution.</p>	National	<p>Mass recreation events or challenges have the potential to impact on tranquillity, particularly when they involve a significant level of support. Recreational activity, both passive and more 'active' can impact on tranquillity when there is large scale use of key sites.</p> <p>Street lighting and external lighting of farmsteads and other large buildings and structures such as the prison or quarries can impact on the quality of night skies.</p> <p>Military structures, including range markers, huts, stables and more recently portaloos can detract from the sense of wildness and remoteness on the open moor.</p>	<p>Encourage exemplary management of the military training areas and camps with consideration given to impact of external lighting, structures and signs.</p> <p>Support opportunities to underground cables where there is no damage to the historic environment.</p> <p>Support and promote initiatives that encourage sustainable recreation.</p> <p>Support opportunities for recreation provision and growth that protect and enhance tranquillity.</p> <p>Promote awareness of dark night skies and encourage and support initiatives that reduce light pollution.</p> <p>Protect and enhance the sense of remoteness and wildness through development management.</p>	<p>Tranquillity</p> <p>Recreation</p> <p>Sense of history</p> <p>Sense of place / inspiration</p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Recreation	<p>Common land/ open access</p> <p>Public rights of way</p> <p>National Cycle Network and off-road trails</p> <p>Rivers</p> <p>Reservoirs</p> <p>Forests</p> <p>Geodiversity</p> <p>Historic features</p> <p>Biodiversity</p> <p>National Nature Reserves</p>	<p>The NCA provides significant recreation opportunities, recognised by 97 per cent of the area being designated as a National Park. Over 40 per cent of the area is designated open access or common land. There are over 730 km of public rights of way (a density of 0.73 km per km²) and an additional 127 km of permissive paths.</p> <p>For cyclists there is the national cycle route around the western boundary, numerous off road routes using tracks and disused railways, and a network of country lanes.</p> <p>The fast-flowing rivers provide challenges for kayakers, notably the Dart Loop which attracts kayakers from across the UK. The rivers are also an important asset for fishing, walkers and families picnicking.</p> <p>There are varying degrees of access at all eight reservoirs, including opportunities for walking, fishing and cycling.</p> <p>Much of the Forest Estate is accessible to the public, providing opportunities for walking and some cycling along tracks.</p> <p>Continued on next page...</p>	National	<p>Dartmoor offers a huge recreational resource, used by significant numbers of people. Dartmoor attracts 2.3 million visitors a year (this doesn't include visits of less than 3 hours or local residents); 75 per cent of these visitors are day visitors.</p> <p>Balancing the needs and desires of landowners, commoners, multiple users and businesses is becoming increasingly complex.</p> <p>There is an increasing trend in water-based activities with greater access to rivers sought by kayakers; gorge scrambling becoming a recognised and promoted activity and 'wild swimming' becoming more fashionable. Popular river banks for 'picnicking' are becoming busier and people are seeking new and more remote venues.</p> <p>Cycling has also increased in recent years, both road cycling with major events like the Dartmoor Classic and off-road cycling following promoted trails and in some cases illegal routes or access areas. Cycling, like camping, exercising dogs, flying kites and model aircraft, is regulated by local byelaws. However, these need to be 'policed' and education and awareness are more effective long-term measures for management.</p>	<p>Plan and manage the development of recreation opportunities for all, including the use of sustainable transport and enhancement and promotion of less sensitive areas.</p> <p>Support collaboration and co-operation between businesses, activity and event organisers, and governing bodies to promote best practise and where appropriate develop codes of conduct ensuring the area's sense of place, history and tranquillity is maintained.</p> <p>Support and promote initiatives that provide imaginative interpretation of the landscape, including its industrial archaeology, historic environment, geodiversity and biodiversity.</p> <p>Support and promote initiatives that through education and awareness enable more people to understand, access, enjoy and respect Dartmoor's natural environment.</p>	<p>Recreation</p> <p>Sense of place/ inspiration</p> <p>Biodiversity</p> <p>Geodiversity</p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Recreation cont.		<p>... continued from previous page</p> <p>The granite tors provide focal points for informal recreation and some provide graded climbs.</p> <p>The area's rich historic environment, industrial landscape and internationally important biodiversity offer numerous opportunities for education and quiet enjoyment.</p>		Education and awareness is also important to ensure people understand the consequences of their activities – the impact of dropped litter, removal of stones from walls or disruption of historic sites.		
Biodiversity	<p>Special Areas of Conservation</p> <p>Sites of Special Scientific Interest</p> <p>National Nature Reserves</p> <p>Semi-natural habitats</p>	<p>Priority habitats cover large areas of this NCA. Blanket bog covers 18 per cent, upland heath 13 per cent and broadleaved woodland (broad habitat) 6 per cent. There are also relatively significant areas of species-rich neutral grassland and Rhôs pasture in valley bottoms.</p> <p>The area supports pland birds, including the red-backed shrike and ring ouzel, at the extreme southern edge of their range in Europe. The Red-backed shrike returned to Dartmoor in 2010 having been lost since 1970. It is Red-listed as a Bird of top Conservation Concern.</p> <p>Continued on next page...</p>	International	The heathland commons are susceptible to management changes and pressures. Some have seen a decline in grazing levels resulting in a spread of bracken, scrub and secondary woodland. Other commons have more intensive grazing and recreational pressure, producing close-grazed grassy 'lawns' in place of heathland habitats. The blanket bogs in the central moorland have been degraded through past inappropriate burning, wildfire events, overgrazing and drainage. Climate change may result in less predictable rainfall and drier summers, resulting in the drying out of the blanket bogs.	<p>Work with farmers and local communities to ensure the necessary skills and knowledge are maintained, shared and enhanced to secure a future for Dartmoor hill farming and the habitats they manage and protect.</p> <p>Restore the hydrological function of blanket bog through a re-wetting programme.</p> <p>Encourage the use of hardy breeds to appropriately graze the moors.</p>	<p>Biodiversity</p> <p>Regulating water flow</p> <p>Regulating water quality</p> <p>Regulating soil erosion</p> <p>Climate regulation</p> <p>Sense of place/ inspiration</p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biodiversity cont.		<p>... continued from previous page</p> <p>Many other priority species are present, such as the bog hoverfly, marsh fritillary and Deptford pink.</p>		<p>Changes in land ownership not only result in a loss of traditional skills and knowledge essential for managing the nationally and internationally important habitats, but have led to a loss of rough pasture land on the edge of the moor traditionally used for in-bye grazing and valuable for habitat connectivity. Hedgerows and rivers are similarly important for connectivity, linking the central moorland area with the surrounding pastoral landscape and beyond.</p> <p>Important areas of Rhôs pasture are under threat due to lack of appropriate grazing by livestock (cattle and ponies). Without appropriate management priority species such as the bog hoverfly and marsh fritillary may be lost. Similar problems apply to the management of ancient hay meadows and species-rich neutral grassland. Dartmoor's neutral grasslands include three variants of the crested dog's-tail and notable species such as moonwort, and Deptford pink, a priority species.</p> <p>Dartmoor supports the largest concentration of upland sessile oak woodland in southern England. Together, the ancient and semi-natural ancient woodland support many important plants and species; wild daffodil, the blue ground beetle and dormouse.</p>	<p>Promote and support sympathetic management of Dartmoor's blanket bogs and upland heath by working jointly with landowners, commoners and relevant organisations and initiatives.</p> <p>Encourage and support the maintenance of and an increase in semi-natural woodland (broadleaved) through natural regeneration along river valleys.</p> <p>Promote management at a landscape scale, encouraging a diversity of species and habitat connectivity.</p> <p>Support the restoration and improvement of plantations on ancient woodland sites for the benefit of biodiversity and a range of ecosystem services.</p>	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Geodiversity	<p>Granite</p> <p>Minerals – including tin, copper, lead, silver and arsenic</p> <p>China clay</p> <p>Tungsten</p>	<p>14 geological Sites of Special Scientific Interest.</p> <p>Seven mixed interest Sites of Special Scientific Interest.</p> <p>Within the UK, resources of china clay are limited to Cornwall and the Lee Moor area near Plymouth. The Lee Moor complex contains three separate sites – Headon, Shaugh and Lee Moor (with Devon accounting for around 12 per cent of UK production).</p> <p>The extraction of china clay is carried out by deep open pit working, and the subsequent on-site processing produces waste sand, which is taken to tip, and mica, which is deposited in lagoons. Large amounts of waste material are generated by the extraction and, despite increasing efforts to process suitable elements for use as secondary aggregates, there are limits to the range and proportion of these materials that can be re-processed, meaning tipping areas continue to be required. The current planning permission will not expire until beyond the 2031 time horizon of the Minerals Core Strategy.</p> <p>Continued on next page...</p>	International	<p>Dartmoor granite has shaped the historic landscape locally for several thousand years. Granite structures such as burial chambers are believed to date back to the early Neolithic (4,000–2,000 BC).</p> <p>Granite is so tough that it was difficult to work before iron tools were available, but it can be seen throughout the high moorland as loose, partly shaped, stone blocks known as ‘moorstone’, some with clear evidence of attempts at splitting and shaping the stone by means of ‘feather and tare’. This was the start of using the granite as a shaped building stone for widespread use, especially for houses, but also everyday rural items such as gateposts, drinking troughs and headstones.</p> <p>Granite from the Haytor quarries was used, in part, to construct the former London Bridge and much of the rest of the stone appears to have come from Dartmoor quarries near Princetown.</p>	<p>Support and promote initiatives that provide imaginative interpretation of the landscape, including its industrial archaeology, historic environment, geodiversity and biodiversity.</p> <p>Protect geological features, both natural and from past workings such as old quarry sites and mines, and improve access to these areas where possible, for research, enjoyment and education.</p> <p>Maintain walls and vernacular buildings using local stone wherever possible, to reinforce links with underlying geology.</p> <p>Support opportunities for large-scale restoration of commercial mines, including the creation of key green infrastructure links between urban areas and open spaces.</p>	<p>Geodiversity</p> <p>Sence of place / inspiration</p> <p>Recreation</p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Geodiversity cont.		<p>... continued from previous page</p> <p>Also found in the Lee Moor area is a rare metal resource, tungsten, which has recently been defined as a 'critical mineral' by the European Union. The current planning permission for extraction of tungsten by open-caste mining at Hemerdon expires in 2021 which is insufficient time to allow complete extraction of the known resource. This process will produce a large amount of waste, and the permission allows for finer material to be deposited in lagoons, with the coarser material tipped outside the NCA.</p>		<p>Quarrying of Dartmoor granite was then an important source of employment but this progressively reduced in the 20th century and now it is insignificant. Sources of Dartmoor granite for building restoration are now scarce as there are no working granite quarries.</p> <p>The metal mines of tin, copper and lead are also now closed. These were another mainstay of the Dartmoor economy. However, at Hemerdon on the south-western edge of Dartmoor a large scale tungsten-tin mine is due to open.</p> <p>The china clay works, also in the south-western part of the NCA, continue to be important in the local economy and in both national and international markets. China clays supply the paper, ceramics, plastics and numerous other industries that are now essential parts of our modern society.</p>		

Photo credits

Front cover: West Mill and Yes Tor from Moor Brook. Granite tors form silhouettes on otherwise smooth, uninterrupted skylines.

© Cathy Fitzroy

Pages 4, 6, 9, 13, 37: © Cathy Fitzroy

Pages 5, 8, 11, 12: © Dartmoor National Park



Natural England is here to secure a healthy natural environment for people to enjoy, where wildlife is protected and England's traditional landscapes are safeguarded for future generations.

Catalogue Code: NE519 ISBN 978-1-78367-079-6

Should an alternative format of this publication be required, please contact our enquiries line for more information: 0845 600 3078 or email enquiries@naturalengland.org.uk

www.naturalengland.org.uk

This note/report/publication is published by Natural England under the Open Government Licence - OGLv2.0 for public sector information. You are encouraged to use, and reuse, information subject to certain conditions.

For details of the licence visit www.naturalengland.org.uk/copyright

Natural England images are only available for non commercial purposes. If any other information such as maps or data cannot be used commercially this will be made clear within the note/report/publication.

© Natural England 2014