National Character Area profile:

8. Cumbria High Fells

Supporting documents

NATURAL ENGLAND

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Introduction

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

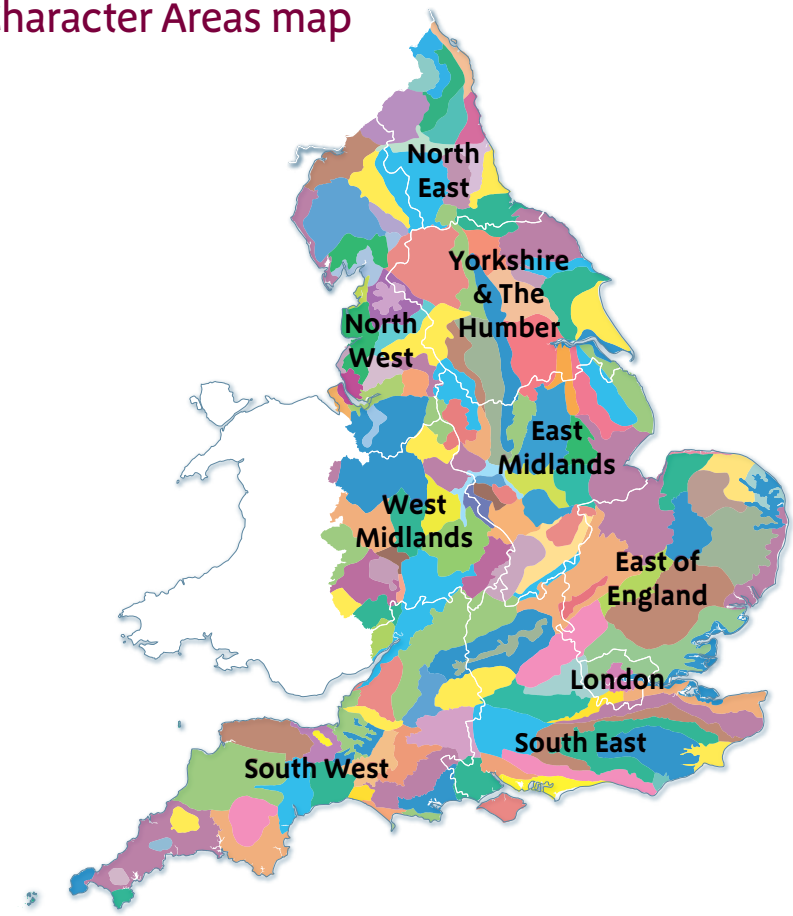
NCA profiles are guidance documents which can help communities to inform their decision-making about the places that they live in and care for. The information they contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and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

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

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

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

National Character Areas map



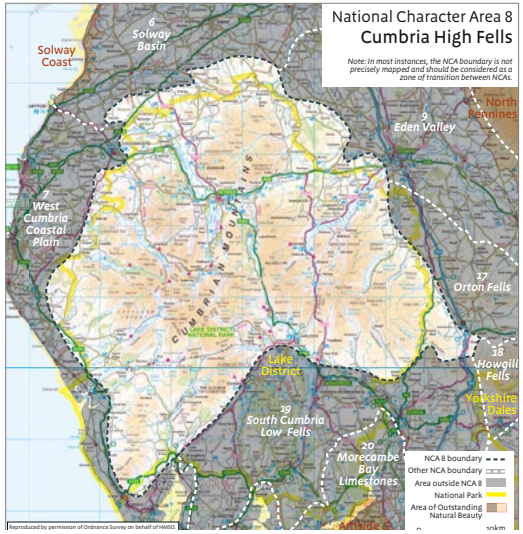
[1] The Natural Choice: Securing the Value of Nature, Defra (2011; URL: **www.official-documents.gov.uk/document/cm80/8082/8082.pdf**)
[2] Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services, Defra (2011; URL: **www.defra.gov.uk/publications/files/pb13583-biodiversity-strategy-2020-111111.pdf**)
[3] European Landscape Convention, Council of Europe (2000; **URL: http://conventions.coe.int/Treaty/en/Treaties/Html/176.htm**)

Summary

The Cumbria High Fells covers the north and central Lake District and is largely within the Lake District National Park. It is a dramatic upland landscape, carved by past glaciations, with rugged peaks, ridges and open fells, separated by U-shaped valleys with a radiating pattern of lakes and rivers. The complex geology of the area has resulted in the smooth sided fells of the Skiddaw Group rocks, the rugged Borrowdale Volcanic Group fells and granite of the central area, with slates, mudstones and limestones forming the surrounding lower fells and foothills. The area is of national importance for its extensive mineralisation and the resultant mining heritage, dating back to the medieval period. Keswick and Ambleside are the main settlements with villages, hamlets and farmsteads along the valleys.

This working, pastoral landscape, with its network of drystone walls, has developed from a hill farming heritage dating from medieval times, with common grazing on the open fells (the largest area of common land in England), small enclosed valley fields and rougher intakes/allotments on valley sides. Cumbria High Fells contains the most biologically diverse range of upland habitats in England, with internationally important fell habitats, Arctic Alpine plants, lakes, rivers, woodlands and a few species-rich meadows/pastures. Native broadleaf woodland and conifer plantations are extensive on the valley sides and bottoms, while the fells support scattered trees and scrub, plus a few small, high level and gill woodlands. Woodlands and peatlands, including blanket bog, are important carbon stores, requiring appropriate management to prevent carbon loss to the atmosphere and through water run-off.

The reservoirs and lakes are important sources of water for north-west England, including Greater Manchester; water quality is of importance for both public and private water supplies, as well as for wildlife and water-based recreation. The general wealth of recreational opportunities, natural beauty, wide open fells, lakes, woods, cultural heritage, traditional hill farming and historic environment make this a popular tourist destination. This dramatic landscape has inspired many since the Romantic period, from Wordsworth, Ruskin and Beatrix Potter to the present day. Despite high visitor numbers, a sense of remoteness is retained in many areas, particularly on the open fells, with large areas of relative tranquillity.



Click map to enlarge; click again to reduce.

Current and future challenges for the area include management of flooding, increasing pressure on water resources, improvement of water quality, achieving long-term improvements in habitat condition and connectivity, managing visitor/ transport pressures, increasing carbon stores in soil/vegetation and strengthening landscape resilience and adaptation to climate change. A key challenge is supporting sustainable and resilient hill farming systems and businesses, which provide food, as well as a host of other public benefits, and maintain traditional skills amongst the next generation. Working with farmers and land managers is essential to deliver multiple public benefits, which also help underpin sustainable economic farm businesses.

Bassenthwaite Lake: the lakes are a key attraction for visitors and are of international importance for wildlife.

Statements of Environmental Opportunity

- **SEO1:** Manage and enhance the expansive areas of fell and fell edge, for their world renowned sense of place, the internationally important habitats and species they support, their historical and cultural heritage, and to protect soils, carbon stores and water resources.
- **SEO2:** Manage and enhance the valleys, to improve the habitat network of pastures, meadows, wetlands and woodlands, within a matrix of improved pasture, and to protect traditional buildings and field patterns of dry stone walls, hedges and boundary trees.
- **SEO3:** Manage and enhance the water catchments, rivers, lakes, tarns and reservoirs for nature conservation, public enjoyment, recreation, water supply and flood management.
- **SEO4:** Manage existing woodlands, restore and expand native woodlands, trees and shrubs, for their nationally and internationally important habitats and species, cultural and historical heritage, and to help deliver climate change adaptation and mitigation, protect soils, improve water quality and supply wood fuel and other wood products.
- **SEO5:** Improve opportunities for enjoyment and understanding of the landscape and promote local involvement in the planning and management of the Cumbria High Fells.

Description

Physical and functional links to other National Character Areas

The Cumbria High Fells are surrounded by the Solway Basin, West Cumbria Coastal Plain, Eden Valley, Orton Fells and Howgill Fells NCAs and are closely linked culturally to the South Cumbria Low Fells. Both are within the eroded dome of the Lake District fells. To the west of the Cumbria High Fells, a narrow coastal plain separates the mountains from the Irish Sea.

There are long-distance views outwards to south-west Scotland, the North Pennine and the Yorkshire Dales escarpments, Solway Estuary, Morecambe Bay and the Irish Sea, and to North Lancashire, including the Forest of Bowland. Conversely, the mountains form an impressive background in many views, as people look towards the High Fells.

The rivers and lakes drain through the radiating glacial valleys, ultimately to the Irish Sea. Topographical features combined with the high rainfall, spatey nature of the Lake District rivers and extreme weather events can present a significant flood risk locally and to downstream Carlisle, Penrith, Cockermouth and Workington. Thirlmere and Haweswater together constitute the largest source of drinking water in north-west England with water transported through large underground aqueducts.

The valleys also provide routes for roads linking to adjacent areas and towns. Rail routes are all peripheral and there are no stations within the NCA. The Lake District is a world-wide tourism destination, although the majority of visitors come from north-west and north-east England.

Upland farming has been developed in close historical association with the surrounding lowlands, with large tracts of common land used extensively for seasonal (summer) grazing. Hardy draft ewes are sold to other parts of the country to provide a hardy cross-bred sheep.

The uplands of the Lake District, though a distinct mountain range, form part of a large expanse of uplands across the north of England and southern Scotland which together support nationally and internationally important habitats and species.

Distinct areas

- Skiddaw Fells.
- Borrowdale, Scafell and central fells.
- Limestone foothills to the north and north-west.

Key characteristics

- Spectacular, formerly glaciated, mountain scenery of open fells and craggy peaks separated by U-shaped valleys with a radiating pattern of rivers and lakes.
- Varied landform arising from the smooth sided fells of Ordovician Skiddaw Group rocks (metamorphosed mudstones) in the north, the more rugged, sharp peaks of the Borrowdale Volcanic Group, accompanied by granite intrusions in the central area. Complex geology includes Eycott Volcanic Group low-lying scarps in the north, Silurian slates and fissile mudstones to the south east and a fringe of Carboniferous limestone foothills. Extensive mineralisation has supported a mining heritage dating from the medieval period.
- The most biologically diverse suite of upland habitats in England with internationally important fell habitats, rivers, lakes unimproved grasslands, and native woodland. The extensive mosaic of fell habitats includes montane and upland heath, blanket bog, scree and ledge communities, springs, flushes, tarns, valley mires, juniper scrub, remnant woodland and Arctic Alpine plant communities.
- Valleys with rivers, lakes and surrounding wetlands, with a scattering of hay meadows, purple moor-grass and other species rich grasslands, in a matrix of improved pastures.
- Native woodland, often extensive, on valley sides and bottoms, with some large conifer plantations, and scattered trees and scrub on the fells, with a few isolated woods, including in gills. Extensive woodlands in Borrowdale, Ullswater and other valleys, supporting the best oceanic western oak woods in England.
- Field pattern of pastoral hill-farming with small valley in-bye fields, rougher intakes/allotments on valley sides and common grazing on the open fells; separated by a network of dry stone walls, with some hedges and trees, including pollards.
- Rich historic environment including Neolithic stone circles, bronze-age clearance cairns, Roman forts, Norse place names and crosses and key elements of the farmed and industrial landscape dating from the medieval period.
- Cultural heritage linked to the picturesque and the Romantic Movement and significant in the foundation of the conservation movement, with houses, burial places and specific features that inspired ideas, art and poetry.
- Local stone-built farmsteads, hamlets and villages along the valleys, with the small markets towns of Keswick and Ambleside, which expanded from Victorian times with the growth of tourism.
- Tourism and recreation with large numbers of visitors attracted by the natural beauty of the area, its wildlife, cultural heritage and access opportunities for walking, climbing, water-based and other activities.
- Large areas of relative tranquillity.

Cumbria High Fells today

The area is characterised by a combination of rugged mountains, ridges and steep scarps, contrasting with the sheltered green valleys, containing lakes, rivers, woods and forests. The deep, U-shaped, glaciated valleys radiate from the central core of the area. The presence of scree slopes, rock basins, arêtes, gills, tarns, waterfalls and fast-flowing streams form distinctive elements in the landscape. This area includes England's highest mountain and deepest lake.

The geology provides a marked contrast between the smooth-sided mudstone and siltstone fells of the Skiddaw Group in the north and the sharp peaks of the Borrowdale Volcanic Group (volcanic deposits and lavas). A series of volcanic intrusions underlie the central area, seen at the surface in Eskdale, Shap, Ennerdale and parts of the Skiddaw massif. The Eycott Volcanic Group comprises volcanic sediments and lavas, seen at Eycott Hill as a series of low-lying craggy scarps. The surrounding foothills are composed of limestone and Silurian sediments. Extensive mineral veins are of national importance and have been mined and quarried for ores of copper, lead zinc and other metals since medieval times. Local rock type is seen in the vernacular architecture of farmsteads and walls with slate, granite, sandstone, mudstone and limestone all being used within this NCA, according to the bed rock.

Past glaciations carved corries and U-shaped valleys, radiating outwards from the centre of the area, in a pattern followed by today's tarns, rivers and lakes. The settlements and road network, connecting dispersed farmsteads and small villages, also occupy the radiating valleys.

Farming and human settlement of the area date back to the prehistoric period; evident in the Neolithic stone circles of Castle Rigg and Swinside, bronze-age clearance cairns and Norse place names, as well as Roman forts, settlements and roads, such as High Street. Today, farming is mainly of hill sheep and some cattle, with hardy breeds such Herdwick, Swaledale and Kendal Rough Fell contributing to the genetic and rare-breed diversity of livestock nationally. This area is the stronghold for the iconic Lakeland Herdwick sheep. Fell grazing, on the largest area of common land in England, is an integral part of the farm. Open access on the fells has allowed areas to retain a sense of tranquillity and remoteness, despite the popularity of the main peaks.

The dry stone wall network, of small valley bottom in-bye fields, larger intakes on the slopes and unenclosed rough grazing on the fells, reflects the development

Slate quarry at Tilberthwaite. Local stone is used for traditional buildings.

of this farming system since medieval times. Some hedges and pollard trees occur in the valleys, where in-bye is mainly improved grassland with a few, internationally important, hay meadows and purple moor-grass pastures. Valley and village agricultural shows remain a popular event in the farming year.

The wild, exposed and open high fells have extensive areas of semi-natural habitats, including internationally important upland heathland, blanket bog, tarns, oak woodland and juniper scrub, with montane grassland and heath on some summits and tall herb vegetation, in refuges from grazing, on rock outcrops, screes and gills. These form an intricate mosaic of habitats along with valley mires, flushes, springs, bracken beds and species poor acid grassland. There is a great diversity of montane and sub-montane habitats and the area is renowned for its arctic alpine plants.

As well as being a key attraction for recreational visitors, the lakes, rivers and tarns comprise the most extensive, biologically diverse range of water bodies in England. Lakes occupy the valleys, where the glaciers gouged deepest and vary in character according to their size, depth, altitude, hydrology and geology. Amongst these, Wast Water, Crummock Water, Buttermere, Derwent Water, Bassenthwaite, Ullswater and numerous small tarns are of international biological importance, as water bodies with low to medium nutrient status. In places, stands of fen, swamp and wet woodland edge the lakes. The reservoirs of Thirlmere and Haweswater, as well as a number of lakes, are an important source of water for the North West.

The rivers start as steep, fast-flowing becks with braided channels and meandering occurring within the less managed sections. Through the in-bye fields, rivers have often been straightened and embanked, separating them from the flood-plain. Parts of the rivers Derwent, Eden, Kent and Ehen systems are of international importance for their habitats and associated species including salmon, otter, river lamprey, brook lamprey and sea lamprey, white-clawed crayfish and freshwater pearl mussel.

Extensive areas of ancient semi-natural, broadleaf, mixed and conifer woodlands are found on the valley slopes and bottoms. Woodlands in Borrowdale and around Ullswater are of international importance for the largest area of bryophyte and lichen-rich western old sessile oak woods in England. The highest peaks are above the natural tree-line and fell woodland is limited to scattered trees, small isolated woods and juniper scrub. Wood pasture, parkland, pollards and old coppice woodland also form part of the rich cultural heritage. Conifer plantations provide timber and wood pulp as well as recreation, with Whinlatter Forest providing a range of facilities and acting as a key natural tourism resource.

This is a major tourism destination with visitors attracted by the upland landscape, semi-natural habitats, relative tranquillity, cultural and historic heritage and a wealth of different recreation opportunities. The small market towns of Ambleside and Keswick expanded in the 19th century with the development of tourism.

The Lake District is nominated as a prospective World Heritage Site for the inspiration its natural environment and traditional farming have provided, particularly for writers and artists. This rich cultural heritage includes the influential Romantic Movement, with the poetry and ideas of William and Dorothy Wordsworth, Coleridge, Southey and De Quincey. This led to visits by painters such as Turner, Beaumont, Constable and Gainsborough. John Ruskin and Beatrix Potter were particularly influential in the formation of the conservation movement in England, initiated by the campaign against Thirlmere Reservoir. The numerous National Trust properties in the area are the lasting legacy of this campaign.

The landscape through time

Two broad groups of rocks influence the scenery of the core of the Cumbria High Fells. Skiddaw Group comprises the oldest rocks in the Lake District. These are a succession of mudstones, siltstones and greywackes of Ordovician age, all of which have been altered or metamorphosed. Skiddaw Group scenery is characterised by steep, rather smooth-sided mountains.

The central part of the Lake District, between Keswick and Ambleside, includes the Scafell, Langdale Pikes, Borrowdale, Helvellyn and High Street Ranges, reflecting the outcrop of the Borrowdale Volcanic Group of rocks. The scenery is spectacular, with many rugged and precipitous crags. Several of the volcanic sediments have been metamorphosed, forming rocks such as 'Lakeland Green Slate', used in local building and still actively quarried at Kirkstone, Honister and Coniston. The granite intrusions of Eskdale and Ennerdale, as well as the Carboniferous Limestone foothills, have also been historically quarried for local building stone. Large active quarries are found on the limestone.

The Skiddaw and Borrowdale Volcanic Groups are important for mineral veins of copper, lead, zinc and a variety of other metals ores as well as the graphite deposit at Seathwaite in Borrowdale. Large scale mining and quarrying took place from the medieval period. There was a marked increase in 16th century with the establishment of the Mines Royal Company and large copper mine and spoil heap complexes near Coniston and Caldbeck. Iron manufacture also expanded at this time with water-powered bloomeries and an associated increase in coppice woodland for charcoal.

The area's valleys were scoured by glaciers to produce the well known 'U'-shaped cross sections, numerous hanging valleys and higher corries. Glaciers also carved the smooth, rounded 'roche moutonnees' outcrops and rock basins now occupied by some of the lakes. Deposition of glacial debris, as till or moraines, has created natural dams behind which lakes and tarns have formed in places. Since the retreat of the glaciers, silting of lakes has produced some alluvial flats and scree has accumulated for example at Wasdale.

The area has been settled and farmed from the prehistoric period. Woodland clearance was very small scale and patchy until the late Bronze Age, when a warming in climate was followed by an increase in clearance of woodland and stone, for farm land, with large clearance cairns and basic stone walls. Although present settlement is concentrated in the valley bottoms, there are extensive bronze-age and Roman settlement remains on the fell edge.

Roman military sites extended across the Lake District, including roads and forts such as the one at Hardknott Pass. The Roman occupation saw a period of greater woodland clearance but it was then followed by subsequent woodland regeneration before another phase of clearance during the late 6th and early 7th centuries. Primary upland clearance reached its peak by the 10th century, shown in Norse place names such as "Thwaite" (clearing) and "Scales" ("shieling" or transhumant summer settlement).

From 1100 the Lake District was owned by Baronial estates on the edge of the area and used as hunting forest for example Skiddaw. By the 13th century this had been replaced by stock grazing and an increase in population lead to peasants' shielings and farms, developing the dispersed settlement pattern along the valleys. Monasteries at Furness, Calder, Shap and beyond, owned farms, fisheries, grazing and wood rights as well as "vaccaries" (dairies) at valley heads.

By the late 13th century a farming system had developed of common grazing

on the fells and communally strip farmed in-bye in the valleys, separated by a ring garth wall. Pigs were grazed in oak woods for example at Swinside and Grisedale, causing a deterioration in woodland by the early 14th century. After 1450, sheep replaced cattle as the main livestock with intakes successively enclosed above the ring garth, particularly in the 18th and 19th centuries.

During a period of prosperity between 1660 and 1740, many farms and farm buildings, including two-storey combination barns and cow houses, were rebuilt in stone. The 18th-century Picturesque movement resulted in villas, ornamental plantings and designed landscapes and with the following influential Romantic period, the area developed as a tourist destination. The construction of the railways in the 19th century led to the expansion of the tourism industry and towns of Keswick and Ambleside. The availability of public and private transport has continued to influence an increase in visitor numbers.

The construction of Thirlmere and other reservoirs had a profound effect on the Cumbria High Fells, contributing to the birth of the National Trust and the modern day conservation movement. The lakes and rivers have also changed over time with woodland clearance, mines, quarrying, changing farming practices, increasing visitor numbers and flood defences impacting on water quality, flow, sediment regimes, physical form, habitats and wildlife of water bodies. The importance of limited in-bye land in valley bottoms has resulted in rivers being straightened, embanked and moved over centuries to maximise farm land. More extreme weather events have resulted in an increase in the frequency of flooding, with the major flood events of 2005 and 2009 causing significant damage to homes and farmland, both within the NCA and downstream of the area.

The high national demand for timber in the first half of the 20th century resulted in large areas (4 per cent of the area) being planted with conifers.

The grazing of sheep and cattle on common land and in-bye, and the co-operation within communities to do this across unenclosed fells, has evolved to create a distinctive and important local land management and cultural system that continues to evolve today. Intensification of farming techniques and reduction of the labour force occurred after the Second World War. This has resulted in an increase in farm size, less small farms and a decrease in active graziers on commons. A decline in arable and the use of bracken for bedding was accompanied by drainage of wetlands, improvement of pastures and replacement of hay by silage, with a loss of species-rich meadows and pastures. Cattle numbers declined slightly and a substantial increase in sheep numbers occurred; across Cumbria sheep numbers more than doubled during the 20th century. Fell habitats have been extensively affected by this grazing pressure, although sustainable grazing regimes are allowing localised recovery of habitats such as upland heath. This contributes to the understanding of both sustainable grazing regimes and recovery rates of upland habitats. Habitats, such as montane heath and blanket bog, are particularly sensitive to grazing.

Sheep numbers have decreased since the 1990s with the introduction of agri-environment schemes and reform of the Common Agricultural Policy, which linked payment to environmental enhancement; between 2000 and 2009 sheep numbers went down by 25 per cent. A less positive reason for the reduction in sheep numbers was the major foot and mouth disease outbreak, which badly affected this part of the UK in 2001. Direct impacts and the controls introduced to prevent further spread of the disease, had a devastating effect upon Lakeland farming and tourism industries.

Ecosystem services

The Cumbria High Fells 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 (under the constituent headings). Further information on ecosystem services provided in the Cumbria High Fells NCA is contained in the 'Analysis' section of this document.

Provisioning services (food, fibre and water supply)

- **Food provision**: The NCA is a significant producer of lamb and to a lesser extent, beef and dairy products. Local high quality produce, such as fell-bred meat, contributes to the tourist industry. Traditional breeds of hardy fell sheep, including Swaledales, provide breeding ewes to produce a hardy cross-bred sheep.

- **Timber provision:** 8 per cent of the area is woodland and almost half of this is coniferous plantation, in both public and private ownership. In addition to timber and pulp from commercially managed conifers, there is also potential for hard wood from broad leaves and an expanding market for wood fuel.

- **Water availability**: Thirlmere and Haweswater reservoirs, along with water abstracted from other lakes and rivers, provide water to over 6.5 million people across north-west England. High rainfall in these upland catchments supports these significant water abstractions. As surface water is abstracted, lakes and rivers respond rapidly to both drought conditions and recharge.

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

- **Climate regulation:** The Lake District peat bogs, mires and peaty soils store an estimated 28.5 million tonnes of carbon. The prime soil stores are the blanket bogs (36,000 ha) which offer significant opportunities to regulate climate change where the habitat is in good condition and not adversely impacted by grazing management. Degraded peat bogs release stored carbon to the atmosphere and through water run-off, affecting down-stream water quality. Carbon storage and sequestration is also provided by the 17,000 ha of woodland in the NCA.

St John's in the Vale. Traditional barn and in bye grassland, enclosed by dry stone walls, with wooded valley side behind.

- **Regulating soil erosion:** The steep topography, high rainfall and in places thin vegetation cover give this area a high risk of soil erosion. This can be exacerbated, particularly on the fells and river banks, by visitor and grazing pressure.

- **Regulating water quality:** The majority of the lakes and several stretches of river are failing to meet Water Framework Directive targets due to nutrient enrichment and, in some cases, high sediment loads. There are opportunities to enhance water quality through addressing soil erosion, particularly on peat soils, creating new woodland, managing nutrients on improved grassland and in farmsteads, as well as through improvements to point source discharges.

Hardy traditional breeds, such as the iconic Herdwick sheep, can survive harsh fell conditions.

- **Regulating water flow:** With high rainfall and rapid run-off rates there is a high risk of flooding to settlements both within and downstream of the area. There is scope to contribute to reductions in flood risk through re-connection of rivers and flood-plains, and land management which increases vegetation cover through increasing surface roughness, water infiltration and retention, including targeted woodland creation.

Cultural services (inspiration, education and wellbeing)

- **Sense of place/Inspiration**: The geology, mountain scenery, extensive wild open fells, lakes, rivers, woodlands, and cultural heritage of traditional hill farming, archaeological sites and historic built environment, as well as the ever changing weather and sense of remoteness, provide a strong, revitalising and inspirational sense of place. The rugged scenery of mountains, lakes and valleys with its large areas of semi-natural habitat has inspired art, writing, ideas, spirituality and a sense of adventure since at least the 18th century. Prominent artists, writers and thinkers inspired by this landscape include Wordsworth, Ruskin, Turner, Constable and Beatrix Potter through to Heaton Copper and Melvyn Bragg today. As well as individual inspiration this area has been influential in the birth and development of the Picturesque, Romantic and conservation movements as well as British rock climbing.

- **Sense of history**: A strong sense of history is associated with this area linked to the land forms carved by past glaciers as well as the evidence of past settlement, farming and mining industry dating back to the Neolithic. The strong sense of cultural history is revealed in the works of art and writing, and the places that have inspired them, over the past 400 years.

- **Tranquillity**: With its large area of open fells, few settlements and roads restricted to the valley bottoms, this NCA is important for the tranquillity it provides. 90 per cent of the area was recorded as undisturbed by CPRE in 2007, in terms of noise and visual intrusion.

- **Recreation**: This area is nationally renowned for its outdoor recreation including walking, fell running, climbing, cycling, sailing and canoeing. Over half of the area is open access land and there is an extensive network of rights of way as well as boating opportunities on Derwent Water, Ullswater and Bassenthwaite. The Lake District National Park receives 12 million visitors annually of which a substantial proportion will be to the NCA. The wealth of guide books to the Lake District, include the historic guides of Wordsworth and Father Thomas West as well as Alfred Wainwright's walking guides. Numerous recreational events and routes include the Fred Whitton cycling sportive and Bob Graham Round fell run

- **Biodiversity:** This is the most biologically diverse upland area in England for its habitats and species. 16 per cent of the area is of international importance for its habitats and associated species, including lakes, tarns, rivers, woodland, hay meadows, purple moor grass pasture and the diverse mosaic of vegetation communities on the fells.

- **Geodiversity:** This NCA has 48 sites of national importance for geodiversity. These consist of natural outcrops and river sections as well as man-made exposures. It is of particular importance for mineralisation, including disused quarries and dumps associated with mineral workings and mines.

Walkers above Borrowdale: this area is nationally renowned for its outdoor recreation.

Statements of Environmental Opportunity

SEO 1: Manage and enhance the expansive areas of fell and fell edge, for their world renowned sense of place, the internationally important habitats and species they support, their historical and cultural heritage, and to protect soils, carbon stores and water resources.

For example, by:

- Promoting sustainable and resilient pastoral upland farming systems and businesses that provide multiple benefits (including food, clean water, carbon storage, biodiversity and access) and strengthen landscape resilience to climate change.
- Encouraging and promoting sustainable commons management, through a whole fell approach, with active collaboration of all common owners and rights holders to deliver multiple benefits, including hefted flocks.
- Enhancing the full range of Lakeland fell habitats and species (heaths, blanket bog, grasslands, springs, flushes, valley mires, juniper and montane willow scrub, woodland, rock ledge and scree vegetation and suites of arctic alpine plants) through grazing regimes, that protect sensitive habitats and provide well vegetated swards to reduce rates of water run-off and prevent soil erosion.
- Increasing grazing diversity via mixed grazing systems, including cattle, where appropriate, to deliver a more varied sward and habitat mosaic, enhancing biodiversity and strengthening adaptation to climate change, while delivering sustainable sheep production.
- Restoring blanket bog and other wetlands to store and sequester carbon, through extensive grazing and re-wetting (including grip blocking) to enable resilience to climate change.
- Protecting the rich historical evidence of past settlement, farming and industry, including the Neolithic axe factory, standing stones and circles, clearance cairns, traditional farm buildings and the dry stone wall network of allotments and intakes.
- Restoring Schedules Monuments at risk, for example through managing vegetation and preventing erosion or vehicle damage.
- Promoting the restoration and management of paths on popular routes, to benefit users and avoid soil erosion.
- Protecting the tranquillity, remoteness, openness, night skies and views both inwards and outwards of the Cumbria High Fells.

Sorting sheep gathered from the fell: this NCA supports the largest area of common land in England.

SEO 2: Manage and enhance the valleys, to improve the habitat network of pastures, meadows, wetlands and woodlands, within a matrix of improved pasture, and to protect traditional buildings and field patterns of dry stone walls, hedges and boundary trees.

For example, by:

- Maintaining , restoring and expanding traditional species-rich meadows and pastures (including purple moor grass pasture and upland calcareous grassland) while seeking opportunities to create a connected habitat network, with wetlands and woodlands, linking to the fell edge; creating small-scale habitat corridors, buffers and stepping stones, within the matrix of improved grassland.
- Ensuring that habitat networks address the requirements of key species (such as marsh fritillary butterfly) and enable adaptation of habitats and species to climate change.
- Ensuring that habitat networks operate in conjunction with sustainable farm management.
- Managing, restoring and buffering wetland valley habitats, including lowland raised bogs and valley mires, through re-wetting and (where appropriate) extensive grazing regimes, increasing their resilience to climate change and ability to store carbon.
- Promoting the conservation of archaeological sites, historic and designed landscapes, industrial archaeology and places associated with the Romantic Movement.
- Restoring Schedules Monuments at risk, for example through managing vegetation and preventing erosion or vehicle damage.
- Recognising the housing needs of local communities, while protecting the natural and cultural attributes, including settlement pattern.
- Ensuring that new development is compatible with local landscape character.
- Promoting the maintenance and restoration of traditional farm buildings, farm houses and listed buildings, where appropriate using local stone and vernacular building styles.
- Maintaining the field pattern of in bye land with its network of dry stone walls, hedges and trees, including pollards, retaining local differences in style of boundary features.

Network of inbye fields. Traditional species-rich pastures and meadows are now rare.

SEO 3: Manage and enhance the water catchments, rivers, lakes, tarns and reservoirs for nature conservation, public enjoyment, recreation, water supply and flood management.

For example, by:

- Promoting a whole catchment approach, involving local communities and visitors, to enhance the area's lakes, rivers and tarns and strengthen their resilience to climate change.
- Supporting improvements to public and private sewage treatment, to reduce nutrient inputs to freshwater.
- Promoting phosphorus-free management practices with tourism businesses.
- Promoting the management of nutrients inputs to farmland, targeting applications to maximise uptake and minimise run-off.
- Managing fells, river banks, floodplains and wetlands for a robust vegetation cover, that reduces soil erosion and water run-off, through appropriate grazing regimes.
- Encouraging woodland creation on areas at risk of soil and coarse sediment erosion, or of benefit to downstream flood amelioration, for example gills, steep slopes, river corridors and flood plains.
- Restoring blanket bog and other wetlands through extensive grazing and re-wetting (including grip blocking) to ensure resilience to climate change.
- Seeking opportunities for sustainable river management that works with natural processes and allows space for rivers within connected flood-plains; to increase resilience to extreme weather events, while enhancing water quality (particularly sediment loads), biodiversity, recreation and downstream flood risk.
- Enhancing, restoring and expanding aquatic and wetland habitats, including fens, swamps and lake shore transitional habitats, ensuring that their natural variety and range are maintained.
- Supporting the management of recreation on lakes, enabling quiet enjoyment, while protecting existing undisturbed areas for wildlife.
- Restoring populations of vulnerable freshwater key species, such as species of whitefish including vendace.
- Managing freshwater invasive non-native fauna and flora, using a systematic approach, starting at the top of catchments.
- Promoting sustainable water use and conservation and the benefits this can provide to the Lake District's lakes and rivers.
- Supporting management of water-use, abstraction and demand, to minimise impacts and increase the resilience of the nationally and internationally important lakes and river systems.
- Ensuring that future development and land use planning is sustainable in terms of impacts on water quality, water resources, flood risk, fragmentation or loss of the extent of rivers, lakes and other wetland habitats.

SEO 4: Manage existing woodlands, restore and expand native woodlands, trees and shrubs, for their nationally and internationally important habitats and species, cultural and historical heritage, and to help deliver climate change mitigation and adaptation, protect soils, improve water quality and supply wood fuel and other wood products.

For example, by:

- Maintaining, restoring and enhancing existing native woodlands through sustainable management (ranging from non-intervention to coppice rotation), while ensuring sufficient retention of dead wood for wildlife.
- Encouraging a rural economy based on woodland products, including supporting farmers in developing skills to actively manage their woodlands as part of their farm business.
- Expanding and linking existing woodland with areas of new native woodlands, wood pastures and shrubs such as juniper and montane willow, in appropriate locations: including following gills and slopes up the fells, on past woodland sites, such as bracken beds, and as part of wetland mosaics on the valley floor.
- Ensuring regeneration in existing native woodland, where necessary, through exclusion of livestock and deer management.
- Restoring native woodland on existing planted ancient woodland sites, and increasing the native broadleaf component of coniferous woodlands.
- Protecting and strengthening the valley landscapes of enclosed pastures and meadows with woodlands, wood pasture, parkland, field trees, hedgerows and scattered scrub, while conserving ancient trees.
- Protecting the historical heritage of woodlands (including charcoal pits, bloomeries, parkland and ancient coppice) and promoting traditional management practices such as coppicing, hedge laying and pollarding.
- Developing local renewable energy generation using wood fuel from locally managed woodlands and by-products from timber production.
- Developing the provision of local wood-based products.

Vegetated lake shore, part of a transition from lake to woodland, Bassenthwaite.

SEO 5: Improve opportunities for enjoyment and understanding of the landscape and promote local involvement in the planning and management of the Cumbria High Fells.

For example, by:

- Raising awareness of, and getting communities involved in, the planning and management of the Cumbria High Fells, linking the environment to local social and business interest and aspirations.
- Increasing the public and professionals' awareness of the role of the area's farmers in sustainably managing internationally important habitats that can provide food, clean water, protect soils, store carbon and provide access for recreation.
- Encouraging the rural economy, through supporting farmers to develop skills to add value to primary produce (including local high quality food) and diversify their business.
- Increasing educational opportunities for visitors and local businesses, which lead to their support of the natural environment.
- Promoting sustainable tourism practices that integrate the management of visitors with the enhancement of the natural and cultural attributes.
- Managing, improving and promoting access and recreational opportunities to land and water, ensuring that the special qualities of the area are maintained.
- Encouraging the delivery of a sustainable transport network with quality services, improved public transport, car parking and integration of services and transport modes.
- Promoting the management of development pressure and access to protect the sense of remoteness and tranquillity.
- Supporting local renewable energy provision, while protecting the natural and cultural attributes.

Small market towns of Keswick (shown) and Ambleside are the largest settlements.

Additional opportunity

1. Protect the strong relationship between landscape and geology and its associated historical mining heritage.

For example, by:

- Maintaining and improving access to important geological exposures, enabling the study of locally and nationally designated sites, while managing specimen collection, particularly at spoil heaps.
- Widening awareness of the value of geodiversity in the Cumbria High Fells.
- Using local stone for field boundaries and farmsteads to reveal the link to the geology.
- Promoting, protecting and managing the historical mining heritage and its link to the geology.
- Encouraging the management of abandoned mines to protect historical heritage and prevent downstream pollution.

Atlantic oak woodland on valley side above Ullswater. Woodlands store carbon, reduce soil erosion and can contribute to improvements in downstream water quality and flood risk.

Supporting document 1: Key facts and data

Total area: 199,007 ha.

1. Landscape and nature conservation designations

Approximately 88 per cent of the NCA (175,564 ha) is within the Lake District National Park.

Management plans for the protected landscape(s) can be found at:

- http://www.lakedistrict.gov.uk/

Please note: Part of this NCA is affected by an Order extending the Lake District National Park. This will not take effect unless confirmed by the Secretary of State. Please see www.naturalengland.org.uk/lakestodales for current status.

Source: Natural England (2011)

1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

Tier	Designation	Name	Area (ha)	Percentage of NCA
International	Ramsar	Duddon Estuary	4	<1
European	Special Protection Area (SPA)	Duddon Estuary SPA	4	<1
	Special Area of Conservation (SAC)	Lake District High Fells SAC; River Derwent & Bassenthwaite Lake SAC; River Eden SAC; Borrowdale Woodland Complex SAC; Naddle Forest SAC; Wast Water SAC, Ullswater Oakwoods SAC; North Pennine Dales Meadows SAC; Asby Complex River Kent SAC; Tarn Moss SAC; Clints Quarry SAC; River Ehen SAC; Drigg Coast SAC; Morecambe Bay SAC	31,287	16
National	National Nature Reserve (NNR)	Bassenthwaite Lake NNR, Tarn Moss NNR, Sandybeck Meadow NNR	576	<1
National	Site of Special Scientific Interest (SSSI)	A total of 110 sites wholly or partly within the NCA	35,835	18

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.

31,287 ha of the SSSI area are designated as being of international importance as SAC. The 4 ha of Duddon Estuary within the NCA are designated as SAC, SPA and a Ramsar site.

There are 671 Local sites in the Cumbria High Fells NCA covering 8,060 ha which is 4 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 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 'Designations/Land-Based Designations/Statutory'

1.1.1 Condition of designated sites

A breakdown of SSSI conditions as of March 2011 is as follows:

SSSI Condition category	Area (ha)	Percentage of SSSI in condition category
Unfavourable declining	1,253	4
Favourable	6,377	18
Unfavourable no change	2,566	7
Unfavourable recovering	25,487	71

Source: Natural England (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 just below sea level to a maximum of 978 m at the summit of Scafell Pike, the highest peak in England. The average elevation is 308 m above sea level.

Source: Natural England (2010)

2.2 Landform and process

The complex geology of the Cumbria High Fells and the South Cumbria Low Fells consists of an eroded dome of ancient rocks. Ordovician marine sediments, lavas and volcanic deposits have been uplifted and metamorphosed by large granite intrusions. More recent glaciation has carved U-shaped valleys, now with rivers and ribbon lakes, radiating out from the central dome of fells. Glaciation features include cirques, arêtes, tarns and scree slopes, with roche moutonnées and moraine deposits in the valleys.

Source : Cumbria High Fells Countryside Character Area Description, Cumbria Fells & Dales Natural Area Profile

2.3 Bedrock geology

The solid geology can be divided into the Skiddaw Group and Borrowdale Volcanic Group of the fells, with the low lying Eycott Volcanic Group and Carboniferous Limestone to the north and north-east.

The Skiddaw Group forms the smooth sided mountains of the north of the Lake District. These Ordovician age metamorphosed mudstones, siltstones and greywackes are of marine origin and the oldest rocks in the Lake District.

The rugged central fells area is comprised of a complex sequence of lavas and ash deposits of the Ordovician Borrowdale Volcanic Group. These are metamorphosed by a large granite intrusion that outcorps in Ennerdale, Eskdale, Shap and the Caldew Valley. The Eycott Volcanic Group, of a similar age, provides a narrow, less rugged and lower lying outcrop in the Caldbeck Fells, Eycott Hill and Binsey, to the north east of the Skiddaw Group rocks.

Rocks of the Skiddaw Group, Eycott Volcanic Group and Borrowdale Volcanic Group, host numerous mineral veins with ores of copper, lead, zinc and a variety of other metals, as well as the graphite deposit at Seathwaite in Borrowdale.

Carboniferous Limestone foothills, with karst features and limestone quarries, encircle the northern fells and extend into the adjacent Orton Fells NCA.

Source : Cumbria High Fells Countryside Character Area Description, Cumbria Fells & Dales Natural Area Profile

2.4 Superficial deposits

Superficial deposits, which cover about 59 per cent of the NCA, are generally present in valleys and lower slopes. They include boulder clay (till), glacial moraines, and fluvioglacial sand and gravel. Fluvial alluvium is associated with active rivers. Significant areas of peat are present in the blanket bogs of the fells as well as the raised bogs to the south-east and east of the NCA.

Source: British Geological Survey (2006)

2.5 Designated geological sites

Tier	Designation	Number
National	Geological Site of Special Scientific Interest (SSSI)	36
National	Mixed Interest SSSI	14
Local	Local Geological Sites	128

This NCA has a high number of SSSI designated for their geodiversity or for both geodiversity and biodiversity interest. These consist of natural outcrops and river sections as well as man-made exposures, including disused quarries and dumps associated with mineral workings and mines.

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

Typical brown podzol soils (intermediate between leached acid soils and more fertile brown earth soils) are widespread on lower slopes with extensive humic rankers (shallow peaty soils over non-calcareous bedrock) across higher slopes. Waterlogged raw oligo-fibrous peat soils (very acid soils where breakdown of organic material is limited) form blanket bog on some areas of high ground, particularly to the east of the area. Cambic stagnohumic gley soils (seasonally waterlogged soils with peaty topsoil lacking clay-enriched subsoil) are found locally in glacial valleys with narrow strips of typical alluvial gley soils (soils deposited by rivers with fluctuating water table) in some valleys.

Source: Natural England (2012)

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

Grade	Area (ha)	Percentage of NCA
Grade 1	0	0
Grade 2	16	<1
Grade 3	11,733	6
Grade 4	43,288	22
Grade 5	133,994	67
Non-agricultural	9,409	5
Urban	268	<1

Source: Natural England (2010)

The fells are Grade 5 agricultural land with Grade 4 restricted to the valley bottoms. The small amount of Grade 3 land is distributed on low lying flatter land around the periphery of the NCA.

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

3. Key water bodies and catchments

3.1 Major rivers/canals

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

Name	Length in NCA (km)
River Derwent (Derwent catchment)	30
River Caldew (Eden catchment)	24
River Duddon (South West Lakes catchment)	21
River Esk (South West Lakes catchment)	21
River Greta (Derwent catchment)	17
Borrow Beck (Lune catchment)	14
River Bleng (South West Lakes catchment)	13
River Sprint (Kent/Leven catchment)	13
River Calder (South West Lakes catchment)	12
River Lowther (Eden catchment)	11
River Cocker (Derwent catchment)	10
River Irt (South West Lakes catchment)	10
River Mite (South West Lakes catchment)	10
River Kent (Kent/Leven catchment)	10
River Brathay (Kent/Leven catchment)	10
Swindale Beck (Eden catchment)	9
River Ellen (Derwent catchment)	7
St John's Beck (Derwent catchment)	7
Birk Beck (Lune catchment)	7
River Eamont (Eden catchment)	6
River Ehen (South West Lakes catchment)	5
Whillan Beck (South West Lakes catchment)	5
River Lune (Lune catchment)	5
River Petteril (Eden catchment)	2

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.

The major lakes, set in valleys radiating from the central dome of the High Fells, are the dominant features in the landscape. Numerous smaller tarns occupy glacially carved corries on the fells. This area has the highest rainfall in England. This, combined with steep gradients, impermeable geology and waterlogged upland soils, results in large amounts of run-off. The Cumbria High Fells NCA contains 5 river/lake Special Areas of Conservation (River Derwent and Bassenthwaite Lake, River Eden, River Kent, River Ehen and Wast Water) as well as freshwater features within other SAC.

The Eden catchment includes the Ullswater Lake and Haweswater Reservoir. The upper catchment is dominated by the steep gradients of Skiddaw, Helvellyn and drains north to the Irish Sea via the Solway Estuary.

The River Derwent and its major tributaries rise in the high fells, draining into the Irish Sea at Workington: The Derwent Catchment includes Buttermere, Crummock Water, Loweswater, Derwent Water and Bassenthwaite Lake, as well as Thirlmere Reservoir. The South West Lakes catchment includes Ennerdale Water and Wast Water. From Workington to Barrow-in-Furness this catchment contains a number of small, rural 'flashy' sub-catchments which drain in a south westerly direction to the Irish Sea.

Kent/Leven catchment includes Elterwater, Rydal Water and Grasmere. The rivers Kent, Leven and Crake drain the southern fells of the Lake District, and drain south into Morecambe Bay via the Kent and Leven estuaries.

The River Lune drains only a small part of the south-east of the NCA area.

3.2 Water quality

The total area of Nitrate Vulnerable Zone is 3,460 ha, 4 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 http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e

River Esk.

4. Trees and woodlands

4.1 Total woodland cover

The NCA contains 18,024 ha of woodlands (over 2 ha), 9 per cent of the total NCA area, of which 5,313 ha is ancient woodland. 45 per cent of ancient woodland sites have had the semi-natural woodland replaced by plantations: Planted ancient woodland sites (PAWS). About half of the woodland is commercial coniferous plantation particularly in north-western valleys and the limestone foothills to the north.

Source: Natural England (2010)

4.2 Distribution and size of woodland and trees in the landscape

Woodland is found mainly on lower slopes and valley bottoms, with the higher fells relatively treeless. Remnant tree cover on the fells is found in a few isolated woodlands and gills, with scattered trees and juniper scrub replaced by dwarf willow at higher altitudes. Trees are found in discrete woodlands, plantations, groups and as scattered individuals, including pollards. Areas of wood pasture (grazed open woodland) include parkland, particularly around some of the lakes. Broadleaved woodlands are found particularly in Borrowdale, around Derwent Water, Ullswater and Haweswater and in the central Lake District around Ambleside and Grasmere and in the Duddon and Longsleddale valleys. Internationally important areas of juniper scrub are associated with the central Lake District, extending into the South Cumbria Low Fells NCA.

Source: Cumbria High Fells Countryside Character Area Description, Cumbria Fells & Dales Natural Area Profile, Natural England (2012)

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)	Percentage of NCA
Broadleaved	6,778	3
Coniferous	8,104	4
Mixed	822	<1
Other	2,320	<1

Source: Forestry Commission (2012)

Area and proportion of ancient woodland and planted ancient woodland sites (PAWS) within the NCA:

Woodland type	Area (ha)	Percentage of NCA
Ancient semi-natural woodland	2,904	1
Planted ancient woodland sites (PAWS)	2,408	1

Source: Natural England (2004)

5. Boundary features and patterns

5.1 Boundary features

In the valleys, drystone walls enclosing the fields and the farmsteads, create a unifying element in the landscape and can often be seen as strongly marked patterns on valley sides. Hedges and individual trees, including pollards, are also part of the network of boundary features, and can provide connectivity between stands of woodland.

Source: Cumbria High Fells Countryside Character Area description; Countryside Quality Counts (2003)

5.2 Field patterns

Patterns of rectilinear fields enclosed by dry stone walls. Small fields in the valley bottoms link through larger intakes and allotments to the open common land of the fells. Field patterns have developed and persisted since the early medieval period with a system of tenure of individually farmed in-bye fields in the valleys and extensive open common grazing on the fells. Above the fell wall the unenclosed rough grazing of the fells comprises the largest area of common land in England. The smaller inbye fields are predominantly agriculturally improved. The transition up the valley sides is marked by an increase in field size and decrease of agricultural improvement to the unimproved open fells.

Source: Cumbria High Fells 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

63 per cent of the holdings run grazing livestock. There is a long tradition of extensive hill sheep farming with common land grazing on the fells. In the lowland valleys and fringes there are some suckler herds, store cattle and dairying (the latter comprise 9 per cent of holdings). Most of the land (95 per cent) has Less Favoured Area status and only a very few areas are used for arable cropping.

Source: Agricultural Census, Defra (2010)

6.2 Farm size

The majority (79 per cent of the total) of the agricultural land in the NCA is in large holdings over 100 ha. Between 2000 and 2009 the number of larger holdings has increased slightly while the number of smaller farms, in particular those under 50 ha, has reduced. In some cases farms may have been amalgamated and farmhouses sold separately.

Source: Agricultural Census, Defra (2010)

6.3 Farm ownership

47 per cent of farms are tenanted, similar to the proportion in 2000.
2009: Total farm area = 111,771 ha; owned land = 57, 029 ha.
2000: Total farm area = 107,798 ha; owned land = 57,561 ha.
These figures do not include common land grazing on the fells which is an integral part of the farming system.

Source: Agricultural Census, Defra (2010)

6.4 Land use

Just over half of the Lake District National Park was registered as agricultural land in 2002. Over half (51 per cent) of the agricultural land within the NCA was in an agri-environment scheme in 2010. In addition to the common grazing on the fells, 96 per cent of the remaining farmland is grassland and uncropped land (including sole rights rough grazing) for sheep, beef and a small amount of dairy.

Source: Agricultural Census, Defra (2010)

6.5 Livestock numbers

Numbers of livestock remain relatively high, although they have decreased since 2000. In 2009 there were 57,900 cattle (68,400 in 2000) and 597,600 sheep (795,000 in 2000). However, the number of pigs has increased significantly to 7,600 from 2,300 in 2000. Cattle represent just under 10 per cent of livestock in the area.

Source: Agricultural Census, Defra (2010)

6.6 Farm labour

The majority of farm employment is as the "principal" farmer (1460 in 2009) with fewer farm managers (22), full-time (168), part-time (156) or casual workers (148). Farmers continue to work in other industries to provide supplementary sources of income. Between 2000 and 2009 the number of people working in agriculture has declined by 12 per cent.

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

Fells:
Fells with extensive internationally important semi-natural habitats, with good potential for ecological connectivity. Fell habitat mosaic of mainly upland heath, blanket bog and acid grassland with valley and basin mires, flushes and springs interspersed with bracken beds, scattered trees and a few small isolated woodlands.

Habitat condition is slowly recovering, although the most sensitive (montane and blanket bog) habitats remain susceptible to grazing pressure. Extensive areas of blanket bog on the Skiddaw, Shap and Armboth fells. Particularly important for montane plant communities, restricted in England to here and the North Pennines. Montane heaths and grasslands are found on the Skiddaw, Helvellyn, Scafell and Grassmoor massifs. Cliffs and rock outcrops are a refuge from grazing for arctic-alpine plants, providing the only English locality for oblong woodsia, alpine catchfly, glaucous meadow grass and the endemic Borrowdale Hawkweed. Fells support important but declining breeding populations of curlew, ring ouzel and merlin. Raven and peregrines nest on the crags while ospreys are found on Bassenthwaite Lake.

Woodlands:
An important NCA for native woodland, found mainly on lower valley sides and in sheltered gills, with valleys such as Borrowdale and Dunnerdale containing good woodland habitat networks. Historically the fells have lost most of their natural woodland cover with high level woodland restricted to small stands, such as Keskadale on the Buttermere Fells and Young Wood on the Skidddaw massif. Juniper scrub can occur from the limit of tree growth down to the valley floor. Internationally important woodlands occur in the Borrowdale Valley and above Ullswater, while other large stands occur on the eastern shores of Haweswater and in the Duddon and lower Langdale Valleys. These support the best English examples of western oceanic bryophytes and old forest lichens.

The native woodland is important for western oakwood breeding birds, such as pied flycatcher, wood warbler, redstart and tree pipit. The rare netted carpet moth, which feeds on touch-me-not balsam, is found in some damper areas. Wet woodland occurs on some valley sides but is generally part of wetland systems around lakes. Wood pasture and parkland habitat is an important woodland element, with good examples near Rydal.

Rivers and lakes:
The NCA contains the most extensive, diverse and biologically important range of water bodies in England. These form important ecological networks of connecting lakes and rivers. The lakes range from deep, large oligotrophic (nutrient-poor) lakes, such as Wastwater to shallower, more mesotrophic lakes, such as Elterwater. Vendace and schelly are fish distinctive to the Cumbria High Fells, with Arctic charr also occurring in the South Cumbria Low Fells area. Small tarns are numerous and varied in altitude, depth, substrate and geology resulting in a wide variety of flora and fauna. The area includes key parts of the River Derwent (including Bassenthwaite Lake and Derwent Water), River Eden (including Ullswater) River Kent and River Ehen systems. These are of international importance for their biological features including salmon, otter, river, brook and sea lamprey, white clawed crayfish, floating water plantain and freshwater pearl mussel.

Inbye grasslands:
Much of the grassland in the valleys and lowlands is agriculturally improved

but small, fragmented areas of more species-rich grassland remain. This NCA has internationally important upland haymeadows, with important sites in Borrowdale and Bretherdale. Purple moor-grass and rush pasture is similarly scattered in small fields across several valleys and some examples support the rare marsh fritillary and small pearl bordered fritillary butterflies.

Wetlands:
Wetland such as valley and basin mires, marsh and fen vegetation are important in the valley bottoms and lowlands. Extensive fen and swamp vegetation (as well as wet woodland) are found around many lakes and larger tarns, with good examples at the south end of Bassenthwaite Lake, Esthwaite Water and Elterwater. The area supports internationally important valley mire at Tarn Moss and nationally important lowland raised mire at Mungrisdale.

Source: Cumbria Fells & Dales 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; wwwnaturalengland.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)	Percentage of NCA
Upland heathland	20,225	10
Blanket bog	13,344	7
Broadleaved mixed & yew woodland (Broad habitat)	5,249	3
Coastal floodplain & grazing marsh	2,482	1
Upland calcareous grassland	480	<1
Lowland dry acid grassland	205	<1
Purple moor-grass & rush pasture	193	<1
Lowland raised bog	123	<1
Lowland meadows	107	<1
Upland hay meadows	110	<1
Lowland calcareous grassland	26	<1
Limestone pavement	9	<1
Reedbeds	8	<1
Lowland heathland	7	<1

Source: Natural England (2011)

Additional local habitat data for Cumbria High Fells from Natural England Habitat Inventory North West provides the following estimates of habitat extent: open water, 4,240 ha (2007), lowland fens 457 ha (2009). No accurate estimates are currently available for rivers or mountain heaths and willow scrub.

- Maps showing locations of priority habitats are available at: http://magic.defra.gov.uk – select 'Habitats and Species/Habitats'

7.3 Key species and assemblages of species

- Maps showing locations of some key species are available at: http://magic.defra.gov.uk – select 'Habitats and Species/Habitats'
- Maps showing locations of S41 species are available at http://data.nbn.org.uk/

8. Settlement and development patterns

8.1 Settlement pattern

The pattern of settlement is largely restricted to the valleys and lowlands with isolated farms along the fell edge. Small villages, hamlets and farmsteads are scattered along access roads in the valleys, where the best farm land is found. The only towns are the small market towns of Keswick and Ambleside, whose populations are substantially increased by tourists at peak times.

Source: Cumbria High Fells Countryside Character Area description; Countryside Quality Counts (2003)

8.2 Main settlements

The main settlements in the Cumbria High fells are: Keswick and Ambleside. The total estimated population for this NCA (derived from ONS 2001 census data) is: 27,881.

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

8.3 Local vernacular and building materials

Substantial farmsteads and older terraced cottages are typically constructed in stone with slated roofs. Local rocks, including different types of slate, have been used for farm buildings and walls, with sandstone, granite or limestone used for detail and finishes such as lime wash. Drystone walls and in places hedgerows form a visual and historic link between settlement and the countryside. Local building practices are seen in chimneys, windows and walling, as well as in hogg houses, peat houses, packhorse bridges and bank barns. Other than stone-built churches and chapels, few buildings from before the 17th century remain. The main town of Keswick has medieval origins but consists mainly of Victorian two and three storey slate buildings, built in response to the sudden influx of tourists at that time. The Lake District also contains some fine examples of villa architecture as well as wood or stone boathouses around some lakes.

Source: Cumbria High Fells Countryside Character Area description; Countryside Quality Counts (2003)

9. Key historic sites and features

9.1 Origin of historic features

Neolithic stone circles such as Castlerigg and Swinside are the earliest built monuments in the area. Neolithic stone axe production, from volcanic tuff in the central Lake District, produced highly polished stone axes widely traded to southern England, Scotland and Ireland.

Bronze Age clearance cairns and settlement remains, are evidence of the more extensive establishment of farming on the lower slopes. Bronze Age stone circles include those at Burnmoor in Eskdale.

Romano-British period sites include major forts at Troutbeck, Ambleside, Hardknott and Ravenglass, civilian settlements at Ambleside and Ravenglass, major roads, such as High Street, plus enclosures and field systems in the lower fells and valleys.

Medieval and later field boundaries are based on a persisting farming system of in-bye grazing in the valleys and extensive open common grazing on the fells. Fellside “intakes” date from the 16th to 18th century.

Widespread Norse place names such as “Thwaite” (clearing) as well as hog

back tombstones and crosses (for example, at Gosforth) date from the late 10th Century onwards.

Industrial remains dating from the medieval period onwards include mines, quarries, spoil tips, for example, Coniston Copper Mines valley, smelting sites (bloomeries), charcoal pits and water-powered forges and mills. Iron manufacture was supported by charcoal production from coppiced woodlands, with a post medieval increase in woodland cover for this industry and fuel. In comparison with other NCAs in the north-west there is an unusually small amount of industrial landscape. 18th-century Picturesque movement features include villas, ornamental plantings and designed landscapes and views.

Hardknot Fort.

Features associated with the influential Romantic Movement poets include houses, for example, the Wordworth's Dove cottage, burial places and landscapes, which inspired ideas and poetry.

National Trust properties are a specific legacy of the birth of the conservation and environmental movement in the Lake District, in response to the construction of Thirlmere Reservoir in the mid 1870s.

The relatively large number of Scheduled Monuments, particularly on the unenclosed land, is due to the lack of intensive land use in these areas over time.

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

9.2 Designated historic assets

This NCA has the following historic designations:

- 4 Registered Parks and Gardens covering 230 ha.
- 0 Registered Battlefield/s covering 0 ha.
- 298 Scheduled Monuments.
- 1,251 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

- 62 per cent of the NCA 125,897 ha is classified as being publically accessible.
- There are 2,458 km of public rights of way at a density of 1.5 km per km2.
- There are no National Trails, however, it is estimated by the Lake District National Park Authority that over 10 million people per year use the footpaths within the Park, the majority of which are within this NCA. The internationally known Coast to Coast Walk from St Bee's Head in Cumbria to Robin Hood's Bay in North Yorkshire crosses the NCA. There is a similar Coast to Coast Cycle route.
- The NCA is internationally known for rock climbing, and there are 17 outdoor activity centres in the National Park, the majority of which are within the NCA.

Sources: Natural England (2010)

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

Access designation	Area (ha)	Percentage of NCA
National Trust (accessible all year)	37,605	19
Common Land	63,993	32
Country Parks	34	<1
CROW Access Land (Section 4 and 16)	117,923	59
CROW Section 15	44,945	22
Village Greens	47	<1
Doorstep Greens	0	0
Forestry Commission Walkers Welcome grants	2,491	<1
Local Nature Reserves (LNR)	0	0
Millennium Greens	0	0
Accessible National Nature Reserves (NNR)	576	<1
Agri-environment Scheme Access	7	<1
Woods for People	10,718	5

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) this NCA contains areas of exceptionally high tranquillity, particularly in the western fells.

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

Tranquillity	Score
Highest Value within NCA	136
Lowest Value within NCA	-45
Mean Value within NCA	34

Sources: CPRE (2006)

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

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 a similar pattern to the Tranquillity Map, with areas of disturbed land associated with the urban areas of Keswick and Ambleside, as well as the major road corridors of the NCA. A breakdown of intrusion values for this NCA is detailed in the table below.

Category of intrusion	1960s (%)	1990s (%)	2007 (%)	Percentage change (1960s-2007)
Disturbed	1	8	10	9
Undisturbed	99	92	90	-9
Urban	<1	<1	<1	0

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are a 9 per cent loss of undisturbed areas to disturbed areas.

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

12. Data sources

National

- 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 Inventory of Woodland & Trees, Forestry Commission (2003)
- Countryside Quality Counts Draft Historic Profiles, English Heritage (2004)*
- Ancient Woodland Inventory, Natural England (2003)
- BAP Priority Habitats GIS data, Natural England (March 2011)
- Special Areas of Conservation data, Natural England (data accessed in March 2011)
- Special Protection Areas data, Natural England (data accessed in March 2011)
- Ramsar sites data, Natural England (data accessed in March 2011)
- Sites of Special Scientific Interest, Natural England (data accessed in March 2011)
- Detailed River Network, Environment Agency (2008)
- Source protection zones, Environment Agency (2005)
- Registered Common Land GIS data, Natural England (2004)
- Open Country GIS data, Natural England (2004)
- Public Rights of Way Density, Defra (2011)
- National Trails, Natural England (2006)
- National Tranquillity Mapping data, CPRE (2007)
- Intrusion map data, CPRE (2007)
- Registered Battlefields, English Heritage (2005)
- Record of Scheduled Monuments, English Heritage (2006)
- Registered Parks and Gardens, English Heritage (2006)
- World Heritage Sites, English Heritage (2006)
- Incorporates Historic Landscape Characterisation and work for preliminary Historic Farmstead Character Statements (English Heritage/Countryside Agency 2006)

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

Supporting document 2: Landscape change

Recent changes and trends

Trees and woodlands

- Woodland and scrub cover has increased since about 2000, particularly due to the England Woodland Grant Scheme as well as scrub creation (including juniper) on fell commons under Higher Level Stewardship and United Utilities Sustainable Catchment Management Programme (Thirlmere and Haweswater Catchments).
- Condition of SSSI woodland has improved, particularly with the exclusion of grazing and there has been significant restoration of planted ancient woodlands (PAWS).
- Deer numbers are significantly impacting upon natural regeneration in woodlands.
- Publicly owned woodlands have been developed to increase their recreation potential for example, mountain biking routes, Go Ape rope courses and wildlife viewing, such as ospreys at Whinlatter.

Boundary features

- The condition of boundary features has improved with considerable restoration and maintenance of dry stone walls under the ESA scheme.

Agriculture

- The number of holdings over 100 ha (79 per cent of agricultural land in 2009) has increased slightly from 2000, continuing a longer term trend.
- From 2000 to 2009, sheep numbers decreased from 794,981 to 597,576, cattle numbers decreased from 68,431 to 57,889 and the number of people working in agriculture declined by 12 per cent. There were significant reductions in grazing pressure from c. 2000, following large increases in the second half of 20th century. Reductions resulted from foot and mouth disease in 2001, EU Common Agricultural Policy reform in 2005, and decoupling payment from stock numbers and agri-environment schemes (particularly to achieve SSSI favourable condition target, 2010). There has also been a reduction in numbers of active commons graziers[4].
- Change in agri-environment schemes from Environmentally Sensitive Area to two-tiered Environmental Stewardship (Higher Level and Upland Entry Level) schemes. HLS has a wider range of targeted objectives and options than ESA. Sheep prices have increased considerably over past few years, recovering to 1980s levels. Input costs however have also risen.
- There has been significant restoration of farm buildings, particularly under the ESA scheme.

[4] Trends in pastoral communities, Natural England, 2009

Settlement and development

- Since the 1960s, there has been a 9 per cent loss of undisturbed areas to disturbed areas.
- There has been significant restoration of farm buildings, particularly under the ESA scheme.

Semi-natural habitat

- Significant improvements in SSSI condition have been gained, particularly due to sustainable grazing regimes on fells. Although much is now in appropriate management, these upland habitats have considerably longer recovery rates than lowland habitats.

Historic features

- Plant growth, erosion and vehicle damage are among the key reasons for Schedules Monuments being at risk.
- Dereliction of former working mines and cessation of pumping resulting in build up of water levels, threatens mine structure and increases heavy metal pollution risk.

Rivers

- Extreme flood events (particularly Derwent 2009) has caused changes in river courses and significant transport and deposition of coarse sediment on flood plain fields and in channel. Gravel from in-bye fields has been largely removed as part of flood recovery work.
- Significant droughts in 2004, 2007 and 2010, caused low flows and draw down on lakes and reservoirs and associated deterioration of water quality.
- Improvements have been made to United Utilities Sewage Treatment Works and abstraction regimes to meet SAC and Bathing Water requirements.
- The spread of invasive non-native freshwater species, into new locations, for example signal crayfish in the River Derwent, and within sites, for example the New Zealand pygmy weed in Bassenthwaite Lake.
- Recovery of becks from low pH conditions has resulted from improvements to emissions causing acid rain.
- Catchment management programmes have been initiated to improve conditions of lakes in Bassenthwaite and Windermere catchments, as well as United Utilities' Haweswater and Thirlmere reservoirs.

Drivers, future challenges and opportunities

Climate change

- Evidence from UK Climate Impacts Programme (UKCP09) shows that over the coming century the Lake District climate is expected, on average to become warmer and wetter in winter and hotter and drier in summer. Under the medium emissions scenario by 2080: mean winter temperatures will increase by 2.6 °C, mean summer temperatures will increase by 3.7 °C, winter precipitation will increase by 16 per cent, summer precipitation will decrease by 22 per cent and there will be an increase frequency of extreme events (floods/droughts).

- Species tolerant of cold temperatures and winter drought may be out-competed, for example, Arctic Alpine plants or fish such as Arctic charr. Species limited by winter cold may expand such as bracken and introduced fish species.

- Peatlands may dry out during prolonged droughts, increasing risks of soil erosion and wildfires, resulting in loss of habitat, stored carbon and archaeological pollen record.

- Freshwater habitats, water supplies and recreation may be affected by low flows, draw-down on lakes and reservoirs and increasing summer lake surface temperatures. Increasing water temperatures and low flows also resulting in deterioration of water quality, including increasing concentration of nutrients, blue-green algal blooms and lack of oxygen at depth. Deteriorations in water quality include increasing colour and sediment load in water abstracted for public supply.

- Extreme weather events likely to increase rates of erosion of river banks and the wider catchment, with impacts on in-bye land, downstream flood risk and increased siltation of river and lake habitats.

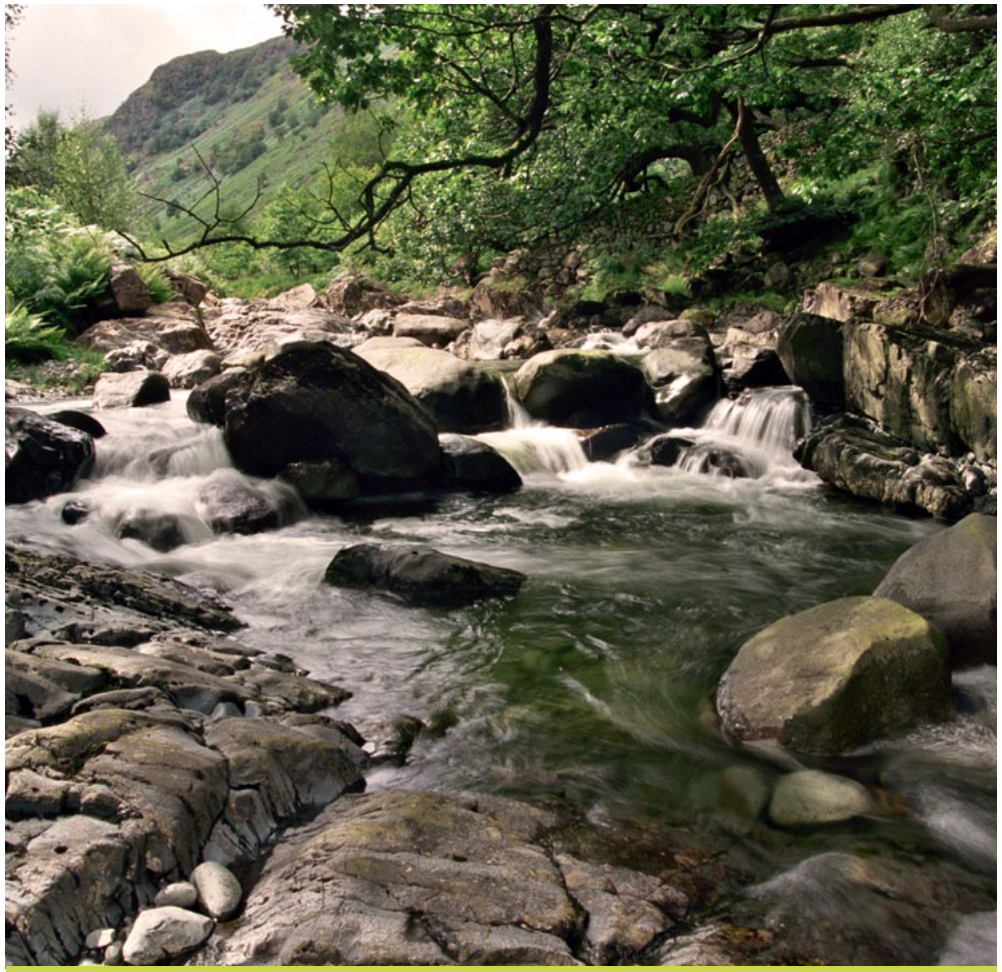
- Farming practices may change with new climate conditions, for example, a longer growing season, and changing demands on industry.

- Increases in extreme storm events are already changing flood risk assessments, requiring increased flood risk management for settlements, and away from management of water courses to reduce flood risk to farmland.

With climate change, species tolerant of cold temperatures, such as the Arctic-Alpine plant moss campion , may be out competed.

Future challenges and opportunities

- Reform of EU Common Agricultural Policy and Rural Development Programme for England in 2014.
- Increasing demand for national food security.
- Maintaining viable farm businesses balancing food production and delivery of other multiple benefits.
- Maintaining hill farming skills, continuity of commons grazing and active commons graziers.
- Attractiveness of farming to future generations with increasing capital costs of land and infrastructure.
- Continuing diversification of farm businesses, particularly into tourism.
- Increasing pressure on water resources; region's public water supply dependant on internationally and nationally designated lakes and river systems.
- Development of renewable energy, including hydro-power, wood fuel and wind turbines, with continuing pressure for wind farm construction on land adjacent to this NCA.
- Flood risk management requirements, including catchment management to reduce downstream flood-risk.
- Promotion of the management of peatlands to store and sequester carbon, reduce erosion and enhance downstream water quality.
- Habitat connectivity will be needed to address species movement and adaptation to climate change.
- Addressing plant health issues, including spread of Phytophthera affecting trees including larch and juniper.
- Visitor and transport pressures likely to continue.
- Affordable housing may be needed to meet the needs of local communities.



Borrowdale.

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.

Castle Rigg Neolithic stone circle: the area has been settled and farmed from the prehistoric period.

The following analysis shows the projected impact of Statement of Environmental Opportunity on Ecosystem Service Provision:

Statement of Environmental Opportunity	Food provision	Timber provision	Water availability	Genetic diversity	Biomass energy	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 hisotry	Tranquillity	Recreation	Biodiversity	Geodiversity
SEO 1: Manage and enhance the expansive areas of fell and fell edge, for the internationally important habitats and species they support, their historical and cultural heritage and to protect soils and water resources.	↔ **	↔ **	↔ **	↔ *	↔ ***	↑ **	↗ **	↗ *	↑ *	↑ **	↔ *	O *	N/A	↑ *	↗ *	O *	↔ *	↑ ***	↔ **
SEO 2: Manage and enhance the valleys, to improve the habitat network of pastures, meadows, wetlands and woodlands, within a matrix of improved pasture, and to protect traditional buildings and the field pattern of drystone walls, hedges and boundary trees.	↔ **	↗ *	↔ **	↔ *	↔ **	↗ *	↔ *	O *	↔ **	↔ **	↔ *	O *	N/A	↑ *	↑ *	O *	↔ *	↑ **	↔ **
SEO 3: Manage and enhance the water catchments, rivers, lakes, tarns and reservoirs for nature conservation, public enjoyment and recreation, water supply and flood management.	↔ **	↔ **	↔ **	↔ *	↔ **	↗ **	↑ ***	↗ *	↑ *	↑ **	↔ *	O *	N/A	↑ *	↔ *	O *	↗	↑ ***	↔ **
SEO 4: Manage existing woodlands, restore and expand native woodlands, trees and shrubs, for their nationally and internationally important habitats and species, cultural and historical heritage, and to help deliver climate change mitigation, protect soils, improve water quality and supply wood fuel.	↘ **	↗ *	↔ **	↔ *	↗ *	↑ **	↑ **	↗ *	↗ **	↑ **	↔ *	O *	N/A	↑ *	↗ *	O *	↔ *	↑ ***	↔ **
SEO 5: Improve opportunities for enjoyment and understanding of the landscape and promote local involvement in the planning and management of the Cumbria High Fells.	↗ *	↔ **	↔ **	↔ *	↗ *	↗ *	↗ *	↗ *	O*	↗ *	↔ *	O *	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.**
=National Importance; =Regional Importance; =Local Importance

Landscape attributes

Landscape attribute	Justification for selection
Spectacular, formerly glaciated, mountain scenery of open fells and craggy peaks, separated by U-shaped valleys with a radiating pattern of rivers and lakes.	■ 88 per cent of area within Lake District National Park. ■ Scafell Pike the highest point in England at 978 m. ■ Elevation range of just below sea level to 978 m. ■ Outstanding area for glacial features, including SSSI for evidence of glacial and periglacial features and processes, for example Skiddaw Group SSSI. ■ Pattern of glacier-cut valleys influencing drainage pattern of rivers and lakes, development of agriculture, roads and settlement pattern. ■ Extensive views, from and to the contrasting fells, lakes and valleys; constantly changing with cloud cover, weather and seasons.
Complex geology of smooth-sided fells of Ordovician Skiddaw Group rocks contrasting with rugged, sharp peaks of the Borrowdale Volcanic Group, Silurian slates and fissile mudstones and a fringe of Carboniferous Limestone foothills.	■ 36 geological SSSI and 14 geological and biological SSSI (mines, quarries, spoil heaps, rock outcrops and river cut exposures) including sites designated for nationally important mineralisation. ■ Mining heritage dating from medieval period for extraction of metal ores from mineral veins, notably iron, copper, zinc and lead. ■ Geology reflected in local building materials.
Extensive mosaic of semi- natural fell habitats including montane and upland heath, blanket bog, scree and ledge communities, springs, flushes, tarns, valley mires, juniper scrub and remnant woodland.	■ The most biologically diverse upland area in England with internationally important montane and upland habitats and species. ■ Extensive areas of fell are designated as Special Area of Conservation (SAC) with Lake District High Fells covering 27,005 ha (14 per cent of total area). Habitats of international importance include blanket bog, montane and upland heath, scree and ledge communities, springs, flushes, tarns, valley mires, juniper scrub and remnant woodland. ■ Farming heritage continuing a farming system which developed from the medieval period with communal grazing of fell commons. Contributing to the Outstanding Universal Value of the World Heritage Site bid. ■ Largest areas of Common Land in England with extensive swathes of open unenclosed fell grazing. ■ The best site in England (along with North Pennines) for its Arctic Alpine Plant community of rock ledges, flushes, montane grassland and heath, including species such as alpine catchfly and oblong woodsia which are found nowhere else in England. ■ The highest altitude oak woodlands in England at Young Wood (Mungrisdale) and Keskadale. ■ Skiddaw, Grasmoor, Scafell and Helvellyn massifs particularly important for montane heaths and grasslands. ■ Extensive areas of deep and shallow peat soils supporting blanket bog, upland heath and degraded habitats. Peat soils of Lake District estimated as storing 29 million tonnes of carbon. Large tracts of blanket bog on Armboth Fells and Skiddaw Massif.

Landscape attribute	Justification for selection
Rivers, lakes, and tarns (plus surrounding wetlands) flowing from the fells into the radial pattern of U shaped valleys.	■ The most biologically important and diverse area in England for freshwater habitats including lakes, tarns and rivers. A wide range of water body characteristics and biological communities varying with size, shape, depth, altitude, geology, substrate and hydrology. ■ 6 lakes and numerous small tarns designated as Special Area of Conservation, ■ 4 SAC river systems (Eden, Derwent, Kent and Ehen) of international importance for riverine habitat and supporting species such as salmon, brook, river and sea lamprey, white-clawed crayfish and freshwater pearl mussel and providing aquatic habitat networks. ■ Lakes of national importance for rare fish populations including vendace, schelly and Arctic charr. ■ Vast majority of English priority habitat for lakes with low to moderate nutrient levels (oligotrophic to mesotrophic). ■ Nationally important, extensive tracts of fen, swamp and wet woodland around the lakes (much designated as SSSI) and some smaller stands beside water courses and on flood-plains. ■ Thirlmere and Haweswater reservoirs, along with abstractions from lakes, providing water to over 6.5 million people in the north-west of England. Abstractions from rivers and lakes for example Wast Water, supplying populations and industry on West Cumbrian coast. ■ Rivers and lakes of importance for recreation, including fishing, swimming and boating activities.
Extensive woodlands networks, especially on the valley slopes.	■ Internationally important woodlands designated as Special Area of Conservation (Borrowdale Woodland Complex, Ullswater Oakwoods, Naddle Forest and the upland oak woodland and juniper scrub stands of the Lake District High Fells.) ■ The best oceanic bryophyte and lichen rich western oak woods in England. ■ Woodlands covering 18, 024 ha (8 per cent of total area), including 2,904 ha ancient semi-natural woodland, 2,408 ha ancient replanted woodland. ■ Altitudinal range of woodland types ranging from small wet woods on floodplains through upland oak and ash woodlands on the valley slopes through to juniper scrub and dwarf willow, at the limit of tree growth on the fells. ■ Extensive native woodland habitat networks in valleys, especially Borrowdale, Duddon and around Ullswater, with sparse woodland cover on the fells, restricted to gills, a few isolated woods and scattered trees and scrub. ■ Nationally important upland woodland bird assemblages and the most northerly population of dormouse. ■ Wood pasture and parkland with some ancient trees, notably in the Rydal area. ■ Hedges and boundary trees, including historical pollards contributing to boundary features in some valleys. ■ Large private and publically owned conifer plantations, covering 8,104 ha (4 per cent of total area), providing timber, wood pulp and other wood products. Large Forestry Commission owned conifer plantations, for example Whinlatter, of importance for access, education and recreation.

Landscape attribute	Justification for selection
Pastoral valleys with a scattering of hay meadows, purple moor-grass and other species rich grasslands, in a matrix of improved pastures.	■ Farming heritage continuing a farming system which developed from the medieval period with enclosed inbye meadows and pastures and communal grazing of fell commons. Contributing to the Outstanding Universal Value of the World Heritage Site bid. ■ Internationally important hay meadows forming part of North Pennine Dales Meadows Special Area of Conservation, containing a significant part of the remaining upland hay meadow resource in England. ■ Purple moor-grass pastures including a site designated as SAC for its population of marsh fritillary butterfly. ■ A scattering of less agriculturally improved pastures supporting lowland dry acid grassland, upland and lowland calcareous grassland priority habitats.
Field pattern of pastoral hill farming with small valley in-bye fields, rougher intakes/allotments on valley sides and common grazing on the open fells	■ Field pattern developed from medieval period, with farming system of enclosed land in the valley and open shared common grazing on the fell. Contributing to the Outstanding Universal Value of the World Heritage Site bid. ■ Dry stone wall field boundaries with some hedges, boundary trees and pollards in valleys. ■ Historic elements of field pattern include medieval ring garths, separating enclosed valley land from the open fells, and 18th century onwards enclosure of fell intakes.
Historic environment showing development of settlement and farming since Neolithic period.	■ Contributing to the Outstanding Universal Value of the World Heritage Site bid. ■ 298 Schedules Monuments. ■ Neolithic and bronze-age stone circles, axe factory and clearance cairns for example Castle Rigg and Swinside stone circles. ■ Extensive Roman military and domestic infrastructure including forts, roads and settlements. ■ Norse legacy of place names, settlement pattern, crosses and settlement remains for example summer shielings. ■ Industrial mining and metal working heritage dating back to the medieval period. Internationally important sites include Coniston Copper Mines Valley and Caldbeck Fells. ■ Key elements of farmed landscape developed from medieval period.
Cultural heritage linked to the Picturesque and Romantic movements, hill farming and the birth of the conservation movement.	■ Contributing to the Outstanding Universal Value of the World Heritage Site bid. ■ Inspiration of ideas, art, poetry and writing from the Picturesque and Romantic movements onwards. ■ Farming heritage continuing a farming system which developed from the medieval period, with enclosed inbye meadows and pastures and communal grazing of fell commons. ■ 18th century Picturesque villas and designed landscapes such as Barrow House on Derwent Water. ■ 4 registered parks and gardens. ■ Key area for inspiration of Romantic Poets especially William and Dorothy Wordsworth, Coleridge, Southey and De Quincey. ■ Ruskin and Beatrix Potter influential in birth of conservation movement and formation of National Trust. Numerous National Trust properties.

Landscape attribute	Justification for selection
Local stone-built farmsteads, hamlets and villages along the valleys, with the small markets towns of Keswick and Ambleside	■ 1,251 Listed Buildings. ■ Local stone-built vernacular farm houses and buildings of predominantly 17th and 18th century origins. ■ Victorian, slate built architecture of Keswick and Ambleside resulting from 19th century expansion of tourism.
Tourism and recreation with large numbers of visitors attracted by the natural beauty of the area, its wildlife, cultural connections and access opportunities for walking, climbing, water-based and other activities.	■ 12 million visitor days to Lake District National Park per year. ■ NCA with the largest proportion (56 per cent) of open access land/registered common land. ■ Extensive public rights of way system (2,458 km), 1.5 kmpan per km ". ■ Public rights of navigation on Derwent Water and Ullswater. ■ Popular routes from Wainwright walking guides including long distance "Coast to Coast" and, more recent C2C cycle route. ■ High density of outdoor education centres. ■ Internationally renowned for rock climbing, with classic Lake District climbing routes. ■ Nationally renowned events and routes include: Bob Graham Round and Fred Whitton cycling sportive. ■ Cultural attractions particularly associated with the Romantic Movement, including houses, burial places and locations that have inspired art. ■ High number of National Trust properties.
Large area of tranquillity	■ 90 per cent of area "undisturbed" in 2007, particularly in the western fells.

Landscape opportunities

- Protect and conserve the mountain scenery, views inwards and outwards.
- Provide opportunities to access and study geological diversity.
- Protect and conserve the qualities of remoteness, wildness and tranquillity.
- Protect and conserve the field pattern and network of dry stone walls.
- Protect and conserve the archaeological evidence of sites and monuments, industrial archaeology, historic designed landscapes, historic buildings and vernacular stone-built architecture.
- Protect and conserve the important sites and features linked to cultural and artistic heritage.
- Protect and improve the strong network of public rights of way and open access land.
- Protect and conserve the ancient woodlands and ancient trees.
- Manage upland grazing systems to enhance existing fell habitat mosaics and soils, strengthen adaptation and mitigation for climate change and provide multiple benefits.
- Manage and enhance existing woodlands and trees for multiple benefits.
- Manage and enhance existing species-rich pastures and meadows.
- Manage restoration of lakes, rivers and their catchments, to enhance water quality and resource, make space for natural development of rivers, reduce downstream flood risk and control invasive non-native species.
- Manage existing wetlands and strengthen connections to rivers and lakes.
- Manage archaeological and historic sites requiring restoration.
- Manage access, to protect sensitive sites, habitats and soils, avoid impacting on sense of remoteness and provide quiet enjoyment for a wide range of users.
- Manage development pressures affecting the natural / cultural attributes.
- Plan for a sustainable agricultural sector, balancing the provision of multiple benefits with efficient, profitable and value added food production.
- Plan for a connected habitat network with creation of habitat buffers, corridors and stepping stones, linking valley grasslands, wetlands, woodlands and the fells.
- Plan for expansion and linkage of native broadleaf woodland and trees and an increase in the broadleaf component of conifer woodlands.
- Plan for expansion of wetland sites, including restoration and connection of blanket bogs, floodplains and water courses.
- Plan for a sustainable low-carbon, low-impact economy.
- Plan for sustainable tourism, sustainable transport, permissive access to open access land and linked access routes for a wide range of users.
- Plan for expansion in provision of wood fuel and wood-based products.

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 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	Common fell grazing land In-bye grassland	Livestock production of principally sheep (c. 600,000 in 2009) with some beef and dairy (c. 58,000 cattle in 2009), providing meat, high quality local produce (promoted by tourist businesses) and hardy cross-bred sheep to lowland areas. Hill farming system based on improved in-bye valley pastures and extensive areas of fell common land, with semi-natural vegetation and hefted sheep flocks.	Local	67 per cent of area Grade 5 agricultural land, with restricted areas of valley inbye (22 per cent Grade 4), when stock gathered from fell. Only traditional hefted flocks can survive the harsh fell conditions, producing "light lambs". Commons management by active graziers is important for the maintenance of hefted flocks. High quality local produce is closely linked to tourist industry. Further development of supply chains and markets is required to maximise this potential. Vast majority of farms are within agri-environment schemes. Under HLS, fell grazing levels are agreed for habitat grazing capacity of individual fells. Increasing the proportion of fell cattle can enhance sward diversity and habitat mosaic. The most sensitive habitats, for example, blanket bog and montane heath, may require no grazing, if degraded. Appropriate grazing levels and a robust cover of vegetation, can reduce soil erosion and run-off, enhancing a range of other services.	Encourage the promotion and development of supply chains and markets for high quality local produce. Appropriately graze fell and valley habitats to produce food and other multiple benefits. Promote use of hardy fell cattle.	**Food provision** **Sense of place/ inspiration** **Sense of history** **Biodiversity** **Climate regulation** **Regulating soil erosion** **Regulating soil quality** **Regulating water quality**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Timber provision	Coniferous woodland Broad leaved woodland	Woodland cover of 18,024 ha (8 per cent) with almost half coniferous woodland. Commercial timber provision provided principally by conifer plantations, for example Whinlatter, Greystoke, Matterdale, Ennerdale and on the south-west fringe, also providing wood for pulp and the timber industry.	National	Large areas of existing conifer plantation, with terrain limiting access for timber removal on some sites. Public owned forests have been developed to maximise recreation and education opportunities, for example Whinlatter. Potential exists for limited increases in production of high quality hard wood from management of existing and future native woodlands.	Manage existing broadleaved woodland, including for some high quality hard wood. Increase area of native woodland. Restocking planted ancient woodland sites with native hard woods. Plan for expansion in provision of wood-fuel and wood-based products.	**Timber provision** **Biomass energy** **Climate regulation** **Regulating soil erosion** **Regulating soil quality** **Regulating water quality** **Regulating water flow** **Recreation** **Biodiversity**
Water availability	Reservoirs Lakes Rivers Surface water catchments High levels of precipitation	High rainfall in upland catchments provide significant surface water abstractions. Thirlmere and Haweswater reservoirs, with links to other water bodies such as Ullswater, provide a quarter of region's water. Ennerdale, Crummock and Over Water, along with river abstractions from the Derwent system, are the principal supplies for West Cumbria. Wast Water provides water for Sellafield. The tributaries of the River Eden contribute to the water supply of Carlisle, abstracted from the River Eden downstream. Water quality is critical for public water supply.	Regional	Public water supply for the region is heavily dependent on abstractions from nationally and internationally designated lakes and river systems in this NCA. All of the water bodies listed across the NCA are either SAC, or abstract water upstream of SAC river systems, for example Thirlmere and Haweswater reservoirs (apart from Over Water which is SSSI). Existing abstractions place pressure on SAC lake and river ecosystems, for example River Ehen, Crummock Water and the Haweswater / Lowther system. As surface water abstractions, lakes and rivers respond rapidly to drought conditions, with draw down, low flows and impacts on water quality, habitats and species. Significant droughts occurred in the mid 1990s, 2003 and 2007. Droughts are unpredictable in terms of year and season of occurrence. Climate change predictions for the Lake District are for more summer droughts.	Encourage promotion of sustainable water use and water conservation by homes and businesses supplied from the catchment, linking this to the lakes and river systems of the Lake District. Ensure management of regional water use, demand and abstraction, minimises impacts and increases resilience of SAC/SSSI lakes and rivers in the NCA (including visual impacts of draw down). Ensure future development regionally addresses water resource planning and encompasses the highest standards for water efficiency.	**Water availability** **Regulating water quality** **Sense of place/ inspiration** **Recreation** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Genetic diversity	Rare sheep and cattle breeds Extensive areas of semi-natural habitats and associated species	Largest population of Herdwick sheep in world. 35,835 ha (18 per cent of area) SSSI. Genetically distinct populations of geographically isolated species including Vendace (only British population in Derwent Water) and marsh fritillary butterfly.	Local	Only traditional hefted flocks, of breeds such as Herdwick, can survive the harsh fell conditions. Providing meat, high quality local produce (promoted by tourist businesses) and hardy breeding ewes to lowland areas. Further development of supply chains and markets is required to maximise this potential. Other isolated species populations likely to be genetically distinct, for example fish, Arctic Alpine plants.	Encourage the promotion and development of supply chains and markets for high quality local produce. Appropriately graze fell and valley habitats to produce food and other multiple benefits. Promote use of hardy fell cattle. Support genetic diversity and distinct populations of priority species.	**Genetic diversity** **Food provision** **Sense of place/ inspiration** **Sense of history** **Biodiversity**
Biomass energy	Coniferous woodland Broad leaved woodland	Currently very small scale local production of biomass. 8 per cent woodland cover offers potential for increased production, both as a by-product of commercial forestry and through the management of existing broadleaved woodland. Limited potential for short rotation coppice. For information on potential impacts of biomass planting within NCA, refer to tables on Natural England website[3]	Local	Supply chains and markets for local wood fuel are currently limited. Development of these is required to maximise the potential for wood fuel as a by-product of commercial forestry. Sensitive management of existing unmanaged broadleaved woodland, also offers potential for wood fuel, although access can restrict management. Dead wood is a critical component of nationally /internationally designated woodland habitats.	Encourage the promotion and development of markets and supply chains for locally sourced wood fuel as a by-product of commercial forestry. Support local management of existing woodland, including coppice, for wood fuel. Increase area of native woodland.	**Biomass energy** **Climate regulation** **Regulating soil erosion** **Regulating soil quality** **Regulating water quality** **Regulating water flow** **Biodiversity**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Climate regulation	Soils and vegetation of the following habitats: Trees, woodland and scrub Blanket bogs, lowland raised mires and other peat habitats Fell habitat mosaic Permanent grassland	Soils and vegetation growth on the extensive areas of semi-natural habitat, store and sequester significant amounts of carbon, in particular: ■ Blanket bog for example Skiddaw, Armboth and Shap Fells. ■ Woodland, for example Borrowdale and other valley sides. ■ Peat soils of the Lake District are estimated to store 29 million tonnes of carbon.	International	Past drainage, in places, of blanket bog and other peat rich wetland habitats, has resulted in the erosion and drying of the peat surface, with loss of both previously stored carbon and ability to sequester more carbon. In certain areas, high grazing levels on the fells and visitor trampling on popular paths and peaks results in loss of vegetation and soils. Sphagnum moss vegetation on blanket bogs is particularly sensitive to grazing. Increasing woodland cover offers significant potential for carbon storage and sequestration. Tree planting is not appropriate on deep peat soils due to drying of the peat surface. To enhance storage of carbon in soils see 'Regulating soil erosion'.	Restore blanket bog through grip blocking and extensive grazing, so that it can sequester carbon. Ensure appropriate grazing of fell habitats for a robust vegetation cover that is resilient to extreme weather events. Expand and restore wetland habitats. Increase area of native broadleaved woodland and scrub. Promote opportunities for a low carbon economy.	**Climate regulation** **Water availability** **Regulating soil erosion** **Regulating soil quality** **Regulating water quality** **Regulating water flow** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water quality	Lakes Rivers Reservoirs Surface water catchments with: trees, woodland and scrub Blanket bogs, lowland raised mires and other peat habitats Fell habitat mosaic Permanent grassland	A number of the lakes including Bassenthwaite, Derwent Water, Brothers Water, Ullswater and Ennerdale fail to meet Water Framework Directive targets due to nutrient enrichment. Public water supplies are susceptible to deteriorating quality due to colour, sediment and pathogens. Haweswater and Thirlmere reservoirs have a Sustainable Catchment Management Programme to reduce inputs from land management to the reservoirs. A number of the lakes, for example Bassenthwaite, are impacted by high sediment loads, due to soil erosion.	National	Public, private and agricultural water supplies, water based recreation and biodiversity all require good water quality in the area's rivers, lakes and tarns. High nutrient levels can exacerbate blue green algal blooms, impacting on recreation, tourism, water supplies and wildlife. Key sources of nutrient include sewage treatment works, small discharges of domestic waste and run-off from farmland, particularly improved grassland. This varies between catchments. River Eden and tributaries, River Derwent, Bassenthwaite Lake and the rivers Kent and Levens are priority catchments under the England Catchment Sensitive Farming Delivery Initiative. Robust, permanent cover of vegetation, especially trees and scrub, can significantly reduce and filter soil erosion and run-off. In certain areas, high grazing levels and visitor trampling on popular paths and peaks results in loss of vegetation and soils, adversely impacting on downstream water quality. Natural river erosion is exacerbated in places by stock access to river banks and past modifications.	Reduce nutrient inputs through improvements to public and private sewage treatment. Promote phosphorus-free management practices with tourism and other businesses. Restore blanket bog through grip blocking. Ensure appropriate grazing of fell habitats and valley pastures for a well vegetated sward. Increase area of native broadleaved woodland/scrub, targeted at areas of high risk of soil erosion. Expand and restore wetland habitats, particularly adjacent to lakes and rivers. Manage river banks, flood plains and lake shores for a robust cover of vegetation, including woodland and scrub in places. Sustainably manage rivers to enable development of sediment deposition features, where not a flood risk. Manage nutrients in farmsteads and on improved pasture.	**Regulating water quality** **Water availability** **Climate regulation** **Regulating soil erosion** **Regulating soil quality** **Regulating water flow** **Recreation** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water flow	Rivers Floodplains Trees, woodland and scrub (increasing surface roughness, infiltration and evapo-transpiration) Other semi-natural habitats	High rainfall, impermeable underlying geology, and waterlogged upland soils result in high and rapid run-off. The Eden, Derwent and Kent catchments have experienced extreme flood events in the last 10 years causing serious damage to homes and farmland, both within the NCA and in downstream towns including Carlisle, Cockermouth, Workington and Kendal. The 2009 Derwent flood caused significant damage to farmland through deposition of gravel and alteration of river courses. Risks of river flooding are likely to increase as a result of the greater intensity of storm events predicted with climate change.	Regional	The Environment Agency's Catchment Management Plans' preferred approach to managing the flood risk in the rivers includes restoring natural floodplains and associated habitats, optimising land management for flood risk reduction, avoiding inappropriate development in flood risk areas and minimising run-off from new development. Land management which increases vegetation cover (particularly tree planting) can slow flood flows, due to increased roughness, infiltration and evapo-transpiration. Woodland creation in gills can help to reduce the supply of coarse sediment which can contribute to increased flood risk and damage farmland.	Restore blanket bog vegetation through grip blocking. Ensure fell habitats and wetlands support a well vegetated sward to enhance infiltration and evapo-transpiration and slow flows due to increase surface roughness. Increase area of native broadleaved woodland/scrub, including targeting the creation of wet woodland within flood plains, and planting within gills and river corridors. Expand and restore wetland habitats, connecting rivers and floodplains. Avoid inappropriate development in flood risk areas and minimise runoff from new development.	**Regulationg water flow** **Water availability** **Climate regulation** **Regulating soil erosion** **Regulating soil quality** **Regulating water quality** **Regulating water flow** **Biodiversity**
Regulating soil quality	Trees, woodland and scrub Blanket bogs, lowland raised mires and other peat habitats Fell habitat mosaic Permanent grassland	Brown podsols on lower slopes with humic rankers above and peat soils on blanket bogs. Gleys and alluvial soils are found in the glaciated valleys and beside rivers. Mainly grade 5 agricultural land (67 per cent) with grade 4 (22 per cent) in valley bottoms. Grade 3 land is restricted to the edge of the area.	Local	Vegetation growth, on the extensive areas of semi-natural habitat, can significantly contribute to soil organic content and structure, if sustainably managed. Over time, native woodland can develop deep humus soils. With high rainfall levels, damaged deep and shallow peat soils are at risk of losing significant organic matter content. In certain areas, high grazing levels on the fells and visitor trampling, on popular paths and peaks, results in compaction of soils, damaging soil structure, reducing aeration and increasing run-off, leading to increased soil erosion. Catchment Sensitive Farming promotes targeted management of nutrient applications following soil analysis of individual fields.	Restore blanket bog through grip blocking. Ensure appropriate grazing of fell habitats and valley pastures for a robust vegetation cover. Increase area of native broadleaved woodland/scrub. Manage nutrients on improved pasture. Expand and restore wetland habitats. Manage access to sensitive sites and restore eroding public rights of way.	**Regulating soil quality** **Food provision** **Water availability** **Climate regulation** **Regulating soil erosion** **Regulating water quality** **Regulating water flow** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil erosion	Trees, woodland and scrub Blanket bogs, lowland raised mires and other peat habitats Fell habitat mosaic Permanent grassland	High rainfall, steep slopes and thin acid- loamy soils result in a high risk of soil erosion.	Local	Robust, permanent cover of vegetation, (especially trees and scrub) can significantly reduce soil erosion. In certain areas, high grazing levels on the fells and visitor trampling on popular paths and peaks results in loss of vegetation and soils.	Increase cover of native broadleaved woodland and trees. Restore blanket bog through grip blocking. Ensure appropriate grazing of fell habitats and valley pastures, wetlands and meadows for a robust cover of vegetation. Manage river banks and flood plains for a robust cover of vegetation, including woodland/scrub creation. Manage access to sensitive sites and restore eroding public rights of way.	**Regulating soil erosion** **Water provision** **Climate regulation** **Regulating soil quality** **Regulating water quality** **Regulating water flow** **Biodiversity**
Pollination	Extensive areas of semi-natural habitats	With limited crops and orchards requiring pollination, this service is of limited importance for food production in this NCA.	Local	Of value largely to biodiversity rather than food production in this NCA.	Enhance fell habitats through appropriate grazing regimes, which increase the diversity of the habitat mosaic. Plan for creation of a connected habitat network, creating and restoring buffers, corridors and stepping stones to link valley grasslands, wetlands, woodlands and fells.	**Pollination** **Biodiversity**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of place/ inspiration	Geology, landform and weather Extensive semi-natural habitats of fells, freshwater and woodlands Traditional hill farming systems Pastoral valleys and field pattern Historic environment and buildings Cultural heritage Tourism, access and recreation Tranquillity	88 per cent within Lake District National Park. World Heritage Site bid for cultural and historic landscape and its influence on the inspiration of art, writing and ideas. 16 per cent of area of international biological importance, including fell, woodland, freshwater and grassland habitats. NCA with the largest proportion (56 per cent) of Open Access land/Registered Common Land and of prime importance for outdoor recreation. Areas of exceptionally high tranquillity, with 90 per cent of area "undisturbed" in 2007.	International	The Cumbria High Fells has been an inspiring place from before the Romantic movement, for its geology, mountain scenery, wild open fells, lakes, rivers, woodlands and cultural heritage of traditional hill farming, archaeological sites and historic built environment. The sense of remoteness and tranquillity and the ever changing weather are paramount to the sense of place. The area is also extremely rich in recreation opportunities. All of this contributes to the attraction of this area as a prime tourist destination. The influence that this area has had on the inspiration of ideas and art over time is a key part of this attraction.	Support the traditional hill farming sector for the contribution it provides to a wide range of services. Protect the views, inwards and outwards, including the contrast between the rugged fells and the sheltered valleys. Also see opportunities for: ■ Sense of history ■ Recreation ■ Tranquillity ■ Food provision ■ Biodiversity ■ Geodiversity ■ Regulating water quality ■ Water provision ■ Regulating soil erosion	**Sense of place/ inspiration** **Geodiversity** **Biodiversity** **Food provision** **Sense of history** **Recreation** **Tranquillity** **Regulating water quality** **Water availability** **Regulating soil erosion**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of history	Neolithic and Bronze age features Extensive Roman forts, roads and settlements. Norse place names, settlement pattern and features Industrial mining heritage Farmed landscape and field pattern developed from medieval period Extensive semi natural habitats managed by traditional farming/ forestry Picturesque villas/ designed landscapes Inspiration from Romantic poets onwards Birth of conservation movement National Trust properties	World Heritage Site bid for cultural and historic landscape and its influence on the inspiration of art, writing and ideas. 298 Scheduled Monuments. 1,251 listed buildings. 4 Registered Parks and Gardens. Nationally important for industrial mining heritage. Key area of inspiration for Romantic movement and birth of conservation movement (following construction of Thirlmere Reservoir). Key features include homes, burial places and landscapes inspiring art, plus numerous National Trust Properties. 63,993 ha common land, with hefted flocks of traditional Herdwick and Swaledale sheep. 2,904 ha ancient semi-natural woodland Extensive semi-natural vegetation on fell common land plus remnant traditional valley meadows and pastures.	National	Hefted flock hill farming systems are a long standing cultural asset. Sustainable sheep and cattle production underpins much of the land management in the NCA. Key landscape features such as walls, barns and farmsteads are associated with this long term pastoral system. Sites associated with cultural and historical heritage require maintenance, promotion and management, as a key attraction for visitors. Impacts on the historic environment are identified in factors causing Scheduled monuments to be at risk. These include: plant growth, erosion, vehicle damage and neglect. Abandoned mines can require management, particularly of water levels, to protect historic structures and prevent downstream pollution, especially by heavy metals. Since 1993, the ESA scheme has significantly contributed to the restoration and maintenance of dry stone walls, barns and other historic farm buildings.	Restore Scheduled Monuments and historic sites at risk. Promote, protect and manage the historic and cultural heritage, including access to sites. Manage abandoned mines to protect historical heritage and downstream water quality. Promote traditional upland farming and forestry systems that maintain and restore the farmed landscape and full range of habitats. Maintain and restore traditional farm buildings, listed/historic buildings and the network of dry stone walls. Ensure that new development is compatible with local landscape character.	**Sense of history** **Sense of place/ inspiration** **Food production** **Biodiversity** **Regulating water quality**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Tranquillity	Expansive areas of fell Lakes and rivers Woodlands	Areas of exceptionally high tranquillity, especially in the western fells. 90 per cent of area "undisturbed" in 2007. Areas of "disturbed "land are associated with the towns of Ambleside and Keswick and the major roads, particularly during peak holiday periods.	National/ International	There has been a 9 per cent loss of undisturbed areas to disturbed areas since the 1960s. Despite high visitor numbers, the vast majority of the area retains its sense of remoteness and tranquillity. This is in part due to the attraction of key areas such as the towns of Ambleside and Keswick. High levels of car traffic occur on the principle routes during peak holiday periods.	Manage development pressure and access, by pedestrians, bikes and vehicles, to protect sense of remoteness, tranquillity and the night skies. Deliver a sustainable integrated transport network, with improved public transport, quality services, car parking and linking of services.	**Tranquillity** **Sense of place/ inspiration** **Biodiversity**
Recreation	Expansive areas of fell Lakes and rivers Woodlands (including publicly owned forests) Public rights of way network Open access land Geology – rock outcrops Cultural and historical heritage	12 million annual visitor days to Lake District National Park. NCA with the largest proportion (56 per cent) of open access land/Registered Common Land. Extensive public rights of way system (2,458 km), 1.5 kmpan per km ". Public rights of navigation on Derwent Water and Ullswater. Extensive public forest with recreation facilities. High density of outdoor education centres. Internationally renowned for rock climbing. Nationally renowned events/routes. Cultural attractions particularly associated with the Romantic movement. High number of National Trust properties.	National/ International	Access areas /routes, recreation facilities and sites associated with cultural and historical heritage require maintenance, promotion and management, as a key attraction for visitors. Recreation also dependent on maintenance and enhancement of habitats, for example fishing and other water based recreation, wildlife viewing, such as osprey on Bassenthwaite Lake, traditional farmed landscape and other attributes contributing to sense of place. Management also required of potential impacts of high visitor numbers such as traffic, loss of tranquillity, nutrient inputs to freshwater and path erosion.	Manage, improve and promote access and recreational opportunities to land and water for a wide range of users, ensuring the landscape attributes are maintained. Deliver a sustainable integrated transport network, with improved public transport, quality services, car parking and linking of services. Promote opportunities for visitors to contribute to the protection/management of the NCA.	**Recreation** **Sense of place/ inspiration**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biodiversity	Fell habitat mosaic Lakes and rivers Woodlands Wetlands Species-rich grasslands	35,835 ha (18 per cent of area) SSSI of which 31,287 ha (16 per cent of area) internationally important SAC (including fell, woodland, freshwater and grassland habitats). 671 Local Sites of biological importance. 2,904 ha of ancient semi-natural woodland. 71 per cent of SSSI are unfavourable recovering, 18 per cent favourable, 7 per cent unfavourable no change and 4 per cent unfavourable declining.	National/ International	The main reasons for unfavourable "declining" or "no change" SSSI condition are overgrazing, invasive freshwater species, forestry and woodland management, deer grazing and diffuse pollution. Significant progress from 2004-20 in securing SSSI restoration to unfavourable recovering condition, with a continuation of appropriate management required to achieve favourable condition. For upland and freshwater habitats, recovery to favourable condition is likely to be a slow process. Native woodland creation is not appropriate on other priority habitats, in particular blanket bog, low land raised mires or species rich grasslands.	Enhance fell habitats through appropriate grazing regimes, which increase the diversity of the habitat mosaic. Increase native woodland and tree cover across the altitudinal range of woodland types and within conifer woodland. Plan for creation of a connected habitat network, creating and restoring buffers, corridors and stepping stones to link valley grasslands, wetlands, woodlands and fells. Restore lakes, rivers and their catchments, to enhance water quality and resource, make space for natural development of rivers and control invasive non-native species. Enhance protected species populations through targeted habitat management and specific management measures, where needed. Integrate habitat restoration with actions to improve the state/supply of other key ecosystem services. Investigate opportunities for habitat based payments for ecosystem services.	**Biodiversity** **Water provision** **Climate regulation** **Regulating soil erosion** **Regulating soil quality** **Regulating water quality** **Regulating water flow** **Sense of place/ inspiration** **Recreation**
Geodiversity	Mines, quarries spoil heaps Rock outcrops River-cut exposures	36 geological SSSI, 14 mixed interest geological and biological SSSI including sites of national importance for mineralisation. 128 local geological sites. Mining heritage dating from medieval period. Geology reflected in local building materials.	National	Designated sites provide important and accessible sections, allowing the interpretation, understanding and continued research into the geodiversity of the NCA. Sufficient exposure of the interest features of designated sites is required for this. Sites of importance for mineralisation, particularly spoil heaps, are at risk of over collection of specimens.	Improve access to important geological exposures. Manage specimen collecting, particularly at spoil heaps. Promote awareness and valuing of geodiversity	**Geodiversity** **Sense of place/ inspiration** **Sense of history**

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