National Character Area profile:

# 18. Howgill Fells



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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.

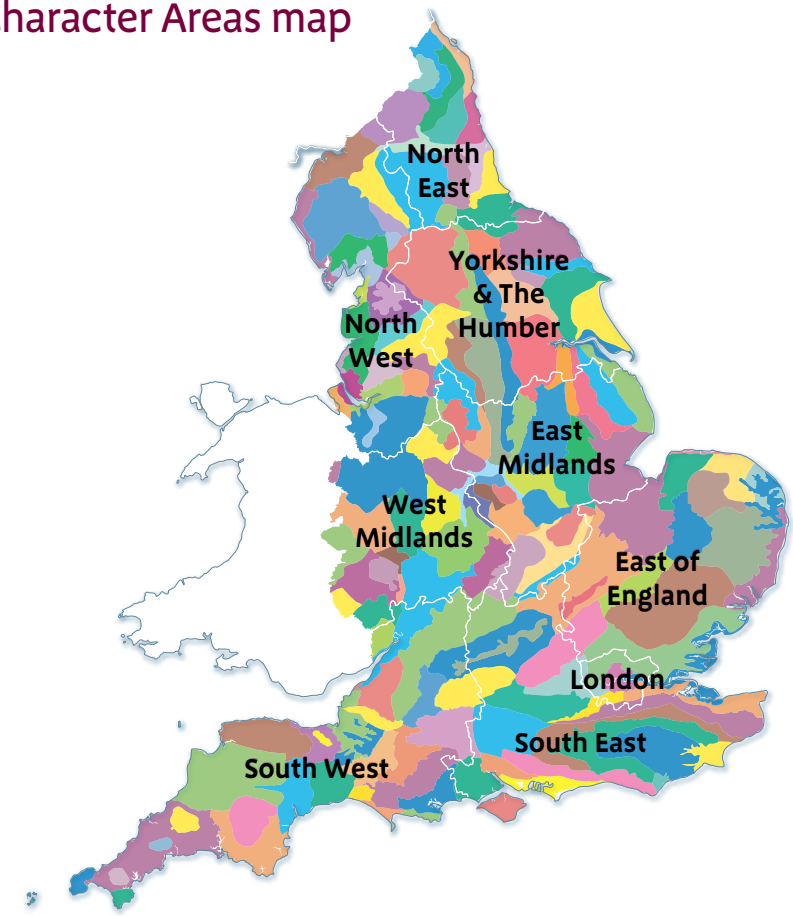
NCA profiles are guidance documents which can help communities to inform their decision-making about the places that they live in and care for. The information they contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and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



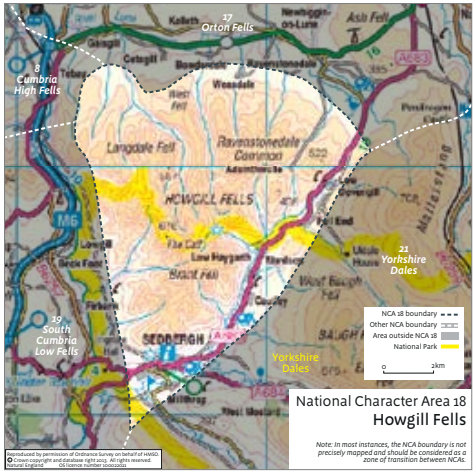

[1] The Natural Choice: Securing the Value of Nature, Defra (2011; URL: **www.official-documents.gov.uk/document/cm80/8082/8082.pdf**)
[2] Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services, Defra (2011; URL: **www.defra.gov.uk/publications/files/pb13583-biodiversity-strategy-2020-111111.pdf**)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

# Summary

The Howgill Fells are Silurian and Ordovician sandstone and gritstone uplands with distinctive high, rounded ridges and dome-like summits separated by long, steep-sided valleys; around half is National Park. The fells are remote, exposed, open, unenclosed common land, covered with a seasonally colourful mosaic of upland habitats, including poorly drained acid grassland and bracken, with some small remnant areas of upland heath, which offer long-distance panoramic views to surrounding uplands. Drainage is radial; incised rocky gills and 'flashy' streams flow into the rivers Lune, Rawthey and Eden. Large areas are designated as Sites of Special Scientific Interest (SSSI) for their geology and active fluvial geomorphology. Lower, enclosed slopes offer a contrasting pastoral scene, with rough, rushy pastures grading into improved land, with some hay meadows and purple moor-grass, surrounded by drystone walls and hedges. Flower-rich verges occur along some quiet lanes. Livestock farming predominates, with sheep, Fell ponies and cattle. There is limited tree cover: mainly gill woodland and remnant broadleaved woods.

Soils are poor and are vulnerable to poaching and erosion. With high rainfall, potential for downstream flooding and predictions for increased storm events, careful soil and water management are required for future protection of the services they provide. The area has very high levels of tranquillity, in part owing to the few settlements, widely dispersed farmsteads and quiet roads, all restricted to the fringe of the National Character Area (NCA) and all of which still retain their local vernacular styles, materials and form, reflecting local geology. There are few designated archaeological features, but the area contains many small-scale features associated with its agricultural heritage, including drove roads, pinfolds and flag-roofed barns.

The area is well used for open-air recreation, with over 80 per cent designated as open access land – the highest level of any NCA. A good network of public rights of way caters for walkers, riders and cyclists, with activities such as photography, hang gliding, wildlife watching and fishing increasing. The area is a source of inspiration to artists and writers from William Wordsworth to Andy Goldsworthy.




Click map to enlarge; click again to reduce

## Statements of Environmental Opportunities:

- **SEO 1:** Conserve, enhance and restore the tranquil, open, unenclosed fells, with their dramatic seasonal colours and textures, mix of upland habitats and active fluvial features, for their national recreation value, their geomorphological interest and their biodiversity. Encourage quiet recreation focused on enjoyment and appreciation of these features, while improving water quality, reducing soil erosion and mitigating climate change.

- **SEO 2:** Conserve and enhance the pastoral lower slopes and valleys with their complex of field patterns, hedges and drystone walls; their range of pasture types, including northern hay meadows, purple moor-grass, species-rich verges, woodlands, and waterside and boundary trees; and their dispersed farmsteads and villages, to conserve upland farming culture and to enhance landscape character and biodiversity.

- **SEO 3:** Conserve, enhance and manage the many watercourses through management of the farmed and semi-natural habitats to enhance their biodiversity, regulate soil erosion, regulate water flow and quality and enhance their recreation interest. Protect and conserve the important geology and fluvial geomorphology.

- **SEO 4:** Conserve, restore and enhance the cultural and upland farming heritage of the area and the sandstone, gritstone and limestone vernacular built heritage, including intact farmstead layouts, bank and field barns and the archaeological heritage. Develop appropriate interpretation to ensure that these different types of heritage are fully understood and appreciated.

**The Howgill Fells from Low Branthwaite, the Howgills in miniature.**

# Description

## Physical and functional links to other National Character Areas

The Howgill Fells National Character Area (NCA) contrasts markedly with the Cumbria High Fells and South Cumbria Low Fells NCAs to the west, the Yorkshire Dales NCA to the south-east, Orton Fells NCA to the north and North Pennines NCA to the east. These areas form an extensive upland landscape of diverse geology and landscape character, much of which is designated as either National Park or Area of Outstanding Natural Beauty. The NCA forms part of an extensive moorland habitat network and a less well-connected woodland network across these upland NCAs. River valleys separate the Howgill Fells from the surrounding uplands.

The small active streams of the Howgills drain primarily into the rivers Lune and Rawthey. The Rawthey joins the Lune just south of Sedbergh, in the South Cumbria Low Fells NCA, and then flows along the north-west fringe of the Bowland Fringe and Pendle Hill NCA, before reaching the sea south of Lancaster in the Morecambe Coast and Lune Estuary NCA. A small area of the northern Howgill Fells above Ravenstonedale drains northwards into the River Eden via Scandal Beck.

The narrow Lune Gorge that runs north–south, west of the Howgill Fells, is a nationally important transport corridor, containing the M6, A685 and West Coast Main Line railway, linking England with Scotland. The A685, which then runs west–east from Tebay to Kirkby Stephen along the northern fringe of the Howgills, and the A683, which runs north–east from Sedbergh to Kirkby Stephen on the eastern fringes, both link the A66 cross-Pennine trunk road with the M6.

**Howgills from Fleshbeck across the Lune Valley, showing fertile pasture on the valley floor.**

## Key characteristics

- Highly distinctive massive, open and sweeping upland block of high, smooth, well-defined rounded ridges and dome-like summits of sandstone and siltstone, separated by long, steep-sided deep valleys.
- Distinctive narrow, steeply incised rocky gills and steep screes on valley sides, with waterfalls, alluvial fans and some crags.
- Bedrock geology predominantly of Silurian sandstones, siltstones and mudstone bedrock, with glacial till drift deposits on lower slopes, peat soils on the higher land and loams on the lower slopes.
- Drainage radiating from the central core of high fells, mostly flowing into the rivers Lune and Rawthey, with a small area draining into the River Eden.
- Extensive, unenclosed moorland of acid grassland, bracken and remnant dwarf shrub upland heath with some blanket bog.
- A pastoral landscape, with predominantly sheep and cattle grazing on the extensive common land, with distinctive local Fell Ponies and Rough Fell Sheep in some areas.
- Lower slopes that support rough, rushy pasture and improved grassland, with some remnant species-rich verges, pasture and meadows in the valleys.
- Very limited tree cover, predominantly broadleaved remnant woodland and gill woodland, with many waterside and boundary trees on lower slopes and valleys.
- Predominantly open character, with drystone walls and hedges confined to the lower slopes and land around Sedbergh.
- An almost total absence of designated archaeological features on the high ground but with an important Roman road route and associated remains along the Lune Gorge.
- Very little settlement, with occasional flag-roofed sandstone and gritstone vernacular field barns, farmsteads and hamlets in the valleys.
- Sedbergh, which, with its blue ragstone buildings, is the most significant settlement, with two limestone villages along the northern boundary of the NCA.
- A quiet, rural area with very high levels of tranquillity, dark night skies and an almost total absence of roads other than around the extreme periphery.
- A strong sense of apparent wildness and remoteness, with open, uninterrupted long-distance views in all directions. Dramatic changes in seasonal colour, textures and weather patterns contribute to the visual interest of the scenery.
- Well used for open-air recreation by riders, active fell walkers and mountain bikers, and one National Trail which crosses the northern part of the NCA.

## The Howgill Fells today

The Howgill Fells are a roughly triangular upland area, well defined by adjacent landscapes of highly contrasting character. They comprise a discrete, very distinctive block of high, smooth, well-defined, rounded ridges with dome-like summits, separated by long, steep-sided deep valleys, ranging from 70 m to 676 m in elevation – the majority are above 300 m. Neighbouring areas to the south (including Holme, Middleton and Barbon Low Fell), although part of the Yorkshire Dales NCA, share the same geology as the Howgill Fells. These unusually shaped sandstone, siltstone and mudstone fells contrast markedly with the neighbouring igneous and metamorphic Cumbria High Fells, the slates and shales of the South Cumbria Low Fells to the west, the limestone of the Yorkshire Dales and Orton Fells to the south-east and to the north, and the gritstone Pennines to the east. River valleys (the Lune and Rawthey) separate the area from surrounding uplands.

Drainage is radial from the central high upland core, with streams running off the high ground in all directions and many active fluvial features (large areas of which are designated as Sites of Special Scientific Interest (SSSI) for their fluvial geomorphology). To the north and west these fells drain directly into the upper reaches of the River Lune, while those to the east and south drain into the River Rawthey, which joins the Lune at the southern tip of the NCA. A small area of fellside in the north-east drains north into Scandal Beck, a tributary of the River Eden which is designated as a Special Area of Conservation (SAC) for its freshwater habitats.

The steep valley sides have screes and some crags, and narrow, steeply incised rocky gills containing small, active streams of a 'flashy' nature, with alluvial fans and waterfalls – some of which are dramatic, notably Cautley Spout, England's highest cascade waterfall above ground level. Active erosion is evident on some steeper slopes.

There is very little woodland. Some remnant gill woods of hawthorn, rowan, ash and alder cling to the slopes, and small copses and broadleaved woodlands – mostly ash, oak and sycamore – occur along the fringing river valleys. Small areas of remnant wood pasture and parkland occur along the slopes above the River Rawthey, mostly of hawthorn, birch, hazel, blackthorn and bird cherry.

**Northern Howgills from Great Kinmond in the Orton Fells.**

There are some small coniferous plantations, particularly around Sedbergh. In places, the lower slopes have a more wooded appearance than is actually the case, partly owing to the presence of many mature waterside and boundary trees and scattered small woods and shelterbelts.

A large proportion of the fells consist of high, exposed, extensive, open moorland, which results from the clearance of the native upland forests in the Neolithic and Bronze Age to provide grazing land. Gently sloping ridgetops are largely covered by poorly drained acid grassland, dominated by mat grass, with some blanket bog underlain by deep peat on flatter areas. Better-drained slopes support patches of bracken and remnant dwarf sub-shrub heath.

**Southern Howgills from Firbank area, open unenclosed uplands contrasting with irregularly enclosed lower slopes.**

The area is heavily grazed by sheep, cattle and Fell Ponies. The Rough Fell, a distinctive local breed of hardy fell sheep, is largely restricted to the Howgills and nearby parts of the Orton Fells and South Cumbria Low Fells.

The mostly unenclosed, extensive commons are separated from pastures on the lower slopes by drystone walls. Lower slopes support rough, rushy pasture, with improved pasture and meadows in the fringing valleys providing silage, hay and winter grazing. Springs and flushes on the lower slopes are the most diverse habitats. A few examples of species-rich northern hay meadows remain along the Rawthey valley, some forming part of the North Pennine Dales Meadows SAC. Species-rich verges occur along roads on the northern fringes and north and east from Sedbergh along the route of the A683. Small, mostly irregular-shaped fields, bounded by drystone walls and hedges (predominantly hawthorn), occur on lower slopes and in the fringing valleys along the rivers Rawthey and Lune, with larger straight-edged, walled fields on the higher valley sides.

There are very few recorded archaeological remains, particularly in the high fells, and only isolated instances of mining activity. Some features of parkland and medieval agriculture survive around the fringes of the area, together with Roman remains such as the Roman road through the Lune Gorge at the western boundary of the NCA (which led from Ribchester Fort to Tebay) and Castlehaw Tower (originally a motte-and-bailey castle and used during the Second World War and as a Royal Observer Corps monitoring post in the Cold War). Other features include drove roads, shielings (summer shepherd residences), pinfolds, settlements and evidence of an iron-age farming community at the foot of Cautley Spout.

There is a notable absence of settlement in the upland core. Isolated flag-roofed sandstone and gritstone vernacular farmsteads and hamlets occur on the lower fringing slopes and valleys, often sheltered by clumps of sycamore and ash. Small and isolated stone, flag-roofed field barns occur on valley slopes. The most significant settlement is the small town of Sedbergh, the older buildings of which are built of local blue ragstone, but the overall architecture of which is heavily influenced by the extensive, largely 19th-century buildings and parkland of Sedbergh School, which occupies a good proportion of the town. Limestone vernacular villages (Newbiggin-on-Lune and Ravenstonedale) lie near the northern boundary of the NCA, with the railway architecture of the village of Tebay to the north-west.

Historically inaccessible and dominated by the unusual and dramatic form of the high, steep-sided hills, the Howgill Fells is a very quiet, rural NCA, with very high levels of tranquillity and an almost total absence of roads or settlements away from its boundary. It retains a strong sense of relative wildness and remoteness, with open, uninterrupted, long-distance views to and from surrounding uplands in all directions, dark night skies and few sources of intrusion, apart from very locally, along the transport corridor to the west and around Sedbergh at the southern tip.

The southern half of the Howgill Fells was designated as part of the Yorkshire Dales National Park in 1954 and the remainder has been proposed for designation by Natural England, reflecting both its high levels of natural beauty and its importance for open-air recreation. The Howgill Fells remain somewhat less well known and less visited than the neighbouring Yorkshire Dales to the east and the Lake District High and Low Fells to the west, despite their recognition by artists and writers such as William Wordsworth and Andy Goldsworthy. The higher land is all publicly accessible, mostly as a result of changes under the Countryside and Rights of Way Act 2000, and is well used by walkers, cyclists, mountain bikers, riders and hang gliders. In recent years the area has attained a higher profile, mainly due to the Alfred Wainwright guides and other guides to walks in the area and because the views from the M6 have been admired by large numbers of people. Nevertheless, the area tends to be visited largely by keen walkers and local people who recognise the fells' distinctive character and appreciate their quietness and seclusion.

**Southern Howgills from Firbank area. The large numbers of waterside and boundary trees on lower ground provide landscape interest and give a more wooded appearance than is the case.**

## The landscape through time

The geology of the Howgill Fells is dominated by the turbidites of the Windermere Supergroup; a series of Ordovician and Silurian sediments deposited by submarine landslides in a basin as the Iapetus Ocean was subducted, resulting in a relatively complex series of sequences of sandstone, siltstone and mudstone. Uplifted and folded by subsequent tectonic events, the hard rocks of the Howgill Fells all possess similar resistance to erosion, giving rise to the characteristic shapes of the fells known locally as 'sleeping elephants', which show few signs of glacial erosion compared with fells in neighbouring NCAs. There is a narrow strip of Carboniferous Limestone along the north-east fringes of the NCA. This is the edge of the Carboniferous Limestone belt which runs continuously through the Orton Fells to the Yorkshire Dales.

Drift geology, where it occurs, consists predominantly of glacial till, but is restricted to the lower slopes and fringing valleys, with some alluvial terraces in the south around Sedbergh and to the north around Ravenstonedale. The high altitude and relatively cool, wet climate have given rise to poor-quality soils: predominantly acid loams, with some areas of deep peat on high ground.

The difficult landform has prevented settlement and there is a notable absence of archaeological features on the high fells. Access has been limited to the river valleys, which have provided routes around the edge of the fells since Roman times, with characteristic drove roads and walled intakes linking settlements with the fell land.

The high fells have little recorded evidence of any particular phase of historical or cultural activity, although they have obviously been cleared of woodland. They have been used for summer grazing and for peat, heather and bracken bedding since prehistoric times. Early settlement along the fringing valleys is indicated by prehistoric hut circles and Romano-British settlement sites. An important Roman road, still visible in places, passed through the Lune Gorge, and associated remains are found along its route, including a Roman fort. Forest (hunting) law applied to much of the higher fell land after the Norman conquest. Medieval trackways, pinfolds and shielings can be found in many places, especially on the lower western slopes of the Calf and Langdale fells.

Isolated farmsteads with irregular field boundaries indicate medieval clearance from woodland, as do many local place names, which include the word 'thwaite', meaning clearing. Within the fringing valleys, some

**The River Lune is an active flashy river and its banks are heavily wooded in places.**

small hamlets and farmsteads date from the 12th and 13th centuries when vaccaries (stock farms) were established at valley heads. Some land was also imparked during the medieval period, notably at Murthwaite Park and at Ravenstonedale on the northern fringe, where some park features remain, such as pillow mounds and park walls, together with medieval field systems, ridge and furrow, and lynchets.

By the 16th century, the fringing dales were populated with small farms. Between the 16th and 18th centuries, piecemeal enclosure of small, irregular fields occurred on the lower slopes and valley bottoms, with larger 19th-century enclosures (known as allotments) running up the valley sides to the fell wall. There remains a medium to high concentration of pre-1750 farmstead buildings, with many substantially complete 19th-century farmstead groups surviving with little change to their traditional form. Two-storey combination barns, bank barns and isolated field barns are common. Surviving 17th- and 18th-century farm buildings are concentrated along the Lune valley on the western and northern fringes of the area. During the 20th century, there was some simplification of enclosure patterns as fields were enlarged. Fencing began to replace traditional boundary features in some areas, and some traditional farm buildings started to deteriorate and become unused as they became unsuitable for modern agriculture. New farm buildings of non-vernacular materials were constructed on some farms.

**Carlin Gill / Lune Gorge showing areas of active screes and gully erosion and the spread of bracken on the slopes.**

Overall, however, the landscape and agricultural patterns show little evidence of change; the high fells remain unenclosed and form a major part of the local farming economy. They are grazed 'in common', with the common rights being held by farming families based in the adjoining valleys. Following the outbreak of foot and mouth disease in 2001, there was a significant reduction in the numbers of sheep and cattle visible on the fells for a time. The advent of agri-environment schemes and the English Woodland Grant Scheme has led to some visible restoration of hedges and walls, gill woods, moorland, pasture, hay meadows and buildings, mostly in the southern Howgills within the National Park.

There has been little new settlement apart from around Sedbergh, which has seen both housing and industrial development over the last 100 years. The building of the M6 along the western side of the NCA led to a localised reduction in levels of tranquillity, but the impact is limited owing to the landform and is felt only along the extreme periphery of the NCA.

## Ecosystem services

The Howgill 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. Further information on ecosystem services provided in the Howgill Fells NCA is contained in the 'Analysis' section of this document.

### Provisioning services (food, fibre and water supply)

- **Food provision**: The Howgill Fells are an important area for upland livestock rearing, primarily of hill sheep breeds and cattle, with 98 per cent of the area of farmed land being grass and uncropped land; however, the climate and poor soils severely limit the levels of intensity and types of farming that can be supported.

- **Water availability:** The area has high rainfall. It is the major exporter of headland water into the River Lune and a minor contributor to the River Eden, both of which are major water supply sources. Major abstractions occur downstream of the Howgill Fells NCA from both rivers.

- **Genetic diversity:** The area supports Fell Ponies, a distinctive northern breed, and the locally distinctive, hardy Rough Fell Sheep, which are both well suited to the harsh conditions. The Rough Fell has a very limited distribution, being mostly restricted to this NCA and neighbouring areas of the Orton Fells and South Cumbria Low Fells NCAs. Local efforts to raise its profile should be supported.

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

- **Climate regulation:** Some 40 per cent of the area has high-carbon, peaty soils, though owing to the steep slopes only 10 per cent is blanket bog and there has been little gripping, which limits the potential to restore the area of bog easily; stocking rates and timings could assist in improving condition. Upland moorland habitats such as acid grassland, heath and bracken cover most of the NCA and contribute to carbon capture. There is some scope to increase carbon capture through new woodland on lower slopes and in the fringing valleys.

- **Regulating soil erosion:** The peaty soils that cover nearly half the NCA are easily damaged and prone to erosion, and the steep slopes and incised gills of the high fells do have significant areas of active erosion. However, the NCA has extensive areas designated as SSSI for their active fluvial geomorphology, including active erosion features, so measures to reduce soil erosion (such as maintaining high levels of vegetative cover, and woodland planting) are only appropriate in areas that do not affect the interest features of the SSSI. On the lower fringing slopes and river valleys there is scope for restricting access by livestock to river banks to reduce trampling and erosion and for introducing measures to ensure that waterlogged soils are not damaged or compacted by mechanised or livestock movements.

- **Regulating water quality:** The Eden and the Upper Lune are Department for Environment, Food and Rural Affairs (Defra) priority catchments, where grants and advice are available for land management practices that will reduce sediment and nutrients washing into the watercourses. The Lune is in good ecological condition and supports high-quality fishing;

the Rawthey is in moderate condition. In the Lune catchment, measures to reduce erosion and sedimentation are only appropriate away from areas that influence the features of interest of the geological SSSI that drain into the Lune. The small part of the Eden catchment in the NCA is in good condition, meeting its Natura 2000 protected area (SAC) targets under the Water Framework Directive.

- **Regulating water flow:** There is little flood risk in this sparsely populated NCA, apart from locally on the flood plain of the Upper Lune around Sedbergh, which is a Defra priority catchment. The area could also contribute to mitigation of flood risk downstream, near Lancaster. Away from the geological SSSI, there is scope to improve water infiltration and holding capacity through appropriate land management. Appropriate measures could include reducing soil compaction on the enclosed farmland, increasing soil carbon, expanding areas of woodland on lower slopes and in river valleys, and restoring and extending riparian mires, wet woodland and other habitats to increase the capacity of the area to hold on to peak flows, enhancing this service downstream of the NCA.

**Fast flowing beck, derelict drystone walls and a field barn.**

### Cultural services (inspiration, education and wellbeing)

- **Sense of place/inspiration:** The outstanding natural beauty of the Howgill Fells is recognised by the designation of nearly half the NCA as part of the Yorkshire Dales National Park and active proposals to designate the remainder. The distinctive landforms of the Howgill Fells NCA, with its high, smooth, steep-sided fells and its incised gills, crags and waterfalls, give the area a very strong sense of place. It is highly tranquil, remote, unsettled and apparently wild, with extensive unenclosed commons where one can walk for miles without barriers; these features are often associated with strong feelings of escapism, spiritual refreshment and inspiration. The extensive long-distance and panoramic views, the highly contrasting and seasonal colours, textures and weather, the contrast between the open unenclosed fell and the enclosed lower pastures, woods and watercourses all add to the visual impact of the area. Use of local stone in buildings and walls provides a direct link with the geology of the area.

- **Sense of history:** While there are few designated features or recorded archaeological sites in the NCA, the area has a strong sense of history. The key elements are the distinctive patterns of upland agriculture dating from the medieval period to the 19th century, with the distinctive and extensive unenclosed commons separated by the fell wall from the small, irregularly

enclosed field patterns on lower slopes. Features still visible include drove roads, shielings and pinfolds associated with past transhumance practice, and high numbers of surviving traditional 18th- and 19th-century farmsteads, farm buildings and field barns, many with little change to their original form. The distinctive vernacular of the few settlements also contributes to the strong sense of history. Survival of local distinctive breeds such as the Rough Fell Sheep and Fell Pony contributes to the ability to read the history of upland agriculture in the landscape.

- **Tranquillity:** This upland area is exceptionally tranquil, with very dark night skies. The strong sense of remoteness and apparent wildness on the high fells throughout the NCA contrasts with the soft, calm, pastoral landscapes with streams, rivers and small woods on its fringes. The area has few roads and a very low population, and the widely dispersed farmsteads and few settlements are restricted to the fringes.

- **Recreation:** The area is of particular significance for the opportunities it provides for open-air recreation, based on the natural assets of the area that are recognised by its designation as a National Park. Over 80 per cent is open access land, offering a rare opportunity to walk for miles without hindrance in apparently wild, remote and far-reaching landscapes. There is a good network of rights of way and quiet lanes in the peaceful lower fringing areas and valleys, which offer a contrasting, much more easily accessible experience, with hay meadows, flower-rich verges, rivers and woods. Recreation use has increased and diversified in recent years to include mountain biking, hang gliding and paragliding as well as the more traditional pastimes of walking, riding, biking and visiting villages. There are also opportunities for salmon and trout fishing and shooting.

- **Biodiversity:** While the NCA does contain areas designated for their biodiversity, particularly hay meadows, these are very limited in extent and are largely confined to the extreme periphery, overlapping with neighbouring NCAs of differing character. However, there is significant opportunity to restore areas of previously more diverse biodiversity, particularly the formerly more extensive areas of upland heath, broadleaved and ancient woodland, upland hay meadows, species-rich verges and purple moor-grass, to reduce fragmentation and to enable re-colonisation by previously iconic species such as black grouse.

- **Geodiversity:** The geodiversity of the area is of national significance, with extensive areas designated as SSSI and Regionally Important Geological and Geomorphological Sites (RIGS) for their Silurian, Ordovician and Carboniferous geology and active geomorphological features, some of very recent origin. The Howgill Fells have a very high level of intervisibility with surrounding uplands of contrasting geology, with many exceptional views both from and into the area. Together, these NCAs demonstrate an exceptionally wide range of geology in a small area, and are much visited by geology students. The widespread use of local stone in buildings and walls and the distinctive vernacular building styles ensure that the geology can be read throughout the area. There are opportunities to develop interpretation to ensure that the geological importance of the area is understood and appreciated.

# Statements of Environmental Opportunity

**SEO 1: Conserve, enhance and restore the tranquil, open, unenclosed fells, with their dramatic seasonal colours and textures, mix of upland habitats and active fluvial features, for their national recreation value, their geomorphological interest and their biodiversity. Encourage quiet recreation focused on enjoyment and appreciation of these features, while improving water quality, reducing soil erosion and mitigating climate change.**

**For example, by:**

- Restoring and extending remnant upland heath and blanket bog, with their bright contrasts in seasonal colour and texture, on high ground outside the geological Sites of Special Scientific Interest (SSSI), to increase both connectivity of the heathland network and biodiversity, encouraging high levels of vegetation cover to reduce erosion, slow run-off and increase infiltration and carbon sequestration.
- Encouraging sustainable mixed grazing on the commons, including grazing by hardy beef cattle, sheep and Fell Ponies, to ensure good ecological condition of priority habitats and a reduction in the spread of bracken and to encourage the diversity of plant communities such as wet flushes.
- Protecting the open, unenclosed common land, with its high levels of tranquillity and sense of remoteness, from development or permanent enclosure. Such protection will retain the panoramic, uninterrupted views, both from the Howgill Fells and into the National Character Area (NCA) from surrounding nationally designated landscapes of contrasting geology, as well as the ability to walk without hindrance for miles.
- Conserving, managing and enhancing the geological SSSI and the Local Geological Sites, as well as other non-designated features which affect them, ensuring appropriate management of their features of interest and the surrounding areas that may have an effect on them. For example, protect them from tree planting, small-scale gravel extraction and flood defences to ensure that natural processes continue to determine their character.
- Restoring, expanding and encouraging management of gill, as well as ancient woodland and other broadleaved woodlands and wood pasture, especially on slopes which are covered with bracken and thus have suitable soil, but avoiding the high ridges and areas of geological, biodiversity or historical interest. This will increase woodland connectivity, enhance biodiversity and landscape interest, reduce soil erosion, improve water quality and produce local wood fuel and wood products.
- Encouraging the retention of locally distinctive grazing stock such as Fell Ponies and Rough Fell Sheep, to maintain breed diversity. Encourage the promotion of local brand meat, based on hardy upland breeds that are used to grazing semi-natural habitats. Support the campaign by the Rough Fell Sheep Breeders Association to raise the profile of the breed.
- Supporting and managing forms of quiet open-air recreation which benefit from and value the high quality of the open fells, mitigating any damage or erosion.

**SEO 2: Conserve and enhance the pastoral lower slopes and valleys with their complex of field patterns, hedges and drystone walls; their range of pasture types, including northern hay meadows, purple moor-grass, species-rich verges, woodlands, and waterside and boundary trees; and their dispersed farmsteads and villages, to conserve upland farming culture and to enhance landscape character and biodiversity.**

**For example, by:**

- Managing grazing of grassland habitats at levels that will encourage good ecological condition. Maintain or enhance diversity of plant communities, including hay meadows, woodland and purple moor-grass.
- Encouraging hay-making, to maintain and enhance the remaining species-rich meadows; and restoring hay-making to suitable meadows, to increase connectivity of the fragmented remnant hay meadows. This will create corridors, buffers and stepping stones of habitats which are important for insects as well as flora.
- Restoring purple moor-grass pastures where conditions are appropriate, to increase connectivity of this fragmented habitat.
- Maintaining appropriate management of species-rich verges to ensure that these local features are retained in the landscape, and encouraging volunteer surveys to establish whether management remains appropriate.
- Maintaining drystone walls and hedgerows (where they are in good condition) and restoring or re-creating both walls and hedges using local stone and hedging styles (where condition has declined, or where they have been replaced by fencing), to maintain habitat connectivity and cultural influence of farming patterns in the landscape and to encourage a reduction in levels of replacement by fencing.
- Protecting the strong sense of remoteness and tranquillity, by controlling development and use of night-time lighting.
- Supporting forms of quiet open-air recreation which benefit from and value the high quality of the landscape of, and the natural environment in, this NCA.
- Restoring and expanding broadleaved woodlands, riparian woodland and wood pasture, ideally through natural regeneration and use of local provenance and locally grown seed – especially on slopes that are covered with bracken and thus have suitable soil, and also in the lower river valley areas (but avoiding areas of geological, biodiversity or historical interest). Such restoration and expansion will increase woodland connectivity, improve biodiversity and landscape interest, increase carbon capture, and reduce run-off and soil erosion.
- Encouraging management of existing woodlands, to provide a local wood fuel/biomass supply by developing open glades, encouraging natural regeneration and leaving patches of deadwood, to enhance biodiversity.
- Encouraging use of a wide range of locally native species suitable for the ground conditions in new woodland and existing upland ash woods, to reduce reliance on ash. Examples of appropriate native species include rowan, hazel, holly, alder, hawthorn, blackthorn, bird cherry, crab apple and oak. This will increase resilience to climate change and ash die-back and will encourage re-establishment of black grouse.

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- Encouraging landowners, farmers, authorities and interest groups to survey and monitor for ash die-back disease; and seeking to identify and propagate locally resistant strains of ash.
- Encouraging replanting and management of the many boundary and waterside trees on enclosed land on the lower slopes and along river valleys; and encouraging restoration of areas of parkland-type planting, to maintain the well-wooded appearance on lower ground.
- Restoring and replanting the distinctive mature shelterbelts and copses around farmsteads and villages using traditional species such as sycamore, oak and ash, to ensure retention of these traditional features.
- Encouraging sympathetic management of coniferous blocks, to improve their form by developing softer edges that follow the landform, increasing the proportion of broadleaved species, opening small glades and enhancing the ground flora. This will improve underlying soil, increase biodiversity and allow better assimilation into the high-quality landscape, as well as increase productive woodlands, wood and wood fuel.
- Encouraging restoration and expansion of wet woodland along watercourses and riparian areas where they can reduce high water flows and improve infiltration, especially around Sedbergh; however, avoid areas of biodiversity, geological or historical interest.

**Northern Howgillls, 'the sleeping elephants', from Little Kinmond in the Orton Fells**

**SEO 3: Conserve, enhance and manage the many watercourses through management of the farmed and semi-natural habitats to enhance their biodiversity, regulate soil erosion, regulate water flow and quality and enhance their recreation interest. Protect and conserve the important geology and fluvial geomorphology.**

**For example, by:**

- Maintaining the high quality of the watercourses so that they continue to provide key habitats and features and opportunities for fishing and wildlife watching, protecting springs and flushes as well as fluvial features of geological interest.
- Conserving, managing and enhancing the important geological SSSI, Local Geological Sites and other non-designated upstream features that affect the geological features, to ensure that natural processes continue to determine their character.
- Ensuring, away from the geological SSSI, appropriate grazing of blanket bog and upland heath, valley pastures and flood plains, to encourage a well-vegetated sward, avoiding exposure of peat and peaty soils to reduce risk of erosion by wind or rain, thus reducing sediment run-off into rivers and streams and sedimentation. Encourage broadleaved woodland and scrub in places.
- Encouraging the restoration and extension of valley mires, riparian habitats and wet woodland along watercourses in the valleys, to slow run-off and increase storage capacity.
- Encouraging uptake of advice and capital grants offered under the Catchment Sensitive Farming Programme to promote good soil management and to reduce diffuse water pollution in the Upper Lune priority catchment and in the small area of the NCA that lies in the Eden priority catchment.
- Encouraging a catchment-based approach to river management, such as 'The Living Lune' initiative led by the Lune Rivers Trust.
- Encouraging best practice in soil management to improve the structure and quality of the soils and reduce erosion, by using low-pressure machinery and by managing stock and machinery movements and cultivation timing, particularly in wet conditions.
- Managing river banks to reduce soil erosion and sedimentation, by providing wide buffer strips of permanent unfertilised grassland next to river banks. Provide watering points and reduce grazing or prevent livestock from accessing watercourses where possible, to avoid compaction and poaching and to minimise sediment supply and run-off.
- Ensuring that river engineering works are carried out in an ecologically sensitive manner, enhancing opportunities for conservation and habitat management.
- Protecting springs and flushes from damage by grazing livestock by providing stock watering points, improved drainage and good effluent management.
- Promoting best practice in nutrient and farm waste management on in-bye land, including by extensive grazing of pasture and management of applications of slurry and manure. This will increase build-up of organic matter, reduce reliance on artificial fertilisers and reduce run-off by avoiding manure spreading in winter on frozen, hard ground or very wet ground, or when there is no grass growth.

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- Ensuring that farm infrastructure is able to reduce rates of point and diffuse pollution generated in and around the farmstead through improved and roofed slurry and manure storage, grey water separation, improvements to storm water overflows and good handling facilities – though these will require sensitive design in this high-quality landscape.
- Designing new off-mains drainage developments to include sustainable drainage systems, to improve water infiltration and protect the aquifer and to promote best practice to prevent effluent leakage from existing septic tanks.
- Avoiding inappropriate development in flood risk areas and minimising run-off from new development, especially in the Sedbergh area.
- Encouraging greater understanding of the importance of the area's fluvial geology and the geodiversity of the NCA and its surrounding uplands, through improved access to exposures, where appropriate, and to accessible interpretation.
- Providing easy access to Local Wildlife Sites and Local Geological Sites, and encouraging the development and production of interpretation materials for both educational and public use.
- Encouraging volunteers to undertake tasks such as surveying and conservation of the Local Wildlife Sites and Local Geological Sites in the area, to increase enjoyment and understanding of their qualities.

**Fast flowing beck.**

**SEO 4: Conserve, restore and enhance the cultural and upland farming heritage of the area and the sandstone, gritstone and limestone vernacular built heritage, including intact farmstead layouts, bank and field barns and the archaeological heritage. Develop appropriate interpretation to ensure that these different types of heritage are fully understood and appreciated.**

**For example, by:**

- Protecting both Scheduled Monuments and non-scheduled archaeological features where known, recognising the high potential in this landscape for undiscovered remains.
- Conserving locally distinctive heritage features, including drove roads, settlements, shielings, pinfolds and vernacular bridges, and encouraging interpretation to raise awareness of the history and time depth of the area.
- Retaining and encouraging restoration, using appropriate local materials, of field barns and other farm buildings such as bank barns which no longer serve their original purpose, along with historic settlement patterns, farmstead forms and field patterns that reflect the geology of the area and the past cultural history of the farming industry and its distinctive practices.
- Encouraging sympathetic conversions of buildings and new development in the town of Sedbergh and the nearby villages of Ravenstonedale, Newbiggin-on-Lune and Tebay which respect the particular character, vernacular styles and materials of each.
- Encouraging a more proactive approach to townscape enhancement, such as that reflected in the Sedbergh Townscape Project.
- Maintaining drystone walls and hedgerows (where in good condition) and restoring or re-creating both walls and hedges using local stone and hedging styles (where condition has declined, or where they have been replaced by fencing), to maintain habitat connectivity and cultural influence of farming patterns in the landscape and to encourage a reduction in levels of replacement by fencing.
- Encouraging appropriate on-farm developments such as new buildings and slurry-handling facilities near the remaining 18th- and 19th-century farmsteads which respect the original form, scale, style and materials of the farmstead, to ensure that these strong, locally distinctive remaining cultural heritage features are retained.
- Encouraging volunteers to undertake tasks such as surveying, researching and conserving the archaeological, historical and cultural interest features of the area, to increase enjoyment and understanding of their qualities.
- Encouraging appropriate interpretation – for visitors as well as residents – of the highly distinctive qualities of the landscape, its archaeology, and its historical and cultural associations, to improve their understanding and enjoyment of the area.
- Encouraging appropriate interpretation of the important Roman route that passes through the NCA along the Lune valley, and its associated remains.
- Providing easily accessible sites of archaeological, cultural and historical interest for both educational and public use.

# Supporting document 1: Key facts and data

**Howgill Fells National Character Area (NCA): 10,360 ha**

## 1. Landscape and nature conservation designations

4,533 ha of the Howgill Fells NCA lie within the Yorkshire Dales National Park which his 44 per cent of the land area of the NCA.

Management plans for the protected landscape can be found at:

- www.yorkshiredales.org.uk/

**Source: Natural England (2011)**

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

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

There are 17 local sites in the Howgill Fells covering 66 ha which is 1 per cent of the NCA.

**Source: Natural England (2011)**

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

### 1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

| Tier | Designation | Designated site(s) | Area (ha) | % of NCA |
|---|---|---|---|---|
| **International** | Ramsar | n/a | 0 | 0 |
| **European** | Special Protection Area (SPA) | n/a | 0 | 0 |
| | Special Area of Conservation (SAC) | River Eden SAC; North Pennine Dales Meadows SAC | 38 | <1 |
| **National** | National Nature Reserve (NNR) | n/a | 0 | 0 |
| **National** | Site of Special Scientific Interest (SSSI) | A total of 7 sites wholly or partly within the NCA | 1,864 | 18 |

**Source: Natural England (2011)**

### 1.1.1 Condition of designated sites

| Condition category | Area (ha) | % of SSSI land in category condition |
|---|---|---|
| **Unfavourable declining** | 0 | 0 |
| **Favourable** | 1,839 | 99 |
| **Unfavourable no change** | 19 | 1 |
| **Unfavourable recovering** | 0 | 0 |

**Source: Natural England (March 2011)**

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

## 2. Landform, geology and soils

### 2.1 Elevation

The land ranges in height from 70 m to 676 m above sea level, the mean height being 359 m.

**Source: Natural England (2010)**

### 2.2 Landform and process

The upland massif comprises distinctively rounded hills of Silurian and Ordovician slates and gritstones, with steeply incised valleys. The area has a broad east-west escarpment to the north, rising above the Orton Fells, and separated from uplands to the west and east by steep-sided valleys which meet at Sedbergh to the south creating a broadly triangular outline. The hard rocks have resisted erosion, giving rise to distinctive smooth, rounded hills.

**Source: Howgill Fells Countryside Character Area profile**

### 2.3 Bedrock geology

The geology of the Howgill Fells is dominated by the turbidites of the Windermere Supergroup, a series of Ordovician and Silurian sediments resulting in a relatively complex series of sequences of sandstone, siltstone and mudstone. The hard rocks of the Howgill Fells all possess similar resistance to erosion, giving rise to the characteristic shapes of the fells. There is a narrow strip of Carboniferous Limestone along the north-east fringes of the NCA which is the edge of the Carboniferous Limestone belt which runs continuously through the Orton Fells to the Yorkshire Dales.

**Source: Natural England (2010)**

### 2.4 Superficial deposits

Superficial deposits (largely Diamicton) are confined to the lower ground on approximately 40 per cent of the NCA area; there is some glacial clay (till) in the valleys and along the lower part of the northern escarpment, with peat locally present, including on high areas.

**Source: Natural England (2010)**

### 2.5 Designated geological sites

| Designation | Number |
|---|---|
| Geological Site of Special Scientific Interest (SSSI) | 3 |
| Mixed interest SSSI | 1 |

There are 7 Local Geological Sites within the NCA.

**Source: Natural England 2011**

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

### 2.6 Soils and Agricultural Land Classification

The main soil types of this NCA (those covering 10 per cent or more of the NCA area) are: very acid loamy upland soils with a wet peaty surface (32 per cent), freely draining slightly acid loamy soils (19 per cent), slowly permeable seasonally wet acid loamy and clayey soils (15 per cent), and blanket bog peat soils (12 per cent). The peat of the very acid loamy upland soils has low strength when wet and is easily damaged, and the blanket bog peat soils are vulnerable to losing organic matter through drying out and erosion. The freely draining slightly acid loamy soils allow water infiltration and have potential for increased levels of organic matter through management

interventions. The slowly permeable seasonally wet acid loamy and clayey soils may suffer compaction as easily damaged when wet, impeding infiltration and creating potential for diffuse pollution from surface water run-off. These soils support upland heath, acidic grassland, or relic heathy vegetation, for example bracken. The majority of the NCA is upland massif which provides the poorest quality agricultural land (Grade 5), with land on the lower moorland fringe of slightly better Grade 4, and a small area of moderately good Grade 3 land around Sedbergh.

**Source: National Soil Resources Institute Soilscapes Maps**

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

| Agricultural Land Classification | Area (ha) | % of NCA |
|---|---|---|
| Grade 1 | 0 | 0 |
| Grade 2 | 0 | 0 |
| Grade 3 | 229 | 2 |
| Grade 4 | 1,475 | 14 |
| Grade 5 | 8,656 | 84 |
| Non-agricultural | 0 | 0 |
| Urban | 0 | 0 |

**Source: Natural England (2010)**

- Maps showing locations of statutory sites can be found at: http://magic.defra.gov.uk/website/magic/ - Select 'Landscape' (shows ALC 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 Rawthey | 13 |
| River Lune | 3 |

**Source: Natural England (2010)**

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

As an upland watershed, the drainage of the Howgill Fells NCA exhibits a radial pattern of upland streams flowing outwards to lower ground. These flow north and westwards into the Lune catchment, which 'contains' the upland on these sides, and east and southwards into the Rawthey valley, a strong landscape feature bounding the NCA here.

### 3.2 Water quality

The total area of Nitrate Vulnerable Zone is 0 ha.

**Source: Natural England (2010)**

### 3.3 Water Framework Directive

Maps are available from the Environment Agency showing current and projected future status of water bodies at: http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e

## 4. Trees and woodlands

### 4.1 Total woodland cover

The NCA contains 157 ha of woodland (2 per cent of the total area), of which 44 ha is ancient woodland.

**Source: Natural England (2010)**

### 4.2 Distribution and size of woodland and trees in the landscape

The area has very limited tree cover although there are some blocks of coniferous woodland on the lower slopes near Sedbergh. Trees are prominent around villages and farmsteads and along watercourses, in particular within the Rawthey valley.

**Source: Howgill Fells Countryside Character Area description**

### 4.3 Woodland types

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

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

| Woodland type | Area (ha) | % of NCA |
|---|---|---|
| Broadleaved | 144 | 1 |
| Coniferous | 5 | <1 |
| Mixed | 5 | <1 |
| Other | 3 | <1 |

**Source: Forestry Commission (2011)**

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

| Type | Area (ha) | % of NCA |
|---|---|---|
| Ancient semi-natural woodland | 42 | <1 |
| Ancient re-planted woodland (PAWS) | 2 | <1 |

**Source: Natural England (2004)**

## 5. Boundary features and patterns

### 5.1 Boundary features

Pastures are bounded by stone walls and hedges, and confined to the lower areas, whilst the higher areas and moorland are largely unenclosed.

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

### 5.2 Field patterns

Largely unenclosed moorland. Irregular pattern of fields on lower ground around the fells, particularly towards Orton Fells NCA in the north, to the east, and south around Sedbergh. Fields vary in size from small, to large intakes from the moors, known as allotments.

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

**Hedgerows and boundary trees provide landscape and biodiversity interest and habitat connectivity.**

## 6. Agriculture

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

### 6.1 Farm type

In 2009, 32 of the 39 commercial holdings within this NCA were classed as livestock grazing in the uplands or LFA (Less Favoured Areas), with small numbers classified as dairy and 'other'.

**Source: Agricultural Census, Defra (2010)**

### 6.2 Farm size

39 per cent of holdings are over 50 ha in size and account for 77 per cent of the agricultural area. Most of the remaining area is in the 49 per cent of holdings of between 20 and 50 ha. Note that the data does not include common or shared grazing.

**Source: Agricultural Census, Defra (2010)**

### 6.3 Farm ownership

2009: Total farm area = 1,853 ha; owned land = 1,079 ha
2000: Total farm area = 2,016 ha; owned land = 1,329 ha.

**Source: Agricultural Census, Defra (2010)**

### 6.4 Land use

The predominant agricultural land use is upland livestock grazing, and 98 per cent of the area of farm holdings is grass and uncropped land.

**Source: Agricultural Census, Defra (2010)**

### 6.5 Livestock numbers

Total stock numbers reduced between 2000 and 2009: from 27,600 sheep and 1,500 cattle down to 22,800 sheep and 800 cattle.

**Source: Agricultural Census, Defra (2010)**

### 6.6 Farm labour

In 2000 there were 74 principal farmers and 15 casual/gang staff (data was not available for part time or full time labour). By 2009 this number had reduced to 58 principal farmers and 10 part-time workers (no data available for full time workers).

**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.**

**Southern Howgills from Firbank area with open unenclosed uplands contrasting with irregularly enclosed lower slopes and scattered field barns.**

## 7. Key habitats and species

### 7.1 Habitat distribution/coverage

The Howgill Fell forms an extensive block of upland heath, and contributes to an extensive heathland network across northern England, extending from the Lakeland peaks into the Yorkshire Dales and North Pennines. The fringing valleys of the Rawthey and Lune contribute to a less well-developed woodland network extending north-south through the northern parts of Lancashire. Acidic grassland dominated by mat-grass is the most abundant habitat with the lower slopes dominated by bracken. Heather is likely to have been much more widespread in the past but today there are only remnants. Springs and flushes on the lower slopes are the most diverse habitats. Upland hay meadows in the valleys are fragmented.

**Source: Cumbria Fells and 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; **http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/englandsbiodiversitystrategy2011.aspx**

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

| Priority habitat | Area (ha) | % of NCA |
|---|---|---|
| Upland heathland | 767 | 7 |
| Blanket bog | 99 | 1 |
| Broadleaved mixed and yew woodland | 67 | 1 |
| Fens | 58 | 1 |
| Upland calcareous grassland | 31 | <1 |
| Upland hay meadow | 22 | <1 |
| Lowland meadow | 20 | <1 |
| Purple moor grass and rush pasture | 18 | <1 |
| Limestone pavement | 5 | <1 |
| Lowland dry acid grassland | 1 | <1 |

**Source: Natural England (2011)**

Maps showing locations of priority habitats are available at

- **http://magic.defra.gov.uk/website/magic/** select 'Habitat Inventories'

### 7.3 Key species and assemblages of species

- Maps showing locations of priority habitats are available at: **http://magic.defra.gov.uk/website/magic/**
- Maps showing locations of S41 species are available at: **http://data.nbn.org.uk/**
- Information on Key Species Interest Zones is available from the Cumbria Biodiversity Data Centre.

## 8. Settlement and development patterns

### 8.1 Settlement pattern

The area has few settlements due to the inaccessible and exposed landform. There are limited numbers of small hamlets and farmsteads contained within the valleys.

**Source: Howgill Fells Countryside Character Area description; Countryside Quality Counts (2003)**

### 8.2 Main settlements

The main town is Sedbergh, which lies in the southern part of the NCA. Villages, which lie at the foot of the fells on the boundary of the NCA, include Tebay, Newbiggin-on-Lune, Gaisgill, Ravenstonedale and Cautley. The total estimated population for this NCA (derived from ONS 2001 census data) is: 1,582.

**Source: Howgill Fells Countryside Character Area description; Countryside Quality Counts (2003)**

### 8.3 Local vernacular and building materials

Traditional materials used are gritstone or sandstone with flagged roofs.

**Source: Howgill Fells Countryside Character Area description; Countryside Quality Counts (2003)**

Packhorse bridge.

## 9. Key historic sites and features

### 9.1 Origin of historic features

Although cleared of woodland in antiquity, and long used for grazing, the inhospitable nature of the Howgill Fells has largely precluded any permanent or semi-permanent settlement above the lower sides and floors of the river valleys. The fells have been used since prehistoric times for summer grazing, peat, heather and bracken. Medieval trackways and shielings can be found in many places, especially on the lower western slopes of The Calf and Langdale Fells. Within the valleys there is a low density of small farming hamlets and isolated farmsteads, some dating from the establishment (in the 12th and 13th centuries) and letting (from the 14th century) of vaccaries (stock farms). Within the NCA there is a medium-high concentration of pre-1750 farmstead buildings, two-storey combination barns and isolated field barns being the predominant building type. There is a concentration of 17th and 18th century farm buildings along the Lune Valley to west and northern edge of the NCA.

**Source: Countryside Quality Counts Draft Historic profile, Countryside Character Area description**

### 9.2 Designated historic assets

This NCA has the following historic designations:

- 0 Registered Parks and Gardens covering
- 0 Registered Battlefields
- 2 Scheduled Monuments
- 119 Listed Buildings

**Source: Natural England (2010)**

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

## 10. Recreation and access

### 10.1 Public access

- 78 per cent of the NCA (8,135 ha) is classified as being publically accessible. This high level of public access is due to the fact that much of the land area is moorland/common, the majority of which is open access land.
- There are 175 km of public rights of way at a density of 1.7 km per km$^2$.
- There is 1 National Trail (The Pennine Bridleway), routed along the north of the Howgill Fells.

**Source: Natural England (2010)**

**Northern Howgills, 'the sleeping elephants', from Muddygill Plain in Orton Fells.**

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

| Access designation | Area (ha) | % of NCA |
|---|---|---|
| National Trust (accessible all year) | n/a | n/a |
| Common Land | 7,931 | 77 |
| Country Parks | n/a | n/a |
| CROW Access Land (Section 4 and 16) | 7,890 | 76 |
| CROW Section 15 | 582 | 6 |
| Village Greens | n/a | n/a |
| Doorstep Greens | n/a | n/a |
| Forestry Commission Walkers Welcome Grants | 6 | <1 |
| Local Nature Reserves (LNR) | n/a | n/a |
| Millennium Greens | n/a | n/a |
| Accessible National Nature Reserves (NNR) | n/a | n/a |
| Agri-environment Scheme Access | n/a | n/a |
| Woods for People | 3 | <1 |

**Sources: Natural England (2011)**

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

## 11. Experiential qualities

### 11.1 Tranquillity

Based on the CPRE map of tranquillity (2006) the majority of this upland NCA is very tranquil, with lower tranquillity experienced on the lower periphery, around the town of Sedbergh and associated with the A683 on the eastern side of the massif.

**Carlin Gill / Lune Gorge, steep-sided gills important for their active fluvial geomorphology.**

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

| Category of tranquillity | Score |
|---|---|
| Highest | 48 |
| Lowest | -33 |
| Mean | 21 |

**Sources: CPRE (2006)**

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

### 11.2 Intrusion

The 2007 Intrusion Map (CPRE) shows the extent to which rural landscapes are 'intruded on' from urban development, noise (primarily traffic noise), and other sources of visual and auditory intrusion. This shows that there is some intrusion from the transport corridor along the Lune Valley to the west of the NCA. A breakdown of intrusion values for this NCA is detailed in the following table.

| Intrusion category | 1960s (%) | 1990s (%) | 2007 (%) | Percentage change (1960s-2007) |
|---|---|---|---|---|
| Disturbed | n/a | 10 | 5 | 5 |
| Undisturbed | 100 | 90 | 95 | -5 |
| Urban | n/a | n/a | n/a | n/a |

**Sources: CPRE (2007)**

Notable trends from the 1960s to 2007 are that there is very little change in the level of intrusion in this area.

- More information is available at the following address: **www.cpre.org.uk/campaigns/planning/intrusion/our-intrusion-map-explained**

## 12. Data sources

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

Please note all figures contained within the report have been rounded to the nearest unit. For this reason proportion figures will not (in all) cases add up to 100 per cent. 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

- There is evidence of some limited recent uptake of the English Woodland Grant Scheme for new planting since 1999, especially of ash, but only a very small proportion of woodland is under active management.
- Stakeholders consulted by the Forestry Commission have identified potential to increase woodland cover from 1.5per cent to 7.4per cent.
- Recent agri-environment schemes have included some significant areas of new woodland and gill planting, especially on the fringes of Tebay Common.
- There has been little management or replanting of the distinctive copses of shelter planting (largely of sycamore, ash and beech) around farmsteads and villages, which are now largely mature and at risk of loss.

### Boundary features

- The estimated length of boundaries for the entire NCA is only around 400 km. In recent years, there has been some loss of boundary features and decline in condition, particularly the replacement of hedges by wire fencing and dereliction of walls, affecting landscape character locally.
- Uptake of linear feature restoration options under Countryside Stewardship and Environmentally Sensitive Areas Schemes remained proportionately lower than the national average until 2005 at around only 5 per cent. However, between 1997 and 2003, significant amounts of sheep fencing was erected under the Countryside Stewardship scheme, including nearly 4 km of fencing in 1999. This had a noticeable effect on landscape character locally. Since 2004, schemes have largely included hedgerow restoration, hedgerow management and stone wall restoration, with some top wiring of stone walls, and fencing has become less popular.

**Carlin Gill / Lune Gorge with steep-sided gills important for their active fluvial geomorphology; the M6 on the fringe of the NCA provides the only impact on the high levels of tranquillity found in the rest of the NCA.**

- Under the Environmental Stewardship scheme, walling restoration became a more popular capital works option, catching up with levels of hedgerow restoration.

- Through Environmental Stewardship, between 2005 and 2010, around 60 km of walling, 10 km of hedgerow and 4 km of woodland boundary have been brought under management, largely under Entry Level Schemes, but there remains significant scope for boundary restoration throughout the NCA.

### Agriculture

- Although they have now largely recovered, total sheep numbers remain 17 per cent lower than pre-foot and mouth disease, but cattle numbers have halved from pre-foot and mouth disease numbers. The decline in sheep numbers since 2001 has, however, been less marked than in surrounding upland NCAs, as there are relatively few upland Higher Level Stewardship agreements on the commons which make up most of this NCA.

- Farm sizes have increased since 2003 with around 40 per cent over 50 ha by 2010, up from only 25 per cent in 2003. However, these figures do not include the extensive commons, so true grazing areas available to landholdings are higher than farm size indicates.

- Changes in agricultural practices in the valleys, notably the switch from hay-making to silage and haylage, along with increases in fertiliser application and re-seeding of pasture, have led to a significant decline in numbers and area of the previously locally distinctive northern species-rich hay meadows, especially on the limestone band along the northern fringe of the NCA, along the Rawthey valley and around Sedbergh.

### Settlement and development

- There has been very little change in levels of settlement and development throughout the NCA, with a few houses constructed in the fringe villages of Tebay and Ravenstonedale and in the town of Sedbergh in the last decade. Recent industrial and commercial development has been restricted to alongside the West Coast Main Line railway at Tebay Sidings and on the fringes of Sedbergh.

- The Sedbergh Conservation Area boundary was revised in 2010 and now excludes a large 1990s housing estate (which was given permission before the Conservation area was extended in 1988) as well as some other modern development.

**Southern Howgills from Firbank area, open unenclosed uplands contrasting with irregularly enclosed lower slopes.**

### Semi-natural habitat

- Stock levels on the high fells decreased significantly during the outbreak of foot and mouth disease in 2001, resulting in a temporary flowering of suppressed heathland and other upland species for a couple of years before sheep numbers recovered, although cattle numbers remain significantly lower at nearly half the pre-2001 number.

- Dwarf shrub heath is likely to have been far more extensive in the past, with acid grassland and bracken having spread significantly at the expense of upland heathland.

- Species-rich northern hay meadows have become far less frequent in the valleys, replaced by re-seeded mixtures of grasses such as rye grass, resulting in a loss of diversity of colour and texture and the development of bright green areas in valley bottoms.

- Purple moor-grass has become less frequent, with such pastures on lower slopes becoming dominated by rushes, particularly in the northern Howgills.

- While there have been improvements in the management of upland heath and other habitats in some areas, proportions of land under management for semi-natural habitat interest remain significantly lower than in surrounding areas of upland in the Cumbria High and Low Fells, the Orton Fells and the Yorkshire Dales.

### Historic features

- There is no hard data on recent change in historic features, either of condition or extent, apart from boundary features.

- Anecdotal evidence suggests that there has been some restoration of farm buildings in the area designated as the Yorkshire Dales National Park. Overall, however, the condition of field barns and other small-scale vernacular farm buildings has deteriorated in recent years and some have been lost, as they have lost their original uses and become abandoned.

- According to the Yorkshire Dales National Park Authority Landscape Character Assessment, historic agricultural and settlement features such as lynchets, ridge and furrow and earthworks are in places in declining condition, owing to changes in agricultural practice such as the re-seeding of permanent pasture. There has, however, been little recent exploration of the condition of non-scheduled archaeological features such as shielings, hut circles, pinfolds, and drove roads in this area, so no recent trends can be evidenced.

### Coast and rivers

- In 1995 the biological and chemical river water quality of the River Lune was predominantly classed as excellent and these high levels have been maintained in the parts of the River Lune which flow from the NCA.

- The way that water quality is assessed has, however, changed since 1995 and water quality is now classified as overall moderate in the stretch of the upper River Eden into which a small area of the NCA drains.[4]

- The extensive geological SSSI, designated for their active fluvial geology, are all now in favourable condition.

### Minerals

- The Howgill Fells is not subject to active mineral workings.

[4] The River Basin Management Plan for the Solway Tweed River Basin District, 2009-2015, Environment Agency and Natural Scotland

## Drivers of change

### Climate change

- Evidence from the UK Climate Impacts Programme (UKCP09) shows that over the coming century the Howgill Fells 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 degrees, mean summer temperatures will increase by 3.7 degrees, winter precipitation will increase by 16 per cent, summer precipitation will decrease by 22 per cent and there will be an increased frequency of extreme events (floods/droughts).

- Species tolerant of cold temperatures and winter drought on the highest summits may be outcompeted, for example, arctic alpine plants such as club mosses. Species limited by winter cold may expand, such as bracken.

- Areas of peat may dry out during prolonged droughts, increasing risks of local erosion and wildfires and resulting in loss of habitat, stored carbon and archaeological pollen records.

- Freshwater habitats may be affected by low flows. Increasing water temperatures and low flows may also result in deterioration of water quality, including increasing concentration of nutrients. Deterioration in water quality includes increasing colour and sediment load in any water abstracted for public and private supply.

- Plant communities in the northern hay meadows and species-rich verges may change slowly to resemble lowland hay meadows.

- More frequent and extreme weather events are likely to increase rates of erosion of river banks and the wider catchment, with impacts on the high fells and the in-bye land, downstream flood risk and increased siltation of river habitats on flatter land around the edge of the NCA. Increased rates of erosion could affect the SSSI designated for their fluvial geology.

- Increases in extreme storm events are already changing flood risk assessments, requiring increased flood risk management for settlements and to farmland. Semi-natural habitats will need to be expanded, buffered and linked to increase resilience to climate change impacts. Connecting habitats will be needed to enable movement of mobile species through the landscape in response to climate change.

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

**Carlin Gill / Lune Gorge showing acid grassland, bracken and small areas of heath.**

### Other key drivers

- Reform of the European Union Common Agricultural Policy and the Rural Development Programme for England in 2014 may offer reduced resources for funding environmentally sensitive farming practices.
- In order to maintain viable farm businesses, farmers may continue to move into diverse activities, including providing for tourism.
- Increasing age of hill farmers and lack of new entrants leading to potential loss of hill farming skills, continuity of commons grazing and active commons graziers.
- Farming may cease to be attractive to future generations with increasing capital costs of land and infrastructure.
- 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.
- There will be a need to promote the management of peatlands to store and sequester carbon, reduce erosion and enhance downstream water quality.
- Continued lack of maintenance of drystone walls, hedges and field barns could lead to deterioration and possible further loss and replacement by fencing.
- Continued lack of monitoring and management of unscheduled archaeological features such as pinfolds and shielings could lead to further losses in local landscape character.
- Lack of management of woodlands, especially upland ash woodlands as well as shelterbelts around settlements, could lead to their decline, which may be exacerbated by ash die-back disease.
- Development pressure is likely to remain low outside of Sedbergh, but with a continuing demand for affordable housing to meet the needs of local communities, and conversions of farm buildings to housing, some for second home use and some as holiday cottages.
- There have been recent increases in the numbers of people visiting the area for outdoor recreation, notably walking, cycling and horse riding, and visitor numbers are likely to increase.
- The proposed designation of the Northern Howgill Fells as National Park, if confirmed, would lead to changes in planning and access management.

Waterfall

# 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.

Packhorse bridge.

| Statement of Environmental Opportunity | Ecosystem Service | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Food provision | Timber provision | Water availability | Genetic diversity | Biomass provision | Climate regulation | Regulating water quality | Regulating water flow | Regulating soil quality | Regulating soil erosion | Pollination | Pest regulation | Regulating coastal erosion | Sense of place/ Inspiration | Sense of history | Tranquillity | Recreation | Biodiversity | Geodiversity |
| **SEO 1:** Conserve, enhance and restore the tranquil, open, unenclosed fells, with their dramatic seasonal colours and textures, mix of upland habitats and active fluvial features, for their national recreation value, their geomorphological interest and their biodiversity. Encourage quiet recreation focused on enjoyment and appreciation of these features, while improving water quality, reducing soil erosion and mitigating climate change. | ↔ * | ↔ ** | ↗ ** | ↗ ** | ↔ *** | ↗ ** | ↗ ** | ↗ ** | ↔ ** | ↑ ** | ↗ ** | ↔ * | n/a | ↗ *** | ↔ ** | ↔ ** | ↑ ** | ↑ ** | ↑ ** |
| **SEO 2:** Conserve and enhance the pastoral lower slopes and valleys with their complex of field patterns, hedges and drystone walls; their range of pasture types, including northern hay meadows, purple moor-grass, species-rich verges, woodlands, and waterside and boundary trees; and their dispersed farmsteads and villages, to conserve upland farming culture and to enhance landscape character and biodiversity. | ↗ * | ↗ ** | ↔ ** | ↗ ** | ↗ ** | ↗ ** | ↗ ** | ↑ ** | ↗ ** | ↑ ** | ↗ * | ↗ * | n/a | ↑ ** | ↑ *** | ↑ ** | ↑ *** | ↗ ** | ↗ ** |
| **SEO 3:** Conserve, enhance and manage the many watercourses through management of the farmed and semi-natural habitats to enhance their biodiversity, regulate soil erosion, regulate water flow and quality and enhance their recreation interest. Protect and conserve the important geology and fluvial geomorphology. | ↔ ** | ↗ ** | ↗ ** | ↔ ** | ↗ ** | ↑ ** | ↑ ** | ↑ ** | ↗ * | ↑ ** | ↗ * | ↗ * | n/a | ↗ ** | ↗ ** | ↗ ** | ↗ ** | ↗ * | ↑ ** |
| **SEO 4:** Conserve, restore and enhance the cultural and upland farming heritage of the area and the sandstone, gritstone and limestone vernacular built heritage, including intact farmstead layouts, bank and field barns and the archaeological heritage. Develop appropriate interpretation to ensure that these different types of heritage are fully understood and appreciated. | ↔ ** | ↔ ** | ↔ ** | ↔ ** | ↔ ** | ↔ ** | ↔ ** | ↔ ** | ↔ ** | ↔ ** | ↔ ** | ↔ * | 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 |
|---|---|
| **Highly distinctive massive, open and sweeping upland block of high, smooth, well-defined rounded ridges and dome-like summits, separated by long steep-sided deep valleys.** | ■ Open and extensive panoramic views are available from many places within the Howgill Fells, contributing to their sense of place and remoteness.<br>■ The southern half of the NCA is designated as National Park for its outstanding natural beauty and opportunities for open-air recreation and the northern half is proposed for National Park designation by Natural England.<br>■ The Howgill Fells NCA is also very important for views from all the surrounding upland landscapes which are also designated for their outstanding natural beauty, including the Lake District and Yorkshire Dales National Parks and North Pennines Area of Outstanding Natural Beauty. |
| **Steep, deep valley sides with springs and flushes, screes and some crags, and narrow, steeply-incised rocky gills, containing small, active streams of a 'flashy' nature, with distinctive fluvial features.** | ■ The area is important nationally for its active fluvial geology, with four extensive geological SSSI containing a range of active fluvial features including active erosion sites, alluvial fans and waterfalls. Relatively recent erosion is evident on some of the steeper slopes.<br>■ The upper stretches of the River Lune alongside the NCA are important for salmon fishing and spawning.<br>■ Part of the NCA drains into Scandal Beck, a designated Site of Special Scientific Interest (SSSI), which in turn drains into the River Eden, a Special Area for Conservation (SAC).<br>■ Springs and flushes form the most diverse habitats on the high fells. |
| **Very limited tree cover, with remnant gill woods, wood pasture and small woodlands, boundary trees and waterside trees on lower slopes and along river valleys.** | ■ The small woods and copses form part of a discontinuous woodland network extending north-south into northern Lancashire.<br>■ Around 1.5 per cent of the NCA is wooded with only 144 ha of broadleaved woodland.<br>■ The many boundary and waterside trees, shelterbelts and small woods are important to current landscape character in the fringes and river valleys of the area, where other woodland is so limited in extent, creating a more wooded appearance in many places than woodland cover levels suggest.<br>■ Only 42 ha of ancient woodland survive. |

| Landscape attribute | Justification for selection |
|---|---|
| **A pastoral landscape, the high unenclosed common land is covered by poorly-drained acid grassland and bracken, with some small remnant areas of upland heath that is heavily grazed by sheep.** | ■ More than three-quarters of the NCA is common land, with a very long and historic pattern of grazing rights for sheep, cattle and ponies/horses.<br>■ The area is important for livestock production and currently carries nearly 23,000 sheep and 800 cattle.<br>■ The NCA forms an important part of an extensive upland heathland network across Northern England, as it provides a continuous link between the Lake District and the Yorkshire Dales and North Pennines. The heathland is considered to have been previously more extensive.<br>■ Matgrass reflects light at certain times of year giving the area a characteristic golden glow much appreciated by some visitors and artists.<br>■ The distinctive Rough Fell breed of sheep is commonly found in the Howgill Fells and nearby parts of the Orton Fells and Cumbria Low Fells It is a large, hardy, mountain breed well suited to conditions in the area.<br>■ The area also supports a large population of Fell Ponies and Swaledale Sheep. |
| **Lower slopes support rough, rushy pasture and some improved grassland, offering relatively poor quality grazing with some remnant species-rich verges, purple moor-grass and northern hay meadows; the most diverse habitats are the springs and flushes.** | ■ The area has relatively few SSSI for biodiversity and there is scope for restoration of species diversity to swards in some areas, potentially expanding from the few remaining areas of diverse flora.<br>■ There are several priority habitats currently present on the lower slopes including upland and lowland meadows, upland calcareous grassland, purple moor-grass and rush pasture.<br>■ Many stretches of verges have been identified as species-rich and have benefited from targeted management by Cumbria County Council over a number of years. |
| **Small, mostly irregular-shaped fields, on lower ground bounded by drystone walls and hedges with straight-edged fields on the higher valley sides.** | ■ The differences in colour between the open unenclosed common land and the enclosed lower fringing slopes and improved pasture give texture and contrast to the area.<br>■ The hedges and drystone walls give a time depth to an area which is otherwise lacking in obvious archaeological features apart from drove roads, and scattered settlements, pinfolds, wash-folds and shielings, mostly on the slopes towards Sedbergh and around the periphery of the NCA.<br>■ Scheduled Ancient Monuments are restricted to a Roman fort and associated remains in the Lune Gorge at Low Borrowbridge, and a motte-and-bailey castle in Sedbergh. |

| Landscape attribute | Justification for selection |
|---|---|
| **A notable absence of settlement in the upland core, with isolated vernacular farmsteads and hamlets restricted to the lower fringing slopes and valleys, and small, isolated flag-roofed field barns on some valley slopes.** | ■ The only significant settlement is the small market town of Sedbergh whose character is strongly influenced by the extensive parkland and buildings of its public school.<br>■ Strong local vernacular style using local stones such as gritstone and sandstone, with distinctive stone window and door surrounds and stone-flagged or Westmorland slate roofs.<br>■ An exceptionally high survival of traditional farmsteads with little change to their traditional form. Two-storey combination barns, bank barns and isolated field barns are important local features.<br>■ The population is extremely low, estimated at around 1,500 and is largely confined to Sedbergh and two small villages alongside the northern boundary of the NCA.<br>■ There is a higher than average proportion of 18th- and 19th-century buildings, with 119 Listed Buildings in this small NCA despite its low level of settlement.<br>■ There is one Conservation Area in the NCA (in Sedbergh) and another on its boundary at Ravenstonedale. |
| **A strong sense of tranquillity, remoteness and apparent wildness, with low levels of intrusion and light pollution.** | ■ The Campaign to Protect Rural England (CPRE) Rural Intrusion Map (2007) shows that 95 per cent of the area is classed as undisturbed, the 5 per cent of disturbed land being confined to Sedbergh and the areas alongside the roads around the edge of the NCA.<br>■ The CPRE Map (2006) shows very high levels of tranquillity throughout the NCA apart from along the main roads around its periphery and in Sedbergh.<br>■ The unenclosed nature of the higher ground contributes significantly to the high levels of remoteness and apparent wildness experienced.<br>■ Lack of settlement means the NCA has very dark night skies away from the settlements and roads on its extreme periphery. |
| **Extensive open access land and a network of paths providing high quality opportunities for open-air recreation and a range of cultural and artistic associations.** | ■ Opportunities for walking, riding, cycling, mountain biking, fishing, hang gliding, paragliding and photography.<br>■ Open access land comprises nearly 80 per cent of the NCA owing to the very extensive commons.<br>■ 175 km of public rights of way at a density of 1.7 km per km2.<br>■ The Pennine Bridleway National Trail passes along the north of the Howgill Fells.<br>■ The area has been the subject of poetry by William Wordsworth, and has been much painted, particularly recently, by artists such as Alan Stones. There are also many guide books to the area including one by Alfred Wainwright which have led to an increase in use in recent years. |

## Landscape opportunities

- Protect, manage and restore remnant heath and blanket bog on high ground to increase connectivity of the heathland network and enhance biodiversity.
- Manage grazing of priority habitats at levels that will encourage good ecological condition and maintain or enhance diversity of plant communities.
- Protect the open, unenclosed common land to retain the panoramic, uninterrupted views both from the Howgill Fells and into the NCA from surrounding nationally designated landscapes, as well as the ability to walk without hindrance for miles, supporting forms of quiet open-air recreation which benefit from and value the high quality of the landscape and natural environment in this NCA.
- Protect the strong sense of apparent wildness, remoteness and tranquillity by controlling development and use of night time lighting, especially on the higher fells.
- Increase levels of woodland and tree cover and restore and encourage management of existing gill and other broadleaved woodlands and wood pasture, ideally through natural regeneration or locally-sourced and grown-on seed, especially on lower slopes which are covered with bracken and thus have suitable soil, and also in the lower river valley areas, to increase woodland connectivity and biodiversity, to reduce soil erosion and improve water quality and landscape interest and to encourage re-establishment of iconic species such as black grouse.
- Encourage management and replanting of boundary trees on enclosed land on the lower slopes and along river valleys and encourage restoration of areas of remnant parkland-type planting to maintain well wooded appearance on lower ground.
- Restore and replant mature shelterbelts around farmsteads and villages using traditional species such as sycamore, oak and ash to ensure retention of these traditional features.
- Encourage more sympathetic management of existing coniferous blocks to develop softer edges which follow the landform rather than hard straight edges. Increase the proportion of broadleaved species and enhance the ground flora.
- Encourage the retention of locally distinctive grazing stock such as Fell ponies and Rough Fell sheep which contribute to landscape character.
- Maintain the high-quality of the watercourses so they continue to provide key habitats, features and opportunities for fishing and wildlife watching, protecting springs and flushes as well as fluvial features of geological interest.
- Encourage the agricultural practice of hay-making to maintain and enhance the remaining species-rich meadows. Encourage restoration of hay-making to suitable meadows to increase biodiversity and connectivity of the remnant hay meadows.

- Maintain appropriate management of species-rich verges to ensure these local features are retained in the landscape and encourage volunteer surveys to establish whether management remains appropriate.

- Restore purple moor-grass pastures where conditions are appropriate to increase connectivity of this fragmented habitat.

- Maintain walls and hedgerows where in good condition and restore or re-create both walls and hedges using local stone and hedging styles where condition has declined or where they have been replaced by fencing, to maintain habitat connectivity and cultural influence of farming patterns in the landscape and encourage a reduction in levels of replacement by fencing.

**Fast flowing beck and upstream landslips.**

- Protect both Scheduled and non-scheduled archaeological features where known, including features such as drove roads, settlements, shielings, pinfolds and vernacular bridges and encourage more survey and recording of features.

- Ensure on-farm developments respect the original form, style and materials of adjacent farmsteads, retaining and encouraging restoration, using appropriate local materials, of field barns and other farm buildings such as bank barns which no longer serve their original purpose, along with historic settlement and field patterns which reflect the geology and cultural history of upland farming and its distinctive practices.

- Encourage sympathetic conversions of buildings and new development in the town of Sedbergh and nearby villages of Ravenstonedale, Newbiggin-on-Lune and Tebay which respects the particular character, vernacular styles and materials of each.

- Provide easily accessible sites of wildlife, historical and geological interest for both educational and public use.

- Encourage appropriate interpretation of the highly distinctive qualities of the landscape, the importance of its fluvial geology and its cultural associations, particularly the important Roman route passing through the NCA along the Lune valley, and its associated remains, to improve people's understanding and enjoyment of the history and time depth of the area.

- Encourage volunteers to undertake tasks such as surveying and conserving the wildlife, historical, cultural and geological interest of the area to increase enjoyment and understanding of its qualities.

## Ecosystem service analysis

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
|---|---|---|---|---|---|---|
| **Food provision** | Upland livestock rearing, including hardy sheep breeds<br><br>Soils | 32 of the 39 commercial holdings are classed as livestock grazing with a small number of dairy and 'other'.<br><br>In 2009 there were over 27,000 sheep and 800 cattle.<br><br>Over 80 per cent of the NCA is classed as Grade 5 agricultural land, with 14 per cent Grade 4 and only 2 per cent Grade 3. | Regional | Owing to the high altitude, cool temperatures and high rainfall, there are severe constraints on the types of agricultural practice that are viable.<br><br>Numbers of both sheep and cattle were much reduced by the outbreak of foot and mouth disease (FMD) in 2001. Sheep numbers have largely recovered but cattle remain at around half the pre-FMD number.<br><br>There may be some scope to increase numbers of cattle, particularly summer grazing, on the high commons, although any increase in slurry and manure would need to be managed to avoid impacts on water quality in the many becks, streams and rivers. Hardy beef cattle could have a beneficial effect on grazing the upland vegetation as they are non-selective grazers.<br><br>Stocking levels would need to be carefully monitored to encourage good ecological condition of upland heath and to avoid poaching on wet soils or erosion of river banks that could cause a reduction in water quality.<br><br>Promotion of local brand meats, such as Rough Fell sheep and traditional beef breeds, could support local farming as well as sustainable agricultural practice and semi-natural habitats.<br><br>Swaledale sheep play an important role in UK farming as the breed of dam used to produce fertile 'mule' sheep when crossed with a blue-faced Leicester ram. | Encourage sustainable mixed grazing on the commons by grazing hardy beef cattle with the Swaledale and Rough Fell sheep and Fell Ponies to ensure good ecological condition, and ideally, expansion of upland heath, and to reduce the spread of bracken.<br><br>Encourage the uptake of agri-environmental schemes to support sustainable livestock production, including management of meadows to produce hay, to protect remaining hay meadows and enhance the species-richness of neighbouring pastures, increasing connectivity of this highly fragmented habitat.<br><br>Promote best practice in food production and farm waste management to reduce impacts on the natural environment, soils and water resources.<br><br>Promote local brand meats to ensure upland farming systems remain viable. | **Food provision**<br><br>**Sense of place/ inspiration**<br><br>**Regulating water quality** |

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
|---|---|---|---|---|---|---|
| **Timber provision** | Gill woodland<br><br>Small broadleaved woods and wood pasture<br><br>Shelterbelts and copses around farmsteads and settlements<br><br>A few small conifer plantations, particularly on the southern fringing slopes of the NCA | There is very little woodland, with around 144 ha representing around 1.5 percent cover. Some remnant gill woods of birch, hawthorn, rowan, ash and alder cling to the slopes and small copses and broadleaved woodlands, mostly ash, oak and sycamore occur along the fringing river valleys. There are small areas of remnant wood pasture along the slopes above the Rawthey valley, mostly of hazel, hawthorn, blackthorn, birch and bird cherry.<br><br>A few small coniferous plantations occur, particularly above Sedbergh.<br><br>In places the lower slopes give an appearance of a more wooded nature than is the case, owing to large numbers of mature waterside and boundary trees and areas of park-like planting, particularly around Sedbergh. | Local | With woodland so restricted, there is very little woodland industry in the NCA and there has been little management of the existing areas of woodland. The existing woodlands, field trees and shelterbelts could be managed more effectively to produce some limited timber and wood fuel for local use.<br><br>Given the extensive stands of bracken on the slopes of the fells, there are areas of soils suitable for upland woodland tree growth, but given the severe conditions of steep slopes, screes, high rainfall and low fertility, conditions for commercial tree growth are relatively poor in much of the NCA, thus limiting the potential for commercial forestry to the more gentle slopes and valleys. | Expand, restore and encourage management of small-scale woods such as the gill woodlands, wood pasture and shelterbelts for local timber use and wood fuel, and encourage expansion, especially on slopes which are covered with bracken and thus have suitable soil, and also in the lower river valley areas, away from features of historic, geological or biodiversity interest.<br><br>Encourage planting and management for local timber production of waterside and boundary trees, on enclosed land and along river valleys, and encourage restoration of areas of park-like planting to maintain well-wooded appearance on lower ground.<br><br>Encourage sympathetic management of the existing coniferous blocks through thinning, selective felling and re-shaping, to develop open glades and softer edges which follow the landform, and increase the proportion of broadleaved species and enhance the ground flora. | **Timber provision**<br><br>**Regulating soil erosion**<br><br>**Regulating soil quality**<br><br>**Sense of place/ inspiration**<br><br>**Biodiversity** |

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
|---|---|---|---|---|---|---|
| **Water availability** | Many fast flowing streams feeding into the Rivers Lune and Rawthey and a tributary of the Eden<br><br>High rainfall | The vast majority of the NCA drains into the Rivers Lune and Rawthey (which in turn joins the River Lune at the Southern tip of the NCA). A small area in the north-east of the NCA drains into the River Eden via Scandal Beck. The NCA does not overlay any major aquifers.<br><br>The area has a high rainfall and a very low population and is a major exporter of water to the River Lune and a minor exporter of water to the River Eden.<br><br>The upper parts of the Rivers Lune and Rawthey within the NCA have 'no water available'.[5]<br><br>Major abstractions from the River Lune, including industrial abstractions near Lancaster, occur downstream of the NCA.<br><br>The River Eden and its tributaries are designated as a Special Area of Conservation (SAC) for its freshwater habitats. | Regional | The limited abstraction from the River Lune within the NCA occurs for agriculture.<br><br>The catchment of the River Eden is a major source of potable water for Carlisle, but abstractions are at the downstream end of the river in the Eden NCA north of the Howgill Fells, and the proportion of its catchment that falls within the Howgill Fells NCA is tiny.<br><br>Blanket bog peat soils cover around 10 per cent, generally on the highest ground, however the area has not been subject to extensive gripping and slopes are very steep, so there is little real scope to increase water infiltration through hydrological restoration, though there is scope to increase variety of vegetation structure to reduce overland flow. | Ensure any further abstraction is carefully controlled to avoid having an impact on the international biodiversity interest of the tributaries of the River Eden, and on the very limited resources available from the River Lune.<br><br>Ensure that the areas of upland heath and blanket bog are subject to sustainable and diverse grazing regimes (including cattle) which encourage good ecological condition and improve the interception and retention of rainwater. | **Water availability**<br><br>**Regulating water quality**<br><br>**Regulating water flow**<br><br>**Regulating soil quality**<br><br>**Regulating soil erosion**<br><br>**Sense of place/ inspiration**<br><br>**Biodiversity** |

[5] The Lune Catchment Abstraction Management Strategy, Environment Agency (March 2004; URL: www.environment-agency.gov.uk/business/topics/water/119927.aspx)

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
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| **Genetic diversity** | Fell Ponies<br><br>Rough Fell Sheep | Large proportions of the NCA are grazed by locally distinctive breeds such as the Swaledale Sheep, Fell Pony and the Rough Fell Sheep.<br><br>The Rough Fell Sheep breed in particular has a limited distribution, the breeding population being largely confined to this NCA and nearby parts of the Orton Fells and South Cumbria Low Fells.<br><br>The area used to support a much higher population of cattle, including dairy shorthorn and Galloway, which were once the preferred breeds in the area and were well suited to the local conditions. | Regional | The Swaledale Sheep, the Fell Pony and the Rough Fell Sheep are northern breeds, bred to tolerate the extreme conditions, the poor grazing and to thrive on the rugged fell habitats while also maintaining the semi-natural habitat.<br><br>Limited distribution of the Rough Fell Sheep increases its vulnerability. Their presence on the Howgill Fells is a locally distinctive feature contributing to the ability to read the farming heritage of the area in the landscape.<br><br>The herds of Fell Ponies which graze the area are a hardy northern breed, found mostly in Cumbria, and have been a distinctive feature on the Howgill Fells for a very long time.<br><br>Swaledale Sheep, grazed throughout the NCA, play an important role in UK farming, as the breed of dam used to produce fertile 'mule' sheep when crossed with a blue-faced Leicester ram.<br><br>There is scope to increase current numbers of cattle to improve diversity of grazing on the fells and an opportunity to reintroduce traditional cattle breeds such as Dairy Shorthorn and Galloway. | Encourage the Rough Fell Breeders Association in its attempts to raise the profile of the breed and to develop a market for its meat.<br><br>Support genetic diversity and distinct populations of priority species and breeds.<br><br>Encourage the re-introduction of traditional cattle breeds such as Dairy Shorthorn and Galloway to diversify the grazing regime of the commons. | **Genetic diversity**<br><br>**Sense of place/ inspiration**<br><br>**Sense of history** |

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| **Biomass energy** | Existing woodland | There is about 1.5 per cent woodland cover and most woods are small and dispersed.<br><br>The area has low potential for short rotation coppice except along the river valley near Sedbergh where potential yield is locally high.<br><br>Potential miscanthus yield is also generally low, apart from a limited area along the valley floor of the River Rawthey. | Local | The low level of woodland cover offers very limited potential for biomass, either through bringing unmanaged woodland under management, or as a by-product of commercial timber production. There may be some very limited potential for wood fuel from existing woodlands or new woodland planned for the area through Environmental Grant Schemes.<br><br>Planting of short rotation coppice or miscanthus would be likely to be obtrusive and highly conspicuous, out of character in a sensitive area within a National Park. It is considered that there is little or no opportunity for the landscape to accommodate biomass crops without significant adverse impact. Detailed information on the potential landscape impacts of biomass plantings within the NCA is available from the Natural England website.[6] Also the area is nearly all permanent pasture and such cropping is more akin to arable farming, which does not occur in this NCA. | Encourage management of gill and other broadleaved woodlands, wood pasture and shelterbelts and the planting of new broadleaved woodland in suitable locations, to increase production of biomass/wood fuel for local use. | **Biomass energy**<br><br>**Timber provision**<br><br>**Climate regulation**<br><br>**Regulating soil quality** |

[6] URL: www.naturalengland.org.uk/ourwork/farming/funding/ecs/sitings/areas/default.aspx

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
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| **Climate regulation** | Woodlands<br><br>Peaty soils | Soil carbon levels are generally high (20–50 per cent) associated with extensive moorland and the peaty soils found across this upland area.<br><br>40 per cent of the area is covered with peaty soils.<br><br>Blanket bog is only present in around 10 per cent of the NCA. | Regional. | Peaty soils with low strength are vulnerable to damage through drying out and erosion as well as losing organic matter if the climate becomes drier.<br><br>Owing to the very steep slopes, the majority of blanket bog could not easily be managed to have active peat-forming surfaces, so there is little realistic scope for a significant increase in carbon sequestration through expansion of blanket bog area. The existing blanket bog has not been subject to gripping. There is some scope to restore active blanket bog species and structure through appropriate grazing management.<br><br>The area also contains extensive SSSI (around 18 per cent) which are designated for their active fluvial geology, so measures to encourage or maintain good vegetative cover, increase soil carbon or reduce erosion will only be appropriate outside the designated areas and any areas which actively contribute to the interest features within the SSSI.<br><br>Increase in summer temperatures and drought could affect the many becks, streams and rivers, reducing water quality and giving rise to stressful conditions for fish species including the important local salmon stocks.<br><br>The high levels of soil carbon are as a result of the extensive semi-natural habitats and permanent grassland.<br><br>Extensive grazing systems and low input techniques on enclosed farmland on the lower slopes would avoid soil compaction and reduce use of artificial fertilisers, both of which release nitrous oxide.<br><br>Expansion of woodland cover would increase carbon sequestration on lower slopes and in the farmland around Sedbergh, although woodland location and design would need to be carefully considered to avoid impact on areas of geological, archaeological or biodiversity interest and to integrate them into the landscape. | Outside the geological SSSI, manage upland heath, acid grassland and blanket bog to encourage good ecological condition, high levels of vegetation cover and active peat formation where conditions allow.<br><br>Encourage expansion of gill woodland on steep gills, and small woods and shelterbelts on lower slopes where soils are suitable and around villages and settlements, avoiding any areas of geological, archaeological or biodiversity interest in order to reduce soil erosion and increase soil carbon and biodiversity.<br><br>On lower enclosed ground, promote extensive grazing of pasture applying light applications of farmyard manure in preference to the use of artificial fertilisers where possible to encourage build-up of organic matter.<br><br>Seek opportunities to extend areas of semi-natural habitats under low input management. | **Climate regulation**<br><br>**Regulating water quality**<br><br>**Regulating water flow**<br><br>**Regulating soil erosion**<br><br>**Sense of place/ inspiration**<br><br>**Biodiversity** |

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| **Regulating water quality**<br><br>*Continued on next page* | Streams and rivers<br><br>Woodlands<br><br>Wetlands<br><br>Fell habitats<br><br>Permanent grasslands | The ecological state of the River Lune within the NCA is good while that of the River Rawthey is moderate; their chemical status is not assessed. The chemical status of groundwater underlying the NCA is poor although it does not form part of a major aquifer.[7]<br><br>The upper river Lune is a priority catchment under the England Catchment Sensitive Farming Programme, the target area covers the stretches of the Rivers Rawthey and Lune which lie in the NCA.<br><br>The River Eden has high quality water and the tributary in this NCA is in good ecological condition. The Eden is designated as a SAC for the wide range of ecological conditions which support a wide range of plant and animal communities.<br><br>The River Eden SAC is one of Defra's Priority catchments in response to Natura Protected Area requirements, where nutrient run-off from slurry and silage, sedimentation and leakage from septic tanks are threats to water quality. | Regional. | The NCA has a high level of rainfall and this, combined with the particularly steep fell sides, means that active soil erosion is present in this NCA, particularly along the gill watercourses. The possible increased frequency and intensity of rainfall events due to climate change would exacerbate this situation. However, there are extensive SSSI in the NCA designated specifically for their active fluvial geology, so measures to reduce soil erosion and sedimentation are only appropriate away from areas influencing the features of interest in these SSSI.<br><br>Away from the SSSI, erosion could be moderated by ensuring high levels of vegetative cover such as permanent grassland or woodland, to bind soils and reduce sediment erosion, particularly along watercourses.<br><br>Springs, flushes and mires which form the headwaters of the rivers and provide the most diverse habitats in the area can be vulnerable to over-grazing, poaching and use for watering livestock. They are also at risk from nutrients and sediments draining into them, threatening their biodiversity interest. This can be exacerbated where farm and other drains are directed into them.<br><br>On enclosed farmland careful soil management is needed to avoid compaction and other soil damage, for example by avoiding mechanised activities on wet soils and reducing risk of poaching through stock management. | Away from the geological SSSI, ensure appropriate grazing of fell habitats and valley pastures to encourage a well-vegetated sward to reduce run-off rates and erosion into river and streams.<br><br>Increase the area of native broadleaved woodland/scrub, targeted at areas of high risk of soil erosion away from the geological SSSI and features of biodiversity or archaeological interest and in appropriate locations such as gills, bracken beds and lower slopes.<br><br>Manage river banks to ensure a robust cover of vegetation, to reduce soil erosion, sedimentation and reduce poaching of riverbanks by stock, encouraging broadleaved woodland and scrub in places and reduction in grazing pressure where feasible.<br><br>Protect springs and flushes from damage by grazing livestock, modification to provide stock watering points, drainage or effluent.<br><br>Ensure river engineering works are carried out in an ecologically sensitive manner, enhancing opportunities for conservation and habitat management.<br><br>Manage semi-natural habitats including blanket bog to maintain good vegetative cover, avoiding exposure of peat and peaty soils to reduce risk of erosion by wind or rain. | **Regulating water quality**<br><br>**Regulating soil erosion**<br><br>**Regulating soil quality**<br><br>**Regulating water flow**<br><br>**Recreation**<br><br>**Biodiversity** |

[7] North West River Basin Management Plan, Environment Agency (December 2009; URL: www.environment-agency.gov.uk/research/planning/33106.aspx)

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
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| **Regulating water quality**<br><br>*Continued from previous page* | | | | Public, private and agricultural water supplies, fishing and biodiversity all require good water quality in the area's becks, streams and rivers, so protection from diffuse and point pollution is important. There are a range of routes by which agricultural inputs can enter watercourses, including via inadequate slurry storage and application of inputs in inappropriate conditions or over and above the requirements of the pasture.<br><br>Farmsteads and settlements which are not connected to mains drainage can also be a cause of effluent entering watercourses.<br><br>Priority catchments for the Catchment Sensitive Farming Programme are run on behalf of Defra on the River Eden by Natural England and on the Upper Lune by the Yorkshire Dales National Park Authority. These organisations offer advice and grants to support appropriate land management practices which protect water quality and maximise efficiency of use of inputs. | Work with the farming community to promote good nutrient management on in-bye land. Manage applications of slurry and manure to maximise uptake and reduce run-off by avoiding manure spreading in winter on frozen, hard ground or very wet ground, or when there is no grass growth.<br><br>Ensure that farm infrastructure is able to reduce rates of point and diffuse pollution generated in and around the farmstead through improved and roofed slurry and manure storage, grey water separation, improvements to storm water overflows and good handling facilities, though these all require sensitive design in this high quality landscape.<br><br>Design new off-mains developments to include sustainable drainage systems to improve water infiltration and protect the aquifer and promote best practice to prevent effluent leakage from existing septic tanks. | |

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| **Regulating water flow** | Rivers Lune, Rawthey and Eden and their headwaters<br><br>Wetlands<br><br>Woodland<br><br>Other semi-natural habitats | This NCA contains the source and headwaters of the Rivers Lune and Rawthey and a small part of the headwaters of the River Eden.<br><br>This upland area combines steep gradients and high rainfall to produce copious and rapid run-off. Due to the remote and sparsely populated nature of this NCA, flood risk to people and property occurs mainly downstream of the NCA, though the flood plain around Sedbergh is vulnerable.<br><br>The Rivers Lune and Eden both suffer regular and extensive flooding in their flood plains, downstream of the NCA, in Halton (Morecambe Bay Limestones NCA) and Lancaster (Morecambe Coast and Lune Estuary NCA) on the lower Lune, and in the lower Eden valley from Appleby to Carlisle (Eden Valley and Solway Basin NCAs). The small market town of Sedbergh at the southern tip of the NCA is at risk of flooding from the River Rawthey, on which it lies.[8] | Regional | The steep fells of this NCA provide the headwaters of the River Lune catchment and receive a great deal of rainfall.<br><br>The often waterlogged upland soils and rapid run-off rates can allow large volumes of water to discharge into water bodies very quickly.<br><br>The Environment Agency's preferred approach to managing the flood risk described above includes encouraging take-up of Environmental Stewardship to optimise land management for flood risk reduction through reduction in surface water run-off, avoiding inappropriate development in flood risk areas and minimising run-off from new development, such as through the inclusion of sustainable urban drainage systems.<br><br>Land management that could be beneficial away from the geological SSSI, especially on lower slopes and the flood plain around Sedbergh, include maintaining a good vegetative cover, restoring flood plain wetland habitats and buffering watercourses with grassland strips. Good soil management to avoid use of machinery on wet soils, reduce riverbank erosion and avoid poaching by stock would be beneficial to water flow management.<br><br>Woodland creation, especially along gills and rivers, can help to reduce the supply of coarse sediment which can contribute to increased flood risk and damage farmland. | Outside the geological SSSI, manage upland heath, acid grassland and blanket bog to encourage good ecological condition, high levels of vegetation cover and active peat formation where conditions allow, to improve infiltration and reduce evapotranspiration, improve resilience to drought conditions and to slow flows due to increased surface roughness.<br><br>Reduce flood risk downstream by managing soils to reduce soil compaction and increase their permeability and subsequent infiltration rates through extensive grazing systems.<br><br>Create new native woodland and scrub and encourage carefully located and designed tree planting in gills, on bracken covered lower slopes and along river corridors to increase water infiltration and to slow flows, avoiding sites of biodiversity or archaeological interest.<br><br>Encourage the restoration and extension of valley mires, riparian habitats and wet woodland along watercourses in the valleys to slow run-off and increase storage capacity.<br><br>Work with land managers and authorities in nearby NCAs to address water flow issues at a catchment scale.<br><br>Avoid inappropriate development in flood risk areas and minimise run-off from new development. | **Regulating water flow**<br><br>**Regulating water quality**<br><br>**Climate regulation**<br><br>**Regulating soil erosion**<br><br>**Regulating soil quality**<br><br>**Biodiversity** |

[8] Lune Catchment Flood Management Plan Summary Report, Environment Agency (December 2009; URL: www.environment-agency.gov.uk/research/planning/33586.aspx)

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
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| **Regulating soil quality** | Geology and drift deposits<br><br>Soil types<br><br>Trees, woodland and scrub<br><br>Fell habitat mosaic<br><br>Permanent grassland | The four main soil types are:<br><br>■ Very acid loamy upland soils with a wet peaty surface (32 per cent).<br><br>■ Freely draining slightly acid loamy soils (19 per cent).<br><br>■ Slowly permeable seasonally wet acid loamy and clayey soils (15 per cent).<br><br>■ Blanket bog soils (12 per cent).<br><br>The cool, wet climate, steep slopes and poor quality agricultural soils (the vast majority are Grade 5) mean that livestock grazing is the predominant farming practice, with 98 per cent of the area of farm holdings being grass and uncropped land, the vast majority permanent pasture. There is no arable land recorded in the NCA. | Local. | The majority of the NCA is upland massif with very high rainfall, steep slopes and poor quality agricultural land, significantly limiting options to improve soil quality.<br><br>The freely draining slightly acid loamy soils allow water infiltration and have potential for increased levels of organic matter through management interventions.<br><br>The slowly permeable seasonally wet acid loamy and clayey soils may suffer compaction, poaching and/or capping as they are easily damaged when wet. Management measures that increase organic matter can make soils more resilient, thus also aiding water infiltration reducing run-off.<br><br>These soils support significant areas of upland heath, acidic grassland and bracken which have potential for restoration to a range of upland priority habitats and can contribute significantly to soil organic content and structure if suitably managed. Over time woodland can develop deep humus-rich soils. | Encourage best practice in soil management to improve structure and quality of the soils by using low pressure machinery and managing stock and machinery movements, particularly in wet conditions, to avoid compaction and poaching.<br><br>Encourage extensive grazing management, protecting wet soils from heavy grazing, poaching and compaction.<br><br>On freely draining soils return organic matter and manure to the soils to maintain fertility, encourage a build up of organic matter and reduce reliance on artificial fertilisers.<br><br>When re-seeding, plan cultivation timings carefully and avoid using heavy machinery on wet soils to avoid damage to and compaction of top soils. This will also improve water infiltration, reducing surface run-off and increasing resilience to drought. | **Regulating soil quality**<br><br>**Regulating soil erosion**<br><br>**Regulating water flow**<br><br>**Regulating water quality**<br><br>**Climate regulation**<br><br>**Biodiversity** |

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| **Regulating soil erosion** | Soil types<br><br>Fell habitat mosaic<br><br>Trees, woodland and scrub<br><br>Permanent grassland | Peaty soils on the high ground are susceptible to erosion.<br><br>The area contains many active erosion features on the steep fell sides. There are extensive SSSI designated specifically for their active fluvial geology.<br><br>The Upper Lune is a priority catchment under the England Catchment Sensitive Farming Programme.<br><br>A small part of the catchment of the River Eden lies within in the NCA. The Eden is also a priority catchment under the England Catchment Sensitive Farming Programme. | Regional | The peat of the very acid loamy upland soils has low strength when wet and is easily damaged and subject to erosion, especially on steep slopes when subject to rapid run-off. The blanket bog peat soils are vulnerable to losing organic matter and loss of particulate organic matter through drying out and erosion. Together these two soil types cover nearly half the NCA.<br><br>The freely draining slightly acid loamy soils can erode easily on steep slopes, especially if vegetation is sparse or removed.<br><br>The slightly acid loamy and clayey soils with impeded drainage are easily compacted by livestock or machinery if accessed when wet.<br><br>The NCA has a high level of rainfall and this, combined with the particularly steep fell sides, means that active soil erosion is present, particularly along the steep gill watercourses. There are also active landslips and screes. The possible increased frequency and intensity of rainfall events due to climate change would exacerbate this situation.<br><br>However, measures to reduce soil erosion and sedimentation are only appropriate away from the areas influencing the features of interest in SSSI designated for active fluvial geology.<br><br>Away from the SSSI, erosion could be moderated by ensuring high levels of vegetative cover such as permanent grassland or woodland, to bind soils and reduce sediment erosion, particularly along watercourses.<br><br>The Catchment Sensitive Farming Programme is run on the Eden by Natural England and on the Upper Lune by the Yorkshire Dales National Park Authority. These organisations offer advice and grants to support appropriate land management practices which protect water quality and maximise efficiency of use of inputs. | Away from the geological SSSI, manage grazing on peaty soils to ensure that high levels of vegetative cover are maintained, to encourage water retention and protect the peat from drying out and oxidising or eroding, as well as protecting the palaeo-environmental evidence within it.<br><br>Ensure appropriate grazing of fell habitats, and valley pastures, wetlands and meadows, to encourage a well-vegetated sward, to reduce run-off rates and reduce erosion into river and streams, especially on peaty and loamy soils.<br><br>Encourage extensive agricultural practices which retain water in-situ and avoid poaching or damage from mechanised activities to reduce soil erosion and damage to soil structure.<br><br>Increase the area of native broadleaved woodland/scrub, targeted at areas of high risk of soil erosion away from the geological SSSI and in appropriate locations such as gills, bracken beds, lower slopes and along water courses, avoiding areas of biodiversity or archaeological interest.<br><br>Manage river banks and flood plains to ensure a robust cover of vegetation, to reduce soil erosion, sedimentation and reduce poaching of riverbanks by stock, encouraging broadleaved woodland and scrub in places and avoiding areas of biodiversity, geological or archaeological interest.<br><br>Throughout the NCA, minimise machinery or stock movements in wet conditions, provide wide buffer strips of permanent, unfertilised grassland adjacent to riverbanks and provide watering points and prevent livestock access to watercourses, where possible, to minimise sediment and run-off.<br><br>Encourage uptake of advice and grants offered under the Catchment Sensitive Farming Programme to promote good soil management in the Upper Lune catchment and the small area of the NCA which lies in the Eden priority catchment. | **Regulating soil erosion**<br><br>**Regulating soil quality**<br><br>**Regulating water quality**<br><br>**Regulating water flow**<br><br>**Climate regulation** |

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
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| **Pollination** | Extensive areas of semi-natural habitats including upland heath and wet flushes<br><br>Upland northern hay meadows<br><br>Species-rich verges | Flowering plants in the upland heathland, wet flushes, woodland, remnant hay meadows and unimproved grassland and species-rich verges provide important nectar sources and habitat for insect communities important for pollination and pest regulation. | Local | Since there is no arable cultivation in this NCA, this service is of value to biodiversity services rather than food production in the Howgill Fells.<br><br>There is potential through appropriate management to increase habitat diversity and connectivity and enhance species diversity to enhance this service. | Enhance upland heath, grassland, wetland and woodland habitats through appropriate grazing and management to increase diversity of habitat mosaics.<br><br>Encourage restoration of remnant hay meadows and appropriate management of species-rich verges to maintain and enhance species diversity and insect populations.<br><br>Increase connectivity of habitats such as hay meadows, woodlands and wetlands through creating corridors, buffers and stepping stones of habitats important for insects and biodiversity. | **Pollination**<br>**Biodiversity**<br><br>**Sense of place/ inspiration** |
| **Pest regulation** | Native broadleaved woodland | Many of the small broadleaved woodlands, copses and shelterbelts and waterside and boundary trees throughout the NCA contain predominantly ash trees. | Local | Ash die-back has been identified near Kendal and in the Eden valley, neither of which are far from this NCA. The potential loss of such a widespread tree in this area would have a very high impact on landscape character and biodiversity in the lower and fringing areas of the NCA as, while tree cover is very low overall, it appears higher in many places owing to large numbers of boundary ash trees, shelterbelts, small woodlands and belts of trees along the many watercourses. Sound management of woodland, particularly to encourage a range of native species through natural regeneration, should be encouraged together with efforts to identify and propagate any naturally resistant local strains of ash. | Encourage woodland management and establishment techniques that favour natural regeneration and use of local provenance, locally grown-on seed of a wide range of native species such as rowan, hazel, holly, alder, hawthorn, blackthorn, crab apple, bird cherry and oak where soils are suitable, to reduce reliance on ash.<br><br>Encourage landowners, farmers, authorities and interest groups to survey and monitor for the disease and to seek to identify and propagate locally resistant strains of ash. | **Pest regulation**<br><br>**Biodiversity**<br><br>**Sense of place/ inspiration**<br><br>**Timber provision** |
| **Regulating coastal erosion and flooding** | N/A | N/A | N/A | N/A | N/A | **N/A** |

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| **Sense of place/ inspiration** | Geology and landform<br>Extensive semi-natural habitats<br>Extensive, high quality and panoramic views<br>Traditional hill farming systems<br>Enclosure patterns<br>Historic buildings and environment<br>Cultural heritage<br>Tourism<br>High quality access and recreation opportunities<br>High levels of tranquillity, remoteness and apparent wildness<br>Dark night skies | Nearly 80 per cent of the NCA is publicly accessible and 44 per cent (4,533 ha) is designated as part of the Yorkshire Dales National Park for its outstanding natural beauty and the opportunities it provides for open-air recreation.<br>The geology gives rise to the highly distinctive landforms, known locally as the 'sleeping elephants'.<br>Extensive unsettled, tranquil, apparently wild, inaccessible and unenclosed uplands.<br>The extremely low population is largely confined to Sedbergh and small villages along the northern edge.<br>Dramatic long-distance, panoramic and uninterrupted views in all directions and very strong intervisibility with surrounding equally scenic upland NCAs, including the North Pennines, Lake District High Fells, Cumbria Low Fells, Yorkshire Dales and Orton Fells, the majority of which are designated as National Park or Area of Outstanding Natural Beauty.<br>Dramatic changes in seasonal colour contrasts, textures and weather patterns contribute to the visual interest of the scenery.<br>Drystone walls separate the high unenclosed moorland from the contrasting enclosed pastures on lower slopes, with hedges being more dominant on lower ground.<br>Use of local stone such as sandstone, gritstone and limestone in buildings and field walls, and traditional 18th- and 19th-century farm building forms and layouts contribute to a strong sense of place in the fringing valleys.<br>The NCA has long inspired artistic interpretation by writers, poets and artists such as William Wordsworth, Alan Stones and Alfred Wainwright. It is the subject of a large number of guide books and walking books. | National | The remaining part of the NCA which is currently not designated as National Park is subject to an Order for Designation (2013) by Natural England which is currently awaiting confirmation or otherwise by the Secretary of State.<br>The key features of the area such as the extensive unsettled, tranquil, apparently wild, inaccessible and unenclosed uplands are often associated with feelings of escapism, spiritual refreshment and inspiration. These features offer a rare opportunity to experience these sensations in this densely populated island and need protection.<br>The very low population contributes to the feeling of being 'away from it all'.<br>The dramatic change from spring to autumn colour of the extensive semi-natural habitats such as bracken, heath, woodland and mat-grass is a striking feature and should be conserved and enhanced.<br>The vernacular architecture, walls, field barns and farm buildings are key to the sense of place and are at risk of loss through development or dereliction and use of non-local materials and styles. Farm buildings in particular have been identified as declining in condition.<br>The important, uncluttered views to and from the NCA are a key feature and at risk from tall, vertical or large-scale development.<br>The forms of enclosure associated with the upland farming heritage are at risk of loss through dereliction and replacement by fencing, reducing the ability to read the farming cultural heritage as well as reducing landscape condition.<br>Despite its national landscape designation and its celebration by walkers, writers, poets and artists, the area remains less well known than the neighbouring Lake District and Yorkshire Dales National Parks. There is significant opportunity to interpret and raise awareness of the distinctive culture and landscape patterns derived from the historical forms of upland management as well as the area's geological, archaeological and biodiversity heritage. | Protect the strong sense of remoteness and apparent wildness and views into and out from the NCA from tall, vertical or large-scale developments.<br>Protect the contrast between the rugged unenclosed fells and the enclosed, sheltered, fringing valleys and the bright patterns of colour and texture which characterise the NCA.<br>Promote upland farming systems which maintain and restore the farmed landscape and range of habitats, including the traditional grazing practices of the extensive commons.<br>Maintain, restore and recreate the patterns of drystone walls and hedges.<br>Manage the heathland habitat mosaic to encourage areas of heath vegetation, but retain some areas of bracken and acid grassland which contribute to the contrasting textures, colours and patterns of the landscape.<br>Maintain the historic integrity of settlements and farmsteads encouraging the retention, conservation and restoration of local vernacular styles and features such as stone window and door surrounds and stone-flagged or Westmorland slate roofs, as well as surviving historic farm building types and layouts.<br>Where appropriate, provide access to and interpretation of sites of wildlife, geological, artistic, archaeological or cultural interest to encourage people of all levels of ability and mobility to better understand and be inspired by the landscape of the area. | **Sense of place/ inspiration**<br>**Geodiversity**<br>**Sense of history**<br>**Recreation**<br>**Biodiversity**<br>**Food provision**<br>**Tranquillity**<br>**Regulating water quality**<br>**Regulating soil erosion** |

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
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| **Sense of history**<br><br>*Continued on next page* | Field patterns<br><br>Local breeds<br><br>Walls and hedges<br><br>Farmsteads and field barns<br><br>Farming practice<br><br>Attractive market town and villages<br><br>Two Conservation Areas<br><br>Roman route and associated remains | Owing to the remote, inhospitable and inaccessible nature of the landscape there are few obvious surviving archaeological features, especially when compared with the surrounding limestone NCAs, and there has been little mining or quarrying activity.<br><br>Upland farming practices have left the most obvious historical impacts on the landscape, with the medieval practice of in-common grazing of the extensive upland commons still extant and the on-going presence of local breeds such as Rough Fell Sheep and Fell Ponies.<br><br>Small, mostly irregular-shaped fields on lower ground are bounded by drystone walls and hedges with larger, straight-edged fields on the higher valley sides. Distinctive fell walls separate the unenclosed commons from lower enclosed land.<br><br>The hedges, walls and farmsteads give time depth to the area, which is otherwise lacking in obvious archaeological features apart from drove roads and scattered settlements, pinfolds, wash-folds, shielings and pack horse bridges.<br><br>Scheduled Ancient Monuments are restricted to a Roman fort and associated remains in the Lune Gorge | Regional | While there are few nationally designated heritage assets in the NCA, the Historic Environment Record lists a very large number of non-protected historic features which would benefit from further study and recording including shielings, pinfolds, drove roads and pack horse bridges.<br><br>Through Environmental Stewardship, some walls and hedges have been brought under management, although uptake remains below the national average and there is scope for far more restoration to ensure these features are not lost.<br><br>Loss and deterioration of small agricultural buildings is more commonplace in the Howgill Fells than in the rest of the Yorkshire Dales National Park. There is an above average percentage of listed working buildings showing obvious signs of structural disrepair.<br><br>There is one Conservation Area in the NCA, in Sedbergh and one on its boundary in Ravenstonedale and both have Conservation Area Appraisals, though the one for Ravenstonedale dates from 1999. A 2009 update of the appraisal for Sedbergh has identified that there has been recent change not contributing positively to the Conservation Area in some parts of the town, including several housing estates built as recently as the 1990's. These have led to proposals to withdraw quite a few areas from the Conservation Area and detailed management proposals have been drawn up and consulted upon. | Encourage surveying and interpretation of sites on the Historic Environment Record to research and raise awareness of the history and time depth of the area.<br><br>Maintain walls and hedgerows where in good condition and restore or recreate both walls and hedges using local stone and hedging styles where condition has declined, or where they have been replaced by fencing, to maintain habitat connectivity and the cultural influence of farming patterns in the landscape and encourage a reduction in levels of replacement by fencing.<br><br>Encourage the retention of locally distinctive grazing breeds such as Fell Ponies and Rough Fell Sheep to maintain breed diversity and reflect local farming heritage.<br><br>Protect both Scheduled and non-scheduled archaeological features where known, including features such as drove roads, settlements, shielings, pinfolds, wash-folds and pack horse bridges, including from damaging activities such as ploughing and tree planting, and encourage sensitive management of non-scheduled historic sites.<br><br>Encourage appropriate interpretation of the important Roman route passing through the NCA along the Lune valley, and its associated remains. | **Sense of history**<br><br>**Sense of place/ inspiration**<br><br>**Food provision**<br><br>**Recreation** |

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| **Sense of history**<br><br>*Continued from previous page* | | at Low Borrowbridge and a motte-and-bailey castle in Sedbergh. There is a higher than average proportion of 18th- and 19th-century buildings, with 119 Listed Buildings in this small NCA despite its low level of settlement.<br><br>There are many substantially complete traditional farmstead groups surviving, with little change to their traditional form, contributing to a strong sense of history of settlement of the area and reflecting local geology and vernacular in their materials, including stone window and door surrounds and stone-flagged or Westmorland slate roofs. Two-storey stone combination barns, bank barns and isolated field barns are common.<br><br>The small market town of Sedbergh has a character which is strongly influenced by the extensive parkland and buildings of its public school and an extensive Conservation Area.<br><br>The villages of Ravenstonedale and Newbiggin-on-Lune on the northern fringe of the NCA exhibit limestone vernacular architecture, more commonly associated with the Orton Fells NCA, reflecting the edge of the limestone outcrop which underlies this edge of the NCA. | | Ravenstonedale has a Conservation Area and is particularly sensitive to changes in building style. | Conserve and restore field barns and other farm buildings such as bank barns, as well as sheepfolds and other small-scale vernacular features which no longer serve their original purpose, along with historic settlement and farmstead forms and field patterns which reflect the past cultural history of the farming industry and its distinctive practices using appropriate local materials.<br><br>Encourage sympathetic conversions of buildings and new development in the town of Sedbergh and nearby villages of Ravenstonedale, Newbiggin-on-Lune and Tebay which respects the particular character, vernacular styles and materials of each.<br><br>Ensure Conservation Plans for the two Conservation Areas remain up to date and develop plans for the conservation of non-scheduled features of historic interest and interpretation to improve enjoyment and understanding of heritage assets. | |

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| **Tranquillity** | Extensive open, unenclosed moorland with a strong sense of remoteness and apparent wildness<br><br>Panoramic long-distance views in all directions<br><br>Lack of enclosure or other obvious signs of human activity on high ground<br><br>Rivers, streams and woodland<br><br>Quiet pastoral rural valleys<br><br>Very little settlement, especially in the upland core<br><br>Very high levels of tranquillity<br><br>Very few roads apart from around the edge of the NCA, making the area inaccessible by car<br><br>Dark night skies<br><br>Extensive high quality opportunities for quiet recreation | Very high levels of tranquillity are found throughout most of the NCA. Lower levels of tranquillity are restricted to the M6 corridor to the west of the NCA and around Sedbergh.<br><br>Levels of intrusion are very low, with over 95 per cent of the area still classed as undisturbed and there are no urban areas, (the largest settlement, Sedbergh has a population of less than 3,000, so is not classed as urban). Levels of intrusion have actually declined by 5 per cent since the 1990s.<br><br>Population is extremely low, estimated at around 1,500, and is largely confined to the small town of Sedbergh and three small villages alongside the northern boundary of the NCA, contributing to the feeling of being 'away from it all'.<br><br>The enclosed pastoral farmland of the lower slopes and fringing farmland with its woodlands, rivers and streams is very quiet, with a limited network of quiet lanes and widely dispersed farmsteads and only four settlements of any size. | National | Tranquil landscapes are important in delivering health and well-being benefits to people; close contact with natural features provides good sensory environments for relaxation which has a calming and restorative effect on mental well-being for both visitors and residents.<br><br>The largely unsettled uplands appear very remote, with high levels of tranquillity and extensive, apparently wild unenclosed uplands and long uninterrupted views out in all directions across other extensive, apparently wild upland moorland landscapes, which are often associated with feelings of escapism, spiritual refreshment and inspiration.<br><br>The unenclosed land is extremely extensive and one can walk for miles without encountering a fence or gate. This makes a significant contribution to perceptions of wildness and the sensation of being unrestricted and 'away from it all'.<br><br>The only main roads and railways skirt the perimeter of the NCA, particularly the M6 and West Coast Mainline Railway to the west of the NCA, and noise penetration into the NCA is limited and contained by the landform to the immediately adjacent areas.<br><br>The very low population ensures that night skies are very dark away from Sedbergh in the south of the NCA. | Protect the strong sense of remoteness and wildness and views into and out of the NCA from tall, vertical or large-scale or inappropriate development.<br><br>Minimise use of fencing on the open fells and, where it is necessary (for example to protect new woodland), ensure it is temporary and is removed once trees are established. Ensure that high standards of design are used to minimise landscape and access impacts where fencing is considered essential.<br><br>Retain the quiet, rural character of the fringing farmland, villages and farms through maintaining the dispersed settlement pattern, restricting development primarily to the main settlements and ensuring it is appropriate in scale and reflects local vernacular styles and materials.<br><br>Control lighting in new developments and conversions, for example by using down-lighters, timers and sensors, to minimise light pollution.<br><br>Encourage quiet recreational activities which respect the special qualities of the area.<br><br>Where feasible, encourage provision of access for people of all abilities to maximise opportunities for all to appreciate and be inspired by the landscape.<br><br>Encourage interpretation of the factors which contribute to the high level of tranquillity to increase people's enjoyment and understanding of the area. | **Tranquillity**<br><br>**Recreation**<br><br>**Sense of place/ inspiration** |

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
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| **Recreation**<br><br>*Continued on next page* | Outstanding long distance views from many parts of the NCA<br><br>High quality upland landscape<br><br>Streams and rivers<br><br>Attractive villages and market town<br><br>Quiet rural roads<br><br>Extensive open access land<br><br>High level of tranquillity<br><br>Public rights of way<br><br>Pennine Bridleway National Trail<br><br>Dales Way | Recreation in the NCA is largely through walking, cycling, horse riding and mountain biking, with additional opportunities for hang gliding, paragliding, wildlife watching and salmon and trout fishing. Recreation draws on the outstanding views, upland and pastoral experiences and habitats and heritage of the area.<br><br>The NCA is valued for its high levels of tranquillity, remoteness, seclusion and apparent wildness, its inspiring qualities and the ability to walk for miles without encountering an obstruction – qualities which no longer exist in much of densely- populated England.<br><br>This relatively small NCA has the highest percentage of open access land in England (over 80 per cent is common land), so is largely publicly accessible above the fell wall.<br><br>Rights of way extend to around 175 km at a high density (1.7km per $km^2$.)<br><br>The NCA is crossed in part by over 5 km of the Pennine Bridleway which continues south into the Yorkshire Dales NCA and north into the North Pennines NCA. | National | The area is of particular significance for the opportunities it offers for spiritual refreshment and inspiration through access to apparently wild and remote landscapes and far-reaching views.<br><br>While there is some relatively easy access to some of the high fells which offer the experience of wild and remote landscapes to a wide audience, the main draw to this area is the many, often challenging, long walks and mountain bike rides up the steep-sided fells to reach the long, broad summit ridges with their panoramic views, attracting visitors in search of a challenge.<br><br>The quiet lower fringing areas and river valleys provide a more accessible experience to a wider audience of pastoral farmland with historic farms and small attractive villages. The good network of paths and the quiet minor roads offer a contrasting experience to the high ground of the opportunity to enjoy the rivers and streams, woods, trees, species-rich verges and remnant hay meadows.<br><br>The Howgill Fells remains somewhat less well known and less visited than the neighbouring Yorkshire Dales to the east and the Lake District High and Low Fells to the west. It is however, well used by walkers, mountain bikers, riders and hang gliders. It has attained a higher profile recently, mainly due to the Alfred Wainwright and other guides to walks in the area and because the views from the M6 have been admired by large numbers of people. Nevertheless, the area tends to be visited mainly by keen walkers and local people who recognise their distinctive character and appreciate their quietness and seclusion. | Protect the open unenclosed common land to retain the panoramic, uninterrupted views both from the Howgill Fells and into the NCA from surrounding nationally designated landscapes, as well as the ability to walk without hindrance for miles.<br><br>Protect the strong sense of apparent wildness, remoteness and tranquillity by controlling development and use of night-time lighting, especially on the fells.<br><br>Promote local brand meat to visitors and residents based on hardy upland breeds that are used to graze semi-natural habitats, including the Rough Fell sheep, to retain the farming heritage of the area.<br><br>Maintain the high-quality of the watercourses so they continue to provide key habitats, features and opportunities for fishing and wildlife watching, protecting springs and flushes as well as fluvial features of geological interest.<br><br>Support forms of quiet open-air recreation that do not conflict with the purposes of its National Park designation and which benefit from and value the high quality of the landscape and natural environment in this NCA. | **Recreation**<br><br>**Sense of place/ inspiration**<br><br>**Tranquillity**<br><br>**Geodiversity**<br><br>**Biodiversity**<br><br>**Sense of history**<br><br>**Food provision** |

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
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| **Recreation**<br><br>*Continued from previous page* | | The Dales Way is a popular route which continues into the neighbouring part of the Yorkshire Dales NCA. | | Recreation use of the area has diversified in recent years as new activities such as hang gliding and paragliding have appeared and activities such as salmon and trout fishing, photography, wildlife watching, visiting villages and local attractions, have become more popular.<br><br>While active walkers and cyclists are well catered for, there are opportunities to improve accessibility for a range of different user abilities, including by developing access for all routes. | Develop interpretation of key features and assets of the area, particularly its important geology, habitats, archaeological and cultural heritage and the importance of historic upland farming practices in developing and maintaining the landscape and vernacular architecture, including the historic commons heritage and the value of small-scale vernacular features that contribute so much to the landscape character in this NCA.<br><br>Provide easily accessible sites of wildlife, historical and geological interest for both educational and public use.<br><br>Encourage volunteers to undertake tasks such as surveying and conserving the wildlife, historical, cultural and geological interest of the area to increase knowledge and understanding. | |

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| **Biodiversity**<br><br>*continued on next page* | Designated sites<br><br>Priority habitats and species including: upland acid grass moorland, blanket bog, upland heath, broadleaved woodland, upland flushes, fens and swamps, northern upland hay meadows and calcareous grassland, purple moor-grass pasture<br><br>Upland birds such as curlew and red grouse<br><br>Limestone pavement<br><br>Species-rich road verges | 18 per cent of the NCA is designated as SSSI with 7 sites wholly or partly within the NCA.<br><br>Less than 1 per cent of the NCA is designated SAC, with the edges of the River Eden and the North Pennines Dales Meadows SAC all slightly overlapping the boundary of the NCA.<br><br>A further 1 per cent of the NCA, spread over 17 sites, is designated as Local Sites of Interest.<br><br>The Howgill Fells form a block of upland which contributes to the extensive heathland network across northern England. Acid grassland, dominated by matgrass is the most extensive habitat, with some blanket bog on the flatter summit areas and more extensive stands of bracken and some remnant upland heath on the slopes. Upland heath is likely to have been much more widespread in the past.<br><br>Small springs and flushes on the lower slopes are the most diverse habitats on the high ground. | Regional | The figure of 18 per cent of the NCA designated as SSSI is high, however the vast majority of the SSSI area is designated for its geological interest (3 out of 7 sites being purely geological, with 1 mixed interest), so the overall percentage gives a misleading idea of the level of biodiversity interest. Less than 100 ha of SSSI is designated for its biodiversity.<br><br>Biodiversity Services are currently rather restricted in this NCA, being limited mostly to the fringes which overlap with neighbouring, more diverse NCAs. The priority upland heath, blanket bog and broadleaved woodland habitats are considered to have been formerly much more extensive, however what remains is in poor condition and there is scope for restoration to reduce fragmentation of remaining stands of priority habitats and to encourage priority upland bird species. There is scope to use agri-environment schemes for habitat restoration on the high ground, though this would require coordinated agreement and action by the owners of the grazing rights for each of the unenclosed individual commons.<br><br>There is scope for the restoration and expansion of the fragmented broadleaved woodland, both in the valleys and on the lower slopes of the fells and in the gills, where soil conditions allow, particularly in the extensive stands of bracken on the lower slopes which are of low grazing value and would not have an impact on the open views from the ridges. This would deliver a wide range of services such as regulating soil and water erosion and quality, sense of place, landscape quality as well as biodiversity. | Restore remnant heath and blanket bog on high ground and manage grazing of upland heathland and grassland habitats and neighbouring areas at levels that will encourage restoration of good ecological condition, to increase connectivity of the heathland network, to increase biodiversity, including the important upland bird species, and to ensure high levels of vegetative cover on areas of peat.<br><br>Restore, expand and encourage management of gill and other upland broadleaved woodlands and wood pasture away from the geological and biological SSSI and historic features, ideally through natural regeneration. New woodland is particularly appropriate along river valleys and on slopes which are covered with bracken and thus have suitable soil but low grazing value.<br><br>Restore, recreate or maintain walls and hedgerows using local stone and hedging styles, especially where condition has declined or where they have been replaced by fencing, to maintain or increase habitat connectivity and conserve cultural influence of farming patterns in the landscape.<br><br>Maintain and enhance the high-quality of the watercourses, so they continue to provide key habitats and opportunities for fishing and wildlife watching, protecting springs and flushes as well as fluvial features of geological interest and controlling invasive species. | **Biodiversity**<br><br>**Sense of place/ inspiration**<br><br>**Regulating water flow**<br><br>**Regulating water quality**<br><br>**Regulating soil erosion**<br><br>**Regulating soil quality**<br><br>**Recreation** |

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| **Biodiversity**<br><br>*continued from previous page* | | Small broadleaved woods can be found in places on the steep gills and in the fringing valleys, part of a discontinuous network extending north-south through northern Lancashire.<br><br>Remnant northern upland hay meadows, species-rich road verges and small areas of purple moor-grass pasture can be found in the fringing valleys on the edge of the NCA, but they are very fragmented. Northern upland hay meadows are more frequent on the more extensive limestone of the nearby Orton Fells and Yorkshire Dales NCAs.<br><br>A small area of limestone pavement is sited on the north-east edge of the NCA.<br><br>The area supports a range of priority upland bird species including snipe, curlew and red grouse, and is used to support iconic species such as black grouse. | | Recently, some woodland habitat management and expansion has been undertaken to assist the upland bird species and to encourage the return of black grouse to the area. This should be encouraged and expanded in suitable locations.<br><br>The areas of species-rich hay meadows, road verges and purple moor-grass pasture are also likely to have been more extensive in the past. The seed resources available nearby, both in the remnant meadows and in the neighbouring NCAs, suggest that there may be some scope for meadow restoration. Restoration may however be difficult owing to the improvement of grasslands and high nutrient levels, potentially limiting the level of realistic potential.<br><br>The extensive network of walls and hedges on the lower enclosed slopes and in the fringing river valleys play an important role in connectivity of habitats, especially the fragmented woodlands. Their restoration and where necessary, recreation, should be encouraged.<br><br>The small stretch of the River Eden in the NCA has SAC status for its range of aquatic habitats. The River Lune is not designated but is also important for wildlife and salmon and trout fishing, as well as its geological features, and its good condition should be maintained. | Encourage the agricultural practice of hay-making to maintain and enhance the remaining species-rich meadows.<br><br>Encourage restoration of hay-making to suitable meadows to increase biodiversity and connectivity of the remnant hay meadows.<br><br>Maintain appropriate management of species-rich verges to ensure these local features are retained in the landscape and encourage volunteer surveys to establish whether management remains appropriate.<br><br>Restore purple moor-grass pastures where conditions are appropriate to increase extent and connectivity of this fragmented habitat.<br><br>Provide or enhance interpretation of the biodiversity of the area.<br><br>Manage recreation to avoid or mitigate any damage to biodiversity. | |

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| **Geodiversity**<br><br>*continued on next page* | Silurian and Ordovician geology<br><br>Active fluvial features<br><br>Complex and diverse surrounding geology in neighbouring NCAs<br><br>Local stone visible in field walls, buildings and settlements<br><br>3 Geological and one mixed SSSI<br><br>7 Local Geological Sites | Upland block of hard sandstone and gritstone with similar resistance to erosion. High, smooth, well-defined rounded ridges and dome-like summits, separated by long steep-sided deep valleys.<br><br>Lack of glacial features compared with surrounding NCAs.<br><br>Surrounded by adjacent upland landscapes of highly diverse and contrasting geological character.<br><br>Radial drainage from the central high upland core with fast, highly 'flashy', streams running off the high ground in all directions in steep valleys and rocky gills.<br><br>The area is important nationally for its active fluvial geology, with 4 extensive geological SSSI containing a range of active fluvial features.<br><br>Drift geology, primarily of glacial till, is restricted to lower land.<br><br>Many traditional farmsteads and settlements, reflecting local geology using sandstone, gritstone or limestone for the walls, window and door surrounds and stone flags or green Westmorland slate for the roofs. | National | The Howgill Fells and the surrounding NCAs demonstrate an exceptionally wide range of geology in a small area and are much visited by geology students. There are many exceptional views both from and into the NCA allowing easy comparison of the differing geologies of the uplands in this part of northern England. The Silurian and Ordovician sandstone and siltstone geology of the Howgill Fells contrasts markedly with the igneous and metamorphic formations of the Cumbria High Fells and the slates and shales of the South Cumbria Low Fells to the west, the limestone of the Yorkshire Dales and Orton Fells to the south-east and north and the gritstones of the North Pennines to the east.<br><br>There is also a narrow strip of carboniferous limestone along the north-east fringes of the NCA. This is the edge of the carboniferous limestone belt which runs continuously through the Lake District High Fells NCA, the Orton Fells NCA and the Yorkshire Dales NCA.<br><br>Langdale, Bowderdale and Carlin Gill are important fluvial geomorphological SSSI sites, the latter being of exceptional importance, containing a wide range of Pleistocene, Holocene and modern active landforms. The primary management principle on such sites is to avoid interfering with these active natural processes and the features they produce.<br><br>Severe relatively recent erosion (dating from flooding in 1982) is also evident on some of the steeper slopes outside the SSSI. The NCA has a high level of rainfall and this, combined with the particularly steep fell sides, means that active | Protect the panoramic, uninterrupted views, both out from the Howgill Fells and into the NCA from surrounding nationally designated landscapes, to retain the facility to read the complex geodiversity of upland northern England.<br><br>Conserve, manage and enhance geological SSSI, Local Geological Sites and other non-designated features which affect the important geological sites.<br><br>Encourage greater understanding of the importance of the area's fluvial geology and the geodiversity of the NCA and its surrounding uplands, through improved access to exposures and quarries where appropriate, and to accessible interpretation.<br><br>Away from features of interest relating to geological SSSI, manage blanket bog to encourage good ecological condition, high levels of vegetation cover and active peat formation (where slopes allow), to re-establish their geomorphological function as a recorder of palaeo-ecological change as well as to restore their biodiversity and carbon sequestration functions.<br><br>Avoid tree planting in or near the geological SSSI, which can restrict natural processes by stabilising the soil and increase rates of water infiltration, affecting natural processes. | **Geodiversity**<br><br>**Biodiversity**<br><br>**Food provision**<br><br>**Regulating water flow**<br><br>**Regulating water quality**<br><br>**Regulating soil quality**<br><br>**Regulating soil erosion**<br><br>**Sense of place/ inspiration**<br><br>**Sense of history**<br><br>**Recreation** |

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| **Geodiversity**<br><br>*continued from previous page* | | The villages of Ravenstonedale and Newbiggin-on-Lune on the northern fringe of the NCA exhibit limestone vernacular architecture, more commonly associated with the Orton Fells NCA, reflecting the edge of the limestone outcrop which underlies this edge of the NCA.<br><br>The small market town of Sedbergh is built of the locally distinctive dark blue ragstone, giving it a different character from other buildings in the NCA. | | soil erosion is present in this NCA, particularly along the gill watercourses. The possible increased frequency and intensity of rainfall events due to climate change would exacerbate this situation. However, owing to the extensive geological SSSI, measures to encourage or maintain good vegetative cover, increase soil carbon or reduce erosion would only be appropriate outside the designated areas and any areas which actively contribute to the interest features within the SSSI.<br><br>Other important geological sites include exposures in the river bed and banks of the Ordovician, Silurian and Carboniferous ages. Management should seek to ensure exposures remain free of vegetation and rock debris.<br><br>The ability to read the geology of the area in its vernacular buildings and walls is currently strong and makes a significant contribution to sense of place, though there has been some loss of features such as walls and barns and some development in settlements such as Sedbergh which are reducing the ability to read the geology through the built heritage of the area.<br><br>Geological SSSI and Local Geological Sites provide opportunities to reveal and interpret the geological heritage of the area to a wide audience. | Encourage a broad and integrated approach to the management of active process geological sites, to prevent damage from developments beyond the SSSI site boundaries such as small-scale gravel removal or flood defences.<br><br>Ensure appropriate sections of SSSI rock exposures remain free of vegetation and rock debris.<br><br>Retain and encourage restoration, using appropriate local materials, of field barns and other farm buildings, along with field walls, historic settlements and farmsteads which reflect the geology of the area and past cultural history of the farming industry and its distinctive practices.<br><br>Encourage sympathetic conversions of buildings and new development in Sedbergh and the small villages, which respect the particular character, vernacular styles and materials of each, to ensure local geology remains visible in settlements.<br><br>Encourage volunteers to undertake tasks such as surveying and conserving the wildlife, historical, cultural and geological interest of the area to increase knowledge and understanding. | |

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