The Appleton Group

Waddow View, Land off Waddington Road, Clitheroe, BB7 2DE

Proof of Evidence for Lorna Cruice
BA, Dip LA, CMLI

Landscape and Visual Matters

On behalf of The Huntroyde Estate/Clitheroe
Auction Mart Co Ltd/Mr J Taylor/Ms Sarah Howard
and Ms Samantha Howard

Volume 2: Appendices

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Small to medium-sized hay meadows and permanent pasture fields are defined by stone walls immediately adjacent to the Bowland Fells, but these become hedgerows within valley bottoms and in areas around settlements. Mature oak, ash and alder trees are common components of hedgerows. Pignut, yellow rattle, great burnet, oxeye daisy and lady's mantle can all be found in the species-rich hay meadows. At higher elevations the improved pastures give way to areas of rough grazing and field patterns become more regular, with stone walls predominating. Here, wet rushy pastures are of particular importance for breeding waders such as lapwing, snipe, curlew, redshank and oystercatchers.

Numerous rivers and watercourses provide habitats for salmon, brown and sea trout, eels, lampray and bullheads, as well as birds such as kingfishers, dippers, grey wagtail, common sandpiper and oystercatchers. Otters are also present along rivers and streams throughout the area. The rivers make a significant contribution to the area, as does the Lancaster Canal, which supports an interesting array of locally rare aquatic plants such as flowering rush, greater spearwort, white water lily and various pond weeds. A number of reservoirs and disused gravel pits along the Wyre Valley are also important as habitat for breeding great crested grebe and wintering wildfowl, while the high density of field ponds between Preston and Garstang provide an important habitat for aquatic plants, freshwater invertebrates and amphibians.

Extensive areas of predominantly ancient, semi-natural woodland are concentrated on the ridges, slopes and valley sides of the many rivers present throughout the area. There are areas of ancient woodland along the Hodder between Whitewell and Hurst Green, as well as along the Brock and Calder, and between Dolphinholme and Abbeystead. Woodlands here are dominated by oak, ash and birch, with extensive amounts of wych elm and wild gean, especially along the Ribble, with alder and willow beside the Brock, Wyre and Calder. The woodlands on the northernmost side of the Fells are particularly important for their rich assemblage of mosses and lichens. Pied and spotted flycatchers, redstart, tree pipit, tawny owl, great spotted woodpecker and sparrow hawk are all characteristic bird species associated with these woodlands.

The settlement pattern is of small stone villages, hamlets and farmsteads. The isolated country houses set in formal parkland, such as Browsholme and Quernmore, are a typical feature of the landscape. These managed estates are enclosed by belts of woodland and estate fencing, and typically consist of open grassland with ponds and lakes, scattered trees of oak, ash, sycamore and lime, enclosed by blocks of secondary woodland. Farms tend to be larger than those in the Bowland Fells, with better-quality land supporting large dairy herds. Farms generally consist of a core of farm buildings and some conspicuous modern outbuildings.

The road network is typified by a complex system of narrow lanes, with few direct routes between settlements. The railway, canal and M6 form the major north–south links in Lancashire, and are confined to a narrow corridor that defines the western boundary. The Pennine Bridleway crosses the eastern corner of this NCA.

This is an intimate, tamed landscape in contrast to the wild, exposed moorland of the Bowland Fells. The combination of well-maintained hedgerows and hedgerow trees, areas of parkland and well-grazed pasture, gives this area a managed character.

The landscape through time

This is a transitional zone between the coastal plain, with its unconsolidated glacial deposits, and the high fells of Bowland, formed by the strong sandstone of the Millstone Grit. The transition from plain to fell landscape is rapid, and reflects the existence of a substantial boundary fault separating the soft Permo-Triassic rocks from the harder Carboniferous rocks. The transition is softened by the presence of thicker glacial deposits around the edge of the upland area, and by the valley features where Bowland's upland streams flow out of the hills onto the plain.

In the south, where the Brock Valley crosses the area, the coarse-grained sandstones of the Millstone Grit of Bowland give way to the softer calcareous mudstones, with limestone beds, of the Carboniferous Limestone. This accounts for the less dramatic change between the Fringe and Fells landscapes. Surface drift features also become more important as the Fringe merges imperceptibly south-eastwards into the landscape of the Ribble Valley. The Ribble and Hodder drain the southern flanks of the Bowland Fells. Within the valleys, strong mounded outcrops or 'reef knolls' form distinctive landscape features that give the area its special character.

The Lune Valley area is gently sloping and undulating, and is contained by steep scarp slopes with the river as the central feature. The Lune's many tributaries commonly arise from deep erosion scars, or cloughs, cut into the steep scarp slopes of the surrounding moorland upland. The solid rocks are overlain by a complex of glacial deposits, mainly comprising thick tills but also with extensive areas of hummocky sand and gravel deposited from glacial meltwater. One such complex, in the Ribble and Hodder valleys at Stonyhurst and Hurst Green, imparts a special quality of small wooded knolls to the local landscape. To the east of Gisburn, a tract of drumlins forms a characteristic landscape.

Little Bowland Knoll Reefs, Tunstall

The Lune Valley has been used as a communication route since the Roman period – and even earlier. It formed a principal route for the Anglian invasion of Lancashire from the east from 570 AD, and for Norse settlers from the Isle of Man, Scotland and Northern Ireland from the early 10th century. The lush pasture and arable land in the Lune Valley has long supported prosperous farms – from the medieval period and earlier – and this is reflected in the number of large farms and country estates that are scattered along the valley sides. The Ribble Valley formed an important Roman communication route to York, and some evidence of Roman roads can still be found.

Large country houses and halls set in parkland, such as Leagram Hall, are a particular feature of the area

The 19th-century (and earlier) settlement pattern, still largely unaltered, tends towards nucleated villages in the river valleys to the north and south-east of the Bowland Fells, and more heavily dispersed patterns of isolated farmsteads and small farming hamlets across the west and south-west. Vaccaries (cattle stock farms), founded in the 12th and 13th centuries, had a large impact on the settlement pattern, especially in the Lune Valley, developing into farmsteads as they were let out by landowners from the 14th century. The settlement pattern of small villages with isolated houses and farms dotted around the winding country lanes dates from the medieval period. Population increases in the 12th and 13th centuries expanded the pattern of settlement through the assarting of former woodland, to produce a small-scale and intimate landscape of scattered farms linked by winding roads and irregular fields, still very evident in the Lune and Ribble valleys. From the 15th century, many small farms were created from vaccaries, and large areas of the adjacent hunting lands of ancient Forest Law were being sold or leased for grazing. Hunting status was, however, retained through the creation of private deer parks within the country estates of the nobility, which have left traces in the boundary and woodland patterns of the area – notably around Pendle Hill and along the upper reaches of the Hodder.

The field pattern around settlements and on valley bottoms is generally irregular, and small to medium in scale, which indicates medieval to 17th-century enclosure from woodland and moor, and also from medieval strip fields. Areas of common land at higher elevations have a more regular field pattern, following late 18th- and 19th-century Parliamentary enclosure. A particular feature of this area is the number of large country houses and halls set in parkland, such as Ellel Grange, Waddow Hall, Bolton Park and Leagram Hall, as well as country estates, such as Abbeystead, which have developed from the medieval period.

In addition to these country houses and halls, there is a distinctive architectural legacy of stone-built farmsteads, houses and settlements, mostly dating from rebuilding in the 18th and 19th centuries.

Isolated stone villages tend to be nestled into the escarpments and are commonly characterised by distinctive becks, greens and mills – each with its own unique charm. Many of the smaller villages and hamlets are linear in character and commonly take the form of terraced stone cottages along the main road. Farmsteads tend to consist of a core of vernacular stone buildings, many dating from the 17th century, with either stone-flagged or slate roofs. On higher ground, traditional stone field barns are commonplace.

The textile industry developed from the 15th century, and farmsteads and settlements retain significant evidence of loom shops, with large windows dating from the 17th century. Industry is also represented by some small mill settlements in the Calder Vale, Oakenclough, Dolphinholme and Galgate (terraced cottages associated with mills), and by lead-mining remains and derelict lime kilns along the Ribble Valley. Settlement expansion dating from the 19th and 20thcenturies is generally restricted to the south and south-east (Clitheroe and Longridge). Modern development around village fringes gives a suburban character, with a mix of building materials and styles.

Barn at Overhouses, Ingleborough can be seen in the background in the adjaceent Yorkshire Dales NCA

Ecosystem services

The Bowland Fringe and Pendle Hill 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 Bowland Fringe and Pendle Hill NCA is contained in the 'Analysis' section of this document.

Provisioning services (food, fibre and water supply)

- **Food provision**: The Bowland Fringe and Pendle Hill area is important for rearing livestock. Many traditional farming practices are still employed here, providing a food resource from the sustainable rearing of sheep and cattle. Locally sourced food also plays an increasingly important role in supporting tourism in the area, and in the process helps to encourage Bowland's green economy.

- **Timber provision**: Some 7 per cent of the area is woodland, and a quarter of this is coniferous plantation. Several large blocks of conifer plantation are present, mainly in the south and north-west, some of which are managed for productive timber. There are opportunities for local woodland products, including wood fuel, from both the conifer and broadleaved under-managed woodlands.

- **Water availability**: Principal surface water resources within the NCA are the catchments of the rivers Lune, Wyre and Ribble. Abstraction is mainly for public water supply, industry, aquaculture, energy generation and topping up the Lancaster Canal.

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

- **Regulating climate change**: In this NCA, soil carbon levels are generally low (between 0 per cent and 5 per cent), reflecting the mineral soils that cover 72 per cent of the area. Small areas of higher soil carbon adjoin the peaty upland area of the Bowland Fells. These soils store significant volumes of carbon dioxide and other greenhouse gases. Degraded peat bogs release stored carbon dioxide and other greenhouse gases into the atmosphere and through water run-off. Sustainable management of blanket bog and other moorland habitats provides an opportunity to safeguard existing stores of greenhouse gases while sequestering increased volumes from the atmosphere. Soil carbon levels will also be high under areas of woodland, and carbon storage and sequestering is provided by the woodland itself.

- **Regulating soil erosion**: Almost a third of this NCA has a high risk of soil erosion. The slowly permeable, wet, very acid upland soils with a peaty surface often found on the moorland plateau tops are at risk of gullying or hagging (and of losing particulate organic matter) where the surface vegetation is damaged, highly modified or lost. Drainage of these soils may also result in increased oxidation of carbon and soil wastage. Erosion is equally prevalent on the very acid, loamy upland soils with a wet peaty surface often found on steep slopes, where a combination of rapid run-off and easily damaged peat layers results in soil erosion. The freely-draining, slightly acid, loamy soils and the lighter-textured (less clayey) variants of freely-draining, lime-rich, loamy soils can erode easily on steep slopes – especially where vegetation is removed, soil is compacted or organic matter levels are low after continuous cultivation. There is also potential for wind erosion on some coarse-textured, cultivated variants of the former soil type.

- **Regulating soil quality**: Over 70 per cent of this NCA may be subject to soil quality issues. The slowly permeable, seasonally wet, acid loamy and clayey soils may suffer compaction and/or capping, as they are easily damaged when wet. In turn, this may lead to increasingly poor water infiltration and diffuse pollution as a result of surface water run-off. Conversely, the slowly permeable, wet, very acid upland soils with a peaty surface are at risk of a loss of organic matter through drought induced by a changing climate and soil erosion.

- **Regulating water quality**: Ecological river water quality is moderate or poor in much of the River Lune catchment, although the rivers Wenning and Greta have good water quality. Langthwaite Reservoir is of moderate ecological quality. The River Conder is of moderate quality, as is the River Calder, while the remainder of the Wyre is of good quality. The River Ribble downstream of Gisburn, including several of its tributaries, are of moderate quality, and most of the remainder of the Ribble catchment within this NCA has good water quality. The chemical status of groundwater is poor in the north and west of the NCA, but good in both the south and east.

- **Regulating water flow (flooding)**: This NCA envelops the higher land mass that forms the Bowland Fells, and contains the middle part of the rivers that drain that upland area, with its steep topography and narrow flood plains. This, combined with waterlogged moorland soils and high rainfall, produces watercourses that respond rapidly to rainfall, increasing fluvial flood risk.

Cultural services (inspiration, education and wellbeing)

- **Sense of place/inspiration**: This NCA forms part of the Forest of Bowland AONB, designated in 1964 because the landscape was thought to be of national importance and worthy of protection. A sense of place is provided by the undulating, rolling landscape that skirts the edge of the Bowland Fells, forming a dramatic backdrop. There are sharp variations in the local landscape resulting from the river valleys and numerous small hills. There are also strong contrasts between the area's traditional farmsteads and settlements (which include evidence of textile working), a small number of industrial settlements, and country houses usually set within extensive, semi-natural woodland and well-maintained formal parkland. The landscape is intensively managed and largely of permanent, improved pasture for dairy and livestock farming, with small to medium-sized herb-rich hay meadows defined by well-maintained hedgerows with mature hedgerow trees, and rough grazing at higher levels. Woodland forms a significant landscape element within the area.

- **Sense of history**: The enclosed landscape – with its legacy of farmsteads, medieval to post-medieval irregular fields, and regular enclosures from moorland of the 19th century – is testament to settlement and land use from the medieval period onwards. Apart from the extensive evidence of medieval settlement and land use, a much earlier development from the pre-Roman period is evident in the many archaeological sites – particularly on the moorland fringes and in valleys, where agriculture has been less intensive, as well as in corridors like the Ribble and Lune valleys, which were important routes from the Roman period onwards (small motte-and-bailey castles being found in the latter). A small number of industrial terraced settlements are characteristic of the Calder Vale, while lead-mining remains and derelict lime kilns are found in the Ribble Valley.

- **Tranquillity**: This NCA is important for the tranquillity it provides: 76 per cent of the area was classified as 'undisturbed' by the Campaign to Protect Rural England in 2007, although this is a significant decrease from the figure of 92 per cent recorded in the 1960s. The lowest areas of tranquillity lie along the major road corridors such as the M6, A65 and A59, as well as around the towns of Clitheroe and Longridge. A sense of tranquillity is likely to be most associated with the wooded river valleys, as well as with the parklands, picturesque villages and hamlets on undulating lowland farmland, and with some small-scale and intimate landscapes in the Lune and Ribble valleys. These areas help to deliver health and wellbeing benefits to all of their visitors: the natural environment provides areas of relative tranquillity and sensory experience for meditation and relaxation, which in turn has a calming and restorative effect and helps to improve mental wellbeing.

View across Clitheroe

- **Recreation**: This is supported by the Pennine Bridleway (19 km of which lies in this NCA). There are 1,537 km of rights of way, with a density of 2 km per km^2. Open access land covers 6.4 per cent of the NCA (4,728 ha). Cycling continues to be popular, with increasing opportunities for off-roading along bridleways. Road cycling is also popular, especially on the designated 'quiet lanes' around Chipping and Downham, and as part of the more challenging Tour of Pendle race. There are opportunities for horseriding along the network of greenways and bridleways. Other popular activities include birdwatching, fishing, gliding and shooting. In addition, there is a developing network of tramper trails that are suitable for people using off-road mobility scooters and pushchairs. The ability to access green spaces has been demonstrated to encourage contact with nature and participation in physical activity – both of which encourage the adoption of other healthy lifestyle choices such as social engagement and consumption of healthy foods.

- **Biodiversity**: Biodiversity Action Plan (BAP) priority habitats cover 6,000 ha (8 per cent) of the NCA and include 1,700 ha of upland heathland and smaller areas of a variety of woodland, grassland and riverine priority habitats. The NCA contains two Special Areas of Conservation (SAC) and one Special Protection Area (SPA), and 2,300 ha (3 per cent of the NCA) are nationally designated as a Site of Special Scientific Interest (SSSI).

- **Geodiversity**: There are currently six nationally designated geological sites within the NCA. These consist mainly of river sections and exposures, along with one of the best examples of knoll reefs in northern England, making up the Clitheroe Knoll Reefs SSSI. The 25 Local Geological Sites include examples of river channels and sections, glacial and fluvio-glacial landforms, disused quarries and ancient coal workings.

Statements of Environmental Opportunity

SEO 1: Protect and enhance the distinctive landscape character of the Bowland Fringe and Pendle Hill NCA for its sense of place, historical and cultural heritage, tranquillity, accessibility and recreational opportunities.

For example, by:

- Encouraging the conservation and restoration of the managed landscapes of isolated country houses – in particular the woodland belts and estate fencing.
- Conserving and managing traditional stone farm buildings and artefacts, ensuring the use of local styles and materials in order to maintain the historic and rural character of the countryside and built environment of rural settlements.
- Conserving significant archaeological sites as part of the evidence for the area's development from the medieval period and earlier.
- Managing development (especially around the fringes of the NCA), in order to maintain the rural character of the landscape, tranquillity and sense of remoteness. Protecting the area from development on ridgelines and hilltops, to maintain the predominantly open character of the landscape.
- Promoting enjoyment, awareness and understanding of the NCA, particularly around less well-known sites and features, to relieve pressure on busier destinations (especially Beacon Fell, Brockbottom, Jeffrey Hill and Kemple End), in order to maintain existing levels of tranquillity, remoteness and landscape character.
- Sympathetically managing recreational sites to enhance visitors' experience and their enjoyment of contact with the natural environment, while managing erosion and traffic, to benefit landscape and wildlife.
- Using the Pennine Bridleway and the network of paths to gain access to, reveal and interpret the area's rich history.

SEO 2: Safeguard, manage and enhance the area's important habitats, including blanket bog, wet heath, waterbodies and woodland, to provide benefits for climate change, flood regulation, soil quality and erosion, and water quality.

For example, by:

- Ensuring that all areas of blanket bog are under good environmental management. Ensuring good vegetative cover and reducing high rates of run-off by restoring the hydrology and ecology of peat habitats. Re-vegetate bare peat.
- Managing the moorland fringe in order to maintain the mosaic of landscape features of the rolling upland farmland, including hay meadows and grasslands used by breeding waders.
- Encouraging sustainable grazing regimes to avoid poaching of soils and to aid water infiltration.
- Protecting, restoring and managing the semi-natural woodland. Much of this is ancient, occuring in the main valley bottoms, side valleys and ridges, and is dominated by oak, ash and alder.
- Restructuring conifer plantations to increase broadleaved component and to soften edges.
- Exploring opportunities to plant new native woodlands appropriate to the area's character. Ensuring that woodland expansion avoids peat, and avoids impacting on other sites of biodiversity or historic value.
- Exploring opportunities to get existing woodland into management for local woodland products and wood fuel supply.

SEO 3: Manage and enhance the landscape character and biodiversity of the farmed environment with its mosaic of pastures and meadows, and strong field patterns defined by drystone walls and hedgerows, to improve ecological networks and strengthen landscape character.

For example, by:

- Conserving and restoring semi-natural and species-rich hay meadows, particularly in the flood plain and farmed landscapes, to counter the effects of intensification.
- Managing pastures in ways that build up organic matter and avoid compaction.
- Avoiding carrying out mechanised activities (such as trafficking) that will cause compaction of soils, especially in wet conditions.
- Managing nutrients on farmsteads and improved pastures, targeting applications to maximise uptake and minimise run-off.
- Conserving and restoring the field boundaries defined by hedgerows, drystone walls, boundary trees and metal estate railings, in order to reduce the enlargement of fields, replacement with stock fencing and lack of management.
- Addressing the restoration and management of the characteristic field ponds north of Preston.

SEO 4: Retain riparian and wetland habitats, and ensure that they are well managed and well connected to the high density of waterbodies. Enhance the network to further increase biodiversity, improve its ability to buffer pollution, increase flood mitigation and improve water quality.

For example, by:

- Conserving and managing the numerous watercourses and bodies, including the rivers Ribble, Hodder, Calder, Wyre and Lune, as well as a number of reservoirs and field ponds north of Preston.
- Restoring and managing field ponds and wetlands throughout the valley flood plain and undulating lowland farmland. Using quarry restoration as an opportunity for wetland and other habitat creation.
- Managing blanket bog and rushy upland pasture, and conserving it from degradation, which results in increased run-off to streams and rivers, river bank erosion and deterioration in downstream water quality.
- Seeking opportunities that will allow rivers to follow their natural course and re-engage with their flood plain.
- Encouraging the management and restoration of riparian woodland for protection against river bank erosion and for their value as habitat corridors.
- Protecting water quality through the use of extensive grazing and permanent grassland creation adjacent to watercourses to reduce run-off.
- Managing nutrients on farmsteads and improved pastures, targeting applications to maximise uptake and minimise run-off.

Additional opportunities

1. Protect the strong relationship between landscape and the underlying geology, the land use it supports and its significance to the cultural identity of the area.

For example, by:

- Maintaining key views of landform and geological features, and using semi-natural land cover to enhance and support biodiversity (but not obscuring landform features).
- Keeping important geological exposures – such as quarry faces, cuttings, outcrops and stream sections – visible and, where appropriate, accessible.

Supporting document 1: Key facts and data

Area of Bowland Fringe and Pendle Hill National Character Area (NCA): 74,090 ha

1. Landscape and nature conservation designations

Some 52 per cent of the NCA (38,175 ha) falls within the Forest of Bowland Area of Outstanding Natural Beauty (AONB). The Forest of Bowland AONB Management Plan provides a policy framework and identifies a 5-year programme of actions (April 2009 - March 2014) to help guide the work of the AONB partnership organisations towards achieving the purpose of this plan; to conserve and enhance the natural and cultural beauty of the Forest of Bowland landscape. The management plan can be downloaded at:

http://www.forestofbowland.com/cons_managementplan

Less than 1 per cent of the NCA (181 ha) falls within the Yorkshire Dales National Park. Please see NCA 21 Yorkshire Dales for further details.

Source: Natural England (2011)

1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

Tier	Designation	Name	Area (ha)	% of NCA
International	n/a	n/a	0	0
European	Special Protection Area (SPA)	Bowland Fells SPA	1,453	2
	Special Area of Conservation (SAC)	Calf Hill and Crag Woods SAC; North Pennine Dales Meadows SAC	41	<1
National	National Nature Reserve (NNR)	n/a	0	0
	Site of Special Scientific Interest (SSSI)	A total of 28 sites wholly or partly within the NCA	2,267	3

Source: Natural England (2011)

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

Within the NCA a total of 2,267 ha is under European or national designation.

The Bowland Fells SPA and Bowland Fells SSSI comprise the same area, and 9 per cent of this falls within the NCA.

The North Pennine Dales Meadows SAC comprises 3 SSSI meadows one of which (Langcliff Cross Meadow SSSI) is wholly within the NCA, Part of Bell Sykes Meadows SSSI is also within the NCA.

Calf Hill & Crag Woods SSSI and SAC comprise the same area and all but the southern tip of Calf Hill Wood is within the NCA.

There are 347 Local sites in Bowland Fringe and Pendle Hill NCA covering 5,139 ha, which comprises 7 per cent of the NCA.

Source: Natural England (2011)

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

1.1.1 Condition of designated sites

SSSI Condition Category	Area (ha)	Percentage of NCA SSSI Resource
Unfavourable declining	15	<1
Favourable	591	26
Unfavourable no change	358	16
Unfavourable recovering	1,298	57

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 NCA is a transitional landscape which wraps around the upland core of the Bowland Fells. Elevation ranges within this NCA from 9 m above sea level to 577 m. .

Source: Natural England 2010

2.2 Landform and process

This is an undulating and rolling landscape with local variation created by numerous river valleys and by the moorland outliers of Beacon Fell (266 m), Longridge Fell (350 m) and Pendle Hill (577 m) on the south side of the area.

Source: Bowland Fringe and Pendle Hill Countryside Character Area description

2.3 Bedrock geology

The transition from plain to fell landscape is rapid and reflects the existence of a substantial boundary fault which separates the soft Permo-Triassic rocks from the harder Carboniferous rocks. In the south where the Brock Valley crosses the area, the coarse-grained sandstones of the Millstone Grit of Bowland give way to the softer calcareous mudstones, with limestone beds of the Carboniferous Limestone. The broad Ribble and Hodder Valleys broadly pick out the less resistant mudstones and limestones from the Millstone Grit rocks which form the fells. Within the valleys, strong moundy outcrops of reef knolls form distinctive landscape features, which give the area its special character.

Source: Bowland Fringe & Pendle Hill Countryside Character Area description

2.4 Superficial deposits

The rapid transition from plain to fell landscape is softened by the presence of thicker glacial deposits around the edge of the upland area. The mouths of the valleys are commonly filled by broad, flat alluvial fans. Ribbons of alluvial sand, gravel and silt follow the courses of these streams. The solid rocks are overlain by a complex of glacial deposits comprising mainly thick tills but with extensive areas of moundy sand and gravel deposited from glacial meltwater. Distinctive drumlins form a characteristic landscape within the river valleys to the north and east.

Source: Bowland Fringe & Pendle Hill Countryside Character Area description

2.5 Designated geological sites

Tier	Designation	Number
National	Geological Site of Special Scientific Interest (SSSI)	6
National	Mixed Interest SSSIs	0
Local	Local Geological Sites	25

Source: Natural England (2011)

**Local sites are non statutory designations*

- 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

Poorer quality soils (Grade 4) occur in the higher areas around the Bowland Fells fringe and on the east side of the NCA. The better quality (Grade 3) soils occur around the north south-west and south. There are 8 main soilscape types in this area: Slowly permeable seasonally wet acid loamy and clayey soils, covering 57 per cent of the NCA. Slowly permeable wet very acid upland soils with a peaty surface (15 per cent); Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (6 per cent); Very acid loamy upland soils with a wet peaty surface (6 per cent); Freely draining slightly acid loamy soils (5 per cent); Freely draining floodplain soils (3 per cent); Loamy and clayey floodplain soils with naturally high groundwater (3 per cent) and Freely draining lime-rich loamy soils (1 per cent).

Source: Natural England 2010

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

Grade	Area (ha)	% of NCA
Grade 1	0	0
Grade 2	39	<1
Grade 3	27,540	37
Grade 4	36,019	49
Grade 5	9,773	13
Non-agricultural	342	<1
Urban	378	<1

Source: Natural England (2010)

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

3. Key water bodies and catchments

3.1 Major rivers/canals

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

Great Stour	9 km
Little Stour	10 km
River Ribble	40 km
River Wenning	21 km
River Hodder	20 km
River Lune	15 km
River Wyre	13 km
River Brock	11 km
River Greta	11 km
River Hindburn	11 km
Tosside Beck	11 km
River Conder	9 km
River Calder	7 km
Leck Beck	3 km
Sabden Brook	<1 km

Source: Natural England (2010)

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

Some 13 rivers flow through the NCA totalling 173 km. The NCA surrounds the Bowland Fells and contains the middle part of rivers that drain the upland area with its steep topography and narrow floodplains.

The northern part of the NCA contains the River Lune and its tributaries the River Hindburn (which drains the northern slopes of the Bowland Fells NCA), the River Wenning (which drains northern slopes of the Bowland Fells NCA and south-west parts of the Yorkshire Dales NCA), and the River Greta and Leck Beck (which drain the south-west parts of the Yorkshire Dales NCA).

The River Lune itself has its source further north in the uplands of the Cumbria High Fells and Howgill Fells NCAs.

The western part of the NCA contains rivers which drain the western and south west slopes of the Bowland Fells - the River Wyre and its tributaries the rivers Calder and Brock as well as the River Conder which flows directly to the Irish Sea.

The southern and eastern parts of the NCA contain the River Ribble, which has its source in the Yorkshire Dales NCA, and its tributaries the River Hodder and Tosside Beck which drain the southern and eastern slopes of the Bowland Fells NCA.

3.2 Water quality

The total area of Nitrate Vulnerable Zone is 43,541 ha, 59 per cent of the NCA.

Source: Natural England (2010)

3.3 Water Framework Directive

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

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

4. Trees and woodlands

4.1 Total woodland cover

The NCA contains 5,060 ha of woodland (7 per cent of the total area), of which 1,165 ha is ancient woodland.

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

4.2 Distribution and size of woodland and trees in the landscape

Extensive areas of predominantly ancient semi-natural woodland are concentrated on the ridges, slopes and valley sides of the many rivers present throughout the area. Woodlands here are dominated by oak, ash and birch with extensive amounts of wych elm and wild gean, especially along the Ribble with alder and willow beside the Brock, Wyre and Calder. Areas of semi-natural woodland are commonly associated with managed estates and parkland. Several large blocks of conifer plantation are present, mainly in the south and north-west.

Source: Source Bowland Fringe & Pendle Hill 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	3,174	4
Coniferous	1,222	2
Mixed	411	1
Other	253	<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	903	1
Planted Ancient Woodland (PAWS)	262	<1

Source: Natural England (2004)

5. Boundary features and patterns

5.1 Boundary features

Medium to small-scale fields are defined by hedgerows with mature hedgerow trees, growth of which is particularly vigorous in the north. Dry stone walls are also common in some areas. Metal railings around estate boundaries are characteristic of the southern and western edges of the NCA.

Source: Bowland Fringe & Pendle Hill Countryside Character Area description; Countryside Quality Counts (2003)

5.2 Field patterns

Principally an area of intricate small-medium scale fields reflecting a long process of piecemeal colonisation and assortment. Ancient (pre 1600) enclosure has widespread survival, but is particularly concentrated to the south. Post medieval (1600-1850) enclosure patterns, similarly irregular, are the dominant field pattern in the area. Much of the higher common land and the lower fellsides especially to the west of the Bowland fells remained unenclosed until taken into large rectilinear grazing enclosures under Parliamentary Acts in the 18th and 19th centuries.

Source: English Heritage Historic Profiles; Countryside Character Area description; Countryside Quality Counts (2003)

6. Agriculture

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

6.1 Farm type

The NCA is characteristically a livestock grazing area. In 2009 there were 400 commercial livestock grazing holdings in the LFA (37 per cent) and 159 in the lowlands (15 per cent). There were also 254 dairy holdings (23 per cent), 22 specialist poultry holdings (2 per cent), 10 horticultural holdings (1 per cent) and 7 specialist pig holdings (<1 per cent). Survey data from 2000 to 2009 shows a 29 per cent increase in the number of grazing farms in the LFA whilst grazing farms in the lowlands have decreased by 7 per cent and dairy farms have decreased by 41 per cent.

Source: Agricultural Census, DEFRA (2010)

6.2 Farm size

There is a fairly even distribution in farm size with, in 2009, 184 (17 per cent) <5 ha, 207 (19 per cent), 5 to 20 ha, 234 (22 per cent) 20 to 50 ha, 246 (23 per cent) 50 to 100 ha and 216 (20 per cent) >100 ha. Between 2000 and 2009 the number of commercial holdings decreased overall by 7 per cent from 1,172 to 1,087. This decrease was across all size bands with the exception of the smallest (<5 ha) and largest (>100 ha) holdings both of which showed a slight increase. (Note: these figures do not include the access that many farms have to common grazing on the moors).

Source: Agricultural Census, DEFRA (2010)

6.3 Farm ownership

2009: Total farm area = 66,610 ha; owned land = 36,723 ha
2000: Total farm area = 65,786 ha; owned land = 39,016 ha.
In 2009 55 per cent of the total farmed area was owner occupied. Between 2000 and 2009 there has been an increase in the total farmed area of 824 ha (1 per cent) although there has been a slight decrease in the number of holders from 1,860 to 1,657.

Source: Agricultural Census, DEFRA (2010)

6.4 Land use

The predominant land use in this NCA is grass and uncropped land mainly for sheep and some cattle and pig rearing.

Source: Agricultural Census, DEFRA (2010)

6.5 Livestock numbers

Sheep are the most numerous livestock type in this landscape (a total of 295,900 in 2009 in comparison to 81,300 cattle and 4,200 pigs). Between 2000 and 2009 sheep numbers decreased by 90,600 (23 per cent), cattle numbers decreased by 12,300 (13 per cent) and pig numbers decreased by 4,900 (54 per cent).

Source: Agricultural Census, DEFRA (2010)

6.6 Farm labour

In 2009 the majority of holdings are run by Principal Farmers (1,657) with only 18 salaried managers being employed. Between 2000 and 2009 the number of salaried managers remained static at 18, full time workers decreased slightly from 228 to 225, part time workers increased from 218 to 255 and casual / gang workers decreased from 218 to 104.

Source: Agricultural Census, DEFRA (2010)

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

7. Key habitats and species

7.1 Habitat distribution/coverage

Small to medium sized hay meadows and permanent pasture fields are defined by stone walls immediately adjacent to the Bowland Fells, which become hedgerows within valley bottoms and areas around settlements. Mature oak, ash and alder trees are common components of hedgerows. The species rich hay meadows with pignut, yellow rattle, great burnet, ox-eye daisy and lady's mantle provide a splash of colour during the summer and attract large numbers of butterflies. At higher elevations the improved pastures give way to areas of rough grazing and field patterns become more regular, with stone walls predominating. Here, wet rushy pastures are of particular importance for breeding waders such as lapwing, snipe, curlew, redshank and oystercatcher. Extensive areas of predominantly ancient semi-natural woodland are concentrated on the ridges, slopes and valley sides of the many rivers present throughout the area. Woodlands here are dominated by oak, ash and birch with extensive amounts of wych elm and wild gean, especially along the Ribble, with alder and willow beside the Brock, Wyre and Calder. The woodlands on the northernmost side of the Fells are particularly important for their rich assemblage of mosses and lichens. Pied and spotted flycatchers, redstart, tree pipit, tawny owl, great spotted woodpecker and sparrow hawk are all characteristic bird species associated with these woodlands.

Numerous rivers and watercourses provide habitats for salmon, brown and sea trout, as well as birds such as kingfisher, dipper, grey wagtail, common sandpiper and oystercatcher. Otters are also present along rivers on the northern side of the Fells. The rivers make a significant contribution to the area together with the Lancaster Canal which supports an interesting array of locally rare aquatic plants such as flowering rush, greater spearwort, white water lily and various pond weeds.

A number of reservoirs and disused gravel pits along the Wyre valley are also important as habitat for breeding great crested grebe and wintering wildfowl, whilst the high density of field ponds between Preston and Garstang provide an important habitat for aquatic plants, freshwater invertebrates and amphibians. Formal parkland surrounding modest country houses adds to the intensely managed character of the area. Typically consisting of open grassland with ponds and lakes, scattered trees of oak, ash, sycamore and lime, enclosed by blocks of secondary woodland, the parklands are

particularly important for their dead wood invertebrates, mosses and lichens. Several heronries are also present.

Source: Bowland Fringe & Pendle Hill Countryside Agency Summary Statements; Forest of Bowland Natural Area Profile

7.2 Biodiversity Action Plan (BAP) priority habitats

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

Habitat	Area (ha)	% of NCA
Broadleaved mixed & yew woodland (Broad Habitat)	1,791	2
Upland heathland	1,747	2
Coastal & floodplain grazing marsh	1,278	2
Blanket bog	973	1
Lowland meadows	363	<1
Purple moor-grass & rush Pasture	351	<1
Lowland calcareous grassland	132	<1
Upland hay meadow	129	<1
Fens	103	<1
Upland calcareous grassland	92	<1
Lowland raised bog	82	<1
Lowland heathland	32	<1
Lowland dry acid grassland	22	<1

Source: Natural England (2011)

7.3 Key species and assemblages of species

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

8. Settlement and development patterns

8.1 Settlement pattern

The settlement pattern is of small villages with isolated houses and farms dotted around the winding country lanes. Many of the smaller villages and hamlets are linear in character and commonly take the form of terraced stone cottages along the main road.

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

8.2 Main settlements

There are many villages dating from the 16th to 18th century, together with hamlets, farmsteads and also country houses and halls set in parkland. The largest settlements within the NCA are: Clitheroe, Longridge, Bentham, Whalley, Caton, Grimsargh and Goosnargh. There are also many small villages and hamlets with populations of <1,000. The total estimated population for this NCA (derived from ONS 2001 census data) is: 55,281.

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

8.3 Local vernacular and building materials

Isolated stone villages tend to be nestled into the escarpments and are commonly characterised by distinctive becks, greens and mills each with its own unique charm. On higher ground traditional stone barns are commonplace. The predominant building materials are stone and roofs are made of slate or, less commonly, stone flags. There has been some, limited, expansion of villages but this has been done sympathetically using local materials.

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

9. Key historic sites and features

9.1 Origin of historic features

The history of the landscape is evident in the long history of piecemeal colonisation reflected in the intricate small-medium scale fields with widespread post medieval and ancient fields, particularly around Preston, and larger rectilinear Parliamentary enclosures. There are many archaeological sites particularly on the moorland fringes and in valleys where agriculture has been less intensive as well as corridors such as the Ribble and Lune valleys which were important routes since the Roman period, the latter with small motte and bailey castles. A small number of industrial terraced settlements, for example Oakenclough, Dolphinholme and Galgate, are characteristic of the Calder Vale while lead mining remains and derelict lime kilns are found in the Ribble Valley. Aspects of history likely to be most evident to the general public include, Stonyhurst College, Gledstone Hall, Clitheroe Castle, large country houses set in their own parkland, such as Abbeysted, Ellel Grange, Waddow Hall, Bolton Park and Leagram Hall and smaller landscape features such as stone bridges.

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

9.2 Designated historic assets

This NCA has the following historic designations:

- 3 Registered Parks and Gardens covering 95 ha
- 0 Registered Battlefield/s covering 0 ha
- 39 Scheduled Monuments
- 1274 Listed Buildings

Source: Natural England (2010)

- More information is available at the following address:
  http://www.english-heritage.org.uk/caring/heritage-at-risk/

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

10. Recreation and access

10.1 Public access

- 6 per cent of the NCA 4,728 ha is classified as being publically accessible.
- There are 1,537 km of public rights of way at a density of 2 km per km^2.
- There is 1 national trail within NCA. 19 km of the Pennine Bridleway falls within this NCA.

Sources: Natural England (2010)

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

Access designation	Area (ha)	% of NCA
National Trust (Accessible all year)	0	0
Common Land	1,371	2
Country Parks	110	<1
CROW Access Land (Section 4 and 16)	4,728	6
CROW Section 15	540	1
Village Greens	7	<1
Doorstep Greens	0	0
Forestry Commission Walkers Welcome Grants	100	<1
Local Nature Reserves (LNRs)	18	<1
Millennium Greens	0	0
Accessible National Nature Reserves (NNRs)	0	0
Agri-environment Scheme Access	3	<1
Woods for People	197	<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 lowest scores are around the main settlements and road routes.

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

Category of tranquillity	Score
Highest value within NCA	127
Lowest value within NCA	-78
Mean value within NCA	11

Sources: CPRE (2006)

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

11.2 Intrusion

The 2007 Intrusion Map (CPRE) shows the extent to which rural landscapes are 'intruded on' from urban development, noise (primarily traffic noise), and other sources of visual and auditory intrusion. This shows that large areas of the NCA are considered 'disturbed' with major transport corridors and urban development occurring throughout the NCA. A breakdown of intrusion values for this NCA are detailed in the table below.

Appendix 1: Extract from Natural England National Character Area profile: 33 Bowland Fringe and Pendle Hill

Category of intrusion	1960s (%)	1990s (%)	2007 (%)	% change (1960s-2007)
Disturbed	8	21	23	15
Undisturbed	92	79	76	-16
Urban	<1	<1	<1	<1

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are an increase in intrusion particularly along the M6 corridor and around Longridge, Clitheroe and the A59.

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

12. Data sources

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

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

Supporting document 2: Landscape change

Recent changes

Trees and woodlands

- Riverside woods have declined due to excessive grazing and lack of management, with smaller, semi-natural woodlands being particularly vulnerable to grazing by stock and deer. In addition heavy grazing and drainage of upland areas has led to increased erosion of riverbanks and riverside trees.

- Many prominent, mature flood plain, parkland and hedgerow trees are over mature or in decline. There is little evidence of regeneration in hedgerows or of replacement planting.

- About 23 per cent of the woodland is Ancient Woodland (1,165ha), of this almost a quarter of the ancient woodland is plantation on ancient woodland sites (262 ha) The proportion of these sites covered by a Woodland Grant Scheme agreement increased from 1999 to 2003 from 8 per cent to 16 per cent.

Boundary features

- The areas important and distinctive stock of field boundaries, although still largely intact is in decline. Surveys by the Forest of Bowland AONB (2007) indicate that more than 50 per cent of field boundaries are in need of restoration; these are mainly within the Bowland Fringe and are predominantly hedgerows although extensive wall restoration is needed too, especially on higher ground. Artefacts such as gateposts, sheepfolds, stone troughs and parish boundary markers are also at risk.

- The most frequent Environmental Stewardship agreements for linear features as at March 2011 were for hedgerows (557,190 m) and stone walls (513,692 m).

- The estimated boundary length for the NCA is about 6,019 km. Total length of Environmental Stewardship agreements for linear features as at March 2011 is equivalent to about 21.2 per cent of this total.

Agriculture

- The primary land use within the NCA is grass and uncropped land (96 per cent) and there was a 1 per cent decrease in the total farmed area between 2000 and 2009.

- Between 2000 and 2009 there was a 10 per cent decrease in the number of all livestock production farm types with an associated significant decrease in livestock numbers. There was however a slight increase in all arable, horticulture, mixed and other farm types. There was a 41 per cent decrease in the number of dairy holdings and an apparent shift from lowland to LFA livestock grazing.

Settlement and development

- Some older farm buildings have fallen into disrepair and conspicuous modern farm buildings have affected the settings of unspoilt traditional farmsteads.

- Tourism and recreation are an important part of the local economy, and the increased pressures associated with the expansion of facilities at key sites, such as Beacon Fell, Brockbottom, Jeffrey Hill and Kemple End requires sensitive management to ensure attendant noise, erosion and traffic are controlled whilst encouraging access to and enjoyment of the natural environment.

- The incremental effective of many small-scale new developments has resulted in dilution of traditional vernacular styles.

Semi-natural habitat

- Semi-natural meadow habitats have been lost due to farm amalgamation and agricultural intensification, particularly in the flood plain and lowland farmland landscape, which are dominated by dairying. Herb-rich flood plain meadows and hay meadows are at particular risk from agricultural improvement.

- Moorland fringe landscapes are vulnerable to change due to declining agricultural income. Farm decline and abandonment may adversely affect the characteristic diverse mosaic of small pastures, meadows and scrub woodlands.

- Changes include decline of moorland / bog habitats in the moorland fringes and loss of field ponds / wetlands elsewhere.

Historic features

- In 2003 about 71 per cent of historic farm buildings remained unconverted. About 95 per cent were intact structurally.

- In 1918 about 2 per cent of the NCA was historic parkland. In terms of its share of the resource the NCA was ranked 75. By 1995 it is estimated that 24 per cent of the 1918 area had been lost. In 2003 about 4 per cent of the remaining parkland was covered by a Historic Parkland Grant, and 9 per cent was included in an agri-environmental scheme.

Rivers

- The NCA does not overlay any major aquifers.

- Principal surface water resources within the NCA are the catchments of the rivers Lune, Wyre and Ribble. The tributaries of the River Lune within the NCA have 'no water available'. Actual abstractions (as opposed to licensed abstractions) in the Lune CAMS area as a whole are mainly for public water supply (particularly the Lancaster area), industry, aquaculture and energy generation. The Lancaster area is supplied from Langthwaite reservoir, which is filled from the River Lune intake at Caton. The River Lune can support flows in the River Wyre via pipeline transfers.

- The River Wyre and its tributaries within the NCA are classified as 'over abstracted', 'over licensed' or 'no water available'. Water abstraction within the Wyre CAMS area is dominated by public water supply but is also used for industry, agriculture, fish farming and topping up the Lancaster Canal.

- The River Ribble catchment within the NCA generally has 'water available' although its tributary the River Hodder is 'over licensed'

Minerals

- There are a number of sand and gravel extraction sites within the NCA, mainly confined to the valley bottoms to the south. There are also clay pits and the most prominent of these is at Claughton Brickworks where aerial ropeways extend from Claughton Moor across the A683 to the brickworks.

River Lune

Drivers of change

Climate change

- Evidence from UK Climate Impacts Programme (UKCP09) shows that over the coming century the climate in NW England is expected, on average to become warmer and wetter in winter and hotter and drier in summer. Under the medium emissions scenario by 2080: mean winter temperatures will increase by 2.6°C, mean summer temperatures will increase by 3.7°C, winter precipitation will increase by 16 per cent, summer precipitation will decrease by 22 per cent and there will be an increase frequency of extreme events (floods/droughts).
- Hotter, drier summers may lead to reduced groundwater and surface drying out of peat bog habitats, which can release carbon into the atmosphere.
- Small fragmented patches of habitat and poor-quality habitat are vulnerable to loss of biodiversity due to changes in rainfall and temperature.
- Periods of heavy rain may lead to an increased risk and frequency of flooding in lowland areas and river valleys and may also result in increased soil erosion and pollution of water courses downstream. There is also a potential increased risk of landslides during times of increased rainfall.
- Prolonged periods of drought are likely to have an adverse effect on peatland habitats, making them more prone to soil erosion and wildfire events.
- Potential for more favourable conditions for crops and other farming practices not presently possible within this area.
- Potential change to cropping patterns and types of crops in response to climate change altering the character of the landscape.
- Threat to trees from changing pests and diseases and extreme weather events.
- There may be increased pressures for renewable energy development and a growing demand for bio-energy crops.

Other key drivers

- Possible abandonment of hill farming in the face of economic pressures is likely to affect species mix and character of upland grassland and moorland.
- Lack of management of semi-natural clough woodland and lack of restoration of plantation on ancient woodland sites may reduce wildlife value. In addition potential changes to wood product markets may influence woodland management.
- Agricultural specialisation, intensification and farm amalgamation may result in a loss of semi-natural habitat and cultural features.
- Heavy fertiliser use and diffuse pollution may lead to loss of biodiversity both on and off agricultural land as well as affecting water quality.
- There is an opportunity to increase tree and woodland cover to provide multiple benefits including reconnecting fragmented habitats increasing resilience and improving water quality.
- Pressure on key destinations needs to be sensitively managed to avoid erosion and potential damage to archaeological sites, loss of habitats, tranquillity and diminished visitor experience, whilst balancing the positive benefits of increasing opportunities for visitors to reconnect with nature.
- Changing agricultural policy and farm subsidies creates uncertainty and pressures on livestock farming. Increasing emphasis on food security and bio-energy crops.
- Pressure for new development and building conversion in an open exposed landscape can be visually intrusive. Sympathetic design of new buildings in keeping with landscape character with appropriate siting and screening should be sought.
- Increasing pressure for commercial-scale renewable energy infrastructure such as windfarms
- The exploitation of mineral deposits has the potential to affect the landscape character of the area and will require sensitive development.
- There is substantial pressure for urban expansion close to Preston / Longridge, as well as some development pressure on the southern margins of the NCA and within the larger historic villages.

Supporting document 3: Analysis supporting Statements of Environmental Opportunity

The following analysis shows the projected impact of Statement of Environmental Opportunity on ecosystem service provision:

Statement of Environmental Opportunity	Ecosystem Service																		
	Food provision	Timber provision	Biomass provision	Water availability	Genetic diversity	Climate regulation	Regulating soil erosion	Regulating soil quality	Regulating water quality	Regulating water flow	Pollination	Pest regulation	Regulating coastal erosion	Sense of place/inspiration	Sense of history	Tranquility	Recreation	Biodiversity	Geodiversity
SEO 1: Protect and enhance the distinctive landscape character of the Bowland Fringe and Pendle Hill NCA for its sense of place, historical and cultural heritage, tranquillity, accessibility and recreational opportunities.	↔ ***	↔ ***	↔ ***	↔ ***	↔ **	↔ ***	↔ **	↔ **	↔ **	↔ ***	↔ ***			↑ ***	↑ **	↑ **	↑ ***	↑ **	↑ **
SEO 2: Safeguard, manage and enhance the area's important habitats, including blanket bog, wet heath, waterbodies and woodland, to provide benefits for climate change, flood regulation, soil quality and erosion, and water quality.	↗ **	↗ **	↗ ***	↑ **	↔ **	↑ *	↑ **	↑ ***	↑ **	↑ **	↔ ***			↑ ***	↔ **	↑ ***	↑ **	↑ **	↑ *

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

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

Statement of Environmental Opportunity	Ecosystem Service: Food provision	Timber provision	Biomass provision	Water availability	Genetic diversity	Climate regulation	Regulating soil erosion	Regulating soil quality	Regulating water quality	Regulating water flow	Pollination	Pest regulation	Regulating coastal erosion	Sense of place/inspiration	Sense of history	Tranquility	Recreation	Biodiversity	Geodiversity
SEO 3: Manage and enhance the landscape character and biodiversity of the farmed environment, with its mosaic of pastures and meadows, and strong field patterns defined by drystone walls and hedgerows, to improve ecological networks and strengthen landscape character.	↗ **	↔ **	↔ **	↑ **	↔ **	↗ **	↗ **	↑ **	↗ **	↗ **	↗ **			↑ ***	↔ **	↗ ***	↗ **	↑ **	↔ **
SEO 4: Retain riparian and wetland habitats, and ensure that they are well managed and well connected to the high density of waterbodies. Enhance the network to further increase biodiversity, improve its ability to buffer pollution, increase flood mitigation and improve water quality.	↔ ***	↗ **	↗ **	↑ ***	↔ **	↗ **	↑ ***	↗ *	↑ **	↑ ***	↔ *			↗ **	↔ **	↔ **	↔ **	↑ ***	↗ *

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

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

Landscape attributes

Landscape attribute	Justification for selection
Undulating, rolling landscape with local variation created by numerous river valleys and by the moorland outliers of Beacon Fell, Longridge Fell and Pendle Hill.	■ The combination of topography, tree cover and field enclosure creates a sense of intimacy in contrast to the expanse of the coastal plain and exposed moorland heights. ■ 13 rivers flow through the NCA totalling 172 km. ■ Elevation ranges from 9.23 m to 549.66 m.
The Bowland Fells provide a dramatic backdrop to the north with extensive views across the river valleys and Lancashire plain below.	■ The NCA is a transitional landscape which wraps around the upland core of the Bowland Fells. ■ The transition from plain to fell landscape is rapid and reflects the existence of a substantial geological boundary fault which separates the soft Permo-Triassic rocks from the harder Carboniferous rocks.
Drumlins on the northern edge of the area.	■ Glacial drift deposits have given rise to a repetitive pattern of rounded hills or drumlins which creates a distinctive rolling landform characteristic of the northern edge of the NCA associated with the rivers Lune and Ribble.
Strong mounded outcrops or 'reef knolls' of limestone form distinct landscape features in the Ribble and Hodder valleys.	■ The Clitheroe Knoll Reefs SSSI comprises a road cutting and four small hills between the villages of Worston and Downham near the market town of Clitheroe. The hills are important examples of an early Carboniferous "knoll reefs" complex. In conjunction with other well exposed sites in the Clitheroe area, the complex shows one of the best examples of such reefs in Northern England.
Ancient semi-natural woodland dominated by oak, ash and alder.	■ Calf Hill and Cragg Woods SSSI/SAC occupies the north and south-facing slopes of a steep-sided valley above the River Conder, a tributary of the River Lune. The woods support one of the most extensive stands of upland oak-birch woodland in Lancashire, as well as large stands of valley alder woodland with wet birch woodland.
Isolated country houses set in formal parkland.	■ Large country houses set in their own parkland include Abbeystead House, Ellel Grange, Waddow Hall, Bolton Park and Leagram Hall.

National Character Area profile:

33. Bowland Fringe and Pendle Hill

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Landscape attribute	Justification for selection
Distinctive boundary features including drystone walls, metal railings and hedgerows.	■ The intricate small-medium scale fields reflect a long process of piecemeal colonisation and assartment. ■ 557,190 m of hedgerow under Environmental Stewardship as at March 2011. ■ 513,692 m of dry-stone wall under Environmental Stewardship as at March 2011. ■ Metal railings around estate boundaries are characteristic of the southern and western edges of the NCA. ■ Medium to small-scale fields are defined by hedgerows with mature hedgerow trees.
Land use is mainly permanent, improved pasture for livestock and dairy farming.	■ Most of the NCA (86 per cent) is medium grade (3 or 4) agricultural land. ■ In 2009, 52 per cent of the commercial farm holdings were livestock and 23 per cent dairy.
Lush hay meadows and some rough grazing at higher elevations.	■ North Pennine Dales Meadows SAC encompasses the range of variation exhibited by Mountain hay meadows in the UK and contains the major part of the remaining UK resource of this habitat. ■ Wet rushy pastures of particular importance for breeding waders.
Numerous rivers, ox-bow lakes, reservoirs and field ponds.	■ 13 key rivers flow through the NCA totalling 172 km. ■ There is a high density of characteristic field ponds north of Preston.
A network of winding hedge-lined lanes connect small, often linear, villages, hamlets and scattered farmsteads, mostly built in local stone. Traditional stone barns are commonplace on higher ground and are of stone with slate or stone flag roofs.	■ Isolated stone villages tend to be nestled into the escarpments and are commonly characterised by distinctive becks, greens and mills each with their own unique charm.

Landscape opportunities

- Protect the distinctive rolling landform from development on ridgelines and hilltops to maintain the predominantly open character of the landscape, by minimising vertical elements and built development.
- Protect views to and from the area from large-scale developments that may erode the open and undeveloped character of the area.
- Promote and protect the geological heritage of the area.
- The conservation and management of riparian woodland, semi-natural and ancient woodland, hedgerows, hedgerow trees and avenues should be considered.
- Maintain the areas highly distinctive stock of field boundaries and associated features, respecting differences in local style.
- Species-rich hay meadows form valuable landscape and ecological areas.
- The restoration and management of the characteristic field ponds north of Preston should be addressed.
- Control built development to maintain vernacular styles and materials and the character of the build environment locally.
- There are opportunities for the appropriate management of recreational sites so visitor pressures are minimised, and benefits and visitor experiences enhanced.

Ecosystem service analysis

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

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

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principle services offered by opportunities
Food provision	Sustainable sheep and cattle grazing	This is an important area for rearing livestock. Soils are relatively poor and this combined with the high rainfall rate means there is little opportunity for arable crops. 62 per cent of the land is Agricultural Grade 4 or 5 and 37 per cent is Grade 3.	Regional	Livestock production systems prevail over a large area of the NCA and have strong associations with the area's cultural services. In many locations well-managed livestock production systems have the potential to increase the overall food provision of the NCA whilst benefiting many of the other key ecosystem services that the area supports. Inappropriate stocking regimes, with insufficient stock management, may have significant detrimental effects on many key environmental services including biodiversity, soil erosion, water quality and climate regulation.	Work with the local farming community to achieve appropriate grazing regimes to produce food and other multiple benefits. Encourage the development and promotion of supply chains and markets for high-quality local produce.	**Food provision** **Biodiversity** **Climate regulation** **Regulating soil erosion** **Sense of place** **Sense of history**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principle services offered by opportunities
Timber provision	Existing woodland and forestry estates	7 per cent of the NCA is under woodland cover. Areas of semi-natural woodland are commonly associated with managed estates and parkland. Extensive areas of ancient semi-natural woodland are concentrated on the ridges, slopes and valley sides of the rivers. Several large blocks of conifer plantation are present, mainly in the south and north-west, some of which are managed for productive timber.	Regional	Much of the broadleaved woodland is on ridge, slopes and valley sides. With much of the land used for livestock rearing there are limited places for woodland creation.	There is scope for some woodland creation on some slopes, but this needs to avoid peat areas, and to avoid impacting on other sites of biodiversity or historic value. There is scope to restructure conifer plantations in the moorland outliers and rolling upland farmland in order to increase their broadleaved component and soften their edges. There are opportunities for woodland management and restoration of ancient woodland.	**Timber provision** **Regulating water flow** **Climate regulation** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principle services offered by opportunities
Biomass energy	Existing woodland and forestry estates	The existing woodland cover (7 per cent of the NCA) offers moderate potential for the provision of biomass, both through bringing unmanaged woodland under management and as a bi-product of commercial timber production.	Local	Supply chains and markets for local wood fuel are currently limited. Development of these is required to maximise the potential for woodfuel as a by-product of commercial forestry. Sensitive management of existing unmanaged broadleaved woodland also offers potential for wood fuel. Biomass production in the area is currently low; however the area has a medium to high potential yield for short rotation coppice. Increased provision of SRC for fuel has the potential to increase climate regulation, but must ensure not to have a negative impact on provision of other ecosystem services for example food supply, biodiversity, sense of place. For information on the potential landscape impacts of biomass plantings within the NCA, refer to the tables on the Natural England website at: http://www.naturalengland.org.uk/ourwork/farming/funding/ecs/sitings/areas/default.aspx	There is an opportunity to increase production of biomass as a bi-product of commercial timber production and through introducing management in currently unmanaged woodlands.	**Biomass energy** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principle services offered by opportunities
Water availability	Reservoirs Rivers and streams Blanket bog High level of precipitation	The NCA does not overlay any major aquifers although the Carboniferous Limestone forms minor (Secondary A) aquifers in this area. Principal surface water resources within the NCA are the catchments of the rivers Lune, Wyre and Ribble. The tributaries of the River Lune within the NCA have 'no water available'. The River Wyre and its tributaries within the NCA are classified as 'over abstracted', 'over licensed' or 'no water available'. The River Ribble catchment within the NCA generally has 'water available' although its tributary the River Hodder is 'over licensed'.	Regional	High rainfall combined with the impervious rock of the Bowland Fells makes the area important for providing clean drinking water as well as supplying industry, aquaculture, energy generation and topping up the Lancaster Canal. Land management practices are key to improving rates of infiltration and storing surface water. For example United Utilities' Sustainable Catchment Management Programme (SCaMP) applies an integrated approach to catchment management across all of their water catchment land.	Opportunities to block moorland grips to increase holding capacity of the moorland habitats over the medium to long term. Ensure that moorland habitats, especially blanket bog are well vegetated and under good environmental management, increasing the capacity of habitats to retain water.	**Water availability** **Regulating water quality** **Biodiversity** **Climate regulation** **Regulating soil erosion** **Regulating water flow**
Genetic diversity	Rare sheep and cattle breeds	The Lonk sheep is a hardy hill breed native to Lancashire and well established in Bowland.	National	Rare breeds in this area provide meat, high quality local produce and hardy breeding ewes to lowland areas.	Encourage the promotion and development of supply chains and markets for high quality local produce	**Genetic diversity** **Food provision** **Sense of place** **Sense of history**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principle services offered by opportunities
Climate regulation	Soils including upland peaty soils and organic soils Existing woodland and other vegetation	In this NCA soil carbon levels are generally low (0-5 per cent), reflecting the mineral soils covering 72 per cent of its area. Small areas of higher soil carbon adjoining the peaty upland area of the Bowland Fells, are associated with the NCA's slowly permeable wet very acid upland soils with a peaty surface (15 per cent of NCA) and the very acid loamy upland soils with a wet peaty surface (6 per cent of NCA). It will also be important to conserve the carbon within the loamy and clayey flood plain soils with naturally high groundwater (1 per cent of NCA). Carbon storage will also be provided by the NCA's woodland (7 per cent of its area).	National	On free draining, slightly acidic soils measures could be taken to improve carbon sequestration by increasing organic matter input and by reducing the frequency/extent of cultivation, although cropping is limited in its extent. It is important to ensure that the existing woodlands are actively managed to enhance both biodiversity and their ability to store and sequester carbon. The area of woodland cover could be expanded where appropriate.	Ensure that all areas of blanket bog are under good environmental management which improves the habitat's ability to actively sequester CO2 from the atmosphere, whilst retaining significant volumes in storage of greenhouse gases. Prioritise the restoration of bare and eroded peatland habitats. Encourage sustainable grazing regimes on permanent pasture with a low input of artificial fertilizer. Ensure existing woodlands are under good management. Create new native woodland where this sits well alongside landscape, biodiversity and historic environment interests. Expand and restore wetland habitats.	**Climate regulation** **Regulating water quality** **Water availability** **Biodiversity** **Regulating soil quality** **Regulating soil erosion**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principle services offered by opportunities
Regulating soil erosion	Slowly permeable wet very acid upland soils with a peaty surface Very acid loamy upland soils with a wet peaty surface Freely draining slightly acid loamy soils Freely draining lime-rich loamy soils	The majority (69 per cent) of the soils covering this NCA are not highly susceptible to erosion. The slowly permeable wet very acid upland soils with a peaty surface (15 per cent) often found on the moorland plateau tops are at risk of gullying/ hagging (and loss of particulate organic matter) where surface vegetation is damaged or lost. Unsustainable burning practices, overgrazing and drainage of these soils (for example through gripping) may also result in increased oxidation of carbon and soil wastage. Erosion is equally prevalent on the very acid loamy upland soils with a wet peaty surface (6 per cent) often found on steep slopes, where a combination of rapid runoff and easily damaged peat layers results in soil erosion. The freely draining slightly acid loamy soils (5 per cent) and the lighter textured (less clayey) variants of freely draining lime-rich loamy soils (1 per cent) can erode easily on steep slopes, especially where vegetation is removed, soil is compacted or where organic matter levels are low after continuous cultivation. There is also the potential for wind erosion on some coarse textured, cultivated variants of the former soil type.	Regional	Measures will be beneficial that retain water in situ; ensure good vegetative cover and avoid over-grazing/ trampling or damage by mechanised activities or burning.	Take steps to restore bare or eroded peat. Manage moorland to ensure good vegetative cover and reduce high rates of run-off by restoring the hydrology and ecology of peatland habitats. Seek opportunities to establish permanent grassland and woodland along watercourses. Manage pastures in ways that build up organic matter and avoid compaction, for example by reducing grazing pressures. Increase cover of native broadleaved woodland and trees targeting areas with high risk of soil erosion.	**Regulating soil erosion** **Regulating water quality** **Regulating soil quality** **Regulating water flow** **Biodiversity** **Climate regulation**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principle services offered by opportunities
Regulating soil quality	Slowly permeable seasonally wet acid loamy and clayey soils Slowly permeable wet very acid upland soils with a peaty surface	The slowly permeable seasonally wet acid loamy and clayey soils (57 per cent of the NCA) may suffer compaction and/ or capping as they are easily damaged when wet. In turn this may lead to increasingly poor water infiltration and diffuse pollution as a result of surface water run-off. Conversely, the slowly permeable wet very acid upland soils with a peaty surface (15 per cent) are at risk of loss of organic matter through climate change and soil erosion.	Local	For loamy and clayey soils, management measures that increase organic matter levels can help reduce these problems. For wet and peaty soils measures should be encouraged that retain water in situ and potentially raise water levels ; ensure good vegetative cover and avoid over grazing/ trampling or damage by mechanised activities	Manage moorland habitats to safeguard the carbon-rich soils and encourage peat-forming plants. Ensure that the management of the pastures and meadows on the moorland fringes will encourage the build up of organic matter, through for instance extensive grazing regimes, which will also reduce the level of poaching by livestock. Avoid carrying out mechanised activities such as trafficking that will cause compaction of soils, especially in wet conditions.	**Regulating soil quality** **Regulating water quality** **Climate regulation** **Regulating water flow** **Regulating soil erosion** **Water availability** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principle services offered by opportunities
Regulating water quality	The many streams and rivers Moorland, rough grazing and woodland	Ecological river water quality is moderate or poor in much of the River Lune catchment although the rivers Wenning and Greta have good water quality. Langthwaite Reservoir is of moderate ecological quality. The River Conder is of moderate quality as is the River Calder (a tributary of the Rive Wyre) whilst the remainder of the Wyre is of good quality. The River Ribble downstream of its confluence with Tosside Beck and the beck itself are of moderate quality, the remainder of the Ribble catchment within the NCA having good ecological quality. The chemical status of groundwater is poor in the north and west of the NCA but good in the south and east.	Regional	Steep agricultural land can be associated with high rates of run-off into adjacent water courses especially after heavy rainfall, when this can be associated with high rates of soil erosion, high turbidity and increased sediment load impacting on areas downstream. Degradation of peat soils can be associated with increased water coloration which water supply companies have to treat before the water enters the supply. United Utilities' Sustainable Catchment Management Programme (SCaMP addressed many of these issues by applying an integrated approach to catchment management across all of their water catchment land.	Re-vegetate bare peat and improve the management of degraded peatland habitats, managing existing moorland vegetation to enhance its biological condition, reducing the degree of water coloration within associated water courses. Seek opportunities to establish permanent grassland (non intensive) scrub and woodland along water courses. Ensure appropriate grazing levels for a well vegetated sward. Manage nutrients in farmsteads and on improved pastures. Increase area of native broadleaved woodland and scrub, targeted at areas of high soil erosion.	**Regulating water quality** **Regulating soil erosion** **Regulating water flow** **Biodiversity** **Climate regulation** **Regulating soil quality** **Biodiversity** **Water availability**

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.

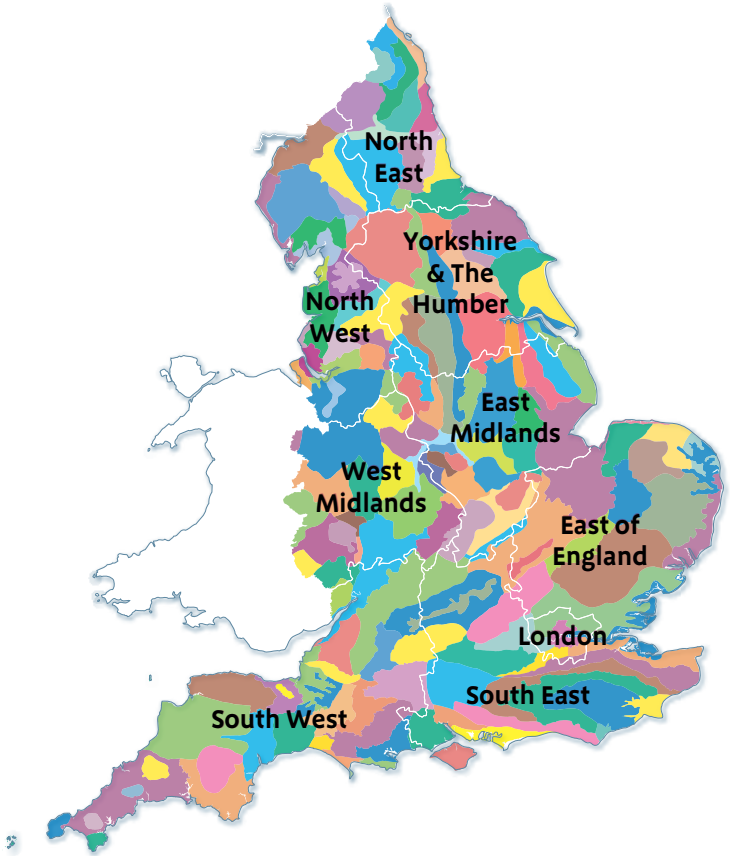
NCA profiles are guidance documents which can help communities to inform their decision-making about the places that they live in and care for. The information they contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and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

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principle services offered by opportunities
Regulating water flow	Many rivers and streams	This NCA surrounds the Bowland Fells NCA and contains the middle part of rivers that drain that upland area with its steep topography and narrow flood plains which combine with waterlogged moorland soils and high rainfall to produce watercourses that respond rapidly to rainfall, increasing fluvial flood risk. The river Lune in the north of the NCA has its source in the uplands of the Cumbria High Fells and Howgill Fells and enters the sea at Morecambe Bay, its tributaries the Hindburn, Wenning, Greta and Leck Beck drain the northern slopes of the Bowland Fells and the south west part of the Yorkshire Dales. The river Wyre in the west of the NCA and its tributaries the Calder and Brock drain the western and south western slopes of the Bowland Fells along with the Conder. The southern and eastern parts of the NCA contain the River Ribble, which has its source in the Yorkshire Dales and its tributaries the River Hodder and Tosside Beck, which drain the southern and eastern slopes of the Bowland Fells NCA.	Regional	Flood hazard in the Lune catchment within this NCA exist along the rivers Wenning in Wennington, Wray, Hornby and Caton. Downstream flood risk exists in Halton and Lancaster on the lower Lune as well as low lying agricultural land. River flooding from the Wyre has historically been a concern in Garstang, St Michaels-on-Wyre and Great Eccleston. Floodrisk also exists at Galgate on the River Conder. Flood risk on the River Ribble is concentrated downstream in Preston and Ribchester. Improving the management and control of flood waters in this NCA will benefit the settlements further downstream in other NCAs. **Continued on next page...**	Slow down run-off from the moorlands by blocking grips and increasing the storage capacity of soils by raising water table levels. Seek opportunities to expand areas of wetland habitats including blanket bog on the moors and reedbeds, wet pastures and woodland along the valley bottoms. Seek opportunities which allow rivers to follow natural courses and re-engage with their flood plains. Ensure fell habitats and wetlands support a well vegetated sward to enhance infiltration and evapotranspiration and slow flows through increased surface roughness.	**Regulating water flow** **Regulating soil erosion** **Regulating water quality** **Water availability** **Biodiversity** **Regulating soil quality** **Climate regulation**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principle services offered by opportunities
Regulating water flow				**... continued from previous page** Opportunities exist to address moorland and upland pasture management and there is some scope for creating opportunities for rivers to re-engage with their flood plains or creating wetlands adjacent to watercourses. An example of such a project is Long Preston Deeps which has been used as a demonstration site to encourage more land owners to undertake restoration works on their land, reconnecting the river to the flood plain. Restoration of moorland habitat further upstream in the Bowland Fells NCA, where many of the rivers arise, is also key to addressing flood risk in this NCA and further downstream.		
Pollination	Semi-natural habitats	Bowland Fringe has a diverse landscape including herb-rich hay meadows and lush pastures, broad-leaved woodlands, parkland and water bodies which provides good habitat for pollinating insects and other invertebrates. However with limited crops and orchards requiring pollination, this service is of limited importance for food production in this NCA.	Local	Of value largely to biodiversity rather than food production in this NCA. Ensure habitats are in good condition and look for ways to expand them.	Seek opportunities to expand areas of species-rich grassland on the moorland fringes and within valleys; also road verge management and small sites within villages.	**Pollination** **Biodiversity**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principle services offered by opportunities
A sense of place/ inspiration	Undulating rolling landscape Many river valleys Moorland outliers, reef knolls, drumlins Picturesque villages Attractive country houses with well maintained formal parkland	The area has a strong and distinctive landscape character and over half (38,175 ha) of the NCA falls within the Forest of Bowland AONB.	National	A sense of place is provided by the undulating, rolling landscape which skirts the edge of the Bowland Fells forming a dramatic backdrop. There are sharp variations in the local landscape resulting from the river valleys and numerous small hills/moorland such as Pendle Hill, Longridge and Beacon Fell to the south. Strong outcrops or 'reef knolls' and limestone beds form distinct landscape features within the Ribble and Hodder valleys, whilst to the north, drumlins characterise the area. Picturesque villages and a small number of industrial settlements sit alongside attractive country houses often set within extensive semi-natural woodland and well maintained formal parkland. Such houses have well-defined estate boundaries, enclosed by either belts of woodland or metal estate fencing; the latter is a particular characteristic to the south and west with dry-stone walls elsewhere. **Continued on next page...**	There is an opportunity to maintain a sense of place, valued by local people and visitors, by conserving the patchwork and variety of landscape features which give the NCA its distinctive sense of place. Also see opportunities for: ■ Sense of history ■ Recreation ■ Tranquillity ■ Food provision ■ Biodiversity ■ Geodiversity	**Sense of place** **Recreation** **Sense of history** **Biodiversity** **Tranquillity** **Food provision**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principle services offered by opportunities
A sense of place/ inspiration				**... continued from previous page** The landscape is intensively managed and largely of permanent improved pasture for dairy and livestock farming with herb-rich, small to medium sized hay meadows defined by well maintained hedgerows with mature hedgerow trees, and rough grazing at higher levels. Woodland forms a significant landscape element within the area; semi-natural woodland much of which is ancient is evident in valley bottoms, side valleys and ridges while hedgerow trees, tree-lined avenues and riverside trees and blocks of coniferous woodland give the NCA a well-wooded appearance. Other prominent landscape features include ox-bow lakes, reservoirs, disused gravel pits and field ponds north of Preston.		

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principle services offered by opportunities
Sense of history	Archaeological sites Small villages, hamlets and isolated farmsteads built in characteristic local stone Network of winding hedge-lined country lanes A few industrial terraced settlements Large country houses set in their own parkland	The history of the landscape is evident in the long history of piecemeal colonisation reflected in the intricate small-medium scale fields with widespread post medieval and ancient fields, particularly around Preston, and larger rectilinear Parliamentary enclosures. There are many archaeological sites particularly on the moorland fringes and in valleys where agriculture has been less intensive as well as corridors such as the Ribble and Lune valleys which were important routes since the Roman period, the latter with small motte and bailey castles. Settlements consist of small villages, hamlets and scattered isolated farmsteads built in characteristic local stone. These are well integrated into the landscape and connected by a network of winding hedge-lined country lanes with traditional stone barns with stone flag or slate roofs on higher ground. A small number of industrial terraced settlements - Oakenclough, Dolphinholme and Galgate – are characteristic of the Calder Vale while lead mining remains and derelict lime kilns are found in the Ribble Valley. **Continued on next page...**	Regional	The area is well known for its many layers of visible history, resulting in a range of structures and features. The main emphasis will be on protecting features, but also on interpreting them for a wider public audience.	There are opportunities to protect, manage and interpret the many layers of historic evidence. There are opportunities to ensure that the restoration of vernacular buildings is carried out using local styles and appropriate materials, and that land management practices and developments such as tracks do not damage archaeological evidence or historic features. There are opportunities to use the Pennine Bridleway and the public rights of way network to gain access to, reveal and interpret the area's rich history.	**Sense of history** **Sense of place** **Recreation**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principle services offered by opportunities
Sense of history		**... continued from previous page** Aspects of history likely to be most evident to the general public include Stoneyhurst College, Gledstone Hall, Clitheroe Castle, large country houses set in their own parkland, such as Abbeystead, Ellel Grange, Waddow Hall, Bolton Park and Leagram Hall, and smaller landscape features such as stone bridges. There are also sites that survive as isolated reminders of the medieval heritage of the Forest of Bowland, for example the Cistercian monastery at Sawley.				
Tranquillity	Wooded river valleys Parklands Picturesque villages and hamlets	Tranquillity and intrusion levels have declined; undisturbed areas have decreased from 92 per cent in the 1960s to 76 per cent in 2007. The lowest areas of tranquillity lie along the major road corridors such as the M6, A65 and A59 as well as around the towns of Clitheroe and Longridge.	National	A sense of tranquillity is likely to be most associated with the wooded river valleys as well as the parklands, picturesque villages and hamlets on undulating lowland farmland and some small-scale and intimate landscapes in the Lune and Ribble valleys.	There are opportunities to retain the sense of remoteness and tranquillity by protecting the areas from inappropriate development. Opportunities exist to promote the calming and restorative effect that contact with tranquil and sensory environments have on visitors' health and wellbeing.	**Sense of tranquillity** **Sense of place** **Biodiversity** **Recreation**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principle services offered by opportunities
Recreation	Pennine Bridleway A network of rights of way Open access land Locally accessible greenspace in addition to the open countryside includes 1 country park and 2 Local Nature Reserves	Recreation is supported by the Pennine Bridleway (19 km lies in this NCA). There are 1,537 km of rights of way with a density of 2 km per km^2. Open access land covers 6.4 per cent of the NCA (4,728ha). Cycling is popular with increasing opportunities for off-road cycling along bridleways. Road cycling is also a popular pursuit, especially on the officially designated 'quiet lanes' around Chipping and Downham, and on the more challenging Tour of Pendle Race. There are opportunities for horse-riding along the network of greenways and bridleways. Other popular activities include: bird watching, fishing, gliding and shooting. In addition there is a developing network of tramper trails that are suitable for people using off-road mobility scooters and pushchairs. In addition to the open countryside, several areas of accessible greenspace exist within the NCA, with 2 LNRs providing venues for recreational and educational activities close to the conurbation of Clitheroe, with Beacon Fell Country Park offering a larger facility nearby.	Regional	There is scope to improve the provision of a range of recreational opportunities and to provide interpretation of the many elements of the landscape. Local greenspace provides a venue for local communities to engage in recreational and outdoor education activities close to where they live, allowing them to enjoy contact with the natural environment, and to play an active role in its future management.	There are opportunities to improve access by ensuring that paths are maintained and well signposted, and that some surfaced paths are provided for use by all levels of ability and interest at key locations. There are opportunities to provide interpretation of the landscape and its many features, especially historic ones, enabling visitors to understand and enjoy its character. Local greenspace provides opportunities for recreation and outdoor education close to where people live, allowing local communities to enjoy their environment, take action to improve it, and to benefit from the health and social rewards it affords them.	**Recreation** **Sense of history** **Regulating soil erosion** **Regulating soil quality** **Regulating water quality** **Biodiversity**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principle services offered by opportunities
Biodiversity	1 SPA 2 SACs 2,267 ha designated as SSSI 347 local wildlife sites Important habitats include herb-rich hay meadows and pastures, broadleaved woodland, parkland and waterbodies	BAP priority habitats cover 6,000 ha (8 per cent) of the NCA and include 1,700 ha of upland heathland as well as smaller areas of a variety of other lowland woodland and grassland priority habitats. The NCA contains 2 SACs, 1 SPA and 2,300 ha are nationally designated as SSSI, covering 3 per cent of the NCA.	National/ international	Improving the biological condition of the biodiversity resource is likely to involve land management activities that will improve other services. This will be achieved principally through increase in coverage of semi-natural habitat, restoration of natural hydrological systems and sustainable grazing regimes. These in turn have the potential to help increase regulating services such as regulation of water quality and soil erosion, whilst also contributing to sense of place.	Improve the area of designated habitat in favourable biological condition. Manage semi-natural woodlands, particularly the area's distinctive clough and riverside woodlands. Renew the areas stock of mature flood plain, parkland and hedgerow trees. Conserve and restore semi-natural meadows. Maintain and where necessary restore blanket bog, wet heath and other upland habitats where they are adversely affected by overgrazing, drainage, erosion. Or unsustainable burning practices. Maintain connectivity between habitats by protecting land in between pockets of habitat from intensification and maintaining the ability of species to move through the landscape.	**Biodiversity** **Sense of place** **Regulating soil erosion** **Regulating water quality** **Climate regulation** **Regulating soil quality** **Regulating water flow** **Water availability** **Pollination**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principle services offered by opportunities
Geodiversity	6 geological SSSIs 25 Local Geological Sites	There are currently 6 nationally designated geological sites within the NCA. These consist mainly of river sections and exposures along with the Clitheroe Knoll Reefs SSSI, one of the best examples of knoll reefs in northern England. 25 Local Geological Sites include examples of: river channels & sections, glacial and fluvioglacial landforms, disused quarries, ancient coal workings.	National	Designated sites provide important and accessible sections allowing the interpretation, understanding and continued research into the geodiversity of the area. Exposure of these areas also makes a positive contribution to sense of place and sense of history.	Safeguard and maintain exposures in man-made quarries and cuttings. Promote the geological heritage of the area. Avoid afforestation where it could obscure landscape features of particular conservation interest.	**Geodiversity** **Sense of place** **Sense of history**

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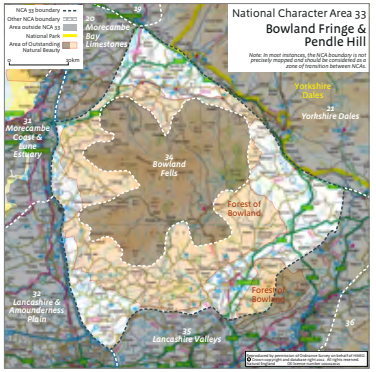
Summary

The Bowland Fringe and Pendle Hill National Character Area (NCA) is a transitional landscape that wraps around the dramatic upland core of the Bowland Fells, underpinned by Carboniferous geology. Over half of this NCA, along with the Bowland Fells, makes up the Forest of Bowland Area of Outstanding Natural Beauty. This is a diverse landscape of herb-rich hay meadows – several of which are nationally and internationally designated – lush pastures, broadleaved woodland, parkland and waterbodies (including rivers and streams supporting nationally and internationally protected species). The numerous river valleys and associated woodlands are a major component of the area. To the west, this NCA includes part of the Bowland Fells Special Protection Area (SPA), designated for its important populations of hen harrier, merlin and lesser black-backed gull. The influence of human habitation and activity, and the area's long farming history, contribute significantly to its character. In contrast to the predominantly rural feel of the area, this NCA includes several relatively urban areas including Clitheroe, Bentham and Longridge.

The NCA faces the challenge of managing substantial pressures to accommodate urban expansion around the major centres of population and recreational destinations, while maintaining and protecting its valuable cultural and biodiversity assets. This, however, also offers increased opportunities, such as through the use of the Pennine Bridleway, to encourage visitors to engage with and enjoy the local environment. A priority for the area is the protection of its rich and distinct landscapes, including the substantial extent of semi-natural woodland, tree-fringed rivers, species-rich hay meadows, and irregular field patterns defined by well-maintained hedgerows and hedgerow trees. To protect the rural quality of the open countryside, it is essential to control and manage the development of the urban fringe and farmsteads to ensure the use of appropriate materials and styles.

Statements of Environmental Opportunity

- **SEO 1**: Protect and enhance the distinctive landscape character of the Bowland Fringe and Pendle Hill NCA for its sense of place, historical and cultural heritage, tranquillity, accessibility and recreational opportunities.
- **SEO 2**: Safeguard, manage and enhance the area's important habitats, including blanket bog, wet heath, waterbodies and woodland, to provide benefits for climate change, flood regulation, soil quality and erosion, and water quality.
- **SEO 3**: Manage and enhance the landscape character and biodiversity of the farmed environment, with its mosaic of pastures and meadows, and strong field patterns defined by drystone walls and hedgerows, to improve ecological networks and strengthen landscape character.
- **SEO 4**: Retain riparian and wetland habitats, and ensure that they are well managed and well connected to the high density of waterbodies. Enhance the network to further increase biodiversity, improve its ability to buffer pollution, increase flood mitigation and improve water quality.



Click map to enlarge; click again to reduce.

Description[4]

Physical and functional links to other National Character Areas

The Bowland Fringe and Pendle Hill National Character Area (NCA) forms a transitional landscape between the dramatic upland core of the Bowland Fells and the flat Lancashire and Amounderness Plain NCA to the west, the Yorkshire Dales NCA to the east and the Lancashire Valleys NCA to the south-east. It lies mainly in Lancashire, but has its eastern edge in the Craven District in North Yorkshire. Over half of this NCA lies within the Forest of Bowland Area of Outstanding Natural Beauty (AONB), which also encompasses the Bowland Fells NCA.

Transport links are concentrated around the lower land, at the fringes of the area, and encircle the Bowland Fells. The M6 and west coast mainline railway line are major north–south links that enclose the area to the west.

The River Lune, in the north of the NCA, has its source in the uplands of the Cumbria High Fells and Howgill Fells, and enters the sea at Morecambe Bay. Its tributaries, the Hindburn, Wenning, Greta and Leck Beck, drain the northern slopes of the Bowland Fells and the south-western part of the Yorkshire Dales. The River Wyre, in the west of the NCA, and its tributaries the Calder and Brock, drain the western and south-western slopes of the Bowland Fells, along with the Conder. The southern and eastern parts of the NCA contain the River Ribble (which has its source in the Yorkshire Dales), and its tributaries the River Hodder and Tosside Beck, which drain the southern and eastern slopes of the Bowland Fells.

The Bowland Fells form a dramatic backdrop to many views within this NCA, and the moorland outliers of Beacon Fell, Longridge Fell and Pendle Hill afford long-distance views across the Lancashire plains and valleys towards the Irish Sea.

Clear Beck hay meadow

[4] A more detailed description of landscape character is provided in the Forest of Bowland AONB Landscape Character Assessment (2009)

Key characteristics

- This is an undulating, rolling landscape, with local variation created by numerous river valleys and by the moorland outliers of Beacon Fell, Longridge Fell and Pendle Hill.
- The Bowland Fells provide a dramatic backdrop to the north, with extensive views across the river valleys and Lancashire plain below.
- On the northern edge of the area, drumlins are characteristic, while on the south, strong mounded outcrops or 'reef knolls' of limestone form distinct landscape features in the Ribble and Hodder valleys.
- Semi-natural woodland, much of which is ancient, occurs in the main valley bottoms, side valleys and ridges, and is dominated by oak, ash and alder.
- Small- to medium-sized fields are defined by hedgerows with mature hedgerow trees. Drystone walls are also common in some areas. Metal railings around estate boundaries and highway corners and junctions are characteristic of the southern and western edges of the NCA.
- Land use is mainly permanent, improved pasture for livestock and dairy farming.
- To the west, this NCA includes part of the Bowland Fells Special Protection Area (SPA), designated for its important populations of hen harrier, merlin and lesser black-backed gull.
- There are species-rich hay meadows, including several that are nationally and internationally designated.
- Rough grazing, rushy pasture and traditionally managed meadows at higher elevations are of national importance for breeding waders such as redshank, lapwing, curlew and snipe. These are also important habitats for breeding skylark.
- There are numerous rivers of importance for many protected species, including bullheads, salmon, trout, eels, otters, kingfishers and dippers. There are also many brooks and small reservoirs.
- There are many archaeological sites, particularly on the moorland fringes and in valleys where agriculture has been less intensive.
- A network of winding, hedge-lined lanes connect small, often linear, villages, hamlets and scattered farmsteads, mostly in local stone. Traditional stone barns are commonplace on higher ground, and are of stone with slate or stone flag roofs.
- Isolated country houses set in formal parkland are typical of the area, and may be enclosed by belts of woodland and estate fencing.
- The relatively urban areas of Clitheroe, Bentham and Longridge provide a contrast to the rural feel of the area.

Bowland Fringe and Pendle Hill today

Bowland Fringe and Pendle Hill is a transitional landscape which wraps around the dramatic upland core of the Bowland Fells. It extends from the Lune Valley in the north, around the slopes of the Bowland massif, before merging imperceptibly eastwards into the landscape of the Ribble Valley. The eastern boundary links with the Yorkshire Dales, while the Lancashire Valleys lie to the south.

Lune Valley view, the Bowland Fells can be seen in the background

This is a diverse landscape of undulating pasture, broadleaved woodland, parkland and waterbodies, including oxbow lakes, reservoirs, disused gravel pits and field ponds. Fields are small to medium-sized, and are enclosed by hedgerows with large mature hedgerow trees. Improved pastureland defined by well-maintained hedgerows is characteristic of the agricultural land in the fringes, which supports both dairy and livestock farming. Over half of this NCA is within the Forest of Bowland AONB.

To the south of Bowland, the moorland outliers of Pendle Hill, Beacon Fell and Longridge Fell, found on Carboniferous Limestone knoll reefs, enclose the Ribble Valley and reinforce its affinity with the Forest of Bowland. The combination of topography, tree cover and field enclosure creates a sense of intimacy which contrasts with the vast expanse of the coastal plain and the exposed moorland heights of the Bowland Fells. Similarly, the herb-rich limestone knoll reefs located around Clitheroe and Chatburn are distinctive and provide unusual relief in a pastoral landscape, as well as a rocky promontory on which Clitheroe Castle is situated.

To the north of Bowland is the Lune Valley, which separates the Fringe from Morecambe Bay. It has a pastoral character, with a meandering river and fields enclosed by hedgerows containing mature hedgerow trees. Deciduous woodland, including some areas of ancient woodland, is concentrated on valley sides, and is most prominent in the Roeburn, Wenning, Greta and Hindburn valleys.

While lying just beyond the boundary of the NCA, the major conurbations of Lancaster to the west, Preston to the south-east and Settle to the east, all exert an influence over the area, through visits for recreational activities, tourism and commerce.