National Character Area profile:

4: Cheviots

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Introduction

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

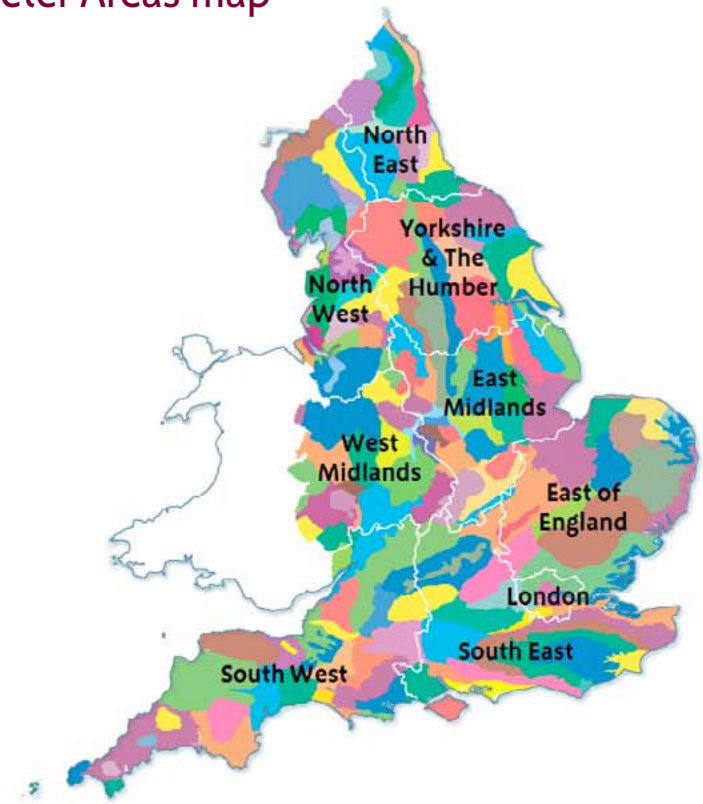
NCA profiles are guidance documents which can help communities to inform theirdecision-making about the places that they live in and care for. The informationthey contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and encourage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

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

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

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

National Character Areas map



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

Summary

The distinctive, smooth, rounded hills of the Cheviots National Character Area (NCA) are part of the remote upland chain of the Northumberland moors which form the northern end of the Northumberland National Park. They rise steeply above the lowland belt of the Cheviot Fringe NCA to the north and east and the Border Moors and Forests NCA to the south. To the west, the rounded hills cascade into southern Scotland but the NCA is bounded by the Scottish border that follows a high natural ridgeline.

The distinct igneous geology has formed a sinuous cluster of rounded hills with tors on some hill tops, rocky outcrops and scree slopes on the northern flanks, and many other glacial and post-glacial features.

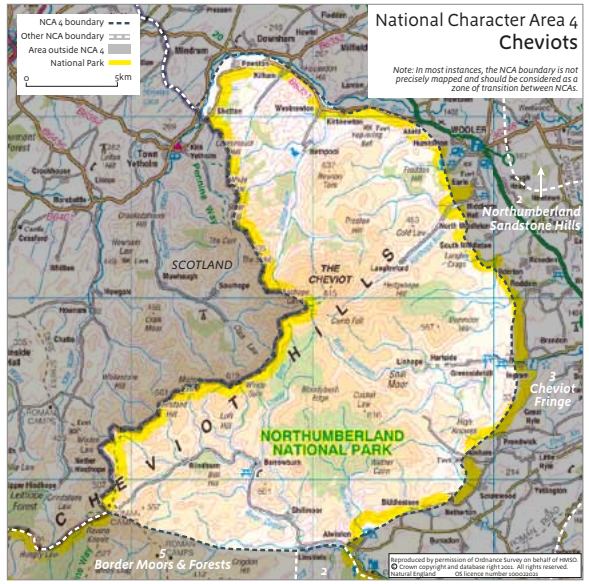
The wild, open upland landscape is dominated by rolling moorlands; there are extensive mosaics of heath, blanket bog and grassland, managed for sheep and cattle rearing and, grouse moors. Areas in the southern end of the NCA are also in use for military training. Large conifer plantations occur on some of the upper slopes, interrupting the smooth lines of the landscape.

This NCA is noted for the high quality of its rivers. The headwaters of the rivers Coquet (a Site of Special Scientific Interest) and Till (within the River Tweed Special Area of Conservation), designated for nationally and internationally important assemblage of wildlife including species such as otter, freshwater pearl mussel, brook and river lamprey, Atlantic salmon, water crowfoot, river jelly lichen and the diatom Didymosphenia radiate out from the core of the Cheviots, tumbling down steep ravines out of the hills to form the wide river valleys of the Coquet and Till in the Cheviot Fringe NCA. The steep-sided valleys are often lined with alder, ash and oak woodland, with species-rich meadows and pasture in the valley bottoms.

Settlement is sparse, with isolated farmsteads in the sheltered valley bottoms and small hamlets and villages in the foothills. Roads are restricted to valley floors with only footpaths, unsurfaced bridleways and restricted byways connecting valleys and crossing the border into Scotland. Buildings are largely constructed from local stone, as are the drystone walls or dykes that enclose the large regular fields on the upper slopes; hedgerows enclose the fields on the lower slopes and in the valley bottoms.

The lack of disturbance and development has ensured the preservation of a wealth of archaeology – evidence of multi-period prehistoric and medieval landscapes offering unique opportunities to study and understand the connections between the landscape and the people who have lived there.

This is a remote, undisturbed landscape, highly valued for its tranquillity and wild,



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open spaces. It provides an important setting for outdoor recreation, including walking, cycling, horse riding, climbing, fishing, grouse shooting, birdwatching and star gazing.

The future is likely to bring an increase in visitor numbers, with the associated benefits for the local economy, but careful management will be required to ensure that this does not detract from the tranquillity and undisturbed character of the area or damage the extensive but vulnerable semi-natural habitats. Other development pressures may come from changing requirements for military training.

With its high rainfall, impervious rocks, peaty soils and extensive semi-natural habitats, this area has an important role to play in the regulation of water quality and flow and carbon storage; however, climate change will bring its own challenges for maintaining these important ecological processes.

Farmsteads, commonly built from sandstone with slate or clay pantile roofs, nestle in the valley bottoms surrounded by smaller in-bye fields enclosed by dry stone walls and post and wire fencing.

Statements of Environmental Opportunity

SEO 1: Conserve, restore and enhance the blanket bog, wet heath, mire and other upland habitats of the Cheviots to ensure that they provide a well-functioning ecosystem that will be more resilient to climate change, reduce the loss of greenhouse gases and increase their ability to sequester further carbon, support nationally and internationally important species of wildlife, and further enhance the regulation of water quality, water flow and soil erosion, while maintaining the highly valued sense of wilderness, tranquillity and dark night skies.

SEO 2: Protect, manage and conserve the distinctive geological environment and the rich historic environment with its wealth of archaeological and built heritage assets, encouraging further research to improve understanding of the landscape and its cultural development, promoting access to, interpretation of and education about these valuable resources.

SEO 3: Manage and enhance the important upland and sheltered valley habitats associated with the Till and Coquet rivers and tributaries to ensure good water quality, improve habitat connectivity and resilience to climate change, protect the nationally and internationally important species of wildlife that they support, strengthen landscape character and contribute to the regulation of water flow.

SEO 4: Protect, restore and extend native woodland cover by managing existing woodland, restructuring and increasing the broadleaved component of conifer plantations, and restoring woodland in the cleughs. This will improve habitat connectivity, enhance landscape value, improve water quality and soil erosion, manage water flow, contribute to climate change mitigation, and provide timber and wood fuel.

The impact of conifer plantations on the landscape is being reduced by more sympathetic rotation plans and the large-scale restructuring and removal of forest blocks, restoring open moorland habitats (such as here in the College Valley) and broadleaved woodland.

Description

Physical and functional links to other National Character Areas

The Cheviots are part of the wild upland chain of the Northumberland moors which continues westwards across the Scottish border. Views from the border ridge are extensive, spanning 360 degrees into Scotland, south-west to the lower moors and forests of the Border Moors and Forests National Character Area (NCA), and eastwards over the Cheviot Fringe NCA to the Northumberland Sandstone Hills and the North Northumberland Coastal Plain NCAs.

Drainage from the Cheviots is radial in form and the NCA contains the headwaters of the rivers Till and Coquet. These rivers provide important water supplies for settlements and agricultural irrigation downstream but respond quickly to rainfall and therefore have a high propensity to cause downstream flooding in the Cheviot Fringe NCA and beyond. The upland habitat is continuous to the north and west but the eastern edge more abruptly defines the boundary between upland and lowland landscapes.

Roads are restricted to valley floors with only footpaths, unsurfaced bridleways and restricted byways connecting valleys and crossing the border into Scotland. The Cheviots also form the northern section of the Northumberland National Park.

The rounded forms of hills such as Yeavering Bell tower above the lowland belt of the Cheviot Fringe to the east.

Key characteristics

- A smooth, sinuous cluster of rounded hills of volcanic origin forming a wild, open windswept landscape dominated by broad moorland horizons and almost totally devoid of settlement.
- Extensive rolling plateaux of semi-natural grass moor and heather moorland; rounded hill tops characterised by mixed areas of heathland, blanket bog and extensive white grassland interrupted by distinctive tors.
- Deep ravines and rocky outcrops with dramatic scree slopes on the northern flanks of the hills supporting rare Arctic–alpine flora; distinctive features of glacial erosion including meltwater channels and ice-gouged hollows.
- Distinctive white-faced Cheviot sheep, Northumberland Blackface sheep and wild goats graze the moorland plateaux, which are managed as grouse moors.
- Largely treeless slopes with broadleaved woodland confined to the narrow valleys but with a diminishing number of large conifer plantations on the upper slopes and smaller blocks of conifers planted as shelterbelts and for military training purposes in the south of the NCA.
- Open moorlands and 'white lands' of the upper slopes contrast with greener, more productive pastures and meadows on the lower slopes and in the valleys.
- Large regular fields enclosed by drystone walls or dykes or new post and wire fencing on higher ground, with smaller in-bye fields enclosed by stone walls, fencing and some hedgerows in the valley bottoms, grazed by sheep, and beef cattle on the more sheltered lower ground.
- Steep-sided valleys with fast-flowing burns radiating from the Cheviots, supporting relict semi-natural broadleaved woodland, gorse scrub, wet flushes and species-rich meadows.
- Dispersed farmsteads and small hamlets, often incorporating older fortified buildings due to centuries of border conflict, nestle in the sheltered valleys, with larger hamlets in the foothills where the valleys meet the lowlands. Traditional buildings are commonly of sandstone and slate but clay pantile roofs are a distinctive feature of the northern valleys.
- Extensive tracts of well-preserved, highly visible and buried prehistoric landscapes with hill forts, settlements and prehistoric field systems, and widespread remains from the medieval period.
- Ancient tracks and drove roads cross the Cheviots, now used by the numerous visitors to the Northumberland National Park.
- A sense of isolation and wilderness is maintained by the absence of settlements and cross-border roads through the Cheviots, with dark night skies and high levels of tranquillity, despite periodic disturbance associated with military training in the south of the NCA.

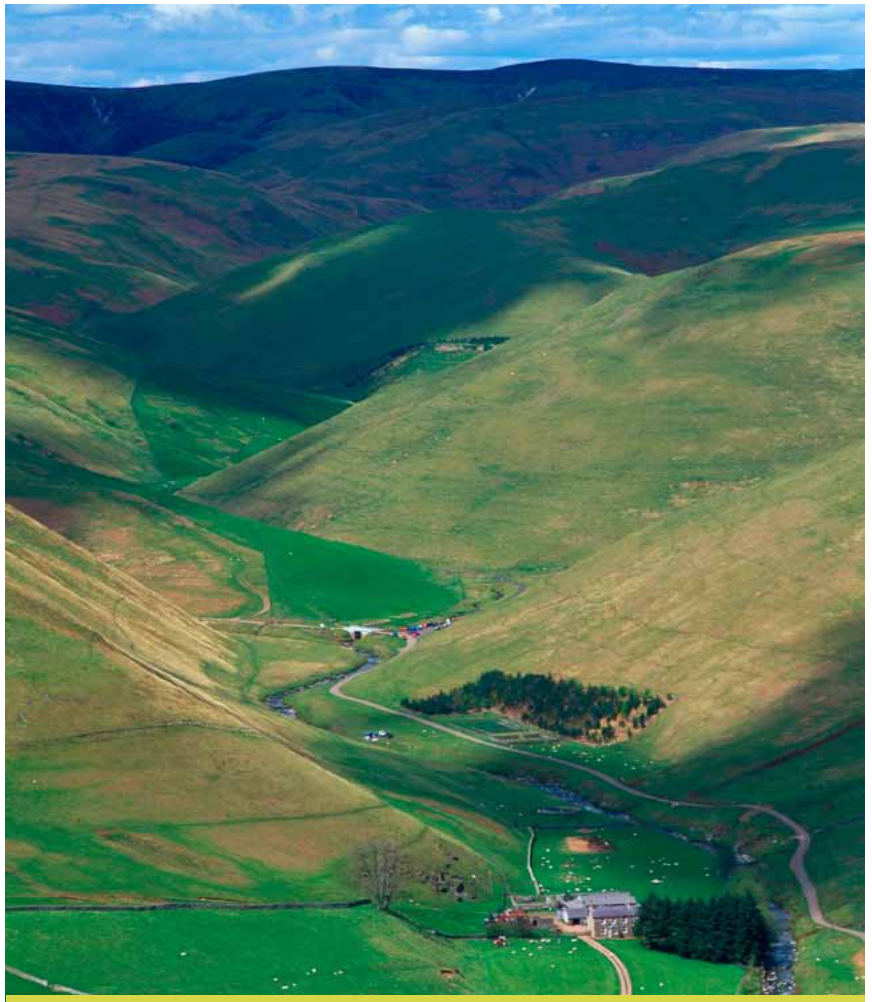
Occasional granitic tors and rocky outcrops interrupt the otherwise smooth lines of the Cheviots, in places supporting rare relict Arctic-Alpine flora.

The Cheviots today

The Cheviot Hills are volcanic in origin and rise as a smooth, sinuous cluster above the lowland Cheviot Fringe NCA to the east and the Teviot valley in southern Scotland to the north-west. Occasional rocky tors rise in sculpted forms above the central moor. On the northern face of the Cheviots, steep ravines, rocky outcrops and dramatic scree slopes or 'glidders' are found. Deep, narrow valleys radiate out from the central core.

Much of the wild uplands are comprised of extensive, unenclosed rolling heather moorland, bog and acid grassland. The Cheviot Site of Special Scientific Interest (SSSI) supports nationally important heathland, grassland and blanket bog habitats, and many upland breeding birds such as black grouse, ring ouzel, peregrine, buzzard, curlew and dunlin. The upper slopes, known locally as 'white lands' due to the bleached or frosted appearance of moorland grasses, contrast with areas of wet acidic blanket bog characterised by sedges, mosses, cotton grass, cloudberry and cross-leaved heath, and colourful drifts of heather on drier sites. Rare relict communities of Arctic–alpine flora survive in patches within the deep rocky ravines of the northern slopes. A herd of rare wild goats, descended from domestic stock put out to graze on the hills centuries ago, still roams the Cheviots.

The fast-flowing upper reaches of a number of rivers tumble through steep-sided valleys that radiate from the central Cheviot core. The River Alwin joins the River Coquet to flow east across the Cheviot Fringe while the River Breamish and the College and Harthope burns flow into the River Till, meandering northwards through the Cheviot Fringe NCA and forming part of the catchment of the internationally important River Tweed Special Area of Conservation (SAC). Broadleaved woodland, gorse scrub and a few unimproved, colourful, herb-rich meadows (relicts of once more widespread grasslands) add much to the variety of the valley bottoms and are of national importance for nature conservation.



Settlement is sparse, with isolated farmsteads in the sheltered valley bottoms and small hamlets and villages in the foothills, with roads restricted to valley floors. This contributes to the highly valued sense of wilderness and isolation, tranquility, and dark night skies of the Cheviots.

Tree cover is generally sparse with broadleaved woodland largely confined to the steep valley sides, but a declining number of large conifer plantations are found on moorland tops and in the upper reaches of some valleys, interrupting the smooth, sinuous lines of the landscape. Pine marten have been found in these woodlands and red squirrels remain in the strongholds of Kidland Forest and Uswayford.

Large extents of the open moorland plateaux are managed as grouse moors and for grazing by distinctive white-faced Cheviot, Northumberland Blackface and Swaledale sheep.

The high moors are divided by historical stone walls or more recent post and wire fencing while the large rectangular fields of the upper slopes, enclosed in the 18th and 19th centuries, are generally bounded by stone walls or dykes. The smaller in-bye fields on the valley floors close to the farmsteads are defined by stone walls or wire fences and some hedgerows. The better quality grassland on the steep, lower slopes is grazed by sheep and hardy beef cattle based on Aberdeen Angus.

The Cheviots have exceptionally well-preserved remains of prehistoric landscapes which can be clearly seen; the hills are scattered with Neolithic and bronze-age burial cairns, bronze- and iron-age settlements and iron-age hill forts, the best known of which include Yeavering Bell and Humbleton Hill overlooking the Milfield Plain to the north, and Brough Law which occupies a commanding position above the Breamish valley. Ancient tracks and drove roads cross the hills and now form part of the network of paths and trails for quiet recreational use within the Northumberland National Park.

The population is sparse and few buildings interrupt the open sweep of the landscape. Isolated farms nestle within the sheltered protection of deep and narrow valleys, often in locations where they could be defended from Reivers during the centuries of border conflict. Larger hamlets, such as Ingram, Alwinton and Biddlestone, are found in the foothills where the valleys meet the lowlands; often occupying strategic sites associated with the border drove roads and the crossing points of rivers.

Medieval fortified buildings, churches and some vernacular architecture of the last three centuries are characteristically built in dark, igneous andesite and granite, while grander buildings are constructed in coursed dressed sandstone brought in from land to the east. More typically, however, the stonework is in random rubble, with structurally important window surrounds, quoins and heads in more easily worked sandstone. Slate is the most common roofing material of many traditional buildings which may once have been thatched with heather, although the use of orange clay pantiles which were produced locally is also widespread, particularly in the farmsteads and villages in the northern valleys of the Cheviots.

Roads are restricted to valley floors and there are no routes through the Cheviots for motorised traffic travelling across the border. This helps to maintain the sense of isolation and wilderness which, along with the extensive cultural heritage, rare wildlife and habitats and sporting opportunities, provide a rewarding experience for visitors to this part of the Northumberland National Park. Numerous trails and paths, including the Pennine Way at the eastern edge of the Cheviots and St Cuthbert's Way in the north, enable visitors to explore the area and experience its isolation and tranquillity. Much of the land (72 per cent) is open access, although the southern part of this NCA is occupied by part of the Otterburn military training area and access is therefore partially restricted. Despite the live firing and other military activities, Cheviots NCA, together with the rest of the Northumberland National Park, is one of the most tranquil and undisturbed areas in England, and the lack of settlement gives rise to remarkably dark night skies.

The landscape through time

The massive rounded hills of the Cheviots, which are unlike other Northumberland hills, are composed of a suite of igneous rocks of Devonian age. About 380 million years ago, the area which was to become the Cheviot Hills was occupied by a volcanic centre. Lavas, mainly andesites, and volcanic sediments erupted from this complex to form the Cheviot Hills we see today. At the centre of the Cheviots, and forming The Cheviot itself, is a large mass of granite intruded into the lavas. Heat from the intruding granite baked the adjacent lavas making them harder and somewhat more resistant to erosion. Cutting the granite and the lavas in a crude radial pattern is a series of igneous dykes, some of which are of similar composition to the lavas. A prominent lens-shaped intrusion, or laccolith, of brick-red microgranite has long been quarried for roadstone at Biddlestone near Alwinton. This is 'red whin', the red roadstone used to line The Mall in London, and to demarcate the hard shoulders on many of Britain's motorways.

The volcanic rocks of the Cheviots typically weather to form rounded hills. Craggy outcrops of lava are rare, except in a few places in the rather harder and more resistant lavas baked by the Cheviot granite where they may form distinctive rocky tors. Cliffs of lava are also to be seen in some stream valleys. Much of the granite outcrop is very poorly exposed, though tors, similar to those found on the granite outcrops of south-west England, are to be seen at Great and Little Standrop and Cunyan Crags on Dunmoor Hill.

The Cheviots display many typical glacial and post-glacial features. The curious hollows of Bizzle and Hen Hole are cirques or corries carved out of the north face of the hills by glacial scouring. Water from melting ice cut the meltwater channels below Yeavering Bell. The modern drainage pattern, distinctively radial in form, is deeply incised into the underlying lavas, creating a series of steep-sided

The distinctive form of Cheviot at the heart of the Cheviots, a large mass of granite intruded into the volcanic lavas.

gorges within the upper courses of the rivers Alwin, Breamish and Coquet and the College and Harthope Burns.

Farmers made use of the upland moors from the Neolithic onwards, clearing and then cultivating areas for seasonal grazing, fuel and heather for roofing. Extensive tracts of well-preserved and highly visible prehistoric landscapes are commonplace in the Cheviot foothills and include burial cairns from the Neolithic and the Bronze

Age, bronze-age settlements with associated field systems, and iron-age palisaded settlements and hill forts, such as Brough Law. Direct Roman influence appears to be absent from most of the area, with the exception of Dere Street and its associated camps such as Chew Green (some of the best-preserved marching camps from the Roman Empire), although a great many Romano-British homesteads exist throughout the area and these sometimes concentrate to form small villages. Such settlements are often associated with extensive rigg-and-furrow field systems (which become terraces on steep slopes) which are usually assumed to be medieval although some may have begun life during the Romano-British period.

The surviving remains from the medieval period, including deserted villages, extensive field systems, shielings and enclosures, suggest a period of greater population and farming diversity prior to the 14th century. However, the border warfare of the 14th to 16th centuries drove people from the area and bastles and towers were built to protect those who stayed from Reivers.

The Union of the Crowns in 1603 led to more settled conditions and, from the late 16th century onwards, large-scale commercial sheep farming driven by large estates began to emerge. A further reorganisation of the landscape occurred in the late 18th and 19th centuries, matched by changes across the Cheviot Fringe and lowland Northumberland and Scotland in the same period. This was again driven by the large estates, redeveloping farming for supply to lowland fattening areas, often owned by the same estates, and resulting in the appearance of large farmsteads with workers' housing. A final phase of Parliamentary enclosure occurred in tandem with this reorganisation when large regular fields were defined by drystone walls or dykes on upper slopes, with hedgerows on lower hillsides.

The Cheviots are crossed by a number of ancient tracks and drove roads which, for centuries, were busy with herds of livestock being driven from Scotland to markets in the south. Although traffic eased during the period of medieval border warfare, these routes were re-established in the 17th and 18th centuries, particularly by drovers keen to avoid the tolls of the new turnpike roads. These tracks now form part of a network in the Northumberland National Park to which visitors are drawn each year, attracted by the wild and lonely landscapes of the uplands.

In the 19th century, management for grouse shooting joined livestock grazing in influencing the extensive tracts of moorland, including managed heather burning for grouse and the creation of tracks and structures such as grouse butts and shooting huts. A combination of managed burns and extensive grazing today helps to retain the characteristic open moorland landscape.

The 20th-century estate-managed planting of significant conifer blocks and geometric shelterbelts had a dramatic impact on the landscape but this is now being reduced by more sympathetic rotation plans and the large-scale restructuring and removal of forest blocks, including those at Wooler Common and Threestoneburn which are being replaced by moorland and native broadleaved woodland as land management priorities shift towards sporting interests and biodiversity enhancement. There has also been some broadleaved woodland expansion, most notably at Blindburn on the Otterburn military training area and in the Breamish valley.

Establishment of the Otterburn military training area in the south of the NCA early in the 20th century resulted in some intrusive features such as new roads, safety barriers, notices, red flags and nighttime warning lights, and associated training activities continue to affect perceptions of tranquillity, although the low-intensity management of the land associated with military training has helped to preserve the wildness of this area.

The asphalting of the valley roads and introduction of the combustion engine vehicle had a major impact on the tranquillity of this area, and the expansion of the overhead power line network in the 1960s which brought mains electricity to the Breamish and College valleys led to an increase in nighttime light pollution that, while limited, contrasts with the otherwise pitch black valley floors.

As technology has progressed throughout recent times and pressure to produce food more cheaply has increased, the farming landscape has changed. In the mid-20th century, increased intensity of the management of agricultural land led to areas of the upland fringe being drained and ploughed, with the resultant loss of semi-natural habitats including heathlands, wetlands, hay meadows and woodlands. During the 1990s and 2000s, however, a change in the emphasis of public funding from production-based subsidies to payments for environmental enhancements saw a reduction in cases of overgrazing and increased restoration of landscape features and habitats. Improved animal husbandry has led to many of the traditional stone-built farmsteads incorporating modern steel-framed stock sheds used to over-winter cattle or for lambing in the spring.

In general, the area has experienced remarkably little development pressure during the 20th and 21st centuries; the low population density has meant that there is very little demand for housing development and there has been little industrialisation with the exception of increased quarrying activity near Biddlestone where the red whinstone quarry appears as a noticeable scar on the landscape.

The Cheviots contain a wealth of archaeology including Neolithic and bronze-age burial cairns and settlements, iron-age hill forts, medieval settlements and field systems, and Chew Green (pictured), one of the best-preserved marching camps from the Roman Empire.

Ecosystem Services

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

Provisioning services (food, fibre and water supply)

- **Food provision:** Agriculture is limited by the harsh upland climate, topography and low grade soils but the area is important for rearing hardy livestock: 53,000 sheep and 2,000 store cattle are extensively grazed on the upland pasture and moorland. Locally sourced food has the potential to play an increasingly important role in supporting tourism in the area, and in the process will help to encourage a locally sustainable green economy.

- **Water availability:** The high rainfall in the Cheviot NCA drains into the headwaters of the rivers Till and Coquet which are crucial for supplying the Cheviot Fringe NCA and beyond with water, predominantly for agricultural irrigation and public water supply respectively. The Upper Coquet has 'water available' but the River Till, as part of the Till/Tweed SAC, has had consents issued for water use up to the 'sustainable' level and no additional water is currently available during the summer months. Sustainable management of the extensive semi-natural habitats will aid water interception and storage.

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

- **Climate regulation:** Large areas (47 per cent) of this NCA are covered by peaty soils which have high carbon content and, depending on their condition, have the potential to sequester further carbon from the atmosphere. Sensitive land management and restoration measures such as grip blocking (drain blocking) should help to reduce the scale of stored carbon being released into the atmosphere and could restore some of the carbon storage capacity and sequestration ability of the peat soils. Extending woodland cover (avoiding deep peat) will also improve carbon capture.

The high rainfall in the Cheviots NCA drains into the pristine headwaters of the rivers Till and Coquet which are crucial for supplying the Cheviot Fringe NCA and beyond with water

- **Regulating soil erosion:** The freely draining acid loamy soils over rock and the peaty soils that cover 95 per cent of the NCA are all prone to water and wind

erosion. Ensuring good vegetative cover on blanket bog and moorland through sensitive land management, good forestry practice, stabilising river banks and controlling footpath erosion will reduce sediment run-off.

- **Regulating water quality:** Water quality is predominantly good in the headwaters of the rivers Till and Coquet but there are some issues with diffuse pollution associated with sheep dips, nutrient and sediment run-off. Addressing these sources of pollution is particularly important in meeting Water Framework Directive requirements and maintaining the high water quality of the rivers, many of which are designated as SSSI and SAC.

- **Regulating water flow:** Steep slopes, impermeable soils and heavy rainfall mean that the watercourses in this NCA respond quickly to rain and have a high propensity to change course and cause downstream flooding in the Cheviot Fringe NCA and beyond. Improving land management practices and restoring the water retention capacity of the blanket bog and heathland habitats, and the strategic planting of woodland along watercourses should help to reduce surface run-off and slow the flow of floodwaters downstream in the Cheviot Fringe and Northumberland Sandstone Hills NCAs and beyond.

Cultural services (inspiration, education and wellbeing)

- **Sense of place/inspiration:** The wild open spaces, unique geology, landforms and historic landscapes lead to an inspiring sense of place, valued by local people and visitors and forming a characteristic part of the Northumberland National Park.

- **Sense of history:** The long history of occupation coupled with the lack of recent cultivation and development means that the Cheviots NCA contains outstanding multi-period prehistoric landscapes in a national and international context, as well as extensive remains from the medieval period, which should be protected, further investigated and interpreted to reveal the connections between the landscape and our history. The network of ancient tracks and drove roads are now used by visitors to the Northumberland National Park.

- **Tranquillity:** Wild, open moorlands, few settlements or roads and dark night skies are responsible for this NCA being perceived as one of the most undisturbed areas in England. Opportunities exist to promote the calming and restorative effect that contact with tranquil and sensory environments has on visitors' health and wellbeing. Development, forestry operations, light sources and intrusion from the Otterburn military training area need to be controlled to maintain the tranquillity that is so highly valued by locals and visitors alike.

- **Recreation:** The extensive areas of open access moorland and the network of public rights of way enable visitors to enjoy the remote, tranquil landscapes and appreciate the wealth of biodiversity, geological and heritage assets contained in this area.

- **Biodiversity:** The Cheviots are nationally important for their moorland, woodland and upland hay meadow habitats and species, and the River Till and its tributaries as part of the River Tweed SAC are internationally recognised for the species such as Atlantic salmon, brook and river lamprey, freshwater pearl mussel, otter and water crowfoot that they support. Over a third of the area is covered by extensive Priority habitats and 11 per cent is designated as SSSI.

- **Geodiversity:** The igneous geology of the Cheviots gives rise to the distinctive rounded hills that characterise this landscape, evoking a strong sense of place. The distinctive geology and abundant glacial and post-glacial features mean that the Cheviots provide important opportunities for research and education to enhance understanding of geological, glacial and post-glacial processes.

Statements of Environmental Opportunity

SEO 1: Conserve, restore and enhance the blanket bog, wet heath, mire and other upland habitats of the Cheviots to ensure that they provide a well-functioning ecosystem that will be more resilient to climate change, reduce the loss of greenhouse gases and increase their ability to sequester further carbon, support nationally and internationally important species of wildlife, and further enhance the regulation of water quality, water flow and soil erosion, while maintaining the highly valued sense of wilderness, tranquillity and dark night skies.

For example by:

- Maintaining and restoring the moorland mosaic (including blanket bog, mires, flushes, wet heath and acid grassland) by securing sustainable grazing and heather-burning regimes which ensure diverse vegetative cover. This will help to conserve the important habitats and species, maintain soil and water quality, regulate water flow, reduce soil erosion, maintain carbon storage and promote sequestration, while continuing to support livestock farming and grouse shooting.
- Restoring areas of blanket bog and encouraging active peat formation by grip blocking to raise water levels where necessary, re-vegetating bare areas and encouraging the establishment of sphagnum to achieve a healthy and functioning peat bog. This should improve the soil's capacity to store carbon and water, thereby helping to regulate water quality and contributing to climate regulation.
- Seeking opportunities provided by the restructuring of conifer plantations to remove trees from areas of deep peat, blanket bog, mire and wet heath, with compensatory planting of broadleaved woodland in more appropriate places.
- Working with farmers to ensure that grazing levels are appropriate to the site to maintain and enhance the condition of habitats: reducing stock levels in some areas, increasing numbers in others, and promoting grazing with hardy cattle, particularly on the extensive areas of grass fell. This should create a patchwork of habitats that will contribute to supporting and enhancing populations of upland waders, ring ouzel and black grouse.
- Managing sheep-grazing levels to protect and enhance the rare Arctic–alpine flora that is found on the andesite crags and ledges on the northern face of the Cheviots.
- Promoting rush management on lower stretches of the Cheviots Hills through cutting and/or cattle grazing, which is particularly important for upland breeding waders such as curlew, redshank and golden plover.
- Encouraging landowners and managers to manage the wild goat population in a sustainable way that prevents overgrazing but maintains a viable population of this rare breed.
- Preventing and responding quickly to uncontrolled wildfires through a collaborative fire control plan.
- Promoting management of bracken to improve the diversity of the moorland mosaic and reduce damage by encroachment, especially where it is affecting below ground archaeology and upland habitats.
- Encouraging and managing responsible and appropriate recreational use to minimise soil erosion, damage to archaeology, disturbance of wildlife and the risk of wildfires, and to protect the sense of tranquillity, while increasing understanding and enjoyment of the moorland environment.
- Minimising damage to semi-natural habitats and preserving the open vistas, sense of tranquillity and remoteness by carefully considering the impacts of any proposed built structures and tracks on the landscape, biodiversity, tranquillity and dark night skies.

SEO 2: Protect, manage and conserve the distinctive geological environment and the rich historic environment with its wealth of archaeological and built heritage assets, encouraging further research to improve understanding of the landscape and its cultural development, promoting access to, interpretation of and education about these valuable resources.

For example by:

- Identifying and protecting the special geological, glacial and post-glacial features of this area, exploiting opportunities to accurately record geological sections in order to further knowledge and understanding of the local geology and geomorphology, and encouraging the designation of local geological sites.
- Encouraging and developing opportunities for earth science research to widen our understanding of the geodiversity of the area, particularly the important phase of igneous activity in the evolution of the British Isles, and processes such as ice-sheet evolution, dynamics of ice streams and cold-based ice preservation of summit forms such as tors.
- Improving access to and providing imaginative interpretation of geological sites and features, including designated sites and quarries, and exploring the possibility of geo-trails, to enhance the public's understanding and enjoyment of the area.
- Encouraging sympathetic land management and use to protect the wealth of archaeological features from damage by people, livestock, land management practices and encroachment by bracken and scrub.
- Conserving and interpreting the historic landscapes which often contain evidence of multi-period occupation, recognising the exceptionally high potential in this area for identifying further archaeological evidence of settlement and use, and encouraging further research to identify these.
- Seeking opportunities to improve access to key historic sites, including those which act as local focal points and reinforce local distinctiveness in each of the valleys, and providing imaginative and clear interpretation to enhance the public's enjoyment and understanding of the area.
- Maintaining the pattern of traditional landscape elements including stone walls, hedges, woodlands and traditional farm buildings which contribute to the character of the Cheviots.
- Encouraging the restoration of Scheduled Ancient Monuments, historic buildings such as bastles, traditional farm buildings and drystone walls, using local building materials and techniques where possible, and ensuring that new and re-developments respect the historic settlement patterns and reflect the local farmstead vernacular in terms of building materials, scale and location.

SEO 3: Manage and enhance the important upland and sheltered valley habitats associated with the Till and Coquet rivers and tributaries to ensure good water quality, improve habitat connectivity and resilience to climate change, protect the nationally and internationally important species of wildlife that they support, strengthen landscape character and contribute to the regulation of water flow.

For example by:

- Preserving and restoring natural fluvial processes and morphology, recognising the importance of the dynamic nature of the rivers which provide the wildlife and landscape interest.
- Promoting land management practices that reduce or prevent water pollution, such as updating sheep-dipping facilities and managing flocks to minimise pollution from sheep dipping, managing stock movements and, where appropriate, fencing watercourses to reduce erosion of banks.
- Ensuring that the application of manure/fertiliser is at appropriate levels/times/locations, introducing buffer strips along watercourses where appropriate, encouraging good soil management and carrying out land management operations in appropriate weather conditions.
- Securing sustainable moorland grazing and heather-burning regimes that do not damage the peaty soils or associated habitats.
- Encouraging the restoration of wetland systems, in particular blanket bog, to achieve good vegetative cover that will improve water interception and storage and reduce soil erosion.
- Managing, expanding and connecting the fragmented relict woodland and scrub in the steep-sided valleys, particularly alder, ash, oak, hazel and juniper woodland and gorse scrub, creating more ecologically robust habitat networks, re-establishing important wildlife corridors, strengthening the character of these key landscape features, improving water infiltration, stabilising banks and reducing soil erosion.
- Restoring and enhancing the traditional hay meadows of unimproved and colourful herb-rich grassland which survive in the Coquet valley by encouraging later cutting dates and aftermath grazing, supporting traditional hay-making and avoiding the use of artificial fertilisers.
- Ensuring the planting and felling of conifer plantations does not contribute to the sedimentation load or acidification of watercourses and that the implications for biodiversity and landscape character of felling and replanting schemes are considered.
- Continuing to monitor the spread of invasive species and to control as appropriate; Himalayan balsam, giant hogweed, Japanese knotweed and signal crayfish are all problematic in the lower stretches of the Till and Coquet catchments and signal crayfish in particular have the potential to spread upstream.
- Ensuring populations of the European Protected and Biodiversity Action Plan species found in the rivers and streams such as otter, freshwater pearl mussel, brook and river lamprey, Atlantic salmon, water crowfoot, river jelly lichen and the diatom Didymosphenia are maintained and increased by improving water quality, controlling non-native invasive species and enhancing riparian habitats.
- Ensuring that the streams and rivers continue to support high quality angling, and exploring opportunities to enhance the amenity provided by the watercourses and valleys for other recreational pursuits such as wildlife watching, encouraging the quiet enjoyment of these resources without detriment to the designated features and habitats.

SEO 4: Protect, restore and extend native woodland cover by managing existing woodland, restructuring and increasing the broadleaved component of conifer plantations, and restoring woodland in the cleughs. This will improve habitat connectivity, enhance landscape value, improve water quality and soil erosion, manage water flow, contribute to climate change mitigation, and provide timber and wood fuel.

For example by:

- Protecting existing semi-natural woodland and scrub, securing management that ensures their long-term survival and productivity, to increase carbon capture, improve water infiltration and soil protection and enhance diversity interest while strengthening landscape character, contributing to sense of place and increasing the local provision of wood fuel where access permits.
- Seeking opportunities to restore and expand relict areas of alder, oak, ash, juniper and hazel woodland and gorse scrub in the cleughs, controlling grazing to encourage regeneration and improving connectivity by linking fragments of ancient semi-natural woodland and helping stabilise river banks.
- Exploring opportunities for large-scale planting of oak and ash woodland, creating areas of woodland that extend from the valley bottoms up onto the hillsides as one of the preferred approaches to managing flood risk in downstream NCAs, increasing water infiltration, stabilising soils and increasing carbon capture while potentially increasing the provision of wood fuel. New planting must take account of the impact on the smooth, rounded lines and open vistas that are characteristic of this area, and avoid areas of deep peat and damage to significant archaeological sites.
- Encouraging further restructuring of conifer plantations, 'softening' their outlines to make them less obtrusive in the landscape, increasing the proportion of broadleaf trees and improving heterogeneity by introducing open spaces. However, manage key plantations for red squirrels: in areas designated as red squirrel reserves (Kidland and Uswayford) or that buffer these reserves, the clear-felling of areas and replanting with large-seeded deciduous species should be avoided and grey squirrels should be controlled to maximise the chances of red squirrels persisting in this NCA.
- Using opportunities presented by the felling of conifer plantations to restore native broadleaved woodland where appropriate, or priority open habitats such as grassland and heath with compensatory planting elsewhere.
- Identifying the occurrence of ash dieback and potentially resistant trees, working collaboratively to control the spread of the disease and managing woodlands to improve their resilience to it.
- Encouraging access to and appropriate recreational uses of forests and woodlands and extending access into new areas where appropriate.

Additional opportunity:

1. Improve public enjoyment and understanding of this wild and remote landscape, enabling people to experience the peace and beauty of the area and learn more about its biological, geological and archaeological assets while managing visitor pressure to conserve the highly valued tranquillity and protect the extensive semi-natural habitats.

For example by:

- Promoting, protecting, managing and enhancing the extensive network of public rights of way, creating more links to the Pennine Way, St Cuthbert's Way and open access land, improving signage, parking and other facilities where appropriate, providing clear interpretation on access to the Otterburn military training area, and ensuring that paths and tracks do not become eroded.
- Improving access to and providing imaginative interpretation of key geological and archaeological sites to improve people's appreciation and enjoyment of the area and strengthen their connections with the landscape. Encourage the use of these resources for education and research.
- Continuing to engage the public in innovative activities that enable them to experience, enjoy and learn more about the wildlife of the area.
- Encouraging voluntary groups and local people to help with monitoring wildlife and detecting the impacts of climate change.
- Enhancing access opportunities for less mobile people, such as wheelchair users and people with pushchairs, and encouraging and facilitating recreational and educational visits by groups such as ethnic minorities that are poorly represented among visitor numbers.
- Encouraging and promoting the continued production of traditional food products such as lamb, mutton, beef and game, using methods that support a healthy moorland environment and marketing them with reference to the special landscapes that their production helps to maintain.
- Supporting farmers, craftspeople and other primary industries to make and market high-quality products that reflect local identity, bringing socio-economic benefits to local communities.
- Ensuring that the remoteness, tranquillity and dark night skies are maintained by avoiding inappropriate development of built structures, incorporating careful lighting design in developments both in this and adjacent NCAs, and removing redundant structures.

Supporting document 1: Key facts and data

Total area: 36,487 ha

1. Landscape and nature conservation designations

99 per cent (36,056 ha) of the NCA lies within the Northumberland National Park.

Management plans for the protected landscape(s) can be found at:
www.northumberlandnationalpark.org.uk/

Source: Natural England (2011)

1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

Tier	Designation	Name	Area (ha)	% of NCA
International	n/a	n/a	0	0
European	Special Protection Area (SPA)	n/a	0	0
	Special Area of Conservation (SAC)	River Tweed SAC; North Pennine Dales Meadows SAC; Harbottle Moors SAC	34	<1
National	National Nature Reserve (NNR)	n/a	0	0
National	Site of Special Scientific Interest (SSSI)	A total of 10 sites wholly or partly within the NCA	3,947	1

Source: Natural England (2011)

Please note: Designated areas may overlap.

A total of 3,917 ha are designated. 33 ha of this SSSI area is also SAC.

There are 13 Local sites in the Cheviots NCA covering 9,858 ha which is 27 per cent of the NCA.

Source: Natural England (2011)

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

1.1.1 Condition of designated sites

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

SSSI condition category	Area (ha)	% of SSSI land in category condition
Unfavourable declining	0	0
Favourable	380	10
Unfavourable no change	21	<1
Unfavourable recovering	3,546	90

Source: Natural England (March 2011)

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

2. Landform, geology and soils

2.1 Elevation

Elevation ranges from 47 m above sea level to a maximum of 817 m at the top of Cheviot.

Source: Natural England 2010

2.2 Landform and process

The characteristic smooth sinuous cluster of the Cheviots is formed from the weathering of igneous intrusive and volcanic rocks. Glacial and post glacial features such as corries, meltwater channels and tors are found throughout the Cheviots. Deep narrow valleys radiate out from the central core.

Source: Cheviots Countryside Character Area Description

2.3 Bedrock geology

The Cheviots are composed of a suite of igneous and volcanic rocks of the Devonian Period and was the centre of volcanic activity 380 million years ago. Andesite lavas erupted from the volcano were intruded by a mass of granite to form Cheviot. Heat from the intruding granite baked the lava, making it harder and more resistant to erosion. More recently, glacial erosion has created features such as corries, meltwater channels and tors in this bedrock.

Source: Cheviots Countryside Character Area Description

2.4 Superficial deposits

Peat has formed over a significant proportion of the upper reaches of the NCA. Glacial and river processes have created till, gravel, silt and sand substrates elsewhere in the NCA, with dramatic scree slopes apparent on the North side of the Cheviots.

Source: Cheviots Countryside Character Area Description

2.5 Designated geological sites

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

There are no Local Geological Sites within the NCA

Source: Natural England (2011)

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

2.6 Soils and Agricultural Land Classification

Acid soils predominate ranging from blanket bog peat soils on the impeded areas to very acid loamy upland soils with a wet peaty surface on better drained areas. On the steeper slopes of the river valleys freely draining acid loamy soils over rock predominate. The underlying rocks, along with high altitude and rainfall, give rise to poor soils, with most of the area classified as Grade 5.

Source: Cheviots Countryside Character Area Description

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

Agricultural Land Classification	Area (ha)	% of NCA
Grade 1	0	0
Grade 2	0	0
Grade 3	365	1
Grade 4	1,824	5
Grade 5	31,744	87
Non-agricultural	0	0
Urban	0	0

Source: Natural England (2010)

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

3. Key water bodies and catchments

3.1 Major rivers/canals

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

Name	Length (km)
River Coquet	17
River Breamish	15
Usway Burn	15
College Burn	15
Harthope Burn	9
Bowmont Water	4
River Alwin	4

Source: Natural England (2010)

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

The NCA has a radial drainage pattern and is the source of several rivers including College Burn, Harthope Burn, Breamish/Till, Alwin and Coquet. The valleys are deeply incised, creating deep sided gorges within the upper courses of the rivers Alwin, Breamish and Coquet, College Burn and Harthope Burn.

3.2 Water quality

The total area of Nitrate Vulnerable Zone is 0 ha or 0 per cent of the NCA.

Source: Natural England (2010)

3.3 Water Framework Directive

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

4. Trees and woodlands

4.1 Total woodland cover

This NCA contains 5,352 ha of woodland (where woodlands are over 2 ha in size) covering 15 per cent of the NCA. Only 84 ha of this is ancient woodland (75 ha ASNW and 9 ha PAWS).

Source: Natural England (2010)

4.2 Distribution and size of woodland and trees in the landscape

Large blocks of coniferous woodland are found on moorland sides and upper valley reaches. Remnant patches of native oak, birch, alder, juniper and hazel woodland are found in the valley bottoms.

Source: Cheviots Countryside Character Area Description

4.3 Woodland types

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

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

Woodland type	Area (ha)	% of NCA
Broadleaved	741	2
Coniferous	3,819 *	10
Mixed	25	<1
Other	767	2

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

*** This figure is maturing trees only and does not include areas of recently felled or planted areas.**

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

Woodland type	Area (ha)	% of NCA
Ancient semi-natural woodland	75	<1
Ancient re-planted woodland (PAWS)	9	<1

Source: Natural England (2004)

5. Boundary features and patterns

5.1 Boundary features

Boundaries, where they are found, are defined by dry stone walls or 'dykes' dating from parliamentary enclosures with some hedges found within the valley bottoms.

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

5.2 Field patterns

The hills are largely unenclosed although the lower slopes have large enclosed fields.

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

6. Agriculture

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

The total farmed area is 15,413 ha, comprising a total of 30 holdings. All figures relate to 2009 unless otherwise stated.

6.1 Farm type

This area remains predominantly a stock-rearing area with 26 grazing livestock holdings registered in 2009 representing 87 per cent of all holdings.

Source: Agricultural Census, Defra (2010)

6.2 Farm size

Large farms of over 100 ha in size remain the dominant farm size; more than 83 per cent of farms were over 100 ha in size in 2000 and 2009.

Source: Agricultural Census, Defra (2010)

6.3 Farm ownership

The total farmed area fell between 2000 and 2009; there was a greater decrease in the area of owned land than tenanted land.

2009: Total farm area = 15,413 ha; owned land = 3,761 ha
2000: Total farm area = 18,851 ha; owned land = 6,292 ha

Source: Agricultural Census, Defra (2010)

6.4 Land use

The dominant land use is grassland, accounting for 14,933 ha (97 per cent) in 2009. Between 2000 and 2009 there was a reduction in the area of grass and uncropped land by 3,310 ha which accounts for the fall in total farmed area over the same period.

Source: Agricultural Census, Defra (2010)

6.5 Livestock numbers

Sheep are the most numerous livestock type (53,100 in 2009) followed by cattle (2,100 in 2009). Sheep numbers declined between 2000 and 2009, falling by 15,400 animals, while cattle numbers remained more-or-less stable.

Source: Agricultural Census, Defra (2010)

6.6 Farm labour

The majority of farms are run by dedicated farmers, supported predominantly by full time workers. Between 2000 and 2009 farm labour fell by 17 per cent, with a change in the reduction in the number of full time workers from 20 to 11.

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

Upland heathland is the predominant priority BAP habitat in the NCA with extensive stands of dry heath with an acid grassland matrix especially at mid to higher altitudes. Bracken occurs on some of the side slopes.

In the wetter, run-off fed or flatter areas of the Cheviots nationally important stands of blanket bog prevail with sphagnum mosses, sedges and cloudberry frequent where optimum conditions prevail.

Upland heathland and blanket bog supports important assemblages of birds including raptors, grouse and waders.

The enclosed fields contain pastures and meadows, with upland hay meadows of international importance represented by Barrow Burn Meadows SSSI (part of the North Pennine Dales Meadows SAC). This is an important and rare habitat found in upland farmland.

Woodlands vary from wet and lowland deciduous woodlands on the valley bottoms, to upland oak woods which form in cloughs on the valley sides especially in rocky situations. The woodlands are fragmented and often neglected although there has been some woodland creation in recent years. There are extensive areas of coniferous woodland.

Source: Border Uplands Natural Area Profile

7.2 UK Biodiversity Action Plan (BAP) priority habitats

The Government's new strategy for biodiversity in England, Biodiversity 2020, replaces the previous Biodiversity Action Plan (BAP) led approach. Priority habitats and species are identified in Biodiversity 2020, but references to BAP priority habitats and species, and previous national targets have been removed. Biodiversity Action Plans remain a useful source of guidance and information. More information about Biodiversity 2020 can be found at; www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/englandsbiodiversitystrategy2011.aspx.

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

UK BAP priority habitat	Area (ha)	% of NCA
Upland heathland	6,735	18
Blanket bog	5,512	15
Broad-leaved woodland (Broad Habitat)	321	<1
Lowland dry acid grassland	17	<1
Upland calcareous grassland	13	<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/ – select 'Habitat Inventories'
- Maps showing locations of S41 species are available at: http://data.nbn.org.uk/

8. Settlement and development patterns

8.1 Settlement pattern

The population is sparse, with isolated farms sheltering in the deep narrow valleys, and larger villages of Ingram, Alwinton, Biddlestone and Hethpool on lower ground around the fringe of the NCA. Medieval or earlier origins are likely for the scattered nucleated villages in the foothill valleys, associated with inter-commoning drove roads and the locations of late prehistoric hillforts.

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

8.2 Main settlements

There are no main towns/cities within the NCA. The total estimated population for this NCA (derived from ONS 2001 census data) is: 1,709.

Source: Office for National Statistics census data 2001 Countryside Character Area description; Countryside Quality Counts (2003)

8.3 Local vernacular and building materials

Dark, durable andesite and granite are the local building materials for churches, bastles and buildings from 1700 onwards. Slate is now the traditional roofing material, which probably replaced thatch. Dressed sandstone is used in the better quality buildings and in the northern valleys clay pantiles are used for roofing.

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

9. Key historic sites and features

9.1 Origin of historic features

The Cheviot foothills were extensively cleared and settled in the prehistoric period, leaving widespread evidence in the form of burial cairns dating from the Neolithic and Bronze Age, palisaded enclosures for example, Brough Law, hillforts and other settlements linked with trackways and field systems dating from the later Bronze Age, Iron Age and Romano-British periods. Romano-British farmsteads, buried or traceable as earthworks, are widespread and occasionally cluster to form village-like groupings. Ridge and furrow is often associated with these settlements. Deserted medieval villages and hamlets together with visible remains of abandoned field systems indicate a period of greater population and farming diversity prior to the 14th century. The patterns of drove ways and tracks crossing the border are pivotal to the development of Cheviot settlements.

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

9.2 Designated historic assets

This NCA has the following historic designations:

- 0 Registered Parks and Gardens covering 0 ha
- 1 Registered Battlefield/s covering 91 ha
- 243 Scheduled Monuments
- 51 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

- 66 per cent of the NCA 24,329 ha is classified as being publically accessible.
- There are 379 km of public rights of way at a density of 1 km per km2. The Pennine Way National Trail covers 23 km within the Cheviots 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	0	0
Country Parks	0	0
CROW Access Land (Section 4 and 16)	26,188	72
CROW Section 15	43	<1
Village Greens	0	0
Doorstep Greens	0	0
Forestry Commission Walkers Welcome Grants	493	<1
Local Nature Reserves (LNR)	0	0
Millennium Greens	0	0
Accessible National Nature Reserves (NNR)	0	0
Agri-environment Scheme Access	0	0
Woods for People	2,467	7

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) it appears that the lowest scores for tranquillity are found at the NCA boundary with the Cheviot Fringe NCA, however, the scores are still relatively high. The highest scores are on the top of the Cheviot plateaux. Tranquillity represents a significant feature of the NCA. This NCA and the adjacent Border Moors and Forests NCA are the most tranquil in England.

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

Tranquillity	Tranquillity Score
Highest value within NCA	141
Lowest value within NCA	-4
Mean value within NCA	78

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 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 reflects the distance of the NCA from major settlements and industry.

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

Intrusion category	1960s (%)	1990s (%)	2007 (%)	Percentage change (1960s-2007)
Disturbed	n/a	n/a	<1	n/a
Undisturbed	94	95	99	3
Urban	n/a	n/a	n/a	n/a

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are the decrease in intrusion to the landscape since the 1960s. The entire NCA is now classified as 'undisturbed' an increase from 94 per cent since the 1960s.

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

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

Supporting document 2: Landscape change

Recent changes and trends

Trees and woodlands

- The uptake of Woodland Grant Scheme agreements for maintaining woodland outside the Forestry Commission estate increased significantly between 1999 and 2003.

- The increase in woodland cover has continued, primarily of upland oak and ash woodlands on privately owned land, in some cases as habitat creation for black grouse: 130 ha of new broadleaf woodland has been planted on the Lilburn Estate and 200 ha in Upper Coquetdale through the Woodland Grant Scheme.

- The main Forestry Commission owned conifer blocks have matured and harvesting has occurred in Kidland Forest since 2000.

- The Forestry Commission granted consent in 2011 for the felling of 567 ha of mainly conifer trees at Threestoneburn Wood to restore open moorland including 232 ha of upland bog, and create 158 ha of new native woodland. Felling began in 2012/13 and will continue over the next decade. 150 ha of conifers were removed from the NCA at Wooler Common with the majority of the site restored to open moorland.

Boundary features

- There has been some decline in the management of boundary features (stone wall and hedges) over recent years and an increase in the use of post and wire fencing for new boundaries. The estimated boundary length for the JCA is 1,227 km. Only about 2 per cent of this total length was included in Countryside Stewardship agreements between 1999 and 2003. There has been limited uptake of boundary feature management through Environmental Stewardship with only 59 km of hedgerows and 55 km of stone walls included in agreements by 2011.

The Cheviots form a smooth, sinous cluster of rounded hills dominated by broad moorland horizons. The higher ground is enclosed by dry stone walls and more recent post and wire fencing.

Agriculture

- Agriculture continues to be dominated by upland sheep farming with some cattle grazing, on large farms (83 per cent are over 100 ha in size). Between 2000 and 2009 the number of sheep fell by 23 per cent.

- Since 2005 there has been widespread uptake of the Higher Level Environmental Stewardship scheme with particular emphasis on maintaining and restoring moorland habitats through sustainable grazing and heather burning, maintaining and enhancing grassland and woodland habitats, and protecting archaeology.

Settlement and development

- Due to the terrain and isolation of the Cheviots, there has been very little demand for development relating to either housing or industry in this NCA.

- In recent years there has been a trend for the construction and upgrading of upland tracks for forestry, military and sporting use.

- Increased usage of footpaths has led to localised erosion of the peaty soils and there is an ongoing programme of works to manage this issue, particularly focussing on stone-flagging stretches of the Pennine Way.

- Developments in the Otterburn military training area in response to changes in military training requirements have resulted in the construction of new infrastructure and a perceived increase in noise intrusion.

- Increases in fuel prices, the fact that many properties do not have mains electricity, and the introduction of Government repayment schemes has lead to a steady uptake of renewable energy technologies including micro wind turbines, solar panels and a high head hydro scheme.

Semi-natural habitat

- The area designated as SSSI is significant (11 per cent of the NCA) and 99.5 per cent are now in favourable condition or recovering. This covers a large range of designated features including upland heath and blanket bog, woodlands, hay meadows, riverine habitats and species, and geological features.

- The 20th century deterioration of upland habitats, especially dry heath and blanket bog, has shown some reversal due to extensive uptake of agri-environment schemes involving reductions in stock numbers and the introduction of sustainable heather burning regimes. Restoration of degraded blanket bog is being addressed in some areas by grip-blocking.

Historic features

- Archaeological features have been threatened in recent decades by wetland drainage, coniferous forestry, bracken, and wildfire but agri-environment schemes and other initiatives are being put into place to alleviate these pressures.

- Historic farm buildings are generally intact but in common with stone walls and hedges have been largely neglected.

- Improved animal husbandry has led to many of the traditional stone-built farmsteads incorporating modern steel-framed stock sheds used to over-winter cattle or for lambing in the spring.

Rivers

- The ecological quality of the rivers and burns in The Cheviots NCA continues to be classified as 'high' or 'good' but there are some issues of diffuse pollution associated with sheep dip and nutrient run-off from fields, and bank erosion by stock.

- Ongoing work to restore heath and blanket bog should help to slow the passage of rainfall into the rivers, reducing the risk of flooding in downstream NCAs.

Minerals

- Historically there has been small-scale stone quarrying across this area but Harden Quarry at Biddlestone is the only operational quarry now and while in the short term this leaves a scar on the landscape, in the longer term the Biodiversity Action Plan in place for its reclamation should ensure sensitive restoration of high biodiversity value habitats.

Drivers of change

Climate change

Climate change projections suggest increased temperatures with drier summers, wetter winters and more heavy rainfall events. This could result in:

- Increased 'flashiness' and volume of flows within all river catchments with potential for more frequent winter flooding and summer drought in downstream NCAs, exacerbating issues with over-abstraction, diffuse pollution and sedimentation.

- Summer droughts drying vulnerable soils such as peat and wetland habitats, causing increased risk and severity of wildfires and oxidisation and loss of peat. This combined with heavy rainfall events could lead to significant increases in erosion and run-off.

- An increase in drought-resistant species and an increase in frequency and severity of pest attacks.

- Species extinction or migration and loss of small or isolated habitats, and continued decline of biodiversity in fragmented habitats such as woodlands. Conditions may begin to favour invasive non-native species.

- Wetter weather causing further enhancement of broadleaf woodland to wet woodland and an increase in bracken encroachment with warmer summers.

- Possible erosion or loss of access to the significant prehistoric buried archaeology from increased winter rainfall, summer drought and encroachment by bracken.

- Scope for new species to be used for crops and timber, but risk of increase in pests and diseases. These will require modification of silviculture systems to adapt to the changing climate, some commercial species becoming less suitable in the future.

Other key drivers

- The increased understanding of the importance of upland peat soils for carbon storage may see increased resources being put towards protection and restoration of moorland and blanket bogs. This will also protect water quality from issues related to peat degeneration such as increased colour.

- The need to maintain or improve water and habitat quality in the Tweed Catchment Rivers SSSI and SAC coupled with implementation of the Water Framework Directive and the Wetland Vision initiative, and combined with the need to manage flooding in downstream areas should improve ecological status of the rivers and water bodies in the area.

- The Natural Environment White Paper (2011) calls for joined-up efforts across the conservation sector and working at a landscape scale, to establish a coherent and resilient ecological network capable of adapting to environmental change and halting losses in biodiversity. An increased focus on connectivity and resilience of habitats should lead to greater networks of habitats, a more diverse mosaic of vegetation, and larger areas of semi-natural habitat.

- The Government's UK Low Carbon Transition Plan (2009), Forestry and Woodlands Policy Statement (2013) and the Regional Forestry Strategy for the North East of England (2005) indicate an increased rate of woodland creation over the next 15-20 years, alongside an increase in demand for timber and wood fuel. A requirement for increasing renewable energy generation could result in increased pressure for wind power, hydro power, wood fuel and biomass crops.

- The Growth and Infrastructure Act 2013 and roll out of Next Generation Access communications networks may result in increased pressure to install new built structures such as communications masts and lines and new electricity supplies.

- Defra's Uplands Policy Review (March 2011) identifies the need to develop strong partnerships with the hill farming and moorland management sector and rural communities to deliver a wide range of public goods and environmental benefits.

- It is likely that visitor numbers will continue to increase, with potential benefits for the local economy, but putting further pressure on habitats and infrastructure, with increased risks of footpath/bridleway erosion, demand for car parks and signage, damage to vegetation and wildfires. Further opportunities for green tourism and voluntary visitor payback could be explored in order to ensure that increased tourism has a net positive impact on the local environment and economy.

- Training requirements at Otterburn military training area will continue to change which may require additional infrastructure and impact on

Supporting document 3: Analysis supporting Statements of Environmental Opportunity

The following analysis section focuses on a selection of the key provisioning, regulating and cultural ecosystem goods and services for this NCA. These are underpinned by supporting services such as photosynthesis, nutrient cycling, soil formation and evapo-transpiration. Supporting services perform an essential role in ensuring the availability of all ecosystem services.

Biodiversity and geodiversity are crucial in supporting the full range of ecosystem services provided by this landscape. Wildlife and geologically-rich landscapes are also of cultural value and are included in this section of the analysis. This analysis shows the projected impact of Statements of Environmental Opportunity on the value of nominated ecosystem services within this landscape.

Steep-sided valleys with fast-flowing burns radiate from the Cheviots, supporting relict semi-natural broadleaved woodland, gorse scrub, wet flushes and species-rich meadows.

Statement of Environmental Opportunity	Ecosystem service: Food provision	Timber provision	Water availability	Genetic diversity	Biomass provision	Climate regulation	Regulating water quality	Regulating water flow	Regulating soil quality	Regulating soil erosion	Pollination	Pest regulation	Regulating coastal erosion	Sense of place / Inspiration	Sense of history	Tranquillity	Recreation	Biodiversity	Geodiversity
SEO 1: Conserve, restore and enhance the blanket bog, wet heath, mire and other upland habitats of the Cheviots to ensure that they provide a well-functioning ecosystem that will be more resilient to climate change, reduce the loss of greenhouse gases and increase their ability to sequester further carbon, support nationally and internationally important species of wildlife, and further enhance the regulation of water quality, water flow and soil erosion, while maintaining the highly valued sense of wilderness, tranquillity and dark night skies.	↗ *	↔ **	↗ **	↗ ***	↔ ***	↗ ***	↗ ***	↗ ***	↗ **	↑ ***	↗ **	↗ **		↑ ***	↗ **	↑ ***	↑ **	↑ ***	↗ **
SEO 2: Protect, manage and conserve the distinctive geological environment and the rich historic environment with its wealth of archaeological and built heritage assets, encouraging further research to improve understanding of the landscape and its cultural development, promoting access to, interpretation of and education about these valuable resources.	↔ **	↔ **	↔ **	↔ ***	↔ ***	↗ *	↗ *	↗ *	↗ *	↗ *	↔ *	↔ **		↑ ***	↑ ***	↔ **	↑ ***	↗ **	↑ ***
SEO 3: Manage and enhance the important upland and sheltered valley habitats associated with the Till and Coquet rivers and tributaries to ensure good water quality, improve habitat connectivity and resilience to climate change, protect the nationally and internationally important species of wildlife that they support, strengthen landscape character and contribute to the regulation of water flow.	↔ **	↔ **	↑ **	↔ ***	↗ *	↗ **	↑ ***	↗ ***	↗ *	↗ ***	↗ **	↗ **		↑ ***	↗ **	↑ **	↗ **	↑ ***	↗ **
SEO 4: Protect, restore and extend native woodland cover by managing existing woodland, restructuring and increasing the broadleaved component of conifer plantations, and restoring woodland in the cleughs. This will improve habitat connectivity, enhance landscape value, improve water quality and soil erosion, manage water flow, contribute to climate change mitigation, and provide timber and wood fuel.	↔ ***	↓ **	↑ **	↔ ***	↗ **	↗ ***	↗ ***	↗ ***	↗ **	↑ **	↗ *	↗ *		↑ ***	↗ **	↑ **	↑ ***	↑ ***	↔ **

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

perceptions of tranquillity.

Landscape attributes

Landscape attribute	Justification for selection
Distinctive volcanic geology forming a sinuous cluster of rounded hills with granitic tors on the summit, rocky outcrops and scree slopes on the northern flanks, and many glacial and post-glacial features.	■ The underlying igneous rocks give rise to the impressive and distinctive rounded hills of the Cheviot massif and surrounding hills that tower over the Cheviot Fringe. ■ Some of the more resistant lavas have weathered to form the distinctive rocky tors on some of the hill tops. ■ A prominent intrusion of brick-red microgranite, the 'red whin', at Biddlestone is quarried for red roadstone used to demarcate 'hard shoulders' on many of Britain's motorways and to line The Mall in London. ■ The Cheviots display many fine examples of glacial and post-glacial features which provide important opportunities for research and education; the Humbleton Hill and the Trows SSSI provides some of the best examples of sub-glacial meltwater channels in northern England. ■ The rocky outcrops and scree slopes on the northern flanks of the Cheviots support rare relict communities of arctic-alpine flora.
Extensive rolling moorlands of blanket bog, heathland and acid grassland grazed by sheep and managed as grouse moors.	■ Over 6,700 ha of upland heath and 5,500 ha of blanket bog; 3,492 ha of this designated as The Cheviot SSSI. ■ The upland mosaic supports a wide variety of birds such as the occasional black grouse, ring ouzel, peregrine, merlin and buzzards and the upland waders, such as dunlin, golden plover and curlew. ■ There is a long tradition of rearing hardy sheep and cattle in the Cheviots to provide stock for cross-breeding and to sell directly to the meat industry, supporting the local economy and maintaining the semi-natural habitats. The characteristic Cheviots and Northumberland Blackface sheep are native breeds that originate from this area. ■ A rare population of wild primitive goats survive on the remote moorlands of the Cheviots. ■ Moorlands provide a range of benefits including biodiversity interest, water and carbon capture, inspirational experience, recreation opportunities and livestock rearing.

Landscape attribute	Justification for selection
Steep-sided valleys with fast-flowing burns radiate from the Cheviots, supporting relict semi-natural broadleaved woodland, gorse scrub, wet flushes and species-rich meadows.	■ The Cheviots contain the headwaters of two major river systems: the River Coquet and River Till. ■ The deep, narrow valleys that radiate out from the Cheviots, each with their own distinct character, drain the uplands and flow into the lowlands of the Cheviot Fringe, providing water for agricultural irrigation and public water supply. ■ This NCA is noted for the high quality of its water. The River Coquet (SSSI), River Till/Tweed (SAC) and their tributaries are recognised for their importance in supporting nationally and internationally important species such as otter, brook and river lamprey, Atlantic salmon, water crowfoot, river jelly lichen, freshwater pearl mussel and the diatom Didymosphenia; the water quality is generally good. They are also nationally important game fisheries. ■ Remnants of alder, ash, oak, juniper and hazel woodland line the watercourses, much of it designated as SSSI. ■ Relatively few of the once more widespread flower-rich meadows that were found in the sheltered valley bottoms still exist but these are recognised for their high biodiversity value and the best examples designated as SSSI and SAC.
Coniferous woodland plantations occur on some upper valley slopes.	■ The NCA contains over 3,819 ha of commercial plantations (this figure represents mature or nearly mature plantation only and does not include new planting or recently felled areas) covering more than10.5 per cent of the NCA. ■ The regular outlines of these plantations interrupt the smooth lines and open vistas of the moorland landscape and re-structuring or removal of many is planned or underway. ■ The presence of these plantations helps to support red squirrels which are still found throughout the area. Some of the larger blocks such as Kidland and Uswayford are being managed as reserves for this iconic species.
A wealth of archaeology with extensive tracts of well-preserved and highly visible prehistoric landscapes and deserted villages, extensive field systems, shielings and enclosures from the medieval period.	■ The Cheviots contain outstanding multi-period prehistoric landscapes such as Yeavering Bell and Humbleton Hill and are one of the most important sites for bronze-age remains in Britain. ■ Iron-age hill forts are distinctive and highly visible features of this area. ■ Bastles reflect the unsettled history of the Anglo-Scottish border area. ■ Extensive remains from the medieval period take the form of deserted villages, field systems, shielings and enclosures and reinforce the sense that human settlement of the area has changed greatly over time. ■ There are 243 Scheduled Monuments.

Landscape attribute	Justification for selection
Large regular fields enclosed by drystone walls or dykes on higher ground and hedgerows in the valley bottoms.	■ Strong patterns of enclosure dating from the late-18th and 19th centuries. ■ Walls constructed from local stone reinforce links with the underlying geology.
Buildings are constructed from local stone. Isolated farmsteads nestle in the sheltered valleys with larger hamlets and villages found in the foothills where the valleys meet the lowlands. Roads are restricted to valley floors and there are no routes through the Cheviots.	■ Low population and few settlements, the pattern dictated by the steep topography and harsh climate. ■ Villages often have ancient origins, occupying strategic sites associated with drove roads and border tracks and sometimes their confluence with rivers. ■ Use of local stone creates strong visual links with the landscape and underlying geology. ■ Sparse settlement and lack of roads contributes to the characteristic sense of remoteness.
Ancient tracks and drove roads that cross the Cheviots form the basis of an extensive public rights of way network.	■ The numerous tracks and drove roads provide strong reminders of the long history of movement of people and animals through this border area, driving cattle from Scotland to markets in the south. ■ These tracks are now used and enjoyed by numerous visitors to the Northumberland National Park.
A wild and remote landscape characterised by low levels of intrusion and light pollution which evokes a strong sense of tranquillity.	■ The entire NCA is now classified as 'undisturbed' according to CPRE data making this NCA, along with the adjacent Border Moors and Forests NCA, the most tranquil in England. ■ Sparse settlement, few built structures and the restriction of vehicular access to the valley floors contribute to a sense of remoteness. ■ The Cheviots form the northern end of the Northumberland National Park. The sheltered, tranquil wooded valleys contrast with the wild, open and windswept moorland, providing a diverse and high quality environment for quiet enjoyment and appropriate recreation. ■ Sparse settlement means the night skies are some of the darkest in England and as such the Northumberland National Park Authority has applied for International Dark Skies Park status to include this NCA.

Landscape opportunities

- Protect the highly-valued tranquillity, remoteness, open vistas and dark night skies which characterise this area by discouraging sources of disturbance, limiting inappropriate development by considering the impacts of development both within this area and adjacent NCAs, and removing redundant structures.

- Protect, manage and enhance the extensive moorland mosaics through securing sustainable mixed livestock farming and grouse moor management to increase biodiversity interest and benefit water, soil and carbon regulation services.

- Restore blanket bog and encourage active peat formation by grip-blocking and through careful grazing and heather-burning management to encourage full vegetative cover, improving water and carbon retention capacity.

- Manage and significantly increase broadleaved woodland cover, particularly along rivers and streams and taking opportunities for large-scale planting from valleys up onto hillsides where this avoids historic ground features, creating an ecological network more resilient to climate change, helping to regulate water flow and strengthening sense of place.

- Protect, restore and enhance the rivers and streams, improving water quality through securing sustainable moorland grazing and heather burning regimes, managing livestock movements near watercourses, encouraging good soil management throughout the catchment and restoring woodland in the cleughs.

- Manage and restructure conifer plantations to 'soften' the landscape impact and increase biodiversity interest. But manage any large, key blocks that support red squirrel populations as refuges, avoiding clear-felling or diversifying with large-seeded tree species and controlling grey squirrels in these and buffering areas.

- Utilise opportunities presented by the felling of mature conifer plantations on upper slopes to restore heathland and grassland habitats, reinstating the smooth lines of the landscape, with compensatory broadleaved woodland planting in more suitable locations such as in the valleys and on lower slopes.

- Find ways to support upland farming practices to protect, manage, enhance and expand valuable grassland habitats, particularly the species-rich hay meadows in the valley bottoms, contributing to ecological networks that should be more robust to environmental change and improving the heterogeneity of the area.

- Protect and conserve the wealth of archaeology, preserving and interpreting the evidence of multi-period occupation, recognising the exceptionally high potential in this area for identifying further archaeological evidence of settlement and use.

- Provide access to and interpretation of the extensive geodiversity and heritage assets of the area and encourage their use for research and education, enabling more people to visit, enjoy and understand the interconnections between the physical geography, natural history and historical development of the area.

- Protect and reinforce the historic settlement pattern, encouraging the restoration of traditional buildings and stone walls using local stone and building methods and ensuring any new developments are appropriate and in-keeping with the landscape and local vernacular.

- Enable appropriate access for all abilities, maintaining and expanding the public rights of way network and range of recreation opportunities, incorporating links to key geological and historical sites wherever possible, linking to tourism facilities and developing innovative activities to enhance people's access to and enjoyment of the natural environment in a responsible and sustainable way.

The geometric outlines of a number of large conifer blocks and smaller shelter belts still interrupt the smooth lines and open vistas of the moorland landscape.

Ecosystem service analysis

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

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

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Food provision	Soils Semi-natural habitats Watercourses Livestock	Agriculture is limited by the harsh climate, topography and low grade soils but the area is important for rearing hardy livestock: 53,000 sheep and 2,000 store cattle which are extensively grazed on upland pasture and moorland.	Regional	Food provision is an important activity in the area, supporting the local economy, playing an increasingly important role in supporting tourism in the area, and in the process helping encourage a locally sustainable green economy, and maintaining rare habitats. Hardy sheep and cattle are sold for cross-breeding to produce animals for the meat industry and cattle are also sold directly for meat. Overgrazing of sensitive upland habitats has been an issue in this NCA but is now being addressed through agri-environment schemes and other initiatives such as Cheviot Futures. The retention of viable mixed farming in the NCA is important both to the local economy and for the maintenance of the characteristic landscape and habitats. Agri-environment schemes have comprised a significant proportion of farm income in the area and any reduction in future funding could hit the farming sector in this NCA harder than many.	Work with the farming community to ensure good soil and nutrient management, protection of historic and other environmental features, and sustainable water use. Supporting sustainable grazing through agri-environment schemes and other initiatives is particularly important in this upland landscape. This may involve reducing or increasing stocking numbers, increasing stock management or encouraging upland grazing by cattle, depending on the area. Promote the use of new technology and best practice to increase the value of food production and farm profitability where this can enable profitable and more sustainable farming systems. **Continued over...**	**Food provision** **Water availability** **Regulating water quality** **Regulating soil quality** **Regulating soil erosion** **Climate regulation** **Sense of place/ inspiration** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Food provision continued					**...continued from previous.** Ensure agri-environment schemes are used to best effect to conserve and enhance wildlife-rich habitats and support the production of traditional food products such as lamb, mutton, beef and game using methods that sustain a healthy moorland environment, marketing them with reference to the special landscapes that their production helps to maintain, and stating the role they play in encouraging a locally sustainable green economy that supports tourism in the area.	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Timber provision	Soils Conifer plantations and broadleaved woodland	The NCA contains over 3,819 ha of commercial plantations such as Kidland Forest covering more than 10.5 per cent of the NCA. (The actual area covered by plantations is probably greater than this as this figure does not include new planting or recently felled areas.) 741 ha of broadleaved woodland is found in the cleughs and river valleys.	Local	The softwood provision in this NCA is locally significant. Many of the conifer plantations are now reaching maturity and some are being felled. Conifers can acidify watercourses so any new planting should consider the impacts on these. Felling can also impact on water quality through sedimentation and operations should be conducted in such a way as to minimise this risk. Kidland Forest will continue to be managed as a commercial plantation. Kidland and Uswayford are being managed as a red squirrel reserves with felling and replanting plans that will benefit the red squirrel population that persists there and minimise the risk of colonisation by grey squirrels, in combination with grey squirrel control. In some areas such as the College Valley Estate the plan is to gradually replace extensive coniferous plantations with a mix of broadleaved species and heather moorland, and in others such as Threestoneburn Wood the plan is to fell the plantation and restore to heather moorland with compensatory broadleaved planting elsewhere. **Continued over...**	Continue to produce timber, but seek ways to reduce the visual dominance of conifer plantations on the valley slopes, through removal or restructuring with broadleaved planting, and enhance recreation and access opportunities. Ensure forestry operations do not contribute to the acidification or sedimentation of watercourses. Use opportunities created by the felling of plantations to restore priority open habitats such as grassland and heath as appropriate, and find compensation sites for planting elsewhere. Encourage the regeneration of semi-natural woodland and wood pasture on valley slopes and tributary valleys, diversifying the age structure of the woodland and strengthening landscape character. This could contribute to local provision of wood fuel while strengthening habitat networks, stabilising soil, reducing soil erosion and potentially assisting with water quality along watercourses. **Continued over...**	**Timber provision** **Biomass provision** **Climate regulation** **Regulating water quality** **Regulating water flow** **Regulating soil erosion** **Regulating water flow** **Sense of place / inspiration** **Recreation** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Timber provision continued				**...continued from previous.** Timber provision is likely to reduce in this NCA as conifer plantations are diversified but opportunities for provision of wood fuel could increase. One of the Environment Agency's preferred approaches to managing flood risk in downstream NCAs is afforestation in upland parts of the catchment[4] and there are opportunities for large scale planting from valley bottoms up onto hillsides, but any new woodland planting should take into account the impact on the smooth, rounded lines and open vistas that are characteristic of the landscape and aim to increase the biodiversity interest of the area.	**...continued from previous.** Planting new woodland on slopes elsewhere in the area, on a large scale where appropriate to landscape character, would maximise benefits in flood control and prevention of erosion in this and downstream NCAs. Manage key conifer plantations to benefit red squirrels, avoiding the clear-felling of areas and avoiding re-planting with large-seeded deciduous species.	

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

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biomass energy	Existing woodland cover	The existing woodland cover (15 per cent) offers moderately high potential for the provision of biomass, either through bringing unmanaged woodland under management or as a by-product of commercial timber production. The NCA has low potential yield for both short rotation coppice (SRC) and miscanthus across most of its area with the exception of small, lowland areas on its eastern and southern boundary where potential SRC yield is high and potential Miscanthus yield is medium.	Local	There are opportunities to increase wood fuel provision through bringing unmanaged woodland under management, as a by-product of commercial timber production, and through planting of new woodland for flood risk management. Management must take into account that deadwood is an important component of semi-natural woodland for biodiversity as well as nutrient cycling and soil formation, which underpin regulating services including soil quality/erosion, water quality and storage/ sequestration of carbon. Managing woodland has the potential to provide environmental benefits such as restoring, expanding and linking woodland habitat and stabilising soils, while providing social and economic benefits. The potential for SRC plantations and Miscanthus is limited. While there are areas on the lower eastern and southern fringes where yields are predicted to be medium to high the impact on landscape character and risks of soil erosion are also likely to be high. In addition, there is no local market. For information on the potential landscape impacts of biomass plantings within the NCA, refer to the Natural England website (http://www.naturalengland.org.uk/ourwork/farming/funding/ecs/sitings/areas/004.aspx).	There are opportunities to manage, enhance and expand the woodland network by improving age structure, diversity and extent for long term survival, providing local sources of wood fuel. Capitalise on opportunities provided by the felling of mature conifer plantations to restore broadleaf woodland on lower slopes and in the valleys and heathland and grassland on upper slopes, with compensatory planting in more suitable locations.	**Biomass energy** **Timber provision** **Regulating water flow** **Regulating soil erosion** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Water availability	Headwaters of the River Till and River Coquet High rainfall in the Cheviots flowing down into the Cheviot Fringe	The headwaters of two major river systems, the River Till and River Coquet, arise in this NCA. The River Till with its tributaries represents the major catchment in the NCA, much of which is part of the River Tweed SAC and abstractions are therefore currently consented by Natural England. Summer abstraction from the River Till for agricultural irrigation, particularly of high value root crops, is consented up to the sustainable level and no additional water is currently available during the summer months. It is likely that all surface waters will move to 'no water available' when the Environment Agency become responsible for licensing abstractions from the Till[5]. The River Coquet in the south of the NCA is part of the Northumberland Rivers Catchment Area Management Strategy area in which the predominant land use is agriculture but the predominant (80 per cent) use of abstracted water is public water supply, followed by industrial and commercial (11 per cent). The Upper Coquet has 'water available'[6]. The NCA does not overlie any major aquifers.	Regional	The high rainfall and very low population density of this NCA mean this NCA plays a critical role in supplying the adjacent NCAs with water. Water is abstracted from the Till for irrigation of high value root crops in the Cheviot Fringe and water is abstracted from the Coquet in the Cheviot Fringe, Northumberland Sandstone Hills and beyond predominantly for public water supply. The large extent of semi-natural habitats allows good overall rainwater retention and increases opportunity for groundwater recharge. The ability of a catchment to maintain a constant flow rather than experience flood and drought episodes is improved by healthy soils and peat and wetland ecosystems with good vegetative cover. Climate change may adversely impact on water availability through increased summer droughts and wetter winters with more heavy rainfall events. This, combined with the restrictions on abstraction from the Rivers Till/Tweed due to their designation as a SAC makes it imperative that water is used sustainably and land management practices are employed which will increase water infiltration and maintain a constant flow to downstream NCAs.	Seek opportunities to restore semi-natural habitats such as blanket bog , wet heath, mires, flushes, wet woodland and grassland to improve water storage capacity while reducing flood risk and soil erosion, improving water quality, climate regulation, habitat networks and ecosystem resilience to climate change. Improve sustainable use of water and sympathetic land management practices such as winter storage reservoirs, and water conservation measures in new development.	**Water availability** **Food provision** **Climate regulation** **Regulating water quality** **Regulating water flow** **Regulating soil erosion** **Biodiversity**

[5] *Till Abstraction Licensing Strategy*, Environment Agency (February 2013, URL: http://www.environment-agency.gov.uk/business/topics/water/119945.aspx)

[6] *Northumberland Rivers Abstraction Licensing Strategy*, Environment Agency (February 2013; URL: http://www.environment-agency.gov.uk/business/topics/water/119945.aspx)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Genetic diversity	Local and traditional livestock breeds A feral population of British primitive goats Semi-natural habitats	Cheviots and Northumberland Blackface sheep are native breeds that originate from this area. A feral population of British primitive goats survives in the Cheviots.	Local	Cheviots and Northumberland Blackface sheep are hardier than continental breeds and are particularly well-suited to the harsh climate, vegetation and topography of this area. This area is also grazed by Aberdeen Angus cattle, another traditional hardy breed which is well-suited to the harsh environment. There is also a population of British feral goats, descended from domestic stock put out on the hills to graze by farmers centuries ago, which persist in the Cheviots. Very little is known about the population and research is currently underway to find out more.	Encourage the use of traditional breeds for conservation grazing and support farmers in attempts to capitalise on the environmental value and heritage/genetic value of these breeds. Support farmers in recognising the commercial value of their traditional breeds through local food initiatives for the area, encouraging a green economy that supports local tourism. Encourage landowners and managers to manage the wild goat population in a sustainable way that prevents overgrazing but maintains a viable population of this rare breed.	**Genetic diversity** **Food provision** **Sense of place / inspiration** **Sense of history** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Climate regulation	Soils with high carbon content Woodland Grassland	Soil carbon levels are high (up to 50 per cent) across much of this NCA, associated with the large tracts of upland heath and blanket bog (covering 47 per cent of the area) and the generally peaty soils found across its upland moorland area. Soils under woodland (15 per cent of NCA area) and grassland will also be relatively high in carbon and the woodland itself will provide carbon storage.	National	The large areas of peaty soils in this NCA have the potential to store significant volumes of carbon but their capacity to act as carbon stores depends on the peat and associated habitats being in good hydrological and biological condition. Some of the peat soils and associated habitats have been damaged by certain types of land management including drainage, overgrazing, heather burning and wildfires, and erosion by walkers and vehicles. Since 2005 there has been widespread uptake of Environmental Stewardship with over 12,250 ha being managed to restore moorland and 6,500 ha being managed to maintain moorland by early 2013. Sensitive land management and restoration measures such as grip-blocking should help to avoid further release of stored carbon to the atmosphere and could restore some of the carbon storage capacity and sequestration ability of the blanket bog and peat soils. Trees and woodland shading watercourses will help regulate conditions for aquatic species under a changing climate by reducing water temperature and thereby maintaining available oxygen levels. Trees and woodland in all locations also sequester carbon, help to regulate the impacts of severe weather events and provide potential sources of wood fuel.	Ensure that peat soils and associated habitats which are in good hydrological and biological condition remain under optimal land management regimes. Seek opportunities to restore areas of blanket bog and wet heath through sustainable land management practices and programmes of work to restore good vegetative cover, so that the peat does not oxidise. Encourage woodland management and planting in appropriate areas such as in the cleughs (and avoiding areas of deep peat) where it would also benefit water quality, flood alleviation and biodiversity without detracting from the landscape, historic environment and recreation opportunities. Protect existing semi-natural grassland through sustainable land management practices such as reducing applications of artificial fertilisers and encouraging extensive grazing regimes to maintain the carbon stored in agricultural soils.	**Climate regulation** **Biomass energy** **Regulating water quality** **Regulating water flow** **Regulating soil quality** **Regulating soil erosion** **Sense of place / inspiration** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil erosion	Soil type - peaty soils and freely draining acid loamy soils over rock Semi-natural vegetation	95 per cent of the soils in the NCA are at some risk of erosion. The freely draining acid loamy soils over rock (46 per cent) are at risk of poaching when wet. The peat of the very acid loamy upland soils with a wet peaty surface (28 per cent) is easily damaged by grazing and trafficking for much of the year. The blanket bog peat soils (19 per cent) are at risk of loss of organic matter through climate change and soil erosion.	Regional	The steep topography and high rainfall of the NCA mean that soil in many areas is at risk of water erosion. Soil erosion has been exacerbated in some areas by gripping, overgrazing and inappropriate moorland burning. Localised erosion has also been caused by recreational use of popular routes such as the Pennine Way, and along vehicular tracks. The NCA falls within the Tweed, Aln, Coquet and Coastal Streams Priority Catchment designated under Defra's Catchment Sensitive Farming initiative. This initiative supports, among other things, land management measures which reduce soil run-off and the impact of livestock on riparian zones.	Secure sustainable grazing and burning management of moorland to reduce erosion of peat soils and secure good grazing and cutting management of in-bye land and meadows to maintain good soil structure, improve infiltration and prevent channelling, run-off and flooding. Good vegetative cover on blanket bog and heather moorland will reduce sediment run-off. Encourage active restoration of peatland habitats. Encourage the restoration and expansion of riparian and woodland habitats, particularly managing and expanding woodland along watercourses and restructuring of upland plantations to improve infiltration, stabilise banks, and help reduce peak flows and the erosive force of rivers. Continue to manage visitor pressure and access routes to minimise soil erosion.	**Regulating soil erosion** **Climate regulation** **Regulating water quality** **Regulating water flow** **Regulating soil quality** **Recreation** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil quality	Geology Soils Semi-natural vegetation Land management practices	There are 5 main soilscape types in this area: freely draining acid loamy soils over rock (covering 46 per cent of the NCA), very acid loamy upland soils with a wet peaty surface (28 per cent), blanket bog peat soils (19 per cent), slowly permeable seasonally wet acid loamy and clayey soils (3 per cent), and freely draining slightly acid loamy soils (2 per cent).	Local	Extensive cover of semi-natural habitats and land management practices play key roles in maintaining soil quality within this NCA. The blanket bog peat soils in particular are at risk of loss of organic matter through drying and erosion and this has been exacerbated by past land management practices including drainage, overgrazing and unsustainable burning. The peat of the very acid loamy upland soils with a wet peaty surface has low strength when wet and is easily damaged by grazing and stock movements for much of the year and consequently poaching is common. On steep often very stony lands where the freely draining acid loamy soils over rock often occur, management is difficult because the grazing season is short; there is generally a low risk of poaching but organic topsoils can poach when wet. Measures should be encouraged that retain water in situ on peaty soils and potentially raise water levels (water storage may also aid flood attenuation), ensure good vegetative cover, and avoid overgrazing/ trampling or damage by mechanised activities.	Improve the condition, structure and carbon content of upland soils by securing sustainable grazing and burning management of moorland. Encourage restoration of peatland habitats through programmes of work to restore the hydrology and ecology of the habitats. Promote good farming practice, ensuring good vegetative cover, avoiding over-grazing and poaching or damage by mechanised activities.	**Regulating soil quality** **Climate regulation** **Regulating water quality** **Regulating water flow** **Regulating soil erosion** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water quality	High rainfall Rivers Extensive semi-natural vegetation, particularly peat soils	The ecological status of river water is 'good' for the headwaters of the River Till, rising to 'high' in the River Till from its source to Stanhope Burn[7]. Ecological status of the River Coquet from its source to its confluence with Usway Burn is 'moderate' as is that of a tributary of the Coquet, the River Alwin[8]; the ecological quality of the Coquet catchment within the NCA is otherwise 'good' or 'high'. The chemical status of rivers within the NCA is 'good' or 'not assessed'. Chemical status of groundwater within the NCA is also 'good'.	Regional	This NCA is noted for the high quality of the headwaters which arise and flow through the extensively farmed and managed semi-natural habitats of this area. The River Till and its tributaries are part of the Till/Tweed SAC and the River Coquet is designated as a SSSI. The water quality of these rivers and their tributaries is essential to the survival of the Atlantic salmon, sea trout, otter, brook and river lamprey, water vole, water crowfoot, river jelly lichen, freshwater pearl mussel and rich invertebrate fauna for which they support. The Rivers Till/Tweed and Coquet are also nationally important game fisheries. There are some issues of diffuse pollution associated with sheep dips, phosphate levels and sediment run-off[9, 10] which are being addressed by a Diffuse Water Pollution plan through initiatives such as Catchment Sensitive Farming and agri-environment schemes; the NCA falls within the Tweed, Aln, Coquet and Coastal Streams Priority Catchment designated under Defra's Catchment Sensitive Farming initiative. **Continued over...**	Promote land management practices that reduce or prevent water pollution such as updating sheep-dipping facilities and managing flocks to minimise pollution from sheep dipping, and application of manure/ fertiliser at appropriate levels/ times/ locations. Create buffer strips along watercourses, and erect stock fencing along river banks where appropriate. Encourage good soil management including carrying out farming operations in appropriate weather conditions. Ensure moorland grazing and burning regimes are sustainable and do not damage the peaty soils or associated habitats, and seek opportunities to restore blanket bog to reduce soil erosion. **Continued over...**	**Regulating water quality** **Water availability** **Climate regulation** **Regulating water flow** **Regulating soil erosion** **Regulating soil quality** **Sense of place / inspiration** **Biodiversity**

[7] *Solway Tweed river basin management plan, 2009–15*, Environment Agency and Scottish Environment Protection Agency (URL: www.sepa.org.uk/water/river_basin_planning.aspx)

[8] *River Basin Management Plan: Northumbria River Basin District*, Environment Agency (December 2009; URL: www.environment-agency.gov.uk/research/planning/124807.aspx)

[9] *Catchment 25: Tweed, Aln, Coquet and Coastal Streams, Capital Grant Scheme – Funding Priority Statement 2013/14*, Natural England (URL: www.naturalengland.org.uk/ourwork/farming/csf/cgs/catchments.aspx)

[10] *Catchment Sensitive Farming: Northumbria and Solway Tweed (Tweed) River Basin District Strategy 2012 to 2014*, Natural England and Environment Agency (March 2012; URL: http://publications.naturalengland.org.uk/category/7941705)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water quality continued				**...continued from previous.** Good farming practices to help reduce the risks of pollution in the NCA include minimising pollution from sheep dips, maintaining good soil structure, minimising bank erosion by stock, and appropriate timing and application of manure and fertiliser. Clear-felling of conifer plantations has the potential to cause a release of silt into water courses through surface run-off; operations must be conducted in ways to minimise this risk. Invasive species such as Himalayan balsam, giant hogweed, Japanese knotweed and signal crayfish are all problematic in the lower stretches of the Till and Coquet catchments and signal crayfish in particular has the potential to spread upstream. Monitoring and controlling these species will be important in ensuring the continued good quality of the water and condition of the SSSI and SAC.	**...continued from previous.** Seek opportunities to restore and enhance riparian and woodland habitats, particularly managing and expanding woodland along watercourses and restructuring of upland plantations to improve infiltration, stabilise banks and reduce soil erosion. Opportunities should be sought to restore degraded peatland habitats. Continue to monitor and control the spread of invasive species in the watercourses.	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water flow	Geology Extensive semi-natural habitats, particularly wetlands and woodlands	The NCA contains the headwaters of the River Till and its tributaries (College Burn, Harthope Burn, and River Breamish) as well as headwaters of the River Coquet and burns flowing to it (Usway Burn, River Alwin). All of these streams drain the uplands of the Cheviot Hills within the NCA where the steep slopes, impermeable soils and heavy rainfall mean that the watercourses respond quickly to rainfall and have a high propensity to change course and cause downstream flooding. Flood risk to people and property within the NCA itself is insignificant because of its sparse population and rural upland nature but occurs downstream in the Cheviot Fringe NCA (for example in Wooler on a burn flowing to the River Till), in the Northumberland Sandstone Hills NCA (for example in Rothbury on the River Coquet) and in the North Northumberland Coastal Plain NCA (for example in Warkworth on the River Coquet).	Regional	The Environment Agency's preferred approaches to managing flood risk in the Till and Coquet catchments relevant to this NCA include promotion of sustainable land management practices that reduce the amount and rate of runoff and erosion, and investigation of the benefits of afforestation in upland parts of the catchment.[11, 12] Woodland planting will contribute to a more ecologically robust network of native broadleaved woodland and strengthen landscape character, but choice of location should take into account the possibility of below-ground archaeology and avoid damage to heritage assets. There is potential to reduce flooding downstream by encouraging greater water retention in the moorland and peat soils through management techniques such as grip blocking and re-vegetating areas to restore a healthy and functioning peat bog.[13]	Seek opportunities to restore and enhance blanket bog and heathland habitats, securing sustainable grazing and burning regimes and encouraging programmes of work to restore hydrology and ecology to achieve good vegetative cover of bryophytes and heather, thus increasing water retention capacity and impeding water flow off the moors. Promote good soil management on farms to improve infiltration of rainwater into agricultural land. Seek opportunities to restore and expand woodland to improve water interception and storage, and stabilise watercourses, through diversifying conifer plantations and expanding and connecting broadleaved woodland, particularly in the cleughs.	**Regulating water flow** **Water availability** **Climate regulation** **Regulating water quality** **Regulating soil quality** **Regulating soil erosion** **Sense of place / inspiration** **Biodiversity**

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

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

[13] *Ecosystem services from Environmental Stewardship that benefit agricultural production*. Natural England Commissioned Report NECR102 (August 2012; URL: http://publications.naturalengland.org.uk/publication/2322452)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Pollination	Semi-natural habitats	Species-rich heather moorland, grassland and hay meadows all provide important nectar sources and habitats for pollinating insects. However, the importance of this resource for pollination of commercial crops is limited as there is very little crop production in the immediate vicinity.	Local	Pollinators play a vital role in producing high yields of many crops but research shows their numbers have declined sharply. Ensuring the presence of nectar and pollen sources throughout the flying season and the habitat structure required for all stages of their life cycles at a landscape scale should help to increase pollinators which will benefit crops such as oilseed rape in adjacent arable areas such as the Cheviot Fringe NCA.	Seek opportunities to increase connectivity for pollinators within the landscape, linking the semi-natural habitats of the uplands in this NCA with the lowlands of the Cheviot Fringe and other adjacent areas where crops such as oilseed rape which require pollination occur. Emphasis should therefore be on fringe areas and valleys, enhancing the network of species-rich hay meadows, grasslands, woodlands, hedgerows, road verges and field margins.	**Pollination** **Food provision** **Regulating water quality** **Regulating soil erosion** **Regulating water flow** **Pest regulation** **Biodiversity**
Pest regulation	Semi-natural habitats	The extensive species-rich and structurally diverse semi-natural habitats within this NCA will support pest-regulating species but the importance of this resource to commercial crop production is limited by distance.	Local	Regulation of pest species by natural predators can be encouraged through the provision of appropriate habitats and resources; the greater the diversity and complexity of habitats the more predator and parasitoid species are likely to be supported.	Seek opportunities to link the semi-natural habitats in this NCA with arable farmland through the enhancement of networks of species-rich grassland, woodland, hedges and field margins to encourage movement of natural enemies.	**Pest regulation** **Food provision** **Regulating water quality** **Regulating soil erosion** **Regulating water flow** **Pollination** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of place/ inspiration	Volcanic geology forming rounded hills, deep ravines and rocky outcrops Remoteness and tranquillity Wild open moorland Fast-flowing rivers Woodland Very low population density; isolated farmsteads and villages Vernacular buildings using traditional materials and local building styles	A sense of place is provided by the distinctive, smooth, wide, rounded hills of the Cheviots which are volcanic in origin. Distinctive glacial and post-glacial features such as steep ravines, rocky outcrops, dramatic scree slopes and the ice-gouged hollows of Bizzle and Hen Hole further reinforce this. People are drawn to the wild, open moorland plateaux and sheltered, wooded river valleys that form the northern end of the Northumberland National Park. There is a wealth of heritage assets reflecting a history of occupation from prehistoric times onwards and highlighting the area's proximity to the English/Scottish border. The NCA is now almost totally devoid of settlement, although scattered farmsteads and a few small hamlets such as Alwinton can be found nestled in the bottoms of the steep-sided valleys. Distinctive local architecture is evident in these dispersed settlements: buildings are constructed from sandstone in varying shades of yellow, pink and grey (either rubble or dressed) with grey Welsh roof slates or orange clay pantiles which are more common in the northern valleys. Dark igneous andesite and granite are characteristic of the medieval fortified buildings and churches.	National	This NCA has a strong and distinct landscape character. Protecting and enhancing sense of place has the potential to increase recreational use, to benefit biodiversity and geodiversity and increase awareness of the sense of history. The long tradition of upland farming has shaped the landscape and maintaining its viability in the future will be critical to securing sustainable and sympathetic land management. While there has been relatively little recent change in the area and development pressures remain low, the landscape character could be weakened by numerous small changes. There will be challenges in allowing the area to evolve, responding to changing pressures such as demand for renewable energy and increased tourism while protecting the landscape character and strengthening the sense of place.	Protect and enhance key habitats including moorland mosaics, pastures, hay meadows and broadleaved woodlands. Maintain and conserve the wealth of heritage assets, seeking opportunities to connect local people and visitors with the history of the area. Restore traditional buildings and drystone walls using local building materials and styles where possible. Ensure new and re-developments respect the historic settlement patterns, using materials in keeping with the vernacular architecture. Seek ways to support viable and environmentally sensitive upland farming. Explore opportunities for sustainable tourism initiatives that will increase the environmental awareness of visitors to the Northumberland National Park and improve profitability of local businesses while protecting the special qualities of the area.	**Sense of place / inspiration** **Sense of history** **Tranquillity** **Recreation** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of history	Historic tracks and routes Neolithic and bronze-age burial cairns, bronze-age settlements and field systems and iron-age hill forts Medieval settlements and field systems Bastles and towers as reminders of border conflict	A sense of history is evident in the patterns of drove ways and tracks crossing the border which were pivotal in the development of the Cheviot settlements. These tracks now form part of the public rights of way network used by visitors to the Northumberland National Park. The upper slopes have large regular fields defined by drystone walls or dykes dating from Parliamentary enclosures, with smaller in-bye fields in the valley bottom. Also evident are the extensive tracts of well-preserved, highly-visible prehistoric landscapes. These include the remains of burial cairns from the Neolithic and the Bronze Age, and iron-age hill forts, the best known of which is Brough Law overlooking the Breamish valley. Bastles and towers remain from the three centuries of border warfare before the Union of the Crowns in 1603 led to more settled times. The remains from the medieval period are similarly impressive including deserted villages, extensive field systems, shielings and enclosures. There are 243 Scheduled Monuments.	National	The long history of occupation coupled with the lack of recent cultivation and development means the Cheviots contain outstanding multi-period prehistoric landscapes such as Yeavering Bell and Humbleton Hill which greatly contribute to our understanding of man's early relationships with the land. The Cheviots represents one of the most important sites in Britain for bronze-age remains[14]; the Breamish valley has an exceptional concentration of archaeological remains that illustrate a high level of prehistoric activity and recent work suggests these represent only a fraction of what is actually there. Historic features are at risk from a number of activities including damage and erosion from inappropriate farming, development and land-use activities, encroachment by vegetation (particularly bracken and scrub), erosion by animal grazing and burrowing, erosion along public access routes, dereliction and neglect, and deliberate damage and theft. A significant number of the Scheduled Monuments are At Risk. **Continued over...**	Protect and interpret historic landscapes which often contain evidence of multi-period occupation, retaining evidence of features and thus enabling improved understanding of past activities. Encourage land management practices such as clearance of bracken and scrub around archaeological features to protect them from further damage. Ensure that key historic and archaeological features are protected and maintained; conservation of historic sites and structures, which act as local focal points and reinforce local distinctiveness in each of the valleys, is important. Encourage further survey work to record the diversity and distribution of buried archaeology, earthworks and structures and encourage interpretation and dissemination of information to land managers and visitors alike. **Continued over...**	**Sense of history** **Sense of place / inspiration** **Tranquillity** **Recreation** **Geodiversity**

[14] *A Landscape Character Assessment of Tynedale District and Northumberland National Park*, Final Report to Tynedale District Council and Northumberland National Park Authority (June 2007; URL: www.northumberlandnationalpark.org.uk/__data/assets/pdf_file/0016/144421/lcafinalreport.pdf)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of history continued				**...continued from previous.** The Cheviots offer excellent opportunities to preserve the evidence of and learn more about the layers of human influence on the landscape, strengthening landscape character and sense of history and place. Increasing access to and interpretation of these sites provides opportunities to engage local people and visitors in the history of the area with benefits for recreation and tourism.	**...continued from previous.** Provide clear and imaginative interpretation of sites and landscapes to improve the understanding and enjoyment of the public. Encourage the restoration of Scheduled Monuments, traditional buildings and drystone walls using local building materials and styles where possible. Ensure new and re-developments respect the historic settlement patterns and reflect the local farmstead vernacular in terms of building materials, scale and location. Take measures to ameliorate the visual impact, or remove structures all together, where inappropriate development has occurred in the past.	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Tranquillity	Wild open moorlands Sheltered wooded valleys Few settlements or roads Dark night skies	The entire NCA is now classified as 'undisturbed' according to CPRE data (an increase from 94 per cent since the 1960s) making this NCA, along with the adjacent Border Moors and Forests NCA, the most tranquil in England.	National	The wild, open moorlands, tranquil sheltered valleys, sparse settlement and restriction of vehicular access to the valley floors contribute to a sense of remoteness and tranquillity. The sense that this area is 'undisturbed' is, however, a perception; in practice grouse shooting and management, timber extraction, and military training intrude on even the remotest places. But the sense of remoteness, wilderness and tranquillity is highly valued by residents and visitors alike. Opportunities exist to promote the calming and restorative effect that contact with tranquil and sensory environments have on visitors' health and wellbeing. The lack of settlement also means the night skies are still dark; the Northumberland National Park Authority has applied for International Dark Skies Park status to include this NCA.	Protect the sense of remoteness and tranquillity by avoiding the introduction of built structures and other inappropriate developments on the moorland, and controlling intrusion from the Otterburn military training area. Minimise the impacts of light pollution from development in this and adjacent NCAs. Sensitively manage visitor access and recreational facilities to avoid loss of tranquillity.	**Tranquillity** **Sense of place/ inspiration** **Recreation**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Recreation	Open access land Public rights of way National and long distance trails Historic drovers routes and tracks Tranquillity Wild open moorlands and sheltered wooded valleys A wealth of heritage assets Grouse moors	The NCA offers a network of rights of way totalling 379 km at a density of just over 1 km per km^2 as well as a very significant area of open access land, covering over 26,000 ha or 72 per cent of the NCA. In addition, just less than 23 km of the Pennine Way National Trail crosses the western perimeter of this NCA and over 14 km of the St Cuthbert's long distance walking route from Melrose to Lindisfarne cuts across the northern end to join the Pennine Way. .	National	Recreation is a key service provided by this NCA: the Cheviots provide a wealth of recreational activities that are dependent upon the special qualities of the environment, including walking, cycling, horse riding, rock climbing, fell-running, birdwatching, star gazing, angling and grouse shooting. Recreational opportunities are supported by the fact that nearly the entire NCA area (99 per cent) forms part of the Northumberland National Park. The National Park has recently had an increase in walkers and rock climbers which has led to some problems of localised erosion especially on the peaty soils along routes such as the Pennine Way. An extensive programme of footpath/ route maintenance employing techniques such as stone-flagging is tackling this. Recreational use should continue to be encouraged but any increase in levels of use will need to be managed to avoid adverse impacts on the natural assets of the area including tranquillity and biodiversity.	Enhance the network of footpaths and bridleways, creating more links to the Pennine Way, St Cuthbert's Way and open access land where appropriate. Maintain and extend recreational facilities where appropriate but plan for and manage visitor numbers to ensure the tranquillity, sense of remoteness and place, dark night skies and biodiversity of the area are preserved. Continue to manage and reduce the impacts of recreation on the sensitive peatland habitats through a programme of works to reduce footpath erosion. Provide imaginative interpretation of the landscape and its many features (geological, historical, species and habitats). Ensure that tourism development is sustainable, sensitively utilises the landscape resource and brings socioeconomic benefits to local communities.	**Recreation** **Sense of place / inspiration** **Sense of history** **Tranquillity** **Biodiversity** **Geodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biodiversity	Sites designated for nature conservation Semi-natural habitats including blanket bog, heathland and woodlands Streams and rivers	There is a significant extent of BAP priority habitats within the NCA (over 33 per cent of the area) in the form of over 6,700 ha of upland heath and over 5,500 ha of blanket bog, plus small areas of upland calcareous grassland and species rich hay meadows. The NCA contains 3 SAC and 3,917 ha (11 per cent of the NCA area) are nationally designated as SSSI. These include moorlands, woodlands, hay meadows and rivers.	National	The NCA has a very high nature conservation value and is one of the large upland blocks of the Border Uplands. Important habitats include upland heathland, blanket bog, acid grassland, flushes, calcareous grassland, rush pastures, traditional hay meadows, native woodland and streams and rivers. The upland habitats support good invertebrate assemblages and a typical community of upland birds such as ring ouzel, peregrine, merlin, buzzards and moorland waders such as dunlin and curlew. Black grouse still occur here but despite positive habitat management for this species numbers are still declining. Enhancing the moorland mosaic, particularly managing and restoring the peatland habitats, and expanding and connecting the very fragmented woodland and meadow networks should improve biodiversity provision. The headwaters of the River Till/Tweed (SAC) and River Coquet (SSSI) radiate out of the Cheviots as fast-flowing rivers. These support key species such as Atlantic salmon, brook and river lamprey, otter, water crowfoot, river jelly lichen, freshwater pearl mussel and the diatom Didymosphenia. The quality of the waters is generally good but there are issues with diffuse pollution from agriculture. **Continued over...**	Protect, restore and extend priority habitats and designated sites and ensure appropriate management of adjacent land to increase the area considered to be in good ecological condition. Create and restore priority habitats including blanket bog and heather moorland by securing sustainable grazing and heather burning regimes which ensure good vegetative cover, and where necessary employing techniques such as grip-blocking. Protect, manage and expand species-rich grasslands and hay meadows, and woodlands, seeking opportunities to link or provide stepping stones between existing habitats to allow species to move more freely through the landscape. Promote rush management on lower slopes through cutting and/or cattle grazing to benefit upland breeding waders. **Continued over...**	**Biodiversity** **Biomass energy** **Climate regulation** **Regulating water quality** **Regulating water flow** **Regulating soil quality** **Regulating soil erosion** **Pollination** **Sense of place / inspiration** **Tranquillity** **Recreation**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biodiversity continued				**...continued from previous.** Maintaining and improving the water quality is critical to maintaining the condition of the designated sites and also to the continuing success of the rivers as game fisheries for which they have international reputations. Monitoring and controlling invasive species such as Himalayan balsam, Japanese knotweed and signal crayfish is also very important. Relicts of alder, ash, hazel, oak and juniper woodland, much of it designated as SSSI, occur in the shelter of the steep-sided river valleys but overgrazing has prevented regeneration. A small number of upland hay meadows such as Barrow Burn Meadows (SSSI and SAC) still persist in the valley bottoms. Rare Arctic-Alpine flora persists on the rocky ledges of the northern face of the Cheviots but these communities have been suppressed by sheep-grazing. Red squirrels are found throughout the area and Kidland and Uswayford forests are designated as reserves. With the high proportion of open access land and rights of way all these habitats and species can be seen and enjoyed by the public. **Continued over...**	**...continued from previous.** Manage stocking levels to protect the rare arctic-alpine flora found on the northern face of the Cheviots. Promote land management practices to maintain and restore good water quality in the watercourses, for example by establishing riparian scrub and woodland, and monitor and control invasive species, and ensure that activities like angling do not impact negatively on the bank-side habitats. Within forest management plans seek opportunities to restore open heathland habitats where appropriate, with compensation planting carried out elsewhere, but considering the implications for red squirrels; clear-felling of large conifer blocks and planting of large-seeded deciduous species should be avoided in refuges and areas buffering red squirrel populations. **Continued over...**	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biodiversity continued				**...continued from previous.** Improving the ecological condition of habitats is likely to benefit a range of ecosystems services. Restoring peatlands through restoration of the hydrological regime and securing sustainable grazing and burning management should contribute to services such as the regulation of climate, water quality and flow and soil erosion, while contributing to sense of place/inspiration and recreation. Managing and expanding fragmented woodland and hay meadow sites will improve connectivity, making these ecological networks more coherent and resilient to climate change, while strengthening landscape character. Woodland restoration and management may have additional benefits such as stabilising river banks, reducing soil erosion and providing local sources of wood fuel.	**...continued from previous.** Encourage access to and interpretation of the natural interest features, enhancing the public's enjoyment and understanding of the area while continuing to manage and reduce the impacts of tourism, particularly on the sensitive peatland habitats through a programme of works to reduce footpath erosion.	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Geodiversity	Distinctive volcanic geology Glacial and post-glacial features 2 geological SSSI and I SSSI with both biodiversity and geodiversity interest	The distinctive igneous geology of the Cheviots gives rise to the characteristic topography and sense of place of the NCA. The igneous rocks are at, or very close to, the surface throughout the Cheviots, but the physical landscape shows dramatic variation as a result of the response of the rocks to different glacial processes; smooth, convex slopes in the east, concave slopes and 'V-shaped' valleys in the west and tors of granite and metamorphosed volcanic rocks on the hill tops. The Cheviots display many typical glacial and post-glacial features, some of which are recognised as being nationally important examples and designated as such: glacial scouring created the curious hollows of Bizzle and Hen Hole, glacial meltwater cut the channels below Yeavering Bell and the modern, characteristic drainage pattern of rivers radiating out from the Cheviots to the Cheviot Fringe is deeply incised into the underlying lavas creating step-sided gorges. Humbleton Hill and the Trows SSSI provide some of the best examples of sub-glacial meltwater channels in northern England. **Continued over...**	National	The distinctive, rounded hills of the Cheviots form one of the most impressive landscapes in the area and the geology and geomorphology is responsible for the extensive and diverse mosaic of semi-natural habitats that characterise this NCA and provide a sense of place. The distinctive geology and abundant glacial and post-glacial features mean the Cheviot massif provides important opportunities for research to enhance understanding on a national scale into the important phase of igneous activity in the evolution of the British Isles and processes such as ice-sheet evolution, diversion and dynamics of ice streams and cold-based ice preservation of summit forms such as tors. A small intrusion of Devonian age has been worked at Harden Quarry, near Biddlestone, for crushed rock and roadstone. The brick-red colour of the rock makes it sought after for surfacing the hard shoulders on Britain's motorways and for lining The Mall in London. It is likely that demand for this roadstone and crushed rock will continue for the foreseeable future. **Continued over...**	Encourage and develop opportunities for earth science research to widen our understanding of certain geomorphological and glacial processes and the geodiversity of the area. Exploit opportunities presented by quarries to accurately record geological sections, and collect and curate representative specimens to further knowledge and understanding of the local geology. Encourage and support the designation of local geological sites. Improve access to and interpretation of geological sites and features, including designated sites and quarries, and explore the possibility of geo-trails, to enhance the public's understanding and enjoyment of the area. Maintain vernacular buildings and drystone walls using local stone wherever possible to reinforce links with the underlying geology and strengthen sense of place.	**Geodiversity** **Sense of place / inspiration** **Sense of history** **Recreation** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Geodiversity continued		**...continued from previous.** Use of locally quarried stone in the construction of buildings has influenced the local vernacular architecture and contributed to sense of place. There are 2 geological SSSI and 1 of mixed interest.		**...continued from previous.** The natural exposures of igneous rocks within the district are generally robust and none appears to be under threat. Although quarries destroy the materials being worked, they provide excellent representative sections of the geology and the continually changing nature of the sections can yield invaluable insights into the rocks exposed. Disused quarries can also provide important habitats for wildlife. Improving access to and interpretation of geological sites and features, including designated sites and quarries, would enhance the public's enjoyment and understanding of the area; a number of sites have already been identified that have the potential to tell a story relating to the geological heritage of the area and there are proposals to interpret the geological and landscape features of the Pennine Way[15].		

[15] *Northumberland National Park Geodiversity Audit and Action Plan*, Commissioned Report (2007; URL: http://www.northumberlandnationalpark.org.uk/understanding/geology/readmoregeodiversity)

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