National Character Area profile:

24. Vale of Mowbray

Supporting documents

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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.

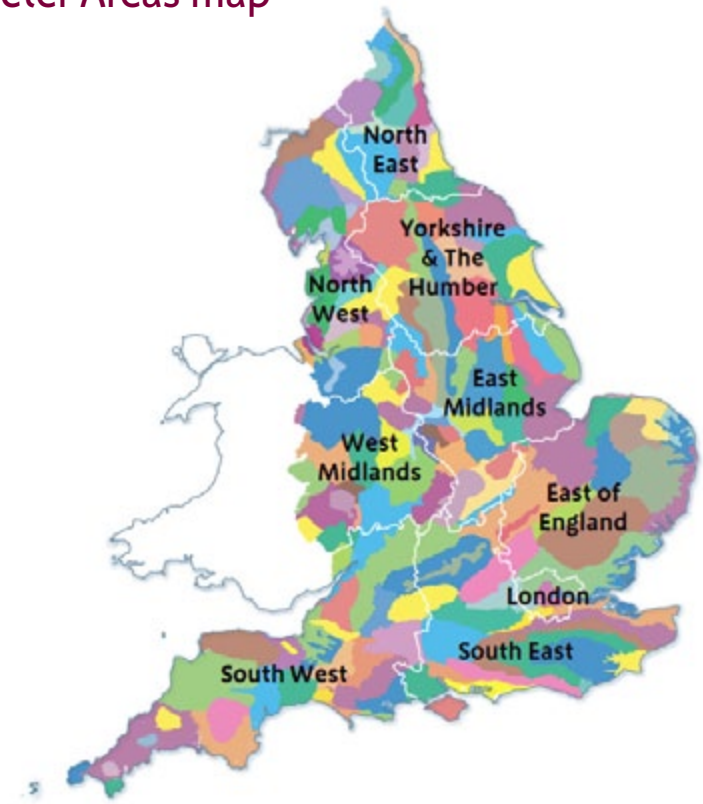
NCA profiles are guidance documents which can help communities to inform theirdecision-making about the places that they live in and care for. The informationthey contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and encourage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

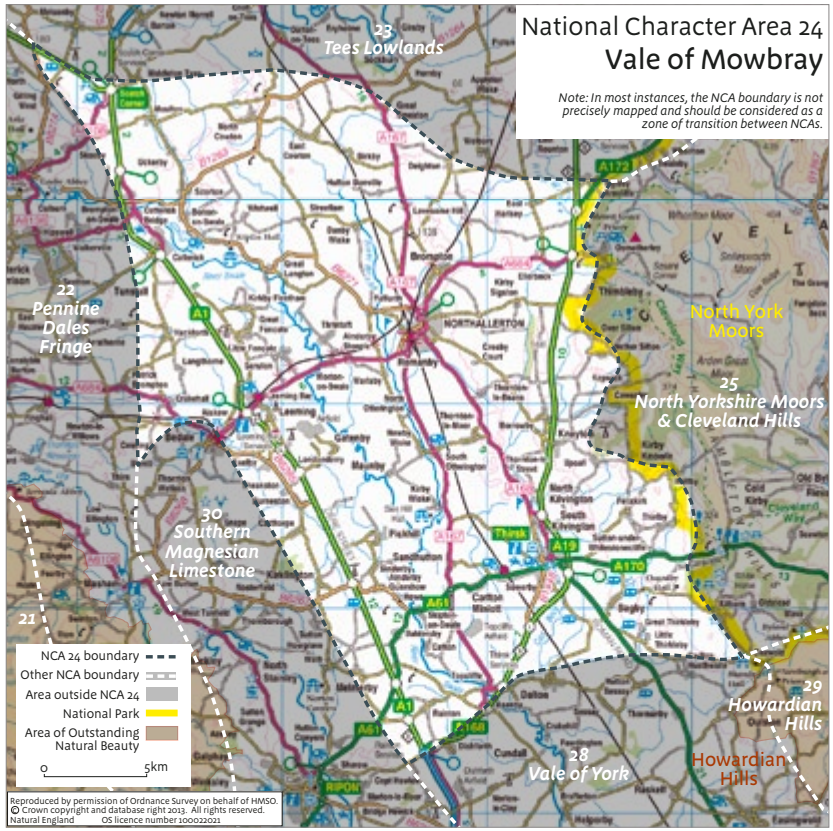


[1] The Natural Choice: Securing the Value of Nature, Defra (2011; URL: www.official-documents.gov.uk/document/cm80/8082/8082.pdf)
[2] Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services, Defra (2011; URL: www.defra.gov.uk/publications/files/pb13583-biodiversity-strategy-2020-111111.pdf)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

Summary

The Vale of Mowbray lies immediately to the north of the Vale of York, occupying the undulating flood plains associated with the rivers Swale, Wiske and Cod Beck. It is framed by the uplands of the Pennines to the west and the North York Moors to the east. The whole National Character Area overlies the Sherwood Sandstone aquifer, the second largest aquifer in England and a major drinking water supply. The orientation of the Vale and its position between the Pennines and North York Moors, have made it a significant transport and communications route between north and south. The route of the A1 today is largely the same as that of the Roman Dere Street, along which Roman settlement and military activity were concentrated. Today the only sizeable towns are the county town of Northallerton and Thirsk, both historic market towns.

This is a farmed landscape, with a mix of livestock rearing, some dairying and arable cropping, making an important contribution to food security and the local economy. Tree and woodland cover tends to be in small copses and game coverts, and the network of hedgerows with hedgerow trees. Trees are also a feature in designed landscapes and parkland. Much of the semi-natural habitat of the Vale is now fragmented: there are remnant areas of high-quality wet grassland alongside the River Swale in the north of the area. The way in which the land is farmed is critical to the protection of the aquifer's drinking water supply, in terms of both the quantity and the quality of the water. The area has been designated a Drinking Water Protected Area, and lies within the Yorkshire Ouse, Nidd and Swale Priority Catchment, where advice and grants are available to farmers to reduce the amounts of nutrients and pesticides entering the rivers. There are opportunities in this landscape to create new semi-natural habitat and to restore habitat networks in order to enhance biodiversity and sense of place, while protecting and improving both public water supply and the resources that farming is so dependent on.



Click map to enlarge; click again to reduce.

Statements of Environmental Opportunity

- **SEO 1:** Protect and enhance the water resources of the Vale, in particular the aquifer and rivers, by supporting sustainable management of the farmed landscape, retaining important levels of food provision while protecting soils and water quality, and establishing networks of habitats including restoration of wetland habitats in the flood plain.

- **SEO 2:** Manage and extend the presently limited native woodland cover throughout the Vale, to develop woodland habitat networks, enhance sense of place, and assist in managing erosion, peak flow events and carbon storage.

- **SEO 3:** Protect and promote understanding and enjoyment of the Vale's geological and historic legacy, the Roman antecedent of the A1 transport corridor, historic buildings, field patterns and parkland, thus enhancing sense of place and local character.

- **SEO 4:** Protect the pattern and character of scattered villages and farmsteads, ensuring that new development is based on sustainable resource use and contributes to sense of place, while limiting intrusion and loss of tranquillity in this rural area; ensure that green infrastructure is integral to new development in order to improve public access to, and enjoyment of, the landscape.

River Swale at Great Langton: The floodbank has been set back from the river here, creating temporary flood storage, wet grassland and natural features such as shingle banks, and allowing the river to meander in its floodplain.

Description

Physical and functional links to other National Character Areas

The Vale of Mowbray is a gently undulating landscape, the broad Vale defined by the higher land of the Yorkshire Dales to the west and North York Moors to the east. There are views over the Vale of Mowbray from this surrounding higher ground, particularly from the higher North York Moors and Cleveland Hills, and views outwards from within the Vale to the surrounding hills. The National Character Area (NCA) is divided from the Tees Lowlands to the north by a minor watershed.

The River Swale flows into the NCA from the Yorkshire Dales (via the Pennine Dales Fringe) and the River Wiske from the shallow watershed with the Tees Lowlands in the north, while Cod Beck rises in the North York Moors. Management in the upper reaches of these rivers and their catchments (in adjacent NCAs) will thus influence their character and condition downstream in the Vale of Mowbray. The rivers flow through the NCA in a south–east direction, the Wiske and Cod Beck joining the Swale which flows on into the Vale of York and ultimately (as a tributary of the Ure, which in turn becomes the Ouse) into the Humber Estuary. The Vale of Mowbray sits over the major Sherwood Sandstone aquifer which extends under the Vale of York.

Historically and to this day, main north–south transport routes have been located through the Vale, principally the A1 and East Coast Main Line, creating strong links to north and south.

The Hambleton Hills and North York Moors define the Vale of Mowbray on its eastern edge.

Distinct areas

Upland fringe on eastern boundary rising to North York Moors National Park.

Key characteristics

- Low-lying, gently undulating landscape underlain by soft sandstones and mudstones on which rest glacial sediments forming hummocky terrain and drumlin fields, combined with low ridges and post-glacial river terraces. Clays and silts deposited in the south and west of the area have produced an open, flat landscape of heavy clay soils.
- A mixed agricultural landscape of arable and grassland: dairying is predominant in the north, with grass leys and fodder crops; and arable to the south of Northallerton, with some pig and poultry rearing throughout the area.
- Drained by the River Swale and its tributaries the River Wiske and Cod Beck, meandering through flood plains.
- Small and fragmented remnants of semi-natural vegetation, most notably the areas of rough grazed riverine meadows in the north, and small woodlands.
- Woodland and tree cover is sparse: small game coverts and parkland landscapes contribute locally to the tree cover, for example along the ridges on the eastern side where plantation woodlands extend into the North York Moors.
- Medium-scale fields enclosed by low hedgerows in the north, more open in the south.
- Settlement pattern characterised by small villages on higher ground, often linear in form and of medieval origin, with brick-built vernacular cottages and dispersed farmsteads.
- Churches with towers or spires create prominent visual landmarks within the wider landscape.
- Roman military remains along the line of Dere Street (now the A1), and medieval villages, churches and motte-and-bailey castles.
- More recent heritage including post-medieval mills and leats along the main rivers and 20th-century airfields, some now disused.
- Major transportation corridors traverse the landscape – A1, A19 and a main line railway (the East Coast Main Line).
- The Coast to Coast long-distance route passes through the Vale of Mowbray.
- Significant horse racing, breeding and training centred on the Thirsk, Northallerton and Catterick areas.
- The adjoining high areas of the dales and moors often form a prominent skyline feature and backdrop to views – views are most expansive across the Vale flood plain in the south.

The main East Coast railway line, runs through the Vale of Mowbray.

Vale of Mowbray today

The Vale of Mowbray is similar to its southern neighbour the Vale of York but is distinguished by the relative containment offered by the prominent scarp of the North York Moors and Cleveland Hills to the east and westwards the more gentle foothills of the Pennine Dales. At the Vale fringes the hills offer a very real sense of enclosure which contrasts with the open Vale. This is a gently undulating flood plain landscape, associated with the rivers Swale, Wiske and Cod Beck, sustaining a mixed agricultural base of arable, dairying and livestock rearing which becomes predominantly arable to the south and into the Vale of York.

The landscape is essentially flat or gently undulating, reflecting the relatively less resistant sandstones and mudstones that underlie the Vale, on which rest younger glacial sediments. The mudstones and sandstones come to the surface in the east, where the land begins to rise to the moors. The Sherwood Sandstone, which underlies much of the NCA, is a major aquifer and source of potable water in the region, supplying the Northallerton, Doncaster, Selby and Goole areas and contributing to supplies in Sheffield and Hull. Between the river valleys, low ridges and knolls occur, appearing prominent above flatter surrounding land. These represent a variety of glacial and post-glacial landforms composed of till, sand and gravel, forming moraines, drumlin fields, eskers, outwash fans and river terraces. Flat land in the south and west is underlain by glacial lake deposits.

The soils of the Vale, formed from glacial and alluvial deposits, are generally quite fertile and support arable farming, dairying and livestock production. Cereal production is closely tied to livestock rearing, maize is grown for dairy fodder north of Northallerton, and a large proportion of cereals go to local feed mills. Livestock rearing in the Vale of Mowbray has become more specialised, for example upland beef herds are brought to the Vale and 'finished' indoors on cereals, supporting thriving livestock markets in Thirsk and Northallerton. Poultry and pig rearing is practised throughout the area. Oilseed rape is commonly grown in rotation as a break crop in the north of the area; south of Northallerton, potatoes are grown on sandier soils. Fields are medium in size, larger towards the south and west, and hawthorn hedges are the most common field boundaries. Other boundaries are marked by drainage ditches, locally known as 'stels', or are fenced. To the north and central area hedges can be substantial and many have been replanted or gapped-up through agri-environment schemes.

Crakehall village on the western side of the Vale is centred on a large village green.

Tree cover is generally low (3.3 per cent), although this varies across the NCA. In the flat areas of the Vale woodland is limited in extent, fields are large, bounded by hedges which are low cut and gappy, hedgerow trees and field trees are widely scattered, creating an open, simple landscape. The eastern area, by contrast, has a more wooded feel, created by small game coverts, parklands and substantial hedgerows with hedgerow trees, many of which are thick and well maintained. The eastern area has a visual and physical continuity with the wooded slopes to the North York Moors. There has been scattered new planting along the valley of the River Swale, and some effort to expand lowland broadleaved woodlands. About 11 per cent of the woodland cover is on ancient woodland sites. Few of the woodlands are under formal management agreements.

The Vale of Mowbray is crossed by the River Swale and its tributaries the Wiske and Cod Beck. The Wiske joins the Swale near Thirsk, and Cod Beck joins further south near Topcliffe. The valleys of these watercourses are quite narrow in the north of the Vale but are nevertheless significant in the landscape. Characteristically they are tree-lined and fringed by a belt of rough pasture or scrub, the old flood plain pastures supporting some of the most important and diverse wildlife within the NCA, which has otherwise lost much of its semi-natural habitat to agricultural improvements. Further south the flood plains open out and are intensively cultivated, sometimes right to the river's edge. Here, the rivers are often contained within embankments to protect farmland from inundation, although occasionally the river is able to meander naturally within its channel, depositing gravel banks and fringed with riparian trees and scrub. Notably, in recent years sea lamprey has begun breeding again in Cod Beck above Thirsk, indicating improved water quality.

Gently undulating rural landscape with hedgerow enclosed fields.

The main settlement within the area is Northallerton, the county town of North Yorkshire, and the market town of Thirsk in the south. Villages are linear in form, commonly with a village green, and are mostly situated on higher ground above the flood plains. Churches with towers are a prominent and repeated landmark across this rural landscape. Farmsteads are dispersed throughout the area. The vernacular building style is of red brick with pantile roofs, bricks varying slightly in colour depending on the source of local clays. In the north of the area, some brickwork is rendered and walls incorporate cobbles from local

glacial deposits. There is some 17th-century and earlier timber frame building. Many old agricultural buildings have been converted to residential use. With the exception of hotspots of high disturbance around transportation corridors and the main settlements, this is a quiet, rural area, sparsely populated.

The most visually prominent historic features are old buildings and churches, and the infrastructure of wartime airfields, all of which can be very visible in this gently undulating landscape. Historically and to this day, major communications and transport routes have been located through this relatively flat, lowland landscape. The A1 (now a motorway for much of its length), the A19 and a main line railway run north–south through the area. There are a number of early military airfields including Leeming, Sandhutton, Topcliffe and Dishforth. Some are now redundant, while others remain in use by the Army and Royal Air Force, or as civilian airstrips. They are usually in quite open areas and the associated structures of roads, runways, fences, hangars and control towers can be highly visible. Settlements at Catterick and Leeming have developed to service military operations at Catterick Garrison and RAF Leeming.

The main areas of economic activity are agriculture, service industry, light industry, and some excavation of flood plain sands and gravels. Horse breeding and training is an important industry within this area, with racecourses at Thirsk and Catterick. Less than 1 per cent of the NCA is classed as being publicly accessible, the Coast to Coast route crosses the Vale, and the area has an average density of 1.1 km of public rights of way per square kilometre.

Historic market town of Thirsk abutting an arable landscape.

The landscape through time

The glacial landforms of the Vale of Mowbray are underlain by bedrock of soft Triassic sandstones and mudstones, with Jurassic mudstones and sandstones to the east where the ground rises to the foot of the North York Moors. Material eroded from areas largely to the north of the Vale of Mowbray was carried southwards by the Vale of York ice sheet and deposited across much of the area during the last glaciation. This formed a thick sequence of deposits consisting of till, gravel and sand. Interactions between the ice sheet and these sediments formed drumlins, while sub glacial meltwater streams deposited linear ridges of sand and gravel that now form eskers aligned parallel to the axis of the Vale. The till forms a slightly elevated bench where it overlaps onto the lower flanks of the moors to the east. Meltwater released from the snout of the glacier was impounded within the confines of the Vale as well as by moraines formed during earlier ice advances. The lake deposits accumulated around the glacial topography, creating large, flat expanses of clay (often laminated) and sands forming fan deposits where the meltwater was released into the lake. This produced the heavy clay and light sandy soils that occur in the south and west of the NCA. The post-glacial topography influenced the modern river courses, confining the rivers to narrow flood plains in the north, but allowing them to meander widely across the flatlands formed by lake deposits in the south. At the margin of the North York Moors, Lake Gormire, one of the few natural lakes in Yorkshire, may have been formed by the impounding of a lateral drainage channel by glacial sediments that slipped off the margin of the Hambleton Hills.

Human activity has influenced the Vale's landscape for at least 10,000 years: stone tools and flint scatters have been discovered dating to the Mesolithic and Neolithic, while bronze-age activity is evidenced by bronze artefacts such as rapiers and axes. Late iron-age and Romano-British settlement can be seen

Farmstead, East Cowton: The huddle of pantile roofs and mellow brick work is characteristic of the Vale.

as occasional cropmarks with the outlines of farmsteads, round houses and field systems visible from the air. The Vale was an important transport corridor between north and south prior to the Roman period. Dere Street (today's A1) was laid out to link Roman forts and towns; smaller settlements and trading posts developed along its length. The Great North Road originated in the medieval period as a trade route between settlements; it became a turnpike road for mail coaches in the 18th century and what we now call the A1 was so named in 1921. The county town of Northallerton developed to service the coaching routes.

The strong pattern of nucleated settlements that we see today developed between the 9th and 13th centuries, by which time much of the former dense woodland on the clay soils had been cleared for farming, with little remaining. Saxon and medieval settlements were located on drier ground. Many

were rebuilt as planned villages after the Harrying of the North in 1069 and incursions by the Scots in 1318. A number failed and survive only as earthworks, such as at Birkby, Swainby and Winton; these and many other deserted settlements are characteristic of the area. Dispersed settlement tended to be of medium-to-low density, with some high-status moated sites dating from the 12th and 13th centuries, for example to the north of Northallerton. Motte-and-bailey castles across the area reflect the troubled period of the Anarchy in the 12th century. Some isolated farmsteads developed from the 14th century from grange farms of medieval monastic houses and from shrunken medieval settlements. Woodland and trees provided cover for hunting animals in the 14th century, as shown by the deer parks and hunting lodges at Upsall and Kirby Sigston. The field pattern of Parliamentary enclosure from the 18th century has largely been replaced by modern improved fields in the west and centre; piecemeal enclosure predominates in the east. Farmsteads were built and rebuilt in brick and tile from the mid-18th century, occasionally mixed with cobbles from glacial and fluvial deposits, and rendered, especially in the north of the area. Further enclosure since 1750 has been associated with field sports, with the re-introduction of woodland in small coverts for game.

The area continued to develop as a major transport corridor around the Great North Road, influencing the position and further development of post-medieval coaching towns such as Northallerton and Thirsk. The main Darlington to York railway was built prior to 1845, with many later branch lines, and forms part of the main rail link on the East Coast between Edinburgh and London. Horse racing has been a feature of the area since the first organised meet at Catterick Bridge in 1783, with permanent racetracks being developed at Catterick and Thirsk in 1813 and 1855 respectively, the area long regarded as being a locus for horse breeding and training. Airfields date from the First World War, when they were built to train pilots and assist in the defence of north-east England (for example, the airfield at Catterick), and mostly from post-1934 expansion, for example at Leeming, and the Second World War. Some remain active while others were subsequently developed as industrial areas.

The period since the 1950s has witnessed further agricultural improvements, creating the modern farmed landscape of today. Agri-environment schemes have not had the uptake or impact here of some neighbouring areas, grants for semi-natural habitats being significantly below the national average; however, hedgerows were planted and managed under Countryside Stewardship agreements. Aided by initiatives such as catchment sensitive farming and the Campaign for the Farmed Environment, the uptake of Entry Level Stewardship options has increased in recent years, including the creation of floristically enhanced margins and overwintered stubbles in arable fields. Sand and gravel reserves in the Swale Valley have been worked for aggregates which supply local and regional markets. Light industry has developed around the main market towns and the major communication routes have been improved, most recently the A1 being upgraded to motorway status.

Ecosystem services

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

Provisioning services (food, fibre and water supply)

- **Food provision:** The Grade 1, 2 and 3 soils support the production of arable crops with some fodder crops, alongside livestock rearing and dairying.

- **Water availability:** Groundwater sources in the NCA include the major Sherwood Sandstone aquifer (the second largest aquifer in England) and the Magnesian Limestone aquifer. Groundwater in the Sherwood Sandstone is heavily used for drinking water supplies in the Northallerton, Doncaster, Selby and Goole areas, and supplies the grid system supporting supply in Sheffield and Hull. This is a Drinking Water Protected Area. The rivers Swale, Wiske and Cod Beck flow through the NCA. Sustainable land management including extending the area of permanent grassland and semi-natural habitats can assist the infiltration of rainwater to recharge the aquifer.

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

- **Climate regulation:** There is generally a low soil carbon content of 0–5 per cent throughout the NCA. There will be higher soil carbon content under the 1,991 ha of woodland in the NCA (3.3 per cent of the NCA area), which could be managed and extended to further enable carbon sequestration and storage. On agricultural land, carbon storage may be enhanced by managing organic matter inputs to soils, by reducing the frequency of cultivation and by reverting some cultivated areas to permanent grassland.

- **Regulating soil erosion:** There is an enhanced risk of soil erosion on moderately or steeply sloping land where cultivated or bare soil is exposed often exacerbated where organic matter levels are low after continuous arable cultivation or where soils are compacted. There is widespread potential for wind erosion of sandy and fen peat soils where soils are cultivated or left bare, especially in spring. Increasing the area of permanent grassland and semi-natural habitats, prudent soils and nutrient management, and careful movement of machinery and livestock in wet ground conditions can all help to regulate this.

- **Regulating soil quality:** Slowly permeable soils are prone to damage and compaction when wet, resulting in poor infiltration and increased surface water run-off. Freely draining soils may play a valuable role in recharge of the important aquifer underlying the NCA: this requires good soil structure to be maintained, to aid infiltration, and close matching of nutrients to needs to prevent pollution of the underlying aquifer.

- **Regulating water quality:** The entire NCA lies within the Department for Environment, Food and Rural Affairs' Yorkshire Ouse, Nidd and Swale Priority Catchment. Two of the key reasons for failing water quality standards in this NCA are water industry storm discharges and diffuse pollution from agriculture. Groundwater quality risks for the Magnesian Limestone aquifer primarily relate to urban and rural inputs from localised use of nitrates and pesticides in agriculture and horticulture. The Catchment Sensitive Farming initiative has offered advice and grants to farmers in this area to reduce diffuse

pollution of the watercourses, concentrating on improved management of soils and chemical applications, and on farmyard infrastructure.

- **Regulating water flow:** Fluvial flood risk is high within this NCA, with a total of over 1,050 properties at risk within Northallerton, Brompton and Thirsk. Within parts of the Cod Beck catchment, the topography leads to the potential of flash flooding with a short period of time between rainfall and the onset of flooding, which means that flooding can be very hazardous in these areas. Land management in the upper catchments of these rivers, for example blocking drains and planting trees, can help to increase infiltration of rainwater into the ground and reduce the volume of sediment in the rivers, which can assist in regulating flow downstream. In the Vale itself the restoration of a more natural course for the Swale and its tributaries and creating wetland habitats within the flood plain can increase the capacity of the river system to deal with the energy and volume of high flows, and of the land to hold water during flood events.

- **Pollination:** 30 ha of fragmented species-rich grassland provides limited nectar sources for pollinating insects or beneficial predator species, the oilseed rape crop being the main beneficiary of insect pollination in this NCA. There is an opportunity to improve food security by increasing the areas and connectivity of suitable habitat for pollinators, including hedgerows, riparian grassland and field margins, which can contribute to climate adaptation in both food production and biodiversity.

Cultural services (inspiration, education and wellbeing)

- **Sense of place/inspiration:** The Vale's landform and topography, rivers and flood plain, land cover, field boundaries and pattern of woodland cover contribute to the area's unique sense of place. There are opportunities to positively manage new developments and the significant transport infrastructure corridors to retain and enhance local character and sense of place.

- **Sense of history:** Aspects of history likely to be particularly evident to the general public and contributing to the Vale's character are the area's medieval churches, the vernacular building style of red brick and also of cobbles with pantile roofs, and the historic market towns of Northallerton and Thirsk. The Roman origins of the A1 route are widely known, as is the local presence of military airfields.

- **Tranquillity:** Tranquillity has declined significantly, with the area of the NCA classed as undisturbed declining from over 80 per cent in the 1960s to 40 per cent in 2007. The main factors affecting tranquillity are the major north–south transport corridors, namely the A1, the A19 and the East Coast Main Line. A sense of tranquillity is most likely to be associated with the rural areas of farmland away from these transport corridors, especially along the undeveloped stretches of the River Swale and within localised parkland and woodland landscapes.

- **Biodiversity:** There are five Sites of Special Scientific Interest within the NCA designated for their wildlife interest, and fragments of priority habitat. Together these should be at the core of attempts to restore habitat networks, particularly grasslands in the flood plain, woodlands and hedgerows, and increase the resilience of local flora and fauna to environmental change.

Statements of Environmental Opportunity

SEO 1: Protect and enhance the water resources of the Vale, in particular the aquifer and rivers, by supporting sustainable management of the farmed landscape, retaining important levels of food provision while protecting soils and water quality, and establishing networks of habitats including restoration of wetland habitats in the flood plain.

For example, by:

- Working with the farming community to continue and enhance the provision of high-quality farmed produce in ways that optimise productivity, while protecting soils and water through good soil and nutrient management and crop selection including fallow and green manures, thereby also enhancing carbon storage and making a positive contribution to sense of place.
- Retaining semi-natural grasslands and managing all grasslands under sustainable grazing levels, seeking opportunities to expand areas of grassland, for instance along field margins, on flood plains and alongside watercourses.
- Ensuring good practice in nutrient and pesticide management, to encourage good soil structure and assist infiltration of rainwater and hence recharge of the major Sherwood Sandstone aquifer, while safeguarding the Drinking Water Protected Area.
- Conserving, extending and re-linking areas of semi-natural habitat (riparian meadows, unimproved wet grasslands, and semi-improved meadows and pastures) and other grasslands into a coherent habitat network, to enhance biodiversity and increase the holding capacity of the land in absorbing peak flows.
- Working with the farming community to restore a more natural morphology to rivers, especially the River Swale, allowing the river to re-connect with the flood plain where this will help to dissipate the volume and energy of peak flows, and contribute to the restoration of a network of wetland areas within the Vale.
- Managing and restoring trees in the farmed landscape, including hedgerows and hedgerow trees, to strengthen the wider habitat network and support pollination and pest regulation.
- In arable areas, introducing and managing features such as conservation headlands and pollen and nectar mixes, to encourage birds, invertebrates and rare arable plants, enhancing the habitat for pollinators and beneficial predators, while protecting soils and enhancing biodiversity and sense of place.
- In arable areas, creating grassland buffer strips around fields and watercourses, and seeking opportunities to revert arable land to permanent grassland, particularly in flood plains or areas of archaeological interest, linking these to the wider grassland habitat network.

Continued over...

SEO 1 continued

For example, by:

- In riparian areas, encouraging management practices that will protect watercourses from diffuse sources of nutrients and sediment input, such as permanent grassland strips, tree planting, preventing livestock access to bank sides and minimising vehicle movements on wet soils, and continuing to promote improvements in farm infrastructure, waste management and waste water storm overflows, to reduce sources of pollution.
- Ensuring that the introduction of energy crops, such as miscanthus and short rotation coppice, is in keeping with local landscape character, can provide enhanced regulation of soil erosion, water supply and peak flows, is sited to avoid historic features and does not replace semi-natural or permanent grasslands.
- Working at catchment scale with neighbouring National Character Areas, identifying and encouraging habitat improvements and land management practice which will regulate the peak water flows experienced in the Vale and thus reduce flood risk to properties and crops within the Vale.

SEO 2: Manage and extend the presently limited native woodland cover throughout the Vale, to develop woodland habitat networks, enhance sense of place, and assist in managing erosion, peak flow events and carbon storage.

For example, by:

- Retaining or restoring active management of existing woodlands, managing where appropriate for a range of benefits, including timber, carbon storage and regulating peak flows, while contributing to the habitat network, supporting woodland bird populations and strengthening local landscape character.
- Restoring ancient woodland sites where plantations have been introduced, increasing the native tree content of these and managing to encourage structural and species diversity, including ground flora and deadwood habitats.
- Maintaining and restoring hedgerows and hedgerow trees and game coverts as key features of the farmed landscape and important elements in the wider habitat network across the Vale.
- Ensuring that parklands are appropriately managed, retaining key historic features including specimen and veteran trees and grasslands, and reinstating wood pastures.
- Encouraging the planting of new riparian and flood plain woodland, in particular along the River Swale and its tributaries, restoring, extending and linking the semi-natural woodland network, and enhancing sense of place, while protecting areas of high-quality grassland and archaeological features.
- Restoring, extending and linking existing fragmented areas of broadleaved woodland and scrub on Vale sides, managing these as a habitat network to increase carbon storage, to help to regulate soil erosion and peak flows, and to enhance landscape character and sense of place.

SEO 3: Protect and promote understanding and enjoyment of the Vale's geological and historic legacy, the Roman antecedent of the A1 transport corridor, historic buildings, field patterns and parkland, thus enhancing sense of place and local character.

For example, by:

- Working in partnership with local geologists and other interested parties, identifying, managing and interpreting geological and geomorphological features in the Vale, to inform their future conservation and increase wider awareness of their scientific importance and influence on the character of the area.
- Protecting sub-surface prehistoric and Roman archaeological features alongside the A1 and on the hilly edges of the area which are vulnerable to disturbance, by protecting them under permanent grassland or by reducing the depth of ploughing.
- Preserving visible historic features in the landscape, including medieval motte-and-bailey castles, settlement earthworks and ridge and furrow.
- Maintaining selected 20th-century military evidence including prisoner of war camps and airfields and associated structures, and providing access along with interpretation to enable people to understand their significance.
- Reducing the threat to historic monuments on the 'at risk' register by bringing them under appropriate management.
- Strengthening historic field systems and patterns through hedgerow restoration and management.
- Managing woodland to retain historic features, and seeking opportunities to reinstate traditional management practice such as coppicing.
- Protecting and managing parklands so that key historic features are retained, and providing access where possible.

Early military airfields and infrastructure within a landscape now predominated by cattle grazing.

SEO 4: Protect the pattern and character of scattered villages and farmsteads, ensuring that new development is based on sustainable resource use and contributes to sense of place, while limiting intrusion and loss of tranquillity in this rural area; ensure that green infrastructure is integral to new development in order to improve public access to, and enjoyment of, the landscape.

For example, by:

- Maintaining the settlement pattern of Northallerton and Thirsk as the main towns, with small villages located on higher ground, and avoiding development on flood plains.
- Ensuring that new development is assimilated into the landscape and designed to minimise resource use, using techniques such as water harvesting and sustainable drainage systems, to protect the underlying drinking water aquifer.
- Ensuring that extractive industry or infrastructure development is assimilated into the landscape and optimises its contribution to restoring habitat networks and strengthening sense of place.
- Maintaining the distinctive linear form of villages with village greens and church towers where they act as prominent visual landmarks within the wider landscape.
- Conserving and enhancing local vernacular style through restoration and sustainable use of traditional farmsteads, farm buildings and cottages and use of traditional materials (mottled brick and pantile) in conservation and restoration projects.
- Seeking opportunities to create linear habitat networks around the transportation corridors, enhancing biodiversity and strengthening landscape character, while providing greater capacity to absorb noise and light, preventing its encroachment into less disturbed areas.
- Minimising light spill through careful lighting design, particularly in areas classified as undisturbed in the Campaign to Protect Rural England's intrusion maps, such as along the eastern edge of the Vale, adjacent to the North York Moors National Park.
- Supporting the work of the North Yorkshire Local Access Forum in identifying opportunities to improve and extend the rights of way network, for example creating new circular routes or links to existing rights of way, particularly the Coast to Coast long-distance route which passes through the Vale of Mowbray.
- Maintaining views to the adjacent dales and moors which form a distinctive backdrop to the area.
- Seeking opportunities for educational access to historic farm buildings and other historic sites, and to interpret these features and the farmed environment.

Supporting document 1: Key facts and data

Total area: 60,633 ha

1. Landscape and nature conservation designations

A small proportion, 1,031 ha or 2 per cent of this character area covers the western boundary of the North York Moors National Park.

More information about the protected landscape can be found at:
http://www.northyorkmoors.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)	Percentage of NCA
International	n/a	n/a	0	0
European	Special Protection Area (SPA)	n/a	0	0
	Special Area of Conservation (SAC)	n/a	0	0
National	National Nature Reserve (NNR)	n/a	0	0
National	Site of Special Scientific Interest (SSSI)	A total of 4 sites wholly or partly within the NCA	61	<1

Source: Natural England (2011)

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

There are 44 local sites in the Vale of Mowbray covering 564 ha which is 1 per cent of the NCA.

Source: Natural England (2011); Greater Lincolnshire Nature Partnership (2012)

- 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 – select 'Designations/Land-Based Designations/Statutory'

1.2 Condition of designated sites

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

SSSI condition category	Area (ha)	Percentage of SSSI in category condition
Unfavourable declining	<1	<1
Favourable	18	29
Unfavourable no change	0	0
Unfavourable recovering	43	70

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

Land within this NCA rises from 14 m above sea level to nearly 262 m, the mean height being 54 m.

Source: Natural England (2010)

2.2 Landform and process

Within the Vale the land is essentially flat or gently undulating. There is slightly more varied land form to the east, where the land begins to rise to the adjacent moors and in the low undulations between river valleys. Low ridges and knolls occur in places and appear quite prominent above the flatter land around them. They are formed from fault-bounded outcrops of the underlying rocks' moraine material or ridges of sand and gravel.

Source: Vale of Mowbray Countryside Character Area description

2.3 Bedrock geology

The main bedrock of the area consists of Triassic sandstones and mudstones. To the east where the land rises to the North York Moors underlying bedrock consists of Jurassic mudstones and sandstones. The bedrock is covered by glacial deposits and has little influence on the landscape. A breakdown of solid geology as a proportion of total land area is as follows: 47 per cent sandstone; 38 per cent mudstone; 3 per cent calcareous mudstone; and 6 per cent limestone, dolomite rock.

Source: Vale of Mowbray Countryside Character Area description

2.4 Superficial deposits

Thick layers of glacial boulder clay (till) cover most of the area. Low lying ridges and moraines of sand and gravel give a low undulating landscape. Some alluvial deposits occur along the flood plain especially next to the River Swale.

Source: Vale of Mowbray Countryside Character Area description

2.5 Designated geological sites

Tier	Designation	Number
National	Geological Site of Special Scientific Interest (SSSI)	2
National	Mixed interest SSSI	1
Local	Local Geological Sites	0

Source: Natural England (2011)

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

2.6 Soils and Agricultural Land Classification

The glacial and alluvial drift deposits that cover the area have produced good, fertile soils ideal for arable farming and pasture for dairy farms. Approximately, 2 per cent of the land is classed as non-agricultural where sand and gravel deposits have been excavated for use in the building industry. The main grades of agricultural land in the NCA correlate with the variety of soils to be found, as follows; Grade 2 mainly silts and clays in the south and south-west of the area; Grade 3 mainly diamicton in the north and north-east of the area; Grade 4 mainly riversides and land at the edge of the North York Moors.

Source: Natural England (2010)

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

Agricultural Land Classification	Area (ha)	Percentage of NCA
Grade 1	366	1
Grade 2	15,222	25
Grade 3	41,380	68
Grade 4	2,059	3
Grade 5	66	<1
Non-agricultural	1,106	2
Urban	433	1

Source: Natural England (2010)

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

3. Key waterbodies and catchments

3.1 Major rivers/canals

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

River name	Length in NCA (km)
Cod Beck	24
River Swale	45
River Wiske	31

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 main watercourse through the Vale of Mowbray is the River Swale which rises in the Yorkshire Dales to the west. This is joined by the Wiske, rising in the Cleveland Hills and Cod Beck rising in the North York Moors, both to the east of the NCA. The Wiske and Cod Beck join the Swale to the north and south respectively of the market town of Thirsk.

Source: Natural England (2010)

3.2 Water quality

The total area of Nitrate Vulnerable Zone is 24,947 ha or 41 per cent of 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

The NCA contains 1,991 ha of woodland, 3.3 per cent of the total area, of which 215 ha is ancient semi-natural woodland, some of which is now planted over with conifers.

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

4.2 Distribution and size of woodland and trees in the landscape

Tree cover is generally sparse, comprising small woodlands, many associated with hunting, and a number of parklands. The eastern part of the area is more wooded. There has been scattered new planting along the valley of the River Swale, and some effort to expand lowland broadleaved woodlands. About 11 per cent of the woodland cover is on an ancient woodland site. Few of the woodlands are under formal management.

Source: Vale of Mowbray Countryside Character Area description, Natural England (2010)

4.3 Woodland types

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

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

Woodland type	Area (ha)	Percentage of NCA
Broadleaved	1,435	2
Coniferous	258	<1
Mixed	164	<1
Other	134	<1

Source: Forestry Commission (2011)

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

Woodland type	Area (ha)	Percentage of NCA
Ancient semi-natural woodland	85	<1
Ancient re-planted woodland (PAWS)	130	<1

Source: Natural England (2004)

5. Boundary features and patterns

5.1 Boundary features

Hawthorn hedgerows are the most common boundaries, especially in the north of the area, some dating from 18th century parliamentary enclosures. Drains form other boundaries as do modern post and wire and stock-mesh fences. To the north and central areas hedgerows can be substantial and many have been replanted/gapped-up through agri-environment schemes. There is some evidence of Countryside Stewardship agreements influencing boundary management, including hedgerow planting and restoration (49 km) and restored boundary protection (48 km), but their extent is limited. The estimated length of boundary features for the NCA is about 5,056 km. Total length of agreements between 1999 and 2003 is equivalent to about 3 per cent of this total.

Source: Vale of Mowbray Countryside Character Area description; Countryside Quality Counts (2003)

5.2 Field patterns

Most fields are medium sized, though they tend to be larger in the south and west. Boundaries are defined by low hedgerows or post and wire fences.

Source: Vale of Mowbray Countryside Character Area description; Countryside Quality Counts (2003)

6. Agriculture

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

6.1 Farm type

The number of dairy farms has dropped by a third reflecting national trends, while the number of farms growing predominantly cereals has increased by over 40 per cent.

Source: Agricultural Census, Defra (2010)

6.2 Farm size

Since 2000 there has been a small decrease in small holdings (<5ha) and farms sized 50 to 100 ha. Other size categories show a small increase in numbers.

Source: Agricultural Census, Defra (2010)

6.3 Farm ownership

2009: Total farm area = 54,411 ha; owned land = 41,749 ha
2000: Total farm area = 52,952 ha; owned land = 41,392 ha

Source: Agricultural Census, Defra (2010)

6.4 Land use

Forty-six per cent of the land is under cereal production; this figure remaining stable over the 2000 to 2009 period. The area of land under grass or 'uncropped'

also remained stable over the period, at 37 per cent of the area. The remaining 14 per cent of the land area for which data is available is under cash roots, stock feed, oil seeds and 'other arable'. The biggest changes in these sectors over the period are a 50 per cent decrease in cash roots, while oilseeds increased by 108 per cent.

Source: Agricultural Census, Defra (2010)

6.5 Livestock numbers

In 2009 there were 47,867 cattle (48,704 in 2000), 89,916 sheep (117,805 in 2000) and 94,878 pigs (138,063 in 2000). Pig numbers have seen a decrease of about 30 per cent and sheep about 20 per cent.

Source: Agricultural Census, Defra (2010)

6.6 Farm labour

Over the 2000 to 2009 period the numbers of principal farmers has remained fairly stable, salaried managers have increased by 18 per cent, and numbers of both full-time workers and casual/gang workers have decreased, by 23 per cent and 29 per cent respectively. Overall total labour has decreased by 8 per cent.

Source: Agricultural Census, Defra (2010)

Please note: (i) Some of the Census data are estimated by Defra so may not present a precise assessment of agriculture within this area (ii) Data refers to commercial holdings only (iii) Data includes land outside of the NCA where it belongs to holdings whose centre point is recorded as being within the NCA.

7. Key habitats and species

7.1 Habitat distribution/coverage

In the north of this NCA the flood plain of the Swale contains remnants of rough grazed riparian meadows which are of high ecological value. Woodland cover is generally low; however, there are ecologically valuable areas of native broadleaved woodland.

Source: Vale of York and Mowbray Natural Area Profile

7.2 Priority habitats

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

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

Priority habitat	Area (ha)	Percentage of NCA
Coastal flood plain and grazing marsh	338	<1
Fens	139	<1
Reedbeds	19	<1
Broadleaved mixed and yew woodland (broad habitat)	743	1

Source: Natural England (2011)

Maps showing locations of priority habitats are available at:

- http://magic.defra.gov.uk – Select 'Habitats and Species/Habitats'

7.3 Key species and assemblages of species

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

8. Settlement and development patterns

8.1 Settlement pattern

Villages, which are often located on higher drier ground, tend to be linear in form. Some have village greens and many have churches with a spire or tower providing landmarks in the wider landscape. The area includes the county town of Northallerton and Thirsk. Its lowland character means it has long been favoured as a transport route and is crossed by the East Coast Main Line and the A1. The area includes a number of active and disused airfields. There is evidence of development and redevelopment around the existing major settlements, and in the wider countryside especially along the route of the A19 corridor.

Source: Vale of Mowbray Countryside Character Area description; Countryside Quality Counts (2003)

8.2 Main settlements

Northallerton in the north of this NCA is the county town for North Yorkshire. The only other town in this NCA is Thirsk; a market town to the south. The total estimated population for this NCA (derived from ONS 2001 census data) is: 56,552.

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

8.3 Local vernacular and building materials

Pantiles and red brick are the main building materials. Bricks vary slightly in colour depending on the source of local clays. In the north of the area some brick work is rendered and walls incorporate cobbles from local glacial deposits.

Source: Vale of Mowbray Countryside Character Area description; Countryside Quality Counts (2003)

9. Key historic sites and features

9.1 Origin of historic features

Mesolithic and Neolithic activity is widely reflected by the discovery of stone tools and flint scatters, and bronze-age activity by other bronze artefacts such as rapiers and axes. Evidence of high-status farmsteads from the Bronze Age can be found on hilltops marked by palisaded enclosures. Some developed into hill forts as at Catterick.

This area was a major transport corridor in the Roman period, with forts and trading settlements developing around Dere Street, now the A1, and Ermine Street. Notable examples of planned settlements can be found at Catterick (Cataractonium - mostly in Pennine Dales Fringe NCA) and Bainesse roadside settlement. Earthworks and castles are distributed along Dere Street, on the fringes of the Cleveland Hills and near Northallerton.

The present strong pattern of nucleated settlements developed between the 9th and 13th centuries, by which time little woodland remained. There were many planned linear and 'green' settlements mostly on higher ground. There is a medium to low density of dispersed settlement, lower in south where there are high-status moated sites of 12th- and 13th-century origin. Some isolated farmsteads developed from the 14th century from grange farms of medieval monastic houses, and from shrunken medieval settlements. A strong manorial structure developed with large houses and parks, including the notable Upsall Estate medieval park pale.

The area continued to develop as major transport corridors with north-south roads influenced the position and development of post-medieval coaching towns, for example Northallerton, although with Roman foundations, and

Thirsk. The main Darlington to York railway was built prior to 1845, with many later branch lines. The establishment of large airfields from the First World War, for example at Catterick, and especially from mid 1930s, notably the bomber bases at Dishforth and Leeming. Some airfields later developed as industrial areas. Minor gentry houses date from the mid-16th century, and there are a number of notable country houses.

Source: Vale of Mowbray Draft Historic Profile; Vale of Mowbray Countryside Character Area description

9.2 Designated historic assets

This NCA has the following historic designations:

- 1 Registered Park and Garden covering 3 ha.
- 1 Registered Battlefield covering 80 ha.
- 66 Scheduled Monuments.
- 844 Listed Buildings.

Source: Natural England (2010)

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

10. Recreation and access

10.1 Public access

- Less than 1 per cent of the NCA, 175 ha, is classified as being publically accessible.
- There are 688 km of public rights of way at a density of per 1.1 km/km2.
- There are no national trails within the Vale of Mowbray NCA.

Sources: Natural England (2010)

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

Access designation	Area (ha)	Percentage of NCA
National Trust (Accessible all year)	0	0
Common Land	1	<1
Country Parks	0	0
CROW Access Land (Section 4 and 16)	64	<1
CROW Section 15	3	<1
Village Greens	33	<1
Doorstep Greens	0	0
Forestry Commission Walkers Welcome Grants	5	<1
Local Nature Reserves (LNR)	0	0
Millennium Greens	1	<1
Accessible National Nature Reserves (NNR)	0	0
Agri-environment Scheme Access	70	<1
Woods for People	75	<1

Sources: Natural England (2011)

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

11. Experiential qualities

11.1 Tranquillity

Based on the CPRE map of tranquillity (2006) this NCA is 'striped' with corridors approximately oriented north-south of less tranquillity associated with the A1, A19 and A168, and with the main towns of Northallerton and Thirsk. The rural areas outside of these corridors are of moderate to high tranquillity.

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

Tranquillity	Tranquillity Score
Highest value within NCA	37
Lowest value within NCA	-59
Mean value within NCA	5

Sources: CPRE (2006)

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

11.2 Intrusion

The 2007 Intrusion Map (CPRE) shows the extent to which rural landscapes are 'intruded on' from urban development, noise (primarily traffic noise), and other sources of visual and auditory intrusion. This shows a similar picture to the tranquillity data with a fairly low rate of disturbance in the more rural isolated areas with greater disturbance around settlements and the road network. A breakdown of intrusion values for this NCA is detailed in the following table.

Intrusion category	1960s (%)	1990s (%)	2007 (%)	Percentage change (1960s-2007)
Disturbed	19	45	58	40
Undisturbed	81	55	40	-41
Urban	<1	n/a	2	2

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are an increase by 40 per cent in the area classed as disturbed, up to nearly 60 per cent in 2007, and a decrease of 40 per cent, down to 40 per cent, of the undisturbed area.

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 woodland cover remained at around 2.5 per cent between 1999 and 2003, but by 2012 was estimated at 3.3 per cent in the Forestry Commission's Woodland Potential mapping.

Boundary features

- Between 1999 and 2003 there was a limited uptake of agri-environment agreements for boundary management including hedge planting and restoration (49 km) and restored boundary protection (48km). In 2011 over 1,000 km of hedgerow were managed under agri-environment agreements within the NCA, 24km of stone walls and nearly 20 km of boundary woodland.

Agriculture

- Between 2000 and 2009 there was a 30 per cent decline in number of dairy farms, with total numbers of pigs down 30 per cent and sheep down 20 per cent over the period. The number of farms listed on the 2009 census as being predominantly cereal had increased by 40 per cent on the 2000 figure, although the actual area under cereals remained stable. There has been a small net loss of pasture, a drop in cash roots over the period, and an increase in oilseeds. There was a small decline in the number of farms of between 50 and 100 ha in size, a small increase in numbers of larger farms.

Settlement and development

- There has been continued development and redevelopment associated with expansion of existing settlement at Northallerton and Thirsk, and along key transport corridors such as the A1 and East Coast main railway line.

- The A1 has been significantly upgraded to motorway status for the section from Dishforth to Leeming, completed in summer 2012.

Semi-natural habitat

- By 2003 the uptake of agri-environment grants for semi-natural habitats was significantly below the national average, however hedgerows were planted and managed under Countryside Stewardship agreements. Aided by initiatives such as Catchment Sensitive Farming and the Campaign for the Farmed Environment, the uptake of entry level stewardship options has increased in recent years, including the creation of floristically enhanced margins and overwintered stubbles in arable fields. The Catchment Sensitive Farming initiative has worked with the Yorkshire Wildlife Trust to improve habitat for otters and water vole along the River Wiske.

Historic features

- The historic landscape structure continued to decline, with historic farm buildings remaining predominantly unconverted (82 per cent) but mainly structurally intact. Of remaining parkland, there were no areas covered by a historic parklands grant, but 35 per cent were included in agri-environment schemes.

- The Heritage at Risk register indicates 46 designated monuments currently at risk within the Vale of Mowbray.

Coast and rivers

- The Vale of Mowbray is a Drinking Water Protected Area and therefore a focus for targeted action under the Catchment Sensitive Farming scheme. CSF has operated in the Swale catchment since 2006, encouraging farming good practice in nutrient and pesticides management, and managing soils, and awarding grants to improve farmyard infrastructure and thus reduce point source pollution from farmyards – this has reduced pesticide, nutrient and sediment input to the watercourses. By 2012, 70 per cent of farmers in the catchment had been contacted by the CSF scheme, and 80 per cent of these had implemented management recommendations.

Minerals

- The North Yorkshire area is an important Regional supplier of aggregate minerals such as sand and gravel from the River Swale valley at sites such as Scorton quarry. Reserves of sand and gravel are limited, making these reserves strategically significant, many of these supplying markets in the north-east of England. There has been some decline in sand and gravel production over recent years in response to economic conditions, although the upgrade of the local section of A1 to a motorway has boosted local demand.[4]

Historically and to this day, main north-south transport routes have been located through the Vale, principally the A1 and the East Coast Main Line, creating strong links to north and south.

[4] *Local Aggregate Assessment for the North Yorkshire Sub-region*, Draft Report, North Yorkshire County Council, City of York Council and the Yorkshire Dales and North York Moors National Park Authorities (January 2013)

Drivers of change

Climate change is likely to result in:

- More frequent and extreme weather events resulting in increased erosion of watercourse channels and a higher risk of flooding in the river valleys of the River Wiske, Swale and Cod Beck, and downstream.
- Summer droughts, leading to increase in water demand for crop growth, a possible increase in water storage facilities on farms and greater pressure on the Sherwood sandstone aquifer.
- Warmer winters leading to increased tree growth, and the introduction of new non-native species.
- A longer growing season potentially leading to double cropping and greater demand for resources.
- Warmer climate leading to new crops, which may have different resource demands; and
- Shifts in species' ranges and consequent opportunities to create habitat space for new native species, but potential loss of species at the southern end of their range. Drought stress could lead to loss of small or isolated habitats.

Other key drivers

- The area has been identified as important for its main transport corridors which provide development opportunities.
- Northallerton and Thirsk are identified as 'Principal Towns' within the region and are therefore a focus for housing, economic, shopping, leisure, education and cultural activities and services.
- Catterick, on the fringe of the NCA, may expand as a major Ministry of Defence settlement.
- Mitigation of flood risk, both through measures taken in adjacent uplands, and the creation of flood plain wetlands and woodlands.
- Supply constraints on sand and gravels and probable lack of opportunity for development of alternative reserves, means that the strategic significance of the Vale of Mowbray's resources is likely to be maintained or increased. A number of applications to extend the lifetime of existing quarries are currently under consideration.[5] These will have associated opportunities for restoration to provide recreational amenities and biodiversity enhancements.
- The area is recognised as having potential for new woodland, and restoring ancient replanted sites to semi-natural woodland.
- Significant opportunity has been identified[6] for the planting of flood plain woodland along the course of the River Swale, and woodland in the wider western area, to reduce downstream flooding in the area.

[5] *Local Aggregate Assessment for the North Yorkshire Sub-region*, Draft Report, North Yorkshire County Council, City of York Council and the Yorkshire Dales and North York Moors National Park Authorities (January 2013)

[6] *Opportunity Mapping for Woodland to Reduce Flooding in the Yorkshire and Humber Region*, Forest Research (2009)

- The majority of the NCA is classed as being of a 'very high' vulnerability to surface soil compaction and waterlogging, due to use of arable machinery in poor soil conditions, frequency of cultivation, and some poaching by livestock. This increases the risk of rapid surface run-off, exacerbated by recent weather trends.

- The catchments of the Swale and Nidd is identified as a priority area for targeting woodland planting due to high levels of risk associated with diffuse water pollution from agricultural practice.

- Much of the NCA is classified as 'Best and Versatile Agricultural Land'[7] in the Yorkshire and Humber region, and there is likely to be continued pressure for increased food production.

- A requirement for increasing renewable energy generation could result in increased pressure for onshore wind turbines and growth of biomass crops. Regional[7] strategy has indicated potential to support biomass production to supply the Region's major power stations.

[7] *The Yorkshire and Humber Plan Regional Spatial Strategy to 2026*, Government Office for Yorkshire and the Humber (May 2008)

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.

Gently undulating farmland, with hedgerows, hedgerow trees and a red brick farmstead.

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: Protect and enhance the water resources of the Vale, in particular the aquifer and rivers, by supporting sustainable management of the farmed landscape, retaining important levels of food provision while protecting soils and water quality, and establishing networks of habitats including restoration of wetland habitats in the flood plain.	↑ ***	↔ **	↑ **	↔ ***	↗ **	↗ ***	↑ ***	↑ ***	↑ ***	↑ ***	↗ ***	↗ *	n/a	↗ ***	↗ **	↗ ***	↔ ***	↑ ***	↔ ***
SEO 2: Manage and extend the presently limited native woodland cover throughout the Vale, to develop woodland habitat networks, enhance sense of place, and assist in managing soil erosion, peak flow events and carbon storage.	↔ *	↑ **	↗ ***	↔ ***	↑ ***	↑ ***	↗ ***	↑ ***	↗ ***	↑ ***	↗ ***	↔ *	n/a	↗ ***	↗ ***	↗ ***	↗ *	↑ ***	↔ ***
SEO 3: Protect and promote understanding and enjoyment of the Vale's geological and historic legacy, the Roman antecedent of the A1 transport corridor, historic buildings, field patterns and parkland, thus enhancing sense of place and local character.	↔ ***	↗ *	↔ ***	↔ ***	↗ **	↗ ***	↗ *	↗ ***	↗ **	↗ ***	↗ ***	↔ ***	n/a	↑ ***	↑ ***	↗ **	↗ **	↗ ***	↑ ***
SEO 4: Protect the pattern and character of scattered villages and farmsteads, ensuring that new development is based on sustainable resource use and contributes to sense of place, while limiting intrusion and loss of tranquillity in this rural area; ensure that green infrastructure is integral to new development in order to improve public access to and enjoyment of the landscape.	↔ ***	↔ ***	↗ ***	↔ ***	↔ ***	↗↔ ***	↗ ***	↗ ***	↔ ***	↗↔ ***	↗↔ ***	↔ ***	n/a	↑ ***	↗ ***	↑ ***	↑↔ ***	↔ ***	↔ ***

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

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

Landscape attributes

Landscape attribute	Justification for selection
Low lying, gently undulating landscape broadly defined by surrounding uplands; overlies major aquifer.	■ This is a flat or gently undulating landscape, visibly defined by the uplands of the North York Moors to the east and the Pennines to the west. ■ Overlays the Sherwood Sandstone aquifer, a major source of drinking water.
Mixed agricultural base, making the Vale of Mowbray distinct from the largely arable Vale of York to the south.	■ A mixed agricultural landscape of arable cropping, dairy and livestock rearing and finishing (including pig and poultry). ■ Significant horse racing, breeding and training centred on the Thirsk, Northallerton and Catterick areas.
Rivers and flood plains.	■ Drained by the River Swale and its tributaries the River Wiske and the Cod Beck, meandering through flood plains with remnant rough-grazed riverine meadows of high ecological value in the north of the vale; flood plains become broader to the south where they traverse flat, glacial, lake deposits.
Hedges, trees and woodlands are visually prominent in low, undulating farmland.	■ Medium-scale fields enclosed by low hedgerows. ■ Low proportion of tree cover (3.3 per cent) tends to be in small copses and game coverts. ■ Parkland landscapes contribute to the tree cover,
Rural pattern of market town and dispersed settlement, church spires are prominent landmarks.	■ Main settlements are market towns of Northallerton and Thirsk, otherwise dispersed small villages. ■ Settlement pattern characterised by small villages on higher ground, often linear in form and of medieval origin, with village green the focal point; Northallerton, the county town, is of Roman origin. ■ Churches with towers or spires create prominent visual landmarks within the wider landscape. ■ Farmsteads, especially two-storey farmhouses and combination barns, and cottages exhibit local vernacular style, constructed from local brick of varying colour with pantile roofs.
Historic buildings and wartime infrastructure are visible reminders of the area's past.	■ Roman influence: Military camps along the line of Dere Street (now the A1) and growth of Northallerton and Thirsk on the Great North Road. ■ Medieval settlements and motte-and-bailey castles in the countryside. ■ More recent heritage includes 20th-century airfields, some now disused.
Strategic transport corridors.	■ Major transportation corridors traverse the landscape: The East Coast Main Line and A1 and A19.
Expansive landscape with high degree of visibility across surrounding uplands.	■ The adjoining high areas of the dales and moors often form a prominent skyline feature and backdrop to views, and provide viewpoints in to the area, for example from the A170 at Sutton Bank on the edge of the moors – views are varied, tending to be most expansive across the vale flood plain in the south.

Landscape opportunities

- Manage hedges to strengthen landscape character and contribute to habitat networks.
- Bring existing woodlands into sustainable management and seek opportunities to expand the wooded area, to ensure their long term survival as features within the landscape, to achieve a strong habitat network, and to enhance the wider public benefits derived from these.
- Managing the river and riparian habitats to strengthen these linear landscape features, increasing their function as core elements in the habitat network, and managing their flood plains to improve flood regulation.
- Supporting good soils and nutrient management in the flood plain, thus supporting a sustainable future for farming which is a major influence on the rural character of the NCA.
- Protecting parkland design and remnant features, conserving veteran trees and managing for future veterans, and seeking opportunities to reintroduce wood pasture.
- Restoring/creating a coherent network of semi-natural habitats in the flood plain, particularly riverine meadows and wet pastures, along with riparian and flood plain woodland, as landscape features and contributors to water and flood storage.
- Maintain and strengthen character through promoting use of local vernacular building style and retaining integrity of traditional settlement pattern.
- Protect and raise public awareness of the historic elements in the landscape, including the Roman legacy and wartime airfields.
- Minimise further reductions in tranquillity levels, seeking to contain noise and light spill.
- Utilising transport corridors as linear habitat networks.
- Retain expansive views across the Vale.

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 service offered by opportunities
Food provision	Fertile soils Water Semi-natural pollinator habitat	1 per cent is grade 1 agricultural quality, 25 per cent is grade 2 and 68 per cent is grade 3. 46 per cent of the land is under cereal production, much for livestock feed. Land under grass / uncropped accounts for 37 per cent. The remaining 14 per cent land area for which data is available is under cash roots, stock feed, oil seeds and 'other'.	Regional	The grade 1, 2 and 3 soils currently support production of cereal and feed grains with livestock rearing dairying, and some arable. Future ability to maintain or increase food production will be shaped by soil quality, and by availability of inputs, including water. Poor soil and nutrient management is associated with diffuse pollution and sedimentation which impacts on water quality and the ecology of watercourses.	Continue working with the farming community to ensure good soil, nutrient and pesticides management, thereby securing the sustainable management of key assets essential to farming and protecting and enhancing other services such as carbon storage and regulating water flow. Enhance pollinator habitat and encourage more diverse food provision by creating conservation headlands and using pollen and nectar mixes to encourage invertebrates, birds and rare arable plants. Maintain mixed farming, with sustainable grazing levels on grasslands, preventing soil compaction and aiding water infiltration and hence recharge of the Sherwood sandstone aquifer.	**Food provision** **Water availability** **Climate regulation** **Regulating water quality** **Regulating water flow** **Regulating soil quality** **Regulating soil erosion** **Biodiversity**

Service	Assets/ attributes main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal service offered by opportunities
Timber provision	Woodland cover, soils	The NCA contains 1,991 ha (3.3 per cent of the total area), of which c215 ha is ancient woodland, some now planted over with conifers.	Local	There is relatively little woodland cover in this NCA. The greatest scope for new native woodland is on the vale slopes, particularly in the east where land rises to the North York Moors, with additional opportunities to increase tree cover through parkland and wood pasture restoration, and creation or expansion of riparian and flood plain woodland in suitable locations. Restoration of plantations on ancient woodland sites (PAWS) offers opportunity to convert to hardwood species with additional benefits in carbon storage and biodiversity. Restoring riparian and flood plain woodland would produce similar benefits, though to date there has been limited uptake of grants for flood plain woodland.	Expand native woodland cover, predominantly on vale slopes, focusing on locations where tree planting will reduce soil erosion and protect watercourses from sedimentation, while maintaining or strengthening local landscape character. Seek opportunities to restore PAWS to native species, and where appropriate reinstate traditional woodland management practices such as coppicing.	**Timber provision** **Biomass energy** **Water availability** **Climate regulation** **Regulating soil erosion** **Regulating soil quality** **Regulating water quality** **Regulating water flow** **Sense of place/ inspiration** **Biodiversity**

Service	Assets/ attributes main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal service offered by opportunities
Water availability	Major Sherwood Sandstone aquifer Magnesian Limestone aquifer Rivers Water also derived from neighbouring upland or upstream NCAs	Key rivers in the NCA are the River Swale and two of its tributaries, the River Wiske and Cod Beck, all running south through the NCA and eventually draining into the Humber. The resource availability status for all surface waterbodies in the NCA has been overridden to 'no water available' to ensure adequate flows further downstream, specifically at Naburn (to the south of York). Groundwater sources in the NCA include the major Sherwood Sandstone aquifer (the second largest aquifer in England) and the Magnesian Limestone aquifer. Groundwater in the Sherwood Sandstone is heavily used for drinking water supplies[8] in the Northallerton, Doncaster, Selby and Goole areas, and supplies the grid system supporting supplies to Sheffield and Hull. This is a Drinking Water Protected Area. The River Swale is underlain by both the Sherwood Sandstone and Magnesian Limestone aquifers and the River Wiske is partially underlain by the Sherwood aquifer. Cod Beck is underlain by a series of minor or non-aquifers with limited use as a source of reliable groundwater. There is 'water available' from all these groundwater resources.[9]	Regional	To protect downstream supply in the Vale of York there is 'no water available' for extraction from surface waters within the NCA, therefore it is imperative that water is used sustainably and that land management practices are employed which will increase water infiltration and enable groundwater supplies to be maintained. Demand for on-farm water storage may increase as contingency against predicted increases in summer droughts.	Seek opportunities to increase area of semi natural habitat, and sustainable grazing of all grasslands, thus increasing ground permeability and infiltration of rainfall to recharge groundwater supplies and reduce surface flooding. Work with the farming community and businesses to improve sustainable use of water and sympathetic land management practices, including crop selection and water harvesting, and that water conservation measures and sustainable drainage is designed in to new development. Ensure that water storage facilities are well integrated within the landscape and make a contribution to habitat networks and biodiversity.	**Food provision** **Water availability** **Regulating water quality** **Regulating soil erosion** **Biodiversity**
Genetic diversity	Not relevant to this NCA.	Not relevant to this NCA.	Not relevant to this NCA.	Not relevant to this NCA.	Not relevant to this NCA.	**Not relevant to this NCA.**

[8] *Humber River Basin Management Plan*, Main document, Environment Agency (December 2009)

[9] *Swale, Ure, Nidd and Upper Ouse Catchment Abstraction Management Strategy*, Environment Agency (March 2004)

Service	Assets/ attributes main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal service offered by opportunities
Biomass energy	Woodland, soils	Woodland cover in this NCA is limited to scattered small woodlands and hedgerow trees, with occasional parkland plantations. There is a total of 1,991 ha of woodland in the NCA (3.3 per cent of the NCA area), which provides local potential for the provision of biomass through bringing unmanaged woodland under management.	Local	There is medium potential yield for Short Rotation Coppice in the NCA while there is a high potential yield for miscanthus through much of the NCA south of Northallerton, and a medium potential yield elsewhere. For information on the potential landscape impacts of biomass plantings within the NCA, refer to the tables of 'opportunities and optimum sitings for energy crops' on the Natural England website.	Work with the farming community to identify suitable opportunities to increase the area of miscanthus and short rotation coppice, where this may be accommodated within local landscape character and provide enhanced regulation of soil erosion, water flow, water supply and water quality.	**Biomass energy** **Timber provision** **Climate regulation** **Regulating water flow** **Biodiversity**
Climate regulation	Woodlands Other semi-natural habitats, particularly wetlands and permanent grassland Management of soils and cropping practice	There is generally a low soil carbon content of 0-5 per cent throughout the NCA. There will be higher soil carbon content under the 1,991 ha of woodland in the NCA (3.3 per cent of the NCA area), which could also be managed to further enable carbon sequestration and storage.	Local	Carbon sequestration can be increased through managing and expanding native woodland cover, and other semi-natural habitats particularly wetlands and permanent grasslands. This can be of wider benefit for regulating water flow and quality if located in riparian corridor or flood plain. Carbon storage in soils can be enhanced through careful management of organic matter inputs to soils, by reducing the frequency of cultivation and reverting some cultivated areas to permanent grassland.	Restore and create wetland habitats, for example flood plain pasture and meadow to increase take-up and storage of carbon while achieving a diverse and coherent wetland habitat network, which can also help regulate peak water flows. Expand native woodland into appropriate locations, such as on the eastern Vale side, in appropriately sited flood plain and riparian woodlands, and expand small farm woodlands to increase the carbon storage within these habitats. Seek opportunities to adopt minimum tillage, increase use of green manure crops within rotations, and create uncultivated margins to arable fields, and along watercourses.	**Climate regulation** **Water availability** **Regulating soil erosion** **Regulating soil quality** **Regulating water quality** **Regulating water flow** **Sense of place / inspiration** **Biodiversity**

Service	Assets/ attributes main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal service offered by opportunities
Regulating water quality	Geology Soils Semi-natural habitats, Farming and other land management practices	The entire NCA lies within Defra's 'Yorkshire Ouse, Nidd and Swale' Priority Catchment. Here nutrient loss, especially phosphates, associated with arable and dairy farming, is a key concern leading to a loss in surface water quality. The ecological potential or status of rivers in this NCA is generally 'moderate', with a lesser number of unmodified river lengths having a 'good' status. The chemical status of surface waterbodies 'does not require assessment'. Groundwater chemical status is 'good' around the River Swale catchment, but is 'poor' elsewhere in the NCA.	Regional	One of the key reasons for failure of water quality standards in this NCA are water industry discharges during storm conditions and diffuse pollution from agriculture. Groundwater quality risks for the Magnesian Limestone aquifer primarily relate to urban and rural inputs from localised use of nitrates and pesticides in agriculture and horticulture. The Catchment Sensitive Farming initiative has offered advice and grants to farmers in this area to reduce diffuse pollution of the watercourses, concentrating on improved management of soils and chemical applications, and in farmyard infrastructure.	Continue working with the farming community to ensure best practice in soils, pesticides and nutrient management, for example using low pressure machinery, carefully managing stock movements and informed nutrient and pesticides application following regular infield analysis. Work with farmers to manage riparian grazing, including fencing off sections of watercourses to prevent access by livestock, creating permanent grassland strips along watercourses, and creating areas of scrub and woodland. Encourage selection of crops which require lower applications of pesticides and fertilisers, to help protect watercourses from diffuse run-off. Promote use of buffer strips to watercourses, and creation of riparian semi-natural habitat. Continue to promote improvements in farm infrastructure and waste management and improvements to waste water storm overflows. In new developments, promote sustainable drainage systems which will improve water infiltration and protect the underlying aquifers.	**Regulating water quality** **Food provision** **Climate regulation** **Regulating soil erosion** **Regulating soil quality** **Biodiversity**

Service	Assets/ attributes main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal service offered by opportunities
Regulating water flow	Flood plain of Swale, Wiske and Cod Beck Semi-natural vegetation cover, particularly wetland and woodland	Fluvial flood risk is high within this NCA, with a total of over 1,050 properties at risk within Northallerton, Brompton, and Thirsk. Within parts of the Cod Beck catchment, the topography creates potential for flash flooding (short period of time between rainfall and the onset of flooding), which can be very hazardous in these areas.	Regional	Land management in the upper catchment (the North York Moors and Cleveland Hills and Yorkshire Dales NCAs), including tree or scrub planting, sustainable management of moorland vegetation, and blocking drains to restore bog hydrology, will influence the degree to which these areas intercept and absorb rainfall and hence influence the volume and characteristics of water flows downstream within the NCA. The use of the Boltby Reservoir (located north east of Thirsk, just beyond the NCA boundary), which was decommissioned in 2005 following damage due to a severe flooding event, is also being considered, along with reducing run-off into Cod Beck and Willow Beck (a tributary of the River Wiske that runs through Romanby) through land use management changes.	Work with organisations in neighbouring upland NCAs to restore the ability of upland habitats to intercept and store increased volumes of precipitation; Restore or create flood storage areas within the flood plains, including creating new wetland areas, which are well-integrated in the landscape, contributing to habitat networks and sense of place. Seek opportunities to restore a more natural morphology to watercourses, in particular the River Swale, allowing the river to reconnect with the flood plain where this will help dissipate the energy of peak flows and contribute to the restoration of a network of wetland areas within the Vale. Promote tree planting and creation of wet woodland habitats in appropriate locations within the flood plains. **Continued over...**	**Regulating water flow** **Timber provision** **Water availability** **Climate regulation** **Regulating soil erosion** **Regulating water quality** **Biodiversity**

Service	Assets/ attributes main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal service offered by opportunities
Regulating water flow continued					**...continued from previous.** Improve hedgerow density, particularly in southern areas where many hedgerows have been lost – these will help reduce cross land flows of water during peak floods, improve soil permeability and the holding time of flood waters within the wider catchment before reaching main watercourses. Promote sustainable drainage in new development by increasing the use of semi-natural habitats and permeable surfacing to reduce run-off and increase water filtration, slowing the rate at which water enters the river system.	

Service	Assets/ attributes main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal service offered by opportunities
Regulating soil quality	Soil types Geological and geomorphological processes Semi-natural habitats	There are 10 main soilscape types in this NCA, the most significant by area being the slowly permeable seasonally wet loam and clay soils (48 per cent of the area); freely draining slightly acid loamy soils (22 per cent); slowly permeable seasonally wet acid loamy and clayey soils (6 per cent); slightly acid loamy and clayey soils with impeded drainage (5 per cent); loamy and clayey flood plain soils with naturally high groundwater (5 per cent).	Regional	The slowly permeable seasonally wet loam and clay soils (48 per cent) may suffer compaction and/or capping as they are easily damaged when wet. In turn this may lead to increasingly poor water infiltration and diffuse pollution as a result of surface water run-off. The freely draining slightly acid loamy soils (22 per cent) may be valuable for aquifer recharge, requiring the maintenance of good structural conditions to aid water infiltration and requiring the matching of nutrients to needs to prevent pollution of the underlying aquifer. Both of these soil types have potential for increased organic matter levels through management interventions. The Catchment Sensitive Farming initiative has offered advice and grants to reduce diffuse and farmyard-source pollution.	Continue working with the farming community to encourage best practice in soil management to improve structure and quality of soils, particularly where this can assist aquifer recharge. This may be achieved using low pressure machinery and managing stock and vehicle movements, particularly in wet conditions, to avoid poaching and compaction. Encourage the use of fallow and green manure crops such as nitrogen-fixing legumes within arable systems to replace nutrients and bind soils, manage organic matter levels in soils, and support informed infield nutrient application, particularly where aquifer recharge occurs. Continue to promote improvements in farm infrastructure and waste management.	**Regulating soil quality** **Food provision** **Water availability** **Climate regulation** **Regulating water quality** **Regulating water flow** **Biodiversity**

Service	Assets/ attributes main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal service offered by opportunities
Regulating soil erosion	Soil type Good soils management Semi-natural habitat	The entire NCA lies within Defra's 'Yorkshire Ouse, Nidd and Swale' Priority Catchment. Priorities in this catchment including reducing sediment losses from farm yards. The River Wiske and River Swale catchments (encompassing the majority of the NCA) are considered 'target areas' of particular importance.	Regional	Around two-thirds of the soils covering this NCA have a low risk of soil erosion, this includes the dominant soil type (slowly permeable seasonally wet loamy and clayey soils) the slowly permeable seasonally wet acid loamy and clayey soils, the loamy and clayey flood plain soils with naturally high groundwater, and the freely draining flood plain soils. Loamy soils with naturally high groundwater generally have a low risk of soil erosion, except where coarser textured variants occur on sloping or uneven ground. Freely draining soils have enhanced risk of soil erosion on moderately or steeply sloping land where cultivated or bare soil is exposed, often exacerbated where organic matter levels are low after continuous arable cultivation or where soils are compacted. There is widespread potential for wind erosion of sandy and fen peat soils where soils are cultivated or left bare, especially in spring. Many of the slightly acid loamy and clayey soils with impeded drainage are prone to capping or slaking, leading to increased risk of erosion. Soils are easily compacted by machinery or livestock if accessed when wet, increasing the risks of soil erosion by surface water run-off, especially on steeper slopes. The Catchment Sensitive Farming initiative has offered advice and grants to improve soils management.	Continue working with the farming community through Catchment Sensitive Farming and other initiatives to promote good soils management, including shallow cultivation and creating permanent grassland or areas of semi-natural habitat within the arable landscape. Other beneficial measures include encouraging use of green manure crops within arable systems to replace nutrients and bind soil, along with winter stubble. Minimise vehicle and stock movements in wet conditions.	**Regulating soil erosion** **Food provision** **Climate regulation** **Regulating soil quality** **Regulating water quality** **Regulating water flow** **Pollination** **Biodiversity**

Service	Assets/ attributes main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal service offered by opportunities
Pollination	Limited areas of semi-natural habitats and arable margins Hedgerows Linear transport routes	30 ha of species-rich grassland and tiny area of heathland provide very limited nectar sources for pollinating insects in this NCA. Hedgerows are predominantly of hawthorn. These will provide some nectar source for pollinators within the farmed landscape.	Local	There is an opportunity to increase food security by increasing the areas and connectivity of suitable habitat for pollinators. This also contributes to climate adaptation in both food production and biodiversity. Many hedgerows, particularly in the southern Vale are gappy and require restoration. Habitat corridors around the main transport routes – rail and main roads – could be managed to increase their berry, seed and nectar provision and structural diversity for birds and insects.	Seek opportunities within the agricultural landscape, particularly in proximity to oil-seed rape, to promote nectar-rich margins and species-rich semi natural habitats, within a coherent network. Manage and restore the network of hedgerows, particularly in the southern Vale. Seek opportunities to create linear areas of habitat for birds and invertebrates, in particular using linear transport corridors.	**Food provision** **Regulating soil erosion** **Pollination** **Sense of place / inspiration** **Biodiversity**
Pest regulation	Limited areas of semi-natural wetland, grassland habitat and hedgerows	Small areas of semi-natural habitat are interspersed with productive agricultural land, provide limited habitat for beneficial species.	Local	Semi-natural habitat within productive agricultural landscapes may support species which prey on pest species, thereby regulating the potential damage of these to food production. Hedgerows are the most common field boundary, providing some habitat for beneficial predator species, although many hedgerows are gappy and require restoration.	Enhance the network of semi-natural habitats throughout the agricultural landscape so they may provide habitat for predator species within close proximity of main food production areas. Manage and restore the network of hedgerows in the southern Vale.	**Pest regulation** **Food provision** **Pollination** **Biodiversity**

Service	Assets/ attributes main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal service offered by opportunities
Sense of place/ inspiration	Landform/vale topography Rivers and flood plain Land cover Archaeological and historic assets	Sense of place is provided by the flat, predominantly open agricultural landscape, framed by surrounding uplands with localised areas of woodland cover and hedgerows producing locally enclosed landscapes, particularly in the east where sense of enclosure is reinforced by parklands. There is an overall sense of containment within the NCA offered by the prominent scarp of the North Yorkshire Moors and Cleveland Hills to the east and the more gentle foothills of the Pennine Dales to the west, with views out to these masses of higher land being a distinctive feature of the area. The low lying valleys of the River Swale and its tributaries are another important element of the landscape, characteristically tree-lined and fringed by a belt of rough pasture or scrub, especially in the north. Villages are generally situated on higher ground, often with a linear form along a wide main street, while churches provide local landmarks.	Local	Pressure for change in this landscape, associated with transport infrastructure, new housing and agriculture could alter the sense of place, with intrusion levels already locally high around the road and rail networks. Restoring hedgerows including hedgerow trees, particularly in the southern part of the NCA where many have been lost, will strengthen landscape character and sense of place, while protecting soils and providing components of a wider restored habitat network.	Ensure that new developments and changes in land use are successfully integrated into the landscape, that they respect historic settlement and field patterns and do not compromise the rural character of this landscape. Manage and restore trees in the landscape, including hedgerow restoration in the southern part of the Vale, and management of veteran trees and parkland on the eastern fringes. Protect and where possible enhance natural features and processes, particularly those associated with the rivers and flood plain. Protect areas classified on Campaign to Protect Rural England (CPRE) maps as 'undisturbed' from further intrusion, particularly important along the eastern edge of the Vale adjacent to the North York Moors National Park.	**Sense of place / inspiration** **Sense of history** **Tranquillity** **Biodiversity** **Geodiversity**

Service	Assets/ attributes main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal service offered by opportunities
Sense of history	Archaeological features Historic settlement patterns Building styles	The history of the landscape is evident in late iron-age/Romano-British settlement seen as occasional crop marks, Roman influence along Dere Street (the A1 trunk road) and Ermine Street, Saxon and Medieval origins to settlements, some later rebuilt as planned villages, others surviving only as earthworks, for example at Birkby, Swainby and Winton. Deer parks and hunting lodges developed in the 14th century with increased woodland and tree cover. The area's long history as a transport corridor (Dere Street and the Great North Road, the latter influencing early development of Northallerton and Thirsk as coaching stops) has continued into the modern day with major north-south road and rail routes. The Vale was the location for a number of early military airfields, some now disused, which are a repeated feature across this landscape. The Heritage at Risk register indicates 46 designated monuments currently at risk within the Vale of Mowbray.	Regional	Aspects of history likely to be particularly evident to the general public are the area's medieval churches, vernacular building style of red brick and occasional cobbles with pantile roofs, and the historic market towns of Northallerton and Thirsk. The local presence of military airfields is widely known and evident in the landscape, the army and RAF retaining a visible and audible presence in the area, with hangars and control towers, used and disused, a common feature. There are a number of designed landscapes and parkland across the area, including Kiplin Hall and Upsall Castle.	Ensure that new developments and changes in land use are successfully integrated into the landscape, that they respect historic settlement and field patterns and do not compromise the rural character of this landscape. Strengthen the pattern of historic field systems in the landscape through hedgerow restoration, where key hedgerows have been lost. Manage and restore parkland features, including veteran trees. Minimise damage to archaeological sites from cultivation, particularly along the north-south transport corridors and the hilly edges to the Vale, where there are concentrations of archaeological evidence – seek to protect key sites under permanent pasture or reduce plough depth; seek opportunities to preserve and where appropriate interpret these features. Retain 20th century military remains and structures as features in the landscape. Reduce the number of 'at risk' heritage sites through targeted management and advice.	**Sense of history** **Regulating soil erosion** **Sense of place / inspiration** **Biodiversity** **Recreation**

Service	Assets/ attributes main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal service offered by opportunities
Tranquillity	Agricultural landscape Semi-natural habitats Historic parkland Low population	Tranquillity has declined significantly in recent years. The main factors affecting tranquillity are the major north-south transport corridors, namely the A1, A19 and the East Coast Main Line, as well as Northallerton in the centre of the NCA. The area of the NCA classed as 'undisturbed' declined from over 80 per cent in the 1960s to 40 per cent in 2007.	Local	A sense of tranquillity is most likely to be associated with the rural areas of farmland away from these transport corridors, especially along the undeveloped stretches of the River Swale and within localised parkland and woodland landscapes. The population is relatively low, concentrated in two market towns, and small scattered villages, which contributes to the rural tranquillity.	Seek to contain further disturbance associated with the main transport corridors through enhanced screening by semi-natural vegetation, enhancing biodiversity and strengthening landscape structure and character. Minimise light spill through careful lighting design, particularly in areas classed as 'undisturbed' on the CPRE intrusion maps, and along the eastern fringe of the NCA bordering the North York Moors National Park. Manage woodland and parklands, extending and linking these, to enhance local sense of enclosure and tranquillity. Manage agricultural land to enhance features associated with tranquillity and sense of place, for example increasing permanent grassland and semi-natural habitats in the flood plain and along the River Swale.	**Tranquillity** **Regulating soil erosion** **Regulating water quality** **Sense of place / inspiration** **Biodiversity**

Service	Assets/ attributes main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal service offered by opportunities
Recreation	Rights of way network and other public access River Swale Thirsk and Catterick Race Courses	Recreation and access are supported by 687 km of rights of way (at a density of 1.13 km per km2), including the Coast to Coast route, although there is virtually no open access land within the NCA. The River Swale provides angling opportunities, while horse racing, hunting and field sports are popular throughout the area.	Local	Recreational opportunities, for residents of the Vale of Mowbray and its visitors may be enhanced though improvement to public access in the landscape, primarily in the rights of way network, and a stronger sense of the Vale's history with improved interpretation of aspects of the historic environment. These opportunities should be pursued in ways which will not undermine the Vale's sense of place, or further erode tranquillity levels.	Identify opportunities to create new circular routes or links to existing rights of way, particularly the Coast to Coast long distance route which passes through the Vale of Mowbray. Seek opportunities for educational access to historic farm buildings and other historic sites, and opportunities to interpret the farmed environment.	**Recreation** **Sense of history**
Biodiversity	Sites designated for their nature conservation interest; priority habitats and species	There is a tiny portion (0.08 ha) of one internationally designated site within the NCA - the North York Moors SPA/SAC, designated for containing the largest continuous tract of upland heather moorland in England. There are also five SSSI in the NCA, totalling only 61 ha (0.1 per cent of the NCA area). The largest of these is the Swale Lakes SSSI, adjacent to the River Swale at Catterick, designated for its diverse population of breeding birds and large numbers of wintering wildfowl and waders. In total there is a small area of priority habitats in this NCA covering some 554 ha, the majority of which is flood plain grazing marsh (338 ha) and lowland mixed deciduous woodland (100 ha). There are also smaller areas of wet woodland and undetermined grassland.	Regional	The fragmentation of semi-natural habitat within the Vale means that the best wildlife-rich areas tend to be isolated and lack the resilience of being part of a more robust ecological network. Restoring hedgerows including hedgerow trees, particularly in the southern part of the NCA where many have been lost, will strengthen this component of a wider restored habitat network, while strengthening landscape character, and protecting soils. Managing and extending native woodlands, and riparian and flood plain habitats can achieve these benefits, which also help to regulate soil erosion and water quality and flows. Habitat corridors around the main transport routes – rail and main roads – could be managed and extended to enhance their contribution to the habitat network.	Seek opportunities to restore a more natural river morphology and restore or create flood plain habitats such as flood plain pasture and meadow. Improve the long term condition of designated wildlife sites and core areas of priority habitat by ensuring that underlying contributors to site condition are understood and managed appropriately, and that these are also considered in light of anticipated environmental change. Seek opportunities to expand and buffer these sites, building more robust ecological networks, particularly for grassland, wetlands and for woodland. Seek opportunities to utilise linear transport corridors to create semi-natural habitat and strengthen the habitat network of the Vale.	**Biodiversity** **Regulating soil erosion** **Regulating water quality** **Regulating water flow** **Sense of place / inspiration**

Service	Assets/ attributes main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal service offered by opportunities
Geodiversity	Sites designated or identified for their geological or geo-morphological interest	There are two geological SSSI and one further SSSI (Gormire) with both geological and biological interest, though this lies mostly within the North York Moors and Cleveland Hills NCA.	Regional	The geological SSSIs of the Vale of Mowbray are exposures created within quarries, Black Scar Quarry being of particular research importance as unique mineralisation band exposed marking transition between the northern and southern Pennines. Factors influencing site condition at Black Scar Quarry are scrub and woodland development. Allowing geomorphological processes to function naturally, such as those associated with rivers, may enhance a variety of habitats, as well as improving the value and range of geomorphological features within the NCA.	Maintain the long-term condition of geological and geomorphological sites and features through their appropriate management and the natural functioning of geomorphological processes. Identify and promote the importance of such features through local partnerships with geologists, schools, colleges and other interested parties. Identify further sites of local and regional importance for geology and geomorphology and where appropriate prepare management advice to maintain or restore their interest.	**Geodiversity** **Regulating soil erosion** **Regulating water quality** **Regulating water flow** **Sense of place / inspiration** **Biodiversity**

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

Catalogue Code: NE442
ISBN: 978-1-84754-301-1

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