National Character Area profile:

71: Leicestershire and South Derbyshire Coalfield

Supporting documents

NATURAL ENGLAND

www.naturalengland.org.uk

Introduction

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

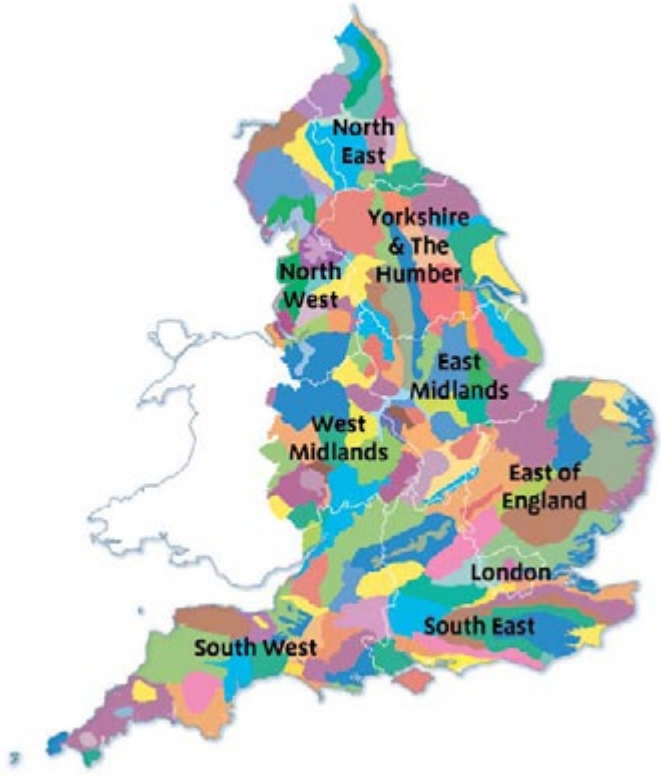
NCA profiles are guidance documents which can help communities to inform their decision-making about the places that they live in and care for. The information they contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and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

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

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

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

National Character Areas map



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

Summary

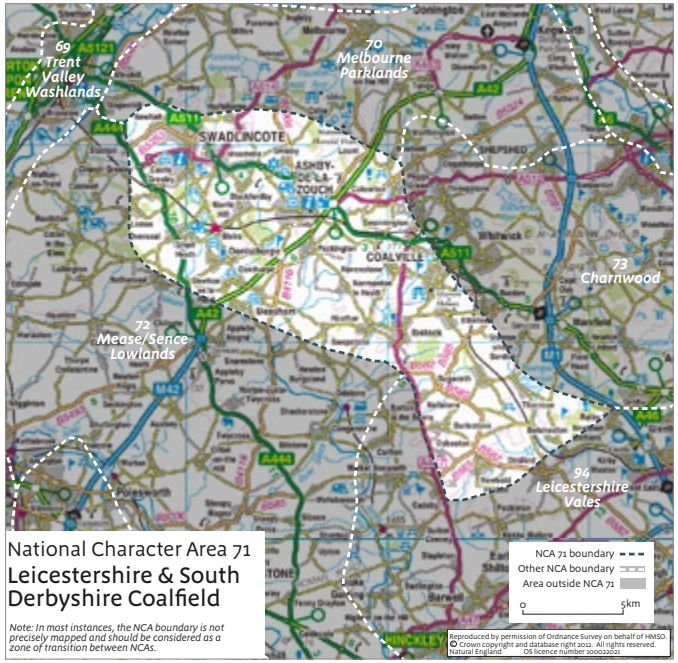
The Leicestershire and South Derbyshire Coalfield landform consists of a plateau with unrestricted views of shallow valleys and gentle ridges that become less pronounced in the south due to a layer of glacial till. To the east the land rises steeply, affording views of the Charnwood National Character Area (NCA). Ancient woodland straddles part of the boundary in the north, where the land falls away affording views of the wooded rolling landscape of the Melbourne Parklands NCA. The River Mease Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC) forms part of the boundary with the Mease/Sence Lowlands NCA in the south-west and the Leicestershire Vales NCA forms a less visually defined border in the south.

The area has a developing woodland character, heavily influenced by work of The National Forest that covers the majority of the NCA and which aims to link the remnant ancient forest landscapes of Melbourne Parklands NCA in the north with those of Charnwood NCA in the east and Needwood and South Derbyshire Claylands NCA in the west.

The landscape is in continuing transition, from an unenclosed rolling landform that was extensively scarred by abandoned collieries, spoil tips and clay pits, to a matrix of new woodland, restored colliery sites, active brick pits and commercial developments that are woven into an essentially rural, agricultural landscape. Settlements consist of a mix of small hamlets, enlarged market towns and former mining settlements.

The wooded spoil tips of abandoned colliery sites, the prevalence of subsidence flashes, the tramways and Ashby Canal are locally prominent features in the landscape and are strong reminders of a long and rich industrial heritage. The medieval remains of the castle in Ashby-de-la-Zouch provide reminders of a pre-industrial heritage and the focus of a wider visitor interest in the area for recreation that is forming the basis of an emerging visitor economy.

Good links to the road network and proximity to East Midlands Airport with its freight terminal mean that the commercial demand for land for housing, agriculture and mineral extraction is likely to increase. This has the potential to further fragment habitats and change settlement patterns, but can also provide opportunities to create a high-quality built environment with multifunctional green space within urban areas and woodland fringe and biomass. There are opportunities to develop the visitor economy, using assets such as The National Forest, heritage sites and the network of heritage trails.



National Character Area 71
Leicestershire & South Derbyshire Coalfield

Note: In most instances, the NCA boundary is not precisely mapped and should be considered as a zone of transition between NCAs.

Statements of Environmental Opportunity

SEO 1: Protect and manage the area's riverine and flood plain environment, its manmade and natural wetland habitats, especially the River Mease for its internationally and nationally important species and range of river plants, for the benefit of biodiversity, sense of place, water quality, recreation, geodiversity and climate regulation.

SEO 2: Manage and conserve ancient and plantation woodland and plan appropriately scaled new woodland cover, particularly in The National Forest; restore and reinstate hedgerows and hedgerow trees and increase biomass provision, timber supply and biodiversity that will mitigate the impact of climate change and enhance the experiential qualities of the area.

SEO 3: Protect and manage the industrial/mining heritage of the coalfield and wider historic landscape; balance the needs of forestry, commercial, industrial and agricultural growth with the developing visitor economy and maintain a high level of public access to the wealth of recreational experiences the National Character Area offers.

SEO 4: Take an integrated approach to managing the natural environment that reflects the strong link between geology and its influence on landscape, biodiversity, industrial development, heritage and settlement pattern of the National Character Area; promote greater understanding of the contemporary link between wildlife and geodiversity, particularly in the distribution of habitats and species, and recognise the importance of former extraction sites for both geodiversity and biodiversity.

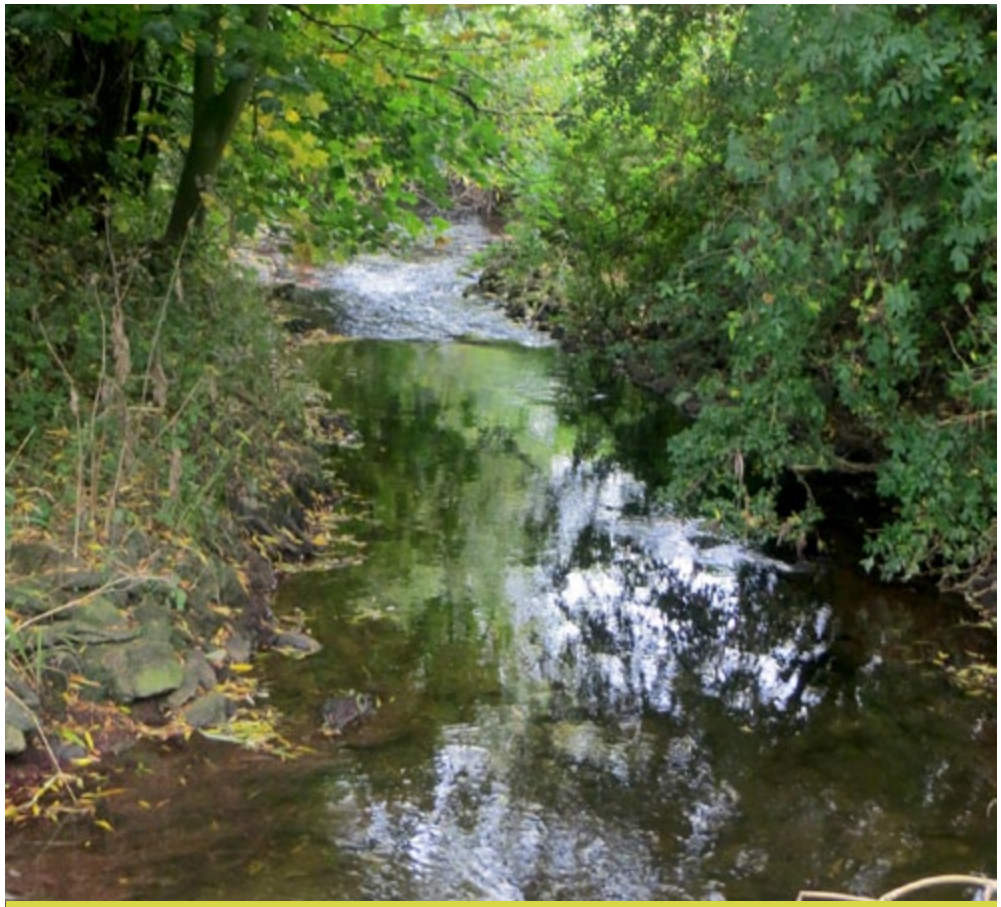
A restored opencast site on the Derbyshire/Leicestershire border near Overseal exemplifies the transition from a landscape extensively scarred by abandoned pits to a matrix of new woodland and wetland.

Description

Physical and functional links to other National Character Areas

The landform of the Leicestershire and South Derbyshire Coalfield National Character Area (NCA) is a plateau with unrestricted views of low ridges and shallow valleys, a characteristic shared with the neighbouring Leicestershire Vales NCA in the south. The River Mease Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC) forms part of the boundary with the Mease/Sence Lowlands NCA to the south-west. To the east the land rises steeply, affording views out across the Charnwood NCA, a result of the Thringstone Fault that limits the eastern extent of the Coal Measures that underlie the majority of the NCA and forms an abrupt boundary with Charnwood NCA. Ancient woodland straddles part of the boundary in the north, where the land falls away affording views of the wooded rolling landscape of the Melbourne Parklands NCA.

The NCA is drained by the relatively unmodified, fast-flowing rivers Mease and Sence and their tributaries, which have a diverse range of channel features, including riffles, pools and slacks. The area forms part of a regional watershed between the River Mease to the south and the River Soar to the east; both rivers join the River Trent, which discharges to the North Sea via the Humber Estuary. Both the River Mease and the River Soar join the River Trent via the Trent Valley Washlands NCA. Many minor, swift-flowing streams drain the area, for example Saltersford Brook and Rothley Brook. The Sherwood Sandstone aquifer occurs at depth and locally at the surface in the central, western and north-western areas. It provides base flow to the rivers and augments supplies of potable water outside the area, including for use in the brewing industry at Burton upon Trent in the



The relatively unspoilt Gilwiskaw Brook is a tributary of the River Mease. The River Mease and Gilwiskaw Brook are special lowland rivers that support internationally significant populations of spined loach and bullhead fish and forms part of the River Mease Special Area of Conservation (SAC).

neighbouring Trent Valley Washlands NCA. Thornton Reservoir, a semi-redundant water supply reservoir, augments water levels downstream of the dam via Rothley Brook, a tributary of the River Soar that flows through Charnwood NCA.

The area has a developing woodland character that is heavily influenced by the regeneration initiative of The National Forest that covers the majority of the NCA and which aims to link the remnant ancient forest landscapes of Melbourne Parklands NCA in the north with those of Charnwood NCA in the east and Needwood and South Derbyshire Claylands NCA in the west.

The NCA has good road and air connections. The north–south- A42, A444, A447 and M1, and East Midlands Airport, are nearby in the east and north respectively. The A511 is the principal east–west route. The Ivanhoe Way and the Leicestershire Round – a 100-mile circular walk around the county of Leicestershire – and the multi-use recreational routes associated with The National Forest offer a wide network of trails and footpaths. The Ashby Canal also provides an important link with the wider area.

A new woodland landscape is unifying the forest area and meeting the original aim of linking the remnant ancient forest landscapes of Needwood and Charnwood.

Key characteristics

- The landscape is unenclosed with shallow valleys, subdued sandstone ridges and a gently undulating plateau.
- There are heavy, poorly draining soils over the Coal Measures and mudstones of the Mercia Mudstone Group, and free-draining soils on the sandstone ridges.

Restored opencast site and new housing within The National Forest at Woodville.

- The area forms part of a regional watershed between the River Mease to the south and the River Soar to the east and has many minor, swift-flowing streams draining the area, for example Saltersford Brook and Rothley Brook. Flooded clay pits and mining have resulted in many subsidence pools or flashes, which in combination with Thornton Reservoir provide valuable open water sites for nature conservation and recreation.
- The area has a developing woodland character that is heavily influenced by the work of The National Forest initiative, which augments locally dense riparian woodland and prominent amenity trees around settlements with developing woodland on former colliery sites.
- Small- to medium-sized fields occur with a wide variation in field pattern, including some narrow, curved fields that preserve the strips of the open field system. Where arable production predominates, fields have been enlarged. Hedgerows are low with a few scattered hedgerow trees and in places show the effects of former open cast workings.
- Agriculture comprises a mixture of arable and mixed sheep and beef units and, to a lesser extent, dairy. Combinable crops are grown on the freer-draining soils. Potatoes are grown in rotation on the heavier soils around Measham and Packington.
- There is remnant acid grassland over sandstone with neutral grassland in the valleys, and acid heathland on open mosaic habitats on previously developed land, particularly colliery spoil. The River Mease SSSI and SAC has internationally important spined loach and bullhead fish and nationally important white-clawed crayfish, otter, and aquatic plants such as water crowfoot.

- Rich heritage assets include Ashby-de-la-Zouch medieval castle and industrial heritage including the Ashby Canal and Moira Furnace, one of the best examples of an early 18th-century blast furnace. Archaeological assets include a moated medieval village at Desford and the Roman town at Ravenstone.
- Traditional vernacular is predominately locally manufactured red brick with tile or slate roofs. Some older buildings are of stone. Locally characteristic around Measham is a double-sized brick of the late 18th century known as the 'Measham gob'. There are many three-storey brick-built farmhouses.
- The settlement pattern is dominated by mining settlements. Isolated hamlets along the roadsides and small villages centred on a church contrast with extensive areas of 20th-century housing and prominent industrial and commercial distribution warehouses at the edge of larger centres, notably Ashby-de-la-Zouch, Measham and Coalville.
- Around Coleorton, a more dispersed pattern of settlement associated with small-scale bell pit mining of the 13th century, spoil heaps, small fields, a dense network of footpaths and a fine example of historic parkland landscape contribute to the distinctiveness of this part of the coalfield landscape.
- The area is easily accessible by major roads and rail and is close to East Midlands Airport. Long-distance recreational routes include the Ivanhoe Way, the Leicestershire Round, and a wide network of local trails and footpaths associated with the recreational assets of The National Forest. The Ashby Canal also provides a link to the wider area.

Ibstock brick pit, just one of a number of pits exploiting the extensive deposits of clay for the manufacture of bricks and tiles.

Leicestershire and South Derbyshire Coalfield today

The Leicestershire and South Derbyshire Coalfield landform is characterised by a repeating sequence of mudstones and sandstones with seatearths and coal seams, which strongly influences both the physical and cultural patterns of the landscape. Part of the South Derbyshire Coalfield has the largest reserves of seatearths or fireclays in England. Ironstone is found as nodules in the mudstone bands and these have been extensively worked. The sequence is easily weathered, which creates a gently undulating landscape with the sandstone beds forming ridges that become less pronounced towards the south where there are locally thick, deep deposits of glacial till.

Lower Coal Measures crop out around Ashby-de-la-Zouch and fireclays, which were the basis of the pottery industry centred on Swadlincote, crop out between Swadlincote and Moira. In the concealed southern section of the coalfield there are extensive deposits of clay suitable for the manufacture of bricks and tiles. The Thringstone Fault limits the extent of the coalfield in the east and defines an abrupt boundary with the Precambrian rocks of Charnwood NCA.

This is a landscape in continuing transformation, in part assisted by the regeneration initiative of The National Forest – from an unenclosed rolling landform that was extensively scarred by abandoned collieries, spoil tips and quarries, to a matrix of developing woodland, restored colliery sites, active brick pits and commercial developments that are woven into an essentially rural landscape, with a mix of small hamlets and former mining settlements.

The area has a developing woodland character heavily influenced by The National Forest initiative that covers the majority of the NCA. The wooded character comprises locally dense areas of riparian woodland and prominent amenity trees around settlements, with developing woodland plantations on former colliery sites. In the north-east, around Coleorton and Newbold, mining has left a legacy of small pasture fields, overgrown hedges, frequent hedgerow trees and small copses. Coleorton Hall hosts the large ancient woodland site of Rough Park.

The Leicestershire and South Derbyshire Coalfield landform consists of a gently rolling, undulating plateau with unrestricted views of shallow valleys and gentle ridges.

Hedgerows enclose small- to medium-sized fields, with a wide variation in field pattern reflecting a diverse history of enclosure and more recent open cast working. Very irregular fields bounded by mixed-species hedgerows containing holly, hawthorn, hazel and field maple mark ancient enclosure. Early enclosure of medieval open fields also tends to show an irregular field pattern, some still featuring the narrow, curved fields that preserve the strips of the open field system.

The NCA forms part of the regional watershed between the River Mease to the south and the River Soar to the east, with many minor, swift-flowing streams draining the area. The River Mease SSSI and SAC comprises the lower reaches of the Gilwiskaw Brook downstream of Packington, and the River Mease downstream of its confluence with the Gilwiskaw Brook; these are special as they are relatively unmodified, lowland rivers and support internationally important populations of spined loach and bullhead fish and nationally important populations of native white-clawed crayfish, otter and water crowfoot. There are many flooded clay pits and deep mining has resulted in subsidence pools or flashes that have become valuable assets for recreation and biodiversity and are within easy reach of large settlements. The largest area of open water is at Thornton, a semi-redundant reservoir that is important for nature conservation and recreation.

The majority of the NCA has good/fair quality soils in terms of their productivity. The predominance of mudstone in the underlying geology tends to give rise to slowly permeable soils. Fine clayey gley soils that are waterlogged in the winter months are the most widespread, with free-draining brown earths occurring over the rare, thicker sandstone beds. Agriculture comprises a mixture of arable and mixed sheep and beef units and, to a lesser extent, dairy. Combinable crops are grown on the freer-draining soils. Potatoes are grown in rotation on the heavier soils around Measham and Packington.

Areas of semi-natural lowland meadow habitat are few and fragmented. Areas of acid grassland occur over sandstone while neutral grassland occurs on the deeper soil in the valleys. Lowland heathland was once widespread across the coalfield but has largely been lost to past mining activities and agricultural expansion, although there is some re-naturalisation of colliery spoil to heath. Open Mosaic Habitats on Previously Developed Land, for example at colliery sites and areas where soil has been removed or severely modified, provide priority habitat for invertebrates and early succession plant communities.

The older settlement pattern is one of small villages and hamlets with buildings clustered around a church. This is dominated by the 19th- and 20th-century former mining villages and small towns with a dense settlement pattern of characteristic terraced houses of red brick, for example Coalville and Swadlincote. Ashby-de-la-Zouch, with the remains of its medieval castle, retains the character of a small market town. The open aspect of the landscape around Ashby and the remains of the castle were the setting for Sir Walter Scott's historic novel *Ivanhoe*.

In an open landscape, the settlements are prominent and urban-fringe expansion – developments of warehousing, light industrial units and large out-of-town retail outlets – is making an increasing visual impact on the landscape.

There are good connections to the road network: Coalville and Ashby-de-la-Zouch have direct links to the M1 and in the west the M42/A42 links south to Birmingham and north to the M1. A network of minor roads connects the numerous villages.

The area has a dense network of footpaths across farmland connecting settlements and outlying farmsteads and a number of long-distance paths, for

example Ivanhoe Way and the Leicestershire Round – a 100-mile circular walk around the county of Leicestershire. The National Forest Company promotes a number of walks that link new woodlands with former industrial sites and nature reserves, for example *Coal Tips to Country Parks* walks and The National Forest trail that is in development.

The industrial archaeological interest of coal, iron and fireclay mines, surface workings, cottages, tramways and visitor attractions, for example Moira Furnace, the Snibston Discovery Museum and the Ashby Canal, are forming the basis of a developing visitor economy. The National Forest is creating positive change and environmental enhancement with recreational and educational activities close to population centres, for example Conkers Discovery Centre.

The 12th-century manor house at Ashby-de-la-Zouch, which became a castle in the 15th-century, serves as a reminder of the town's long history and influenced Sir Walter Scott's writing of Ivanhoe.

The landscape through time

The Pennine Coal Measures of the Leicestershire and South Derbyshire Coalfield were laid down during the Carboniferous Period, in warm, swamp-like rainforest conditions, around 300 to 318 million years ago, producing frequent coal seams.

An opencast coal site in the late 1990s near Measham shows a well bedded sequence of sandstones and mudstones overlying a coal seam on the floor of the excavation. The extraction of coal by opencast methods continues.

The area can be divided geologically into two sections: a northern section, where the Coal Measures are exposed; and a southern section, where they are concealed beneath the Triassic Mercia Mudstone Group and the sandstones and conglomerate of the Sherwood Sandstone Group of the Early Triassic Period. These sediments form the Sherwood Sandstone aquifer, the second most important in England. The Mercia Mudstone Group was deposited mainly as dust in a widespread, flat desert area. Periodic rainstorms produced flash floods that deposited thin beds of siltstone and fine-grained sandstone. Gypsum also occurs in these beds.

Superficial deposits comprise both till and glacio-fluvial sand and gravel. They were deposited approximately 440,000 years ago and occur mainly around Ibstock, west of Packington and north of Ashby-de-la-Zouch.

Evidence of Roman settlement is limited to the buried artefacts near Ravenstone that include the remains of a pottery and tile kilns. References to heathland in place names throughout the area, for example Normanton Le Heath, suggest that the wildwood that covered most of Britain had been cleared at an early date in prehistory. However, place names like Willesley indicate that there were still considerable areas of woodland during Anglo-Saxon occupation, while the ton and worth names are evidence of settlements dating from that time. The thorps in place names, for example Donisthorpe, are legacies of Viking occupation during the 9th and early 10th centuries. By the time of the Domesday survey in 1086, the area was still sparsely populated. Settlements were separated by large areas of open common heath for grazing and in some cases by extensive deer parks and chases.

There were medieval parks at Ashby-de-la-Zouch and the remains of the 12th-century manor house, which became a castle in the 15th century, serve as a

reminder of the town's long history. Much of the area appears to have been open common, particularly in the north. In the areas suitable for cultivation, the open fields that developed during the Middle Ages were mainly enclosed before the end of the 16th century.

Mining has significantly changed this landscape through time. Evidence shows that coal was being mined in Swannington as far back as 1293. By 1520 there were five pits there and active mining at Newbold, Oakthorpe and Coleorton, with Measham becoming active in the following century.

With the invention of steam power in the 18th century, industry developed considerably in the area and by the 19th century an expanding transport network, with the construction of the Ashby Canal and its tramways, opened up the area around Moira where coal, fireclay, and lime from the nearby Ticknall and Dimminsdale lime quarries were extracted. Later in the century this transport network enabled expansion to several other areas, including deep mines in the concealed coalfield at Hugglescote, Ellistown, Nailstone and Desford. Coal mining, lime working, a blast furnace and a spa developed at Moira, the evidence now preserved in a museum complex on the site.

In a traditionally sparsely populated area, mining has heavily influenced the settlement pattern. The older pattern, of small villages and hamlets with buildings clustered around a church, began to be dominated by the 19th- and 20th-century mining villages with blocks of terraced miners' cottages built of red brick, with tile or slate roofs. Frequent, isolated groups of cottages along the roadsides and new mining towns were built, for example Coalville, while previously small hamlets like Snibston and Hugglescote were enlarged to accommodate an influx of miners. Mining subsidence has been a continual problem over the years throughout the area. In recent years, pumping water from the abandoned coal mines has ceased. Water levels have risen and polluted water is now flowing out into the surface rivers. A side effect of this has seen the ground starting to rise rather than subside.

During the 20th century the brick-making industry expanded in the southern part of the area, notably around Ibstock, and extensive open cast mines developed. The closure of deep coal mines led to large-scale unemployment and the development of a rather neglected character to the mining villages and a landscape scarred by tips of deep mines, abandoned colliery sites, tramways and open cast sites. The last mine to close in the area was at Bagworth, in 1991

Expansion to commercial agriculture during the 20th century resulted in larger field sizes, enabling cultivation by larger, heavier machinery. Good links to the road network assist the distribution and processing of food – for example, there is a potato processing and packing plant located close to the A42 near Measham.

During the 21st century The National Forest has been transforming the landscape, reclaiming derelict land and abandoned colliery sites. Flooded clay pits have become sites of ecological importance, while some former colliery sites and clay pits are now local nature reserves and country parks providing recreational amenities close to populated areas. The infrastructure of industry is now forming the basis of a developing visitor economy, with visitor and heritage centres – for example, at Conkers and Snibston. The brick-making industry remains important to the area as evidenced by the recent expansion of a factory at Measham, with estimated clay reserves of 25 years.

The rate of change to urban areas is high. There has been significant urban development around Swadlincote and east of Ellistown. To the north of the

old market town of Ashby-de-la-Zouch and Coalville there are prominent warehouses for industrial and commercial distribution, and the modern brickwork sites at Ibstock and Measham also have large industrial buildings. The northern bypass around Ashby, the M42 and good links to the M1 and to East Midlands Airport mean that ribbon development is likely to continue. The challenge to finance the management of both woodland and sites of heritage and ecological importance is likely to increase. Schemes such as Payments for Ecosystem Services, and the development of markets and supply chains for wood as a by-product of forestry management and 'developer contribution schemes', may provide sources of revenue to sustain the management of these sites.

Mining subsidence has been a continual problem and in recent years pumping water from the abandoned coal mines has ceased – as a consequence, the ground has started to rise rather than subside and water levels are higher with the potential for pollution to surface waters.

There is a rich industrial heritage including the Moira Furnace, one of the best examples of an early 18th-century blast furnace which is part of an attractive museum complex.

Ecosystem services

The Leicestershire and South Derbyshire Coalfield 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 Leicestershire and South Derbyshire Coalfield NCA is contained in the 'Analysis' section of this document.

Provisioning services (food, fibre and water supply)

- **Food provision:** Food provision is important to the region. Agriculture comprises mixed sheep and beef units and, to a lesser extent, dairy; combinable crops are grown on the free-draining soils, and potatoes on the heavier soils around Measham and Packington. The predominance of Coal Measures geology produces poor, slowly permeable soils and fine clayey gley soils that are waterlogged in the winter months. The National Forest offers financial incentives to farmers to convert the less productive agricultural land to woodland and other associated habitats.

- **Water availability:** The rivers Mease and Sence and their tributaries are the primary supplies of water available for water abstraction in the Humber catchment. Unsustainable abstraction results in low flow levels that have a negative impact on biodiversity and water quality in terms of Water Framework Directive assessment and also the experiential qualities of the NCA. Part of the NCA is underlain by the deep Sherwood Sandstone aquifer that provides base flow to the rivers and storage capacity, which no surface reservoir can match in terms of quantity and quality, and water from this is used by the brewing industry in Burton upon Trent.

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

- **Regulating water quality:** Failing ecological status for stretches of the watercourses in the area is a result of channel modifications, diffuse pollution from fertiliser and pesticides, and discharges from sewage treatment plants. Rising mine water also poses a threat to water quality and requires careful management to prevent it from entering public supplies and sensitive habitat. Good water quality is particularly important for public and industrial use, and the River Mease SSSI and SAC is a priority catchment under the Catchment Sensitive Farming Programme, which is focused on reducing diffuse water pollution, for example phosphate and sediment, to protect the aquatic environment, particularly the internationally important populations of spined loach and bullhead fish.

Cultural services (inspiration, education and wellbeing)

- **Sense of history:** The character of this NCA is heightened by the clear evidence of past human land use and visual links with the past, principally through mineral extraction. Sites of historic and cultural significance require maintenance, promotion and interpretation to ensure their longevity in the landscape and culture of the NCA – for example, the Moira Furnace site. Opportunities exist for the area's industrial heritage to form the basis of visitor attractions such as the Snibston Discovery Museum, which can bring about an improved enjoyment of the landscape and improved management. Tourism can provide employment and benefit the local economy. Parklands and associated country homes provide a sense of the wealth that the industry brought to the area and remain an important historic asset. The settlement pattern reflects the process of change and development. Although many rural villages and scattered farmsteads remain, many villages have expanded. The continued

expansion of settlements may pose a risk of losing traditional settlement patterns, especially the distinctive pattern of the early 13th-century mining settlements around Coleorton.

- **Recreation:** Linear routes, for example the Ashby Canal and its towpath, link the NCA with the neighbouring Mease/Sence Lowlands NCA, while woodland walks in the north of the NCA cross into the Melbourne Parklands NCA. The mining and industrial infrastructure of the NCA is now a valuable asset for recreation, biodiversity and tourism and is within easy reach of the city of Leicester. Thornton Reservoir, a semi-redundant public water supply reservoir, is now important for biodiversity and recreation. Other open bodies of water associated with mineral extraction sites could also be restored for public access, ideal for circular strolls.

- **Biodiversity:** The River Mease and Gilwiskaw Brook are special lowland rivers as they are relatively unspoilt and support internationally important populations of spined loach and bullhead fish. This is why the rivers were designated as an SAC under the EU Habitats Directive, and as an SSSI under the Wildlife and Countryside Act. The rivers also support populations of white-clawed crayfish, otter, and a range of river plants such as water crowfoot.

The National Forest is becoming increasingly influential in the landscape, not only creating new woodland but also a new tourism resource and improving recreation and public access opportunities.

Statements of Environmental Opportunity

SEO 1: Protect and manage the area's riverine and flood plain environment, its manmade and natural wetland habitats, especially the River Mease for its internationally and nationally important species and range of river plants, for the benefit of biodiversity, sense of place, water quality, recreation, geodiversity and climate regulation.

For example by:

- Working in collaboration with partners to achieve the objectives of the River Mease priority catchment of the Catchment Sensitive Farming Programme and the Water Framework Directive – addressing the reasons for bad ecological quality by reducing diffuse water pollution and, in conjunction with Environmental Stewardship schemes, buffering watercourses from adjoining land uses.
- Working in partnership to re-naturalise modified sections of the River Mease and its tributary, Gilwiskaw Brook, removing weirs and other barriers to migration.
- Working in collaboration to improve water quality by tackling pesticide, fertiliser and sewage diffuse pollution sources.
- Enhancing the visual and ecological continuity of river corridors and their tributaries through positive management – for example, facilitating natural regeneration and, where appropriate, planting riparian trees and vegetation that can stabilise soils and slow water flow, particularly in the upper parts of the catchments.
- Identifying natural floodwater storage areas and protecting them from inappropriate development; planting reedbeds that can filter and slow flow rates, thus alleviating flooding of agricultural land and providing benefits to biodiversity.
- Avoiding uniform pollarding to conserve and manage mature and over-mature trees within riparian environments, thus ensuring a supply of coarse woody debris, important for aquatic and invertebrate species, where it does not increase the risk of flooding.
- Judiciously managing riparian woodland to provide adequate shade, which can significantly reduce peak summer temperatures, thus maintaining water temperatures within a favourable range for salmonid fish and other sensitive freshwater fauna.
- Evaluating the services that the riverine environment provides, through ecosystem services assessments, to inform 'developer contribution schemes' that can provide sources of revenue to sustain the management of these sites.

SEO 2: Manage and conserve ancient and plantation woodland and plan appropriately scaled new woodland cover, particularly in The National Forest; restore and reinstate hedgerows and hedgerow trees and increase biomass provision, timber supply and biodiversity that will mitigate the impact of climate change and enhance the experiential qualities of the area.

For example by:

- Supporting the vision of The National Forest Strategy – to unify the forest area by planting native and mixed-species woodland to link the remnant ancient forest landscapes of Melbourne Parklands National Character Area (NCA) in the north with those of Charnwood NCA in the east and Needwood and South Derbyshire Claylands NCA in the west – to benefit landscape character, biodiversity and climate change.
- Encouraging farm diversification to woodland in order to reverse the fragmentation of ancient and plantation woodland in the NCA, for example Rough Park and Lount Wood.
- Reversing the fragmentation of semi-natural habitat; where appropriate, creating new wetlands, lowland meadows and lowland heathlands to increase biodiversity, mitigate the effects of climate change and strengthen landscape character while increasing the experiential qualities of the NCA.
- Increasing woodland cover in blocks of all sizes, except in the Coleorton historic mining area where only small-scale planting is appropriate, and developing community woodlands adjacent to urban areas.
- Reversing fragmentation of woodland by restoring typical zones of woodland types from alder, crack willow, hazel, and grey willow in valleys, to oak/birch woodland on higher slopes; developing and managing transitional scrub communities between woodland and adjoining habitats to create a coherent, robust habitat network.
- Finding a financially sustainable solution to woodland management by seeking an economic return on the by-products of woodland management; developing supply chains, encouraging demand for wood fuel in urban areas and encouraging the installation of wood-fuelled boilers in local amenity buildings.
- Reinstating native woodland on Plantations on Ancient Woodland Sites (PAWS).
- Encouraging the restoration of hedgerows with typical species, through gapping up and reinstating by new planting, ensuring the distinction between early and contemporary hedged enclosures with their historically different enclosure patterns and complements of hedgerow trees; adopting appropriate cutting regimes and tagging to extend the age range and species diversity.
- Maintaining historic parklands, restoring their key historic features and maintaining their structural and age diversity, providing access where appropriate.
- Training volunteers to assist with the surveillance of key habitats and species by surveying to monitor the health, distribution and population sizes of species as evidence of habitat quality.

SEO 3: Protect and manage the industrial/mining heritage of the coalfield and wider historic landscape; balance the needs of forestry, commercial, industrial and agricultural growth with the developing visitor economy and maintain a high level of public access to the wealth of recreational assets the National Character Area offers.

For example by:

- Supporting the objectives of The National Forest Strategy; restoring mineral and derelict sites; providing opportunities for agriculture, woodland creation, biodiversity, public access, sport, recreation and tourism development.
- Managing the impact of visitors on sites by ensuring that paths are adequately signposted and surfaced to prevent erosion and to divert public access away from sensitive habitats; providing sustainable transport solutions to alleviate potential traffic congestion; developing an integrated transport network between visitor attractions, linking with public rights of way, canal towpaths and cycle routes.
- Encouraging more visitors to the open countryside for quiet enjoyment, and meeting the needs of diverse audiences, improving health and wellbeing, while reducing the number of visitors to traffic-congested sites.
- Seeking ways to sustainably manage the demand for water and energy resources and providing recycling facilities at tourist destinations, to minimise the impact on the environment and to raise awareness.
- Conserving the many redundant mining features of industrial archaeological interest, ensuring that afforestation and redevelopment of former industrial land preserve the industrial heritage.
- Using new technological solutions to interpret the natural and built environments of the coalfield, its habitats, artefacts and historic buildings, describing the role of each in the heritage and development of the landscape over time.
- Supporting the objectives of the English Heritage conservation areas, ensuring that sustainable use of historic buildings does not compromise their characteristic features.
- Maintaining and/or restoring key landscape features, for example vistas, preserving archaeological sites and maintaining historic parkland and associated buildings, and providing access and interpretation where possible.
- Agreeing management strategies to protect buried archaeology by adopting shallow cultivation methods or protecting under permanent grass leys.

Hicks Lodge cycle park in The National Forest is one of many recreational assets that the Forest has to offer.

SEO 4: Take an integrated approach to managing the natural environment that reflects the strong link between geology and its influence on landscape, biodiversity, industrial development, heritage and settlement pattern of the National Character Area; promote greater understanding of today's link between wildlife and geodiversity, particularly in the distribution of habitats and species, and recognise the importance of former extraction sites for both geodiversity and biodiversity.

For example by:

- Conserving post-industrial sites of ecological value and recognising that local features resulting from quarrying and mining activity, such as flashes created by subsidence, have potential as wildlife and recreation sites.
- Recognising the biodiversity potential of open mosaic habitats on previously developed land; identifying a suite of sites and protecting them for the niche habitats they provide for invertebrates and first succession plants.
- Encouraging the natural regeneration and management of heathland on spoil tips and, where ecological conditions allow, planting new areas of heathland to reverse the fragmentation of this habitat that once covered the coalfield, in order to increase carbon sequestration and for its value as a late source of nectar.
- Protecting and maintaining the natural geomorphological features and exposures in the river valleys and stream banks to maintain ecological status, and providing opportunities for research and education to study past environmental change and enhance recreational experience.
- Providing interpretation and educational material at heritage centres, considering new technological solutions to interpret and describe the important role of geodiversity in the heritage and development of the landscape over time.
- Developing and promoting geology trails, in partnerships with, for example, the British Geological Survey and The National Forest.
- Raising awareness of local geodiversity assets, for example fossil and mineral collections at local museums and heritage centres, and providing areas for recreational fossil hunting.
- Supporting the objectives of the Local Geodiversity Action Plan, by conserving and managing the suite of Local Sites to protect and improve their condition by agreeing management plans with owners and occupiers and undertaking restorative management of designated sites.
- Encouraging geodiversity partnerships to train volunteers in surveying techniques and geo-conservation methods, with the objectives to improve the quality of sites and to retain the knowledge and skills required for future management of sites.
- Ensuring that the restoration proposals for former mineral extraction sites, for example at Acreswood Quarry and Cadeby Gravel Pit, include provision of geological exposures for recreation, education and scientific research; and, where appropriate, improving access to cuttings, quarries and other geological features by improving footpaths and providing signage and interpretation.

Additional opportunity

1: Ensuring that, in this open landscape, the design of urban-fringe developments of warehousing, light industrial units and large retail outlets mitigates the visual impact on the landscape and that levels of noise and light pollution are minimised to preserve areas of tranquillity.

For example by:

- Ensuring the careful design and positioning of lighting and buildings in the urban-fringe areas and mitigating visual impact by planting shelterbelts or constructing bunds where appropriate and compatible with the landscape character.
- Ensuring that all new developments provide areas of greenspace, thus contributing to green infrastructure, and incorporate elements of sustainable urban drainage – for example, unsealed surfaces that allow water infiltration; and seeking ways to expand the rights-of-way network both within and between new developments.
- Planting blocks of trees and street trees in urban areas to provide shade, thus mitigating the effect of the urban heat island, increasing water infiltration rates and purifying the air, and helping to reduce the impact of higher summer temperatures through climate change.
- Ensuring that the designs of expanding settlements contribute to high-quality built and natural environments that respect the juxtaposition, scale and materials of traditional local buildings characteristic of the area.
- Minimising signage and the use of inappropriate street furniture and urban-style highway improvements in traditional settlements.
- Retaining areas of open landscape, resisting urban development into undisturbed areas, and buffering where appropriate to retain areas of tranquillity.

Supporting document 1: Key facts and data

Total area: 20,471 ha

1. Landscape and nature conservation designations

There are no landscape designations in this NCA.

Source: Natural England (2011)

1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation de1signations:

Tier	Designation	Name	Area (ha)	% of NCA
International	n/a	n/a	0	0
European	Special Protection Area (SPA)	n/a	0	0
	Special Area of Conservation (SAC)	River Mease SAC	4	<1
National	National Nature Reserve (NNR)	n/a	0	0
National	Site of Special Scientific Interest (SSSI)	A total of 3 sites wholly or partly within the NCA	15	<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 62 local sites in the Leicestershire and South Derbyshire Coalfield NCA covering 289 ha which is 1 per cent of the NCA.

Source: Natural England (2011)

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

1.1.1 Condition of designated sites

SSSI condition category	Area (ha)	% of SSSI land in category condition
Unfavourable declining	3	23
Favourable	2	12
Unfavourable no change	5	33
Unfavourable recovering	5	33

Source: Natural England (March 2011)

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

2. Landform, geology and soils

2.1 Elevation

Elevation ranges from 63 m above sea level to a maximum of 186 m around the area of Pistern Hill. The average elevation of the landscape is 124 m above sea level.

Source: Natural England (2010)

2.2 Landform and process

The coalfield landform consists of gentle ridges and shallow valleys which, as a result of glacial deposits, are softened and less pronounced in the south. The Thringston Fault forms an abrupt boundary between the Leicestershire and South Derbyshire Coalfield and Charnwood in the east. To the north, the land falls away towards the wooded rolling landscape of the Melbourne Parklands. The Mease/ Sence Lowlands, together with the Leicestershire Vales, lie on the respective south-western and southern borders. The area has very little woodland or scrub cover and is heavily influenced by mixed agricultural and extraction industries. Spoil tips of deep mines, abandoned colliery sites, tramways, opencast sites, fire clay pits and extensive brick pits are all prominent features in the landscape.

Source: Coal Measures Natural Area profile, Leicestershire and South Derbyshire Countryside Character Area description.

2.3 Bedrock geology

The bands of sandstone, mudstone and coal measures form a gently undulating plateau of ridges and shallow valleys. In the north of the area Coal Measures of the Carboniferous Period are exposed.

In the eastern area, the exploitation of fire clay has resulted in a productive industry developing around Swadlincote. In the south, the Coal Measures are concealed beneath Mercia Mudstone. These rocks are themselves overlain by glacial till that is extracted for the manufacture of bricks and tiles. Bands of sandstone, mudstone and coal measures combine to form a gently undulating plateau of ridges and shallow valleys.

The Leicestershire and South Derbyshire Coalfield consists of a northern section, where the Lower, Middle and Upper Coal Measures of the Carboniferous Period are exposed, and a southern section where they are concealed beneath Mercia Mudstone and Sherwood Sandstone.

An anticline which plunges gently to the south-east results in the unproductive Lower Coal Measures being brought to the surface around Ashby-de-la-Zouch, so that the coalfield is effectively divided into eastern and western halves. In the western half, fireclays crop out between Swadlincote and Moira and are the basis of the industry centred on Swadlincote.

In the concealed part of the coalfield there are extensive deposits of clay suitable for the manufacture of bricks and tiles. The Thringstone Fault defines an abrupt boundary with Lower Carboniferous strata and the Precambrian rocks of Charnwood at the eastern boundary. To the north-east, just outside the area, there are outcrops of Carboniferous Limestone, as at Breedon, which have played an important part in the coalfield's development.

Source: Coal Measures Natural Area profile, Leicestershire and South Derbyshire Countryside Character Area description.

2.4 Superficial deposits

In the south of the NCA, glacial till softens the landscape forming a gently undulating plateau of ridges and shallow valleys. The glacial till is extracted for the manufacture of bricks and tiles.

Source: Coal Measures Natural Area profile, Leicestershire and South Derbyshire Countryside Character Area description.

2.5 Designated geological sites

Designation	Number of sites
Geological Site of Special Scientific Interest (SSSI)	0
Mixed interest SSSI	0

There are 2 Local Geological Sites within the NCA.

Source: Natural England (2011)

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

2.6 Soils and Agricultural Land Classification

Soils within farmlands are generally poor and predominantly heavy, clayey to loamy in texture and seasonally waterlogged. These traditionally support dairy farming but in some areas, where soils are more freely draining over sandstone, there is a stronger presence of arable farming. Mining activity has resulted in the disturbance of soils and decline in their quality. Wastelands have nutrient poor clays and exposed colliery tips with free-draining, acid substrates.

Source: Coal Measures Natural Area profile, Leicestershire and South Derbyshire Countryside Character Area description.

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

Agricultural Land Classification	Area (ha)	% of NCA
Grade 1	0	0
Grade 2	2,058	10
Grade 3	13,418	66
Grade 4	3,917	19
Grade 5	0	0
Non-agricultural	0	0
Urban	1,079	5

Source: Natural England (2010)

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

3. Key water bodies and catchments

3.1 Major rivers/canals

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

Name	Length (km)
River Mease	2
Ashby-de-la-Zouch Canal	1

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 coalfield forms part of the watershed between the Mease and Sence to the south and the Soar to the east, with numerous brooks draining the generally undulating land.

Thornton Reservoir used to provide water for parts of Leicestershire but Severn Trent Water no longer uses it as a source of water. The 31-hectare site is now a refuge for a diversity of wildlife, including mammals, birds, butterflies and dragonflies.

3.2 Water quality

The total area of Nitrate Vulnerable Zone is 20,471 ha or 100 per cent of the NCA.

Source: Natural England (2010)

3.3 Water Framework Directive

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

4. Trees and woodlands

4.1 Total woodland cover

This NCA contains 3,138 ha of woodland (where woodlands are over 2 ha in size), covering 15 per cent of the NCA, including 227 ha of ancient woodland.

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

4.2 Distribution and size of woodland and trees in the landscape

The area has a developing woodland character heavily influenced by The National Forest initiative that covers the majority of the NCA. The wooded character comprises locally dense areas of riparian woodland and prominent amenity trees around settlements with developing woodland plantations on former colliery sites. In the north-east, around Coleorton and Newbold, mining since the 13th century has left a legacy of small pasture fields, overgrown hedges, frequent hedgerow trees and small copses. Coleorton Hall hosts the large ancient woodland site of Rough Park.

Source: Coal Measures Natural Area profile, Leicestershire and South Derbyshire Coalfield Countryside Character Area description.

4.3 Woodland types

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

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

Woodland type	Area (ha)	% of NCA
Broadleaved	1,844	9
Coniferous	88	<1
Mixed	58	<1
Other	1,148	6

Source: Forestry Commission (2011)

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

Woodland type	Area (ha)	% of NCA
Ancient semi-natural woodland	127	1
Ancient re-planted woodland (PAWS)	100	<1

Source: Natural England (2004)

5. Boundary features and patterns

5.1 Boundary features

Much of the farmland retains its former character of sparse, low hedgerows with few hedgerow trees, but this pattern is changing as the hedgerow structure is strengthened through new planting. Boundary enhancement is an objective of The National Forest, but should be carefully managed to maintain the distinction between early and later hedged enclosures with their historically different complements of hedgerow trees.

Source: Leicestershire and South Derbyshire Countryside Character Area description; Countryside Quality Counts (2003); Geological Narrative; West Midlands Geodiversity Partnership

5.2 Field patterns

There is a wide variation in field pattern, with many irregular fields interspersed with areas of parliamentary enclosure with geometric-shaped fields. Where arable predominates fields have been enlarged. Small pasture fields, overgrown hedgerows, frequent hedgerow trees and small copses are common in the north-east around Coleorton and Newbold.

Source: Leicestershire and South Derbyshire Countryside Character Area description; Countryside Quality Counts (2003); Geological Narrative; West Midlands Geodiversity Partnership

6. Agriculture

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

6.1 Farm type

The total farmed area in 2009 was 11,797 ha, comprising a total of 219 holdings. This represents a slight decrease from 2000 when the total farmed area was 11,950 ha comprised of 235 holdings.

Source: Agricultural Census, Defra (2010)

6.2 Farm size

Farms between 5 ha and 20 ha are the most numerous, with 63.There are 40 farms over 100 ha in size, totalling 7,001 ha of the farmed area representing approximately 60 per cent of the total.

Source: Agricultural Census, Defra (2010)

6.3 Farm ownership

2009: Total farm area = 11,797 ha; owned land = 8,857 ha
2000: Total farm area = 11,950 ha; owned land = 8,791 ha

Source: Agricultural Census, Defra (2010)

6.4 Land use

Farming activity is predominantly lowland grazing with 66-holdings in 2009, representing 30 per cent of the total holdings. This figure has increased relative to 2000 when 57 holdings were registered lowland grazing. Cereal growing represents 24 per cent of the total holdings with 53 holdings registered in 2009. This is a similar number to 2000. Dairying has decreased during the period 2000 to 2009 with a 38 per cent reduction in holdings registered (10 in 2009). Comparing statistics for 2000 and 2009, the largest reduction in holdings has been in the 'mixed' and 'other' registered holdings with a 57 per cent and 100 per cent decrease respectively.

Source: Agricultural Census, Defra (2010)

6.5 Livestock numbers

Comparing statistics for 2000 and 2009 there has been a significant decrease in the number of livestock: a 20 per cent decrease in the number of cattle from 10,814 to 8,631; a 17 per cent decrease in the number of sheep from 11,518 to 9,506; and a 16 per cent decrease in the number of pigs from 4,285 to 3,582.

Source: Agricultural Census, Defra (2010)

6.6 Farm labour

There were 334 principal farmers in 2000. This compares to 312 in 2009. There has been a reduction in the number of full-time, part-time and casual workers employed since 2000 (full-time from 73 to 34, part-time from 77 to 36 and casual from 56 to 19).

Source: Agricultural Census, Defra (2010)

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

7. Key habitats and species

7.1 Habitat distribution/coverage

The landscape is in continued transition, from an unenclosed rolling landform, extensively scarred by abandoned collieries, spoil tips and quarries to a matrix of new woodland, restored colliery sites, active brick pits and commercial developments that are woven into an essentially rural landscape. The presence of localised patches of sandier acid soils that occur in some areas overlying the sandstone outcrops, has resulted in the development of 'heathy' habitats. These unimproved neutral grasslands with their concentrations of meadow saxifrage, knotted clover and nettle-leaved bellflower provide colour in the summer. A once more widespread presence of this former habitat, particularly on the ridges, hill summits and steeper slopes, is indicated by place names

such as Heather and Normanton-le-Heath in Leicestershire. Overall, the The National Forest has created 340 ha of new nature conservation and heritage sites. Thornton Reservoir is a refuge for a diversity of wildlife, including mammals, birds, butterflies and dragonflies. In 2005, Thornton Reservoir was designated as a Local Wildlife Site due to its importance for wildlife.

Source: Leicestershire and South Derbyshire Coalfield Countryside Character Area description, Coal Measures 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)	% of NCA
Lowland meadows	17	<1
Lowland heathland	17	<1

Source: Natural England (2011)

Maps showing locations of priority habitats are available at

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

7.3 Key species and assemblages of species

- Maps showing locations of Priority Habitats are available at: http://magic.defra.gov.uk/website/magic/
- Maps showing locations of S41 species are available at http://data.nbn.org.uk/

8. Settlement and development patterns

8.1 Settlement pattern

The settlement pattern reflects the process of change and development. While many rural villages and scattered farmsteads remain, with older buildings often constructed in the local Coal Measures sandstone, many villages have been expanded into sprawling mining settlements with red brick former mining terraces and ribbon development.

The area has quite a dense settlement pattern which is dominated by very large mining villages such as Coalville and Swadlincote. These settlements are now surrounded by extensive recent housing estates making them prominent settlements.

There has been significant expansion of urban and urban fringe into peri-urban around Swadlincote, and there is a marked concentration of development on the eastern boundary of the area near to Ellistown.

Ashby-de- la-Zouch, which lies at the centre of the coalfield, but outside the main coal deposits, retains something of the character of a small market town.

Beyond these settlements are numerous small villages together with small roadside groups of cottages and isolated older house.

The area around the edges of the settlements has an urban fringe character created by horse grazing, patchy fencing, sheds, run down pastures and quite extensive area of light industrial development.

As well as the larger villages there are many smaller ones but there are also small roadside groups of cottages and isolated older houses.

Source: Leicestershire and South Derbyshire Countryside Character Area description; Countryside Quality Counts (2003); Geological Narrative; West Midlands Geodiversity Partnership

8.2 Main settlements

The main settlements are: Ashby-de-la-Zouch; Coalville and Swadlincote. The total estimated population for this NCA (derived from ONS 2001 census data) is: 105,354.

Source: Leicestershire and South Derbyshire Countryside Character Area description; Countryside Quality Counts (2003); Geological Narrative; West Midlands Geodiversity Partnership

8.3 Local vernacular and building materials

Older buildings are made of Coal Measures Sandstone, particularly in and around Ashby-del-Zouch. Houses are principally built of red brick, with tile or slate roofs. Blocks of brick-built terraced miners' cottages are frequent in the smaller hamlets and in isolated groups along the roadsides. A peculiarity of the area is the double-sized brick of the late 18th century used in the Measham area and known as the 'Mesham gob'.

Source: Leicestershire and South Derbyshire Countryside Character Area description; Countryside Quality Counts (2003)

9. Key historic sites and features

9.1 Origin of historic features

The area has a strong industrial heritage, with the Ashby Canal, Moira Furnace and many tramways, miners' cottages and old brick buildings. The Moira Furnace Museum Trust is now located in the impressive iron-making blast furnace built by the Earl of Moira in 1804 and now fully restored. It houses a new industrial history exhibition and the site also features lime kilns, a woodland, a group of small workshops and a section of the restored Ashby Canal. The Ashby Canal suffered from mining subsidence during the first half of the 20th century and was progressively closed but recent restoration activity has seen the restoration and reopening of the Ashby Canal from Snarestone to Moira. There were medieval parks at Ashby-de-la-Zouch, Preslop, Whitwick, Bardon, and Bagworth. Ashby-de-la-Zouch Castle, the ruins of which can still be seen, dates from the late 15th century.

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

9.2 Designated historic assets

This NCA has the following historic designations:

- 3 Registered Parks and Gardens covering 139 ha.
- No Registered Battlefields.
- 17 Scheduled Monuments.
- 382 Listed Buildings.

Source: Natural England (2010)

More information is available at the following address:

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

10. Recreation and access

10.1 Public access

- The National Forest Discovery visitor and activity centre near Moira is named Conkers and is a popular recreation, education and access resource. Conkers runs a range of education programmes designed specifically for schools with National Curriculum linked activities. There are over 48 hectares of woodland, lakes and gardens, an assault course and a covered amphitheatre which hosts a range of activities.
- The National Forest has many walking and cycling trails and offers opportunities for outdoor recreation such as fishing, horse riding and outdoor education.
- There are 471 km of public rights of way at a density of 2.3 km per km2.
- There are 0 National Trails within the NCA.
- 0.1 per cent of the NCA 27 ha is classified as being publically accessible.

Sources: Natural England (2010)

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

Access designation	Area (ha)	% of NCA
National Trust (accessible all year)	78	<1
Common Land	17	<1
Country Parks	0	0
CROW Access Land (Section 4 and 16)	261	1
CROW Section 15	37	<1
Village Greens	<1	<1
Doorstep Greens	0	0
Forestry Commission Walkers Welcome Grants	81	<1
Local Nature Reserves (LNR)	36	<1
Millennium Greens	3	<1
Accessible National Nature Reserves (NNR)	0	0
Agri-environment Scheme Access	0	0
Woods for People	1,576	8

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) tranquillity is lowest around Ashby, Swadlingcote and the A42. The Conkers site includes woodland which provides a tranquil resource and encourages biodiversity, providing access to nature and inspiration for visitors.

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

Tranquillity	Tranquillity Score
Highest value within NCA	27
Lowest value within NCA	-70
Mean value within NCA	-17

Sources: CPRE (2006)

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

11.2 Intrusion

The 2007 Intrusion Map (CPRE) shows the extent to which rural landscapes are 'intruded on' from urban development, noise (primarily traffic noise), and other sources of visual and auditory intrusion. This shows that based on the CPRE map of tranquillity (2006) this urbanised NCA generally has a disturbed

and un-tranquil nature caused by the industry, the major infrastructure routes and the expansion of settlements. There are some pockets of tranquillity in the remaining undisturbed agricultural land away from the large settlements. The Conkers site includes woodland which provides a tranquil resource and encourages biodiversity, providing access to nature and inspiration for visitors. Based on the CPRE map of tranquillity (2006), tranquillity is lowest around Ashby, Swadlingcote and the A42. A breakdown of intrusion values for this NCA is detailed in the following table:

Intrusion category	1960s (%)	1990s (%)	2007 (%)	Percentage change (1960s-2007)
Disturbed	44	64	76	32
Undisturbed	50	30	14	-36
Urban	7	7	10	4

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are the decline in undisturbed areas, likely due to the expansion of infrastructure networks and the expansion of settlements.

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)
- 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

- Between 1999 and 2003 an area equivalent to 104 per cent of the 1999 total stock was approved for new planting under a Woodland Grant Scheme agreement (882 ha).

A restored site neighbours a concrete plant at Swainspark, showing existing and new woodlands that are part of The National Forest. Former tracts of derelict land and mineral extraction sites are providing opportunities for landscape-scale improvements.

- Local evidence indicates that woodland character is strengthening, with afforestation of abandoned collieries and derelict land through The National Forest initiative.

- The pattern of planting varies spatially with larger blocks concentrated around Ibstock in the central part, and more varied sizes around Swadlincote.

Boundary features

- Between 1999 and 2003 Countryside Stewardship agreements for linear features included 7 km of fencing, 2 km of hedge management and 17 km hedge planting and restoration with 11 km of restored boundary protection.

- By 2011, boundary options under agri-environment schemes totalled 219 km of hedgerow, 11 km ditches and 6 km of woodland.

- Local evidence indicates that hedgerow structure is being strengthened through boundary enhancement projects as part of The National Forest initiative.

- Where arable production predominates, fields have been enlarged in some cases, resulting in the loss of hedgerows.

Agriculture

- Statistics show that there was a 17 per cent overall reduction in the number of holdings between 2000 and 2009. Dairying decreased during the same

period with a 38 per cent reduction in registered holdings. The largest reduction in holdings has been in the 'mixed' and 'other' registered holdings.

- In 2003, Countryside Stewardship annual agreements included over-wintered stubble followed by a spring crop and over-wintered stubble followed by a spring/summer fallow.

- Local evidence indicates an increase in the number of holdings converting to equestrian activities around urban fringes.

Settlement and development

- The rate of change to urban is high; there has been significant expansion of urban development around Swadlincote and of the area east of Ellistown.

- Much of the land around the settlement of Swadlincote has been subjected to extensive large-scale clay extraction, deep coal mining and open cast workings, leaving a very open and immature landscape.

- In recent years, there has been significant expansion of residential and commercial areas to the north of the old market town of Ashby-de-la-Zouch.

- The northern road bypass around Ashby and the M42 also impacts locally.

Semi-natural habitat

- There is limited uptake of Countryside Stewardship agreements for semi-natural habitats.

- The most extensive annual agreements in 2003 were for lowland pastures on neutral/acid soils and lowland hay meadows with some heathland regeneration.

- The Coalfield once contained extensive areas of heathland and locally, there has been regeneration of heathland on the exposed tips of Coal Measures, however, some heathland has been lost to agriculture.

- Local evidence shows that areas of semi-natural habitat have naturally regenerated on areas of derelict land, including spoil heaps, railway lines and clay pits. In areas of acidic freely draining soil, patches of heathland have developed with birch.

Historic features

- Historic farm buildings have been converted to alternative uses, thus ensuring their retention in the landscape.

Coast and rivers

- The ecological[4] quality of the brooks and rivers range from bad (River Sence) to good (Repton Brook). The reasons for poor and bad quality include channel modifications and diffuse pollution from sediment, phosphates, pesticides and sewage farms.

- The current chemical quality of the groundwater of the NCA[5] is poor.

- The most notable trend has been the increased demand for water compounded by periods of drought. The catchment supports limited abstraction for spray irrigation and industrial purposes.

---

[4] URL: http://maps.environment-agency.gov.uk/wiyby/wiybyController?value=swadlincote&lang=_e&ep=map&topic=wfd_rivers&layerGroups=default&scale=9&textonly=off#x=431420&y=319168&lg=2,7,8,9,&scale=6

[2] URL: http://maps.environment-agency.gov.uk/wiyby/wiybyController?topic=wfd_groundwaters&layerGroups=default&lang=_e&ep=map&scale=6&x=437556.51041666674&y=309680.46875#x=435638&y=315316&lg=2,7,9,&scale=6

Minerals

- In the north around Swadlincote and Moira are the pits of the past fireclay industry while, in the south around Ibstock and Measham extensive brick pits are still active, with substantial buildings of the large brick manufacturers, also around Desford.
- Open cast coal mining is still ongoing; pits in the South Derbyshire Coalfield continue to work fireclay deposits where they are encountered.
- Old colliery sites, spoil heaps, subsidence flashes and former railway lines, have developed
- into sites of ecological significance.
- The area's industrial heritage, based upon mineral extraction, is forming the basis for a developing visitor economy, with visitor centres such as the Snibston Discovery Museum and Moira Furnace, which is now an attractive museum complex.
- Appropriate afforestation and redevelopment of former industrial land continues as part of The National Forest initiative.

Drivers of change

Climate change

- Projected climate change trends suggest increased rainfall, periods of drought and more frequent storm events. Impacts are expected to increase as the magnitude of climate change increases.
- Climate change exacerbates the risk that many non-native species, insect pests and pathogens may establish and spread. For example, Ash die back, a disease caused by the fungus *Chalara fraxinea*, and Acute Oak Decline (AOD) which poses a threat to the oaks throughout the NCA. If unchecked, these and other diseases and pests, for example, the Oak Processionary Moth have the potential to fundamentally change the landscape. In the aquatic environment, crayfish plague, a fungal disease, is a particular threat to native white-clawed crayfish in the River Mease and its tributary, Gilwiskaw Brook. The plague is carried by the Signal Crayfish, itself an invasive species.
- Projected climate change trends suggest increased rainfall, increasing the incidences of contamination from rising mine waters and possible increased rising ground.
- Projected climate change trends suggest an increase to summer temperatures leading to warmer water temperatures and greater incidences of algal bloom on water bodies, for example, Thornton Reservoir and Saltersford Valley.
- Increased summer temperatures further emphasises the importance of riparian woodland in providing shade, thus maintaining favourable water temperatures for aquatic species, such as populations of Bullhead and Spined Loach in the River Mease.
- The Environment Agency flood risk map indicates that localised flooding occurs along the river valleys. The frequency of these events is likely to increase and flood damage to settlements and vernacular buildings may increase and in agricultural areas, greater risk of soil erosion through increased surface water run-off and wind erosion.

- Increased incidences of flooding could also lead to changes in watercourses and greater risks of slope instability and landslides.

- Extended periods of drought may change the suitability of current agricultural crops and/or methods of cultivation.

Other key drivers

- The demand for land for housing and out-of-town retail and commercial developments with associated road improvements is likely to increase. Through the National Planning Policy Framework (NPPF), opportunities exist to ensure that new developments contribute to high-quality built and natural environments that respect the local vernacular and contribute to green infrastructure.

- As the demand for housing and infrastructure increases, so will the demand for raw materials from existing extraction sites, resulting in increased lorry movements. Prolonged demand may lead to an increase to planning applications for extensions to existing quarries and the development of new or 'non-operational' quarries.

- The need for food security will potentially result in increased agricultural production, with changing farming practices which may adversely impact on ecological habitats, networks and species, as well as landscape character. For example, if areas of grassland and meadows along river valleys are agriculturally improved for silage and grass leys, a feature of the landscape will be lost.

- The National Forest incentive scheme for farm diversification is securing sites for future woodland and other associated habitats; it seeks to minimise the impacts on areas available for food provision and is strengthening the woodland character to benefit a range of provisioning and regulatory ecosystem services.

- The number of visitors to attractions, such as, The National Forest's Conkers Centre, Snibston Discovery Park and Moira Furnace, is likely to increase; this is both a challenge and an opportunity for developing the visitor economy, environmental education and understanding of the local heritage.

- The drive towards achieving the target set for generating renewable energy presents opportunities, in collaboration with The National Forest, to increase the production of biomass, on a scale, and in appropriate areas, that will not be detrimental to the landscape character.

- There will be an ongoing requirement for the appropriate maintenance and management of historic parkland, the moated medieval site at Desford and the Roman town and tile kiln at Ravenstone.

- The challenge to secure an economic return from the management of woodland and sites of heritage and ecological importance is likely to increase, particularly as developing woodland matures. Schemes such as, Payments for Ecosystem Services and the development of markets and supply chains for wood as a by-product of forestry management and 'developer contribution schemes', may provide sources of revenue to sustain the management of these sites.

- Local Development Frameworks, Area Masterplans and ecosystem services assessments can identify opportunities and measures to help regenerate the area based around sustainable industry and tourism.

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.

There are opportunities to develop the visitor economy, using assets such as The National Forest, heritage sites and the network of heritage trails.

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 manage the area's riverine and flood plain environment, its manmade and natural wetland habitats, especially the River Mease for its internationally and nationally important species and range of river plants, for the benefit of biodiversity, sense of place, water quality, recreation, geodiversity and climate regulation.	↗ *	↔ ***	↑ ***	N/A	↔ ***	↗ **	↑ ***	↑ ***	↗ **	↑ ***	↗ *	↗ *	N/A	↗ *	↗ **	↑ ***	↗ **	↑ ***	↗ ***
SEO 2: Manage and conserve ancient and plantation woodland and plan appropriately scaled new woodland cover, particularly in The National Forest; restore and reinstate hedgerows and hedgerow trees and increase biomass provision, timber supply and biodiversity that will mitigate the impact of climate change and enhance the experiential qualities of the area.	↘ **	↑ **	↗ **	N/A	↗ **	↑ ***	↗ **	↗ **	↗ **	↗ **	↗ **	↗ *	N/A	↑ ***	↑ ***	↑ ***	↑ ***	↑ ***	↔ **
SEO 3: Protect and manage the industrial/mining heritage of the coalfield and wider historic landscape; balance the needs of forestry, commercial, industrial and agricultural growth with the developing visitor economy and maintain a high level of public access to the wealth of recreational assets the National Character Area offers.	↔ **	↗ *	↔ **	N/A	↔ **	↔ **	↔ **	↔ **	↗ *	↗ *	↔ ***	↔ ***	N/A	↑ ***	↑ ***	↗ *	↑ ***	↗ **	↗ **
SEO 4: Take an integrated approach to managing the natural environment that reflects the strong link between geology and its influence on landscape, biodiversity, industrial development, heritage and settlement pattern of the National Character Area; promote greater understanding of today's link between wildlife and geodiversity, particularly in the distribution of habitats and species, and recognise the importance of former extraction sites for both geodiversity and biodiversity.	↔ **	↗ ***	↗ **	N/A	↗ ***	↗ ***	↗ *	↗ *	↗ ***	↗ **	↗ *	↗ *	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
Gently undulating landform of shallow valleys and ridges.	■ Beds of sandstone, mudstone and coal underlie an undulating landform with gentle ridges and shallow valleys. ■ Heavy, poorly draining soils over Coal Measures and Triassic mudstones with free draining soils on the sandstone ridges. The ridges become less pronounced towards the south where there are locally thick deep deposits of glacial till.
The rivers Mease, Sence, streams, ponds, old quarries and subsidence flashes and Thornton Reservoir.	■ The NCA is drained by the fast flowing rivers Mease, Sence and their tributaries that have a diverse range of channel features, including riffles, pools and slacks. Due to the fast-flowing nature of the rivers, aquatic vegetation is sparse. ■ The River Mease and its tributary, Gilwiskaw Brook is relatively unmodified and is designated as both a SSSI and Special Area of Conservation for its diverse freshwater fish community including nationally significant population of spined loach. ■ Old quarries and subsidence flashes are providing opportunities for habitat creation and a number have been designated Local Wildlife Sites that provide opportunities for recreation close to settlements. ■ Thornton Reservoir; a semi-redundant water supply reservoir, is now important for biodiversity and provides recreational activities, such as, angling, sailing and walking. A flat, surfaced, circular path encircles the reservoir providing access for all abilities.
Predominantly a mixed agricultural, unenclosed landscape, except in the north-east around Coleorton and Newbold, with a developing woodland character.	■ The National Forest is strengthening the woodland character and there are locally dense areas of riparian woodland, prominent amenity trees around settlements and natural regeneration on abandoned mineral workings. ■ The open character is emphasised by low hedgerows with few hedgerow trees. ■ In the north east, around Coleorton and Newbold there are small pasture fields, overgrown hedges, frequent hedgerow trees and small copses. Coleorton Hall hosts the large ancient woodland site of Rough Park. ■ The farmland is in mixed arable and pasture use and where arable predominates fields have been enlarged in some instances, resulting in a loss of hedgerows. ■ There is a wide variation in field pattern, from small to medium sized fields, reflecting a diverse history of enclosure. Early enclosures of medieval open fields tend to show an irregular field pattern.

Landscape attribute	Justification for selection
Mosaic of semi-natural habitats that include ancient woodland, lowland meadow, lowland heathland and wetland habitat.	■ Locally dense trees along streamlines include, crack willow, alder and ash that are a source for coarse woody debris entering watercourses, providing important habitat for fish and invertebrates. ■ Ancient woodland is sparse with the exception of some large blocks in old parklands, for example, at Rough Park and those that straddle the border of Melbourne Parklands NCA, Calke Park and Staunton Harold. ■ Most of the grassland is agriculturally improved, although there are patches of neutral and acid grassland and patches of heathland have developed on acidic freely draining soils and spoil tips. ■ Flooded old quarries and subsidence flashes provide valuable aquatic and wetland habitat.
Legacy of a long history of mineral exploitation characterised by tile and brick works, prominent deep mine relics, tips, clay pits and dense pattern of mining settlements contrast locally with a fine example of historic parkland landscape.	■ A rural landscape contrasting with visible relics of the industrial heritage: the tips of deep mines, abandoned colliery sites, tramways and open cast sites. ■ In the north around Swadlincote and Moira, there are the pits of the past fireclay industry while in the south around Ibstock, some of the extensive brick pits are still active and there are substantial buildings. ■ Open cast coal mining is still ongoing; pits in the South Derbyshire Coalfield continue to work fireclay deposits where they are encountered. ■ Many redundant mining features of industrial archaeological interest, for example, Moira Furnace. ■ Buried artefacts near Ravenstone indicate Roman occupation and early industry - pottery/tile kilns. ■ A dense settlement pattern with large, former mining villages characterised by 19th-century terraced housing following the main road lines and roadside clusters of cottages. ■ A fine example of ornamental parkland surrounding Coleorton Hall; a grade II* registered Historic Parks and Garden. ■ Around Coleorton, a dispersed pattern of settlement arose in connection with small scale bell pit mining and their associated spoil heaps which, together with small fields and a dense network of footpaths contribute to the distinctiveness of this part of the Coalfield landscape.
Distinctive red-brick terrace houses of mining settlements.	■ 19th- and 20th-century buildings are predominately red brick, locally manufactured, with tile or slate roofs. Brick production is still active at Ibstock exploiting the Triassic Mercia Mudstone Group which provides the distinctive red colouration. ■ Some older buildings are of stone. ■ A characteristic of the NCA is the double-sized brick of the late 18th century used in the Measham area and known as the 'Measham gob'.

Landscape attribute	Justification for selection
Extensive rights-of-way network, roads and new out of town developments.	■ The NCA has good road connections, with the A50, M42/A42 that are visible features in the landscape and have provided opportunities for roadside planting of trees and shrubs. ■ The Ivanhoe Way and The Leicestershire Round, a 100 mile circular walk around the county of Leicestershire, and the multi use recreational routes associated with The National Forest offers a wide network of trails and footpaths. ■ The Ashby Canal provides 35 km of lock-free cruising which exemplifies the relatively flat topography of the landscape. ■ In an open landscape, the settlements are prominent and urban-fringe expansion and developments of warehousing, light industrial units and large out of town retail outlets are making an increasing visual impact on the landscape but are providing opportunities for screen planting and buffering.

Urban fringe developments of warehousing, light industrial units and infrastructure (power lines) can have a significant visual impact on the landscape. Opportunities to minimise visual impact and light pollution should be found to preserve areas of tranquillity.

Landscape opportunities

- Protect, manage and enhance core sites, for example, SAC, SSSI, LNRs and the network of Local Sites to improve their condition and buffer to maintain their integrity and improve their connectivity.

- Manage, protect and where appropriate expand the mosaic of riparian pasture and wood that provide a buffer to rivers and streams; thus protecting watercourses from diffuse pollution and maintaining a supply of woody debris in to the watercourses, where it does not cause flooding.

- Conserve and enhance the canal network that provides a valuable wildlife corridor, links urban with rural areas and provides opportunities for recreation and volunteering.

- Buffer core sites and semi-natural woodland by creating and managing transitional scrub communities between woodland and adjoining habitats; linking them together to create a coherent habitat network. Maintain and buffer blocks of ancient woodland and manage veteran trees to maintain a continued supply of over-mature trees; encourage successional planting of native mixed species to maintain the structural diversity and landscape character.

- Maintain and protect from further fragmentation and degradation areas of heathland and where appropriate expand as part of the restoration of former colliery sites and where appropriate ecological conditions and opportunities exist; provide for areas of successional colonisation by flora to deliver a high quality and diverse environment.

- Maintain and restore where necessary, the pattern of small pastures and hedgerows with hedgerow trees associated with relic parkland, particularly around Coleorton and Newbold - enhancing the setting of visible archaeological sites, historic buildings and conservation areas through new planting.

- Protect and reinstate hedgerows throughout, by gapping-up with typical species and planting their accompanying hedgerow trees – adopting appropriate cutting regimes and tagging to extend the age range, species diversity and structural integrity thus providing wildlife corridors; resource protection to soils; maintaining historic field patterns and strengthening the landscape character.

- Ensure that the design of new developments respect the juxtaposition, scale and materials of traditional local buildings and settlement characteristics and mitigate the visual, noise and light impacts. Create new or extend public rights of way and cycle routes through new developments to improve the connectivity between residential areas, places of work, out into the surrounding countryside to encourage physical activity and sense of wellbeing.

Ecosystem service analysis

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

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

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Food provision	Soils Mixed arable and pasture Water availability	Food provision is important to the region. The majority of the NCA has grade 3 quality soils, in terms of their productivity. 66 per cent of the NCA has Agricultural Land Classification grade 3 and 19 per cent is grade 4 and this is reflected in the land use. Mixed sheep and beef units and to a lesser extent, dairy with combinable crops grown on the freer-draining soils. Potatoes are grown in rotation on the heavier soils around Measham and Packington and this can raise issues of water abstraction for irrigation during drier periods.	Regional	The predominance of Coal Measures geology produces slowly permeable soils and fine clayey gley soils that are waterlogged in the winter months and best suited to livestock rearing. Free draining brown earths are present over sandstone, these are often cultivated. Some areas have been affected by open cast mining. Such disturbed soils are generally very poorly drained and will only support rough grazing or woodland. Good links to the road network assists the distribution of food. There is a potato processing and packing plant located close to the A42 near Measham. The National Forest provides farmers with financial incentives to convert less-productive agricultural land to woodland and other associated habitats that will reduce the capacity to grow food, but will contribute to a range of other provisioning and regulation services.	Safeguard food provision and promote sustainable land management techniques that will protect the water and soil resources of the NCA. Promote the uptake of catchment sensitive farming, which can advise farmers on water harvesting and over-wintering storage of water to reduce abstraction during peak demand.	**Food provision** **Biodiversity** **Regulating soil quality** **Regulating water quality** **Sense of place/ inspiration** **Water availability**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Timber provision	Broadleaf woodland The National Forest plantations	Statistics show that total woodland cover, (where woodland is over 2 ha) is currently7 per cent of the NCA. The National Forest initiative covers 87 per cent of the NCA, is helping to strengthen the woodland character, resulting in a landscape that is more diverse –delivering a wider range of ecosystem services. Mature woodland is generally limited to small, isolated blocks of broadleaf woodland although there are large blocks of ancient woodland associated with historic parkland around Newbold, Coleorton and on the border of Melbourne Parkland NCA.	Local	Commercial woodland planting by The National Forest and managing existing woodland will increase opportunities for timber provision. The National Forest offers financial incentives for the conversion of less-productive agricultural land to woodland and other associated habitats. Planting should be of an appropriate scale, sensitively located in the landscape, not detrimental to heritage assets or other habitat. The conversion of less productive agricultural land to woodland will have a slight detrimental effect on food provision, but will enhance other provisioning and regulating services. Bringing more woodland in to positive management will increase the supply of timber by-products that can contribute to sustainable management.	Seek opportunities to increase native woodland planting to increase timber provision while improving biodiversity and strengthening landscape character. Seek opportunities to reverse fragmentation of woodland by restoring locally characteristic zones of woodland and buffering core sites by developing transitional scrub communities between woodland and adjoining habitats. Encourage positive management of ancient woodland associated with historic parks, for example, Rough Park and those that straddle the border of Melbourne Parklands NCA, Calke Park and Staunton Harold. Developing supply chains and encouraging demand for timber to provide an economic return on the by-products of woodland management.	**Timber provision** **Biodiversity** **Climate regulation** **Water availability** **Regulating water flow** **Sense of place/ inspiration** **Sense of history** **Biomass energy**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Water availability	Rivers and their tributaries Aquifer Canal Reservoir	The rivers Mease and Sence and their tributaries are the primary water supplies available for abstraction by the agricultural industry. Sandstones and conglomerates of the Triassic Sandstone occur at depth and locally at the surface and provide base flow for rivers and water for public water supply. Water is also abstracted by the brewing industry in Burton upon Trent, in the Trent Valley Washlands NCA. The Ashby Canal and Thornton Reservoir are man-made water bodies. Discharges are made from Thornton Reservoir to maintain water levels downstream of the dam via the Rothley Brook.	Regional	The River Mease is a tributary of the River Trent and the River Sence joins the River Tame via the River Anker. All are important sources of water in the Humber Catchment.[6] Unsustainable abstraction results in low flows that negatively impact on biodiversity and water quality in terms of Water Framework Directive assessment and also the experiential qualities of the NCA. The deep Sherwood Sandstone Aquifer provides base flow to the rivers and a large underground storage capacity, which no surface reservoir can match in terms of quantity and quality. Increasing the area of semi-natural habitat in aquifer recharge areas can increase water infiltration rates. The construction of winter water storage reservoirs would alleviate over abstraction during peak demand.	The River Mease is identified as a priority catchment in the Catchment Sensitive Farming[7] scheme that helps to identify ways and opportunities of using water supplies more sustainably. Buffer watercourses, thus increasing areas of wetland habitat while increasing water storage and reducing flow rates to increase water infiltration. Ensure appropriate stocking levels to prevent soil compaction. Protect flood plains from inappropriate development.	**Water availability** **Biodiversity** **Regulating water flow** **Regulating water quality** **Food provision** **Regulating soil quality** **Regulating soil erosion**
Genetic diversity	N/A	n/a	n/a	n/a	n/a	**n/a**

[6] *Dove Catchment Abstraction Management Strategy*, Environment Agency.

[4] A joint project between the Environment Agency and Natural England, funded by Defra and the Rural Development Programme for England, working in priority catchments within England.

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biomass energy	The National Forest plantations Woodlands Miscanthus Short rotation coppice	Biomass provision is currently limited although new planting by The National Forest has the potential to increase capacity. Short rotation coppice (SRC) is grown in the area around Thornton.	Local	The National Forest new plantations include commercial woodlands and short rotation coppice for biomass/wood fuel. The arisings from managed woodland can also increase coppice products/wood fuel. Information provided by Defra indicates that there is a medium potential yield[8] for Miscanthus, with small areas identified as high yield to the west of Swadlincote and north of Ashby. There is a medium potential yield for SRC[9] with small areas identified as high yield around Ashby, Coalville and in the south around Newbold Verdon. SRC and miscanthus on woodland fringes could provide a transitional habitat. Planting on less-productive agricultural land can achieve broader environmental objectives such as slowing water flow at times of flooding, increasing interception rates and reducing agricultural diffuse pollution.	Seek opportunities to increase biomass provision where it will not be detrimental to other habitat. For example, planting biomass crops where flood plain edges blend into existing woodland on agricultural areas and around urban woodland planting such as Swadlincote Urban Forest Park. Bring more woodland in to positive management and encourage the development of markets and supply chains for locally sourced wood as a by-product of forestry management to provide an economic return that can sustain forestry management. Encourage the installation of small-scale wood-fuel boilers in local civic buildings and at tourist visitor centres.	**Biomass energy** **Climate regulation** **Regulating soil erosion** **Sense of place/ inspiration** **Regulating water flow**

[8] URL: www.naturalengland.org.uk/Images/em-miscanthus-yield-250_tcm6-4853.pdf

[6] URL: www.naturalengland.org.uk/Images/em-src-yield-250_tcm6-4857.pdf

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Climate regulation	Soil Woodland Heathland Wetlands	The mineral soils over most of the NCA have low carbon content (0–5 per cent). There are small pockets of soil with higher carbon content (5–10 per cent) likely to be associated with areas of lowland heathland and certain woodlands. Woodland along watercourses. Large blocks of ancient woodland associated with historic parkland around Newbold, Coleorton and on the border of Melbourne Parkland NCA and new plantations associated with The National Forest. Remnant heathland on acid soils and associated with the re-colonisation of mining tips and colliery spoil. Riparian habitats associated with watercourses and mining flashes.	Local	Carbon sequestration and storage by soils can be enhanced by increasing organic matter inputs and by reducing the frequency and area of cultivation. Woodland is likely to be the most significant contributor to carbon storage and sequestration in this NCA, particularly with the developing woodland character being strengthened by The National Forest. Heathlands are characterised by a cover of 25 per cent dwarf shrubs of the botanical family Ericaceae. Woody shrub species play an important role in carbon sequestration in grassland ecosystems. Areas of heathland once covered the coalfield and are beginning to re-naturalise spoil tips. Wetlands provide essential ecosystem provisioning and regulatory services, including greenhouse gas reduction.	Work in collaboration with farmers to ensure appropriate management techniques are employed in arable systems to enhance organic inputs and reduce fertiliser inputs. Support measures taken by The National Forest that create new woodland at appropriate sites and manage the existing woodland resource. Support initiatives to monitor the effects of climate change on woodland including the spread of Invasive Non-Native Species and diseases. Maintain and enhance the existing areas of heath by arresting further losses or degradation; where appropriate create secondary heathland on post-industrial sites. Where appropriate expand wetland habitats for the multiple benefits to climate regulation, biodiversity, water flow and quality.	**Climate regulation** **Water availability** **Regulating soil erosion** **Regulating soil quality** **Regulating water quality** **Regulating water flow** **Biodiversity** **Sense of place/ inspiration**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water quality	Rivers and their tributaries Mine waters Aquifer Land management in the catchment	Data from the Environment Agency[10] indicates the following ecological status of the watercourses: 'poor' (Gilwiskaw Brook and Darklands Brook), 'bad' (the River Sence), 'moderate' (River Mease) 'good' (Repton Brook). Reasons for failing ecological status of stretches of the watercourses in the area include, channel modifications, diffuse pollution from fertiliser, pesticides and discharges from sewage treatment plants. Rising mine water also poses a threat to water quality and requires careful management to prevent it entering public supplies and sensitive habitats. Sandstones and conglomerates of the Triassic Sandstone occur at depth and locally at the surface and provide base flow for rivers and augment supplies of potable water for public, agriculture and industrial uses. For example, the brewing industry in nearby Burton upon Trent. The current chemical quality of the groundwater of the NCA[11] is poor.	Regional	Good water quality is particularly important for public and industrial use and the River Mease SSSI and SAC. The River Mease is a priority catchment under the Catchment Sensitive Farming scheme which is focussed on reducing diffuse water pollution, particularly phosphate and sedimentation to protect the aquatic environment, particularly the internationally important populations of spined loach and bullhead fish. Planned improvements to sewage treatment works at a number of locations in the River Mease catchment can reduce the levels of phosphate in the SAC.	Work with partners to secure opportunities to re-naturalise modified channels and re-connect them where possible to their natural flood plain. Through catchment sensitive farming, reduce foul runoff from outdoor feeding areas, silage clamps, yards and cattle tracks; prevent stock from entering streams and poaching stream banks and manage livestock to avoid poaching of fields by cattle movement. Reduce fertiliser and pesticide inputs by careful infield analysis of need. Protect areas of unimproved pasture and semi natural habitat and buffer watercourses. Support partners and community initiatives to identify point and diffuse sources of pollution and waste water pipe mis-connections in urban areas that contribute to polluted discharges. Support partners with the management of mine waters.	**Regulating water quality** **Regulating soil quality** **Regulating soil erosion** **Climate regulation** **Biodiversity**

[10] URL: http://maps.environment-agency.gov.uk/wiyby/wiybyController?value=swadlincote&lang=_e&ep=map&topic=wfd_rivers&layerGroups=default&scale=9&textonly=off&submit.x=14&submit.y=12

[11] URL: http://maps.environment-agency.gov.uk/wiyby/wiybyController?topic=wfd_groundwaters&layerGroups=default&lang=_e&ep=map&scale=6&x=437556.51041666674&y=309680.46875#x=435638&y=315316&lg=2,7,9,&scale=6

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water flow	Rivers and their tributaries Riparian woodland and vegetation Sustainable urban drainage schemes (SUDS) Thornton Reservoir	Data from the Environment Agency[12] indicates that the risk of flooding is 'significant', but is confined to river valleys and watercourses where it inundates agricultural land. Elsewhere, the risk is 'low'. During periods of peak abstraction, water is discharged from Thornton Reservoir to maintain the water level in Rothley Brook; a tributary of the River Soar in neighbouring Charnwood NCA.	Local	The Environment Agency's Humber Flood Risk Management Strategy[13] includes investigating land use changes which will reduce run-off rates. This may also lessen soil erosion from cultivated land which is an issue in this NCA. Identifying locations where flood attenuation ponds or wetland areas could be improved or developed with associated habitat enhancement and potential sites for priority habitat creation. Riparian woodland can also attenuate flow rate and also provide coarse woody debris in to water channels to provide habitat for aquatic species and invertebrates.	Where appropriate increase riparian woodland and vegetation along watercourse banks including the rivers Mease, Sence, their tributaries and along the Ashby Canal. Removing constrictions to flow, such as weirs. This will also benefit migratory fish. Increase the length of open water corridors through the urban areas by de-culverting rivers and streams and creating riparian habitat, for example, reedbeds that can reduce the rate of run-off and filter water. Ensuring that new developments take into account the principles of SUDS by including green spaces and areas of land with unsealed surfaces.	**Regulating water flow** **Regulating soil erosion** **Regulating soil quality** **Sense of place/ inspiration** **Biodiversity**

[12] URL: http://maps.environment-agency.gov.uk/wiyby/wiybyController?topic=floodmap&layerGroups=default&lang=_e&ep=map&scale=6&x=434197&y=318475#x=439050&y=310297&lg=1,&scale=9

[13] URL: http://www.environment-agency.gov.uk/homeandleisure/floods/cy/31704.aspx

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil quality	Soils derived from Coal Measures Soils derived from Triassic sandstone Glacial till	The main soils in this NCA include: ■ Slowly permeable seasonally wet acid loamy and clayey soils, covering 32 per cent of the NCA. ■ Slightly acid loamy and clayey soils with impeded drainage (27 per cent). ■ Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (19 per cent). ■ Freely draining slightly acid loamy soils (14 per cent).	Local	The majority of the soils are derived from the Coal Measures that have impeded drainage, therefore are at risk of diffuse pollution and flooding as a result of poor water infiltration. Soils are easily damaged when wet and therefore it is important to minimise compaction and/ or capping which will tend to exacerbate run-off problems. These soils may have limited potential for increasing organic matter levels by management interventions. The freely draining slightly acid loamy soils have the potential for enhanced organic matter levels through management interventions. They may be valuable for aquifer recharge requiring the maintenance of good structural conditions to aid water infiltration and protection from pollution. Mines and quarries disturb the natural soil profile and local hydrology. On colliery spoil, the loamy and clayey soils are prone to capping and compaction however well designed, high quality restoration of mineral extraction sites can avoid these conditions and deliver other ecosystem services.	Encourage the adoption of Catchment Sensitive Farming techniques to manage arable and livestock systems sustainably to protect the soil structure, for example, preventing poaching and adopting sustainable stocking levels. During the restoration of mineral extraction sites: ensure the correct handling of soils and installation of drainage, or seek opportunities for the creation of wetland habitat, for the multiple benefits this will realise.	**Regulating soil quality** **Food provision** **Water availability** **Climate regulation** **Regulating soil erosion** **Regulating water quality** **Regulating water flow** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil erosion	Soils Permanent grassland and riparian vegetation Hedgerows Old spoil heaps and tips	Freely draining slightly acid loamy soils (14 per cent) have an enhanced risk of wind erosion, where they occur on moderately or steeply sloping land, or where large, open arable systems are cultivated and bare soil is exposed. The heavier soils along watercourses are at risk from flood events. Elsewhere, the loamy, clayey soils are prone to compaction and capping, increasing the risk of soil erosion by surface water run-off.	Local	Food production and water quality is important to the region, therefore soil erosion in an important issue in this NCA. Permanent vegetation cover, for example pasture alongside streams and on flood plains, stabilises exposed areas, trapping sediment and slowing water flow. Physical barriers in open landscapes can alleviate wind erosion of soil, for example, permanent grassland around field boundaries, hedgerows and tree shelterbelts. Riparian woodland and vegetation along watercourses offer resource protection against run-off. Conversely, invasive non-native species, for example stands of Himalayan balsam, can lead to bare earth in the winter months which are markedly more prone to soil erosion. The restoration of hedgerows may constrain food productivity, but in the longer-term maintains the productivity of the land by protecting the soil resource and is likely to lead to an improvement in water quality and an increase in biodiversity.	Encourage the adoption of Catchment Sensitive Farming techniques to manage arable and livestock systems sustainably and protect the soil resource, for example, buffering watercourses and field boundaries with permanent grass leys or conservation margins. Encourage increased surveillance by trained volunteers to monitor and control the spread of Himalayan balsam. Encourage the uptake of agri-environment options to increase areas of permanent grassland on field margins and along watercourses for the multiple benefits to resource protection, and biodiversity.	**Regulating soil erosion** **Regulating water quality** **Regulating soil quality** **Food provision** **Regulating water quality** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Pollination	Lowland heathland Lowland meadow Hedgerows, field margins and open mosaic habitats on previously developed land Allotments and private gardens	Areas of lowland heath, meadow and grassland habitats provide sources of nectar for pollinating insects. Late flowering nectar sources, such as heather, are important in providing supply of nectar over an extended period of time. Residential gardens, formal parks, allotment sites and open mosaic habitats on previously developed land provide important sources of nectar in the urban areas and often have more diverse sources of nectar than occurs in agricultural monocultures.	Local	Food crops currently grown in the NCA do not rely on pollinators therefore their value is to biodiversity. This could be a limiting factor should cropping regimes change. An increase in the populations of pollinators may facilitate an increase in the types of crops that could be grown in the future thus expanding the range of food provision and increasing the resilience to the effects of climate change. Lowland heathland and lowland meadow each represent less than one per-cent of the NCA, currently limiting the provision of this service. However, expanding areas of lowland heath and meadow, planting a network of species-rich hedgerows, creating flower-rich field margins in agricultural areas and species rich roadside verges would all reduce habitat fragmentation thus providing a more robust ecological network for pollinators.	Seek opportunities to increase nectar provision within the agricultural landscape through promotion of agri-environment scheme options. This would also provide habitat and food source for potential pest regulators, for example, birds. Encourage local authorities, highways and road maintenance contractors to diversify the species mix of roadside verges.	**Pollination** **Food production** **Climate regulation** **Regulating soil erosion** **Regulating water quality** **Biodiversity** **Sense of place/ inspiration** **Pest regulation**
Pest regulation	Semi-natural habitat Hedgerows and field margins	The extent of fragmented semi-natural habitat and gappy hedgerows in this NCA mean that the contribution to pest regulation services is limited.	Local	Semi-natural habitats and hedges proximal to areas of commercial arable agriculture may support species of predators that can regulate populations of pests that adversely affect crop yields, hence food provision.	In agricultural areas, expand existing areas or create new semi-natural habitat, for example, beetle banks, headlands and re-instate hedgerows, to provide a mosaic of habitats in areas of monoculture, thus providing a more robust ecosystem that will benefit food production and biodiversity.	**Pest regulation** **Pollination** **Biodiversity** **Food production** **Sense of place/ inspiration**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of place/ inspiration	Open landscape character of gentle ridges and shallow valleys Medieval castle remains at Ashby-de-la-Zouch Prominent groups of red brick miners' cottages Industrial archaeological interest The National Forest Historic parks and gardens	Although mining and urban features dominate the landscape, there are areas that remain rural. There are small villages, particularly in the coalfield in the south, and there are some areas of very distinctive character such as the landscape around Coleorton where small pasture fields, overgrown hedges, with frequent hedgerow trees and small copses are linked to a dispersed pattern of cottages and small groups of houses along winding lanes with a network of paths and tramways. The landscape is in transition; influenced by work of The National Forest, from a landform extensively scarred by abandoned collieries, spoil tips and quarries; to a matrix of new woodland, restored colliery sites, active brick pits and commercial developments that are woven into an essentially rural landscape.	Local	Sir Walter Scott chose the open landscape character around Ashby-de-la-Zouch and the ruins of the medieval castle for the setting of his historic novel Ivanhoe. The Ivanhoe Way exists as a long distance footpath. Restored industrial buildings, canals and disused railway lines can offer recreational opportunities and increase access to the industrial heritage of the NCA, inspire volunteer activities, arts events, education trails and skills development events, for example, Moira. The Industrial archaeological interest is forming the basis for visitor attractions such as the Snibston Discovery Museum, Moira Furnace and the Ashby Canal. The National Forest is creating positive change and environmental enhancement with recreational and educational activities close to population centres, for example, Conkers Discovery Centre. The National Forest provides farmers with financial incentives to convert less-productive agricultural land to woodland and other associated habitats, thus strengthening the sense of place and offering opportunities for recreation.	Manage and protect the Mease and Sence rivers and their valleys which form the most distinctive natural features of this predominantly open, arable, lowland landscape. Protect and manage the large estates, wooded parklands and country houses of the NCA, for example Rough Park, which contribute to its sense of place and provide areas of tranquillity. Encourage farm diversification of less productive agricultural land to woodland and other associated habitats, to realise multiple benefits.	**Sense of place/ inspiration** **Sense of history** **Recreation** **Tranquillity** **Biodiversity** **Geodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of history	The remains of a Roman settlement and tile kiln at Ravenstone Remains of Ashby's medieval castle and the moated site at Desford The Industrial archaeological interest of surface workings, deep mines, cottages, tramways, Ashby Canal and Moira Furnace Settlement patterns Historic parks and gardens	The remains of Ashby's 12th-century manor house, which became a castle in the 15th century, serve as a reminder of the town's long history. Exploitation of the mineral wealth began in the 13th century but gained landscape changing-scale in the 18th and 19th centuries with the invention of steam power and the building of the iron-smelting furnace at Moira, the Ashby Canal and the many railways. The influx of mine workers influenced settlement patterns with dense settlements of red-brick terrace houses. In contrast, around Coleorton, a dispersed pattern of settlement arose in connection with small scale mining, together with small fields, a dense network of footpaths, and bell pits and their associated spoil heaps. These features still contribute to the distinctiveness of this part of the Coalfield landscape.	Regional	The character of this NCA is heightened by the clear evidence of past human land use and visual links with the past. Sites of historic and cultural significance require maintenance, promotion and interpretation to ensure their longevity in the landscape and culture of the NCA, for example, Moira Furnace site. The area's industrial heritage has potential to attract visitors, such as, the Snibston Discovery Museum, which can bring about an improved enjoyment of the landscape and improved management whilst benefiting the local economy. Parklands and associated country homes provide a sense of the wealth that the industry brought to the area and remain an important historic asset. The settlement pattern reflects the process of change and development. Although many rural villages and scattered farmsteads remain, many villages have expanded. The continued expansion of settlements may pose a risk of losing traditional settlement patterns, especially the distinctive pattern of the early 13th-century mining settlements around Coleorton.	Retain and manage the area's historic assets including the legacies of industry by finding alternative uses for buildings and post industrial sites. For example, the development of educational visitor centres and restoration of former mineral sites and transport networks for recreation, biodiversity and geodiversity. Maintain the historic park land and associated houses. Ensure that the grouping and design of new developments reflects the juxtaposition, scale and materials of traditional local buildings characteristic of the area.	**Sense of history** **Sense of place/ inspiration** **Recreation** **Biodiversity** **Geodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Tranquillity	Expansive rural areas Woodland River valleys and watercourses	The 'Intrusion Map 2007' provided by the Campaign for the Protection of Rural England (CPRE) shows that over three-quarters of the NCA is classified as disturbed. A notable trend since the 1960s is the decline in undisturbed areas, likely due to the expansion of settlements and transport infrastructure.	Local	Despite the reduction in tranquil areas, the NCA is important in providing experiences of wide open spaces for people living in the adjacent towns. Tranquillity can still be experienced along river valleys, in the mature woodlands and around restored quarries, for example, Saltersford Valley. The National Forest is strengthening the woodland and boundary features that will enhance the experiential qualities of the NCA and has a visitor centre (Conkers) that provides a tranquil setting.	Retain areas of open landscape, resisting urban development in to undisturbed areas. Buffer the areas of the NCA where intrusion is low and sensitively plan any expansion to urban areas and roads by planting woodland shelterbelts reducing visual impact, noise and light pollution. Maintain the balance between undisturbed areas and public access by providing recreational facilities in appropriate areas.	**Tranquillity** **Sense of place/ inspiration** **Sense of history** **Recreation** **Biodiversity**
Recreation	Public rights of way and heritage trails Local nature reserves, country parks and woodland Heritage visitor centres The National Forest Ashby Canal Thornton Reservoir Restored quarries	There are 471 km of public rights of way. The Ivanhoe Way is a circular 58 km walk through Leicestershire within The National Forest and extends in to the neighbouring Charnwood Forest NCA. The walk is split into different sections to allow for shorter strolls. The Leicestershire Round is a 160 km circular walk around Leicestershire connecting many places of historical and geographical interest. Ashby Wolds heritage trail runs along a disused railway line and links Local Nature Reserves, Conkers Visitor Centre and Moira Furnace industrial heritage site. There are over 1,500 ha of 'woods for people' that provide woodland walks.	Regional	Linear routes, for example the Ashby Canal and its towpath, link the NCA with the neighbouring Mease and Sence Lowlands NCA, while woodland walks in the north of the NCA cross into the Melbourne Parks NCA. The mining and industrial assets of the NCA are important for recreation, biodiversity and tourism and are within easy reach of the City of Leicester. Thornton Reservoir, a semi-redundant public water supply reservoir is now important for biodiversity and recreation. Other open-water bodies associated with mineral extraction sites could also be restored for public access; ideal for circular strolls, for example, Saltersford Valley Local Nature Reserve.	Support initiatives by The National Forest to increase the recreational resource of the NCA. Restore post-industrial sites paying regard to their historic value and future value for both biodiversity and geodiversity. Increase the number of circular, well-surfaced, routes suitable for all age ranges and physical abilities. Promote the use of the existing network of rights of way within the NCA and its links with the National Cycle Network. Raise awareness of circular routes associated with the Leicestershire Round and Ivanhoe Way long distance footpath.	**Recreation** **Sense of place/ inspiration** **Sense of history** **Biodiversity** **Geodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biodiversity	Rivers and their tributaries Bullhead and spined loach fish, white-clawed crayfish and water crowfoot The National Forest Ancient and semi-natural woodland Lowland heathland Lowland meadow Open mosaic habitats on previously developed land Open water and subsidence flashes Hedgerows	Two km of the total 25 km length of the River Mease SSSI and SAC flows within the NCA and comprises the lower reaches of the Gilwiskaw Brook downstream of Packington, and the River Mease downstream of its confluence with the Gilwiskaw Brook and covers 4 ha of the NCA. The SSSI is in 'unfavourable, no change' status. There are 127 ha of ancient semi-natural woodland and 100 ha of plantations on ancient woodland sites. Other priority habitat includes 17 ha of lowland heathland and 17 ha of lowland meadow. There are locally dense ribbons of woodland along watercourses. Deep mining and quarrying has left a legacy of subsidence pools and old settling lagoons that are now providing wetland habitat.	National	The River Mease and Gilwiskaw Brook are special lowland rivers as they are relatively unspoilt and support internationally important spined loach and bullhead fish. This is why the rivers were designated as a Special Area of Conservation (SAC) under the EU Habitats Directive, and a Site of Special Scientific Interest (SSSI) under the Wildlife and Countryside Act. The rivers also support populations of white-clawed crayfish, otter and a range of river plants such as water crowfoot. Despite protection, the ecological quality is poor due to channel modifications, weirs and high levels of phosphates due in part to sewage discharges, agricultural run-off and rising mine waters. Along watercourses, primary tree species include silver birch, sessile and pedunculate oak with some birch, ash and holly. Wet woodland includes alder and crack willow. The predominant shrub layer comprises hazel, hawthorn and grey willow. These riparian woodlands stabilise soils, slow water flow and provide woody debris, important for aquatic and invertebrate species. Hawthorn is the predominant hedgerow species with some field maple, hazel, holly and blackthorn, providing habitat for pollinators and food sources for predators. Fragmented areas of lowland meadow exist and lowland heathland, once widespread, is confined to isolated areas, spoil tips and open mosaic habitats on previously developed land.	Work in collaboration to remove weirs that constrict fish and invertebrate migration, re-naturalise the channel depth and profile, and use semi-natural vegetation strips and riparian wetlands to buffer watercourses from adjoining land uses. Work in collaboration to reduce point source and diffuse pollution from a wide range of sources and establish mitigation measures for rising mine waters. Support initiatives such as the 'Developer Contributions Scheme' (DCS) which will enable development to proceed in the catchment of the River Mease Special Area of Conservation whilst ensuring it does not result in a deterioration of water quality. The scheme will pay for projects to offset the phosphate contribution made by the new development. Where appropriate, extend areas of riparian woodland and manage riparian woodland ensuring a supply of dead wood and over-mature trees. **Continued over...**	**Biodiversity** **Sense of place/ inspiration** **Regulating water flow** **Regulating soil erosion** **Regulating soil quality** **Pollination** **Pest regulation**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biodiversity continued					**...continued from previous.** Restore and reinstate hedgerows with typical species, by gapping-up and planting their accompanying hedgerow trees; adopting appropriate cutting regimes and tagging to extend the age range and species diversity. Encourage the expansion of lowland heathland and lowland meadow into robust ecological networks as part of The National Forest and look for opportunities to manage previously developed land as priority open mosaic habitat.	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Geodiversity	Quarries River cuttings Glacial and present-day geomorphological processes Minerals and ores Designated sites	There are a number of operational and non-operational extraction sites in the NCA. The most notable being for brick production at Ibstock, Measham, Heather, Ellistown and Desford. Seatearth or 'fireclay' associated with the Coal Measures is used for refractory linings, sewerage and drainage applications and is produced in the Swadlincote area. As well as being important to the local economy and for employment, quarries provide opportunities for the study of geology. Sandstones in the Pennine Coal Measures and Sherwood Sandstone have been worked for building stone.	Local	Quarries can provide opportunities to record and study stratigraphy and geological processes. They also provide a tangible link with the industrial heritage of the NCA. Increased education and interpretation can demonstrate how geology influences settlement patterns, human activity and innovation, from source rock to product and how this relates to the landscape. Glacial till, which is evident in the south of the NCA, provides opportunities to study the effects of glaciation. The rivers Mease and Sence can both be used to demonstrate fluvial activity in the form of channel migration and flood plain deposition.	Enhance the condition of designated sites and manage former extraction sites and natural exposures for the range of mutually beneficial interests including geodiversity, biodiversity, industrial heritage, recreational, educational and scientific research purposes. Improve access and interpretation of present-day geomorphological activity associated with the rivers. Work in partnership to further the objectives and aspirations of the Local Geodiversity Action Plan and to develop restorative management of former quarries offering opportunities for volunteering and community engagement. Look for opportunities to develop new Local Geological Sites; work with open cast coal and other quarry managers to preserve geodiversity features. Encourage the use of locally sourced building materials in building conservation works and new developments.	**Geodiversity** **Biodiversity** **Regulating soil quality** **Recreation** **Sense of history** **Sense of place/ inspiration**

Photo credits

Front cover: The area is essentially a rural landscape. Settlements consist of a mix of small hamlets, enlarged market towns and former mining settlements. The area has a developing woodland character, heavily influenced by work of The National Forest that covers the majority of the NCA. © Natural England/Rob Gornall

Page 4 & 31: © Lesley Eddleston, LCC (2012)

Page 5: © Natural England/Rob Gornall with kind permission of landowner

Page 8: © Copyright NERC. With kind permission of K.Ambrose

Page 6, 9, 11, 16, 19 & 39: © Natural England/Rob Gornall

Page 12: © A.Ratcliffe (Clay Colliery Co Ltd.)

Page 14 & 35: © Natural England/Karen Devonport

NATURAL ENGLAND

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: NE535

ISBN: 978-1-78367-095-6

Should an alternative format of this publication be required, please contact our enquiries line for more information: 0845 600 3078 or email enquiries@naturalengland.org.uk

www.naturalengland.org.uk