National Character Area profile:

70. Melbourne Parklands

Supporting documents

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NATURAL ENGLAND

Introduction

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

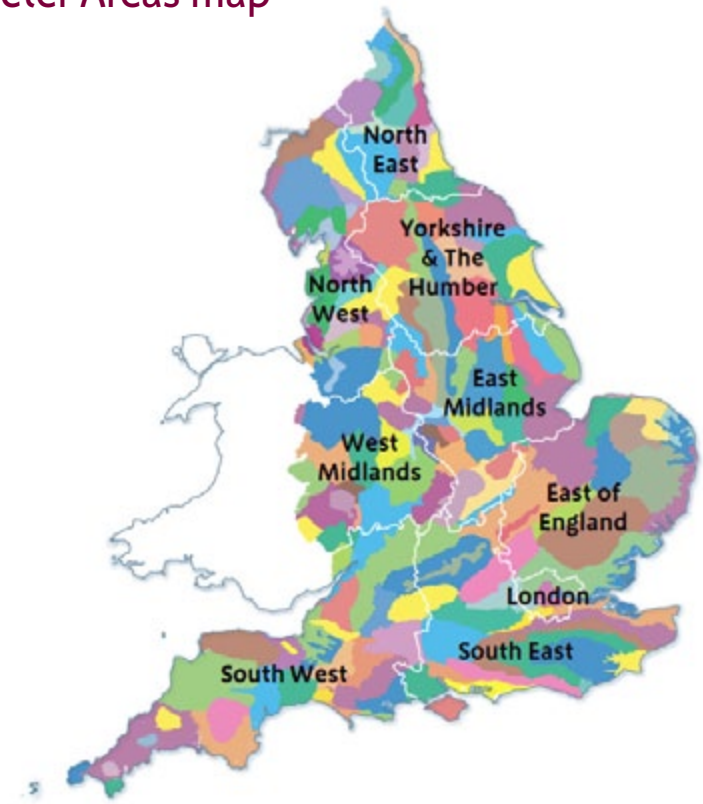
NCA profiles are guidance documents which can help communities to inform theirdecision-making about the places that they live in and care for. The informationthey contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and encourage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

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

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

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

National Character Areas map



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

Summary

The Melbourne Parklands NCA is located between the ancient forests of Needwood and Charnwood. The Trent Valley forms its northern and western boundary, in a wide arc sweeping round from its confluence with the River Soar in the north-east, to Burton-upon-Trent in the south-west.

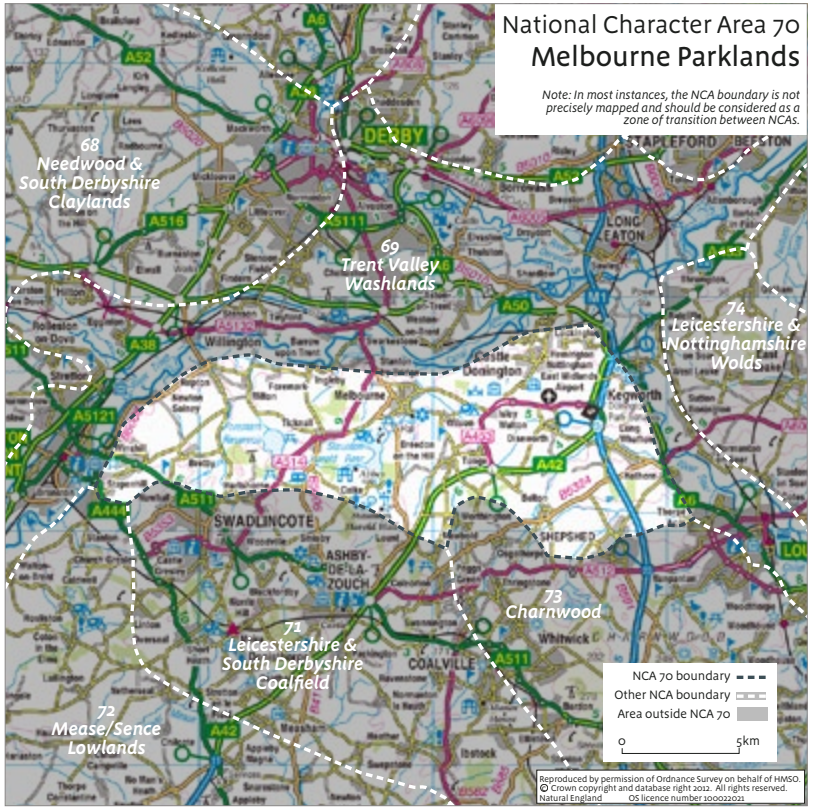
It is a landscape of rolling farmland, ancient and plantation woodland and, as the name suggests, a cluster of landscaped parklands with grand country houses, one of which, Calke Abbey, boasts a Grade II* listed historic park and garden. The park has also been designated a National Nature Reserve (NNR), and contains many notable ancient and veteran trees. One-quarter of the NCA is within The National Forest and 10 per cent is woodland.

The NCA is predominantly rural, although there are strong and often abrupt contrasts with the urban areas on its peripheries. The M1 and A42 cross the NCA and East Midlands Airport is sited on the central plateau in an otherwise undulating area.

It is an important area for water supply. Two valleys have been dammed to create large reservoirs. Both Foremark and Staunton Harold Reservoirs are supplied from the River Dove in the adjacent NCA. Outcrops of the Sherwood Sandstone Group form recharge areas to the Sherwood aquifer.

Most of the area is in agricultural use, with extensive areas under arable production, and mixed arable and pasture on the steeper ground. Siltstones and mudstones of the Mercia Mudstone Group in the east of the NCA produce a gently rolling lowland plateau of productive, reddish clay soils suitable for agriculture.

Commuter development pressures are likely to continue around the villages and small settlements of Castle Donington, Repton and Melbourne, at the edge of the area.



Click map to enlarge; click again to reduce.

Statements of Environmental Opportunity

- **SEO 1:** Manage the new planting of The National Forest and restore the characteristics of the historic parklands and woodlands. Conserve and manage the hedgerows and hedgerow trees, preserving the field patterns of early enclosures and maintaining the legacy of historic land use, bringing benefits for soil quality, biodiversity and recreation.

- **SEO 2:** Promote sustainable agricultural practices to help protect and manage areas of semi-natural habitat and, where appropriate, link these areas together to create a coherent and resilient habitat network.

- **SEO 3:** Protect the important water resource in the NCA to safeguard the quality of public, private and agricultural water supplies, and to improve its contribution to biodiversity and recreation.

- **SEO 4:** Protect and enhance the historic landscape character and historic ecclesiastical centres. Promote opportunities for high-quality, accessible green space, and for the interpretation of historical features, increasing opportunities for community engagement, access, recreation and education.

Designed parkland avenues and parkland trees add to the wooded character.

Description

Physical and functional links to other National Character Areas

The Melbourne Parklands National Character Area (NCA) is an undulating landscape that extends through South Derbyshire from the Staffordshire border in the west into Leicestershire in the east. There are long views out of the NCA, from the high ground near Foremark and Breedon over the Trent Valley Washlands NCA to the north. Carboniferous limestones form a broken ridge of hills, and Upper Carboniferous sandstones and mudstones underlie pronounced ridges that afford views into the neighbouring Leicestershire and South Derbyshire Coalfield NCA to the south.

The high ground of neighbouring Leicestershire and South Derbyshire Coalfield NCA and Charnwood NCA forms a watershed that is drained by streams that feed the rivers Trent and Soar that skirt the north and western boundaries of the Melbourne Parklands NCA. The plateau in the core of the NCA is dissected by narrow, north-flowing river valleys. Two valleys have been dammed to create large reservoirs that provide drinking water to over 80,000 people in Leicestershire and the surrounding area.

An outcrop of the Sherwood Sandstone Group extends towards the River Trent, and this serves as a recharge area for the deep Sherwood Sandstone aquifer, the second most important aquifer in the UK. It is exploited by the brewing industry in Burton- upon-Trent, located in the neighbouring Trent Valley Washlands NCA.

View across and out of the NCA from Breedon Hill with the quarry in the foreground. In the distance, the control tower of East Midlands Airport just within the NCA and the cooling towers of Ratcliffe on Soar power station in Leicestershire and Nottinghamshire Wolds NCA.

The National Forest is creating new woodland within this and adjoining NCAs, building a strong woodland link with neighbouring Leicestershire and South Derbyshire Coalfield NCA and Charnwood NCA. The roadside vegetation that includes bracken, gorse, oak and ash, also visually links the parklands to these neighbouring NCAs.

Large quarries straddle the southern boundary of the NCA. Both Cloud Hill Quarry and Breedon Quarry are important sources of magnesium-rich dolomitic limestone or dolostone. The stone is used across the East Midlands as an aggregate for road dressing. Sandstones from the Sherwood Sandstone Group have been widely used as a building stone, both within the NCA and in neighbouring NCAs, invoking a strong sense of place.

The M1 and A42 cross the NCA, and East Midlands Airport is sited on a natural plateau in an otherwise undulating area.

Foremark Reservoir. One of two reservoirs in the NCA that supply drinking water to Leicestershire and the wider area.

Key characteristics

- An undulating landform of Sherwood Sandstone in the west of the NCA, with Carboniferous limestones forming a broken ridge of hills in the east and extending south-eastwards. Flatter areas around Ticknall, Calke Abbey and Dimminsdale.
- In the east of the NCA the less resistant Triassic siltstones and mudstones of the Mercia Mudstone Group produce a gently rolling lowland plateau of productive, reddish clay soils suitable for agriculture. The less permeable soils are typically used for pasture (and, historically, for dairying), the drier soils are for cereals and potatoes, and the dark loams around Melbourne are for market gardening.
- The Breedon Hill Site of Special Scientific Interest (SSSI) comprises one of the largest areas of species-rich limestone grassland in Leicestershire.
- Alluvium deposits and river terraces are evident between Hemington and Lockington, in the north-east of the NCA.
- Differential erosion by dynamic river systems has dissected the plateau and created narrow-sided, north-flowing river valleys. Two valleys have been dammed to form large reservoirs.
- Large landscaped parks with grand country houses and mixed woodlands, and remnant orchards associated with market gardening.
- New woodland planting associated with The National Forest.
- There are many scattered, sometimes ancient, hedgerow trees in the core area. By contrast, low and well-trimmed hedges are found around some arable fields in peripheral areas.
- Extensive areas of unimproved pasture and remnant acid grassland with heathy scrub persist, with woodland on some steep, undulating sandstone slopes.
- The major Mercian ecclesiastical centres at Repton and Breedon-on-the-Hill are rich in Christian and Viking heritage, and prominently-sited churches invoke a historic feel to the NCA. Breedon-on-the-Hill was the site of a Saxon monastery, with Saxon carvings preserved in the church.
- Large, nucleated villages – the most remote built of attractive, mellow yellow brick, with a few surviving timber-framed buildings.
- Small, clustered red-brick villages retain a rural character, but those close to the River Trent valley, including Melbourne, Repton and Castle Donington, are larger.
- East Midlands Airport, with its important passenger and freight terminal, is located in the east of the NCA and serviced by the A42 and M1.

Triassic siltstones and mudstones of the Mercia Mudstone Group, produce a gently rolling plateau of productive, reddish, clay soils suitable for agriculture.

Hedgerow trees, in the wooded estatelands add to the sense of wooded character and enclosure in the surrounding farmland.

Melbourne Parklands today

The parklands rise abruptly out of the Trent Valley, where the undulating mixed farmland conceals woodlands, reservoirs, landscaped parklands with grand country houses, and scattered villages.

The plateau in the core of the NCA is dissected by narrow, north-flowing river valleys, with stands of ash and alder in the valley bottoms, which are occasionally associated with rich, lime-loving ground flora including giant bellflower and hart's-tongue fern. Two valleys have been dammed to create large reservoirs, at Staunton Harold and Foremark, which provide public drinking water and valuable habitats. Oak-birch woodland and bur-reed swamp occur around the margins of Foremark Reservoir. Enclosing the reservoirs and parks are substantial areas of mixed woodland, some ancient. These tend to be located on ridge-tops and steeper slopes associated with poorer soils.

The parkland and woodland are mutually reinforcing. Designed parkland avenues, parkland trees, hedgerow trees and remnant orchards in the surrounding farmland all add to the sense of wooded character and enclosure. Although it is better known for festivals and motor racing, Donington Park has an SSSI that comprises a medieval park containing a fine population of ancient oak trees. Calke Park (designated as both an SSSI and a National Nature Reserve (NNR)) includes two veteran oak trees that are over 1,000 years old. One-quarter of the NCA is covered by The National Forest, and new woodland planting accentuates the rolling landform, further enhances the traditional wooded character of the NCA, and strengthens its links with neighbouring Charnwood and Needwood forests.

The rolling, undulating landscape of the Melbourne Parklands is predominantly a tranquil, agricultural landscape that retains a historic estate influence. Most

The proliferation of country houses reached a peak in the 17th and 18th centuries. The parkland landscapes make a major contribution to the area both in terms of landscape character and visitors to the NCA.

of the broad plateau in the core of the NCA is in agricultural use, with extensive areas under arable production (with mixed arable and pasture on the steeper ground). Within the landscape, there are extensive areas of unimproved pasture and remnant acid grassland, dominated by brown bent, wavy hair-grass, sheep's fescue and heath grass. Heath bedstraw and harebell are also prevalent. Breedon Hill SSSI comprises one of the largest areas of species-rich limestone grassland in Leicestershire, and is representative of such grassland habitats in the Midlands.

Disused mineral railway lines provide opportunities for recreation. National Cycle Route 6 skirts the boundary of Cloud Wood in the south of the NCA.

The settlement pattern comprises predominantly large, nucleated villages, those furthest from the Trent Valley built of attractive, mellow yellow brick, with a few surviving timber-framed buildings. Settlements closest to the Trent Valley have been enlarged in recent times; Melbourne, Repton and Castle Donington are predominantly red brick, with local sandstone detailing and imported slate.

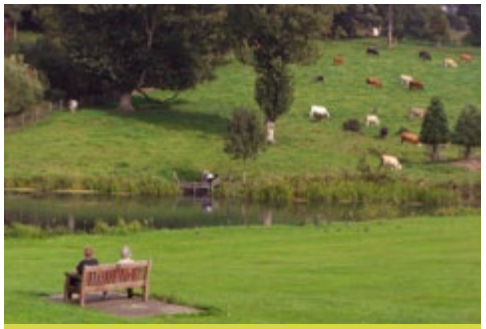
The area's churches provide prominent historic landmarks, for example, the imposing church at Melbourne, which is one of the finest and most complete Norman churches in England, and at Breedon-on-the-Hill, where the spectacularly sited church overlooks cliffs created by quarrying.

There are a number of disused quarries that now provide habitats for flora and invertebrates. Ticknall Quarries SSSI comprises a range of habitats, including open water, ash woodland and flower-rich calcareous grassland. Dimminsdale SSSI is a former lead and limestone mine, and now supports nationally important heath grassland and woodland.

Contrasting strongly with surrounding valleys and urban areas, the tranquil, agricultural landscape of the Melbourne Parklands attracts visitors seeking quiet recreation. The reservoirs at Staunton Harold and Foremark also offer a range of leisure opportunities.

The sense of place and tranquillity within the NCA changes at the eastern and western boundaries of the NCA, with the juxtaposition of the urban fringes of Burton-on-Trent and Swadlincote in neighbouring NCAs in the west, and East Midlands Airport, with its passenger and freight handling centre, in the east. The M1 and A42 also cross the NCA.

Twenty-five per cent of the NCA is within The National Forest. Woodland planting is strengthening the landscape character of the NCA.



Contrasting strongly with the urban areas, the tranquil setting of Staunton Harold Reservoir attracts visitors seeking quiet recreation.

The landscape through time

The oldest rocks in the NCA occur as outcrops of hard Carboniferous limestone that were laid down in a warm, shallow sea around 345 to 326 million years ago, which were folded into a large anticline, and now form a broken ridge of hills.

The majority of the terrain of the Melbourne Parklands is dominated by Triassic rocks: sandstones and conglomerates of the Sherwood Sandstone Group, and red mudstones of the Mercia Mudstone Group. These rocks were deposited under arid, desert conditions. The Sherwood Sandstone Group was deposited by a major river that crossed England and originated in what is now northern France. The mudstones were wind-blown dust that settled on sun-baked mudflats when continental conditions prevailed around 248 to 200 million years ago. These have weathered to productive, reddish, clay soils, which underlie much of the undulating western half of Leicestershire. The Triassic sandstones form a recharge area for the deep aquifer in the east of the NCA.

The Millstone Grit Group rocks of the Melbourne area comprise mudstones and sandstones, and there are small outliers of Pennine Lower Coal Measures around Melbourne and in the south of the NCA, near Swadlincote.

Superficial deposits are limited in extent, comprising a few areas of till in the tributary valleys to the rivers Trent and Soar. Alluvium deposits and river terraces are evident between Hemington and Lockington, in the north-east of the NCA.

The rocks provide strong cultural associations, for example, the spectacularly sited church at Breedon-on-the-Hill is built on an outcrop of Carboniferous limestone on the site of an iron-age hill fort and, later, monastery. Sandstones from the Millstone Grit and Sherwood Sandstone Groups have been extensively used as building stone. The Carboniferous Peak Limestone Group is regularly used as an aggregate, but historically it has been used extensively for lime, mortar and (sporadically) as a building stone.

Calke Park, designated both an SSSI and an NNR is recognised internationally for wood pasture and parkland.

There is scattered evidence of Mesolithic occupation in the Melbourne Parklands, but this (and later Neolithic and bronze-age finds and sites) appears to relate to activity spreading out from the Trent and Tame valleys. Clearance of the area throughout the Iron Age and Roman period produced heathlands,

which established themselves over the glacial till soils. The first substantial evidence of human influence comes from the Anglo-Saxon period.

Repton and Breedon-on-the-Hill were major ecclesiastical centres of the kingdom of Mercia in the 8th and 9th centuries, Repton was the seat of the Bishop of Mercia and the Mercian royal family established Repton Abbey. During the second half of the 9th century Vikings landed at Repton, having sailed up the River Trent, and settled there, incorporating the abbey into their fortifications. They chose nearby Ingelby as their burial site: it is the only known Scandinavian cremation cemetery in England.

The predominant pattern of nucleated settlement was established by the end of the Anglo-Saxon period, the villages being dominated by their parish churches and surrounded by open fields and commons, which extended across most of the farmland in the medieval period. This period, and into the 14th century, also saw the spread of smaller scattered settlements amid the woodlands and heaths.

The Normans continued with the building of parish churches that had begun in England in the late Anglo-Saxon period, and Melbourne Parish Church is one of the finest and most complete Norman churches in England.

Estates had a major influence: by the 13th century monastic houses and secular estates controlled both farmland and deer parks, for example at Calke Abbey. The dissolution of the monasteries prompted the enlargement of estates, and the proliferation of country houses and parklands reached a peak in the 17th and 18th centuries. Parkland landscapes make a major contribution to the area, often based on medieval parks and, in some cases, retaining elements of the original boundaries or pales of these earlier parks.

The area has a long history of mixed farming, evident from the survival of pre-18th century irregular pasture enclosures, and nationally-significant fragments of medieval ridge and furrow. The NCA contains a variety of fieldscapes, a legacy of historic land uses that combine to produce a complex landscape. Woodland provided sheltered grazing, fuel and timber for building. The villages retained communal arable fields and common pasture into the 18th and 19th centuries. Melbourne and Castle Donington have seen continual expansion as local market centres, to become commuter settlements more recently. Isolated villages remain small, and where they are closely associated with major estates they are defined by the estate architecture (Ticknall is a good example).

In the 18th century, lead extraction took place on a commercial scale at Earl Ferrers' Mine in Dimminsdale. At Ticknall, the limestones were exploited for lime on a scale that resulted in the construction of a tramway that linked the lime yard at Ticknall to the Ashby Canal.

In the early to mid 19th century, Samuel Robinson founded Melbourne's market gardening enterprise and made 'Robinson of Melbourne' well known. In 1850, 240 acres were under spade cultivation for the market, exploiting the rich loams derived from an inlier of Millstone Grit.

At the onset of the Second World War, the need for food production prompted the conversion of grassland to arable land, and this was accompanied by a loss of hedgerows and field ponds. Dairying, market gardening and woodland management all declined in the post-war period. Remnant orchards associated with the tradition of market gardening survive.

Today, the fields are largest on the predominantly arable plateau areas, and more irregular and smaller on the valley sides, where earlier farmsteads are

concentrated and close to villages. The advent of Environmental Stewardship schemes has encouraged more sympathetic management of hedgerows and grasslands, with specific measures to manage (and in some cases restore) parkland, for example at Calke, Castle Donington, Staunton Harold and Langley Priory – some of which are now English Heritage-registered parks and gardens. An extensive area of arable land around Calke Park has been returned to grassland, to improve biodiversity and to enhance the setting of the parkland. Several farm shops, craft shops and visitor centres have also opened in recent years to diversify farm and estate income.

Some 25 per cent of the NCA is within The National Forest. Tree planting began in 1990 in response to the fragmentation of the existing woodlands, and to the decline in industry and mining in central England. As of October 2012, 8 million trees have been planted over 200 square miles.[4] The National Forest has had a positive impact, borne out by the 'Countryside Quality Counts'[5] data for the period 1999 to 2003 that shows that woodland planting has strengthened the landscape character of the NCA.

Significant infrastructure projects have had an impact on the character of the NCA. The M1, Britain's first official motorway, was opened in 1959, and crosses the NCA close to its eastern boundary. Also in the east, East Midlands Airport, which opened in 1965, has been developed and expanded since its original use as a Second World War airfield. Road enhancement schemes such as the A42 have also impacted on the character of the NCA.

Large quarries straddle the southern boundary of the NCA and are a localised feature in an otherwise agricultural landscape. Both Cloud Hill Quarry and Breedon Quarry are important sources of magnesium-rich dolomitic limestone or dolostone. The stone has had many uses, including as a source of lime and for mortar, but is now used across the East Midlands as an aggregate for road dressing.

The spectacularly sited church at Breedon-on-the-Hill overlooks cliffs created by quarrying of the Carboniferous Limestone.

[4] See www.nationalforest.org/forest for more about The National Forest.

[5] See www.naturalengland.org.uk/ourwork/landscape/englands/character/cqc/default.aspx

Ecosystem services

The Melbourne Parklands 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 Thames Valley NCA is contained in the 'Analysis' section of this document.

Provisioning services (food, fibre and water supply)

- **Food provision:** The various soil profiles in the NCA support a range of food provisioning: for example, less permeable soils are used for dairying and potatoes, while wheat and barley (and increasingly maize) are the main arable crops grown on the higher-fertility, free-draining soils. The best soils, the dark loams around Melbourne, support market gardening, and some remnant orchards survive as well.

- **Timber provision:** The Melbourne Parklands NCA falls between the ancient forests of Needwood and Charnwood, and existing woodland represents 10 per cent of it. Some 25 per cent of the NCA is within The National Forest. The NCA's woodland character has been significantly enhanced, with new, mixed woodland creation including commercial plantations. Short rotation coppice is uncommon, although there is potential for it to be sensitively accommodated within the wooded landscape.

- **Water availability:** There are two large reservoirs in the NCA, Foremark Reservoir and Staunton Harold Reservoir, both of which are important for public water supply to the region. They also provide local ecological, conservation and recreational value. An outcrop of the Sherwood Sandstone Group, in the east of the NCA, serves as a recharge area for the deep Sherwood Sandstone aquifer, the second-most important in the UK. The aquifer is protected by the Environment Agency and is within a protected water area.[6] There are also a number of public water supply boreholes within the NCA that have source protection zones around them.

- **Genetic diversity:** A number of parklands, some originating from the Middle Ages, still contain managed deer herds with very long genetic continuity: they may have adaptive characteristics that could be significant in terms of resistance to diseases and pests. The remnant orchards associated with market gardening contain some local varieties; Leicester-Burton Pippin and Dumelow's Seedling are just two of approximately 100 varieties of apple indigenous to Leicestershire that are not in the National Fruit Collection at Brogdale Farm, which is run by the University of Reading in partnership with the Department for Environment, Food and Rural Affairs (Defra).

- **Biomass energy:** According to Defra's biomass potential map,[7] there are opportunities for growing energy crops – provided that they are grown within the wooded landscape and do not have a detrimental visual impact on the setting of the country houses and parkland, or any direct physical impact on buried archaeology.

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[6] http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=_e&topic=groundwater#x=435353&y=325433&lg=1,&scale=7

[7] http://archive.defra.gov.uk/foodfarm/growing/crops/industrial/energy/opportunities/index.htm

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

- **Climate regulation:** The soils over most of the NCA have a low carbon content, although there are small pockets of soil with a higher carbon content, associated with areas of woodland and permanent grassland. New tree plantations, made as part of The National Forest, as well as the effective management of existing woodland, can ensure that the role of the woodland in sequestering and storing carbon is optimised.

- **Regulating water quality:** Maps from the Environment Agency's river basin management plan for the area[8] indicates that the current ecological status of the main rivers in the NCA is 'moderate' and the chemical status is 'good'. Controlling pollutants and sediments entering feeder watercourses – resulting from soil and nutrient run-off and livestock directly accessing watercourses – could improve the ecological quality of the water.

- **Regulating soil quality:** Food provision is an important service in the NCA, and the quality and versatility of the soil has a direct impact on crop yield**.** The slowly permeable clay soils of the NCA can suffer from compaction and/or capping when wet, damaging the soil structure. This leads to nutrient loss and worsening rates of water infiltration.

- **Regulating pests:** Semi-natural habitats and hedges close to commercial agriculture areas may support predators that can regulate pests that adversely affect food provision.

Cultural services (inspiration, education and wellbeing)

- **Sense of place/inspiration:** A sense of place is evoked by the large landscaped parklands and grand country houses surrounded by extensive estate woodlands, and by the associated red-brick estate farmsteads and villages set within an undulating, tranquil, mixed-farming landscape.

- **Sense of history:** A strong sense of history is evoked by the imposing and historically important churches, country houses and designed parklands, notably at Calke and Melbourne, which date from the 17th and 18th centuries. Melbourne Parish Church is one of the finest and most complete Norman churches in England, and, like the spectacularly sited church at Breedon-on-the-Hill, is a prominent historic landmark. Areas of remnant ridge and furrow survive as a further indication of historic land use that is still legible in this landscape.

- **Recreation:** The number of visitors to the NCA is important to the local economy. Recreational opportunities are provided by the woodlands that form part of The National Forest, as well as by historic country houses and their associated landscaped parklands (such as Calke Abbey, which is now owned by the National Trust). Reservoirs at Staunton Harold and Foremark both offer a range of leisure opportunities, with popular visitor centres providing children's play areas. Public rights of way also provide leisure opportunities and National Cycle Route 6 (Derby to Loughborough) passes through the NCA.

[8] http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=437500.0&y=320500.0&topic=wfd_rivers&ep=map&scale=9&location=Staunton%20Harold%20Hall,%20Leicestershire&lang=_e&layerGroups=default&distance=&textonly=off#x=439273&y=323590&lg=3,7,8,9,&scale=7

- **Biodiversity:** There are over 533 ha (4 per cent of the total area) of Biodiversity Action Plan (BAP) priority habitats within the NCA, including 223 ha of wet woodland and 156 ha of lowland mixed deciduous woodland. There are 312 ha of land nationally designated as an SSSI. Calke Park (designated as both an SSSI and an NNR) is recognised internationally for wood pasture and parkland. The park has exceptional deadwood invertebrate fauna, including many that are endangered or nationally scarce. It is also important for its fungi, the oak polypore being nationally scarce and only occurring on very old oak trees. A good diversity of woodland birds and at least eight species of bat have all been recorded here, including the serotine bat (this is its only known location in Derbyshire). Elsewhere in the NCA, stands of ash and alder occur in the valley bottoms, occasionally associated with rich, lime-loving ground flora including giant bellflower and hart's-tongue fern. These give way to stands of birch and English oak on the Millstone Grit, with associated acidic woodland ground flora and extensive areas of unimproved grassland.

  Breedon Hill SSSI comprises one of the largest areas of species-rich limestone grassland in Leicestershire, and is representative of such grassland habitats in the Midlands. Carvers Rocks SSSI comprises an area of wet alder, birch and willow carr, and also supports a diverse invertebrate fauna, with several nationally or regionally rare and scarce species. A large number of regionally scarce plants are associated with the wet woodlands. Ticknall Quarries SSSI comprises a range of habitats, including open water, ash woodland and flower-rich calcareous grassland.

- **Geodiversity:** Designated Local Geological Sites provide important and accessible sections allowing interpretation and understanding of, and research into, the soils and geology of the NCA, aiding our understanding of past climates. Of particular interest are the Peak Limestone Group at Breedon Quarry, Cloud Hill Quarry and the former Ticknall lime works. Other quarries are found in the Millstone Grit in the area around Melbourne, and in the Sherwood Sandstone Group at Dimminsdale. Minerals from the Earl Ferrers' Mine at Dimminsdale feature in major collections in both the UK and other countries, and material from the spoil heaps offers opportunities for the study of mineral genesis. The legacy of quarrying contributes to the character of the NCA and to the local vernacular; the appropriate, small-scale extraction of stone could provide materials for repairing existing buildings and for new development, to maintain the vernacular.

Statements of Environmental Opportunity

SEO 1: Manage the new planting of The National Forest and restore the characteristics of the historic parklands and woodlands. Conserve and manage the hedgerows and hedgerow trees, preserving the field patterns of early enclosures and maintaining the legacy of historic land use, bringing benefits for soil quality, biodiversity and recreation.

For example, by:

- Ensuring the planting of indigenous tree and shrub species, including a proportion of large, long-lived species, and ensuring that any new plantations follow existing or historic patterns and guidelines set out by The National Forest.
- Securing a successor generation of veteran trees through the identification, protection and recording of candidate specimens. Conserving and renewing ornamental plantations and individual parkland trees over a long period of time.
- Retaining over-mature hedgerow trees for the habitat they provide and planting new saplings to ensure the continuity of mature hedgerow trees.
- Maintaining species-rich hedgerows, in particular those associated with earlier enclosure, gapping-up where necessary and ensuring any new planting is on historic field boundaries where relevant and where best able to secure benefits to soil erosion and soil quality.
- Managing and restoring areas of semi-natural grassland, through suitable land management.
- Protecting the settings of historic designed parkland, associated country houses, and estate farmsteads and villages, for the benefits to heritage and recreation.
- Bringing remnant orchards into active management to conserve the genetic continuity of fruit species, and seeking opportunities to create new orchards.
- Working with developers to establish hedgerows of native species as part of commercial and residential development.
- Conserve areas of ridge and furrow through suitable land management.

SEO 2: Promote sustainable agricultural practices to help protect and manage areas of semi-natural habitat and, where appropriate, link these areas together to create a coherent and resilient habitat network.

For example, by:

- Encouraging land owners and managers to take up conservation and/or Countryside Stewardship schemes that protect existing semi-natural habitats, and to appropriately manage areas that link together or buffer areas of semi-natural habitats.
- Encouraging sustainable farming practices through management plans, and promoting the suitable management of arable land to deliver habitat for farmland birds.
- Working in partnership with land owners and managers to investigate opportunities to link together woodland plantations, where appropriate.
- Working in collaboration with farmers to maintain levels of productivity and to maximise the benefits of varied and versatile soils, while investigating and applying management techniques that enhance landscape character and increase biodiversity.
- Working in collaboration with riparian land owners and managers to manage watercourses to prevent diffuse pollution entering the watercourses.

SEO 3: Protect the important water resource in the NCA to safeguard the quality of public, private and agricultural water supplies, and to improve its contribution to biodiversity and recreation.

For example, by:

- Encouraging sustainable management techniques to protect the quality of public, private and agricultural water supplies.
- Protecting watercourses and aquifer recharge areas from pollution, and promoting the sustainable use of water.
- Investigating ways to reduce high nutrient levels entering watercourses, as this can have a detrimental effect on water quality – benefiting biodiversity and recreation.
- Ensuring a robust, permanent cover of vegetation, especially trees and scrub, that can significantly reduce soil erosion and filter water run-off.
- Protecting soil quality, and reducing soil erosion and nutrient loss from farmland, by managing livestock through best practice methods. For example, encouraging the use of management plans that address the issues of bank erosion, direct soil deposition into watercourses from livestock directly accessing them, and soil erosion due to mixed and livestock farming practices.
- Expanding and restoring wetland habitats, particularly adjacent to watercourses, in areas where flooding is a risk.
- Promoting the sustainable use of water and effluent discharge in areas that are important to the commercial, recreational and tourism sectors.
- Sustainably managing streams to enable the development of sediment deposition features, in areas where flooding is not a risk.
- Enhancing the landscape character and ecological continuity of river corridors through the management, natural regeneration and planting of riparian vegetation.
- Working in collaboration with the Environment Agency to encourage developers to use sustainable urban drainage techniques to control the quality and quantity of water entering watercourses.

SEO 4: Protect and enhance the historic landscape character and historic ecclesiastical centres. Promote opportunities for high-quality, accessible green space, and for the interpretation of historical features, increasing opportunities for community engagement, access, recreation and education.

For example, by:

- Using an understanding of local architectural traditions and materials, in combination with the historic pattern of settlement, to plan for and inspire new development.
- Ensuring a supply of local building stone. Recognising the link between the distribution of habitats and species, as well as the importance of former extraction sites, for the sake of heritage, geodiversity and biodiversity.
- Protecting important registered parks and gardens and historic centres, for example at Breedon-on-the-Hill and Repton, and their settings. Seeking to increase opportunities for people to enjoy and deepen their understanding of the natural and historic environment and to take action to improve it.
- Master-planning new urban expansions to ensure that accessible, multi-functional green spaces become an integral component, establishing a high-quality environment for the local community. Key views to and from settlements should be retained.
- Integrating the co-ordinated provision of green infrastructure into any development, ensuring that local communities have opportunities to enjoy their local green space and to take action to improve it.
- Ensuring that any development plans include areas for landscape character and biodiversity enhancement, for example wildlife corridors. This will increase the resilience of species to climate change.
- Improving access to the rights of way network and National Cycle Network through new rights of way that will offer increased opportunities for recreation near to where people live and work, contributing to creating a sustainable transport network.

Additional opportunity

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

For example, by:

- Taking an integrated approach to the natural environment that reflects the strong link between geodiversity and its influence on agriculture, the landscape, industrial development and the settlement pattern of the NCA.
- Conserving and managing the suite of SSSIs and Local Wildlife Sites to protect and improve their condition by agreeing management plans with owners and occupiers, and working collaboratively with partners and stakeholders to undertake restorative management of designated sites.
- Undertaking restorative management of Local Wildlife Sites, offering opportunities for volunteering and community engagement, and improving access for educational, scientific research and recreational purposes.
- Using designated Local Geological Sites, for example at Breedon, Cloud Hill, Dimminsdale and Ticknall Quarries, for the important and accessible sections that they provide to allow interpretation and understanding of, and research into, the soils and geology of the NCA, aiding our understanding of past climates.

Remnant acid grassland with heathy scrub persist, with woodland on some steep, sandstone slopes.

Supporting document 1: Key facts and data

Total area: 15,045 ha

1. Landscape and nature conservation designations

There are no National Parks or Areas of Outstanding Natural Beauty in this NCA.

Source: Natural England (2011)

1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

Tier	Designation	Name	Area (ha)	Percentage of NCA
International	n/a	n/a	0	0
European	Special Protection Area (SPA)	n/a	0	0
	Special Area of Conservation (SAC)	n/a	0	0
National	National Nature Reserve (NNR)	Calke NNR	80	<1
National	Site of Special Scientific Interest (SSSI)	A total of 9 sites wholly or partly within the NCA	312	<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 47 local sites in Melbourne Parklands NCA covering 872 ha which is 6 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 – select 'Designations/Land-Based Designations/ Statutory'

1.2 Condition of designated sites

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

SSSI condition category	Area (ha)	Percentage of SSSI in category condition
Unfavourable declining	5	2
Favourable	122	39
Unfavourable no change	11	3
Unfavourable recovering	166	53

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 25 m above sea level to a maximum of 159 m. The average elevation of the landscape is 81 m above sea level.

Source:Natural England (2010)

2.2 Landform and process

Carboniferous limestones form a broken ridge of hills, and Upper Carboniferous gritstones and mudstones produce pronounced ridges and steep sided, wooded valleys. Sandstones and breccias to the east and west form slopes and heaths. Less resistant overlying siltstones and mudstones produce a gently rolling lowland plateau. The pronounced valleys of the River Trent and the River Soar bound the general rolling plateau landscape of the region to the west, north and east. The positions of the rivers are probably controlled by major faults in the underlying bedrock. The plateau is dissected by steep-sided north flowing river valleys caused by the rejuvenation of streams down cutting to the lowered base level of the major Trent Valley, enhanced by processes in a periglacial environment. The channel flowing into the Trent Valley at Repton for example displays a relief of up to 80m in its upper reaches. This degree of incision reflects relatively rapid down cutting of these small tributaries through the easily erodible Mercia Mudstones.

Source: Trent Valley and Rises Natural Area Profile, Melbourne Parklands Countryside Character Area description, Geology Narrative; West Midlands Geodiversity Partnership.

2.3 Bedrock geology

The geology here is complex. Carboniferous limestones form a broken ridge of hills, of which Breedon Hill is the most conspicuous. Upper Carboniferous gritstones and mudstones produce pronounced ridges and steep sided, wooded valleys. Lower Triassic sandstones and breccias to the east and west form sandstone slopes and heaths. Less resistant overlying siltstones and mudstones produce a gently rolling lowland plateau. There are deposits of Millstone Grit around Melbourne and sandstones extending towards the River Trent. The pronounced valleys of the River Trent and the River Soar bound the general rolling plateau landscape of the region to the west, north and east. The positions of the rivers are probably controlled by major faults in the underlying bedrock.

Source: Trent Valley and Rises Natural Area Profile, Melbourne Parklands Countryside Character Area description, Geology Narrative; West Midlands Geodiversity Partnership.

2.4 Superficial deposits

The area is dominated by the Triassic Mercia Mudstones, which give rise to productive, reddish clay soils, partially overlaid by glacial till in the east. There are localised areas of acidic soil that support a diverse flora, for example at Calke Abbey. As it is located beyond the Late Devensian ice limit, there is little in the way of obvious landscape evidence for past glacial activity. The interfluves on the plateau are however associated with sporadic and highly-weathered tills that provide evidence of an older ice advance that was more extensive than the Late Devensian glaciation. While these glacial deposits have not been dated, they are likely to relate to the Anglian glaciation (c. 450 ka BP).

Source: Trent Valley and Rises Natural Area Profile, Melbourne Parklands Countryside Character Area description, Geology Narrative; West Midlands Geodiversity Partnership.

2.5 Designated geological sites

Tier	Designation	Number
National	Geological Site of Special Scientific Interest (SSSI)	0
National	Mixed Interest SSSI	3
Local	Local Geological Sites	10

Source: Natural England (2011)

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

2.6 Soils and Agricultural Land Classification

The area is dominated by the Triassic Mercia Mudstones, which give rise to productive, reddish clay soils but are partially overlaid by glacial till in the east. There are areas of free draining sandy soils that overlie sandstone and localised areas of acidic soil that support a diverse flora for example at Calke Abbey. The Millstone Grit around Melbourne weathers to produce a dark loamy soil that supports market gardening; however, the majority of the area is classified as Grade 3 agricultural land.

Source:Trent Valley and Rises Natural Area Profile, Melbourne Parklands Countryside Character Area description, Geology Narrative; West Midlands Geodiversity Partnership, Natural England (2010).

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

Agricultural Land Classification	Area (ha)	Percentage of NCA
Grade 1	0	0
Grade 2	4,034	27
Grade 3	9,689	64
Grade 4	922	6
Grade 5	0	0
Non-agricultural	205	1
Urban	195	1

Source: Natural England (2010)

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

3. Key waterbodies and catchments

3.1 Major rivers/canals

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

River Name	Length in NCA (km)
n/a	n/a

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.

There are no major rivers in the NCA. There are two main reservoirs in the NCA; Foremark Reservoir and Staunton Harold Reservoir. Both are important for water supply as Staunton Harold Reservoir is located between Derby and Burton-upon-Trent. The reservoir was created from one of six naturally occurring ponds in 1964 to provide Leicester and the East Midlands with drinking water.

Foremark Reservoir was built in the 1970s and the reservoir draws water from the River Dove at Eggington, outside the NCA boundary, supplying Melbourne water treatment works.

In August 2010, water storage levels in the reservoirs were 83 per cent at Foremark and 74 per cent at Staunton Harold Reservoir.

The plateau around Donnington Park and East Midlands Airport is deeply dissected in parts by a series of relatively small but deeply incised river systems that flow from south to north.

The channel flowing into the Trent Valley at Repton for example displays a relief of up to 80 m in its upper reaches. This degree of incision reflects relatively rapid down cutting of these small tributaries through the easily erodible Mercia Mudstones.

3.2 Water quality

The total area of Nitrate Vulnerable Zone is 15,045 ha, 100 per cent of NCA.

Source: Natural England (2010)

3.3 Water Framework Directive

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

4. Trees and woodlands

4.1 Total Woodland Cover

The NCA contains 1,499 ha of woodland (10 per cent of the total area), of which 396 ha or 3 per cent by area of NCA is ancient woodland. Melbourne Parklands makes up 11 per cent by area of the National Forest.

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

4.2 Distribution and size of woodland and trees in the landscape

Calke Park, with its ancient and veteran trees of international importance is perhaps the best known parkland. Designated as a National Nature Reserve, the wood pasture here contains two oaks aged over 1,000 years, remnants of the ancient wildwood. Collectively the trees and woodlands play an important role in emphasising estate character. Dense lines of trees along watercourses and locally prominent parkland and amenity trees play a key role in defining the scale and enclosure of the intervening spaces. Many estate woodlands are mixed species plantations managed as game coverts or for commercial timber. Part of the NCA lies within the National Forest where extensive woodland and other habitat creation /management activity is underway. Within the National Forest between Melbourne and Swadlincote planting in large blocks has reinforced the current pattern. Between 1999 and 2003, 267 ha were approved for planting under a Woodland Grant Scheme agreement.

Source: Trent Valley and Rises Natural Area Profile, Parklands Countryside Character description.

4.3 Woodland types

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

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

Woodland type	Area (ha)	Percentage of NCA
Broadleaved	1,215	8
Coniferous	188	1
Mixed	57	<1
Other	39	<1

Source: Forestry Commission (2011)

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

Woodland type	Area (ha)	Percentage of NCA
Ancient semi-natural woodland	185	1
Ancient re-planted woodland (PAWS)	211	1

Source: Natural England (2004)

5. Boundary features and patterns

5.1 Boundary features

Hedgerows are generally low and well trimmed where they surround large arable fields on shallow slopes, and dense with many scattered hedgerow trees where they enclose permanent pasture or mixed farmland on steep slopes.

Source: Melbourne Parklands Countryside Character Area description; Countryside Quality Counts (2003); Geological Narrative; West Midlands Geodiversity Partnership.

5.2 Field patterns

Predominantly medium size semi-regular and regular fields enclosed by hedgerows. Increasingly intensive arable cultivation, especially in the estate farmlands, field enlargement and tree loss through Dutch elm disease have created a very open landscape in many areas.

Source: Melbourne Parklands 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

Mixed farming with large arable fields on the broader plateau. Grassland often associated with former parks. This is borne out by the following figures on farm type. In 2009, the predominant agricultural sectors were; 58 cereal producers (representing 37 per cent of the farmed area) and 26 lowland grazing units (37 per cent of the farmed area) with other mixed arable and combinable crops. During the period 2000 to 2009 there was a small increase in the number of cereal producers (46 to 58) respectively.

Source: Agricultural Census, Defra (2010)

6.2 Farm size

Farms of area greater than 100 ha are the most common size totalling 9,908 ha, representing 77 per cent of the total agricultural area within the NCA. Farms of area 50 – 100 ha are the second most common size totalling 1,720 ha, approximately 13 per cent of the total agricultural area of the NCA. During the period 2000 to 2009 trends show an increase to the total agricultural area and a corollary increase to the two most common farm sizes.

Source: Agricultural Census, Defra (2010)

6.3 Farm ownership

2009: Total farm area = 12,816 ha; owned land = 6,962 ha
2000: Total farm area = 10,936 ha; owned land = 5,022 ha

During the period 2000 to 2009 trends show an increase to the total farmed area and an increase to the owned land. In 2009, 54 per cent of the agricultural land was farmed by the owner.

Source: Agricultural Census, Defra (2010)

6.4 Land use

During the period 2000 to 2009 cereal producers and grazing increased. The same period saw a small decrease in dairy units and a significant increase in 'other types', from less than 5 to 27).

Source: Agricultural Census, Defra (2010)

6.5 Livestock numbers

During the period 2000 to 2009 lowland grazing of livestock increased from 19 to 26 units yet despite this increase, the overall number of sheep in the NCA fell by over 8,200 head from 17,800 to 9,600. During the same period the number of cattle declined from 8,100 to 7,000, while there was a small increase to the number of pigs from 2,800 to 3,700.

Source: Agricultural Census, Defra (2010)

6.6 Farm labour

Figures for the period 2000 to 2009 show a declining trend in the number of principal farmers, full-time and casual gang workers. During the same period the number of salaried managers and part-time workers increased.

Source: Agricultural Census, Defra (2010)

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

7. Key habitats and species

7.1 Habitat distribution/coverage

There are discrete small areas of acid and calcareous grassland with lowland meadows and heath. Woodlands are a dominant habitat in the NCA and are relatively well-linked with large blocks linked to the National Trust's Calke estate and the nearby Staunton Harold estate.

Source: Melbourne Parklands Countryside Character Area description; Geological Narrative; West Midlands Geodiversity Partnership.

7.2 Priority habitats

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

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

Priority habitat	Area (ha)	Percentage of NCA
Broadleaved mixed & yew woodland (broad habitat)	476	3
Coastal and floodplain grazing marsh	301	2
Fens	14	<1
Lowland meadows	12	<1
Lowland dry acid grassland	11	<1
Reedbeds	9	<1
Lowland calcareous grassland	8	<1

Source: Natural England (2011)

Maps showing locations of priority habitats are available at:

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

7.3 Key species and assemblages of species

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

8. Settlement and development patterns

8.1 Settlement pattern

Scattered red brick estate farmsteads and the occasional country house, with imposing and dramatically sited churches.

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

8.2 Main settlements

Substantial settlements along the edge of the Trent Valley include Repton, Melbourne and Castle Donnington. The total estimated population for this NCA (derived from ONS 2001 census data) is: 46,061.

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

8.3 Local vernacular & building materials

Brick and sandstone vernacular buildings are a feature of the villages. Timber framing still survives in a few areas. Churches made from friable sandstone have undergone substantial reconstruction during the 19th and early 20th centuries. Most of the manor houses and country houses are constructed of imported stone. In Breedon, a small number of farmsteads and drystone walls have been constructed from Carboniferous limestone.

Source: Melbourne Parklands Countryside Character Area description; Countryside Quality Counts (2003); Geological Narrative; West Midlands Geodiversity Partnership.

9. Key historic sites and features

9.1 Origin of historic features

Scattered evidence of Mesolithic, later Neolithic and Bronze Age finds in the NCA appear to relate to activity spreading out from the Trent and Tame Valleys. Occupation and clearance of areas throughout the Iron Age and Roman periods is evident. Heathlands had become established over the glacial hill soils. Repton and Breedon on the Hill were major ecclesiastical centres of the Kingdom of Mercia. Post-Conquest period, Melbourne was an important market and manorial centre and there were monasteries at Calke, Repton and Gresley with extensive parks.

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

9.2 Designated historic assets

This NCA has the following historic designations:

- 7 Registered Parks and Gardens covering 616 ha.
- 0 Registered Battlefield/s covering 0 ha.
- 14 Scheduled Monuments.
- 537 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

- 3 per cent of the NCA, 484 ha, is classified as being publically accessible.
- There are 244 km of public rights of way at a density of 1.6 km per km2.
- There are no National Trails with the Melbourne Parklands NCA.

Sources: Natural England (2010)

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

Access designation	Area (ha)	Percentage of NCA
National Trust (Accessible all year)	0	0
Common Land	8	<1
Country Parks	0	0
CROW Access Land (Section 4 and 16)	8	<1
CROW Section 15	0	0
Village Greens	1	<1
Doorstep Greens	0	0
Forestry Commission Walkers Welcome Grants	80	<1
Local Nature Reserves (LNR)	1	<1
Millennium Greens	0	0
Accessible National Nature Reserves (NNR)	80	<1
Agri-environment Scheme Access	3	<1
Woods for People	409	3

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 likely to be associated with the large parklands and surrounding woodlands, as well as the unimproved pastures, heathy scrub on steep, undulating sandstone slopes and areas around the reservoirs at Foremark and Staunton Harold and the rural area around Repton.

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

Tranquillity	Score
Highest Value within NCA	23
Lowest Value within NCA	-69
Mean Value within NCA	-15

Sources: CPRE (2006)

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

11.2 Intrusion

The 2007 Intrusion Map (CPRE) shows the extent to which rural landscapes are 'intruded on' from urban development, noise (primarily traffic noise), and other sources of visual and auditory intrusion. This shows that the results are similar to the tranquillity scores with the undisturbed areas in the parklands and woodlands. A breakdown of intrusion values for this NCA are detailed in the table below:

Intrusion category	1960s (%)	1990s (%)	2007 (%)	Percentage change (1960s-2007)
Disturbed	59	79	79	+20
Undisturbed	39	20	16	-23
Urban	1	1	5	+4

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are a significant reduction in the area of undisturbed land in the area bounded by the M1 and A42 around Shepshed.

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

- Woodland is a significant feature in the NCA, with extensive estate mixed woodlands and new woodland planting associated with The National Forest between Melbourne and Swadlincote. Woodland character has been significantly enhanced by The National Forest initiative, 11 per cent of which falls within the NCA with new planting used to frame views, accentuate the rolling landform and strengthen woodland character. Standalone and boundary veteran oaks, wood pasture and parkland are locally very significant and many are over-mature.

Boundary features

- Commercial agriculture, accompanied by a shift towards arable production, has resulted in some loss of traditional hedgerow patterns and some are closely trimmed and gappy hedgerows. Take up of agri-enviornment schemes is beginning to address this issue.

- Increasing development for commercial purposes, for example around the junction of the M1 and East Midlands Airport has resulted in the loss of some hedgerows.

- Mature and veteran oaks and other species growing within hedges are a special characteristic of the wooded estate lands. Many of these are over-mature, although some boundary trees are being augmented.

Agriculture

- Many agricultural holdings have increased the extent of land associated with arable farming systems. This transition from grassland systems to arable cultivation it thought to be most marked around the periphery of the NCA and upon some of its larger estates.

- An increase in the number of Environmental Stewardship schemes within the last decade has realised improvements to many farmland habitats in addition to reinstating many of the NCA's landscape features.

- The farming community and partner organisations have been central in the design and implementation of restoration plans for many of the NCA's historic parklands. The programme of parkland restoration around Calke Park is one of the largest projects of its kind in the country.

- A decrease in the amount of land used for pastoral farming, a loss of hedgerows and an increase in the amount of land used for cereal production have increased the risk of soil erosion on lighter soils in the far west of the area.

Settlement and development

- East Midlands Airport, which opened in 1965, has been developed and expanded since its original use as a Second World War airfield and is now an important passenger terminal and freight handling depot. Road schemes have also impacted on the landscape, for example, the opening of the M1 in 1959 in the east of the NCA. Since then there has been a number of road improvement schemes for example, the A42.

- Settlements such as Castle Donington, Melbourne, Shepshed and Repton, once small villages, have grown and are now important commuter settlements within easy reach of Derby, Leicester, Nottingham and the airport.

Semi-natural habitat

- The NCA contains important Biodiversity Action Plan (BAP) habitats and Calke Park is recognised for wood pasture and parkland. Semi-natural habitats are susceptible to shifts towards arable production, invasive non-native species and development pressures. These pressures are a threat particularly to remnant unimproved pasture, heath and ancient woodland. Restorative management is underway at some sites, for example Pasture and Asplin Wood SSSI. However, recreation and access to the reservoirs, woodlands and parklands is increasingly popular with visitors from surrounding urban areas, which is placing increasing pressure on semi-natural habitats and increasing the demand for more recreation facilities.

Historic features

- There is a significant monastic heritage, many fine churches and an important Viking burial site. The churches are often built from friable sandstone resulting in an on-going programme of restoration.

- The fine landscaped parklands are the traditional draw for many visitors and Environmental Stewardship is playing a role in maintaining and in some cases restoring these historic designed landscapes.

Coast and rivers

- The NCA is an important water storage area with two significant reservoirs. There is a need to prevent deterioration of water quality and protect areas from pollution that provide a pathway for surface water to recharge the important Sherwood Sandstone aquifer which is exploited by the brewing industry in Burton-upon-Trent in the neighbouring NCA.

Minerals

- The Carboniferous Peak Limestone Group is still quarried in the east of the NCA on its southern boundary with Charnwood NCA. The limestone is used as aggregate for road dressing, but in the past has been used for lime, mortar and locally as a building stone contributing to the local vernacular. The more friable Sherwood Sandstone has been used to build churches, however many buildings in Melbourne are constructed from the more durable Millstone Grit sandstones. Historic extraction has left a localised legacy of disused quarries and distinctive landmarks that now provide valuable wildlife habitats.

- Historically, lead mining at Earl Ferrers Mine was economically important as were the lime works at Ticknall.

Drivers of change

Climate change

- Projected climate change trends suggest increased rainfall, periods of drought and more frequent storm events.

- The predicted alterations in rainfall pattern, and related issues of erosion and pollution, are likely to have an impact on the River Dove and its tributaries as a provider of water to Staunton Harold and Foremark reservoirs, impacting adversely on the water level and associated habitats.

- Over-abstraction from the Sherwood Sandstone aquifer places greater importance on areas that provide a potential pathway for surface water to

recharge the aquifer, also highlighting the importance of those areas that are most at risk to pollution of this key natural resource.

- The Environment Agency flood risk map indicates that for much of the NCA flooding is not generally a major issue. However, localised flooding does occur and could become more frequent and flood damage to vernacular buildings may increase.

- A changing climate is likely to cause stress and increase the vulnerability of the ancient oak trees to physical damage, pests and disease. Wood pasture and heathland may become more vulnerable to bracken incursion and fire.

- More frequent and intense weather events could lead to instability of steep slopes and greater risk of landslides.

Other key drivers

- Castle Donington, Melbourne, Shepshed and Repton, have grown and are now important commuter settlements within easy reach of Derby, Leicester, Nottingham and the airport. They are likely to remain under development pressure.

- Development pressure around the larger commuter villages and towns offers opportunity to ensure new development is well designed and incorporates green infrastructure. This will bring opportunities to reduce abrupt urban-rural contrast, such as exists around the Winshill and Stapenhill suburbs of Burton-upon-Trent in the adjacent NCA in the west.

- The character of the distinctive villages and estate farmsteads should be carefully managed and protected.

- The fine landscaped parklands attract many visitors to the area and there is an opportunity to extend this interest and better interpret the impressive Christian and Viking heritage.

- Changing farming practices can impact on ecological habitats, networks and species, as well as landscape character. There are opportunities to work with land managers to conserve and enhance farmland habitats and the rural character of the landscape through conservation projects and Environmental Stewardship schemes.

- New woodland should continue to increase access opportunities and respect the distinction between the relatively open estate farmlands and the more wooded estate.

- Some remnant traditional orchards survive and would benefit from active management and new planting. Opportunities to establish new orchards also exist. Short rotation coppice and other energy crops are uncommon, although could be sensitively planted within the wooded landscape.

- The extension of arable reversion at Calke Park and woodland creation projects elsewhere should be carefully monitored in order to inform other potential habitat creation projects in this and other NCAs.

- Supporting the work of The National Forest, Derbyshire County Council, Leicestershire County Council, North West Leicestershire District Council, the National Trust, Severn Trent Water, the Wildlife Trusts, Forestry Commission and others in the projects they implement will bring opportunities across the Melbourne Parklands, in addition to maximising opportunities to improve the natural environment arising from the partnership of these organisations.

Supporting document 3: Analysis supporting Statements of Environmental Opportunity

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

Statements 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: Manage the new planting of The National Forest and restore the characteristics of the historic parklands and woodlands. Conserve and manage the hedgerows and hedgerow trees, preserving the field patterns of early enclosures and maintaining the legacy of historic land use, bringing benefits for soil quality, biodiversity and recreation.	↘ **	↗ **	↗ **	↗ *	↗ **	↑ ***	↗ **	↗ **	↗ **	↗ **	↗ **	↗ *	N/A	↑ ***	↑ ***	↑ ***	↑ ***	↑ ***	↔ **
SEO 2: Promote sustainable agricultural practices to help protect and manage areas of semi-natural habitat and, where appropriate, link these areas together to create a coherent and resilient habitat network.	↘ **	↔ *	↗ *	o	↗ *	↗ **	↗ **	↑ ***	↗ **	↑ ***	↗ **	↗ *	N/A	↑ ***	↑ ***	↑ ***	↑ ***	↑ ***	↔ **
SEO 3: Protect the important water resource in the NCA to safeguard the quality of public, private and agricultural water supplies, and to improve its contribution to biodiversity and recreation.	↗ *	↔ *	↗ *	o	↔ *	↑ **	↑ **	↗ **	↗ *	↑ **	↗ *	↗ *	N/A	↑ **	↑ ***	↗ *	↗ *	↑ ***	↗ **
SEO 4: Protect and enhance the historic landscape character and historic ecclesiastical centres. Promote opportunities for high-quality, accessible green space, and for the interpretation of historical features, increasing opportunities for community engagement, access, recreation and education.	↔ **	↔ **	↗ **	o	↔ *	↗ **	↗ **	↗ *	↗ ***	↗ *	↗ *	↗ *	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
An undulating landscape that exemplifies the link between geology and landform.	■ The Carboniferous Peak Limestone Group forms a broken ridge of hills of which, Breedon Hill to the east, is the most conspicuous. The highly visible and dramatically sited church here overlooks a steeply undulating landscape and localised quarrying. ■ Less resistant, overlying siltstones and mudstones of the Triassic Mercia Mudstone Group produce a gently rolling lowland plateau. Differential erosion by dynamic river systems has produced a plateau that is deeply incised in places forming narrow valleys. Two valleys have been dammed to create reservoirs at Foremark and Staunton Harold. ■ Triassic sandstones of the Sherwood Sandstone Group and breccias to the east and west of the NCA form slopes of free-draining sandy soils that support heathland and there are also areas of remnant acid grassland. Elsewhere, neutral grassland can be found in the nutrient-rich valleys. ■ The dominance of Triassic Mercia Mudstones over the east and extreme west of the NCA, produce productive soils that are slowly permeable and can be prone to seasonal water-logging. ■ Sandstones in the Millstone Grit around the Melbourne area form a distinctive part of the landscape with a series of ridges and valleys.

Landscape attribute	Justification for selection
Extensive estate mixed woodland, new woodland creation, small game coverts roundels and tree belts and remnant orchards contribute to an overall wooded character.	■ Woodlands occur on steeper slopes, usually along valley sides, but are particularly evident in association with historic parklands at Calke, Melbourne, Staunton Harold and Bretby among others. ■ Collectively the trees and woodlands play an important role in emphasising estate character. Dense lines of trees along watercourses and locally prominent parkland and amenity trees play a key role in defining the scale and enclosure of the intervening spaces. ■ The woodlands are relatively well-linked with large blocks linked to the National Trust's Calke estate and the nearby Staunton Harold estate. ■ 25 per cent of the NCA lies within The National Forest where extensive woodland and other habitat creation and management activity is underway, furthering the objectives of the strategy for The National Forest. Within The National Forest between Melbourne and Swadlincote, planting in large blocks has reinforced the current pattern.
Mixed farmland including market gardening surrounds the areas of parkland and arable farming dominates the plateau top with grazing on the steep-sloping valley sides.	■ Food production is an important service in the NCA. The parkland remains largely pastoral and where the soils are heaviest or the slopes are steep, pasture predominates. Much of the pasture has been improved and where the soil is free-draining there is some cropping. ■ Dairying was historically more prevalent and the Calke estate retains some commercial dairy farms. ■ Remnant orchards survive associated with the tradition of market gardening.
Hedgerows are generally low and well-trimmed where they surround large arable fields. There are many, scattered, sometimes ancient, hedgerow trees.	■ Field patterns are variable, reflecting the diverse history of enclosure. Within the lower-lying valleys the fields are small to medium size and irregular in shape reflecting the earliest enclosures. Surrounding the villages, field sizes become smaller and the pattern semi-regular and are characteristic of historic land uses. Hedges in these localities are mixed species comprising holly, hazel, blackthorn and hawthorn. ■ On the plateau, the field are generally medium to large in size and are rectilinear in shape reflecting a period of later enclosure. The hedgerows are fragmented and predominantly comprise hawthorn. ■ The expansion of commercial agriculture has resulted in the loss of some field boundaries with many small fields being amalgamated into larger fields.

Landscape attribute	Justification for selection
A mosaic of semi-natural habitats	■ Extensive oak woodland as well as fine ancient trees within parks. ■ Where pasture prevails, particularly in areas of parkland, extensive areas of unimproved pasture and remnant acid grassland with heathy scrub persist. ■ Lowland heathland and lowland meadows support a variety of pollinators and nectar sources. ■ Areas of ridge and furrow are an indication of historic land use. ■ Remnant orchards would benefit by being brought into management and new orchards created.
A plateau that is deeply incised in places forming narrow valleys and having a consistent water supply affords the opportunity for the two large reservoirs at Foremark and Staunton Harold.	■ Foremark Reservoir supplies Melbourne water treatment works within the NCA. This and Staunton Harold Reservoir are supplied with water from the River Dove that rises from the moors near Buxton outside the NCA and supplies drinking water to more than 800,000 people in Leicester and the east Midlands. ■ Both reservoirs offer a range of leisure opportunities with popular visitor centres and children's play areas. Carvers Rocks, at the southern tip of Foremark, is managed by Derbyshire Wildlife Trust and is a scheduled Site of Special Scientific Interest (SSSI) for its geology and plants. ■ Minor streams flowing northwards into the River Trent and eastwards into the River Soar have narrow floodplains that are often prominent in the wider landscape as they are fringed by a ribbon of willow and alder. ■ Triassic sandstones of the Sherwood Sandstone Group in the east and west of the NCA provide a pathway for surface water to recharge the nationally important Sherwood Sandstone aquifer.

Landscape attribute	Justification for selection
The small settlements at Repton and Breedon, are rich in Christian and Viking heritage.	■ Many of the estates were originally monasteries. Repton and Breedon were major ecclesiastical centres of the kingdom of Mercia. Repton was the seat of the Bishop of Mercia in the 8th and 9th centuries and Breedon-on-the-Hill was a Saxon monastery. The Saxon stone carvings in the church are amongst the finest of their type. ■ Vikings landed and settled at Repton incorporating the abbey into their fortifications. They chose Ingelby, nearby, as their burial site and it is the only known Scandinavian cremation cemetery in England. ■ The area's churches provide prominent historic landmarks, for example, the imposing church at Melbourne, which is one of the finest and most complete Norman churches in England and the spectacularly sited church at Breedon-on-the-Hill. Staunton Harold estate church has superb carved woodwork and panelling. The churches have developed a dual role as spiritual centres and historic buildings containing works of art. .
Imposing country houses and associated landscaped parklands and red brick farmsteads and villages provide a strong sense of place.	■ There are 7 registered parks and gardens representing 4 per cent of the area of the NCA. ■ Two examples are the historic Calke Abbey set in parkland, an NNR and SSSI, which contains many notable ancient and veteran trees, and Staunton Harold Estate, located in a valley with two lakes and includes the house, church, estate cottages and stables. ■ Small clustered red brick villages retain a rural character and a historic settlement pattern. ■ Areas of ridge and furrow, an indication of historic land use.
The extensive reservoirs and their surrounding areas at Staunton Harold and Foremark contribute to the experiential qualities of the NCA.	■ Tranquillity maps from 2007 show areas of undisturbed land around the reservoirs at Foremark and Staunton Harold and the rural area around Repton. This is in contrast to a significant reduction in the area of undisturbed land in the area bounded by the M1 and A42 around Shepshed. ■ A strong rural character with an undulating upland feel offering plateau-top views northwards across the Trent Valley Washlands NCA. ■ Historic designed parkland and associated country house estates provide opportunities for quiet recreation.

Landscape opportunities

- Maintain the ancient woodlands, estate mixed woodland, small game coverts, roundels, traditional orchards and tree belts to conserve the distinctive character of the parklands and to ensure the legacies of historic land use are preserved for future generations.
- The areas of ridge and furrow are an indication of historic land use that is often associated with semi-natural grassland and species-rich hedgerows.
- Protect the remaining areas of tranquillity around the reservoirs at Staunton Harold and Foremark.
- Bring areas of ancient woodland, wood pasture and traditional orchards into management and expand areas of existing woodland. Consider successional planting over a long period of time to maintain the canopy and the wooded character of the NCA.
- Plan to augment over-mature hedgerow trees over a long period of time, to maintain the overall character of field boundaries.
- Maintain and where possible enhance the existing geological exposures by agreeing management plans with owners and occupiers.
- Gap-up and reinstate hedgerows on historic boundaries where possible.
- Plan long-term conservation of rock exposures at key geological sites, by agreeing restoration plans with mineral extraction companies.
- Establish new woodland plantations that strengthen the mosaic of interconnecting habitats in The National Forest.

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	Varying and versatile soil types with mixed farming Large open arable fields on the broader plateau	Extensive arable production on the broad plateau with small-scale pastures on heavier soils, steep slopes and around settlements. Statistics from 2009 show that lowland grazing of livestock; 9,589 sheep, 7,032 cattle and 3,738 pigs. In 2009, the predominant agricultural sectors were; cereal producers (representing 37 per cent of the farmed area) and lowland grazing units (37 per cent of the farmed area) with other mixed arable and combinable crops. The Calke Estate retains a number of dairy farms.	Regional	Food provision is important to the NCA and the various soil types support a diverse range of crops. Soils derived from Triassic Mercia mudstones produce moderately fertile reddish clay soils. The less permeable soils and lush vegetation associated with water courses lend themselves to pasture and historically, dairying. The drier soils lend themselves better to potatoes and cereals with wheat, barley and maize the main arable crops on better soils. The very best dark loams of Melbourne are used for market gardening. An increase in the number of Environmental Stewardship agreements has resulted in improvements to farmland habitats and a strengthening of landscape features. Special options to manage several parklands have been agreed with landowners resulting in one of the largest areas of arable reversion in the country at Calke Park.	A continued increase to the area of land under stewardship agreement can further strengthen and improve the quality of the landscape character and ecological richness of the NCA within the farmed environment. Work in collaboration with farmers to maintain levels of productivity and maximise the benefits of varied and versatile soils, while investigating and applying management techniques that enhance landscape character and increase biodiversity. Work in collaboration with riparian land owners and managers to manage watercourses to prevent diffuse pollution entering the water courses.	**Food provision** **Biodiversity** **Regulating soil erosion** **Regulating soil quality** **Sense of place/ inspiration**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Timber provision	Broadleaf woodland is a dominant feature of the landscape Fast growing willow and alder Soils	The existing woodland cover (1,499ha) represents 10 per cent of the area of the NCA. In the valley bottoms, there are stands of fast growing willow and alder. Extensive estate mixed woodlands and new woodland planting associated with The National Forest. The National Forest creates a strong woodland linkage to the neighbouring coalfield NCA and the Charnwood NCA.	Local	Estate influences are evident with many of the woodlands being mixed species plantations managed for both traditional uses and for commercial timber. Sustainable woodland management at a small-scale is being trialled at Calke Park where the woodlands are providing fuel to a wood-fuel boiler that heats the visitor centre. The National Forest has had a positive impact in other areas and this is born out in the Countryside Quality Counts data for the period 1999-2003 when woodland planting strengthened the landscape character.	Opportunities exist to manage the existing woodland more sustainably for commercial purposes, which will also have a beneficial effect upon other services. New commercial plantations should continue to respect existing woodland patterns, the setting of historic houses and their associated parklands. New plantations strengthen the landscape character by linking together areas of woodland. Work in collaboration with the Forestry Commission to further the objectives contained within the Strategy for The National Forest.[9] New plantation woodlands can provide shelter belts which could reduce incidences of soil erosion.	**Timber provision** **Recreation** **Sense of history** **Sense of place / inspiration** **Regulating soil erosion**

[9] The Strategy: *The National Forest 2004 – 2014*, The National Forest (2004)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Water availability	Two extensive reservoirs Small aquifer Soils	There are no main rivers in the NCA however; there are two extensive reservoirs, Foremark and Staunton Harold Reservoirs, both important for water supply as well as for their ecological, conservation and recreational value. Sandstones of the Sherwood Sandstone Group outcrop in the NCA provide an important pathway for surface water to recharge the Sherwood aquifer.	Regional	Erosion by rivers has produced a plateau that is deeply incised in places forming narrow valleys. Two valleys have been dammed to create reservoirs at Foremark and Staunton Harold. Both are important for water supply. Staunton Harold was constructed around one of six naturally occurring ponds. Foremark reservoir draws water from outside the NCA from the River Dove and supplies Melbourne water treatment works. In August 2010 water storage levels were 83 per cent at Foremark and 74 per cent at Staunton Harold.	Opportunities exist for careful management of water to avoid over-abstraction, through efficient use of water and seeking more sustainable sources of water supply where possible. Seek opportunities to increase areas of semi-natural habitats, especially grassland, to improve water infiltration. Work in collaboration with farmers to seek ways of increasing rates of infiltration on the arable plateau and reducing chemical inputs especially in aquifer recharge areas. Seek to minimise incidences of compaction on clay soils, which can arise from over-grazing, trafficking or other mechanised activities. This leads to nutrient loss and worsening rates of water infiltration, a particular problem in the aquifer recharge areas. Work in collaboration with riparian land owners and managers to manage watercourses to prevent diffuse pollution entering the water courses and allow water table levels to rise where appropriate.	**Water availability** **Food provision** **Regulating soil quality** **Regulating soil erosion** **Biodiversity** **Recreation**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Genetic diversity	Deer herds Traditional orchards	Donington Park still contains a managed deer herd with a very long genetic continuity. There is a long association with market gardening in the area and associated remnant orchards survive today containing local and traditional varieties such as the Newton Wonder.	Local	Deer parks have a long association with parkland landscapes and are often based on earlier deer parks and in some cases retaining elements of the boundaries of the medieval pale. Changes in land use and a lack of management of orchards have resulted in many being lost. The National Forest has objectives to establish new orchards and manage remnant ones, which may help to preserve the genetic characteristics contained within them.	Adaptive characteristics may exist in the deer herd that could be significant in pest and disease resistance and should be considered an asset to the NCA. Adaptive characteristics may exist in local varieties of apples that could be significant in pest and disease resistance and should be considered an asset to the NCA.	**Genetic diversity** **Biodiversity** **Sense of history** **Sense of place / inspiration** **Food provision**
Biomass energy	Existing woodland Soils	The existing woodland cover (1,499ha) represents 10 per cent of the area of the NCA.	Local	Sustainable woodland management at a small scale is being trialled at Calke Park where the woodlands are providing fuel to a wood-fuel boiler that heats the visitor centre. An undulating landform, well-treed character and sense of enclosure could provide opportunities for miscanthus and short rotation coppice provided that the integrity of archaeological remains, historic parklands and estates and viewpoints are not compromised.	Opportunities exist to identify other sites where wood/biomass boilers could be installed. Opportunities exist for planting short rotation coppice and miscanthus on lowland slopes. This would also benefit the regulation of water flow, by reducing rates of run-off. There could be a potential benefit to the sense of place and history in growing miscanthus thus restoring historic enclosures and would provide a more intricate landscape in the most intensive arable areas. Plantations could also extend woodland edges. Plantations should respect existing woodland patterns, the setting of historic houses and their associated parklands.	**Biomass energy** **Biodiversity** **Climate regulation** **Regulating water flow** **Regulating soil erosion** **Sense of place / inspiration** **Timber provision**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Climate regulation	High carbon content soils Woodland Permanent grassland	The soils over most of the NCA have a low carbon content (0-5 per cent) although there are small pockets of soil with a higher carbon content (5-10 per cent) associated with areas of certain woodlands and permanent grasslands.	Local	The majority of the soils in the NCA offer limited potential to improve climate regulation. Woodland is likely to be the most significant contributor in this NCA. Good management of existing woodland can ensure its role in sequestering and storing carbon is optimised. The expansion of woodland on suitable sites could increase carbon sequestration and storage. This expansion could also benefit other services.	11 per cent of The National Forest is within the NCA. Local targets within the Landscape Action Plan for The National Forest could optimise the management of existing woodland and identify areas for planting while maintaining the existing planting patterns thus strengthening the character of the NCA and identifying key locations for long-term carbon storage in woodland soils. Biodiversity, regulation of water flow through interception and sense of history could all benefit from the expansion of woodland. However, new plantations on agricultural land may limit increases in food production. Opportunities exist around management and creation of permanent grassland, particularly in river valleys and the fringes of reservoirs. The creation of reedbeds which are a potentially good carbon store.	**Climate regulation** **Biodiversity** **Regulating water flow** **Sense of history** **Regulating soil quality**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water quality	Reservoirs Sherwood Sandstone aquifer Soils Semi-natural grassland	There are no priority catchments under the Catchment Sensitive Farming initiative in the NCA. The ground water chemical status is generally good in the eastern area of the NCA and poor in the west. The current ecological status of Foremark and Staunton Harold Reservoirs is moderate[10]. The surface water chemical status currently does not require assessment in either reservoir[11]. Data from the Environment Agency's River Basin Management Plan[12] indicates that the current ecological status of the main rivers in the NCA is 'moderate' and the chemical status is 'good'. The whole of the Sherwood Sandstone aquifer is currently over-licensed for abstraction.	Regional	Staunton Harold Reservoir was created from one of six naturally occurring ponds in 1964 to provide Leicester and the East Midlands with drinking water. Controlling pollutants and sediments entering feeder watercourses as a result of soil and nutrient run-off and livestock directly accessing water courses, could improve the ecological quality of the water. A widespread decline in dairying may have locally improved water quality by reducing the incidences of manures, slurry and silage effluent reaching the water courses. Foremark Reservoir was created in the 1970s and is fed by the River Dove, which lies outside the NCA and supplies Melbourne water treatment plant. Replenishment of the Sherwood Sandstone aquifer is desirable. Areas underlain by Triassic sandstone provide a potential pathway for surface water to recharge the aquifer. The correct management of clay soils can play an important part in regulating water flow.	There exists an opportunity to encourage riparian landowners to take steps to reduce soil erosion and nutrient loss from farmland through best practice and management plans. Encourage arable reversion and the establishment of permanent grassland, especially alongside water courses, with low input management, to reduce nutrient run-off and increase water infiltration.	**Regulating water quality** **Regulating soil erosion** **Regulating soil quality** **Food provision** **Biodiversity**

[10]Environment Agency Data information from: http://maps.environment-agency.gov.uk/wiyby/wiybyController?extraClause=NAME~'Foremark%20Reservoir'

[11]Environment Agency Data information from: http://maps.environment-agency.gov.uk/wiyby/wiybyController?extraClause=NAME~'Foremark%20Reservoir'

[12]http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=437500.0&y=320500.0&topic=wfd_rivers&ep=map&scale=9&location=Staunton%20Harold%20Hall,%20Leicestershire&lang=_e&layerGroups=default&distance=&textonly=off#x=439273&y=323590&lg=3,7,8,9,&scale=7

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water flow	Wooded river valleys Vegetated steep slopes Clay soils	There are no main rivers in the NCA although there are tributaries of the rivers Dove and Trent.	Local	The Environment Agency's Flood Risk Assessment indicates that for much of the NCA flooding is not generally a major issue, although there are some relatively small areas of 'significant' flood risk associated with tributaries and the floodplain associated with the River Trent that skirts the northern boundary of the NCA. The correct management of clay soils can play an important part in regulating water flow.	There exists opportunities for flood risk management for example the identification of locations where flood attenuation ponds or wetland areas could be created with associated habitat improvement and the identification of potential sites for priority habitat creation[13]. It is important to minimise incidences of compaction on clay soils, which can arise from over-grazing, trafficking or other mechanised activities. This leads to nutrient loss and worsening rates of water infiltration, a particular problem in the aquifer recharge areas. There is an opportunity to increase vegetation cover and extend areas of floodplain habitats such as flood meadows, wet woodland and reed beds. These could be considered to attenuate the flow downstream and increase rates of infiltration particularly in the aquifer recharge areas.	**Regulating water flow** **Regulating water quality** **Biodiversity** **Water availability**

[13]*The River Trent Catchment Flood Management Plan Summary Document*, Environment Agency (2010)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil quality	Slowly permeable clay soils Lighter soils on the central plateau Higher quality soils around Melbourne	The slowly permeable clay soils can suffer from compaction and/or capping when wet, damaging the soil structure.	Local	It is important to minimise incidences of compaction on clay soils, which can arise from over-grazing, trafficking or other mechanised activities. This leads to nutrient loss and worsening rates of water infiltration, a particular problem in the aquifer recharge areas. Minimising incidences of flooding through regulation of water flow in water courses can have multiple benefits; reducing soil erosion maintaining soil structure and reducing the amount of leaching of nutrients.	There exists opportunities to implement management techniques, for example minimal tillage. Increasing the percentage of organic matter in the soil improves the soil structure and can lead to reduced incidence of soil compaction. Opportunities relating to the regulation of water quality and water flow also have a beneficial effect on soil quality and food production.	**Regulating soil quality** **Regulating water flow** **Food production** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil erosion	Reddish clay soils over the majority of the NCA Wooded valleys Uncultivated areas on steep valley slopes Cross field hedgerows	Soil erosion has not been identified as an issue for the majority of the NCA, although there is a risk of soil erosion on lighter soils in the far west of the area.	Local	A decrease in the amount of land used for pastoral farming, an increase in the amount of land used for cereal production and loss of some hedgerows has increased the risk of soil erosion on lighter soils in the far west of the area. Stability of soils under permanent pasture and woodland particularly on steeper sided valley slopes. Minimising incidences of flooding through regulation of water flow in water courses can have multiple benefits; reducing soil erosion maintaining soil structure and reducing the amount of leaching of nutrients.	There exists opportunities to implement management techniques, for example minimal tillage, that reduce soil erosion and nutrient loss from farmland and improve livestock management through best practice and management plans. The expansion of permanent grassland and semi-natural habitats on steep valley slopes can help to reduce soil loss, regulate surface water run-off and increase the rate of water infiltration. Opportunities exist for the reinstatement of cross field hedgerows to reduce incidences of wind-blown soil erosion.	**Regulating soil erosion** **Regulating soil quality** **Regulating water quality** **Regulating water flow** **Biodiversity** **Climate regulation** **Food production**
Pollination	Lowland heathlands Lowland meadows Remnant orchards	Some habitats in the NCA, such as lowland heathlands, remnant orchards in the north of the area and lowland meadows, support a variety of pollinators and nectar sources.	local	Pollination is not currently a service required by the predominant agricultural crop. However, an increase to this service could deliver multiple benefits.	An expansion to this service may facilitate the growing of a greater diversity of crops in the future thus improving resilience to food supply. An increase to this service is likely to improve biodiversity.	**Pollination** **Biodiversity** **Food provision**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Pest regulation	Areas of semi-natural habitat Hedgerows	Areas of semi-natural grassland and hedgerows proximal to areas of agricultural production.	Local	Semi-natural habitats and hedges proximal to areas of commercial agriculture may support species of predators, which can regulate populations of pests that adversely affect food and timber provision.	Opportunities exist to enhance semi-natural habitats and re-instate hedgerows through Countryside Stewardship. This would provide a mosaic of habitats in areas of monoculture, thus providing a more robust ecosystem.	**Pest regulation** **Food provision** **Timber provision** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of place/ inspiration	Historic parklands and country houses The National Forest Extensive estate mixed woodlands Undulating landform Many valleys with riverside meadows Estate farmlands on the plateau Red brick villages Reservoirs Sandstone slopes and heaths Prominent and imposing churches	Sense of place is invoked by the large landscaped parklands and grand country houses surrounded by extensive estate woodlands and the associated red brick estate farmsteads and villages set within an undulating, tranquil, mixed farming landscape. This is supported by the undulating landform dissected by narrow river valleys, prominent in the wider landscape as they are fringed by a ribbon of willow and alder, with small woods sited on ridge tops. The large reservoirs at Foremark and Staunton Harold and the imposing and dramatically-sited churches, for example at Melbourne and at Breedon-on-the-Hill, where the church overlooks cliffs created by quarrying.	Regional	11 per cent of the NCA lies within The National Forest. Collectively the trees and woodlands play an important role in emphasising estate character. Dense lines of trees along watercourses and locally prominent parkland and amenity trees play a key role in defining the scale and enclosure of the intervening spaces. The woodlands are relatively well-linked with large blocks linked to the National Trust's Calke estate and the nearby Staunton Harold estate. Both reservoirs offer a range of leisure opportunities with popular visitor centres and children's play areas. The churches have developed a dual role as spiritual centres and historic buildings containing works of art. They also contribute to the wider landscape as landmarks, most notably the Priory church of St Mary and St Hardulph, Breedon-on-the-Hill.	Landscape action plans for the proportion of the NCA that lies within The National Forest identify: woodland planting in large blocks to reinforce the landscape character; increasing the extent of lowland acid grassland; neutral grassland and heath grassland for the benefits this will bring to landscape character and other provisioning services. Planting and restoring hedgerows strengthens the landscape character but also benefits soil erosion and soil quality. Habitat creation on riparian land can also benefit the regulation of water quality and water flow. Opportunities exist throughout the NCA to compliment these plans through appropriate Countryside Stewardship agreements and initiatives associated with the Water Framework Directive that will benefit biodiversity.	**Sense of place/ inspiration** **Recreation** **Sense of history** **Regulating water quality** **Regulating water flow**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of history	Ecclesiastical centres Historic country houses Designed parklands Prominent and imposing churches Viking sites Anglo-Saxon settlement pattern Areas of ridge and furrow	A sense of history is invoked by the area's imposing and historically-important country houses and designed parklands. There are s7registered parks and gardens representing 4 per cent of the area. There are 14 Scheduled Monuments and 537 listed buildings. Prominently sited churches as well as the traditional built vernacular. Many of the historically important sites visible today overlay earlier settlements.	Regional	The NCA has a strong Christian heritage with many of the estates and grand houses for example, Calke and Melbourne, which date from the 17th and 18th centuries, originally being monasteries. Repton and Breedon-on-the-Hill were major ecclesiastical centres of the kingdom of Mercia. Repton was the seat of the Bishop of Mercia and the 8th and 9th century Anglo-Saxon stone carvings at Breedon church are amongst the finest of their type. During the second half of the 9th century, Vikings landed at Repton and incorporated the abbey into their fortifications. They chose Ingelby, nearby, as their burial site and it is the only known Scandinavian cremation cemetery in England. Prominently sited churches for example at Breedon and fine examples of Norman architecture such as Melbourne Church, which is one of the most imposing and most complete Norman churches in England. The principal material of the older buildings in the villages is brick with pan tile roofs although timber framing still exists in a few places. Churches have been constructed from friable sandstone and have been restored in 19th century restorations. **Continued over...**	Opportunities exist to protect, manage and interpret the many historic assets as stated in the Leicestershire, and Rutland Historic Landscape Characterisation Programme. Restoration of hedgerows, arable reversion; expansion to, and maintenance of, woodland could restore enclosure patterns and historic land uses, reinforcing the sense of history of the NCA. Opportunities exist to ensure that restoration of historic buildings and new developments use local building stone to maintain the vernacular and reflect the historic patterns of settlement.	**Sense of history** **Sense of place/ inspiration** **Recreation**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of history continued				**...Continued from previous** Some field patterns reflect early enclosures and there are areas of surviving ridge and furrow indicative of historic land use. Soil is also important in protecting buried archaeological features. Many of the buildings are at risk from erosion and the settlement patterns of villages could be threatened by inappropriate development. Below ground archaeology and areas of ridge and furrow could be at risk if there is an expansion to commercial agriculture.		
Tranquillity	Historic parkland estates and woodlands Reservoirs Secluded valleys	Just 16 per cent of the NCA is classified as undisturbed according to CPRE data[1], a decline from around 40 per cent in the 1960s.	Local	Tranquillity is associated with the large parklands and surrounding woodlands, as well as the unimproved pastures and heathy scrub on steep, undulating sandstone slopes and the areas around the reservoirs at Foremark and Stuanton Harold. This disturbance largely relates to the high traffic volumes on the main roads that cross this small NCA including the A42, M1 and East Midlands Airport. Nevertheless this is largely a quiet, rural area.	Opportunities exist to retain the areas of tranquillity by protecting them from inappropriate development and by buffering developments by tree planting.	**Tranquillity** **Sense of place/ inspiration**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Recreation	Woodlands including The National Forest Reservoirs Secluded valleys A network of rights of way Green infrastructure Historic parkland estates National Cycle Network	Recreational opportunities are provided by the woodlands that form part of The National Forest. Staunton Harold and Foremark reservoirs are popular with visitors seeking a range of outdoor recreation pursuits such as sailing, fishing, walking, pony-trekking and cycling. Both have popular visitor centres and children's play areas. Calke Abbey Estate including Calke Park SSSI and National Nature Reserve. 244 km of rights of way (at a density of 1.62 km per km2), and around 8 ha of open access land (covering 0.05 per cent of the NCA). National Cycle Network route 6 passes through the NCA.	Regional	The number of visitors to the NCA is important to the local economy. Visitor numbers to the National Trust estate at Calke Abbey in 2010 were approximately 250,000. The visitor centres at Staunton Harold and Foremark are important for environmental education provision. Incorporation of green infrastructure into new developments can provide multiple benefits to other services. National Cycle Network route 6 passes approximately north to south through the NCA linking Derby to Loughborough.	There is an ongoing initiative in The National Forest to create a large-scale forest that blends commercial forestry and non-commercial woodland creation with ecological, landscape and public access benefits, as well as maintaining the historic parkland landscapes. Green Infrastructure offers the local community opportunities to enjoy their local greenspace and to take action to improve it as well as provide benefits to urban drainage and biodiversity. Opportunities exist to promote the recreational and educational opportunities afforded by the network of rights of way and improved access to the open countryside from towns, which could have a beneficial effect on people's health and well-being. Opportunities exist to expand the local cycle network to link with the National Cycle Network route 6. This would provide more accessible opportunities for physical exercise and contribute to solutions to sustainable transport.	**Recreation** **Sense of place/ inspiration** **Sense of history**

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