National Character Area profile:

# 66. Mid Severn Sandstone Plateau



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# Introduction

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

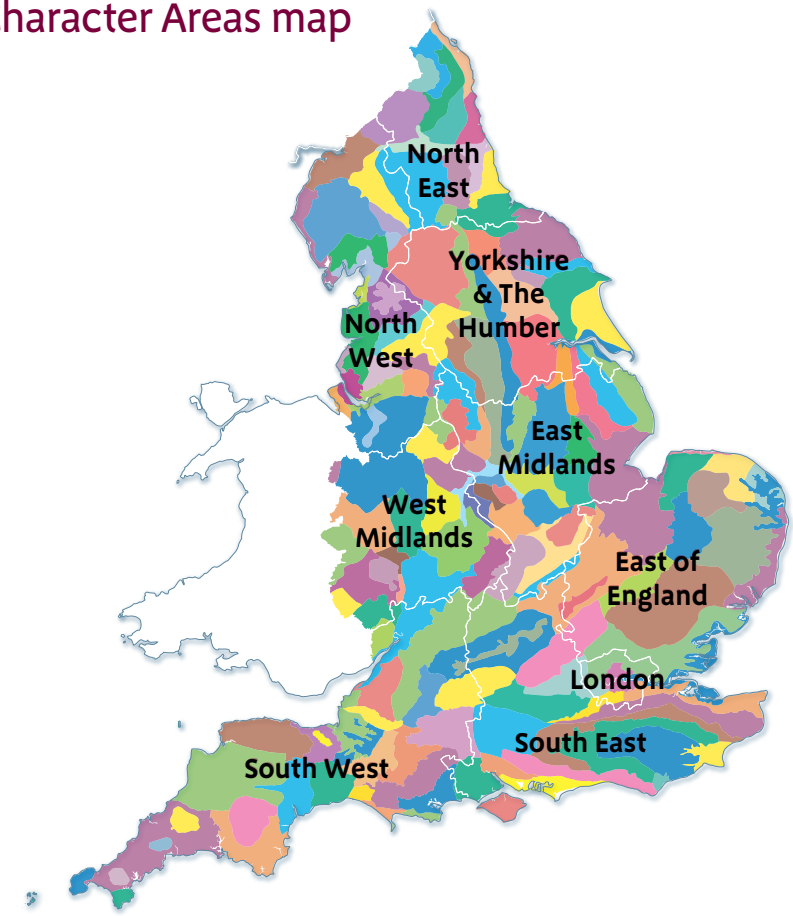
NCA profiles are guidance documents which can help communities to inform their decision-making about the places that they live in and care for. The information they contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and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

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

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

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

## National Character Areas map




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

# Summary

The Mid Severn Sandstone Plateau National Character Area (NCA) is located in the central catchment of the Severn and the lower Stour rivers and is a national watershed between the north- easterly flowing River Trent and the south-westerly flowing River Severn. The Mid Severn Sandstone Plateau is predominantly rural and important regionally for food production, with large arable fields in the central and eastern areas, and remnant areas of characteristic lowland heathland. Parklands provide an estate character in places, as exemplified by Weston Park. The plateau is drained by fast-flowing tributaries of the rivers Worfe and Stour which have incised the Permian and Triassic sandstones and conglomerate resulting in many steep-sided, wooded dingles throughout the NCA. The main river is the fast-flowing Severn, entering the NCA through the Ironbridge Gorge.

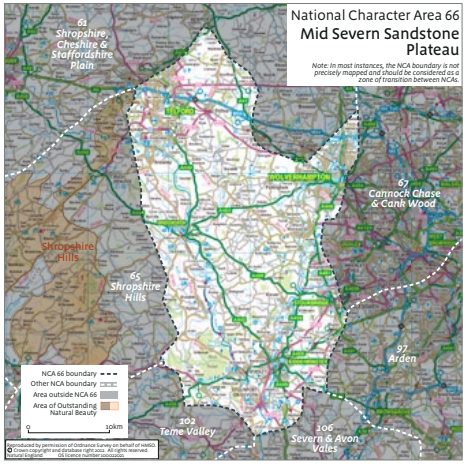
The NCA exemplifies the link between geodiversity, landscape and industrial heritage, in particular at the Ironbridge Gorge, a World Heritage Site widely recognised as the birthplace of the Industrial Revolution. During the 18th and 19th centuries, the area around the Severn Valley was recognised as being rich with raw materials: coal; iron ore; limestone to flux the slag in the blast furnaces; sand for moulding cast iron; clay to make tiles, bricks and refractory linings; and the finest clay used for the manufacture of porcelain at Coalport. The world's first iron bridge, constructed in 1779 by Abraham Darby III, spans the River Severn in the steep-sided, wooded gorge that belies its industrial past.

The NCA is regionally important for water supply. Two reservoirs, at Chelmarsh and Trimpley, store water that is abstracted from the River Severn, and the Sherwood Sandstone aquifer underlies the eastern part of the NCA. The Elan Valley aqueduct crosses the NCA, supplying water to Birmingham from the valleys in Wales.

Wyre Forest National Nature Reserve and Site of Special Scientific Interest is a remnant of a once vast wildwood and one of the largest ancient lowland oak woods in England. It hosts nationally important populations of many wildlife species and also has features of historical and archaeological interest.

The M54 and a railway line cross the NCA, broadly following the route of the Roman road Watling Street. The Staffordshire and Worcestershire Canal, Monarch's Way long-distance footpath and National Cycle Network Route 45 also cross the NCA. Development pressures for land on the urban fringe and commuter villages in the core of the NCA will continue and the demand for water and food provision is likely to increase, presenting challenges for habitat conservation and sustainable recreation, given the proximity of this area to urban populations.

In the Black Country urban areas, the demand placed on the health and community services is likely to increase, as the magnitude of climate change increases. Extreme weather events such as floods have clear impacts on ecosystems and the services that they provide and also on infrastructure adjacent to rivers, for example at Bewdley. Climate change may also alter the severity and frequency of periods of drought, presenting challenges to agriculture on the plateau.




**Click map to enlarge; click again to reduce**

## Statements of Environmental Opportunities:

- **SEO 1:** Protect, expand and appropriately manage the characteristic habitats of the NCA, specifically lowland heathland, acid grasslands and woodland including orchards and hedgerows, thus reinforcing the sense of history and reducing habitat fragmentation for the benefits that this will bring to resource protection, biodiversity, climate regulation and the recreational and experiential qualities of the NCA.

- **SEO 2:** Protect and manage the rivers and streams of the NCA to mitigate the extremes of drought and flood events, and protect the water quality of the River Severn and safeguard aquifer recharge areas by managing discharges to watercourses and protecting and increasing areas of semi-natural riparian habitats along river valleys, streams, canals and urban watercourses.

- **SEO 3:** Protect from inappropriate development and manage a stock of post-industrial and extractive sites around Telford and the Black Country which exemplify the strong influence that geodiversity has on the landscape, through industrial development and settlement patterns and for their often unique value to biodiversity. Protect and maintain the natural geomorphological features and exposures in the river valleys that can be used for research and education to study past environmental change as well as for recreation.

- **SEO 4:** Work in collaboration with the World Heritage Site, English Heritage and the local authorities to implement sustainable solutions to protect and manage the landscape and heritage attributes of the Ironbridge Gorge World Heritage Site and the wider historic landscape, including the canals, historic ports and bridging towns, finding sustainable solutions to manage visitor pressure, while maintaining high levels of public access for the benefits to the visitor economy and employment.

**Characteristic heathland at Hartlebury Common. Heathland was once widespread in the area.**

# Description

## Physical and functional links to other National Character Areas

The Mid Severn Sandstone Plateau National Character Area (NCA) is located in the central catchment of the Severn and the lower Stour rivers and the plateau is a national watershed between the north-easterly flowing River Trent which flows out to sea through the Humber and the south-westerly fast-flowing River Severn which runs through the neighbouring Severn and Avon Vales NCA before flowing out to sea through the Bristol Channel.

To the west and south-west, the land rises out of the Severn Valley to afford views of the Shropshire Hills and Teme Valley NCAs. A prominent volcanic ridge at Lilleshall provides views out of and into the NCA. To the east, the land rises out of the Stour Valley and the sandstone ridge at Kinver Edge provides views across the Cannock Chase and Cank Wood and Arden NCAs. In the south, the rolling landform gradually subsides into the Severn and Avon Vales NCA while in the north there is a transition from the predominantly sandstone plateau to the clays of the Shropshire and Staffordshire Plain NCA.

Heathland and acid grassland were once widespread in the NCA, a characteristic shared with the neighbouring Arden and Cannock Chase and Cank Wood NCAs, but they now only survive in small, discrete areas, particularly in the south near Wyre Forest. Interlocking blocks of mixed woodland and old orchards provide a well-wooded landscape and conifer plantations combine with parklands to evoke an estate character in places.

The NCA has important wetland habitats and is regionally significant for water supply. The Sherwood Sandstone aquifer underlies the eastern area of the NCA and augments supply that is abstracted from the River Severn. The River Severn rises in the Cambrian Mountains in Wales and water is abstracted and stored in the reservoirs at Chelmarsh and Trimpley. The Elan Valley aqueduct crosses the NCA and supplies drinking water to Birmingham.

The M54 and a railway line broadly follow the route of the Roman road Watling Street and link the city of Wolverhampton in the east with Shrewsbury in the neighbouring Shropshire and Staffordshire Plain NCA in the west. The Staffordshire and Worcestershire Canal starts in Stourport-on-Severn in the south of the NCA, passing through Cannock Chase and Cank Wood NCA before joining with the Trent and Mersey Canal. The Monarch's Way long-distance footpath passes through the NCA as does National Cycle Network Route 45 from north to south on its way from Salisbury to Chester.

**Lilleshall Hill, crowned by the monument to the Duke of Sutherland, provides views out the NCA.**

## Key characteristics

- Extensive sandstone plateau in the core and east of the NCA underpins an undulating landscape with tree-lined ridges; this contrasts with the irregular topography and steep, wooded gorges of the Severn Valley in the west.
- Plateau underlain by Permian and Triassic sandstones and conglomerate from the Sherwood Sandstone Group forming an important aquifer. Silurian limestones and Carboniferous Coal Measures of the Coalbrookdale and Wyre Forest coalfields in the west provide the source of mineral wealth which fuelled the Industrial Revolution.
- Permian and Triassic sandstones erode to free-draining, slightly acid mineral soils which historically supported extensive heathland and grassland. In contrast, marls and sandstones associated with Coal Measures erode to clayey (argillic) brown earth soils.
- The plateau is drained by the rivers Worfe and Stour and fast-flowing streams in small wooded, steep-sided streamside dells, locally known as dingles.
- The main river is the fast-flowing Severn, flowing north to south in the west of the NCA, often through steep, wooded gorges, the largest being the Ironbridge Gorge.
- Interlocking blocks of mixed woodland and old orchards provide a well-wooded landscape and conifer plantations combine with parklands to give an estate character. Wyre Forest is part of one of the largest ancient lowland oak woods in England.
- Large, open arable fields with a weak hedgerow pattern on the plateau contrast with mixed arable and pasture land with smaller, irregular-shaped fields bounded by hedgerows with hedgerow oaks in the west.
- Characteristic lowland heathland associated with acid grassland and woodland supports nationally important populations of flora and fauna, notably butterflies including the pearl-bordered fritillary.
- Post-industrial sites, disused coal mines and mineral quarries are important habitats around Telford and urban areas in the Black Country and are becoming increasingly important because of their dwindling number.
- Rich and important heritage assets have led to World Heritage status for Coalbrookdale and Ironbridge, the birthplace of the Industrial Revolution.
- Traditional buildings constructed of brick vary in colour. The local Kidderminster and Bromsgrove Sandstone features extensively. Its characteristic red colouration provides local distinctiveness to many towns and villages and estate boundary walls.
- The Stour and Severn valleys contain frequent villages and there are a number of attractive historic towns, for example Bridgnorth and Bewdley with cores of Georgian and earlier buildings; there are fine individual examples of timber-framed buildings in Kinver, Bewdley and Bridgnorth.
- There is a coalfield remnant landscape along the Severn Valley.
- Important manmade features include the Roman road Watling Street, the Staffordshire and Worcestershire Canal, the M54 and the railway line that links the urban areas of Birmingham and the Black Country in the east with Shrewsbury in the neighbouring NCA in the west.

## Mid Severn Sandstone Plateau today

The NCA is predominantly rural and the extensive sandstone plateau extends across the central and eastern area where it meets with the urban areas of Birmingham and the Black Country. The plateau has an undulating landscape with large, open arable fields punctuated by areas of lowland heathland, acid grassland and small wooded streamside dells, locally known as dingles. Ridges, often tree lined, follow the variations in geological formations. The sandstone ridges at Kinver and a volcanic outcrop at Lilleshall afford views both into and out of the NCA.

In contrast to the plateau, the western extent of the NCA is characterised by irregular topography and the steep-sided gorges of the Severn Valley. The more fertile soils support mixed agriculture with irregular, smaller fields and a strong hedgerow structure with frequent hedgerow oaks.

There are abrupt contrasts in landscape and settlement pattern with the urban areas, for example around Telford, where exploitation of the mineral wealth of the NCA has left a legacy of derelict land, post-industrial sites, coal mines and quarries which contrast against the expanding areas of new housing and commercial developments. Along the river valleys, there are a number of attractive historic towns, for example Bridgnorth and Bewdley, with cores of Georgian and earlier buildings and some fine individual examples of timber-framed buildings.

The plateau is drained by the fast-flowing rivers Worfe and Stour and a number of narrow streams such as the Dowles Brook and Smestow Brook, the latter being the largest tributary of the River Stour. These have eroded the Permian and Triassic sandstones and conglomerates, resulting in steep-sided dingles throughout the NCA.

The whole area has been substantially modified by ice and meltwater processes. The ice sheet deposited economically important quantities of aggregate and created the many characteristic deep, narrow, flat-bottomed gorges which are now important wetland habitats. The fast-flowing River Severn enters the NCA through the steep-sided gorge at Ironbridge and flows from north to south through the NCA before running into the neighbouring Severn and Avon Vales NCA south of Stourport-on-Severn. The River Severn is a designated local site throughout its entire length in the NCA and the steep banks and valleys are lined with alder, willow and poplar, while in the valley bottoms, marshland, valley mire, flush, wet meadows and marshy grassland are evident.

**The wooded valley of the Severn Valley.**

Manmade waterbodies include the reservoirs at Chelmarsh and Trimpley and flooded pits and quarries. The most extensive manmade waterway on the plateau is the canal network which connects urban centres with rural landscapes and joins the river system at Stourport-on-Severn.

The NCA is regionally important for water supply for public and industrial use and agricultural irrigation. The freely draining soils on the plateau are permeable and valuable for aquifer recharge where they overlie the Triassic Sandstone aquifer. There are also a number of abstraction boreholes in the aquifer. Water is also abstracted from the River Severn and is stored in the reservoirs at Trimpley and Chelmarsh, which also provide valuable habitats for overwintering waterfowl including water rail and reed warbler. Chelmarsh Reservoir offers leisure opportunities, for example sailing, fishing and walking. The Monarch's Way passes both reservoirs as does National Cycle Network Route 45 on its way from Salisbury to Chester.

The area has a long industrial past; post-industrial sites, disused coal mines and mineral quarries are important habitats around Telford and urban areas in the Black Country and are becoming increasingly important because of their dwindling number. Muxton Marsh Site of Special Scientific Interest (SSSI) has the best example of unimproved grassland, fen and carr in Shropshire and the Severn Valley Country Park[4] provides habitat for dragonflies including the club-tailed and hairy hawker; important flora include wild parsnip, greater spearwort and bee orchid. Both occupy sites of former coal mines.

Many of the woodlands on the plateau are conifer plantations which combine with parklands to evoke an estate character, as exemplified by the large estates of Dudmaston, Apley, Patshull and Weston Park (more recently known for hosting the popular V Festival).

Wyre Forest National Nature Reserve (NNR) and SSSI is one of the largest ancient lowland oak woods in England. It has elements of both lowland and upland woodland. The reserve has a mosaic of habitats, remnant orchards and woodland clearings that support nationally important metapopulations of bats and the pearl-bordered fritillary butterfly. Breeding birds in the Wyre Forest area include wood warbler, redstart, pied flycatcher, tree pipit and lesser-spotted woodpecker, while dipper, grey wagtail and kingfisher are found on the larger streams.

**A pearl-bordered fritillary.**

[4] www.shropshiretourism.co.uk/attractiondetails.php?estid=1828

The NCA is important for food production. The large, open fields of the plateau have soils that are free draining and support arable crops, and have a weak field pattern with closely cropped hedgerows. Discrete areas of farmland support important populations of farmland birds including lapwing, yellow wagtail and corn bunting. In contrast, the river valleys in the west comprise areas of smaller, irregular-shaped fields with more distinctive hedgerows containing hedgerow oaks. The soils are deeper and loamy, supporting mixed agriculture and some dairy.

The NCA exemplifies the link between geodiversity, landscape and industrial heritage. The Ironbridge Gorge is a World Heritage Site which is widely recognised as the birthplace of the Industrial Revolution. During the 18th and 19th centuries, the area around the Severn Valley was recognised as being rich with raw materials: coal; iron ore; limestone to flux the slag in the blast furnaces; sand for moulding cast iron; clay to make tiles, bricks and refractory linings; and the finest clay for the manufacture of porcelain at nearby Coalport. The world's first iron bridge, constructed in 1779 by Abraham Darby III, spans the River Severn in the steep-sided, wooded gorge. The area is now economically important to the region as a tourist destination and for employment.

Evidence of early settlement still exists in the form of troglodytic dwellings in the sandstone cliffs along the River Stour at Kidderminster, Wolverley and Kinver. Elsewhere, the settlement pattern is one of small hamlets and isolated farms linked by a network of narrow lanes. The predominant traditional building material featuring in local vernacular is brick in a range of colours. Local sandstone of the Kidderminster and Bromsgrove formations has been used throughout and its characteristic red colouration imparts local distinctiveness to many towns and villages.

A rich wealth of industrial heritage is legible in the landscape and in the buildings in and around Ironbridge, the historic inland ports, warehouses, bridges of the river towns and cottages and terraces of the mining areas. Many of the parks and gardens, once owned by rich industrialists, are tourist attractions, for example Dudmaston Hall, once owned by the Darby family, which is now owned by the National Trust.

Other important heritage features include the Staffordshire and Worcestershire Canal, built by James Brindley and opened in 1771, which links the River Severn with the Trent and Mersey Canal. Once an important trade route, it is now important for recreation and tourism, drawing narrowboaters from a wide area.

Large infrastructure is limited to the M54 and a national railway line, both broadly following the route of the Roman road Watling Street and linking the city of Wolverhampton with the neighbouring Shropshire and Staffordshire Plain NCA.

**A water storage reservoir at Chelmarsh.**

## The landscape through time

The Mid Severn Sandstone Plateau can be divided geologically into two areas. The western part of the NCA is underlain by sedimentary rocks of the Silurian and Carboniferous periods. Rocks of the Silurian Period were deposited around 444 to 416 million years ago in a warm, shallow shelf sea, resulting in deposits of limestone. These are overlain by Carboniferous Coal Measures, laid down in warm, swamp-like conditions around 318 to 300 million years ago. The convergence and subsequent exploitation of these deposits led to the internationally important Industrial Revolution which centred on Coalbrookdale and Ironbridge. The Coal Measures eroded to form loamy soils suitable for mixed arable and dairy pasture.

The extensive central and eastern plateau is underlain by sandstones and conglomerate of the Sherwood Sandstone Group of the Permian and Triassic periods. These were deposited by a major river that crossed England and originated in what is now northern France around 245 to 210 million years ago. These sediments form the aquifer and have eroded to free-draining soils suitable for arable cultivation.

The landscape was substantially modified by ice and meltwater during the Devensian stage of the ice age. At its height, approximately 20,000 years ago, the ice sheets reached the area that is now Wolverhampton, as proven by the presence of glacial erratics left behind when the ice melted. The ice sheet blocked the upper reaches of the River Severn which originally flowed north to the Dee Estuary. Melting resulted in the catastrophic release of water, cutting the Ironbridge Gorge and allowing the River Severn to drain to the Bristol Channel. The ice sheet is responsible for economically important sources of aggregates and for creating the many characteristic deep, narrow gorges that are now important wetland habitats.

The Severn Valley had become significantly settled by Neolithic times. Occupation of the fertile land in the river valleys is likely throughout the prehistoric period. There may have been early clearance of the poorer land between the Severn and Stour rivers to form the heathland which characterised the landscape in later centuries. Iron-age occupation was also extensive on the fertile sites and there were hill forts on higher ground, for example at Kinver. Troglodytic dwellings still exist in the sandstone cliffs along the River Stour at Kidderminster, Wolverley and Kinver.

Roman activity was significant in the area; the Roman road Watling Street passes through the NCA linking London with Wroxeter in the neighbouring Shropshire Hills NCA, before turning north to Holyhead. Further Roman roads exist within the NCA, including three that converge at Greensforge near Kinver, where a series of marching camps and forts were established, probably to monitor the crossing of the Smestow Brook.

The Anglo-Saxon settlements occupied a landscape with substantial cleared areas, particularly in the river valleys, surrounded by woodlands and heathlands. Bridgnorth was a fortified settlement as early as the 9th century and Kidderminster had large estates on the surrounding lands.

The River Severn has always been strategically important. The Anglo-Saxon Chronicle[5] records that Vikings travelled up the river to raid the Kingdom of

[5] The Anglo-Saxon Chronicle is a collection of annals written in Old English, chronicling the history of the Anglo-Saxons

Mercia, culminating in a battle in 910 AD at Tettenhall near Wolverhampton, where they were defeated by Edward the Elder, King of the Anglo-Saxons of Mercia and Wessex. The legacy remains in present-day street names, for example Danescourt.

After the Norman conquest, much of the area was covered by the Royal Forests of Kinver and Wyre with the exception of frequent settlements on pockets of fertile land. Prosperity lay in the settlements along the river valleys, with the River Severn being navigable by quite large craft.

From the 15th century onwards, wool became a significant commodity and Wolverhampton's early importance and prosperity were founded on the wool trade; the legacy remains in the street names and in a number of folds throughout the city. The towns of Stourport-on-Severn and Kidderminster were known for their carpet looms. In the rural landscape, parks such as Leigh House, Davenport House and Dudmaston Hall were laid out. Heathland remained a prominent landscape feature until the enclosure movement gained pace in the 18th century with the resultant expansion in agriculture.

As early as the 17th century a water-powered iron industry was present along the Stour Valley and Smestow Brook, where both buildings and earthworks survive. By the early 18th century the Industrial Revolution was gaining pace and industrialisation had a profound effect on the landscape. Abraham Darby I's first furnace at Coalbrookdale in 1708 was fuelled by charcoal until in 1709 he perfected a technique for smelting iron using coke instead of charcoal which enabled for the first time the mass production of high-quality iron. In 1779 the world's first iron bridge was opened. The bridge and the ten museums are now designated by UNESCO[6] as a World Heritage Site. The area has inspired many artists drawn by the contrasts between the natural landscape of the gorge and the flames and smoke of the thriving industries. Prior to Abraham Darby's innovation of using coke to smelt iron, charcoal had been the source of fuel for the smelters and the valley woodlands were managed for this purpose. The NCA supported a wide range of industry: porcelain production at Coalport, carpet looms at Kidderminster, glass making at Stourbridge and a wide range of trades at Bewdley and Stourport-on-Severn.

**Parks and estates were laid out from the 15th century onwards such as here at Dudmaston Hall, now in the ownership of the National Trust.**

[6] United Nations Educational, Scientific and Cultural Organization

Until the construction of the railways, the inland ports on the River Severn, including Bridgnorth, Bewdley and Stourport-on-Severn, prospered. The last named had a canal basin on the Staffordshire and Worcestershire Canal which opened in 1771 and linked the River Severn with the Trent and Mersey Canal. The canal links the Staffordshire Potteries with the Black Country via the junction with the Birmingham Canal at Aldersley near Wolverhampton. The strong local identity of the Severn towns in this period is evident from the regional novels of Francis Brett Young with his vivid evocations of both town and country.

Today, the historic transport routes, the canal network and disused railway lines have been adopted for recreational use; for example, Route 45 of the National Cycle Network uses sections of disused railway lines. Post-industrial and former coal mining sites have been used for habitat creation and recreation, for example Severn Valley Country Park, while some sites have been left derelict and have naturalised, for example Muxton Marsh, which is now an SSSI.

In contrast to the historic towns of the Severn Valley, Telford, named after the famous civil engineer Thomas Telford, is a relatively new planned town of the 1960s, with a mix of residential and commercial areas, largely built on restored land and surrounded by a mosaic of derelict land and post-industrial and coalfield sites.

A recent trend in the rural landscape is the decline in agriculture in favour of equestrian activities on the urban fringe and some evidence of diversification, for example farm attractions, local produce shops and public events, notably at Weston Park. There has been an increasing trend in the prevalence of diseases and invasive non-native species, for example diseases such as Phytophthora and invasive plants such as Japanese knotweed and Himalayan balsam in terrestrial environments, and the signal crayfish and killer shrimp in waterbodies.


**Telford, a new town, named after the famous civil engineer Thomas Telford.**

## Ecosystem services

The Mid Severn Sandstone Plateau 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 Mid Severn Sandstone Plateau NCA is contained in the 'Analysis' section of this document.

### Provisioning services (food, fibre and water supply)

- **Food provision**: The NCA supports food provision on a commercial scale which is important to the region. The agricultural census for 2010[7] indicates that farms are evenly distributed between livestock (sheep and cattle) and arable. Soils are mostly classified as Grade 3 on the plateau, although significant areas of Grade 2 exist in the fertile valleys.

- **Water availability:** The River Severn is a major source of water, augmented by boreholes in the Sherwood Sandstone aquifer providing water for agriculture, industry and public supplies to the city of Wolverhampton, and Birmingham, Shrewsbury and Gloucester outside the NCA. The River Severn, its tributaries and the Sherwood Sandstone aquifer are 'over-abstracted'.

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

- **Climate regulation:** Woodland is likely to be the most significant contributor to carbon storage and sequestration in this NCA. Fourteen per cent of the NCA is covered by woodland, including significant blocks in Wyre Forest and along the Severn Valley. Other contributors include organic rich soils in the river valleys and wetland areas and there are significant tracts of heathland supporting woody shrubs.

- **Regulating soil erosion:** Light sandy mineral soils and freely draining loamy soils cover the majority of this NCA (52 per cent). There is an enhanced risk of wind erosion where these soils occur on moderately or steeply sloping land, or where large, open arable fields are cultivated and bare soil is exposed. The loamy, clayey soils of the NCA (24 per cent) are prone to compaction and capping.

- **Regulating soil quality:** The freely draining, lightly acid sandy soils (26 per cent) of the NCA are permeable and valuable for aquifer recharge where they overlie the Triassic Sandstone aquifer. Increased agricultural production, especially on the plateau, will adversely affect the quality of the mineral soils and will need careful management, in particular the incorporation of organic matter in cultivated soils. Well-managed livestock systems, appropriate stocking levels and keeping stock away from wetland areas can alleviate the risk of poaching and compaction of the loamy and clayey soils. In urban areas, open spaces with unsealed soils allow infiltration of rainfall.

[7] www.defra.gov.uk/statistics/foodfarm/landuselivestock/junesurvey/junesurveyresults/

- **Regulating water quality:** The River Severn is considered a 'highly modified' waterbody and has a 'moderate' ecological potential. The ecological status of its tributaries varies from good to bad and the chemical status of the aquifer is poor. The Environment Agency has identified a Drinking Water Protected Area[8] extending along the Severn Valley from Stourport-on-Severn in the south to Bridgnorth in the north as being 'At Risk'.

- **Regulating water flow:** There is a relatively high risk of fluvial flooding, particularly at the confluences of the Severn with the rivers Worfe and Stour, and along the Severn Valley. There is significant flood risk at the bridging towns of Bridgnorth, Stourport-on-Severn, Kidderminster and Bewdley, with the potential risk of flooding stretching into the neighbouring Severn and Avon Vales NCA.

### Cultural services (inspiration, education and wellbeing)

- **Sense of place/inspiration:** The sense of place is provided by the rolling sandstone plateau, the wooded gorges of the River Severn and the smaller steep, wooded dingles as other rivers flow through the landscape. Ironbridge, with the world's first iron bridge, has a strong international sense of place as the birthplace of the Industrial Revolution and Coalbrookdale has inspired artists since the 18th century. They have been drawn by the contrast between the natural landscape of the gorge and the flames and smoke of the thriving industries. The historic inland ports and bridging towns of the Severn inspired the novelist, poet and playwright Francis Brett Young to write what became known as the Mercian Novels.

- **Sense of history:** The NCA has one World Heritage Site, 16 Registered Parks and Gardens, 67 Scheduled Monuments and 2,609 Listed Buildings. Coalbrookdale and Ironbridge Gorge are known throughout the world as the birthplace of the Industrial Revolution and this is epitomised by the first iron bridge, constructed in 1779 by Abraham Darby III. The sense of history also extends to other important towns, including Stourport-on-Severn and Kidderminster which were known for their carpet looms, Stourbridge for its glass making, and the distinctive riverside towns including Bewdley and Bridgnorth. Wolverhampton's early importance and prosperity were founded on the wool trade and the legacy remains in the street names and in a number of folds throughout the city. In the rural landscape, there are large estates and parks, for example Leigh House, Davenport House and Dudmaston Hall. The NCA attracts visitors from around the world owing to the wealth of heritage assets of cultural and economic significance found there.

- **Recreation:** The World Heritage Site and Wyre Forest NNR offer a host of recreational activities and there are 1,521 km of public rights of way which link settlements with the rural areas. The long-distance cycle path Route 45 passes north–south through the NCA. A number of tourist attractions are located in the NCA, for example the Severn Valley Railway (a heritage railway) and the West Midland Safari Park, located at Bewdley. The canals also provide recreational opportunities and stimulate tourism, which is economically important to the region.

[8] http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&lang=_e&textonly=off&topic=drinkingwater#x=373459&y=294280&lg=1,&scale=6

- **Biodiversity:** The NCA has 24 biological SSSI and 213 Local Sites of interest. Some 708 ha (28 per cent) of SSSI are in favourable condition with a further 1,476 ha (70 per cent) in unfavourable recovering condition. A characteristic feature of the NCA is the heathland and associated grassland, notably at Kinver and Hartlebury. Wyre Forest NNR and SSSI, located in the south of the NCA, is part of one of the largest ancient lowland oak woods in England and hosts nationally important metapopulations of many wildlife species, for example bats and the pearl-bordered fritillary butterfly. Post-industrial sites are important; the topography and soil conditions that remain following mining or excavations have been important in creating conditions favourable to natural colonisation by valuable communities of flora and fauna. Estate parkland, for example at Dudmaston, Patshull and Weston Park, is typified by its species-rich permanent grassland and often contains native and introduced specimen trees.

- **Geodiversity:** There are eight geological SSSI and 72 Local Geological Sites within the NCA. Fast-flowing rivers have incised the rocks, creating expansive exposures, as can be seen in the Ironbridge Gorge. During the 18th century, the area around the Severn Valley and in the Black Country was rich with raw materials. Exploitation of this wealth has left a legacy of disused quarries with geological exposures which now provide opportunities for research, education and recreation. Erosion of the differing rock types has resulted in different soil profiles, thus supporting varied habitats and land uses. Many buildings in the towns and villages have been constructed using local sandstones.

Pearl-borderd fritillaries in a woodland clearing in the Wyre Forest.

# Statements of Environmental Opportunity

**SEO 1: Protect, expand and appropriately manage the characteristic habitats of the NCA, specifically lowland heathland, acid grasslands and woodland including orchards and hedgerows, thus reinforcing the sense of history and reducing habitat fragmentation for the benefits that this will bring to resource protection, biodiversity, climate regulation and the recreational and experiential qualities of the NCA.**

**For example, by:**

- Working in collaboration with partners to seek ways of avoiding further losses or degradation of existing characteristic habitats from threats posed by commercial forestry, mineral extraction and housing, the expansion of arable cultivation, increased demand for recreation and over-abstraction of water.
- Restoring heathland and grassland by re-introducing traditional land management techniques, reinstating appropriate levels of grazing where possible and managing sensitive areas of habitat by restricting public access where and when necessary and providing alternatives.
- Working in collaboration with quarry operators to encourage the restoration of quarries to priority habitats, for example heathland and acid grassland, incorporating habitats for invertebrates.
- Encouraging the restoration of hedgerows with typical species, by gapping up and planting their accompanying hedgerow trees, adopting appropriate cutting regimes and tagging to extend the age range and species diversity.
- Encouraging the natural regeneration of characteristic habitats in areas traditionally occupied by this habitat in order to reduce fragmentation, thus enabling the movement of species in response to climate change.
- Buffering and improving the quality and connectivity of core areas of characteristic habitats, for example Sites of Special Scientific Interest, the National Nature Reserve, Local Nature Reserves and Local Sites, particularly in the urban areas.
- Encouraging the uptake of Environmental Stewardship options that promote the establishment of blocks of woodland and grassland margins in agricultural areas that buffer existing sites and the use of species-rich seed mixes.
- Discussing with equestrian landowners the option of laying mixed-species grassland and planting mixed-species hedgerows, particularly on the urban fringe where equestrian land use is most prevalent.
- Working in collaboration with the forestry sector to encourage landowners to plant more trees where appropriate in the landscape.[9]
- Encouraging landscape partnerships and woodland owners to reinstate traditional woodland management techniques, for example coppicing to thin the canopy and clear felling to provide woodland clearings that benefit woodland flora, birds and invertebrates, and recruiting volunteers to learn species monitoring and habitat management, to improve the quality of sites and to halt the decline in traditional skills.

[9] www.gov.uk/government/uploads/system/uploads/attachment_data/file/221023/pb13871-forestry-policy-statement.pdf

**SEO 1 continued on next page**

**SEO 1 continued from previous page**

- Seeking ways of stimulating the market for wood fuel and wood products by encouraging the installation of wood fuel boilers in local community buildings close to the source, to sustain woodland management, for example as happens in Wyre Forest.
- Replacing plantations on ancient woodland sites with native broadleaved species and augmenting ancient and veteran trees with similar species, thus maintaining the structural diversity and sustaining their value as both a biodiversity and cultural resource.
- Considering selective felling of woodland that was once used as wood fuel, to reinstate vistas which are now obscured, for example along sections of the Severn Valley.
- Controlling invasive species, for example rhododendron and ivy, and introducing biosecurity measures in areas that are not accessible by the public.
- Managing the remnant orchards in Wyre Forest and establishing new orchards throughout the NCA to stimulate the market for local produce and for the benefits that this will bring to ecosystem services of genetic diversity, biodiversity and climate regulation.
- Working in collaboration with farmers and landowners to protect the valuable soil resource of the NCA through appropriate management.

**Volunteers of the landscape partnership coppicing in Wyre Forest.**

**SEO 2: Protect and manage the rivers and streams of the NCA to mitigate the extremes of drought and flood events, and protect the water quality of the River Severn and safeguard aquifer recharge areas by managing discharges to watercourses and protecting and increasing areas of semi-natural riparian habitats along river valleys, streams, canals and urban watercourses.**

**For example, by:**

- Encouraging sustainable use of water; promoting water conservation measures to reduce demand and thus abstraction by increasing water harvesting in urban areas and establishing over-winter storage for agricultural use, when water is plentiful.
- Reducing the use of pesticides and minimising fertiliser inputs to protect the important recharge areas of the Sherwood Sandstone aquifer from diffuse pollution; protecting watercourses within the Drinking Water Protected Area from diffuse pollution and reducing sediment load.
- Buffering watercourses in agricultural areas to prevent, or minimise, the levels of pesticides, nitrates and sediment entering the rivers, resulting in expensive filtration; ensuring good soil management throughout the National Character Area (NCA).
- Identifying natural areas for floodwater storage to reduce the reliance on hard engineering solutions; widening flood plains where possible and ensuring that they are not inappropriately developed, reinstating flood meadows throughout the riparian environs in the NCA and ensuring dual use of riparian open spaces in urban areas, for example flood-compatible playing fields and parks.
- Managing and increasing areas of woodland along river valleys and dingles for the benefits that this can bring to water quality and water flow rates.
- Incorporating the principles of sustainable drainage systems such as those that exist in Telford and Wrekin into new developments.
- Increasing the length of open water corridors and areas of connected green space through the urban areas by de-culverting rivers and streams where appropriate and creating riparian semi-natural habitats, for example reedbeds that can slow the current and filter water.
- Supporting landscape partnerships and the Canal and River Trust with projects to create priority habitats along sections of canals to benefit priority species, for example floating water plantain on still water in disused branches of canals, water vole on modified canal banks and bats in canal tunnels.
- Protecting areas of undeveloped and unsealed soil in urban areas from development that enables water infiltration.
- Supporting projects that identify point and diffuse pollution in urban areas, for example through misconnections, illegal discharges and run-off.


**The canal basin at Stourport-on-Severn where the Staffordshire and Worcestershire Canal joins the River Severn.**

**SEO 3: Protect from inappropriate development and manage a stock of post-industrial and extractive sites around Telford and the Black Country which exemplify the strong influence that geodiversity has on the landscape, through industrial development and settlement patterns and for their often unique value to biodiversity. Protect and maintain the natural geomorphological features and exposures in the river valleys that can be used for research and education to study past environmental change as well as for recreation.**

**For example, by:**

- Raising awareness through the Local Biodiversity and Geodiversity Action Plans and the planning system of the increasing importance of post-industrial and extractive sites to our understanding of industrial heritage and for the unique habitats that they provide.
- Working in partnership with local authorities and partners to survey and identify a stock of post-industrial sites, in order to ensure a balance in the numbers of these sites prior to development.
- Working in partnership with the construction industry and quarry operators to develop schemes and restoration proposals for working sites that provide opportunities for successional colonisation by flora and for the provision of geological exposures, affording opportunities for research and education in biodiversity and geodiversity.
- Working with local authorities and consultants engaged to maintain the integrity of road cuttings, to ensure that geological exposures are not obscured by hard engineering solutions. This is of particular relevance in the Severn Valley, where landslips are occurring more frequently.
- Working in partnership with sand and gravel quarry operators to develop restoration proposals to incorporate wetland habitats that could provide floodwater storage areas.
- Working with the local geodiversity partnerships to designate further Local Geological Sites to assist with the understanding of soils and enjoyment of geodiversity and to provide opportunities for recreation and volunteering.
- Improving access to cuttings, quarries and other geological features by improving footpaths and providing signage and interpretation.
- Through geodiversity partnerships, encouraging volunteering to train volunteers in surveying techniques and geoconservation methods, to improve the quality of sites and to retain the knowledge and skills required for their future management.
- Encouraging appropriate small-scale extraction of stone as this could provide material for repairing traditional buildings and estate walls, thus maintaining the vernacular.

**Muxton Marsh SSSI. A complex of habitats which have developed on a semi-derelict coal mining site.**

**SEO 4: Work in collaboration with the World Heritage Site, English Heritage and the local authorities to implement sustainable solutions to protect and manage the landscape and heritage attributes of the Ironbridge Gorge World Heritage Site and the wider historic landscape, including the canals, historic ports and bridging towns, finding sustainable solutions to manage visitor pressure, while maintaining high levels of public access for the benefits to the visitor economy and employment.**

**For example, by:**

- Providing sustainable transport solutions for visitors, to alleviate traffic congestion in the World Heritage Site and in the narrow streets of the old ports and bridging towns.
- Encouraging an integrated transport network between visitor attractions which links with public rights of way and cycle routes.
- Encouraging more visitors to the open countryside for quiet enjoyment, meeting the needs of diverse audiences and improving health and wellbeing, while reducing the number of visitors to traffic-congested sites.
- Seeking ways to sustainably manage the demand for water and energy resources and providing recycling facilities at tourist destinations, to minimise the impact on the environment and to raise awareness.
- Managing the impact of visitors on sites by ensuring that paths are adequately signposted and surfaced to prevent erosion and to divert public access away from sensitive habitats.
- Considering new technological solutions for the interpretation of habitats, artefacts and historic buildings, describing the role that each has had in the heritage and development of the landscape over time.
- Restoring the historic canal networks and improving pedestrian access, taking advantage of opportunities to create new circular routes and identify opportunities to improve access by ensuring that paths are well maintained and signposted and that some surfaced paths are provided to ensure easy access walks.
- Improving the interpretation of the Roman road Watling Street and Roman sites adjacent to the route.

**Almost obscured, the world's first iron bridge nestles in the wooded gorge of the Severn. Opened in 1779 and viewed from the Rotunda on Lincoln Hill, itself a SSSI. The Rotunda was built in the 1790s and had a revolving seat to take in the panoramic views of the surrounding countryside.**

## Additional opportunities

**1. Promote sustainable agricultural practices to maintain the food productivity of the plateau, while incorporating semi-natural habitats into arable fields and valley pastures, to protect the quality of the soil and prevent erosion, thus also increasing the contribution to biodiversity, landscape character and climate regulation.**

**For example, by:**

- Establishing tree belts with native species and reinstating prevalent species of hedgerows to provide windbreaks across open countryside, where appropriate in the landscape.
- Continuing to maintain and reinstate where necessary sandstone walls of estate grounds.
- Protecting the soil resource by endeavouring to reduce the incidence of bare earth on large open fields or on sloping ground and ensuring good soil management.
- Managing soil in areas where buried archaeological artefacts are known, to protect the heritage of the NCA.
- Incorporating semi-natural habitats into arable fields, for example semi-natural grassland and beetle banks which can reduce wind erosion and benefit biodiversity.
- Incorporating enhancements into arable fields to assist with resource protection and the recovery of farmland birds, for example by the establishment of field margins with nectar-rich flora, the retention of wintering stubbles and incorporation of skylark plots.
- Planting short rotation coppice and miscanthus at an appropriate scale and only where suitable to the local landscape character, to diversify a largely arable landscape, as exists on the plateau, thus providing shelterbelts.

A typical estate mixed woodland bounded by a sandstone wall.

**2. Protect and manage the cultural heritage and the wider historic landscape for its intrinsic value and contributions to sense of history and to sustainable development.**

**For example, by:**

- Conserving and improving the outstanding universal value of the Ironbridge Gorge World Heritage Site by managing its landscape, buildings, sites, monuments and collections and adopting sustainable approaches to tourism.
- Conserving and enhancing the local character and distinctiveness of the area's riverside towns including Bewdley, Stourport-on-Severn and Bridgnorth by ensuring that new development is well designed and responds to the local vernacular and characteristic materials.
- Encouraging the sustainable use of historic buildings associated with industrial heritage of the area and especially those identified by English Heritage as being at risk.
- Increasing awareness and understanding of the heritage interest of Wyre Forest, including its archaeological significance, as well as the archaeological potential of the river valleys, and encouraging an integrated approach to land management options, delivering benefits for the natural and historic environment.
- Conserving and enhancing the canal network by maintaining and repairing associated structures and buildings, securing good design in all new canal-side development and improving access and interpretation.
- Encouraging the preparation of conservation management plans for designed landscapes and parklands to support the sustainable management of their heritage assets as well as biodiversity, parkland habitats and veteran trees, taking into account the original design intent.
- Identifying, conserving and enhancing the above- and below-ground archaeological interests within the NCA and where appropriate providing interpretation.
- Protecting and enhancing the historic built environment within the towns, villages and hamlets of the NCA as well as its historic farm complexes.
- Maintaining and enhancing the historic landscape character of the NCA, for example through the strengthening of the pattern of enclosure through the reinstatement of lost historical field boundaries.
- Protecting and sensitively managing the sandstone rock dwellings found along the Severn Valley.

**Kinver, an attractive historic town with a mix of Georgian buildings and fine, individual examples of timber-framed buildings.**

# Supporting document 1: Key facts and data

Total area: 88,803 ha

## 1. Landscape and nature conservation designations

Thirteen hectares of the Shropshire Hills Area of Outstanding Natural Beauty (AONB) fall within this NCA.

Management Plans for the protected landscape can be found at:

- www.shropshirehillsaonb.co.uk/

**Source: Natural England (2011)**

### 1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

| Tier | Designation | Designated site(s) | 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) | Wyre Forest NNR | 573 | 1 |
| **National** | Site of Special Scientific Interest (SSSI) | A total of 32 sites wholly or partly within the NCA | 2,543 | 3 |

**Source: Natural England (2011)**

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

There are 285 local sites in the Mid Severn Sandstone Plateau covering 4,759 ha which is 5 per cent of the NCA.

**Source: Natural England (2011)**

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

#### 1.1.1 Condition of designated sites

| Condition category | Area (ha) | Percentage of SSSI land in category condition |
|---|---|---|
| **Unfavourable declining** | 50 | 2 |
| **Favourable** | 708 | 28 |
| **Unfavourable no change** | 28 | 1 |
| **Unfavourable recovering** | 1,476 | 70 |

**Source: Natural England (March 2011)**

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

## 2. Landform, geology and soils

### 2.1 Elevation

The lowest elevation in this NCA is 15 m and the highest point is 233 m. The mean elevation across the NCA is 97 m.

**Source: Natural England 2010**

### 2.2 Landform and process

A landscape substantially influenced by ice-age processes and deposits. The overall character is one of gently undulating country with tree-lined ridges that follow the variations occasioned by geological boundaries. To the west, around the Severn Valley, the light sandy soils and rolling landform give way to heavier soils and more irregular topography. To the south, the valley sides steepen and become heavily wooded with steep sided tributary dingles. In the north the Severn Valley narrows to a spectacular gorge. North of the Ironbridge Gorge is a landscape of gentle valleys and escarpments forming the east Shropshire Coalfield.

**Source: Mid Severn Sandstone Plateau Countryside Character Description**

### 2.3 Bedrock geology

The bedrock is generally sandstone of one sort or another with relief provided by slightly harder or softer beds within the sequence. The Mid Severn Sandstone Plateau has two distinct terrains. The western area equates with the Severn Valley and encompasses Carboniferous age and older rocks of the Wyre Forest and Coalbrookdale coalfields. The more extensive eastern area drained by the rivers Worfe and Stour, features late Permian and Triassic age rocks in the form of a downfaulted block which separates the Wyre Forest and Coalbrookdale coalfields in the west from the South Staffordshire (Black Country) coalfield which forms part of the eastern boundary. The Lower and Middle productive Coal Measures were worked for coal and ironstone from an early date. Silurian limestones available from the southern end of the coalfield supported the early iron industry. Dolerite intrusions are encountered in the productive measures giving rise to surface features, for example at Kinlet and as a thin dyke from Witnells End to Arley Wood. The Stour Valley, and much of the northern watershed between the two valleys, is underlain by Permo-Triassic sandstones. The Permo-Triassic sandstones and pebble beds are important underground aquifers for water supply to the major centres of population and industry. The sandstones of the Kidderminster and Bromsgrove formations have been extensively used as local building stone and their characteristic red colouration brings local distinctiveness to many towns and villages.

**Source: Mid-Severn Plateau Countryside Character Area description. Geology narrative; West Midlands Geodiversity Partnership.**

### 2.4 Superficial deposits

The whole area has been substantially modified by ice and meltwater especially during the last phase of the last ice age. At its height, about 20,000 years ago, the ice sheets reached the Wolverhampton area. When the ice retreated great swathes of Till (Boulder Clay) were left behind, especially in the northern part of the area, blanketing the bedrock formations. Large glacial boulders, known as erratics, of Lake District, Scottish and Welsh origin were dispersed over most of the area north of the latitude of Wolverhampton. Economically important deposits of glacio-fluvial sands and gravels, indicating former meltwater channels, predominate in the central part of the area. Only the Wyre Forest area is relatively free of drift deposits. An unusual deposit of blown sand at Hartlebury Common is notable. Periglacial (sub-arctic) conditions south of the ice sheet led to cold, dry, steppe-like lands in places.

**Source: Mid-Severn Sandstone Plateau Countryside Character Area Description. Geology narrative- West Midlands Geodiversity Partnership**

## 2.5 Designated geological sites

| | Designation | Number |
|---|---|---|
| National | Geological Site of Special Scientific Interest (SSSI) | 8 |
| National | Mixed interest SSSI | 1 |
| Local | Local Geological Site | 72 |

**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

**Ensuring the integrity of a road cutting after a landslip in the Severn Valley, without obscuring the geology.**

## 2.6 Soils and Agricultural Land Classification

To the west, around the Severn Valley, the light sandy soils and rolling landform give way to heavier soils and more irregular topography. Here the land is of mixed arable and pasture use. To the east of the Severn, soils are dry and sandy. To the south the soils are sandier around Kidderminster and Stourbridge and more gravel based to the north-east of Bromsgrove.

**Source: Mid-Severn Sandstone Plateau Countryside Character Description**

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

| Agricultural Land Classification | Area (ha) | Percentage of NCA |
|---|---|---|
| Grade 1 | 1,032 | 1 |
| Grade 2 | 22,105 | 25 |
| Grade 3 | 42,865 | 48 |
| Grade 4 | 6,028 | 7 |
| Grade 5 | 0 | 0 |
| Non-agricultural | 5,125 | 6 |
| Urban | 11,649 | 13 |

**Source: Natural England (2010)**

- Maps showing locations of statutory 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.

| Name | Length in NCA (km) |
|---|---|
| River Severn | 48 |
| River Stour | 27 |
| River Worfe | 16 |

**Source: Natural England (2010)**

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

The main river is the Severn which enters the area through the Ironbridge Gorge, flowing in a south-westerly direction, and is served by often fast flowing tributaries. To the south-west, the Stour flows from the Clent Hills to join the Severn at Stourport. To the north of the plateau are many small streams and rivers, notably the Worfe, a tributary of the Severn. Large open waterbodies are generally confined to reservoirs such as Chelmarsh. The largest man-made waterways on the plateau are the extensive canal system, including the Staffordshire and Worcestershire Canal (37 km) and the Shropshire Union Canal (7 km) which in places link with the river system.

### 3.2 Water quality

The total area of Nitrate Vulnerable Zone is 74,240 ha, or 84 per cent of the NCA.

**Source: Natural England (2010)**

### 3.3 Water Framework Directive

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

**Bewdley, a historic port and bridging town on the River Severn.**

## 4. Trees and woodlands

### 4.1 Total woodland cover

The NCA contains 12,721 ha of woodland (14 per cent of the total area), of which 4,164 ha is ancient woodland. Forest of Mercia Community Forest, one of twelve Community Forests established to demonstrate the contribution of environmental improvement to economic and social regeneration, covers 1,209 ha or 1 per cent of this NCA.

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

### 4.2 Distribution and size of woodland and trees in the landscape

Extensive clearance of woodlands on the sandstone plateau occurred in prehistory and is also evident by the late 11th century. Extensive ancient and secondary woodland survives mostly along the steep slopes of the valleys and ancient woodland is intermixed with conifers in Wyre Forest. Estate parkland, which includes conifer plantations, dating from the 19th century is a significant element in the land cover. This includes Dudmaston Hall to the west and many others across the sandstone plateau. Many of the woodlands are conifer plantations which combine with parklands. Along the valley bottoms there is greater tree cover, especially to the western Severn area where there are abundant hedgerow trees.

**Source: Midlands Plateau Natural Area Profile**

### 4.3 Woodland types

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

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

| Woodland type | Area (ha) | Percentage of NCA |
|---|---|---|
| Broadleaved | 8,158 | 9 |
| Coniferous | 2,684 | 3 |
| Mixed | 1,268 | 1 |
| Other | 611 | 1 |

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

Area and proportion of ancient woodland and planted ancient woodland within the NCA:

| Woodland type | Area (ha) | Percentage of NCA |
|---|---|---|
| Ancient semi-natural woodland | 2,046 | 2 |
| Ancient re-planted woodland (PAWS) | 2,096 | 2 |

**Source: Natural England (2004)**

**Blocks of woodland on a ridge rising out of the central plateau.**

## 5. Boundary features and patterns

### 5.1 Boundary features

Notable are the large-scale and regular boundaries of planned enclosure, mostly dating from the late 18th century, with pockets of assarted fields and piecemeal enclosure retaining profiles of strip fields from common arable.

**Source: Mid-Severn Sandstone Plateau Countryside Character Area description; Countryside Quality Counts (2003)**

### 5.2 Field patterns

Field patterns are predominantly piecemeal enclosures to the east and west with some blocks of much larger and later 20th-century fields. To the west, around the Severn Valley, the land is in mixed arable and pasture use with irregular, smaller fields with a stronger hedgerow framework. In the northern areas, at the edges of the towns, arable land is still present on the flatter land. On the steeper ground mixed or predominantly pasture land is present within small hedged fields. In the east, on the more level ground, arable use with low hedgerows with few hedgerow trees predominates.

**Source: Mid-Severn Sandstone Plateau Countryside Character Area description; Countryside Quality Counts (2003)**

**There are often abrupt contrasts in landscape between the rural and urban areas, for example, around the relatively new town of Telford.**

## 6. Agriculture

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

### 6.1 Farm type

The area's farm holdings are relatively evenly divided between livestock and arable farm type. Of the 730 holdings, 166 (23 per cent) are mainly grazing livestock, 129 (18 per cent) cereals, 113 (15 per cent) general cropping, 50 (7 per cent) mixed and 42 (6 per cent) horticulture.

**Source: Agricultural Census, Defra (2010)**

### 6.2 Farm size

Twenty-seven per cent of farms are between 5 and 20 ha, although these cover only 4 per cent of the agricultural area. Almost 70 per cent of the agricultural area is in farms greater than 100 hectares.

**Source: Agricultural Census, Defra (2010)**

### 6.3 Farm ownership

2009: Total farm area = 50,321 ha; owned land = 31,403 ha
2000: Total farm area = 52,107 ha; owned land = 33,058 ha

**Source: Agricultural Census, Defra (2010)**

### 6.4 Land use

The two main land uses are cereal growing (35 per cent) and grass and uncropped land (39 per cent). Land for oilseeds has almost trebled since 2000 from 2 to 7 per cent of the agricultural area.

**Source: Agricultural Census, Defra (2010)**

### 6.5 Livestock numbers

In 2009 there were 68,100 sheep (95,300 in 2000), 21,300 cattle (25,700 in 2000) and 14,100 pigs (24,900 in 2000).

**Source: Agricultural Census, Defra (2010)**

### 6.6 Farm labour

In 2009 the agricultural workforce was 2,082, a decrease of almost 20 per cent since 2000. Almost half of workers were principal farmers (996, or 48 per cent), followed by 400 (19 per cent) casual / gang workers, 353 (17 per cent) full time workers, 206 (10 per cent) part time workers and 127 (6 per cent) salaried managers.

**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

The section of the River Severn, between Bridgnorth and Bewdley is particularly fine, with steep banks and rich, tall herb communities on and above the banks providing splendid insect habitats. Associated with the lowland rivers, characteristic riparian features are evident, with marshland well represented. The extensive canal system contains ecology intermediates between ponds, lowland rivers and urban areas, with possibly the most notable plant species being found here; the floating water plantain, which is internationally rare. Key sites of woodland include the Wyre Forest, which forms an assemblage of habitat with the Severn Valley, Chaddesley-Randon woods and the Ironbridge Gorge woodlands. Remaining ecologically valuable grassland occurs in the Wyre Forest and many small, grazed meadows are found along the River Severn.

**Source: Midlands Plateau Natural Area Profile**

### 7.2 Priority habitats

The Government's new strategy for biodiversity in England, Biodiversity 2020, replaces the previous Biodiversity Action Plan (BAP) led approach. Priority habitats and species are identified in Biodiversity 2020, but references to BAP priority habitats and species, and previous national targets have been removed. Biodiversity Action Plans remain a useful source of guidance and information. More information about Biodiversity 2020 can be found at; http://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 and yew woodland (broad habitat) | 5,963 | 7 |
| Lowland heathland | 266 | <1 |
| Lowland meadow | 149 | <1 |
| Lowland dry acid grassland | 75 | <1 |
| Coastal and flood plain grazing marsh | 53 | <1 |
| Fen | 28 | <1 |
| Purple moor grass and rush pasture | 26 | <1 |
| Reedbeds | 13 | <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

Along the Stour Valley large villages, like Kinver and Wolverley, lie between the towns of Wombourne, Kidderminster and Stourport. The last two are substantial settlements, spreading either side of the river and onto adjacent higher ground. The larger towns and villages are found in and around the Severn Valley. In the north, Bridgnorth is an attractive market town; its ancient core is on a prominent hilltop and its medieval street plan is still readily apparent. In contrast Telford is essentially a loosely-grouped cluster of large new villages found within a typical new town structure that is crossed by the M54 and other major roads. The towns in Severn Valley are linked by the Severn Valley Railway that runs from Kidderminster to Bridgnorth and is now a steam railway, tourist attraction. Settlement patterns away from the river valleys are of a more rural character of small hamlets and isolated farmsteads. Around both coalfields there is a scatter of small groups of former miner's cottages.

**Source: Mid Severn Sandstone Plateau Countryside Character Area description; Countryside Quality Counts (2003)**

### 8.2 Main settlements

The main settlements within the NCA are; Wolverhampton, Telford, Kidderminster, Stourbridge, Bridgnorth and Albrighton. The total estimated population for this NCA (derived from ONS 2001 census data) is: 527,426.

**Source: Mid-Severn Sandstone Plateau Countryside Character Area description; Countryside Quality Counts (2003)**

### 8.3 Local vernacular and building materials

The predominant material of older vernacular buildings is brick with a range of colours from the mellow red-brown brick of settlements like Bewdley to a mixture of colours, including Victorian polychromy in Kidderminster. Timber framing is also found on the borders with the adjacent Arden NCA. Red-brown plain tiles and grey slate tend to predominate as traditional roofing materials while thatch may have once been more common. Local sandstone has been used in the churches and grander buildings as well as the walls or lower courses of some farm houses and other rural buildings.

**Source: Mid-Severn Sandstone Plateau Countryside Character Area description; Countryside Quality Counts (2003)**

**The historic bridging town of Bridgnorth. A fenicular railway links the riverside low town to the high town.**

## 9. Key historic sites and features

### 9.1 Origin of historic features

There is extensive evidence of settlement during the Neolithic period with the formation of heathland through woodland clearance on the thin-soiled higher land between the rivers Stour and Severn. There is also extensive evidence of Roman settlement, including a major occupation centre at Greensforge. Predominant settlement patterns in the river valleys are clearly evident by late 11th century. Industrial development from the 16th century is closely linked to the navigation of the River Severn and development of the canal system. These developed from the 1760s and include Telford's Birmingham Main Line and other canals of the mid-19th century, mostly built as extensions for the Birmingham Canal Navigation Company. Coal and clay was exploited from the Ironbridge Gorge area from mid 16th century. The ironworks of Abraham Darby I and his furnace at Coalbrookdale in 1708 went on to produce the world's first, and now famous, iron bridge, completed in 1779 by Abraham Darby III. Country houses and estates developed throughout the area, especially on the sandstone plateau and within some villages. The period after the Second World War saw major opencast exploitation of the northern coalfield and the development of the town of Telford.

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

### 9.2 Designated historic assets

This NCA has the following historic designations:

- 1 World Heritage Site.
- 16 Registered Parks and Gardens covering 2,135 ha.
- 0 Registered Battlefields.
- 67 Scheduled Monuments.
- 2,609 Listed Buildings.

**Source: Natural England (2010)**

- More information is available at the following address: www.english-heritage.org.uk/caring/heritage-at-risk/
- www.english-heritage.org.uk/professional/protection/process/national-heritage-list-for-england/

## 10. Recreation and access

### 10.1 Public access

- Five per cent of the NCA, 3,951 ha, is classified as being publically accessible.
- There are 1,521 km of public rights of way at a density of 1.7 km per km2.
- There are no National Trails within the NCA.

**Sources: Natural England (2010)**

The following table 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 | 286 | <1 |
| Country Parks | 237 | <1 |
| CRoW Access Land (Section 4 and 16) | 1,396 | 2 |
| CRoW Section 15 | 130 | <1 |
| Village greens | 2 | <1 |
| Doorstep Greens | 12 | <1 |
| Forestry Commission Walkers Welcome Grants | 1,363 | 2 |
| Local Nature Reserves (LNR) | 484 | 1 |
| Millennium Greens | 1 | <1 |
| Accessible National Nature Reserves (NNR) | 573 | 1 |
| Agri-environment scheme access | 4 | <1 |
| Woods for People | 3,422 | 4 |

**Sources: Natural England (2011)**

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

## 11. Experiential qualities

### 11.1 Tranquillity

Based on the CPRE map of tranquillity (2006) the highest scores for tranquillity can be found in the west of the NCA in the Wyre Forest and Severn Valley. The lowest scores are around the major population centres of Wolverhampton and Telford.

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

| Tranquillity | Score |
|---|---|
| Highest | 41 |
| Lowest | -100 |
| Mean | -11 |

**Sources: CPRE (2006)**

- More information is available at the following address: **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 major disturbance occurs around the population centres of Wolverhampton, Stourbridge, Kidderminster, Bridgnorth and Telford and along the road network that link these centres. Undisturbed areas tend to be isolated and towards the west of the NCA away from the major conurbations, for example at Wyre Forest and at isolated areas along the Severn Valley. A breakdown of intrusion values for this NCA is detailed in the table below.

| Intrusion category | 1960s (%) | 1990s (%) | 2007 (%) | Percentage change (1960s-2007) |
|---|---|---|---|---|
| Disturbed | 37 | 51 | 53 | 16 |
| Undisturbed | 52 | 38 | 32 | -20 |
| Urban | 11 | 11 | 15 | 4 |

**Sources: CPRE (2007)**

Notable trends from the 1960s to 2007 are an overall increase in the area of disturbed land by 16 per cent, with a similar decrease in the areas of undisturbed land by 20 per cent. Urban areas increased by 4 per cent.

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

**Kinver heathland**

## 12. Data sources

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

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

# Supporting document 2: Landscape change

## Recent changes

### Trees and woodlands

- There is a developing woodland framework in the NCA; 7 per cent of the NCA is broadleaved mixed and yew woodland. Plantations on ancient woodland sites are being replaced with native broadleaved species and existing woodlands are being managed, thus creating opportunities for improved woodland understorey and a developing wood fuel market. This is most notable in Wyre Forest and is one of the objectives shared by the large, landscape partnerships in Wyre and Birmingham and the Black Country.

- Local evidence concurs with evidence from the Countryside Quality Counts survey[10] (CQC) indicating that the woodland character of the NCA is strengthening. Upon maturity, conifer plantations are being replaced with mixed plantations. Between 1999 and 2003 an area equivalent to 2 per cent of the 1999 total stock was approved for new planting under a Woodland Grant Scheme agreement (171 ha). Much of the planting is in the form of small isolated blocks throughout the area. In 2003 the proportion of established, eligible, National Inventory of Woodland and Trees woodland stock, was approximately 21 per cent.

- Between 2010 and 2013 a partnership project in Wyre Forest achieved landscape-scale changes by planting new hedgerows and felling portions of woodland to create butterfly-filled forest clearings. New fences have been erected enabling a cattle grazing regime to be established that is controlling bracken, resulting in new saplings appearing, thus strengthening the native woodland character of the area.

### Boundary features

- A weak hedgerow pattern exists over much of the plateau, in the central and eastern areas of the NCA which, contrasts with the river valleys in the west that is comprised of areas of smaller, irregular shaped fields with more distinctive hedgerows containing hedgerow oaks. Environmental Stewardship agreements are beginning to address the decline in hedgerows. Evidence from CQC, and more recent evidence, shows that approximately 30 km of hedgerows have been planted through Environmental Stewardship schemes, thus strengthening the boundary features of the NCA.

- Large estate farms have traditionally used local sandstone as a material for field boundary walls. Many of these have fallen into disrepair; however, Environmental Stewardship schemes have stimulated the repair and reinstatement of over 6 km of stone walls.

[10] Tracking Change in the Character of the English Landscape, 1999–2003

### Agriculture

- In the north of the NCA around Telford, and along the eastern boundary with the Birmingham and Black Country urban area, farm economics, development pressure and the demand for recreational and equestrian use is leading to a decline in urban fringe agriculture. Some farms and estates have diversified by offering on-farm sales of produce, the largest, at Weston Park also hosts frequent events and the popular 'V-festival'. A small number of farms have become farm attractions, for example, Ray's Farm and Hoo Farm.

- Economic pressure on the dairy sector is resulting in a decline in small scale dairy units, with a shift towards larger scale units where economies of scale prevail. This has led to fragmentation of holdings, as smaller dairy farms are broken up and the land put to other uses, for example equestrian activities.

- Until recently sugar beet was a widely grown crop in the NCA. However, revisions to agricultural payments associated with the reduction of the UK sugar quota has led to the closure in 2007of the processing plant at Allscott, in the neighbouring Shropshire Hills NCA. Many farms are now growing a special strain of maize instead of sugar beet. There has also been an increase in the area of oilseed rape grown in the NCA, producing swathes of yellow in the landscape in the early summer months.

- From October to February some dairy and arable farms in the NCA, receive off-farm wintering sheep from upland farms in neighbouring NCAs and Wales. This is locally known as having sheep 'on tack'. In recent years the number of sheep 'on tack' has declined and this has been attributed to the reduction of payments to upland farms.

### Settlement and development

- Data collected by CQC between 1998 and 2003, shows that there has been a high increase in housing provision in the in the north of the NCA around the relatively new town of Telford and also Dawley, Oakengates and Donnington,mostly on post-industrial sites. Development has also occurred at Wombourne, Kinver and Bewdley which are important commuter settlements within easy reach of the urban areas in the east. Development pressure is likely to continue in these commuter settlements. There have been smaller increases to housing stocks in the towns of Bridgnorth, Highley and Broseley in the Severn Valley.

- The same survey also shows an increase in non-residential developments in the north of the NCA, around Telford and Dawley, again, mostly on post-industrial sites. A similar pattern has occurred at Kidderminster in the south. A flagship development, amounting to 12 ha is being built west of junction 2 of the M54, north of Wolverhampton, on the border of the NCA It is an example of ongoing ribbon development alongside the motorway.

- Development pressure on the scattered hamlets on the plateau, for example, Claverley and Alveley, in the core of the NCA, is likely to increase as the urban areas in the east expand and these hamlets come within easy reach of commuters.

- There has been an increase in the number of conversions of redundant agricultural buildings to dwellings, due to economic pressures on farms, changes in agricultural practises and the demand for such developments from commuters seeking peaceful retreats.

### Semi-natural habitat

- Environmental Stewardship agreements have had a positive impact on the management of the characteristic heathland in the NCA. Once neglected and regarded as poor farmland due to their low fertility, heathlands are now recognised for their ecological, recreational and landscape value. Projects to increase areas of heathland, for example at Highgate Common and Lower Penn are underway and large, landscape partnership projects, for example in the Birmingham and Black Country area also have objectives to enhance and increase areas of heathland.

- Grassland is an important semi-natural habitat in the NCA. However, once common, some native species of flora and grasslands habitats are becoming increasingly rare, due to losses; there remains 266 ha of lowland meadow, 75 ha of lowland dry acid grassland and 26 ha of purple moor grass and rush pasture, each, representing less than one per cent of the area of the NCA. Although Environmental Stewardship schemes support measures to arrest the decline in these habitats, the pressure for food production, the decline in traditional management and more recently, overgrazing, especially by horses, continues to threaten these habitats.

- Over the last ten years, there have been large improvements to the environmental performance of modern manufacturing and extractive industries and this has benefited wildlife and the natural environment. The legacy of polluting, manufacturing industry and extractive operations in the NCA during the 19th century, has left topographic and soil conditions favourable to natural colonisation by valuable communities of flora and fauna. The number of these sites is declining due to continued development.

### Historic features

- The ten museums that comprise the World Heritage Site, receive approximately 545,000 visitors per annum and this is expected to increase. The museums are widely separated and this causes traffic congestion in a relatively enclosed, rural valley. Servicing this number of visitors also places great strain on the infrastructure and the community that lives there.

- There are 16 Registered Parks and Gardens and 2,609 Listed Buildings. The fine landscaped parklands are a traditional draw for many visitors and Environmental Stewardship is playing a role in maintaining and in some cases restoring these historic designed landscapes. Some, for example Dudmaston Hall and gardens and Kinver Edge and Rock Houses are managed by the National Trust, which popularises these attractions.

- A very high proportion of listed historic farmsteads have been converted to residential use.

Glasshouse cone near the canal

### Coast and rivers

- The most notable trend has been the increased demand for water; for public water supply and for agricultural irrigation, compounded by periods of drought. This is likely to lead to a further degradation in the ecological status of the River Severn and its tributaries. In particular, levels of pesticides and phosphate in the water may increase during dry periods. There is 'no water available' in the River Severn from Bridgnorth, in the north of the NCA, to Dowles Brook, a tributary of the Severn that flows through the Wyre Forest, in the south of the NCA. All of the tributaries east of the Severn, including the River Stour are 'over abstracted'. Most of the groundwater abstractions are from historical licences and the Environment Agency are not granting new licences and are reducing those up for renewal. Continued over abstraction from the aquifer may lead to ground shrinkage.

- In contrast, extreme and persistent weather events, have led to increased incidences of flooding in the NCA, which have provoked hard engineering flood solutions in towns like Bridgnorth and Bewdley.

- There has been an increase in the prevalence of invasive non-native species entering water habitats, for example, the signal crayfish and the killer shrimp which have had a significant impact on the native species that are now restricted mainly to isolated waterbodies. Japanese knotweed and Himalayan balsam are examples of invasive non-native species of flora.

### Minerals

- There are significant deposits of sand and gravel across the NCA, which are exploited by a number of operational quarries, for example, at Seisdon, Trysull and Enville. A number of extraction sites have been identified and are currently non-operational, although this could change if demand from the construction industry for the product increases.

- Although the coalfields have been exploited for centuries, larger plant and improved extraction techniques mean that areas of the coalfields in the west of the NCA have become economic to mine and present opportunities for extraction by opencast methods. For example, the recent opencast site at New Works site, west of Telford.

- The exploitation of mineral wealth has left a legacy of old quarries in the landscape, some of which are designated SSSI and Local Sites for both geodiversity and wildlife, that afford opportunities for interpretation and education, for example, Severn Valley Country Park.

**Natural woodland regeneration on old spoil heaps left behind by coal mining activities.**

## Drivers of change

### Climate change

- Projected climate change trends suggest increased rainfall, periods of drought and more frequent storm events. There is strong evidence that climate change is already affecting UK biodiversity. Impacts are expected to increase as the magnitude of climate change increases.

- Climate change increases the risk that many non-native species, insect pests and pathogens may establish and spread. For example, ash die back; a disease, caused by the fungus Chalara fraxinea; red band needle blightthat affects over 60 species of pine which, together with Phytophthora, is becoming prevalent in Cannock Chase AONB in the neighbouring NCA and poses a threat to blocks of conifer plantations in this NCA. Acute Oak Decline poses a threat to the oaks throughout the parklands of the area and in particular in Wyre Forest. If unchecked, these and other diseases and pests, for example, the oak processionary moth have the potential to fundamentally change the landscape.

- Increased rainfall destabilises river valleys increasing the risk of landslips, as evidenced from rock falls, resulting in road closures in the Severn Gorge. Geophysical evidence from the gorge also indicates that both banks of the valley are slipping into the river, placing stress on the world famous iron bridge.

- The predicted alterations in rainfall pattern, and related issues of soil erosion and pollution, are likely to have an impact on the River Severn and its tributaries as providers of drinking water to Chelmarsh and Trimpley reservoirs, impacting adversely on their water level and associated ecosystems.

- Projected climate change trends suggest an increase in summer temperatures leading to warmer water temperatures and greater incidences of algal bloom on waterbodies, for example at Chelmarsh and Trimpley reservoirs.

- Over-abstraction from the River Severn and Sherwood Sandstone aquifer, especially during periods of drought, 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 essential natural resource.

- A combination of a prolonged period of drought and over abstraction from the Sherwood Sandstone aquifer may lead to ground shrinkage and subsidence.

- The Environment Agency flood risk map indicates that localised flooding occurs along the river valleys. The frequency of these events is likely to increase and flood damage to traditional vernacular buildings especially may increase.

- Wood pasture and heathland may become more vulnerable to bracken encroachment and fire.

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

- The network of protected sites, which includes Sites of Special Scientific Interest and National Nature Reserves, will continue to have a valuable role in conservation, although there will be changes in populations, communities and ecosystems at individual sites.

- Climate change can affect the timing of seasonal events and modify migration routes that can result in changes in the inter-relationship between species, for example, predator and prey and beneficial host relationships.

### Other key drivers

- The need for food security will likely result in increased agricultural production along with changing farming practices which may adversely impact on ecological habitats, networks and species, as well as landscape character. Environmental Stewardship options provide opportunities to work with land managers to incorporate farmland habitats; developing networks of linked habitats, reusing redundant farm buildings and enhancing the rural character of the landscape.

- Increased agricultural production, especially on the plateau, will adversely affect the quality of the mineral soils and will need careful management, in particular, the incorporation of organic matter into cultivated soils.

- Pressures from the expansion of sand and gravel extraction and housing development, together with issues of over-abstraction of water, present threats to heathland areas. Recreational pressure on areas of heathland is also likely to continue, posing potential problems of bio-security, erosion and increased risk of fire during dry periods.

- The number of visitors to the World Heritage Site is likely to increase and presents opportunities for environmental education and understanding of local heritage; this is also a pressure on the resource. The development of the Severn Valley Country Park and the Mercian Way, long-distance cycle route, provide alternative visitor locations.

- Development pressures on the urban fringe and commuter villages in the core of the NCA are likely to continue. Through the National Planning Policy Framework, (NPPF) opportunities exist to ensure that new developments contribute to a high quality built and natural environment, contributing to green infrastructure.

- Large, landscape partnership projects, such as exists in Birmingham and the Black Country, can effect a step change in the conservation of semi-natural habitats within the urban areas. By improving the quality, connectivity and diversity of core sites, for example SSSI, Local Sites and Local Nature Reserves, and increasing the wildlife value of buildings, gardens, local authority-owned open spaces, canals, railway lines, road verges and blocks of woodland through management, connectivity can be achieved, both through and between the urban and rural areas.

- The drive towards achieving the target set for generating renewable energy presents opportunities in the NCA to increase the production of biomass, on a scale and in appropriate areas, which will not be detrimental to the landscape character. For example, planting short rotation coppice and miscanthus could diversify a largely arable landscape, as exists on the plateau. The widespread management of woodland, both in the rural and urban areas, could support the renewable wood fuel market, as demonstrated in the Wyre Forest, and support the timber product market, as demonstrated at Dudmaston and Weston Park both of which have sawmills.

- Supporting the work of the Local Councils, the many non-Government organisations, landscape partnerships and voluntary organisations, will present opportunities to improve the quality of the natural environment and the ecosystem services it support across the NCA.

# Supporting document 3: Analysis supporting Statements of Environmental Opportunity

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

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

**The cooling towers of the power station in the Severn Valley are a distinctive landmark.**

| Statement of Environmental Opportunity | Ecosystem Service | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Food provision | Timber provision | Water availability | Genetic diversity | Biomass provision | Climate regulation | Regulating water quality | Regulating water flow | Regulating soil quality | Regulating soil erosion | Pollination | Pest regulation | Regulating coastal erosion | Sense of place / Inspiration | Sense of history | Tranquillity | Recreation | Biodiversity | Geodiversity |
| **SEO 1:** Protect, expand and appropriately manage the characteristic habitats of the NCA, specifically lowland heathland, acid grasslands and woodland including orchards and hedgerows, thus reinforcing the sense of history and reducing habitat fragmentation for the benefits that this will bring to resource protection, biodiversity, climate regulation and the recreational and experiential qualities of the NCA. | ↘ *** | ↑ ** | ↗ ** | ↔ *** | ↔ *** | ↑ *** | ↗ *** | ↗ *** | ↗ *** | ↑ *** | ↗ ** | ↗ * | N/A | ↑ *** | ↑ *** | ↑ ** | ↑ *** | ↑ *** | ↔ *** |
| **SEO 2:** Protect and manage the rivers and streams of the NCA to mitigate the extremes of drought and flood events, and protect the water quality of the River Severn and safeguard aquifer recharge areas by managing discharges to watercourses and protecting and increasing areas of semi-natural riparian habitats along river valleys, streams, canals and urban watercourses. | ↗ * | ↔ *** | ↑ *** | ↔ *** | ↔ *** | ↗ ** | ↑ *** | ↑ *** | ↗ ** | ↑ *** | ↗ * | ↗ * | N/A | ↗ * | ↗ ** | ↔ *** | ↗ ** | ↑ *** | ↔ *** |
| **SEO 3:** Protect from inappropriate development and manage a stock of post-industrial and extractive sites around Telford and the Black Country which exemplify the strong influence that geodiversity has on the landscape, through industrial development and settlement patterns and for their often unique value to biodiversity. Protect and maintain the natural geomorphological features and exposures in the river valleys that can be used for research and education to study past environmental change as well as for recreation. | ↔ *** | ↔ *** | ↔ *** | ↔ *** | ↔ *** | ↗ ** | ↗ * | ↗ * | ↗ * | ↗ * | ↗ * | ↗ * | N/A | ↑ *** | ↑ *** | ↔ *** | ↗ *** | ↑ *** | ↑ *** |
| **SEO 4:** Work in collaboration with the World Heritage Site, English Heritage and the local authorities to implement sustainable solutions to protect and manage the landscape and heritage attributes of the Ironbridge Gorge World Heritage Site and the wider historic landscape, including the canals, historic ports and bridging towns, finding sustainable solutions to manage visitor pressure, while maintaining high levels of public access for the benefits to the visitor economy and employment. | ↔ *** | ↔ *** | ↗ ** | ↔ *** | ↔ *** | ↔ *** | ↗ * | ↗ * | ↔ *** | ↗ ** | ↔ *** | ↔ *** | 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.

National Importance; Regional Importance; Local Importance

## Landscape attributes

| Landscape attribute | Justification for selection |
|---|---|
| **Exploitation of the mineral wealth of the NCA has left a legacy of post-industrial sites, for example, former coal mines, opencast sites, spoil heaps and tips, especially in the areas around the Severn Valley, Wyre Forest and Telford.** | ■ Manufacturing activities and extractive operations since the 18th and 19th centuries have left topographic and soil conditions favourable to natural colonisation by valuable communities of flora and fauna. For example, Muxton Marsh Site of Special Scientific Interest (SSSI), an old coal mine has the best example of unimproved grassland, fen and carr in Shropshire.<br>■ The convergence of minerals has influenced the settlement pattern and has left a coalfield remnant landscape along the Severn Valley.<br>■ Abandoned quarries provide valuable opportunities for geodiversity. |
| **The industrial heritage is legible in the landscape, in the buildings in and around Ironbridge and along the Severn Valley, particularly in the mining areas.** | ■ A coalfield remnant landscape exists along the Severn Valley, with clusters of cottages around the area of Wyre Forest.<br>■ A power station is located 1 km from the World Heritage Site and set deep in the Severn Gorge. The cooling towers of the power station contrast sharply with the well-wooded aspect of the valley.<br>■ The old inland ports with warehouses and cottages and terraces of the mining areas.<br>■ The historic bridges of the river towns of Bridgnorth, Bewdley and Stourport-on-Severn.<br>■ Disused mineral railway lines; one has become the Severn Valley Railway, (a heritage railway line) a popular tourist destination. |
| **The plateau in the central and east of the NCA is characterised by a rolling landform punctuated by areas of heathland and tree-lined ridges.** | ■ Permian and Triassic sandstones and conglomerate underlie the plateau, with topographic relief provided by the harder and softer beds within the sequence.<br>■ The sandstones are part of the Sherwood Sandstone aquifer, an important source of water supply to the region.<br>■ The sandstones erode to form free-draining, slightly acid mineral soils that once supported extensive areas of heathland, woodland and acid grasslands.<br>■ The soil on the plateau is classified as good to moderate quality that support extensive areas of arable crops, with a weak field pattern and hedgerow structure. |
| **In the deeply incised Severn Valley the topography is more irregular and well wooded with small fields with a strong hedgerow pattern.** | ■ Mudstone, shale and limestone from the Silurian Period and Carboniferous Coal Measures underlie the western parts of the NCA, the harder limestones providing a more irregular topography.<br>■ The underlying rocks erode to form deep, fertile, loamy soils classified as very good agricultural land supporting mixed arable and pasture agriculture.<br>■ Fields and pastures are small and irregularly shaped, bounded by a strong hedgerow pattern with frequent hedgerow oaks.<br>■ The well-wooded, deeply incised, Severn Valley runs north–south through the NCA adjacent to the western boundary, culminating in the spectacular gorge at Ironbridge within the World Heritage Site.<br>■ The NCA has been substantially modified by ice-age deposits and processes, for example, the Ironbridge Gorge was cut by glacial outwash. |

| Landscape attribute | Justification for selection |
|---|---|
| **Extensive interlocking blocks of mixed woodland with orchards around Wyre Forest and wooded dingles throughout the NCA. Parklands and estate woodland with blocks of conifer plantations bounded by sandstone walls punctuate the landscape of the arable plateau.** | ■ Wyre Forest National Nature Reserve (NNR) and SSSI is part of one of the largest ancient oak woods in England. The forest has the characteristics of both lowland and upland woodland, forming an assemblage with the Severn Valley woodlands running into the Ironbridge Gorge.<br>■ Wyre Forest has nationally important metapopulations of many wildlife species including bats and the pearl-bordered fritillary butterfly.<br>■ Many of the woodlands on the plateau are conifer plantations which combine with parklands to give an estate character in many places.<br>■ There are many steep-sided, wooded dingles throughout the NCA, providing diverse, tall herb communities on their banks, with fen, marsh, and wet woodland on the flood plains.<br>■ Within the urban areas isolated blocks of woodland and scrub are important features, providing important havens for wildlife and recreation.<br>■ Landscape partnerships are making significant improvements to woodland by reinstating management of the woodlands and orchards. |
| **The rivers Severn, Stour, Worfe, their tributaries and the reservoirs at Chelmarsh and Trimpley.** | ■ Dynamic river systems of the rivers Stour and Worfe drain the plateau and have incised sediments creating geomorphological features and exposing geological sections.<br>■ The river valleys and dingles provide freshwater habitats and wetland habitats, for example, valley mire, flush, wet meadows and marshy grassland.<br>■ Threats from flooding along the Severn Valley, particularly at Bewdley and the confluences of the River Worfe with the River Severn north of Bridgnorth, and the River Stour with the River Severn at Stourport-on-Severn, have prompted hard engineering solutions, for example, flood barriers.<br>■ Both reservoirs are important for public water supply and sustaining the ecosystems of the River Severn and also contribute to the tranquillity and experiential qualities of the NCA.<br>■ Both reservoirs support recreational activities for example, sailing and angling. Chelmarsh is located within the Severn Valley Country Park and provides a habitat for waterfowl including water rail and reed warblers and in winter hosts in excess of 10,000 birds. The reservoir also provides habitat for dragonflies including the club-tailed and hairy hawker and important flora including wild parsnip, greater spearwort and bee orchid. |
| **Historic inland river ports, bridging towns and canals.** | ■ Towns located on the rivers Severn and Stour, for example Bridgnorth, Bewdley and Stourport-on-Severn, were once important as inland ports and, until the construction of the railways, the towns prospered.<br>■ Stourport-on-Severn has a canal basin on the Staffordshire and Worcestershire Canal that links the River Severn with the Trent and Mersey Canal. This was once an important trade route, but now serves tourists and provides recreational activities.<br>■ Many of the bridging towns, for example Kidderminster and Stourbridge have now expanded to become substantial settlements and have a rich industrial heritage. Kidderminster is known for its carpet looms and Stourbridge, with its distinctive bottle-kilns, for its glass industry. |

| Landscape attribute | Justification for selection |
|---|---|
| **Rural and urban mix of varied settlement patterns and local vernacular architecture and building materials.** | ■ The largest population centres are in the east, with the city of Wolverhampton, and towns of Stourbridge and areas of Dudley that lie within the Birmingham and Black Country landscape partnership area.<br>■ Away from the main urban areas, the larger towns and villages are in the Severn and Stour valleys, for example Bridgnorth and Bewdley which, are attractive market towns with historic cores.<br>■ There is a dispersed settlement pattern along the Severn Valley, particularly around former mining settlements, for example, Highley and the edge of Wyre Forest.<br>■ The landscape away from the river valleys is a rural one with small hamlets and isolated farms and parklands that contain fine country houses, for example, Dudmaston Hall.<br>■ The predominant building material of the older vernacular buildings is brick, with a range of colours from mellow red-brown brick, for example, at Bewdley, to a mixture of colours from the Victorian period, as found in Kidderminster.<br>■ Local sandstone from the Kidderminster and Bromsgrove Sandstone Formations, have also been used extensively as a building stone, their characteristic red colouration providing local distinctiveness to many towns and villages and estate boundary walls.<br>■ There are fine individual examples of timber framed buildings in Kinver, Bewdley and Bridgnorth. |
| **A wealth of recreational resources, including a network of public rights of ways and linear trails, a network of canals and two reservoirs enabling access to and enjoyment of the many natural and historical features in the NCA.** | ■ Route 45 of the National Cycle Network, the Mercian Way, passes through the NCA on a 320-kilometre long heritage trail from Salisbury to Chester. The route broadly follows the Severn Valley in places, using disused mineral railway lines.<br>■ The Monarch's Way, long-distance footpath, describes a sinuous path through the NCA. The Monarch's Way is thought to follow the escape route taken by King Charles II in 1651 after being defeated at the Battle of Worcester.<br>■ The Silkin Way and North Worcestershire long-distance paths pass through the NCA.<br>■ The extensive canal network, that includes the Staffordshire and Worcestershire Canal and the Stourbridge and Dudley canals were once major trade routes but are now popular with narrowboaters visiting the area and the towpaths offer pleasant walks, providing insights into the industrial heritage of the area. |

## Landscape opportunities

- In partnership with local authorities and other partners, identify and conserve a stock of post-industrial, old mine and quarry sites to ensure a balance in the numbers of these sites, prior to development, to protect the often irreplaceable habitats and sense of history they provide.
- Improve the interpretation of post-industrial sites to raise awareness of the importance of these sites.
- Protect from further loss and degradation all semi-natural habitats, particularly the most important characteristic types, for example heathland, hedgerows and hedgerow trees, woodland, neutral and acid grassland by working in collaboration with farmers, planners and developers.
- Encourage landscape partnerships that can affect a step-change in nature conservation by improving the connectivity, quality and quantity of core sites, for example, SSSI, NNRs, Local Nature Reserves (LNRs) and Local Sites.
- Seek opportunities to expand and buffer existing areas of semi-natural habitats and link them together to create a coherent habitat network.
- Encourage the uptake of Countryside Stewardship options to help maintain and restore the pattern of small pastures and hedgerows with hedgerow oaks in the area around the Severn Valley.
- Preserve and enhance the historic landscape character.
- Maintain and buffer the areas of ancient woodlands, estate mixed woodland and parklands with veteran trees throughout the NCA. Encourage successional planting of native mixed species to maintain the structural diversity and landscape character. Restore traditional orchards in Wyre Forest by effective management.
- Conserve and restore estate sandstone walls.
- Protect the NCA's important river valley landscapes by maintaining the locally distinctive mosaic of riparian pasture and woodlands.
- Work in collaboration with farmers and riparian landowners to reduce incidences of diffuse pollution from entering the groundwater and watercourses, especially within aquifer recharge areas thus protecting the quality of the regionally important water resource.
- Manage sensitively, public access throughout the river valleys to maintain the current levels of tranquillity. Protect the remaining areas of tranquillity around the reservoirs at Chelmarsh and Trimpley and Wyre Forest by promoting appropriate, sustainable management of adjoining land.
- Restore traditional buildings in the World Heritage Site and the historic settlements.
- Conserve the canal network that provides valuable wildlife corridors that link urban with rural areas and provide recreational opportunities.

- Ensure that new developments and the maintenance of old buildings maintain the vernacular; manage small-scale extraction of local building stone for this purpose.

- Protect and enhance the many Local Geological Sites in the NCA by promoting sustainable management of sites that provide opportunities for volunteering, education and community involvement.

- Create new or extend public rights of way and permissive access to improve the connectivity of core sites, for example, SSSI, NNRs, LNRs and Local Sites.

- Create new or extend public rights of way and permissive access to improve the connectivity of tourist attractions to encourage integrated sustainable transport solutions between popular visitor attractions and the rural and urban areas. Take advantage of opportunities to create new circular routes and identify opportunities to improve access by ensuring that paths are well maintained and signposted and that some surfaced paths are provided to ensure easy access walks.

- Enhance the interpretation of the canal routes and old mineral lines explaining their historical significance and place in the landscape.


**A way marker on the Mercian Way long distance footpath.**

## 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** | Arable and mixed livestock systems and to a lesser degree dairy farming<br><br>Predominantly well drained, light, sandy soils in the central and eastern NCA<br><br>Heavier, more fertile soils in the valleys, the western edge and northern areas of the NCA support a mix of arable and pasture<br><br>Water availability | The NCA supports food provisioning on a commercial scale. The agricultural census for 2010[11] indicates that 70 per cent of farms are greater than 100 ha and are evenly distributed between livestock (sheep and cattle) and arable farms.<br><br>Soils are mostly classified as Grade 3, although significant areas of Grade 2 exist in the fertile valleys.<br><br>In the central and eastern areas, arable farming predominates with combinable crops of oats, wheat, barley and oilseed with some potatoes.<br><br>Pasture and dairy farming is restricted to the north of the NCA and these supply the dairies at Crudgington and Market Drayton in neighbouring NCAs.<br><br>From October to February, some dairy and arable farms receive off-farm wintering sheep from upland farms in neighbouring NCAs and Wales. This is locally known as having sheep 'on tack'.<br><br>Some farms have diversified, by opening farm shops and attractions, augmenting farm income. | Regional | The lighter, free-draining soils on the plateau support arable farm systems. The deeper, loamy soils of the Severn Valley support pasture with a few dairy farms.<br><br>Where large-scale arable farming systems predominate, there is a weak field pattern and hedgerows are closely trimmed. Environmental Stewardship options have begun to address these issues benefiting, landscape and biodiversity and reducing soil erosion.<br><br>During periods of drought crops grown on the free-draining soils require irrigation that exacerbates the 'over abstraction' status of the rivers and tributaries. Periods of drought also increase the concentration of pollutants in watercourses.<br><br>Farm economics and the demand for land for development, recreational and equestrian use on the urban fringe have led to a decline in the number of farms. | Work in collaboration with farmers to safeguard food provision and promote land management interventions that will help safeguard future yields and protect the water and soils of the area. | **Food provision**<br><br>**Regulating soil quality**<br><br>**Regulating soil erosion**<br><br>**Regulating water quality**<br><br>**Regulating water flow**<br><br>**Biodiversity**<br><br>**Sense of place / inspiration**<br><br>**Sense of history** |

[11] www.defra.gov.uk/statistics/foodfarm/landuselivestock/junesurvey/junesurveyresults/

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
|---|---|---|---|---|---|---|
| **Timber provision** | Plantation woodland<br><br>Estate parkland<br><br>Wyre Forest<br><br>Wooded river valleys and the many woodland dingles | There are a number of commercial plantations, specifically managed for timber.<br><br>Estate parklands often contain native and introduced species that are managed for timber products and form an important component of the estates. | Local | Commercial plantations of woodland are owned and managed by the Forestry Commission. The majority comprise Sitka spruce for the production of wood pulp.<br><br>A number of estate parklands actively manage their woodlands for the provision of timber products; for example, at the National Trust estate at Dudmaston, timber is harvested to fuel a wood chip boiler. While there are sawmills at Weston Park and Dudmaston that sell forestry products.<br><br>Wyre Forest NNR and SSSI Landscape Partnership Scheme,[12] led by the Forestry Commission, is restoring the unique landscape of Wyre Forest by sustainable management. This includes installing wood-burning boilers in local schools and community buildings to create a market for wood fuel that sustains the management of the woodland.<br><br>Some oak woodland surrounding the Wyre Forest is grown solely for commercial sales. | Opportunities exist to replace mature, commercial plantations on ancient woodland sites with native species.<br><br>There are opportunities to consider planting energy crops on the fringes of commercial plantations.<br><br>Opportunities exist to stimulate the wood fuel market in order to sustain the management of woodlands, as demonstrated at Wyre Forest.<br><br>Opportunities exist through landscape partnerships to increase the provision of timber and timber products through management of neglected woodland in parklands and throughout the urban areas. | **Timber provision**<br><br>**Biodiversity**<br><br>**Regulating water flow**<br><br>**Climate regulation**<br><br>**Sense of place / inspiration**<br><br>**Sense of history**<br><br>**Recreation** |

[12] www.growwithwyre.org.uk/

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
|---|---|---|---|---|---|---|
| **Water availability** | River Severn<br><br>Sherwood Sandstone Aquifer<br><br>Chelmarsh and Trimpley reservoirs | The River Severn is a major source of water for agriculture, industry and public supply to the city of Wolverhampton and cities outside the NCA including Birmingham, Shrewsbury and Gloucester.<br><br>The underlying Permian and Triassic sandstone of the plateau, forms part of the Sherwood Sandstone aquifer and provides large underground water storage capacity, which no surface reservoir can match in terms of quantity and quality.<br><br>There are two surface storage reservoirs in the NCA at Chelmarsh and Trimpley.<br><br>There are a number of boreholes, some are in private ownership. | Regional | During the summer months the volume of water in the River Severn is insufficient to meet abstraction demands and to protect the river's ecosystems. Therefore additional water is supplied from reservoirs located at the headwaters of the Severn, outside the NCA.<br><br>During periods of drought the surface water resource is augmented by water pumped from deep boreholes in the Sherwood Sandstone aquifer, managed in accordance with 'The Shropshire Groundwater Scheme.'[13]<br><br>There is no natural water supply to the two reservoirs in the NCA. Both store water that has been pumped from the River Severn when water is plentiful. Trimpley Reservoir supplements the supply of drinking water to Birmingham from the Elan Valley in Wales.<br><br>Water abstracted from the River Severn contains high levels of nitrates from pesticides and herbicides and the water has to be treated prior to distribution. | Although the River Severn is not a priority catchment area for the Catchment Sensitive Farming initiative, opportunities exist to work in collaboration with farmers and riparian landowners to seek ways of using water supplies more sustainably. For example, the construction of winter water storage reservoirs would alleviate over abstraction during peak demand.<br><br>The creation of in-field ponds, scrapes and planting of cross-field hedgerows and semi-natural grassland on steeper slopes would increase water infiltration rates.<br><br>Work in collaboration with farmers and landowners located within Surface Water Drinking Water Protection Areas,[14] to reduce fertiliser inputs; reduce the use of herbicides and pesticides to prevent nitrate and diffuse pollution entering the groundwater aquifer and watercourses by buffering watercourses. | **Water availability**<br><br>**Regulating water quality**<br><br>**Biodiversity**<br><br>**Food provision**<br><br>**Sense of place / inspiration**<br><br>**Regulating soil erosion** |

[13] www.environment-agency.gov.uk/homeandleisure/drought/38847.aspx

[14] http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&lang=_e&textonly=off&topic=drinkingwater#x=377166&y=276022&lg=1,&scale=6

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
|---|---|---|---|---|---|---|
| **Genetic diversity** | Domestic orchard varieties | In Wyre Forest and the surrounding area, orchards were an important industry and many remnants of orchards exist in gardens and fields around the forest. | Local | Orchards are a characteristic, but declining, feature of the countryside where 70 per cent of orchards have been lost since 1950 due to neglect or changes in land use.<br><br>Orchards provide a range of ecosystem services, adding to the evidence supporting the need to manage existing orchards and restore remnant ones that provided Britain with its rich orchard heritage.<br><br>Results from a recent study[15] show that; low-intensity management of orchards produces wildlife hotspots, providing unique and valuable habitats for pollinators and soil high in organic matter. Managed orchards are fast growing and are good for accumulating and storing carbon thus reducing the atmospheric concentration of harmful greenhouse gases.<br><br>All the orchards benefitted the local economy. | Work in collaboration with the landscape partnership in Wyre Forest to establish new orchards and restore remnant ones that will preserve the genetic resource and characteristics of local varieties of apples and pears. Local varieties of apples include Worcester Pearmain and Hawthornden and pears include Black Worcester and Seckle. | **Genetic diversity**<br><br>**Sense of history**<br><br>**Sense of place / inspiration**<br><br>**Food provision**<br><br>**Biodiversity** |

[15] www.naturalengland.org.uk/about_us/news/2012/040512.aspx

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
|---|---|---|---|---|---|---|
| **Biomass energy** | Existing short rotation coppice<br><br>Soils<br><br>Established miscanthus production<br><br>Coppice woodland | The majority of the NCA has a medium yield potential for the provision of biomass energy. However, the central and western areas have a high yield potential for both short rotation coppice (SRC) and miscanthus.<br><br>Soil pH and texture are just two of the variables that influence potential yields.<br><br>A small number of holdings located in the centre of the NCA and outside, on the northern boundary of the NCA, have established miscanthus crops through the Energy Crops Scheme. [16]<br><br>Some estate woodland, for example, at the National Trust estate at Dudmaston, timber is harvested from the estate woodland to fuel a wood chip boiler.<br><br>The NCA has significant blocks of woodland that would benefit from coppice management; for example along the Severn Valley. | Local | An increase in the provision of SRC for fuel has the potential to influence climate regulation, but could decrease the provision of food if placed on farmed land. A major expansion could also affect the sense of place if the SRC becomes a major component of the landscape.<br><br>Suitability is also determined by the amount of annual rain fall, seasonal rain fall (March – October), the number of frost days, soil pH and soil texture, in particular sand, clay or loam.<br><br>There may be opportunities to plant SRC alongside or on the fringes of commercial woodland. | There is an opportunity to plant energy crops, on a small-scale, in sheltered valleys and alongside plantation woodland; where appropriate to the landscape character.<br><br>During planting and harvesting there are opportunities for good soil management to improve the condition of the soil.<br><br>Planting short rotation coppice (SRC) and miscanthus could diversify a largely arable landscape, as exists on the plateau, thus providing shelter belts, where appropriate to the landscape character.<br><br>By working in collaboration, there are opportunities to replicate biomass schemes such as those that exist at Dudmaston and Wyre Forest. | **Biomass energy**<br><br>**Climate regulation**<br><br>**Regulating soil quality** |

[16] Natural England Energy Crops Scheme

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
|---|---|---|---|---|---|---|
| **Climate regulation** | Soils<br><br>Woodland and orchards<br><br>Heathland<br><br>Flood plain pasture | The majority of the NCA has free-draining sandy soils with a low carbon content of between zero and five per cent reflecting the dominance of mineral soil. Deeper, more organic-rich soils are evident in the river valleys and wetland areas.<br><br>Fourteen per cent of the NCA is covered by woodland. Significant areas include Wyre Forest and along the Severn Valley. Woodland is likely to be the most significant contributor to carbon storage and sequestration in this NCA.<br><br>Remnant orchards occur in Wyre Forest.<br><br>Significant tracts of heathland exist in the NCA. | Regional | The continuous cultivation of mineral soils depletes the carbon content of the soil. Carbon sequestration and storage can be increased through the addition of organic matter to cultivated soils which will also benefit crop yields.<br><br>Good management of existing woodland can ensure their role in sequestering and storing carbon is optimised. Blocks of trees planted in urban areas, provide multiple benefits. The Birmingham and Black Country urban areas form a heat island up to a maximum of 7 degrees Celsius higher than the surrounding land.[17] Blocks of trees planted in urban areas provide shade, mitigating the effect of the urban heat island. Trees also increase water infiltration rates and purify the air.<br><br>Managed orchards are fast growing and are good for accumulating and storing carbon[18] thus reducing the atmospheric concentration of harmful greenhouse gases.<br><br>Heathlands are characterised by a cover of 25 per cent dwarf shrubs of the botanical family Ericaceae. Woody shrub species play an important role in carbon sequestration in grassland ecosystems. | Work in collaboration with farmers to ensure appropriate management techniques are employed in arable systems to increase organic inputs and reduce fertiliser inputs.<br><br>Investigate ways of reducing emissions from farms by using the online calculator; Carbon Accounting for Land Managers – Environmental Stewardship. (CALM-ES) [19]<br><br>The expansion of woodland on suitable sites would increase carbon sequestration and storage.<br><br>Work with the Wyre Forest landscape partnership to restore remnant orchards and plant new orchards, increasing the benefits to a number of services.<br><br>Maintain and enhance the existing areas of lowland heath, arresting further losses or degradation and through the creation of secondary heathland on post-industrial sites. | **Climate regulation**<br><br>**Regulating soil quality**<br><br>**Regulating water quality**<br><br>**Biodiversity**<br><br>**Sense of place / inspiration**<br><br>**Sense of history**<br><br>**Regulating soil erosion**<br><br>**Regulating soil quality** |

17 West Midlands Climate Change Adaptation Partnership
18 www.naturalengland.org.uk/about_us/news/2012/040512.aspx
19 www.calm.cla.org.uk/

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
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| **Regulating water quality** | Rivers and valleys<br><br>Reservoirs<br><br>Aquifer<br><br>Agricultural land<br><br>Soils<br><br>Woodland | The River Severn is considered a 'highly modified' waterbody and has a 'moderate' ecological potential. The ecological status of its tributaries varies from 'good' to 'bad' and the chemical status of the aquifer is 'poor'.<br><br>The NCA is not located within a priority catchment for the Catchment Sensitive Farming initiative[20] (CSF).<br><br>The Environment Agency has identified an area extending along the Severn Valley from Stourport-on-Severn in the south, to Bridgnorth in the north, as a Drinking Water Protection Area[21] (Dr WPA) and as being 'At Risk '.<br><br>In the central and eastern areas arable farming predominates on the sandy, free-draining soils which can lead to erosion.<br><br>Interlocking blocks of woodland particularly along river valleys and along streams and dingles. | Regional | Waterbodies that have 'moderate' and 'poor' ecological status are failing the targets of the Water Framework Directive. Diffuse pollution and nitrate levels in groundwater and watercourses result in expensive filtration of raw water.<br><br>Over-abstraction of water poses a significant threat to the habitats and ecosystem services they provide in the Severn Valley. Falling water level through over-abstraction of water has a detrimental effect on water quality affecting biological oxygen demand (BOD), reducing flow rates and stressing the ecology, resulting in a greater concentration of pollutants and negative effects.<br><br>The Catchment Sensitive Farming initiative delivers practical solutions and targeted support to enable farmers and land managers to take voluntary action to reduce diffuse water pollution from agriculture to protect waterbodies and the environment.<br><br>For 'at risk' DrWPAs the Environment Agency may establish Safeguard Zones. These non-statutory Safeguard Zones are areas where action to address pollution is targeted, so that extra treatment of raw water can be avoided. Safeguard Zones are a joint initiative between the Environment Agency and water companies. Safeguard Zones are one of the main tools for delivering the Drinking Water Protected Area objectives of the Water Framework Directive.<br><br>Sandy soils tend to have a weaker structure and are prone to erosion, especially where they are cultivated, leading to increased sediment loading in watercourses and can reduce the storage capacity of reservoirs through siltation.<br><br>Woodland along river valleys and streams reduce diffuse pollution. | Work in partnership with land owners and managers to adopt CSF management techniques to protect waterbodies. This would also contribute to the outputs of the Environment Agency's DrWPA.<br><br>Work in partnership with land owners and managers to establish permanent ground cover to control soil erosion that can have a detrimental effect on water quality, through sediment loading, siltation of water courses and preventing soil particles that carry pesticides and phosphates from entering watercourses. For example, by buffering watercourses with hedgerows and grassland buffer strips.<br><br>Work in collaboration with landowners to manage and where appropriate expand woodland along river valleys and dingles. | **Regulating water quality**<br><br>**Regulating soil quality**<br><br>**Regulating water flow**<br><br>**Biodiversity**<br><br>**Sense of place / inspiration** |

[20] Catchment Sensitive Farming (formerly known as 'The England Catchment Sensitive Farming Delivery Initiative') is a joint venture between the Environment Agency and Natural England, funded by Defra and the Rural Development Programme for England, working in priority catchments within England. It delivers practical solutions and targeted support to enable farmers and land managers to take action to protect waterbodies and the wider environment.

[21] http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&lang=_e&textonly=off&topic=drinkingwater#x=373459&y=294280&lg=1,&scale=6

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
|---|---|---|---|---|---|---|
| **Regulating water flow** | Areas of semi-natural grassland along river valleys<br><br>Soils<br><br>Flood plains<br><br>Wetland habitat<br><br>Sustainable drainage schemes | There is a relatively high risk of fluvial flooding in this NCA, particularly at the confluences of the Severn with the rivers Worfe and Stour, and along the River Severn corridor.<br><br>Soils on sloping river valleys and dingles are prone to water erosion.<br><br>There is significant flood risk at the bridging towns of Bridgnorth, Stourport, Kidderminster and Bewdley, with the potential for flooding in the lower reaches of the Severn in the Severn and Avon Vales NCA.<br><br>Interlocking blocks of woodland, particularly along river valleys and along streams and dingles help to regulate water flow. | Regional | Trends in land management and land use have increased flood risk over time. The risk of flooding along the River Severn is expected to rise significantly in the long term due to the increased frequency of intense and prolonged precipitation.[22]<br><br>Soils can enter watercourses through water erosion increasing the concentration of sediment. Better management of soils can help to reduce flood risk.<br><br>The Environment Agency classifies the River Severn as being significantly modified. Stretches of the Severn have been re-naturalised and re-profiled in neighbouring NCAs.<br><br>Hard engineering solutions, for example, raised flood defences, have been constructed at the bridging towns of Kidderminster and Bewdley by the Environment Agency. However, a more sustainable solution exists in Telford where there is a Sustainable Drainage Scheme (SuDS).<br><br>Areas of semi-natural habitats and woodland increase rates of infiltration by slowing the rate of run-off and can help to reduce flooding. | For the effective regulation of water flow through the NCA it is desirable to adopt similar measures to those that have been implemented in the upper and lower reaches of the River Severn in neighbouring NCAs. For example re-naturalisation and re-profiling stretches of the Severn and its tributaries.<br><br>Where appropriate, encourage the planting of woodland and other semi-natural habitats to help stabilise soils on slopes and river valleys and dingles.<br><br>Undertake planning exercises which incorporate flood mitigation measures in the design of new settlements.<br><br>Identify natural areas for floodwater storage to reduce the reliance upon hard engineering solutions.<br><br>Ensure that flood plains are not inappropriately developed and where feasible, reinstate flood meadows throughout the riparian environs in the NCA.<br><br>In collaboration with landowners, increase the areas of semi-natural habitats and, where appropriate woodland, to increase infiltration rates by slowing run-off.<br><br>Increase the length of open water corridors and increase areas of connected green space through the urban areas by de-culverting rivers and streams where appropriate and create riparian habitats, for example, reedbeds that can reduce the rate of run-off and can filter water.<br><br>Incorporate green space in new developments and ensure the dual use of riparian open spaces in urban areas, for example, flood compatible playing fields and parks as part of sustainable urban drainage schemes. | **Regulating water flow**<br><br>**Regulating soil erosion**<br><br>**Biodiversity**<br><br>**Recreation**<br><br>**Sense of place / inspiration**<br><br>**Sense of history**<br><br>**Geodiversity** |

[22] www.sstaffs.gov.uk/pdf/Severn%20Catchment%20Flood%20Management%20Plan.pdf

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
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| **Regulating soil quality** | Soils<br><br>Unimproved pastures and areas of semi-natural grassland<br><br>Porous urban areas | Soils are a multi-functional resource that provides a range of ecosystem goods and services.<br><br>Areas of semi-natural grassland were once widespread across the NCA, but now only appear in discrete areas associated with heathland. Some semi-natural estate meadows and pastures exist.<br><br>The freely draining lightly acid sandy soils of the NCA are permeable and valuable for aquifer recharge where they overlie the Triassic Sandstone aquifer.<br><br>The slightly acid loamy and clayey soils with impeded drainage are easily poached by livestock and compacted by machinery when the soil is wet.<br><br>Porous surfaces in urban areas allow infiltration of rainfall. | Regional | Continuous cultivation of arable crops and conversion of grassland to arable production can reduce soil organic matter, reduce crop yields and release $CO_2$ into the atmosphere.<br><br>Some semi-natural estate meadows and pastures exist where traditional management techniques have survived.<br><br>In urban areas, intense or prolonged rainfall can overwhelm drainage systems. Open areas with unsealed soil can reduce the magnitude of flood events by allowing rainfall and run-off to infiltrate. | Work in partnership with landowners and farm managers to protect areas of unimproved pasture and semi-natural grassland. Buffer watercourses and take appropriate action to prevent herbicides and pesticides from entering watercourses, particularly within the Drinking Water Protection Areas.<br><br>Well-managed livestock systems, appropriate stocking levels and preventing stock from entering watercourses and wetland areas can reduce the risk of poaching and compaction of the loamy and clayey soils.<br><br>In arable areas ensure that organic matter is incorporated into cultivated soils to increase soil organic matter and use minimum tillage on areas where loamy soil occurs.<br><br>Work with estate owners, including the National Trust, to reinstate meadows on estate lands.<br><br>In urban areas, protect porous surfaces from development and capping and ensure that new developments incorporate green space.<br><br>Restoration of former mineral extraction sites offer opportunities for soil restoration to deliver ecosystem services. | **Regulating soil quality**<br><br>**Regulating soil erosion**<br><br>**Climate regulation**<br><br>**Regulating water quality**<br><br>**Regulating water flow**<br><br>**Sense of place / inspiration** |

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| **Regulating soil erosion** | Soils<br><br>Permanent grassland<br><br>Hedgerows<br><br>Sustainable systems of arable cultivation<br><br>Short rotation coppice and miscanthus | Free-draining sandy soils and freely draining loamy soils cover the majority of this NCA (52 per cent). These soils have an enhanced risk of wind erosion, where they occur on moderately or steeply sloping land, or where large, open arable systems are cultivated and bare soil is exposed.<br><br>The loamy, clayey soils of the NCA (24 per cent) are prone to compaction and capping. | Regional | Soils in the open arable fields are more prone to wind erosion, while those on the steeper slopes of the valleys and dingles are more prone to water erosion.<br><br>Soil erosion from areas of bare soil has a detrimental effect on water quality by increasing sediment loading and from pesticides and phosphates that attach to soil particles and are transported into watercourses.<br><br>By comparison, the loamy, clayey soils are prone to compaction and capping, increasing the risk of soil erosion by surface water run-off.<br><br>Extreme weather events may result in an increased risk of erosion associated with flash floods, drier summers and wetter winters.<br><br>Physical barriers in open, arable fields can reduce wind erosion of soil, for example, hedgerows, tree shelter belts and areas of short rotation coppice and miscanthus. | Work in partnership with farmers and landowners to adopt Countryside Stewardship options to reinstate hedgerows on large, open arable fields and to maintain sandstone walls on estates, and to create areas of semi-natural habitats and permanent ground cover to stabilise areas on valley slopes.<br><br>Adopting sustainable systems of arable cultivation to minimise the exposure of the light, free-draining sandy soils to wind and maintain appropriate stocking levels to prevent cattle poaching the loamy, clayey soils. | **Regulating soil erosion**<br><br>**Regulation soil quality**<br><br>**Biodiversity**<br><br>**Regulating water quality**<br><br>**Regulating water flow**<br><br>**Sense of place / inspiration**<br><br>**Sense of history** |

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| **Pollination** | Species-rich grassland (lowland heath and meadow)<br><br>Gardens, parks and allotments of the urban areas<br><br>Flower-rich roadside verges<br><br>Well-dispersed networks of orchards and hedgerows | The NCA contains over 500 ha of lowland heath, meadow and grassland.<br><br>In the urban areas allotments and gardens are important sources of nectar. Flower-rich roadside verges also support this service.<br><br>Pollination services are particularly important to Wyre Forest and surrounding area in respect of fruit orchards. | Local | Areas of lowland heath, meadow and grassland habitats exist in discrete areas and provide sources of nectar for pollinating insects. Late-flowering nectar sources, such as heather, are important in providing a supply of nectar over an extended period of time.<br><br>An increase in the populations of pollinators may bring about an increase in the types of crops that could be grown in the future. Increasing the areas that support sources of nectar would also result in a significant increase in biodiversity.<br><br>Regeneration of heathland, a characteristic of this NCA, will also benefit this service, biodiversity and the sense of place.<br><br>Private gardens and allotment sites provide important sources of nectar in the urban areas and often have more diverse sources of nectar than occurs in agricultural monocultures. | The continued management of existing areas and creation of new areas of heathland is particularly important to this service. Options available through Countryside Stewardship schemes can increase the area and connectivity of flower-rich lowland meadow and encourage the use of nectar and forage mixes in arable systems. This will increase the availability of nectar sources for pollinators in close proximity to crops requiring pollination.<br><br>An increase to this service may enable a more diverse range of crops to be grown in the future, expanding the range of food provision therefore increasing the resilience of the area to the effects of climate change.<br><br>Raise awareness to the importance of gardens and allotments to pollination and biodiversity in urban areas. | **Pollination**<br><br>**Food provision**<br><br>**Biodiversity**<br><br>**Sense of place / inspiration**<br><br>**Sense of history** |
| **Pest regulation** | Areas of semi-natural habitat<br><br>Hedgerows<br><br>Field margins | Areas of semi-natural grassland and hedgerows are sparse in areas of arable production. Field patterns are also weak on the plateau. | Local | Semi-natural habitats and hedgerows proximal to areas of commercial agriculture may support species of predators, which can regulate populations of pests that adversely affect crop yields and food provision | Opportunities exist through Countryside Stewardship schemes to enhance semi-natural habitats, for example, beetle banks and headlands in arable systems and the reinstatement of hedgerows. This would provide a mosaic of habitats in areas of monoculture, thus providing a more robust ecosystem. | **Pest regulation**<br><br>**Biodiversity**<br><br>**Food provision**<br><br>**Sense of place / inspiration** |

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| **Sense of place / inspiration** | Sandstone plateau,<br><br>wooded gorges and dingles<br><br>Rivers Coalbrookdale, the Iron bridge and Ironbridge Gorge World Heritage Site<br><br>Many ancient and plantation estate woodlands and extensive interlocking blocks of woodland in Wyre Forest<br><br>Historic bridging towns<br><br>Canals<br><br>Severn Valley heritage railway line | The sense of place is provided by the rolling sandstone plateau; the wooded gorges of the River Severn and the smaller, steep wooded dingles as other rivers flow through the landscape, combined with the distinctive natural and man-made features of the Severn gorge, providing the NCA with a nationally recognisable sense place.<br><br>Ironbridge has a strong, international sense of place as the birthplace of the Industrial Revolution. This draws in large numbers of visitors that place pressure on the infrastructure of the World Heritage Site and the other historic bridging towns of the Severn Valley, with their narrow streets. Many of the industrial buildings have been converted to residential use, increasing the population of the towns.<br><br>There is an extensive canal network that links the urban centres via rural landscapes, which are popular with narrowboaters and tourists.<br><br>The Severn Valley heritage railway runs from Bridgnorth to Kidderminster along a disused line and is a popular tourist attraction. | International | Coalbrookdale has inspired artists since the 18th century. They were drawn by the contrasts between the natural landscape of the gorge and the flames and smoke of the thriving industries. For artists and visitors, the iron bridge remains a focal point, epitomizing the birthplace of industry.<br><br>In 1956 the artists Edward Bawden and John Nash painted landscapes featuring the iron bridge.<br><br>The NCA offers a contrast between a range of rural landscapes and densely urban areas, with many historical, industrial and retail centres. The legacy of industry remains a very significant feature bringing large numbers of visitors to the area. Managing visitor pressure on the infrastructure and maintaining the historic features, while ensuring they remain available for access and education will be a key challenge.<br><br>Ancient woodland, wooded tree-lined ridges and the many plantation woodlands on the plateau combine with parklands to give an estate character in many places.<br><br>The inland ports and historic bridging towns of the Severn inspired the 19th-century novelist, poet and playwright Francis Brett Young to write what became known as the Mercian Novels.<br><br>There is a canal network that links with the river network and these networks were once important for the transport of commodities to nearby inland ports from settlements across the region.<br><br>The Severn Valley railway has featured in a number of period films and television programmes and has inspired many period re-enactments. | Work with the World Heritage Site and local authorities to increase interpretation and understanding of the geology and landscape and how it is has inspired both engineers and artists.<br><br>Ensure that new developments and infrastructure projects to alleviate visitor pressure respect local settlement patterns and use local building materials that will maintain the sense of place.<br><br>Sustainably manage the woodland along the Seven Valley where historically trees were managed as a source of charcoal for fuel.<br><br>Restoring lost vistas along the valley which were once a source of inspiration.<br><br>Restored canals and disused railway lines can offer recreational opportunities and increase access to the industrial heritage of the NCA, inspire volunteer activities, arts events, education trails and skills development events. | **Sense of place / inspiration**<br><br>**Recreation**<br><br>**Sense of history**<br><br>**Biodiversity** |

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| **Sense of history** | World Heritage Site<br>Registered Parks and Gardens<br>Scheduled Monuments and Listed Buildings<br>Large farming estate landscape<br>Wooded landscapes in the Severn Gorge and Wyre Forest<br>Post-industrial landscapes of the coalfields<br>Historic inland ports and bridging towns and the rivers and canals that link them | Coalbrookdale and Ironbridge are known throughout the world as the birthplace of the Industrial Revolution and the ten museums of the site attract large numbers of visitors that place significant pressure on the infrastructure.<br>The area includes a number of Registered Parks and Gardens. A number are owned by the National Trust and are tourist attractions. A number are in private ownership.<br>Large farming estates occur throughout the NCA, often bounded by distinctive sandstone walls.<br>The NCA is characterised by interlocking blocks of woodland that were once extensive. The often dense woodland of the Severn Gorge was once coppiced to produce charcoal for the iron works. The demise of industry also led to the abandonment of large areas of coppice. In Wyre Forest the decline in demand for oak bark for tanning and oak casks also saw large areas of coppice abandoned.<br>Traditional orchards were once prevalent around Wyre Forest.<br>The exploitation of mineral wealth has left a legacy of old quarries in the landscape particularly around Telford, Wyre and the Severn Valley, leaving a mosaic of derelict land, post-industrial and coalfield sites.<br>Historic inland ports and bridging towns contain fine buildings and often retain a historic centre, for example, Bridgnorth with its medieval street plan. There are fine individual examples of timber framed buildings in the towns of Kinver, Bewdley and Bridgnorth. | National | The World Heritage Site is an important asset to the region; as an economic asset and for the employment it creates. The increasing number of visitors to the site causes congestion on the narrow roads and places pressure on the environment and service industries.<br>Within the rural landscape parklands contain fine country houses, for example, the 17th-century Dudmaston Hall and Davenport House. There are a number of Registered Parks and Gardens for example those surrounding, Patshull Hall, Dudmaston Hall, Himley Hall and Wightwick Manor, reflecting the historical wealth generated during the Industrial Revolution.<br>Large farming estates occur throughout the NCA, for example, Apley, Willey, Enville and Weston Park. The latter, now known more widely for hosting the popular V-Festival. Some estates contain areas of species-rich permanent grassland and meadows, where traditional management techniques have survived.<br>Wyre Forest is part of one of the largest ancient lowland oak woods in England and was managed for centuries before a decline in the early 20th century. A landscape partnership scheme is beginning to reinstate traditional management of the woodland and is replanting traditional orchards. Both woodlands are within easy reach of the large urban areas in the east of the NCA.<br>During the 18th and 19th centuries, the area around the Severn Valley was recognised as being rich in raw materials; coal; iron ore; limestone to flux the slag in the blast furnaces; sand for moulding cast iron; clay to make tiles bricks and refractory linings; and the finest clay being used for the manufacture of porcelain at Coalport. This has left a legacy of derelict land, post-industrial and coalfield sites some of which are designated SSSI and Local Sites for both geodiversity and wildlife.<br>The industrial heritage is tangible in the landscape; in the buildings in and around Ironbridge, Stourbridge and the inland ports of Bridgnorth, Bewdley and Stourport-on-Severn; the warehouses, bridges of the river towns and cottages; and terraced housing of the mining areas.<br>The archaeological and historical assets in the NCA are a prime driver for tourism, recreation and sense of place and are therefore valued not only for their intrinsic value but also for their societal value. | Work with the World Heritage Site, local authorities, public transport providers and landowners to manage the increasing numbers of visitors to the World Heritage Site and historic ports; for example, by providing sustainable transport solutions to alleviate traffic congestion in the World Heritage Site and in the narrow streets of the old ports and bridging towns.<br>Encouraging the development of an integrated transport network between visitor attractions that link with public rights of way and cycle routes.<br>Encouraging more people to visit the open countryside for quiet enjoyment to meet the needs of diverse audiences, improve health and wellbeing while reducing the number of visitors to traffic-congested sites.<br>Seeking ways to manage sustainably, the demand for water and energy resources and providing recycling facilities at tourist destinations to minimise the impact on the environment and to raise awareness.<br>Work with the National Trust to identify opportunities to reinstate the management of meadows and semi-natural habitats in estate grounds; retain veteran trees.<br>Work with owners of large estates to manage and expand areas of semi-natural habitats and encourage the uptake of Countryside Stewardship options that maintains the distinctive sandstone estate walls.<br>Support landscape partnerships to manage woodland and replant traditional orchards.<br>Improve access and manage visitor numbers.<br>The mosaic of derelict land, post-industrial and coalfield sites afford opportunities for interpretation and education, for example, Severn Valley Country Park.<br>Work with partners to alleviate the pressure of visitor numbers, while retaining access to the canals and historic centres of the NCA.<br>Work with English Heritage to signpost and interpret alternative visitor destinations. | **Sense of history**<br>**Sense of place / inspiration**<br>**Recreation** |

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| **Tranquillity** | Wyre Forest<br><br>Severn Valley and gorge<br><br>Reservoirs | The 'Intrusion Map 2007' provided by the Campaign for the Protection of Rural England (CPRE), shows that currently 53 per cent of the NCA is classified as 'disturbed' compared to 37 per cent in the 1960s. Areas classed as 'Urban' have increased by 4 per cent over the same period of time.<br><br>The waters in the Severn Valley afford places of fast-flowing rapids while the reservoirs provide areas of still water.<br><br>The reservoirs of Trimpley and Chelmarsh offer places for quiet contemplation. | Local | Data collated by CPRE, shows that the total area of undisturbed territory is declining.<br><br>Major disturbance occurs around the population centres of Wolverhampton, Stourbridge, Kidderminster, Bridgnorth and Telford and along the network of roads that link these centres.<br><br>Undisturbed areas tend to be isolated, towards the west of the NCA, for example, at Wyre Forest and isolated areas along the Severn and Stour valleys.<br><br>Fast-flowing water and the rapids in the Severn Gorge provide areas of excitement. In contrast, the reservoirs in the Severn Valley provide areas of still water for quiet contemplation and recreation. | Expanding areas of woodland would have a beneficial effect on tranquillity, biodiversity and climate regulation.<br><br>There exists an opportunity to protect and buffer the areas of the NCA where intrusion is low by resisting inappropriate development.<br><br>Sensitively plan any expansion to urban areas and roads by planting woodland shelter belts reducing visual impact, noise and light pollution.<br><br>Maintain the balance between undisturbed territory and public access by providing recreational facilities in appropriate areas. | **Tranquillity**<br><br>**Sense of place / inspiration**<br><br>**Biodiversity**<br><br>**Recreation**<br><br>**Sense of history** |

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| **Recreation** | Ironbridge Gorge World Heritage Site<br><br>Wyre Forest National Nature Reserve and the number of heathland commons<br><br>Severn Valley, reservoirs, heritage railway and West Midlands Safari Park<br><br>Public rights of way, long-distance cycle routes and footpath and canal towpath<br><br>Canals<br><br>Parks and gardens including estates | The World Heritage Site offers a host of recreational activities.<br><br>Wyre Forest and the heathland sites of Kinver, Hartlebury and Highgate commons are easily reached by visitors from the urban areas in the east of the NCA.<br><br>The Severn Valley has a number of recreational sites important to the region; two reservoirs; a heritage railway; and a safari park.<br><br>Five per cent of the NCA is classified as publically accessible. There are 1,521 km of public rights of way that link settlements with the rural areas. There are a number of long-distance cycle routes and footpaths and there is an extensive network of canals that provide access for narrowboaters and walkers. | National | The ten museums that comprise the World Heritage Site receive over 545,000 visitors per annum with around 70,000 of these being visits from schools[23].<br><br>Wyre Forest and the heathland commons are popular sites being within easy reach of the 2.1 million people who live in the urban areas of Birmingham and the Black Country, posing challenges to the management of the sensitive habitats.<br><br>The heritage railway attracts 240,000 passengers with a gross value to the regional economy exceeding £4.5 million.[24] West Midland Safari Park receives 750,000 visitors annually. Estimated revenue in 2009 was £12.6 million.[25] These sites are important to the economy of the region and for employment but present challenges if visitor numbers continue to rise.<br><br>The Severn Valley has a long-distance cycle path Route 45, (The Mercian Way) passing through it and the Monarch's Way, North Worcestershire long-distance path and Silkin Way long-distance footpath.<br><br>The Mercian Way takes in the reservoirs at Chelmarsh and Trimpley and the Severn Valley Country Park, before passing through Wyre Forest NNR.<br><br>The extensive canal network, which includes the Staffordshire and Worcestershire Canal and the Stourbridge and Dudley canals, is popular with narrowboaters visiting the area and the towpaths offer pleasant walks along the canals, providing insights into the industrial heritage of the area.<br><br>There are a number of estates throughout the NCA. Some, for example, Davenport House are privately owned. Dudmaston Hall is owned by the National Trust and offers visitors' tours of the hall and gardens. Others, for example, Patshull and Weston Park are Crown Estates. The latter hosts a programme of events throughout the year, but most popular, is the V-music festival. | Visitor numbers to the main tourist sites in the Severn Valley continue to grow, placing increased pressure on transport infrastructure. There may be opportunities to introduce park-and-ride schemes and to improve public transport links between these sites and integrate with public rights of way.<br><br>Opportunities exist to encourage the use of public rights of way for the benefits to health and wellbeing through physical activity.<br><br>Take advantage of opportunities to create new circular routes and identify opportunities to improve access by ensuring that paths are well-maintained and signposted and that some surfaced paths are provided to ensure easy-access walks.<br><br>Opportunities exist to improve access to alternative Local Sites from long-distance paths and canals to alleviate the numbers of visitors and the erosion they cause to sensitive and characteristic habitats.<br><br>Support the work of landscape partnerships that are increasing the biodiversity of canal banks and towpaths by using soft engineering techniques, for example coir mats. | **Recreation**<br><br>**Sense of history**<br><br>**Sense of place / inspiration**<br><br>**Tranquillity**<br><br>**Biodiversity** |

[23] www.ironbridge.org.uk/about-us/ironbridge-gorge-museum-trust/facts-and-figures/
[24] The Severn Valley Railway Strategy Plan 2009–2020, Severn Valley Railway (2010; URL: www.svr.co.uk/pdf/9071X7_StratPlan_2F.pdf)
[25] West Midland Safari Park: Economic Impact Study, ReWyre Initiative (February 2011)

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| **Biodiversity** | Designated sites<br>Wyre Forest<br>Orchards<br>Heathland<br>Post-industrial sites<br>Estate parkland, trees and grassland<br>Gardens and allotments | The NCA has a total of 24 biological SSSI and 213 Local Sites of interest; 708 ha (28 per cent) of SSSI are in favourable condition with a further 1,476ha (70 per cent) in unfavourable recovering condition.<br>Wyre Forest NNR and SSSI is located in the south of the NCA and is part of one of the largest ancient lowland oak woods in England. It is jointly managed by Natural England and the Forestry Commission.<br>A characteristic feature of the NCA is the patchy heathland, notably at Kinver and Hartlebury.<br>Industry has had a profound effect on the landscape of the NCA. Post-industrial sites occur throughout, but particularly on the urban fringes and in the Severn Valley. The topography and soil conditions that remain following mining or excavations have been important in creating conditions favourable to natural colonisation by valuable communities of flora and fauna. For example, the secondary heathland on pit mounds at Telford illustrates the resilience of heathland flora.<br>Estate parkland, for example at Dudmaston, Patshull and Weston Park, are typified by their species-rich permanent grassland and often contain native and introduced specimen trees. | Regional | Wyre Forest NNR and SSSI have a mosaic of habitats including forest, open grassland, remnant orchards and steep-sided valleys. The landscape partnership is reinstating the coppice system in the woodland and restoring the remnant orchards. Wyre Forest is now considered to be one of the most important sites in England for certain species of invertebrates; 33 species of butterfly, including the UK's fastest declining butterfly, the pearl-bordered fritillary. In excess of 1,150 types of moth have been recorded. Plant species include wood cranesbill, lily of the valley, marsh fragrant orchid and green-winged orchid. Both the woodland and grassland are rich in fungi; over 1,400 species have been listed. Wyre Forest also supports important and diverse populations of birds, mammals and reptiles.<br>Heathland once dominated the sandstone plateau; however, 90 per cent of the heathland has been lost over the last 200 years and only survives in disparate patches. Heather, bilberry, cowberry and common gorse, along with wavy hair-grass and purple moor grass characterise the heaths. Environmental Stewardship schemes are resulting in scrub control and heathland restoration.<br>The sites of former manufacturing activities and coal mines, for example, Muxton Marshes SSSI, support regionally rare communities of plants of acid conditions and calcium-loving plants. Former sand and gravel workings also provide wetlands that provide habitats for a range of plant, birds and mammals.<br>The oldest reclaimed sites are becoming increasingly important habitats for a variety of species for example, crucifers, hypericums, mugwort and yellow rattle. Secondary heathland on pit mounds at Telford indicates substrates suitable for habitat creation.<br>In estate parkland where unenclosed, permanent grassland and meadow occurs, traditional grazing or hay-cropping have often sustained herb-rich habitats. Veteran trees provide habitat niches for hole-nesting birds and invertebrates. Dead wood is also a valuable habitat.<br>Areas of semi-natural habitat are at risk from invasive non-native species and the continued expansion of commercial agriculture. This places a greater emphasis on the positive outcomes that Environment Stewardship schemes can provide, informed by a local biodiversity action plan.<br>On the plateau, where large, open, modern arable systems predominate it is unfortunate that many once-common species of birds are now only significant where they occur, for example, the skylark, corn bunting and both partridges. It is also the case with arable weeds, for example, the field pansy, corn buttercup, corn marigold, and corn cockle. However, initiatives through Environmental Stewardship is delivering sympathetic farm management for a suite of range-restricted and declining birds and flora associated with arable and mixed farmland. | Restorative management of SSSI and Local Sites offers opportunities for partnership working, volunteering and community engagement.<br>Landscape partnerships offer opportunities for habitat creation and restoration.<br>Opportunities exist to secure the future of local varieties of apple, for example, Worcester Pearmain and Hawthornden and local varieties of pears, Black Worcester and Seckle through a landscape partnership scheme in Wyre Forest.<br>Restoration of former mineral extraction sites offer opportunities for biodiversity and to strengthen landscape character, for example, new areas of heathland. This would reduce the effects of fragmentation, creating a more coherent ecosystem and restoring a characteristic habitat of the NCA.<br>Augmenting ancient and veteran trees with similar species, thus maintaining structural diversity and sustaining their value as both a biodiversity and cultural resource.<br>Protect the early industrial sites, which are irreplaceable due to modern restoration demands and techniques.<br>In urban areas, raise the awareness of local communities to the importance of gardens and allotments for biodiversity. | **Biodiversity**<br>**Sense of history**<br>**Sense of place / inspiration**<br>**Recreation** |

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| **Geodiversity** | Minerals<br><br>Soils<br><br>Designated sites<br><br>Disused quarries<br><br>Topography<br><br>Canals and road cuttings<br><br>Building stone<br><br>Geomorphological features | Exploitation of the wealth of minerals has left a legacy of assets; industrial complexes, that are now largely tourist attractions and disused mines and quarries that have become naturalised in the landscape.<br><br>Permian and Triassic sandstones underlie the central and eastern NCA. Silurian limestones and Carboniferous Coal Measures underlie the west of the NCA, around the Severn Valley and Wyre Forest.<br><br>Some of the sandstones have been used as building material and the clays to make bricks.<br><br>Dynamic river systems have produced deeply incised valleys, and landslides are becoming more frequent in the Severn Valley due to peak flows. | Regional | The range of industrial activities and the numerous extraction sites have provided geologists with the opportunity to study Silurian and Carboniferous stratigraphy.<br><br>The Permian and Triassic sandstones form a rolling undulating landscape that erodes to form light, freely draining soils. The Silurian limestones and the Carboniferous Coal Measures create an irregular topography and erode to form heavier, loamy, more fertile soils.<br><br>Canal and road cuttings, for example, Claverley Road Cutting SSSI, provide important sites for the study of Triassic environments.<br><br>Sandstones of the Kidderminster and Bromsgrove Formations have been used extensively as a building stone. Their characteristic red colouration provides local distinctiveness to many towns and villages and estate boundary walls.<br><br>Dynamic river systems have produced geomorphological features of interest to researchers, for example, the River Stour Floodplain SSSI is important to the study of the development of river systems during the last ice age.<br><br>Increased precipitation and infiltration has led to an increasing frequency of land slips, particularly in the Severn Valley, where the geological structure exacerbates the situation. | Raise the profile of geodiversity through increased education and interpretation to show how geology influences settlement patterns, human activity and innovation, from source rock to product and relate this to the landscape.<br><br>Enhance the condition of designated sites and manage former extraction sites and natural exposures, for their range of mutually beneficial interests including geodiversity, biodiversity, industrial heritage and educational purposes.<br><br>Appropriate, small-scale extraction from quarries could provide building stone to repair historic buildings, thus maintaining the local vernacular.<br><br>Work in partnership to further the objectives and aspirations of the Local Geodiversity Action Plan and to develop restorative management of Local Geological Sites offering opportunities for volunteering and community engagement.<br><br>Work with highway and local authorities to maintain the integrity of road cuttings while not obscuring geological exposures with hard engineering solutions; of particular relevance in the Severn Valley, where landslips are occurring more frequently. | **Geodiversity**<br><br>**Recreation**<br><br>**Sense of history**<br><br>**Sense of place / inspiration** |

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