National Character Area profile:

103. Malvern Hills

Supporting documents

NATURAL ENGLAND

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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.

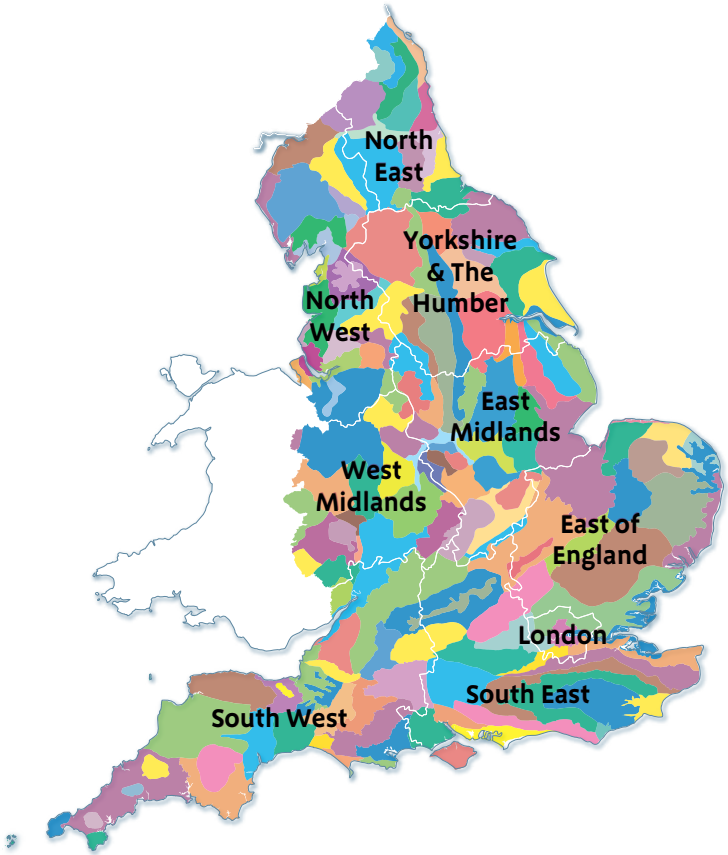
NCA profiles are guidance documents which can help communities to inform their decision-making about the places that they live in and care for. The information they contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and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

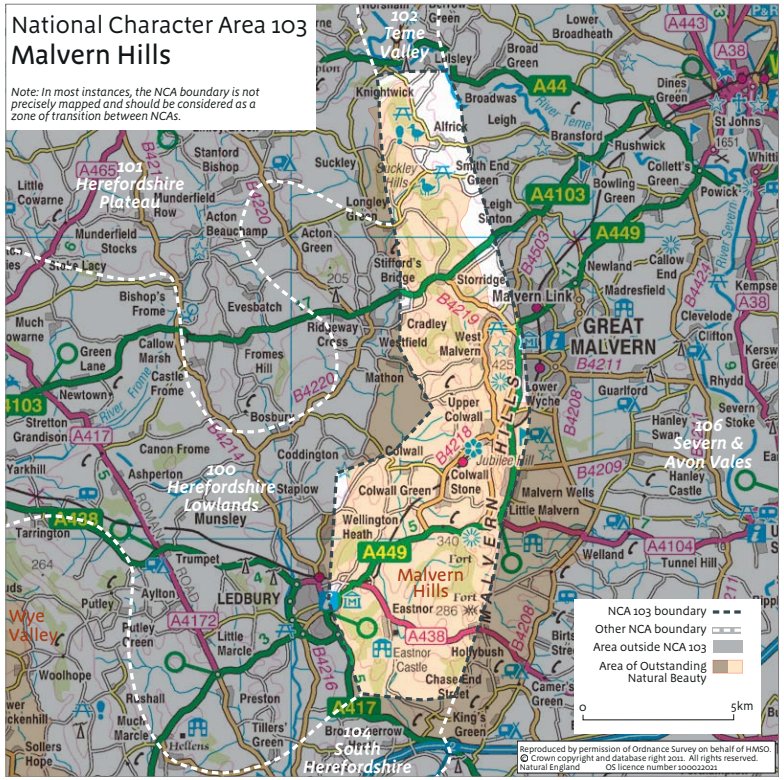
[2] Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services, Defra (2011; URL: www.defra.gov.uk/publications/files/pb13583-biodiversity-strategy-2020-111111.pdf)

[3] European Landscape Convention, Council of Europe (2000; URL: http://conventions.coe.int/Treaty/en/Treaties/Html/176.htm)

Summary

Malvern Hills National Character Area (NCA) comprises a narrow ridge of rounded hills, with hill forts rising above the Severn and Avon Vales to the east. To the west these subside to the Herefordshire Lowlands, and to the north-west they subside to the Herefordshire Plateau. The area is one of great contrasts. These range from the majestic height of the hills themselves to the undulating swells and low wooded escarpments of Eastnor and the Suckley Hills, and to the jumble of rolling hills and woodlands marching away to the west. Most of the area lies within the Malvern Hills Area of Outstanding Natural Beauty (AONB).

From the early 1800s the Malvern Ridge was very popular for its pure spring waters. This led to an influx of holidaymakers and visitors, who had a great influence on settlements such as the spa town of Great Malvern where a Victorian and Edwardian character dominates. The smaller settlements of Colwall Stone and Colwall Green sit on the western side of the hills, with more modern dwellings spread between older cottages and terraced housing. The area has inspired many poets, artists and authors such as Elizabeth Barrett Browning, W H Auden and John Masefield. The hills have been the subject of the work of many painters – not least Benjamin Leader and Paul Nash – and one of the best known associations of the area is with the music of Edward Elgar. The geology of the area includes some of the oldest rocks in England, and as such the area is associated with some of the very earliest work on geology. Other key ecosystem services in this area include food and drink production (orchards), pollination, the archaeological landscape, sense of place and sense of history. Future challenges and opportunities include pressure from development, managing visitors, the expansion of woodlands where appropriate and the effects of climate change.



Click map to enlarge; click again to reduce

Statements of Environmental Opportunity:

- **SEO 1**: Conserve and appropriately manage the highly distinctive range of the Malvern Hills, and the areas of semi-natural habitat in the wider character area such as woodland and traditional orchard, providing economic opportunities, fostering community participation.

- **SEO 2**: Manage and improve access to the landscape, as well as the cultural and geological features of the Malvern Hills National Character Area and promote enhanced understanding and enjoyment to reinforce a strong sense of place.

- **SEO 3**: Protect and appropriately manage the historic environment and its setting, ensuring that historic features and landscapes are recognisable and valued.

- **SEO 4**: Plan for an expansion of semi-natural habitat where appropriate, so that a significant ecological network is created and interconnected to adjoining areas. This will increase biodiversity, pollination, food and drink production, as well as regulate soil erosion, water and soil quality, reinforcing a strong sense of place.

Designed parkland at Eastnor Park with many veteran trees.

Description

Physical and functional links to other National Character Areas

The Malvern Hills National Character Area (NCA) forms a dramatic narrow ridge rising abruptly to a point of 425 m above the Severn vales – a highly recognisable landform from surrounding areas. Popular viewpoints are the Worcestershire Beacon, the highest point in the NCA, and the strikingly located iron-age hill fort at British Camp. The great popularity of the Malvern Hills can be attributed in part to the spectacular views which they afford towards Bredon Hill and the Cotswolds to the east and south, and to the more undulating and hilly landscapes of Herefordshire and Wales visible to the west. Some 86 per cent of the NCA is designated as part of the Malvern Hills Area of Outstanding Natural Beauty (AONB) – the remaining parts of the AONB fall within the Severn and Avon Vales and Herefordshire Lowlands NCAs. The significant area of ancient woodland, on hillsides to the west and north of the Malvern Hills ridge, extends into the Teme Valley NCA, forming an important biodiversity resource and ecological network.

To the west of the main Malvern Hills ridge, in the Colwall area, is a significant watershed from which the stream systems drain the lower slopes: one flows north into Herefordshire Lowlands NCA, and the other south into South Herefordshire and Over Severn NCA. The ridge itself is flanked in the west by a series of well-wooded limestone ridges and pastoral vales, which extend north of the ridge as the Suckley and Abberley Hills in the Teme Valley NCA. The area's dramatic upland ridge, open space and springs have stimulated its development as a recreational landscape notably in the Victorian era.

The main Malvern ridge is common land, but the common lands running off the lower slopes of the hill ridge in the east lie mainly in the neighbouring Severn and Avon Vales NCA, for example at Castlemorton and Hollybed Commons. Functional connections to the Malvern Hills NCA are forged by the use of these commons as rough grazing land and by their very high wildlife and cultural history value.

Looking north from British Camp, the narrow ridge of the hills is a prominent feature of the area.

Key characteristics

- A prominent, narrow north–south ridge of high, unenclosed, rounded hills of igneous and metamorphic rocks, which rise abruptly from the Severn Vale along a fault plane to form a highly visible dominant landmark, visible from a long distance. The ridge is offset by several faults, which have been eroded to form prominent passes through the hills.
- A varied geology, which is reflected in the soils, which range from thin, acidic soils on the Malvern Hills, through deeper, neutral soils over the Old Red Sandstone to calcareous soils on Silurian shale and siltstone.
- Along the Malvern Hills ridge there are a number of dramatic historic sites, including the bronze-age barrows, iron-age hill forts at British Camp and Midsummer Hill, and the Shire Ditch.
- The high hills and the surrounding area are dominated by unimproved grassland, heathland and bracken, with encroaching scrub from the woodlands below.
- There is a high density of public rights of way and an extensive area of open access land.
- There are good rail and road links to urban populations.
- To the north and west of the hills there are wooded limestone ridges, separated by vales of mixed shale. The lower slopes and ridges – particularly the steeper ones – are densely wooded, with blocks of ancient woodland and occasional plantations. Many field boundaries are species-rich and also of medieval origin.
- The ridges and vales form a mixed pastoral landscape of small irregular fields, orchards, hop yards and many ancient, species-rich hedgerows and meadows. Interspersed throughout this landscape (particularly to the south, where larger farms and estates developed) are larger fields bounded by thorn hedges, resulting from 18th- and 19th-century reorganisation.

Key characteristics

- In the north of the area, the Leigh Brook flows west to east. Other small streams flow from the spring lines along the hills.
- Redundant quarries and sandpits providing relatively rare standing water habitats.
- A diversity of building materials influenced by the variations in geology, with Malvern stone houses and walls, limestone houses and walls and timber frame buildings.
- Some large estates with designed landscapes – such as Eastnor Castle – lie in the foothills. Scattered farmsteads and cottages occur on lower ground beneath the main hill ridge and lower hills. This is an area of mixed dispersed, linear and loose courtyard farmsteads and smallholdings (in areas associated with unenclosed common or historic, subsequently enclosed common), juxtaposed with larger, loose and regular courtyard farmsteads in landscapes with a longer history of settlement.
- On the steep sides of the Malvern Hills are distinctive Victorian and Edwardian buildings.

Timber framed buildings in-filled with brick are a common feature.

Malvern Hills today

At the core of the area's character, and providing a dominant and unifying feature, is the north-south ridge formed of igneous and metamorphic rocks of Precambrian and Cambrian age. Steep slopes plunge abruptly to the farmlands of the Severn Vale to the east and blend more subtly with the plateau landscape to the west. Beyond the central ridge, to the north, south-west and south, there are more varied landscapes. In the north, wooded hills rise abruptly above the Teme Valley in a steep scarp. There is a strong pattern of parallel ridges in the Suckley Hills in the north. Shallow valleys with abundant orchards, woodlands, pastures and some arable land lie between the hills. The valleys vary greatly in character: they are often strikingly deep-sided and sinuous, but becoming gentler in form in the south. To the south-west of the main ridge the landscape is varied, with gentler, broader and more sweeping slopes. There are complex minor ridges with varied alignments, although a general north-north-east trend is apparent.

In the north of the area there are many wooded hillsides.

The north–south alignment of the hills is mirrored in the Cambrian and Silurian rocks. Here Cambrian grits and Silurian shales and limestones form a series of wooded limestone ridges and pastoral vales, from Ridgeway Wood across to Coneygree and Frith Woods near Ledbury, and extending north of the main hill's mass as the Suckley Hills. Further west, the Old Red Sandstone rocks include mudstones and sandstones, which grade subtly into the more gently rounded hills, with more fertile soil conditions in the Herefordshire Lowlands. Shallow soils on the ridgetops support mosaics of open, unimproved grassland and heathland, grading into scrub and bracken on lower slopes. These areas are grazed by sheep and cattle.

In the Colwall area is a significant watershed from which the stream systems drain the lower slopes, one flowing north and the other south. In the north of the area, the Leigh Brook flows west to east, while other small streams flow from the spring lines along the hills. Malvern water emerges in the springs around the base of the main ridge.

Parts of the NCA are heavily wooded, with a high proportion of semi-natural woodland (for example Halesend and Crews Hill Woods), some of which is famed for its spectacular springtime display of bluebells. There is also a pattern of wooded ridgetops, such as that near Ledbury. In the south, clusters of conifers, limes, oaks and other parkland trees are a notable feature. They are, however, fragmentary compared with Eastnor Castle (in the upper catchment of the Glynch Brook), from which an estate character spreads to the surrounding woodlands and farmland. Around Whiteleaved Oak there is a mosaic of commons, woodland and small pasture fields. Old oak trees stand on knolls of intruded igneous rock as relics of an ancient wood/pasture landscape. Acid grassland and mire habitats can be found on Castlemorton and Hollybed Commons. Orchards producing fruit for making juices, perry and cider survive and they provide a rich habitat featuring deadwood (this NCA is considered significantly important for rare deadwood invertebrates and fungi), nest holes and semi-improved grassland. Abundant mistletoe is a strong feature of these orchards, and they support rare species such as the noble chafer (beetle) and mistletoe tortrix (moth). There are important populations of wild daffodil, green-winged orchid, adder's tongue and many other infrequent plant species in the meadows and woods to the south and west of the area.

Around the modest-sized settlements of Colwall Stone and Colwall Green, modern housing has spread between clusters of older cottages and terraced housing, all within a strong pattern of specimen conifers and woodland. Also in this area small to medium sized irregular fields bounded by hedges can be found. Victorian and Edwardian housing, constructed of Malvern stone, light-coloured stucco and red brick, dominates the town of Great Malvern sits on glacial terraces on the flanks of the hill ridge.

The Malvern Hills ridge is among the most popular of England's inland countryside visitor destinations. This is a key part of the AONB, accessed via 279 km of public rights of way, and an extensive area of open access land. The Worcestershire Way runs through the area as far as the town of Great Malvern (its southern point), and the Geopark Trail links many features of geological interest within the area.

The landscape through time

The main Malvern Hills ridge is made up of Precambrian rocks formed deep inside the earth by melting of the bedrock and intrusion of granites and other igneous rocks. A massive fault forms the steep eastern face of the hills, which are extensively faulted and fractured. Major transverse faults offset the ridgeline, creating prominent passes between the main hills. On Herefordshire Beacon and Broad Down, these faults have exposed the pillow lavas and other volcanic rocks, creating more friable, base-rich soils, which support wildlife-rich vegetation. This complex mix of metamorphic, igneous and volcanic rocks, exposed in outcrops and quarries, is of national scientific interest and is particularly important in understanding the geological history of south-west England. The fractures and faults also control water flow within the hills: the area is noted for the many springs and spouts arising on fault lines and at junctions between different rock types. These were an important influence on settlement patterns – from the establishment of iron-age hill forts to Edwardian and Victorian spa town developments. In the north and west of the area, alternating layers of Silurian limestones, shales and sandstone outcrop. In places (such as Crews Hill Wood and the Suckley Hills), highly inclined limestones form conspicuous steep, wooded hills and ridges.

Finds from the Palaeolithic, Mesolithic and Neolithic eras indicate that the Malvern Hills NCA has been a focus of human activity from the earliest times. Ritual significance is evident from the round barrows on the high ridge and from the standing stone at Colwall. There was certainly a settlement at Mathon by the middle Bronze Age. The Shire Ditch, an ancient earthwork boundary, possibly dating from the Bronze Age, runs along the spine of the Malvern Hills. It seems likely that the hills were an upland grazing area for the surrounding settlements during prehistoric times, and by the Iron Age there were major hill forts – including those at British Camp and Midsummer Hill – established at strategic locations. There was also a substantial pottery industry, which continued into the Roman period.

In the post-Roman and Anglo-Saxon periods, the Malvern Hills were probably a boundary between different small kingdoms before all were subsumed in Mercia. However, after the Normanconquest, the area was part of a royal forest, with chases to the east and west. The western chase belonged to the bishops of Hereford, and the park at Eastnor is a residue of this estate. Monastic houses at Great and Little Malvern and Colwall were conspicuous medieval features. Strip lynchets, and strips of ridge and furrow in small closes, are witness to pre-14th-century levels of arable production in areas of higher ground now more suited to grass.

From the 16th century, the eastern chase was gradually reduced as land was granted away and, finally, in 1632 the remainder was divided between the commoners and the Crown. The more acidic soils of the area are best suited to a pastoral economy, and orchards developed to an intense scale of production from the late 17th century onwards. Hops were intensively cultivated from the 18th century, particularly on the northern valley sides.

Once extensive, some orchards still survive, particularly at Leigh and Alfrick. Enclosure proceeded in a piecemeal fashion throughout the period and into the 18th century but, with the growth of settlement and the development of Malvern as a spa, the management of the commons was eventually formalised by the Malvern Hills Act 1884, which has been significant in preserving the natural beauty and areas of open land in this NCA.

The British Camp Iron Age hill fort is an outstanding feature of the hill ridge.

The spring waters have attracted visitors since medieval times, with scattered shrines linked to springs. There were monastic houses at Great and Little Malvern and Colwall. Tourism, founded on spa waters, drove the expansion of Great Malvern in the 19th century. Victorian and Edwardian villas, set among mixed ornamental woodland, are a prominent characteristic of the eastern slopes. On the western side of the hills around Colwall, some late 19th-century and mostly 20th-century houses, set within conifers and woodland, give the area a suburban character. Another sign of this development is the proportion of traditional farmsteads remaining in agricultural use: this is the lowest of any in the West Midlands (at 21 per cent), with three farmsteads out of four being converted to residential use, which is also associated with high participation in substantial business activity.

Quarrying became a significant industry, with limestone being quarried for agriculture, local buildings and flux for the iron industry. Sand was also quarried. Gullet Quarry, which finally closed in 1977, supplied road stone for the building of the M5. One of the campaigners against quarrying was George Bernard Shaw. He is just one of many writers, artists and musicians strongly associated with the Malvern Hills: others include Elizabeth Barrett Browning, W H Auden and John Masefield. The hills have been the subject of the work of many painters, not least Benjamin Leader and Paul Nash, as well as countless amateurs. But the area's best known association is perhaps with Edward Elgar's music.

Recent decades witnessed a significant reduction in sheep and cattle grazing on the high hills and the common lands. However since c.2000 there has been a re-introduction of stock in these areas, leading to the clearance of significant amounts of scrub. There is little restocking or regeneration of hedgerow trees to replace the predominantly mature trees that have been lost. Hops have also been lost, bush orchards increased, traditional orchards decreased, barns converted, and large gardens built upon and there has been significant use of local woodlands for shooting, especially those in estate ownership.

Ecosystem services

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

Provisioning services (food, fibre and water supply)

- **Food provision**: The farming industry is diverse, with many small farms and specialist growers in the area. Sheep and cattle grazing dominate, and food produced in the area includes cereals, potatoes, dairy products, vegetables, salads, pork, poultry, eggs, cheese, game birds, oils and herbs. The area is part of an important drinks-producing zone in the west of England that produces fruit juices, beer, perry and cider.

- **Timber provision**: Currently the main source of commercial timber is around 500 ha of coniferous woodland in small blocks around the NCA. Woodland covers some 21 per cent of the total area, with a high proportion of this being ancient woodland sites (either broadleaved or mixed woodland). Some 35 per cent is subject to replanting. Forestry Commission research indicates that there is scope for an additional 72 to 170 ha (average 120 ha) of woodland in the NCA.

- **Biomass energy**: The area is relatively heavily wooded. Although little woodfuel is currently produced there is scope to produce biomass from management of broadleaved woodlands.

- **Genetic diversity**: Apple, pear and cherry orchards are a significant feature of the area, with many traditional and rare varieties of fruit trees.

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

- **Regulating soil erosion**: Over a third of the NCA area is covered by seasonally wet acid loamy and clayey soils that have a low risk of erosion. However they are susceptible to poaching and compaction which can exacerbate run-off problems.

- **Regulating soil quality**: Slowly permeable and seasonally wet soils covering over 37 per cent of the area are susceptible to poaching and compaction, which can exacerbate run-off problems. Elsewhere, freely-draining, loamy soils on steep slopes can poach easily when wet.

- **Regulating water quality**: The majority of the area lies within the River Teme priority catchment, and issues of concern relate to agricultural run-off from manure stores, as well as from stock gathering, and stock feeding. In the Leigh Brook, a shallow, fast-flowing stream, water quality has also been affected by nutrient enrichment caused by sewage discharges. This has led to a reduction in invertebrate populations. The ecological status of surface water bodies in the NCA is only 'moderate' and the chemical status of groundwater is 'good'.

- **Pollination**: The extensive, semi-natural mosaic of grassland, heathland and scrub habitats, both on the hill ridge and in unimproved grasslands across the area, provides nectar sources for pollinating insects, which are particularly important for pollination of the area's traditional apple orchards, hops and other important food crops.

Cultural services (inspiration, education and wellbeing)

- **Sense of place/inspiration**: The highly distinctive ridge of the Malvern Hills is considered to be one of England's most striking landforms. The mosaic of habitats (including traditional orchards, acid and limestone grasslands, scrub, heathland, meadows, parkland and ancient woodland) that covers the varied topography of the NCA makes for a richly diverse and sometimes intimate landscapes. Traditional orchards are strongly associated with a heritage of local cider, perry and fruit juice-making. A range of building styles and materials reflects the complex underlying geology of the area. The striking topography, natural beauty and distinctive character of the Malvern Hills have been a significant source of cultural inspiration in the fields of art, poetry and music for greats including Elizabeth Barrett Browning, W H Auden, John Masefield and Evelyn Waugh. The hills have been the subject of the work of many painters, not least Benjamin Leader and Paul Nash, as well as countless amateurs. But the area's best known associations are perhaps with Edward Elgar's music and with the Malvern Drama Festival, dedicated to George Bernard Shaw and established in 1929. Morgan Cars and Land Rover are both strongly associated with the area and use the association in their marketing. The Malvern Hills attract in excess of 1million visits per year and still provide inspiration and a strong sense of place,, especially for the high proportion of visitors who come from the three counties and from nearby conurbations.

- **Sense of history**: The dramatically-sited iron-age hill forts on the hill ridge combine with large estates, designed parklands, species-rich hedgerows, traditional orchards and the Victorian/Edwardian spa towns to create a strong sense of history across the area. The Malvern Hills were an upland grazing area for the surrounding settlements from the prehistoric period and parts of the NCA have a long history as a royal hunting forest from the 11th to the 16th century, when much land was granted or leased. Final disafforestation and division in 1632 concentrated on the Crown estates to the west. Orchards developed to an intensive scale of production from the late 17th century onwards, and are now concentrated on the eastern edge of the area, as well as to the west and the north. From the 18th century, hop yards were concentrated on the valley sides in the north of the area. Large estates developed in the 18th and 19th centuries, most notably Eastnor Castle and its landscape, which was laid out in the early 19th century. Spring waters attracted visitors from at least the medieval period onwards, with scattered shrines linked to the springs. There are monastic houses at Great and Little Malvern, and at Colwall. Victorian and Edwardian villas, set among mixed ornamental woodland, are now a strong element in the character of the eastern slopes.

- **Tranquillity**: The hill ridge with its open summits, outstanding views (to the west over rolling and sparsely populated countryside) and dense ancient woodlands on lower slopes provides an important source of tranquillity. However, some of the NCA's most tranquil areas are to be found to the north and west of the hill ridge.

- **Recreation**: The hill ridge is among the most popular of England's countryside visitor destinations. Much of the area is an AONB, accessed via 279 km of public rights of way and with an extensive area of open access land. There are also good transport links (both rail and road).

- **Biodiversity**: A total of 1,843 ha (22 per cent of the NCA) is priority habitat. There are no internationally designated sites within the NCA, but it contains 16 Sites of Special Scientific Interest (SSSI), which make up 12 per cent of the total area. These include the Malvern Hills SSSI and the Eastnor Park SSSI. Traditional orchards, with their own unique biodiversity, are a particular feature of the narrow, meandering river valleys of the Malvern Hills NCA. There are important populations of scarce and rare species, such as the noble chafer (beetle) and the mistletoe tortrix (moth), associated with deadwood in parklands and traditional orchards. There is also an important adder population. The Malvern Hills area is part of a wider zone across west-central England that is considered significantly important for rare deadwood invertebrates and fungi. There are important species-rich, unimproved meadows and pastures, and populations of wild daffodil and many other infrequent plant species exist in meadows and woods to the south and west of the area.

- **Geodiversity**: There are five SSSI in the area (designated for geological and biological interest) and 48 Local Geological Sites. On Herefordshire Beacon and Broad Down, faults have exposed the pillow lavas and other volcanic rocks, creating more friable, base-rich soils. These support vegetation that is of particularly high interest in terms of biodiversity. The limestones and some of the shales and sandstones are very fossiliferous, and are an important educational resource.

Statements of Environmental Opportunity

SEO 1: Conserve and appropriately manage the highly distinctive range of the Malvern Hills and the areas of semi-natural habitat in the wider character area such as woodland and traditional orchard, providing economic opportunities, fostering community participation.

For example, by:

- Managing the mosaic of habitats and species on and close to the ridge of the Malvern Hills to achieve a mix of habitats in close proximity to each other, to encourage and support important species.
- Restoring traditional orchards and improving the species diversity of grasslands, especially species rich unimproved grassland and including lowland meadows, especially those in close proximity to existing areas to increase their important biodiversity resource.
- Protecting ancient woodlands and wood pasture, together with their impressive displays of bluebells and other woodland flora.
- Managing woodlands, especially those on inaccessible or difficult sites, to maintain their important biodiversity, their contribution to landscape character and to provide other products such as wood fuel.
- Restoring plantations on ancient woodland sites.
- Increasing the quantity and quality of sheep and cattle grazing, where appropriate, to control scrub, bracken and secondary woodland cover and increase the amount of open grassland, especially on and close to the ridge of the Malvern Hills.
- Maintaining the characteristic hedgerow boundaries (including mature and veteran trees) around small-medium sized fields.
- Restoring hedgerows to good condition (especially species rich hedgerows of ancient origin).
- Protecting the ancient rights of the commoners.
- Managing and restoring species rich meadows and daffodil meadows.
- Altering the management regimes of roadside verges to maximise their biodiversity value (within the limits of highway safety).
- Working with landowners to target the inputs into arable and intensively managed grasslands.
- Managing levels and placement of over-wintering livestock (including horses) to help reduce incidents of soil churning and compaction thereby enhancing soil and water quality and reducing soil erosion.

SEO 2: Manage and improve access to the landscape, as well as the cultural and geological features of the Malvern Hills National Character Area and promote enhanced understanding and enjoyment to reinforce a strong sense of place.

For example, by:

- Maintaining excellent access across the Malvern Hills and adjoining commons.
- Promoting simple and clear messages to recreational users about rights and responsibilities across open access land.
- Enhancing access on public rights of way away from, and connecting with, the heavily visited Malvern Hills ridge.
- Identifying, protecting, managing and interpreting the characteristic geodiversity of the NCA within and outside designated areas, including the role of geology in determining appropriate habitat restoration and the role of geological processes in planning for future climate change resilience.
- Finding new and improved ways of providing information about the natural beauty of the NCA.
- Interpreting important environmental assets while also explaining the importance of the wider landscape within which the assets sit.
- Facilitating the exploration of the NCA by sustainable means of transport, especially from nearby urban populations.
- Managing visitor access to ensure landscape attributes are maintained and supporting the management and creation of local greenspace to help reduce pressure on the most visited sites.
- Working with local groups to ensure that a new generation is inspired by the landscape, for example, by connecting with the lives and works of composers artists and authors.

SEO 3: Protect and appropriately manage the historic environment and its setting, ensuring that historic features and landscapes are recognisable and valued.

For example, by:

- Retaining locally characteristic settlement patterns, and the diverse range of vernacular buildings and locally distinctive design.
- Conserving the varied character of historic farmsteads throughout the NCA.
- Conserving historic parklands (together with their important veteran trees and deadwood fauna and flora), in particular focusing on continuity of the mature and veteran tree resources – both in the parkland and in the surrounding landscape.
- Conserving and interpreting archaeological earthworks and sub-surface archaeology, while recognising the potential for undiscovered remains.
- Conserving and appropriately managing iron-age hill forts, bronze-age barrows and the Shire Ditch along the busy Malvern Hills ridge.
- Managing and protecting historic environmental assets, including archaeological sites and remains, and historic landscapes.
- Ensuring the good management of soils across the area – this can be important for the protection of the historic environment.
- Ensuring that new development (both within and outside the NCA) does not have a detrimental impact on views (both from and towards the NCA) – particularly related to ridge of the Malvern Hills.
- Managing and protecting historic environmental assets that survive both on the boundaries of and within woodlands.

SEO 4: Plan for an expansion of semi-natural habitat where appropriate so that a significant ecological network is created and interconnected to adjoining areas. This will increase biodiversity, pollination, food and drink production, as well as regulate soil erosion, water and soil quality, reinforcing a strong sense of place.

For example, by:

- Adopting a planned and measured approach to the creation of new areas of semi-natural habitat which will support existing wildlife habitats and species of importance in the area,
- Maximising the potential of blossom and fruit crops – with due regard to landscape acceptability – to encourage the cider and perry industry as well as good pollination across the area.
- Utilising locally appropriate corridors to create physical links between semi-natural habitats, for example flower rich verges, species rich hedgerows and copses.
- Creating and designating 'refuge' sites for breeding or resting for key wildlife species which may be subject to and susceptible to disturbance.

Supporting document 1: Key facts and data

Total area: 8,324 ha

1. Landscape and nature conservation designations

7,175 hectares (86 per cent) of the NCA falls within the Malvern Hills Area of Outstanding Natural Beauty (AONB).

- Management plans for the protected landscape can be found at: www.malvernhillsaonb.org.uk/

Source: Natural England (2011)

1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

Tier	Designation	Name	Area (ha)	Percentage of NCA
International	n/a	n/a	0	0
European	Special Protection Area (SPA)	n/a	0	0
	Special Area of Conservation (SAC)	n/a	0	0
National	National Nature Reserve (NNR)	n/a	0	0
	Site of Special Scientific Interest (SSSI)	A total of 16 sites wholly or partly within the NCA	1,025	12

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 54 Local sites in the Malvern Hills NCA covering 1,607 ha which is 19 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'

1.2 Condition of designated sites

SSSI condition category	Area (ha)	Percentage of SSSI in category condition
Unfavourable declining	0	0
Favourable	425	42
Unfavourable no change	69	7
Unfavourable recovering	528	52

Source: Natural England (March 2011)

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

2. Landform, geology and soils

2.1 Elevation

Elevation ranges from 19 m above sea level to a maximum of 405 m. The average elevation of the landscape is 136 m. The highest point is the Worcestershire Beacon.

Source: Natural England 2010

2.2 Landform and process

The Malvern Hills comprise a narrow ridge of rounded hills rising majestically to 400 m or more above the Severn and Avon Vales to the east. To the west they subside to the Herefordshire Lowlands and to the Herefordshire Plateau in the north-west. They are one of England's most striking landforms, an eastern outlier landscape of the rugged hills of the Welsh Marches.

Source: Malvern Hills Countryside Character Area Description

2.3 Bedrock geology

The main ridge of the Malvern Hills is formed of ancient Precambrian rocks formed deep in the earth.

A massive fault forms the steep eastern face of the hills and the hills have been extensively faulted and fractured.

Major transverse faults offset the ridgeline and have created the prominent passes between the main hill masses.

On Herefordshire Beacon and Broad Down, faults have exposed the pillow lavas and other volcanic rocks creating more friable base rich soils, which support vegetation of particularly high biodiversity interest. This complex of metamorphic, igneous and volcanic rocks interpreted through their impact on the landforms, are of national scientific interest.Many springs and spouts arise on fault lines and at junctions between different rock types.

These springs have influenced settlement patterns from the establishment of the Iron Age hillforts; settlement of quarrying and squatter cottages around the hills, to the Edwardian and Victorian development of the main settlements.

These hard rocks have been extensively quarried to supply local building stone but latterly to supply roadstone.

In the south-west, the quarried exposures showing the contacts between the Precambrian rocks and the Cambrian and Silurian rocks are particularly important in elucidating the geological history of the Midlands.

The Malvern Hills Conservators established powers through 19th-century Acts of Parliament which prevented further damage by quarrying to the natural beauty of the hills.

Gullet Quarry, which finally closed in 1977, supplied roadstone for the building of the M5. These quarries provide fascinating exposures demonstrating the geological and industrial history of the area. In the north and west of the area, alternating layers of Silurian limestones, shales and sandstone outcrop. In places, highly inclined limestones form conspicuous steep, wooded hills and ridges such as Crews Hill and Suckley Hills.

Limestone has been quarried for agricultural use, local buildings and flux for the iron industry, so the wooded ridges include frequent small quarries and limekilns.

The limestones and some of the shales and sandstones are very fossiliferous and are an important teaching resource.Bracklesham Beds. These sands and clays were deposited on a large coastal plain.

Source: Geological Narrative West Midlands Geodiversity Partnership, Malvern Hills Countryside Character Area Description, Malvern Hills AONB Management Plan

2.4 Superficial deposits

The flanks of the Malvern shave a thin veneer of glacial, fluvial and lacustrine sediments providing evidence of early glaciations – during the Anglian 400,000 years ago – and subsequent evolution of surrounding rivers in response to climatic fluctuation. Spring waters, rising through fissures in the Malvern Complex and as consequence of faulting bring the Malvern Complex against surrounding impermeable rocks, have been bottled since the 18th century and lead to the establishment of health spas throughout the area.

Source: Geological Narrative West Midlands Geodiversity Partnership, Malvern Hills Countryside Character Area Description

2.5 Designated geological sites

Tier	Designation	Number
National	Geological Site of Special Scientific Interest (SSSI)	0
National	Mixed Interest SSSI	3
Local	Local Geological Sites	33

Source: Natural England (2011)

**Local sites are non statutory designations*

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

2.6 Soils and Agricultural Land Classification

The varied geology is reflected in the soils which range from thin acidic soils on the Malvern Hills, through deeper, neutral soils over the Old Red Sandstone to calcareous soils on Silurian shales and siltstones.

Source: Malvern Hills Countryside Character Area Description

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

Agricultural Land Classification	Area (ha)	Percentage of NCA
Grade 1	37	<1
Grade 2	726	9
Grade 3	4,983	59
Grade 4	1,588	19
Grade 5	5,561	7
Non-agricultural	0	0
Urban	427	5

Source: Natural England (2010)

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

3. Key waterbodies and catchments

3.1 Major rivers/canals

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

Name	Length in NCA (km)
River Teme	1

Source: Natural England (2010)

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

The only major river within the NCA is the River Teme, of which 1 km flows through an area to the west of Broadwas. The Leigh Brook, a tributary of the Teme, crosses west to east across the north of the area. To the south-west, the Cradley Brook and its tributaries feed in to the Leadon catchment, as does the Glynch Brook. The Leadon flows south to join the Severn.

3.2 Water quality

The total area of Nitrate Vulnerable Zone is 5,929 ha, 71 per cent of NCA .

Source: Natural England (2010)

3.3 Water Framework Directive

Maps are available from the Environment Agency showing current and projected future status of water bodies at:

http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e

4. Trees and woodlands

4.1 Total woodland cover

This NCA contains 2,218 ha of woodlands (over 2 ha) including 1,139 ha of ancient woodland.

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

4.2 Distribution and size of woodland and trees in the landscape

Woodland covers some 27 per cent of the area with a high proportion of this occurring on ancient woodland sites, either as broadleaved or mixed woodland, with some 35 per cent subject to replanting, for example at Crewshill, Ravenshill and Frith Wood. Woodlands occur mainly on hill slopes such as the Silurian Hills

and the Malvern Hills. Much of the woodland has been clear felled or coppiced in the past and consequently most woodlands contain few large veteran trees – mainly marking old boundary lines. In the south of the NCA are a number of parklands with old mature and veteran trees, particularly oak, ash and field maple. Ancient, mixed species hedges are frequent, and provide a further resource of mature trees. Localised orchards are found on lower slopes across the area.

Source: Natural England (2010), Malvern Hills Countryside Character Area Description

4.3 Woodland types

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

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

Woodland type	Area (ha)	Percentage of NCA
Broadleaved	1,853	22
Coniferous	135	2
Mixed	147	2
Other	83	1

Source: Forestry Commission (2011)

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

Woodland type	Area (ha)	Percentage of NCA
Ancient semi-natural woodland	736	9
Planted ancient woodland sites (PAWS)	404	5

Source: Forestry Commission (2011)

5. Boundary features and patterns

5.1 Boundary features

To the north, west and south-west of the main ridge ancient, mixed species hedges are typical, often with mature and veteran trees.

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

5.2 Field patterns

The main ridge of the Malvern Hills – the dominant feature of the NCA – is an unenclosed bare-topped landscape. Small pastures are typical of the lower slopes beneath hills, with larger arable fields confined to the lowest ground. There are three main patterns of field enclosure: In the east, around Colwall is an area characterised by a field enclosure that is derived from the arrangement of medieval open fields, thus supporting the statement of a long history of arable cultivation in this area. To the north there is an area characterised by a mix of enclosure from former woodland and areas derived from the medieval open field system with surviving parcels of woodland. The south of the NCA is characterised by enclosure from former wood pasture

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

6. Agriculture

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

6.1 Farm type

The landscape's predominantly pastoral character is supported by its breakdown of farm types: 41 grazing livestock holdings (39 per cent), 13 horticulture holdings (10 per cent) and 10 mixed farming holdings (9 per cent). Farms classified as 'other' (likely to be small-holdings) are numerous – accounting for 29 holdings (28 per cent). There was a 21 per cent decrease in grazing livestock holdings from 2000 to 2009, by 11 holdings. Trends also show an increase in the number of mixed farms from 6 to 10 holdings (66 per cent).

Source: Agricultural Census, Defra (2010)

6.2 Farm size

Farms between 5 and 20 hectares are the most numerous, accounting for 45 holdings (28 per cent). Farms in the largest size bracket (over 100 ha) account for 12 holdings, or 11 per cent - the third most common size in the NCA. Overall, holdings over 100 ha make up 65 per cent of the total farmed area, compared to those of 5 to 20 hectares which cover 9 per cent of the area. Confirming the trends under 'farm type', between 2000 and 2009 there was a 20 per cent increase in the number of holding of over 100 ha (from 10 to 12 holdings). Holdings between 50 and 100 ha decreased in number by 40 per cent (from 15 to 9 holdings).

Source: Agricultural Census, Defra (2010)

6.3 Farm ownership

2009: Total farm area = 5,744 ha; owned land = 3,702 ha
2000: Total farm area = 4,921ha; owned land = 3,684 ha

Source: Agricultural Census, Defra (2010)

6.4 Land use

The dominant land use is grassland and uncropped land, accounting for 3,565 (63 per cent). This is followed by cereal crops (891 hectares or 16 per cent of land). Between 2000 and 2009 there was an increase in the area of grassland and uncropped land (by 433 hectares or 14 per cent) and an increase in the area of cereal crops (by 181 hectares, or 26 per cent).

Source: Agricultural Census, Defra (2010)

6.5 Livestock numbers

Sheep are the most numerous livestock type within this landscape, a total of 18,200 animals, followed by 2,500 cattle and 400 pigs. Total sheep and cattle numbers have remained relatively static for the period 2000 to 2009. Pig numbers increased by 100 animals, or 36 per cent.

Source: Agricultural Census, Defra (2010)

6.6 Farm labour

The figures suggest that the majority of holdings are run by dedicated farmers or managers on a full or part-time basis, with fewer employed workers. Trends from 2000 to 2009 show an increase in the number of part time and casual/ gang workers. Fulltime workers have decreased slightly.

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

On the Malvern Hills ridge there are extensive areas of unimproved acid and neutral grassland which run onto adjoining commons. These grasslands form part of a mosaic of habitats that includes heathland, scrub and bracken. A key species of this mosaic is high brown fritillary. Areas of heathland on the hill ridge which in recent years have been extended through conservation grazing management.

Densely distributed blocks of ancient broadleaved woodland on the flanks of the hill ridge, on low hills to the west and north of the area, where small-leaved lime and wild service trees are a frequent component of many woods. There are also ancient woods along stream sides and in dingles around Alfrick.

Extensive areas of parkland at Eastnor, Ledbury Deer Park, Old Colwall and Bromesberrow Place. These parklands and wood pasture habitat form part of an outstanding national deadwood resource for invertebrates across this and adjoining NCAs.

Numerous traditional orchards characteristic of the sloping valleys and lower hillsides in the north and west of the area. Part of a national stronghold for noble chafer beetle.

Unimproved neutral grasslands (lowland meadows) often associated with small farms or smallholdings with orchards on the more undulating ground of the lower hill slopes or valley sides. These meadows have a rich flora, sometimes with over a hundred species present, including cowslip, adder's tongue, wild daffodils and green-winged orchid.

Source: Malvern Hills and Teme Valley 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)	864	10
Lowland heathland	38	<1
Lowland meadows	29[1]	<1
Lowland dry acid grassland	3[2]	<1
Lowland calcareous grassland	3[3]	<1
Upland calcareous grassland	0[4]	0

Source: Natural England (2011)

Footnotes: Local inventories from Herefordshire BRC indicate the following areas of priority habitat to be present: [1] Lowland Meadows 50 ha [2] Lowland dry acid grassland 56 ha [3] Lowland Calcareous grassland 5 ha [4] Upland Calcareous Grassland 4 ha. In addition local inventories indicate: 541ha Wood Pasture and Parkland (West Midlands habitat inventory); 124 ha of Traditional Orchard (PTES survey) and 1 ha of Ponds (Herefordshire BRC) to be present within Malvern NCA. National inventories of these habitats are not currently available.

- 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

The high hills and summits are open without settlement. There are isolated cottages and scattered grouping of quarry and squatter cottages on the high slopes clustered around springs and major passes over the hills. The Victorian and Edwardian town of Great Malvern borders the area. Away from the urban area, lower slopes are characterised by scattered farmsteads and cottages. In the west of the area some villages take a more nucleated or linear form.

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

8.2 Main settlements

The main towns/cities within the NCA are: Colwall, Malvern Wells, West Malvern and part of Great Malvern. The total estimated population for this NCA (derived from ONS 2001 census data) is: 12,001.

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

8.3 Local vernacular and building materials

Farmsteads and cottages on and around the main ridge are built of Malvern stone – with several distinctive mortaring styles. In the limestone areas to the west and north of the ridge there are timber frame houses with open wattle and brick noggin, and houses built of limestone often with drystone curtilage walls also built of limestone. Clay deposits in the vales were exploited for bricks framing. Stone built cottages and churches, some with massive square towers, are frequent in the smaller villages. Moated farmhouses and cowled hop kilns are a characteristic of the area.

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

9. Key historic sites and features

9.1 Origin of historic features

British Camp and Midsummer Hill iron-age hillforts on the hill ridge. The probably bronze-age Shire Ditch marks a boundary between territories; this was later modified as a Malvern Chase boundary feature. The surrounding hills were an upland grazing area in prehistory – evidenced by the early name for the area meaning 'Bare Hill' – and grazing has continued more or less unbroken to the present day. The predominant settlement pattern of high dispersal, with scattered farmsteads and cottages was established by the 11th century. Isolated 12th- and 13th-century moated sites. Large estates developed in the 18th and 19th centuries, notably Eastnor Park. Substantial quarries on the hill ridge date from the 19th- and 20th-centuries.

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

9.2 Designated historic assets

This NCA contains the following numbers of designated heritage assets:

- 2 Registered Parks and Gardens covering 1,402 ha.
- 0 Registered Battlefield/s covering 0 ha.
- 16 Scheduled Monuments.
- 372 Listed Buildings.

Source: Natural England (2010)

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

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

10. Recreation and access

10.1 Public access

- 11 per cent of the NCA 897 ha is classified as being publically accessible.
- There are 279 km of public rights of way at a density of 3 km per km2.
- There are 0 National Trails within Malvern Hills 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)	12	<1
Common Land	564	7
Country Parks	0	0
CROW Access Land (Section 4 and 16)	739	9
CROW Section 15	906	11
Village Greens	26	<1
Doorstep Greens	0	0
Forestry Commission Walkers Welcome Grants	75	1
Local Nature Reserves (LNRs)	0	0
Millennium Greens	0	0
Accessible National Nature Reserves (NNRs)	0	0
Agri-environment Scheme Access	0	0
Woods for People	139	2

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 are on the Malvern Hills ridge, within the AONB. The lowest scores for tranquillity are at the towns. The western parts of this NCA falls within areas considered to be relatively tranquil in comparison to much of England.

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

Tranquillity	Score
Highest value within NCA	32
Lowest value within NCA	-52
Mean value within NCA	1

Sources: CPRE (2006)

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

11.2 Intrusion

The 2007 Intrusion Map (CPRE) shows the extent to which rural landscapes are 'intruded on' from urban development, noise (primarily traffic noise), and other sources of visual and auditory intrusion. This shows a similar pattern to the Tranquillity Map. A breakdown of intrusion values for this NCA are detailed in the table below.development occurring throughout the NCA. A breakdown of intrusion values for this NCA are detailed in the table below.

Intrusion category	1960s (%)	1990s (%)	2007 (%)	Percentage change (1960s-2007)
Disturbed	4	34	56	53
Undisturbed	96	62	39	-58
Urban	n/a	5	5	0

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are that there has been a significant decrease of 58 per cent in the proportion of undisturbed or intruded land during the 1960s to 2007 period, matched by an increase in disturbed land.

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

12. Data sources

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

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 and trends

Trees and woodlands

- Countryside Quality Counts Data suggests that neglect and replacement of traditional orchards have affected the landscape.
- About 66 per cent of the woodland cover is on ancient woodland sites. The proportion of these sites covered by Woodland Grant Scheme, according to Countryside Quality Counts data, has changed since 1999 from 15 per cent to 47 per cent. More recent data from the State of the Malvern Hills Area of Outstanding Natural Beauty Report 2009, suggests that only 11 per cent of the woodland in the AONB was under Forestry Commission grant schemes at that time.
- Woodland clearance and the gradual loss of trees along hedgerows and stream sides have damaged visual links between areas historically cleared and those still wooded.

Boundary features

- There is a limited extent of hedgerow boundary management which suggests that given past losses, the resource remains weakened. The estimated boundary length for the NCA is about 649 km. Total length of agreements between 1999 and 2003 is equivalent to about 2 per cent of this total. The overall resource has probably been neglected.
- In some areas the strong regular enclosure pattern has deteriorated and hedgerows and hedgerow trees have been lost or replaced by fencing. There is little restocking or regeneration of hedgerow trees to replace the predominantly mature trees that have been lost.
- There has been hedgerow neglect, particularly in the wooded hills and Cradley Brook valley. Trees (especially fruit trees) in hedgerows are often lost.

Agriculture

- Previous decades have witnessed a significant reduction in sheep and cattle grazing on the high hills and the common lands. This has led to more scrub, bracken and secondary woodland cover and a reduction in the amount of open grassland. However, significant progress has been made to increase the quality and quantity of grazing activity since 2002 but more effort is required, especially on the northern and southern hills.

- The landscape's predominantly pastoral character is supported by its breakdown of farm types: 41 grazing livestock holdings (39 per cent), 13 horticulture holdings (10 per cent) and 10 mixed farming holdings (9 per cent). Farms classified as 'other' (likely to be small-holdings) are numerous – accounting for 29 holdings (28 per cent).There was a 21 per cent decrease in grazing livestock holdings from 2000 to 2009, by 11 holdings. Trends also show an increase in the number of mixed farms from 6 to 10 holdings (66 per cent).

- The dominant land use is grassland and uncropped land, accounting for 3,565 ha (63 per cent). This is followed by cereal crops (891 ha or 16 per cent of land).Between 2000 and 2009 there was an increase in the area of grassland and uncropped land (by 433 ha or 14 per cent) and an increase in the area of cereal crops (by 181 ha, or 26 per cent).

Settlement and development

- Data shows a gradual increase in the number of small farms in the AONB[4], probably as a result of the break-up of larger holdings. This break-up can result in the enlargement of extant properties and/or an increase in the demand for buildings and associated infrastructure (both residential and agricultural). It can also lead to a loss in linear habitats such as hedgerows.

- There is also potential for growth in the size of settlements around the NCA which will impact on views into and out of the area.

- The growth of farm shops and diversification of farm buildings into non-agricultural businesses has meant that many agricultural buildings have taken on new lives and their traditional settings may have changed. These issues can all impact on the landscape with increased built development in both settlements and rural areas, a loss of local vernacular design and distinctiveness and 'higher' standards of highway management and road signing that can be out of character with the area.

- Gas lamps have been restored in some areas to reflect the traditional local character.

- There has also been a loss of local shops and pubs.

[4] 'An Evidence base for the Malvern Hills AONB', Centre for Rural Research (2007)

Semi-natural habitat

- Recent years have seen an increase in areas of open grassland and heathland on the ridge of the Malvern Hills as a result of Environmental Stewardship agreements with graziers.
- Overall there has been a loss of traditional orchards and species rich grassland.
- A total of 16 SSSI sites wholly or partly within the NCA. Total area designated 1,024.5 ha. No sites are declining, 51.6 per cent of the sites are unfavourable recovering, 6.8 per cent no change and 41.6 per cent favourable.
- There are 54 Local Sites in Malvern Hills NCA, covering 1,607 ha which is 19.4 per cent of the NCA.

Historic features

- Iron-age hillforts along the ridge, notably Midsummer Hill and British Camp (Scheduled Ancient Monuments), as well as bronze-age round.
- Several large estates with designed landscapes in the foothills, such as Eastnor Castle.
- Spa towns and villas characterised by eclectic Victorian and Edwardian styles.
- Traditional gas lamps
- Spring waters attracted visitors from at least medieval period, with scattered shrines linked to springs. Monastic houses at Great and Little Malvern and Colwall.

Rivers

- The biological river water quality in 1995 was predominantly very good but it has been weakened recently. The chemical water quality in 1995 was predominantly good and this has been maintained.
- In the Colwall area is a significant watershed from which the stream systems drain the lower slopes, one flowing north, the other south. In the north of the area the Leigh Brook flows west to east, otherwise small streams flow from the spring lines along the hills. Malvern water emerges in the springs around the base of the main ridge.

The landscape near Colwall is typified by irregular pastoral fields, bounded by hedges and with a strong tree pattern.

Drivers of change

Climate change

Climate change is likely to result in:

- Periods of heavy rain that may destabilise slopes and alter streamside habitats.
- Summer droughts leading to increase in demand for surface water storage and the potential impacts this might have for the landscape.
- A longer growing season potentially leading to double cropping.
- Species migration and loss of small or isolated habitats.
- A requirement for increasing renewable energy generation could result in increased pressure for onshore windfarms, growth of biomass crops (Defra's maps show potentially high Miscanthus yields in this area).
- Farmsteads will increasingly look to becoming more self-sufficient in their energy requirements. Farms will be encouraged to fit solar PV arrays onto buildings, small scale wind turbines (distinct from larger wind farms which may also be appropriate for some areas), micro hydro systems, anaerobic digestion systems and biomass boilers.
- There is likely to be increased pressure for food production in the future, as a result of a national drive for greater self-sufficiency in food.
- Lack of freezing conditions may affect the germination of many native tree species.
- The prospect of increased drought conditions brings with it the distinct possibility of increased fire risk. Historically the hills have regularly experienced extensive fires across hillsides.

Other key drivers

- There is potential opportunity to manage and extend traditional orchards and increase the resource for the production of fruit and apple juice, perry and cider and to benefit wildlife and pollination.

- Development pressures present the opportunity to advocate good, sustainable design, looking to reduce the impact on the landscape and increase climate regulation, within the parameters of maintaining the built character. The sloping terrain may lend itself to the construction of earth covered buildings.

- Challenge to reduce the impacts on the NCA of polythene and polytunnels that are being used for intensive production of certain crops and can be highly visible. This is particularly prominent around the borders of the AONB, especially to the south and west.

- Potential to manage the increased biomass production in the area, making use of wood which is already a component of the landscape.

- Forestry Commission research indicates that there is scope for an additional 72 to170 ha (average 120 ha) of woodland in the NCA. As well as increasing habitat this could absorb some of the pressure of recreational use from other heavily used areas.

- Extension of semi–natural habitats and maintenance of hedgerows to connect adjoining landscapes and make biodiversity stepping stones and corridors.

- Insensitive development can lead to the direct loss of, or adverse effect on, geodiversity through the loss of designated sites or exposures. Sensitive development, on the other hand, can create temporary or even permanent exposures and features. At present little data is available on the extent of loss or damage to sites of geodiversity interest other than designated sites. Lost sites include part of Tank Quarry at the north end of the Malvern Hills (which has been used for landfill), and Brays Pit and Mathon Pit to the west of the hills.

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.

Apple orchard at Colwall.

Statement of Environmental Opportunity	Ecosystem service																		
	Food provision	Timber provision	Biomass energy	Water availability	Genetic diversity	Climate regulation	Regulating soil erosion	Regulating soil quality	Regulating water quality	Regulating water flow	Pollination	Pest regulation	Regulating coastal erosion	Sense of place/inspiration	Sense of history	Tranquility	Recreation	Biodiversity	Geodiversity
SEO 1: Conserve and appropriately manage the highly distinctive range of the Malvern Hills, and the areas of semi-natural habitat in the wider character area such as woodland and traditional orchard, providing economic opportunities, fostering community participation.	↔ **	↔ **	↗ *	↗ **	↗ *	↗ *	↗ *	↗ *	↗ *	↗ *	↗ *	↗ *	n/a	↗ **	↔ **	↗ **	↗ *	↗ **	↔ **
SEO 2: Manage and improve access to the landscape, as well as the cultural and geological features of the Malvern Hills National Character Area and promote enhanced understanding and enjoyment to reinforce a strong sense of place.	↔ *	↔ *	↔ *	↔ *	↔ *	↔ *	↔ *	↔ *	↔ *	↔ *	↔ *	↔ *	n/a	↑ **	↑ **	↑ **	↑ **	↑ **	↑ **

Note: Arrows shown in the table above indicate anticipated effect 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 effect is available.

Dark plum = national importance; mid plum = regional importance; light plum = local importance

Statement of Environmental Opportunity	Ecosystem service																		
	Food provision	Timber provision	Biomass energy	Water availability	Genetic diversity	Climate regulation	Regulating soil erosion	Regulating soil quality	Regulating water quality	Regulating water flow	Pollination	Pest regulation	Regulating coastal erosion	Sense of place/inspiration	Sense of history	Tranquility	Recreation	Biodiversity	Geodiversity
SEO 3: Protect and appropriately manage the historic environment and its setting, ensuring that historic features and landscapes are recognisable and valued.	↔ *	↗ *	↗ *	↔ *	↗ *	↗ *	↗ *	↗ *	↗ *	↗ *	↗ *	↗ *	n/a	↑ **	↑ **	↗ *	↑ **	↑ **	↔ *
SEO 4: Plan for an expansion of semi-natural habitats where appropriate, so that a significant ecological network is created and interconnected to adjoining areas. This will increase biodiversity, pollination, food and drink production, as well as regulate soil erosion, water and soil quality, reinforcing a strong sense of place.	↑ **	↑ **	↗ **	↗ *	↗ **	↗ **	↗ **	↗ **	↗ *	↗ *	↗ *	↗ *	n/a	↑ **	↗ *	↗ *	↗ **	↑ **	↔ *

Note: Arrows shown in the table above indicate anticipated effect 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 effect is available.

Dark plum = national importance; mid plum = regional importance; light plum = local importance

Landscape attributes

Landscape attribute	Justification for selection
The steep sided ridge of the Malvern Hills – a nationally important historic landmark and geological feature in an open landscape of permanent pasture and scrub with woodland on its lower slopes.	■ Distinctive and prominent unenclosed hill ridge of igneous and metamorphic rocks. A famous landmark that defines the eponymous Malvern Hills Area of Outstanding Natural Beauty. ■ 680 ha of SSSI, designated for the large area of semi-natural vegetation with extensive unimproved acid grassland, bracken, scrub, ancient woodland heathland, flushes, open water and bare rock faces. The ridge is also important for a number of uncommon plants, including the scarce spring cinquefoil and upright chickweed plants, as well as butterflies and moths (over a third of all priority moths occur within this small NCA) and the nationally rare high brown fritillary butterfly. ■ Geologically, the Malvern Hills is one of the largest and most important outcrops of Precambrian rocks in England. Exposures in outcrops and quarries reveal a range of rock types and geological structures. The geomorphology of the hill ridge is of geological interest, contributing to the understanding of mountain formation and erosion processes. ■ Dramatically sited iron-age hill forts at British Camp and Mid-summer's Hill and ancient, possibly Bronze Age, ridge top boundary - Shire Ditch. ■ 665 ha of open access land, enjoyed by very high numbers of visitors. The very high visitor pressure creates erosion problems for historic monuments. ■ In some woodlands and on the bracken slopes there are extensive and stunning displays of bluebells attracting many visitors in spring. ■ There are popular viewpoints along the whole of the ridge and particularly at the Worcestershire Beacon and British Camp – although on some parts of the ridge these are increasingly obscured by the rising treeline, especially secondary sycamore woodland (a problem for habitats, and appreciation of the geology and landscapes). The visual impact of polytunnels in adjoining NCAs is significantly changing the views from the hill ridge.

Landscape attribute	Justification for selection
Mixed mosaic of habitats in a relatively small area.	■ Ancient woodlands on hill ridges and steep sided valleys of harder limestones, including important ancient woodlands such as Crews Hill and Halesend Woods (SSSIs) – limestone ridge woodlands with a rich shrub layer and ground flora. In the west are further ancient woodlands. The West Midlands Woodland Opportunities Map identifies this NCA as having high potential for creating new woodlands within an NCA with an existing high proportion of ancient woodland. ■ A rich mosaic of habitats exemplified by the Leigh Brook Valley SSSI, containing, broadleaved woodland, unimproved herb-rich meadows, old orchards and a section of the Leigh Brook itself. Designated for its woodland, grassland and invertebrate interest. ■ An important concentration of priority habitat herb-rich meadows, including the SSSI at Lords Wood Meadows and Little Byefields Meadow. On softer rubbly limestones, limey shales and siltstones there are remnant areas of calcareous grassland. ■ Numerous traditional orchards valued for their contribution to landscape character and as a priority habitat. These orchards support typical orchard birds including all three woodpecker species and wintering flocks of thrushes and sometimes contain semi-improved grassland sward. They also host outstandingly important populations of invertebrates associated with deadwood and old trees, including the priority species noble chafer beetle – part of a stronghold that extends into neighbouring NCAs to the north, west and east: and mistletoe tortrix moth. The orchards of this area are considered the best known in England for invertebrates of deadwood. Fungi associated with orchards are also an important feature of this habitat. ■ Geology underpinning the ridge and vale scenery including, for example, the SSSI at Osebury Rock which boasts an important exposure of Haffield Breccia, a mixture of igneous rock and limestone fragments set in a sandy matrix. ■ Field boundaries around small pastures and orchards, creating a distinctive boundary pattern of hedgerows. ■ Distinctive cowled hop kilns and other vernacular buildings including timber framed, red brick and local stone cottages, farm buildings and moated farmsteads. ■ Ancient species rich hedgerows with frequent fruit trees, particularly to the north of the area, some with an important resource of mature and veteran trees. ■ The NCA shows good habitat connectivity and so is important for wide ranging species such as bats and polecats.

Landscape attribute	Justification for selection
Historic parklands and estates.	■ Designed parks of national historic interest, including their wood pasture, trees and woodlands containing significant biodiversity interest. A good example is Eastnor Castle which has significant invertebrate and flora interest, including a stronghold site for the nationally rare high brown fritillary butterfly, presence of the rare priority beetle Gastrallus immarginatus and five other red data book beetle species. ■ Herb rich meadows and woodlands, an important biodiversity resource, much valued by the public for annual displays of wild daffodils. ■ An intimate landscape of scattered cottages, parkland, unenclosed pasture, small pasture fields and woodland.
Extensive area of access land and public rights of way.	■ 665 ha of access land covering some 8 per cent of the area. ■ 278 km of public rights of way providing access across the landscape away from the main hill ridge. ■ The Worcestershire Way runs through the area (Malvern is it's most southerly point) and the Geopark Trail also runs through the area linking many features of geological interest. ■ The Malvern Hills NCA is within easy travelling distance of large urban populations to the north, west and south. There are easy public transport connections from the West Midlands conurbation. ■ A good public rights of way network, combined with quiet lanes and nature reserves provide a varied menu of access options for visitors and offer potential to take visitors from the heavily pressurised Malvern Hills ridge.

Landscape opportunities

- Conserve and appropriately manage the highly distinctive ridge of the Malvern Hills, maintaining its largely open and unenclosed character, and its high potential for retaining the prehistoric and later archaeology of land use and the extensive area of interconnected habitats, aiming for an appropriate balance between the variety of grassland, bracken, woodland, scrub, heathland, flush and bare rock face habitats.
- Protect and appropriately manage the mosaic of traditional orchards, meadows ancient broadleaved woodland and hedgerows. Maintain the connectivity for species such as bats and for climate change resilience.
- Protect and manage internationally and nationally important geological sites (SSSI) and locally important geological sites (Local Geological Sites) within the NCA.
- Identify and protect the characteristic geodiversity of the NCA within and outside designated areas. This includes the upland exposures (natural and quarried) of the ancient Precambrian rocks in the Malverns, the folded Silurian rocks of the Malvern and Suckley Hills, the diverted drainage of the River Teme and the former Mathon River and the fossil fish of the Downton beds.
- Conserve and appropriately manage the area's archaeology of land use and settlement that dates back to the Neolithic period and earlier. This includes designated sites such as the iron-age hill forts, bronze-age barrows and the Shire Ditch along the Malvern Hills ridge, and significant undesignated sites.
- Conserve and appropriately manage the area's rich architectural legacy, which extends from modest timber-framed houses sited close to its historic commons to larger timber houses and estate and villa architecture. Use this understanding, and the area's distinct patterns of historic dispersed settlement, to plan for and inspire any new development.
- Protect and manage historic parklands to retain their important contribution to landscape character and sense of history and to conserve their important deadwood fauna. Management of parklands should include establishment of new generations of trees, appropriate management of mature and veteran trees and retention of dead wood.
- Protect and appropriately manage the area's displays of wild bluebells and daffodils.
- Maintain the integrity of the views to and from the Malvern Hills ridge by carefully planning and designing development so that the character of surrounding areas is maintained and views remain uninterrupted. The Malvern Hills AONB document, 'Guidance on identifying and grading views and view points' can be used to support delivery of this opportunity.
- Enhance and manage the area's access land and extensive public rights of way to provide and enhance opportunities for visitors to discover the whole NCA area, not just the well known Malvern Hills ridge.

- Manage hedgerows to maintain their presence in the landscape, thus ensuring continuity of the distinctive boundary pattern of small pastures and fields. Establish and nurture new hedgerow trees and manage existing mature hedgerow trees to provide continuity of the veteran tree resource.

- Plan for expansion of various habitats, principally traditional orchards, meadows, and broad-leaved woodland to create an interconnected habitat network in accordance with landscape character. Networks should consolidate and connect with neighbouring networks in the Teme Valley and Severn and Avon Vales NCAs.

- Maintain and enhance access to geodiversity, and increase interpretation and appreciation (and utilisation) of the role and function of geodiversity across the NCA, (including the role of geology in determining appropriate habitat restoration and the role of geological processes in planning for future climate change resilience).

- Plan any new development so that it maintains the character of the existing settlement pattern and reflects the built character of the local area. The Malvern Hills AONB 'Building Design' guide could support delivery of this opportunity.

There is potential opportunity to manage and extend traditional orchards.

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 the analysis and opportunities may change upon publication of further evidence and better understanding of the inter-relationship between services at a local level.

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Food provision	Soils, livestock, mixed and cereal farms, orchards	The soils range from thin acidic soils on the Malverns, through deeper, neutral soils over the Old Red Sandstone to calcareous soils on Silurian shales and siltstones. The landscape's predominantly pastoral character is supported by its breakdown of farm types: 41 grazing livestock holdings (39 per cent), 13 horticulture holdings (10.4 per cent) and 10 mixed farming holdings (9.5 per cent). Farms classified as 'other' (likely to be small-holdings) are numerous – accounting for 29 holdings (27.6 per cent).	Regional	The Malvern Hills has a diverse farming industry with many small farms and specialist growers. Sheep and cattle grazing dominates, and other food produced in the area includes cereals, potatoes, dairy products, vegetables, salads, pork, poultry, eggs, cheese, oils and herbs. The area is part of an important drinks producing zone in the west of England that produces fruit juices, beer, bottled water, perry and cider. However, the demand for more cider and juice is being met by new bush orchards being planted rather than traditional orchards. There is a need to encourage traditional orchards in appropriate areas that will enhance pollination, biodiversity, genetic diversity and sense of place.	Work together with farmers, land owners and local communities to manage, restore and expand traditional orchards to encourage connectivity, biodiversity and pollination in appropriate locations.	**Food provision** **Biodiversity** **Sense of place/ inspiration** **Sense of history** **Pollination** **Genetic diversity** **Climate regulation**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Timber provision	Woodland including ancient woodland Orchards Currently the main source of commercial timber is around 500 ha of coniferous woodland in small blocks around the NCA	Woodland covers some 21 per cent of the area with a high proportion of this occurring on ancient woodland sites, either as broadleaved or mixed woodland, with some 35 per cent subject to replanting, for example at Crewshill, Ravenshill and Frith Wood.	Regional	Provision is currently high but could be enhanced if some sites come into active management, with a range of management options including non intervention. This could provide increased opportunities for biodiversity, climate regulation and reinforce sense of place. Forestry Commission research indicates that there is scope for an additional 72-170 ha (average 120 ha) of woodland in the NCA.	Opportunity to work with local land managers and communities to manage the many under managed woodlands in this NCA to provide more timber and enhance biodiversity. Restock planted ancient woodland sites with native hard woods. Increase cover of woodland/ scrub and orchards.	**Timber provision** **Biodiversity** **Climate regulation** **Sense of place/ inspiration** **Regulating soil erosion** **Regulating soil quality** **Regulating water quality**
Biomass energy	Existing woodland cover 21 per cent of the area	Woodland covers some 21 per cent of the area with a high proportion of this occurring on ancient woodland sites, either as broadleaved or mixed woodland.	Regional	There is the potential for significant provision of biomass by bringing unmanaged woodland under management. There is a high potential yield for miscanthus in the NCA, and a medium potential yield for short rotation coppice. For information on the potential landscape impacts of biomass plantings within the NCA, refer to the tables on the Natural England website[5]. Sensitive management of existing unmanaged woodland offers potential for wood fuel. Dead wood is a critical component of broadleaved woodland for biodiversity.	There is an opportunity to increase production of biomass through introducing management in currently unmanaged broadleaved woodlands/orchards and encouraging miscanthus where appropriate. Increase cover of woodland/ scrub and orchards.	**Biomass energy** **Biodiversity** **Climate regulation** **Regulating soil erosion** **Regulating soil quality** **Regulating water quality**

[5] Natural England website, *Opportunities and optimum sitings for energy crops* (accessed October 2010), http://www.naturalengland.org.uk/ourwork/farming/funding/ecs/sitings/areas/103.aspx

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Water availability	Reservoir Brooks Drinking water from springs	There are no major rivers in this NCA, although the River Teme passes briefly through the north of the NCA and joins the River Severn to the east of the NCA. Several brooks and streams run through the NCA, such as Leigh Brook. The NCA does not overlay a major aquifer but has an important spring line at the base of the slopes. The British Camp reservoir lies to the south of Little Malvern.	Local	There is 'no water available' from the limited surface and groundwater resources in this NCA[6,7]. In the north and west of the NCA, surface and groundwater resources have been assessed as 'water available'. However, high quality drinking water is bottled from the Holywell Spring and this link between the brand and the landscape could be developed.	Support measures to maintain and improve soil structure to increase permeability andwater retention by the soil. Support the local bottled water industry to make strong links between the brand and the landscape that it is derived from.	**Water availability** **Regulating water quality** **Regulating soil erosion** **Regulating soil quality**
Climate regulation	Woodlands, grassland heathland Trees/avenues in Colwall and settlements, and large gardens cool the area	Woodland covers some 21 per cent of the area, 38 ha of lowland heath (less than 1 per cent of NCA). The soils in this NCA have a low carbon content of between 0-5 per cent. There will however, be localised storage of soil carbon associated with woodland and grassland habitats (including 1,839 ha of priority habitats).	Local	Currently there is little storage of carbon due to the nature of the soils in this NCA. Where there is increased storage under woodlands, grasslands and heathlands there is an opportunity to maintain the carbon storage potential of the area and increase it through the extension of these habitats.	Maintain and extend woodland and grassland to maximise carbon storage and benefit biodiversity. Increase cover of woodland/ scrub and orchards.	**Climate regulation** **Biodiversity** **Sense of place/ inspiration** **Regulating soil erosion** **Regulating soil quality** **Regulating water quality**

[6] Environment Agency, *Teme Catchment Abstraction Management Strategy,* September 2005
[7] Environment Agency, *Severn Vale Catchment Abstraction Management Strategy,* January 2008

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil erosion	Soils Woodlands Hedgerows Orchards	Over a third of the NCA area is covered by seasonally wet acid loamy and clayey soils that have a low risk of erosion. However these soils are easily compacted by livestock and machinery. Elsewhere soils are at risk of erosion on steeper slopes, particularly under conditions of continuous arable cultivation.	Regional	The areas likely to be at risk are the steeper slopes and in areas of intensive grassland and cultivated fields. Strengthening the hedgerow and orchard network would help to improve soil health and reduce run off. Strengthening the hedgerow and orchard network would add to the sense of place as well as increasing biodiversity.	Working together with land managers there is scope to reinstate and strengthen the hedgerow and orchard network. Increase cover of woodland/scrub and orchards targeted at areas of high soil erosion risk. Ensuring appropriate grazing levels to prevent erosion and compaction. Ensure good management of soils across the area as this can be important for the protection of the historic environment.	**Regulating soil erosion** **Biodiversity** **Sense of place/ inspiration** **Regulating soil quality** **Regulating water quality**
Regulating soil quality	Soils Woodland Heathland Hedgerows	Slowly permeable and seasonally wet soils over 37 per cent of the area are susceptible to poaching and compaction which can exacerbate run-off problems. Elsewhere, freely draining loamy soils on steep slopes can poach easily when wet.	Local	It is important to minimise compaction, which can arise from over-grazing, trafficking or other mechanised activities. These will tend to exacerbate run-off problems as well as damaging soil structure. These soils may have limited potential for increasing organic matter levels by management interventions this in turn should have enhanced benefits for biodiversity.	There is scope to employ minimal tillage and incorporate organic matter to increase level of soil organic matter and relieve soil compaction over a proportion of the NCA. Increase cover of woodland/scrub and orchards. Managing access to historic sites, ensuring appropriate grazing levels to prevent erosion and compaction.	**Regulating soil quality** **Regulating soil erosion** **Regulating water quality** **Biodiversity** **Water availability**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water quality	Soils, semi-natural habitats	The majority of the area lies within the River Teme Priority catchment and issues of concern relate to agricultural run-off, poaching of soils by over-wintering livestock. The ecological status of surface water bodies in the NCA is 'moderate' and the chemical status of groundwater is 'good' Good water quality is important in the catchment of River Teme SSSI/SAC and for the bottled water industry.	Local	Improvements are required to the water quality through selective reduction in inputs from point source pollution through better land management/stock husbandry and the buffering of water courses which should help address specific pollutant issues in water bodies.	Increase cover of woodland/scrub and orchards. Reduce nutrient inputs through improvements to public and private sewage treatment. Manage nutrients in farmsteads and improved grassland .	**Regulating water quality** **Regulating soil erosion** **Biodiversity** **Regulating soil quality**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water flow	Rivers	There is a relatively low level of fluvial flood risk in this NCA, generally in small pockets that are fairly far apart[8]. There is not a significant risk of fluvial flooding in Great Malvern[9]. Ledbury is at risk of flooding (from the River Leadon, just downstream of this NCA), and surface water flooding is an additional problem[10].	Local	A relatively low issue for this NCA however, it is an important area for its' potential contribution to attenuation of flooding in downstream Ledbury, particularly through land management which increases vegetation cover (particularly trees/ scrub) and surface roughness to increase evapotranspiration and infiltration and slow flows. These actions will also increase biodiversity, water availability and improve soil quality through the expansion, restoration and siting of semi natural habitats, which have a higher water storage potential.	Seek to restore ad extend semi-natural habitats. Seek opportunities to incorporate grass buffer strips and restore hedgerows across slopes within river catchments. Increase cover of woodland/scrub and orchards. Improve soil quality to increase water retention and reduce runoff. Work with the Environment Agency, water companies, local authorities, highways and developers to create more sustainable urban drainage to tackle surface water flooding.	**Regulating water flow** **Biodiversity** **Water availability** **Regulating soil erosion** **Regulating soil quality** **Regulating water quality**
Pollination	Grassland, meadows, heathland, hedgerows Orchards Active bee keepers clubs Roadside verges	The extensive semi-natural habitat mosaic of grasslands, heathland and scrub, on the hill ridge and in unimproved grasslands across the area, provide nectar sources for pollinating insects.	Local	There is real scope to improve the availability of nectar sources in this NCA through the good management and extension of hedgerows and orchards. This would have positive benefits for biodiversity, crop provision and enhance the landscape character.	Work with land managers and communities to identify the most appropriate places to extend the good management of hedgerows and orchards to ensure the best outcomes for biodiversity and food production as well as for pollinating insects. Improve habitat connectivity and allow meadows/ pastures to flower.	**Biodiversity** **Sense of place/ inspiration** **Pollination** **Food provision**

[8] Environment Agency, *River Severn Catchment Flood Management Plan, Summary Report,* December 2009
[9] Environment Agency, *Flood Map,* 2010
[10] Environment Agency, *River Severn Catchment Flood Management Plan, Summary Report,* December 2009

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of place/ inspiration	Malvern Hills Ridge Geology Parklands and ancient woodland Traditional orchards Links with poets, authors, composers RADAR and science Land Rover and Morgan cars Malvern and Ledbury festivals	Countryside Quality Counts data suggests that the character of the resource has probably been maintained.	National	Management to enforce sense of place is likely to increase sense of history. Conserving and enhancing the distinctive landscape features is also likely to benefit biodiversity by enhancing or expanding habitat. Managing the orchards is also likely to benefit food production and pollination and improve soil quality and soil erosion. Using the links to the poets, artists, authors and composers.	Work with landowners to manage and restore the network of traditional orchards/ parklands and woodlands to reinforce sense of place and enhance biodiversity. Maintain excellent access to the main hill ridge and its adjoining commons. Protect internationally and nationally important geological sites (SSSIs) and locally important geological sites (Local Geological Sites) within the NCA. Identify, protecting, managing and interpreting the characteristic geodiversity of the NCA. Conserve historic parklands as a recreational resource and to benefit biodiversity. Work with local groups to use the Malvern Hills links to famous authors, artists and composers to inspire a current generation about the distinctive landscape.	**Sense of place/ inspiration** **Sense of history** **Biodiversity** **Recreation** **Tranquillity** **Food production** **Pollination** **Regulating soil quality** **Regulation soil erosion** **Regulating water quality** **Geodiversity**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of history	Iron-age hill forts along the ridge, notably Midsummer Hill and British Camp, as well as bronze-age round barrows and the standing stone at Colwall. Churches and priories. Several large estates with designed landscapes in the foothills, such as Eastnor Castle, and the spa towns and villas characterised by eclectic Victorian and Edwardian styles. Historic tree scapes or woodlands, orchards, hedges and veteran boundary trees.	There has been pressure for development around the main towns and villages between the dispersed settlements at the foot of the hills and within the grounds of large Victorian villas. The hinterland of Malvern (wooded hills and Cradley Brook valley) has been particularly affected. (CQC 2003) 2 Registered Parks and Gardens covering 1,402 ha. 16 Scheduled Monuments. 372 Listed Buildings.	National	This NCA needs to maintain its sense of history as the assets listed are a real draw for visitors. These provide recreational opportunities and sense of place by reinforcing the historic character of the landscape. Conserving the designed landscapes will also have positive benefits for biodiversity.	There is an opportunity to retaining a pattern of dispersed settlements and their diverse range of vernacular buildings and farmstead architecture through influencing local plans. Conserve historic parklands as a recreational resource, a distinctive characteristic of the landscape and to benefit biodiversity and sense of history. Conserve and enhance historic tree-scapes of woodlands, orchards, hedges and veteran boundary trees. Protect and explain archaeological earthworks and sub-surface archaeology that can enrich our perception of the sense of place and history. Manage visitor access to ensure landscape attributes are maintained. Manage soils particularly in the farm environment as important for the protection of historic environment.	**Sense of history** **Sense of place/ inspiration** **Biodiversity** **Regulating soil quality** **Regulating soil erosion** **Recreation**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Tranquillity	Malvern Ridge The high hills and summits are open without settlement Isolated cottages and scattered farmsteads Dense ancient woodlands on lower slopes Quiet country lanes and intimate landscapes with frequent woodland to the north and west of the hill ridge Hedgerow network	Based on the CPRE map of tranquillity (2006) the highest scores for tranquillity are on the Malvern Hills ridge, within the AONB. The lowest scores for tranquillity are at the towns. The western parts of this NCA falls within areas considered to be relatively tranquil in comparison to much of England.	National	There is a need to protect the open summits and retain the scattered settlement pattern as well as ensuring that new development does not impact on the tranquillity. This will also help to maintain biodiversity and quiet enjoyment of the area. By managing and increasing the hedgerow networks across the area tranquillity will also be enhanced.	Maintain the existing upland character of the iconic Malvern Hills. Ensure that new development contributes positively to the qualities of the Malvern Hills AONB. Manage visitor access to ensure landscape attributes are maintained.	**Tranquillity** **Sense of place/ inspiration** **Recreation** **Biodiversity**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Recreation	The hill ridge, the Area of Outstanding Natural Beauty, public rights of way, extensive area of open access land Equestrian activities, hang gliding, kite flying, model gliding, sledging, cycling, abseiling and walking	10.7 per cent of the NCA is publically accessible. 279 km of public rights of way at a density of 3.36km per km^2. The hills support in excess of 1 million visits per year. 665 ha of open access land covering 8 per cent of the NCA. Just over 86 per cent of the NCA lies within the Malvern Hills AONB.	National	More housing development within the surrounding area and a growing awareness of the need to keep healthy will only increase recreational pressure on this NCA. The existing resource needs to be maintained, keeping the benefits for biodiversity, geodiversity and sense of place. There is a need to encourage visitors to make use of other assets rather than just using the ridge and to create new assets such as green space.	Maintain excellent access to the main hill ridge and its adjoining commons (some in neighbouring NCAs). Enhancing access on public rights of way and through access agreements to areas outside the Malvern Hills ridge. Supporting the creation of new assets such as green space. Manage visitor access to ensure landscape attributes are maintained. Interpreting the important geodiversity, biodiversity and historic environment assets across the NCA. Providing improved access by public transport from nearby urban populations.	**Recreation** **Biodiversity** **Geodiversity** **Sense of place/ inspiration**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biodiversity	Priority habitat: Unimproved acid and neutral grassland, heathland, scrub and bracken Ancient broadleaved woodland, small-leaved lime and wild service trees Parkland and wood pasture national deadwood resource for invertebrates Traditional orchards	A total of 16 sites wholly or partly within the NCA. Total area designated 1,024.5 ha. No sites are declining, 51.6 per cent of the sites are unfavourable recovering, 6.8 per cent no change and 41.6 per cent favourable. There are 54 Local Sites in Malvern Hills NCA, covering 1,607 ha which is 19.4 per cent of the NCA.	Regional	Already a rich mosaic of habitats exist in this NCA, but the improvement in the condition, and expansion, of woodland, hedgerows and traditional orchards will assist in climate regulation through the storage of carbon. Increases in habitat extent could also have a positive effect on increasing recreation, water quantity, water quality, pollinators and soil erosion.	Create an ecological network by connecting areas of semi natural habitat to the large area of habitat on the main hill ridge and its adjoining commons. Restore and create new areas of traditional orchard and priority grasslands, including lowland meadows in close proximity to extant areas. Restore to good condition ancient species rich hedgerows and create new hedgerows where appropriate, including the establishment and management of mature and veteran trees. Expand the area over which the nationally rare high brown fritillary butterfly occurs by protecting and appropriately managing existing sites and restoring areas close by as suitable habitat.	**Biodiversity** **Sense of history** **Sense of place/ inspiration** **Recreation** **Pollination** **Regulating soil erosion** **Regulating soil quality** **Regulating water quality**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Geodiversity	Important outcrops of Precambrian rocks Exposures in outcrops and quarries reveal a range of rock types and geological structures The geomorphology of the hill ridge is of geological interest, contributing to understanding of mountain formation and erosion processes Nationally distinctive geology and a complex and diverse range of soil types Many designated geological sites	48 Local Geological Sites (LGS) within NCA. Very few LGS are managed appropriately or regularly monitored to assess change in their condition. Little data is available on the extent of loss or damage to sites of geodiversity interest other than designated sites. Lost sites include part of Tank Quarry at the north end of the Malvern Hills (which has been used for landfill), and Brays Pit and Mathon Pit to the west of the hills.	National	There is a need to have more active management at many of the LGS to ensure that this unique geodiversity is not lost. This will have benefits for biodiversity and sense of place. Designated sites, in particular provide important, and accessible sections of geology allowing the interpretation, understanding and continued research into the geodiversity of the NCA Sites of geological interest are, in places, under pressure from high visitor use. Sensitive sites with unique features such as Gullet Top Quarry regularly experience significant visitor pressure Other sites within the AONB such as Whitman's Hill Quarry can be used to draw visitors away from honeypot sites to explore other parts of the area. These sites can be promoted positively, and interpreted, for geological exploration.	Identify, protect, manage and interpret the characteristic geodiversity of the NCA within and outside designated areas.	**Geodiversity** **Biodiversity** **Sense of place/ inspiration** **Recreation** **Sense of history**

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