



Introduction

As part of Natural England's responsibilities as set out in the Natural Environment White Paper¹, Biodiversity 2020² and the European Landscape Convention³, we are revising profiles for England's 159 National Character Areas (NCAs). These are areas that share similar landscape characteristics, and which follow natural lines in the landscape rather than administrative boundaries, making them a good decision-making framework for the natural environment.

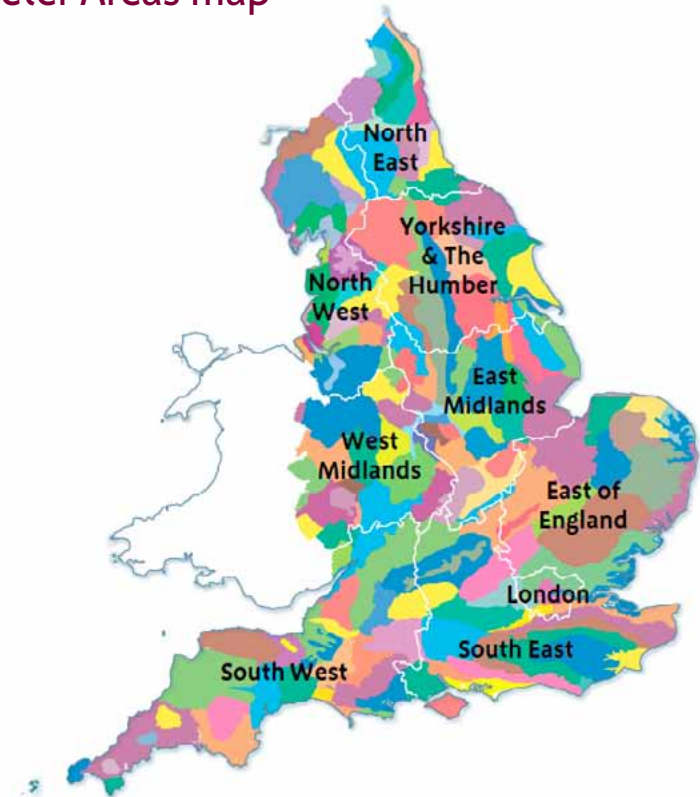
NCA profiles are guidance documents which can help communities to inform their decision-making about the places that they live in and care for. The information they contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and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

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

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

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

National Character Areas map



¹ The Natural Choice: Securing the Value of Nature, Defra (2011; URL: www.official-documents.gov.uk/document/cm80/8082/8082.pdf)

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

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

Summary

The Trent Valley Washlands National Character Area (NCA) comprises the river flood plain corridors of the middle reaches of the River Trent's catchment in the heart of England. It is a distinctly narrow, linear and low-lying landscape, often clearly delineated at its edges by higher ground, and it is largely comprised of the flat flood plains and gravel terraces of the rivers.

A washland is described as an area of flood plain that is allowed to flood or is deliberately flooded for flood management purposes.⁴ Thus the Trent Valley Washlands are strongly defined by the riverine environment and periodic inundation. The key ecosystem services provided are related to water, its availability and regulation of flow. Thick superficial deposits of alluvium and river terrace gravels dominate the Washlands' geology. Variations in these, the resultant soils and the differences in elevation above and below flood levels have determined both settlement pattern and agricultural land use. Arable crops are by and large located on the freely draining soils of the river terraces and on the higher ground where fields are big and hedgerows are small with few trees. Pastoral farming generally takes place on the river flood plains, where soils are subject to frequent flooding or are naturally wet. Here fields are usually smaller and the hedgerows fuller with more tree cover. Overall woodland cover in the Washlands is very limited, although riparian trees, especially willows, provide an important component of the landscape.

The broad rivers, their riparian vegetation and the semi-natural parts of the flood plain form the main habitats of the Washlands, with flooded former gravel extraction

sites introducing new wetland habitat into the area. Characteristic species are those associated with these wetlands such as grey heron, lapwing and kingfisher.

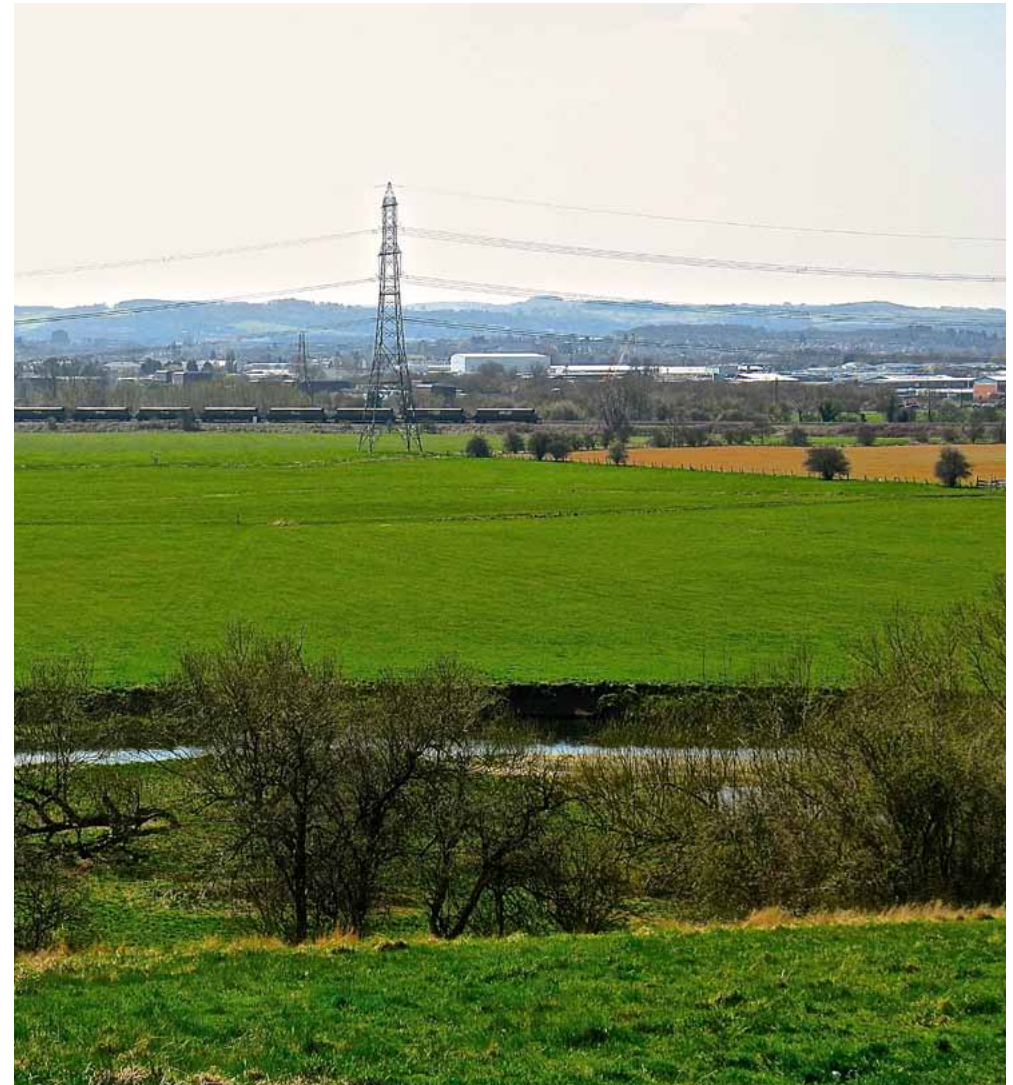
The rivers have attracted humans from the earliest times, especially the gravel terraces and crossing points. Traditional buildings are typically made of red brick with clay plain tile roofs with the occasional survival of some earlier timber-framed structures, while grander dwellings and churches are often built from sandstone.

⁴ *Working with Natural Processes to Manage Flood and Coastal Erosion Risk*, Environment Agency (2010)

[Click map to enlarge](#); [click again to reduce](#).

A unifying thread throughout the Washlands is provided by the rivers, their flood plain tracts of pasture and the bordering higher ground; however, it is also a landscape that is heavily fragmented and intruded upon by modern built development, communication and transport infrastructure. It is greatly influenced by past and present industry, from energy generation to aggregate extraction. The landscape is experiencing significant forces for change over short timescales from housing, infrastructure, the sand and gravel industry, agriculture and commercial 'big shed' development which detracts from the established character.

Despite these intrusions, in places, particularly beside the rivers, the Washlands provide a picturesque pastoral landscape with a beguiling, timeless quality. In addition, the potentially abundant opportunities for recreation offered by the many water resources are particularly important owing to their accessibility to the many people living within and near the area.



View over the Soar Valley towards Loughborough and the hills of Charnwood.

Statements of Environmental Opportunity

SEO 1: Carefully plan and manage new development within the NCA to ensure that landscape character and ecosystem services are strengthened, that heritage features, wildlife habitats, woodland and the hedgerow network are enhanced, and that opportunities for creation of multifunctional green infrastructure are realised so that this landscape is resilient to the forces of change that it is experiencing.

SEO 2: Manage and enhance the Trent Valley Washlands' river and flood plain landscape to combine its essential provision and regulation of water role with landscape enhancement, nature conservation, climate regulation, farming, recreation and a resource for understanding geodiversity.

SEO 3: Protect, manage and enhance the pastoral landscape of the Trent Valley Washlands, seeking to join up and expand areas of pasture and associated attributes and habitats, to preserve heritage features, enhance biodiversity and geodiversity, protect farmland and provide additional recreational opportunities.

SEO 4: Protect and enhance the historic environment of the Trent Valley Washlands and their characteristic historic landscape. Increase awareness of the richness of this resource, protect it from neglect and physical damage, and ensure that future development complements and enhances the sense of history of the NCA.



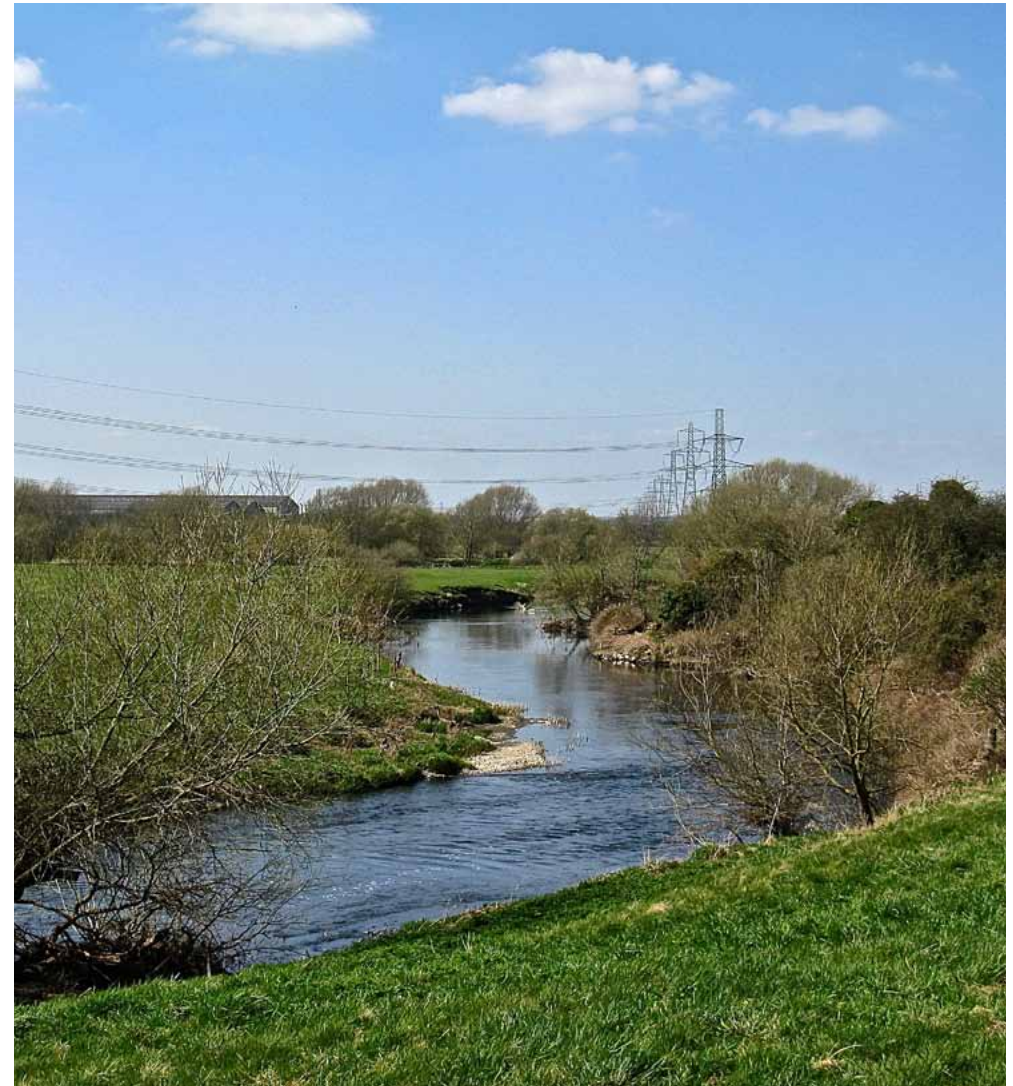
Pasture with willows in the Trent flood plain near Weston-on-Trent.

Description

Physical and functional links to other National Character Areas

This National Character Area (NCA) is a distinctly narrow and linear landscape which, at its widest around Derby, is only about 9 km wide but has a total length close to 100 km. It adjoins 13 other NCAs and extends through Warwickshire, Staffordshire, Derbyshire, Nottinghamshire and Leicestershire. It is strongly defined by its watercourses which all provide multifunctional links with the upstream and downstream NCAs of the Trent catchment which extends over 10,000 km². The River Trent's source is Biddulph Moor in Staffordshire (Potteries and Churnet Valley NCA) and it flows through the Needwood and South Derbyshire Claylands before entering the Trent Valley Washlands NCA. The river flows out into the Trent and Belvoir Vales NCA, on into the Humberhead Levels NCA and finally to its confluence with the River Ouse to form the River Humber (Humber Estuary NCA).

The Trent's tributaries of the rivers Tame, Blythe and Cole flow in from the south from Arden NCA while the Bourne Brook flows in from the west from Cannock Chase and Cank Wood NCA and the River Anker and River Mease from the east from Mease/Sence Lowlands NCA. The River Dove flows in from the west from the Needwood and South Derbyshire Claylands NCA and the River Derwent from the north from the Derbyshire Peak Fringe and Lower Derwent NCA, while the River Erewash flows in from the north from the Nottinghamshire, Derbyshire and Yorkshire Coalfield NCA. The River Soar flows in from the south from the Leicestershire Vales NCA, is joined by the River Wreake flowing in from the east from the Leicestershire and Nottinghamshire Wolds NCA,



The River Soar with electricity pylons near Loughborough.

Gaddesby Brook from the east from the High Leicestershire NCA and Rothley Brook from the west from Charnwood NCA.

As all these watercourses are within the Trent catchment, actions anywhere will have an impact downstream. The NCA is a receiver of water from all these surrounding NCAs except the Trent and Belvoir Vales NCA which is located entirely downstream. It also artificially receives significant inputs from the River Severn catchment via the drinking water supply to Birmingham and subsequent treated effluent outfall into the River Tame.

The underlying geodiversity contributes to the Washlands' characteristic landscape with views towards adjoining higher ground a consistent feature, particularly under clear weather conditions. The Soar Valley, generally less than 3 km across, is heavily influenced visually by the high ground of Charnwood to the west and the Nottinghamshire and Leicestershire Wolds to the east. The Tame Valley, mostly less than 4 km wide, is flanked by the higher ground of Arden, Cannock Chase and the Mease/Sence Lowlands. The northern edge is defined by ground rising to the Needwood and South Derbyshire Claylands and the Nottinghamshire, Derbyshire and Yorkshire Coalfield. The southern edge abuts the Melbourne Parklands, abruptly in places where past fluvio-glacial action has cut into the bedrock.

The bedrock Mercian Mudstones which underlie most of the Washlands form geological links to other NCAs as does the older Sherwood Sandstone Group which provides an important aquifer across the region. This aquifer is used by the brewing industry at Burton-upon-Trent. Meanwhile, the NCA is linked to the downstream Trent and Belvoir Vales via the extensive sand and gravel deposits.

Transport infrastructure provides physical links to other NCAs including major roads such as the A50, A38 and M1, mainline railways connecting the Midlands with the north and south and power lines and pylons which traverse the landscape. Canals connect to the wider canal network, providing recreational links far and wide for boat and towpath users, while routes along the rivers and through urban areas provide further connectivity.

The National Forest extends into the Washlands, building a woodland link with the neighbouring Needwood and South Derbyshire Claylands, Mease/Sence Lowlands and Melbourne Parklands NCAs.

Key characteristics

- Distinctly narrow, linear and low-lying landscape largely comprised of the flat flood plains and gravel terraces of the rivers and defined at its edges by higher ground.
- Geology dominated by superficial alluvium and gravel river terrace deposits underpins the contrast in arable and pastoral agricultural use, arable crops predominating on the free-draining soils of the river terraces, with grassland more commonly located along the alluvial river flood plains where soils are subject to frequent flooding or are naturally wet.
- Flood plain pastoral areas where riverside pastures are subdivided by thick, full hedgerows with some trees contrast with arable areas with larger fields divided by low, small hedgerows with few trees.
- Limited tree cover, but local concentrations give the impression of a well-timbered landscape in many places. Riparian trees, especially willows, provide an important component.
- A landscape strongly defined by its rivers and their flood plains with the extensive canal network adding significantly to the watery character and providing major recreational assets for the area.
- Diverse range of wetland habitats supporting notable species such as spined loach and bullhead fish, otter, water vole, white-clawed crayfish, shoveler, bittern, lapwing, snipe and redshank.
- Rich history of human settlement and activity reflected in the archaeology and historic buildings with a particular focus on river crossing points and the gravel terraces, as well as being significant for early Christianity in the Midlands, and later for its canal and brewing heritage.
- Settlement pattern heavily influenced by flood risk, confining villages to

the gravel river terraces and to rising ground at the edges of the flood plains. Traditional buildings are characteristically of red brick and clay plain tile with earlier timber frame and grander dwellings and churches typically built from sandstone. Red brick and Welsh slate of 19th- and early 20th-century urban expansion prominent in larger settlements along with modern housing and development.

- A landscape heavily used as transport and communication corridors along the rivers and canals, for major roads and railways, and for power lines.
- A landscape marked by extensive sand and gravel extraction, power stations and prominent urban-edge industrial and commercial development.



The Soar Valley displaying some of the key characteristics of the Washlands.

Trent Valley Washlands today

The Trent Valley Washlands NCA is a riverine landscape dominated by the drainage of the middle reaches of the River Trent as it drains towards Nottingham. It is a landscape formed by the action of glaciers and meltwaters, which carved out the river valleys and led to the deposition of huge quantities of sand, gravel and alluvium deposits.

Geology, soils and landform play a big part in the settlement pattern of the Washlands. Early settlements were constrained by the flooding of the valley bottoms. Those that do occur in the flood plains are on the drier, slightly elevated sand and gravel river terraces and at river crossing points.

The linear nature of the landscape is exacerbated by its narrowness, generally less than 4 km across. A typical section comprises the rivers flowing through alluvial flood plains between slightly higher terraces of sand and gravel. At the flood plain's edges the underlying geology rises above the thick superficial deposits in a defining landform change marking the border of the NCA. This ranges from gradual transitions from the flood plain to abrupt changes where the past action of water and ice has created steep scarp slopes and even precipitous cliffs where underlying Triassic rocks are exposed. The height of this transition is in the order of 20 to 40 m and occasionally 50 m above the valley floor, providing views over the NCA.

The main rivers are the Trent and its major tributaries, notably the Tame and the Soar, which drain in from the south, and the lower reaches of the Dove and the Derwent. They are in their mature stages in the Washlands: broad and slow moving and generally following their natural courses, though subject to much modification with weirs and canalised sections. As the name implies, much of



Gravel workings and train line near Willington looking towards the redundant cooling towers of the former power station site.

the Washlands is subject to flooding, although less so than in the past, as in many places the rivers have been deepened or are confined by flood banks and flood alleviation schemes which, along with fringing vegetation, often hide them from view; however, regular inundation within the flood plains is still a feature, temporarily transforming the landscape.

Freshwater is a common feature, emphasised by the river and canal network and the many worked-out, flooded gravel pits. The landscape has changed through the impact of mining of sand and gravel, from active excavations with their associated infrastructure and the lasting visual intrusion of the unsympathetic restoration of some pits, although some have been restored to a high standard to the benefit of people and the natural environment.

Woodland cover is low although the landscape often appears well furnished with trees. More tree cover on prominent bordering steep slopes, in and around settlements and within parklands as well as the considerable amount of waterside trees and scrub, particularly willow, result in a well-timbered character in places. Linear tree belts are also found planted on the wide verges and embankments of major trunk roads. Withy beds, pollarded willows, ash, alder and poplar, including the occasional black poplar, mark the locations of dykes, streams and rivers and attest to a rural resource that is no longer managed. Hedgerow trees, mostly oak and ash, are generally few in number. In the pastoral parts in the flood plains where hedgerows are fuller, hedgerow trees, mainly ash and willow, are more common.

Farming is mixed, with slightly more arable land than pasture but with local variation. Arable crops tend to be grown on the higher ground and the gravel terraces where fields are large and open with low, tightly trimmed hedgerows and few hedgerow trees. Past removal of hedgerows has increased the scale of this part of the landscape. In the lower-lying and wetter areas and around the villages pastoral farmland is more common and fields tend to be smaller and the hedgerows fuller and thicker with more hedgerow trees.

The field patterns are interrupted by urban, commercial and industrial development, sand and gravel extraction, and major roads and railways.

Tranquillity is hard to find in the Washlands as they sit between major conurbations with the valleys used as transport corridors. Around a quarter of the area is classified as urban. It is crossed by the M1 and M42 motorways and by air traffic from nearby East Midlands and Birmingham airports. The immense coal-fired power station at Ratcliffe-on-Soar and redundant cooling towers at Willington dominate the landscape locally as do the huge sheds of commercial and industrial estates, and the rows of giant electricity pylons.

Villages remain compact, but the larger towns expanded rapidly in the 19th and 20th centuries and have sprawled out across the valleys with a mix of housing, commerce and industry. The main urban areas are Tamworth, Burton-upon-Trent, Derby, Long Eaton and Loughborough. Where traditional architecture has been retained typical building materials are red brick and clay plain tile or Welsh slate. More significant buildings, structures and churches are commonly built from Triassic Sherwood Sandstone quarried from nearby sources – especially from the King's Mills area. The type of stone varies with location with Blue Lias Limestone and the hard igneous rocks of Charnwood often used in the Soar Valley. Some timber-framed buildings of the 17th century and earlier survive in parts of the inner Trent Valley and in urban cores.

Notable heritage assets include the causeway at Swarkestone, the ancient cave church near Ingleby, the Saxon crypt at Repton, the castle at Tamworth, the canals and associated Georgian architecture, the many fine churches and halls, and the highly innovative and influential 20th-century buildings of the Boots company at Beeston.

The rivers, their riparian zones and the semi-natural parts of the flood plain form the main habitats, providing migratory corridors and homes for many species including water vole, otter, redshank, kingfisher and grey heron. Flood

plain grazing marsh covers 11 per cent of the NCA, mainly concentrated beside the upper reaches of the rivers where soils tend to be naturally wet with low-to-moderate fertility.

Key wildlife sites include Attenborough Site of Special Scientific Interest (SSSI) which has an exceptional assemblage of breeding birds associated with open waters and their margins while numbers of wintering shoveler and bittern are nationally important. Lockington Marshes SSSI supports important invertebrate fauna including nationally scarce beetles and flies. The River Mease's international designation as a Special Area of Conservation is primarily for the presence of spined loach and bullhead fish. It is a relatively unspoilt, meandering lowland river and approximately 3 km of its 25 km total length flows within the Washlands before it joins the Trent. Boulton Moor SSSI is a key site of conserved Quaternary geodiversity.

There is very little open access land; however, the rivers, canals and network of flooded gravel pits provide some access and recreational opportunities on and off the water. The towpath of the Trent and Mersey Canal provides an unbroken linear route through most of the NCA while the Trent Valley Way is a long-distance footpath starting from near the river's source, passing through the Washlands, and on all the way to the Humber Estuary.



The view south from Weston-on-Trent churchyard across arable farmland to the River Trent and to the higher ground of the Melbourne Parklands.

The landscape through time

Geological processes have had a fundamental impact on the character of the Washlands today. Most of the bedrock is undifferentiated Triassic mudstones, siltstones and sandstones known as the Mercia Mudstone Formation, formed 248 to 206 million years ago in a hot desert environment. Other than at the edges where the landform rises, this bedrock is buried under deep deposits of alluvium (silt and clay) and sand and gravel, mainly deposited during the Late Quaternary (the last 500,000 years or so). During warm, interglacial phases of this period, the Trent would have flowed as a meandering channel through its flood plain, while during cold phases meltwater from glaciers and a lack of vegetation meant that it would have flowed in multiple braided channels, moving over a wide area and changing course frequently owing to floods and blockage by ice or debris, similar to the outwash plains seen in Alaska today.⁵ Eroded rocks, sand and gravel were washed down from melting glaciers and ice sheets forming terraces flanking the rivers, while overbank flooding events formed flood plain alluvium deposits of fine silt and clay. In places, glacial till, also known as diamicton or boulder clay, a mix of material ranging from fine silts to large stones, was formed under, and deposited by, ancient ice sheets that periodically covered the landscape. Within these deposits, fossil evidence of past landscapes and climates as well as archaeological evidence of early humans are often preserved, such as the woolly rhinoceros skeleton found among other ice-age fauna in a sand and gravel quarry near Alrewas in 2002 and hippopotamus remains found at Boulton Moor SSSI.

Humans have been active in the Trent Valley from the earliest times, the river being a major source of food and water as well as a boundary and a conduit for transportation and trade. The free-draining gravel terraces attracted settlement from Neolithic (4,000 bc to 2,500 bc) times and have retained cropmark and



The causeway at Swarkestone, dating from the 13th century.

earthwork remains such as the elongated ceremonial 'cursuses' and associated burial mounds found at Willington and Aston-on-Trent. A bronze-age barrow cemetery lies near Swarkestone while two log boats dating from 1500 bc were found in a gravel pit at Shardlow, one now being housed in Derby Museum. At Catholme are a cluster of settlement remains dating from the Neolithic through to the Anglo-Saxon period.

The Romans were active in the area, building settlements at Derby and near the confluence of the Trent and Soar, and a fort at Sawley. They also built roads: Ryknild Street, which the current A38 follows, and Watling Street, crossing the Washlands at Tamworth.

⁵ Stone Age Nottinghamshire, D Budge and C Robinson (2011)

Today's pattern of settlement and enclosure became established in Anglo-Saxon times, as place names indicate. Flood risk confined settlement to the gravel river terraces and to the rising ground at flood plain edges. Key sites developed near river crossing points, mainly fords before bridges were built. Tamworth was the principal royal and administrative centre of the Mercian kings⁶ and by 913 had become a key fortified border town from which Aethelflaed fought the Danes, while its castle was built following the Norman conquest. Christianity was first preached in the Midlands in 653 at Repton where the Mercian royal family were baptised and founded an abbey. A community of Christian hermits lived around the Anchorite cave church near Ingleby. The Vikings were active in the 9th and 10th centuries, using the Trent for transport, and destroyed Tamworth and sacked Repton in 874.

The area was substantially cleared of woodland by the 11th century. Its villages were also established by then, operating within a landscape of open-field agriculture and extensive pastures dictated by the seasonal flooding of the rivers. Burton-upon-Trent and Swarkestone were main crossing points of the Trent for hundreds of years. The present causeway at Swarkestone dates from the late 13th century. Hemington was also a key crossing point, where the remains of several medieval timber bridges have been found. After marching from Scotland in his attempt to reclaim the British throne, Bonnie Prince Charlie and his Jacobite army arrived at Swarkestone bridge in 1745, the southernmost place that they reached and from where they turned back.

Although enclosure had taken place before 1750 many open fields farmed from village-based farmsteads remained. Holdings were generally small and mixed, with stock fattening and dairying forming a significant part of farming income. Cheese making was particularly important. This mixed economy maintained numerous small village farms, as did a pattern of piecemeal enclosure which

left little room for the wholesale enclosure seen elsewhere in the east Midlands. Later enclosure prompted the amalgamation of farms and the development of some large-scale courtyard-plan red brick farmsteads. In some instances, especially to the north along the Derwent Valley, these enclosures retain the outline of furlongs of earlier common arable fields, and medieval ridge-and-furrow earthworks.

Water-powered mills such as at King's Mills were constructed for corn, paper and grinding of gypsum which was present in the Mercia Mudstones and mined at Aston-on-Trent. As coal power took over in the 18th and 19th centuries, the close proximity to the Nottinghamshire and Derbyshire coalfields together with the development of the canal, rail and road network led to the rapid growth of textile and engineering industries. The Trent and Mersey Canal was completed in 1777. Shardlow, at its start, developed into a busy port transferring freight between canal, river and road. Early settlement pattern became subsumed in the expansion of Derby, Nottingham, Tamworth and Burton-upon-Trent. Villages set on restricted gravel terraces in the flood plain tended to avoid expansion.

Stock fattening and dairying activities grew in relation to the demands of the developing urban centres in the 19th century and earlier farmsteads were rebuilt and new ones established to a variety of courtyard plans.

Attempts to restrain the natural dynamics of the River Trent and its tributaries to ease navigation and reduce flooding developed from the 18th century through the construction of flood banks and walls, weirs, channel deepening and canalisation. The River Soar became plaited together with sections of canal to form the Soar Navigation, part of the Grand Union Canal.

⁶ Tamworth Castle website (accessed 12 April 2013)

The availability of suitable water from the gypsum-rich bedrock led to the rapid growth of the Burton-upon-Trent brewing industry. At its height in the 19th century, 31 breweries were located in the town. Production of Marmite using brewing by-products started in 1902 while making of a new pickle commenced at nearby Branston in 1922.

As post-Second World War agricultural productivity soared, the better-drained terraces of the Washlands were developed for modern arable farming with a consequent amalgamation of fields and loss of hedgerows, semi-natural habitats and remnant ridge and furrow. Wetland habitats were lost through the deepening of the rivers by dredging, draining adjacent land.

Nearby coalfields and the availability of large quantities of water for cooling made the Trent a prime location for electricity generation with several coal-fired power stations being constructed. With greater use of gas for energy generation, stations at Castle Donington, Hams Hall and Drakelow were demolished while at Willington the cooling towers remain as of 2013.

Sand and gravel deposits were extensively exploited in the 20th century to provide construction materials. The second half of the century saw the massive development and upgrading of the road network with the dualling of the A38 and the A52 and the building of the M1. Road building has continued in recent years with the opening of the A50 in 1998, and the widening of the A453 commenced in 2013. Pressure to accommodate further industry, transport and urban development continues.



Canal warehouse built in 1780 at Shardlow.

Ecosystem services

The Trent Valley Washlands 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 Trent Valley Washlands NCA is contained in the 'Analysis' section of this document.

Provisioning services (food, fibre and water supply)

- **Food provision:** While land in agricultural use adds up to around a third of the total area and loss of agricultural land to built development and sand and gravel extraction has been significant, food provision is still an important ecosystem service, with the area's generally fertile and versatile soils having supported a diversity of farming over a long period of time. Modern agricultural improvements, particularly to benefit arable crop production, have, however, impacted on other ecosystem services and the natural elements that underpin food provision.
- **Water availability:** The rivers, watercourses and waterbodies are important water sources for the area, providing large amounts of water for public consumption (both inside and outside the NCA), energy generation, agriculture, industry and recreation as well as supporting wetland habitats and biodiversity. The Sherwood Sandstone aquifer partly extends under the area and is used by the brewing industry in Burton-upon-Trent.

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

- **Regulating water quality:** The sheer amount of water that passes through the Washlands and its importance for biodiversity, human consumption and



The River Trent near Attenborough.

recreation means that regulation of water quality is a key ecosystem service. The areas of pasture, woodland, wetland and other semi-natural habitats help to intercept, filter and purify water before it enters the watercourses but, despite this, the water quality of the rivers is in need of improvement with the main factors affecting quality including diffuse pollution from urban areas and agricultural sources and point source discharges from sewage treatment works.

- **Regulating water flow:** The Washlands get their name from their natural flood plain function which regulates the flow of the rivers downstream by temporary inundation of surrounding land, enabling in-situ storage and infiltration of excess water. Riparian vegetation, hedgerows and semi-natural flood plain habitats help to attenuate the flood flows.

Natural washland function is constrained in many places by a range of engineered solutions to flood risk, including levees, deepened channels and flood walls. While these reduce the risk of flooding locally they also reduce levels of in-situ storage and infiltration, increasing flows and potentially causing greater risk of flooding downstream. A key challenge for the area is how to maximise the Washlands' important function in the regulation of water flow while addressing flood risk to land and property within the area.

Cultural services (inspiration, education and wellbeing)

- **Sense of history:** Sense of history is engrained in this landscape through ancient earthworks, geodiversity and the ancient remains found in gravel workings, early Christian sites, Swarkestone Causeway, Tamworth Castle and the scattered historic houses and parkland, and also by historic settlement and the older buildings of the villages with their traditional vernacular architecture and historical sandstone churches, the towers and spires of which often form landmarks. In some pastoral areas, especially beside the rivers, a sense of permanence and history is lent by the mature hedgerows, old willow pollards, permanent pasture with palaeo-channels and ridge and furrow, and the relative tranquillity. A sense of industrial history is provided by the canal architecture throughout the area and the 19th-century brick and slate houses and brick and stone public buildings of the main settlements.

Despite this rich past, in many places the sense of history and place is challenged by an evolving contemporary landscape of major roads, active and former sand and gravel workings, modern commercial agriculture, indistinctive prominent commercial, industrial and distribution developments and dominant electricity pylons.

- **Recreation:** The Washlands are a location of easy access for large numbers of people. The watercourses, flood plains and some of the large number of



Scale of charges from the old Cavendish Bridge, washed away in 1947.

waterbodies created from sand and gravel extraction provide a major recreational resource, offering a range of opportunities including boating, watersports, fishing, walking, and informal recreation and experiencing wildlife. The canal towpaths provide extensive walking, cycling and informal recreation opportunities. Cycling opportunities are also provided by National Cycle Network routes and the network of minor roads. The National Forest and various partnership initiatives seek landscape and biodiversity enhancements and promote recreation and access in the area. Visitor attractions include Drayton Manor theme park, the National Memorial Arboretum and the recreational provisions of the urban centres.

The area's local green spaces (country parks and Local Nature Reserves) offer people a number of opportunities to get involved in order to increase their understanding and enjoyment of the natural environment, while also valuing the contribution it makes to their health and wellbeing.

- **Biodiversity:** The most extensive priority habitat is flood plain grazing marsh, covering 11 per cent of the area. This, along with the rivers, their riparian zones and other wetland habitats, provides the main biodiversity resource; however, many natural river processes and habitats have been lost.

The 3 km, 2.7 ha stretch of the River Mease within the Washlands is of international importance for biodiversity, the whole river being designated a Special Area of Conservation. It supports populations of spined loach and bullhead fish, as well as white-clawed crayfish and otter.

The farmed environment includes ditches, hedgerows, copses and field margins dispersed through the landscape and providing ecological links and habitats for farmland species. Agricultural intensification coupled with urban development and the widespread transport infrastructure means that semi-natural habitats are scarce and fragmented, especially outside the flood plains.

Gravel extraction has also led to the loss and fragmentation of semi-natural habitats such as riparian scrub and meadows; however, through high-quality restoration schemes it has enabled new wetland habitat sites to be created which were once more widespread in the Washlands.

- **Geodiversity:** While the landform of the Washlands expresses the link to the underlying geology at its borders where the land rises, it is the landforms and deposits associated with river and glacial activity that are the key geological



Holme Pit SSSI and adjacent broad-leaved woodland on the steep slope of the Mercia Mudstones at the edge of the Trent flood plain.

features. These glacial, interglacial and post-glacial deposits contain remains of past fauna and flora and enable research into the past climatic and environmental conditions of the region and the geographic evolution of the Trent Valley as well as potentially providing insights into the impacts of future climate change.

Sand and gravel extraction for the construction industry continues, especially within the Trent Valley with reserves among the greatest in the country. The large number of open water lagoons is a legacy of the demand for this resource.

Sherwood Sandstone hewn from bedrock geology in places on the edge of the NCA features widely as a building material in the churches and more substantial buildings. In the Soar Valley limestone and igneous building stone from bordering areas add geodiversity interest.

Statements of Environmental Opportunity

SEO 1: Carefully plan and manage new development within the NCA to ensure that landscape character and ecosystem services are strengthened, that heritage features, wildlife habitats, woodland and the hedgerow network are enhanced, and that opportunities for creation of multifunctional green infrastructure are realised so that this landscape is resilient to the forces of change that it is experiencing.

For example by:

- Meeting the challenge of integrating development while enhancing the character of the Washlands, informed by local partnership visions and master planning.
- Working with planning authorities and developers to ensure that the natural environment is enhanced and not just mitigated through new development.
- Maximising planning gain from new development for the benefit of the natural environment and ensuring that section 106 agreements are aligned with the objectives of landscape planning and enhancement initiatives.
- Working with the sand and gravel industry and local authorities to ensure that restoration plans are of a high quality so that biodiversity, geodiversity, landscape, access and recreation, water flow and water quality enhancements are maximised and operations are well located so that damage to archaeology and existing habitats is minimised.
- Locating new built development within existing settlements and avoiding the valley floors and bordering slopes, and ensuring that the location, form and design of new development are guided by landscape character assessment objectives, village design guidance and design briefs and consideration of local architectural styles and materials.
- Raising the design quality and appearance of new and existing development, including that of large shed-type warehouses, to avoid indistinctiveness and visual intrusion and to seek high-quality design such as that of the listed Boots buildings, along with blending into the landscape through the use of, for example, tree planting, earthworks and green roofs.
- Ensuring that new development is built to high environmental standards, including routine use of sustainable drainage schemes to increase the capacity of water provision and regulation services and the incorporation of green infrastructure.
- Planning a landscape that is more resilient to development pressures and change, using woodland to screen existing negative industrial, urban and infrastructural influences such as peri-urbanisation and major roads and incorporate new development into the landscape.
- Planning for appropriate woodland planting around settlement fringes to help to integrate new and existing modern development into the landscape while combining it with the development of green infrastructure, biomass, carbon storage and water flow and quality regulation.
- Developing recreational resources compatible with landscape, health and environmental objectives such as the creation of circular footpaths, bridleways and cycle paths that link with public transport and local communities. **Continued over...**

SEO 1: continued...

- Providing improved information about access opportunities to local residents, workers and visitors to increase people's understanding and enjoyment.
- Offering local communities the opportunity to enjoy and take action to improve their local green spaces, for example by setting up 'friends of' groups.

SEO 2: Manage and enhance the Trent Valley Washlands' river and flood plain landscape to combine its essential provision and regulation of water role with landscape enhancement, nature conservation, climate regulation, farming, recreation and a resource for understanding geodiversity.

For example by:

- Reconnecting rivers with their flood plains, making space for the action of natural processes to increase flood resilience and the capacity to adapt to climate change.
- Enhancing the mosaic of wetland and flood plain habitats, especially those alongside watercourses and including those along urban river corridors, by linking and extending existing habitats, including the interconnection of waterbodies, to improve landscape character, attenuate flood flows, improve water quality and increase their recreational value.
- Protecting and enhancing the traditional pastoral landscape of the flood plains to benefit the water flow and quality regulation value of the Washlands through means such as the targeting of agri-environment grants and putting land in trust for future generations to appreciate.
- Improving the climate regulation role of the flood plains through expanding areas of native woodland and semi-natural habitats such as reedbeds and other wetland habitats, which lead to the deposition of organic matter.
- Protecting and enhancing belts of trees and riparian habitats that demarcate watercourses. Scoping and implementing opportunities to create new native woodland including possible creation at former sand and gravel extraction sites to improve landscape character and water quality and attenuate flood flows.
- Enhancing the hedgerow and tree cover network and creating new habitat areas to increase infiltration and groundwater levels by regulating water flow across the landscape.
- Adapting existing drainage schemes and planning for new sustainable drainage schemes to incorporate habitats and green infrastructure in order to boost water infiltration rates so as to help to maintain river levels and water quality, and also reducing abstraction needs through harvesting and storage of rainwater in situ.
- Reducing agricultural chemical inputs to minimise risk to water quality, for example through use of crops with low fertiliser and pesticide requirements, conversion of arable to pasture, and the use of appropriate organic farming principles.

Continued over...

SEO 2: continued...

- Maximising opportunities to sustainably use wetland habitats for food provision such as flood plain grazing marsh for cattle grazing, while conserving significant heritage features such as watermeadow systems and archaeological deposits.
- Exploring the potential for growing of biomass crops and native woodland where appropriate with the reinstatement of active flood plains as well as opportunities for grassland harvesting to produce biogas.
- Promoting interpretation of the biodiversity, archaeology and geodiversity interest of the River Trent and its tributaries, their evolution and the sand and gravel deposits, including the promotion of appropriate recreational activities.
- Maximising opportunities to enhance green infrastructure along urban river corridors, including optimising the route of the Trent Valley Way and other multi-use trails to improve the network and provide a better recreational offer.
- Working with the National Forest to maximise native woodland and tree planting opportunities, where appropriate, as well as the creation and management of other habitats and green infrastructure within the forest area, while conserving and integrating heritage assets within new schemes.
- Controlling non-native invasive species.



View over Loughborough towards Ratcliffe-on-Soar power station.

SEO 3: Protect, manage and enhance the pastoral landscape of the Trent Valley Washlands, seeking to join up and expand areas of pasture and associated attributes and habitats, to preserve heritage features, enhance biodiversity and geodiversity, protect farmland and provide additional recreational opportunities.

For example by:

- Protecting existing pasture from fragmentation and loss to other uses such as arable cropping, development and gravel extraction, particularly riverside meadows and those with historical and geomorphological features and remains.
 - Re-creating more permanent grassland, especially in the flood plains, to join up with other pasture and restore the characteristic secluded 'meadow' landscapes along the riversides as well as to benefit the management of water resources in the Washlands.
 - Converting arable land use to pasture such as marginal arable land prone to flood damage where pasture and livestock production would be a better use of the land, in order to enhance landscape character and strengthen ecosystem services, including raising soil organic carbon content.
 - Sustainably using wetland habitats for food provision such as flood plain grazing marsh for cattle grazing.
 - Protecting the key characteristics of the riverside pastures such as scattered riverside trees, wet grassland and the diverse range of riparian habitats, meandering river channels, wet ditches and small streams, and expanding and linking habitats together to enhance biodiversity and recreational opportunities.
 - Reinstating traditional management of the pastoral riverside landscape to enhance the sense of history, including willow pollarding along traditional boundaries, planting of black poplar and management of withy beds.
- Maximising take-up of agri-environment schemes and other initiatives which lead to the enhancement of the landscape and ecosystem function, and seeking to build on existing habitats to create wider networks.
 - Protecting the relative tranquility of parts of the flood plain from further intrusion by urban and industrial influences.



Pastoral landscape at Middleton Pool SSSI.

SEO 4: Protect and enhance the historic environment of the Trent Valley Washlands and their characteristic historic landscape. Increase awareness of the richness of this resource, protect it from neglect and physical damage, and ensure that future development complements and enhances the sense of history of the NCA.

For example by:

- Protecting sense of history in the landscape from inappropriate development including that which adversely affects the setting of historic features.
- Enhancing sense of history through native woodland screen planting of existing indistinctive development influences on the landscape, where appropriate, and promoting the highest standards of design quality and appearance of new development, ensuring that it is sensitively located and integrated with the landscape.
- Protecting archaeological remains and geomorphological features from mineral extraction by influencing the siting of workings, and in all workings ensuring that opportunities to document record and interpret features and remains are maximised. While much is recorded or sometimes retrieved through excavations, permanent loss of features and the historical environment inevitably results.
- Restoring and managing hedgerows where they have been lost, to strengthen the historical field patterns, improve wildlife networks and enhance landscape character, especially important historic hedgerows such as the sinuous boundaries where mixed-species hedgerows define the flood plain and areas of earlier enclosure.
- Positively managing and enhancing the distinctive historic landscapes, such as historic parklands and some pastoral areas, as well as protecting the many Listed Buildings and Scheduled Monuments while promoting public awareness, accessibility and recreational value.
- Conserving and enhancing heritage features that tell the story of the working past of the rivers and canals of the Washlands and raising public awareness of this history.
- Retaining and enhancing the historic settlement pattern and local architectural character through informed planning and development control based on an understanding of local character, and using this to inspire and influence any new built development.
- Reducing cultivation damage to archaeology and geodiversity by encouraging best practice such as direct drilling and shallow tilling, and also seeking opportunities to protect archaeology through reversion of arable land to pasture.
- Promoting wider awareness of the historic environment to encourage its enjoyment, understanding and protection and, where possible, providing improved public access to sites of historic interest.

Supporting document 1: Key facts and data

Total area: 39,376 ha

1. Landscape and nature conservation designations

There are no National Parks or Areas of Outstanding Natural Beauty in the Trent Valley Washlands NCA.

Source: Natural England (2011)

1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

Tier	Designation	Name	Area (ha)	% of NCA
International	n/a	n/a	0	0
European	Special Protection Area (SPA)	n/a	0	0
	Special Area of Conservation (SAC)	River Mease SAC	3	<1
National	National Nature Reserve (NNR)	n/a	0	0
National	Site of Special Scientific Interest (SSSI)	A total of 14 sites wholly or partly within the NCA	412	3

Source: Natural England (2011)

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

The Trent Valley Washlands only has one area of overlap and that is the River Mease SAC (3 ha) which is also a SSSI.

There are 244 local sites in Trent Valley Washlands NCA covering 2,749 ha or 7 per cent of the NCA.

Source: Natural England (2011)



Middleton Pool SSSI.

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

1.1.1 Condition of designated sites

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

SSSI condition category	Area (ha)	% of SSSI land in category condition
Unfavourable declining	2	<1
Favourable	148	36
Unfavourable no change	35	9
Unfavourable recovering	223	55

Source: Natural England (March 2011)

Details of SSSI condition can be searched at:

<http://www.sssi.naturalengland.org.uk/Special/sssi/reportIndex.cfm>

2. Landform, geology and soils

2.1 Elevation

The lowest point in the Washlands stands at 21 m, the highest point is 99 m. The mean average elevation is 48 m.

Source: Natural England 2010

2.2 Landform and process

The Trent Valley Washlands NCA is a distinct linear landscape. Within its main section between Burton-upon-Trent and Nottingham the Washlands are defined on the northern side by a gradual rise from the flood plain up to the Needwood and South Derbyshire Claylands and the Nottinghamshire, Derbyshire and Yorkshire Coalfield NCAs. On the southern side, where the Washlands abut The Melbourne Parklands, The Leicestershire and Nottinghamshire Wolds and the Trent and Belvoir Vales NCAs, there is generally a more abrupt transition

Source: Trent Valley Washlands Countryside Character Area Description

2.3 Bedrock geology

The underlying rocks are predominantly the mudstones, siltstones and sandstones of the Triassic Mercia Mudstone formation. The Washlands are closely defined by the rise in land at the edges, formed principally of the Mercia Mudstones and other rocks of Triassic age.

Source: Trent Valley Washlands Countryside Character Area Description, Geological Narrative West Midlands Geodiversity Partnership

2.4 Superficial deposits

Most of the Washlands bedrock is overlain by a variety of fluvio-glacial, periglacial and river deposits mostly sands and gravels and alluvium.

Source: Trent Valley Washlands Countryside Character Area Description, Geological Narrative, West Midlands Geodiversity Partnership

2.5 Designated geological sites

Designation	Number of sites
Geological Site of Special Scientific Interest (SSSI)	1
Mixed interest SSSI	0

There are 8 Local Geological Sites within the NCA.

Source: Natural England (2011)

■ Details of individual Sites of Special Scientific Interest can be searched at:

<http://www.sssi.naturalengland.org.uk/Special/sssi/search.cfm>

2.6 Soils and Agricultural Land Classification

On the gravel terraces soils tend to be freely draining loams whereas in the flood plains the soils tend to be heavier loams naturally wet or subject to frequent flooding. The variations in the soils, and slight elevations above the flood levels and poorly draining clays, have determined both agricultural activity and settlement.

Source: Trent Valley Washlands Countryside Character Area Description

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

Agricultural Land Classification	Area (ha)	% of NCA
Grade 1	0	0
Grade 2	4,734	12
Grade 3	18,136	46
Grade 4	8,053	21
Grade 5	0	0
Non-agricultural	1,677	4
Urban	6,776	17

Source: Natural England (2010)

Maps showing locations of Statutory sites can be found at:

<http://magic.defra.gov.uk/website/magic/> – select 'Landscape' (shows ALC classification and 27 types of soils)

3. Key water bodies and catchments

3.1 Major rivers/canals

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

Name	Length (km)
River Trent	67
Trent and Mersey Canal	40
River Tame	32
River Soar	32
River Derwent	20
River Dove	9
River Erewash	5

Name	Length (km)
River Wreake	4
River Mease	3
River Blythe	2
River Anker/Cole	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 River Trent passes through the middle reaches and is joined by a number of major rivers through this stretch of the Washlands. The Dove flows in from the west, the Derwent and the Erewash flow in from the north while the Tame and the Soar flow in from the south.

3.2 Water quality

The total area of Nitrate Vulnerable Zone is 39,376 ha, or 100 per cent of the NCA.

Source: Natural England (2010)

3.3 Water Framework Directive

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

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

4. Trees and woodlands

4.1 Total woodland cover

The NCA contains 1,719 ha of woodland (4 per cent of the total area), of which 75 ha is ancient woodland. The Greenwood Community Forest, one of twelve Community Forests established to demonstrate the contribution of environmental improvement to economic and social regeneration, covers 501 ha of this NCA, which is less than 1 per cent of the area. The National Forest covers 4,966 ha, or 13 per cent of the area.

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

4.2 Distribution and size of woodland and trees in the landscape

There is limited tree cover, but with local concentrations such as around settlements, on boundary steep slopes, in parklands, along watercourses and around former gravel extraction sites that gives the impression of a well-timbered landscape in many places. Riparian trees, especially willows, provide an important component.

Source: Trent Valley and Rises Natural Area Profile, Trent Valley Washlands Countryside Character Area Description

4.3 Woodland types

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

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

Woodland type	Area (ha)	% of NCA
Broadleaved	1,471	4
Coniferous	69	<1
Mixed	44	<1
Other	135	<1

Source: Forestry Commission (2011)

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

Woodland type	Area (ha)	% of NCA
Ancient semi-natural woodland	75	<1
Ancient re-planted woodland (PAWS)	33	<1

Source: Natural England (2004)

5. Boundary features and patterns

5.1 Boundary features

On the gravel terraces and on higher ground where arable crops tend to be grown, hedgerows tend to be low and tightly trimmed with few hedgerow trees. In the lower-lying and wetter areas and around the villages where pastoral farmland is more common, hedgerows tend to be fuller and thicker with more hedgerow trees.

Source: Trent Valley Washlands Countryside Character Area description; Countryside Quality Counts (2003)

5.2 Field patterns

Field size tends to be large where arable crops are grown and smaller in areas of pasture.

Source: Trent Valley Washlands Countryside Character Area description; Countryside Quality Counts (2003)

6. Agriculture

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

The total farmed area is 14,990 ha, in 2009 consisting of a total of 247 holdings; a reduction by 41 holdings since 2000. All figures below relate to 2009 unless otherwise stated.

6.1 Farm type

The landscape's mixed farming character is supported by figures on farm type; 61 cereal holdings (25 per cent) and 55 lowland grazing holdings (22 per cent). Survey data from 2000 to 2009 show no change in the number of cereal farms, while lowland grazing decreased by 4 per cent (a reduction of 2 holdings).

Source: Agricultural Census, Defra (2010)

6.2 Farm size

Farms between 5 ha and 20 ha are the most common farm size, accounting for 75 units, but they only cover 6 per cent of the total farmed area. Holdings between 20 ha and 50 ha are the second most common farm size with 55 units, which only account for 12 per cent of the farmed area. Farms with land holding over 100 ha account for 58 per cent of the total farmed area, but only account for 46 units.

Source: Agricultural Census, Defra (2010)

6.3 Farm ownership

2009: Total farm area = 14,990 ha; owned land = 9,693 ha

2000: Total farm area = 18,098 ha; owned land = 10,849 ha

Source: Agricultural Census, Defra (2010)

6.4 Land use

Forty-one per cent of the farmed area is grass and uncropped land (6,179 ha). Cereal crops covers 4,983 ha (33 per cent) – the second most prevalent land use. Between 2000 and 2009, there was a 73 per cent (329 ha) decrease in the area farmed for vegetables. Cash root crops also decreased by 36 per cent (294 ha). The areas farmed for oilseeds increased by 21 per cent (331 ha) up to 1,576 ha.

Source: Agricultural Census, Defra (2010)

6.5 Livestock numbers

Sheep are the most numerous livestock within this landscape (a total of 9,000 animals), followed by cattle (7,700) and 3,400 pigs. The area of grassland, between

2000 and 2009, declined by 1,081 ha or 15 per cent. There was an overall decline in all livestock figures between 2000 and 2009; the largest decline was in pigs (5,300 or 61 per cent). The decline in cattle numbers (4,000 or 34 per cent) was the next largest decline followed by sheep (2,200 or 20 per cent).

Source: Agricultural Census, Defra (2010)

6.6 Farm labour

The figures suggest that the largest number of holdings are managed by owner farmers (323), followed by those with full-time managers/farmers (22).

Source: Agricultural Census, Defra (2010)

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

7. Key habitats and species

7.1 Habitat distribution/coverage

The River Trent (and its tributaries) is the main feature within the Washlands. The river is a significant migratory corridor for a range of waders and wildfowl and provides permanent habitat for species such as kingfisher and heron. Evidence of water vole and otters has been found at various points of the river course and its tributaries. Wet flood plain grasslands support some of the richest wildlife, and are important for breeding birds such as the redshank. Wet woodland is another characteristic feature along the rivers, dominant species including willow and ash. In addition the NCA contains important arable habitats.

Source: Trent Valley and Rises Natural Area Profile

7.2 Priority habitats

The Government's new strategy for biodiversity in England, Biodiversity 2020, replaces the previous Biodiversity Action Plan (BAP) led approach. Priority habitats and species are identified in Biodiversity 2020, but references to

BAP priority habitats and species, and previous national targets have been removed. Biodiversity Action Plans remain a useful source of guidance and information. More information about Biodiversity 2020 can be found at; www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/englandsbiodiversitystrategy2011.aspx.

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

Priority habitat	Area (ha)	% of NCA
Coastal and flood plain grazing marsh	4,231	11
Broadleaved mixed and yew woodland (broad habitat)	584	2
Fens	189	<1
Reedbeds	135	<1
Lowland meadows	125	<1
Purple moor grass and rush pasture	4	<1

Source: Natural England (2011)

- Maps showing locations of Priority Habitats are available at: <http://magic.defra.gov.uk/website/magic/> – select ‘Habitat Inventories’

7.3 Key species and assemblages of species

- Maps showing locations of Priority Habitats are available at: <http://magic.defra.gov.uk/website/magic/> – select ‘Habitat Inventories’
- Maps showing locations of S41 species are available at: <http://data.nbn.org.uk/>

8. Settlement and development patterns

8.1 Settlement pattern

There are few settlements actually on the low-lying flood plains within the Washlands. Geology has had a significant influence on the settlement patterns, with settlements being developed on land which has good drainage, overlooking the Washlands, such as Newton Solney, Winshill and Repton for example.

This pattern of settlement is particularly clear along the edge of the valley floor of the Soar, where Degworth, Hathern, Stanford, Normanton and Ratcliffe-upon-Soar are all on slightly higher land.

The villages are compact and nucleated, but the larger towns have expanded rapidly in the 20th century and have sprawled out across the valleys with a mix of housing, commerce and industry, as is the case at Derby, Burton-upon-Trent, Loughborough, Tamworth and Long Eaton.

Transport routes are a major feature of the valleys. Along the Trent, the roads, railway, canal and river are in effect ‘plaited’ together as they follow the valley, while the A38 and A6 follow the Tame and Soar valleys respectively.

Several main roads cut across the valleys such as the M1, M42 and A5.

Source: Trent Valley Washlands Countryside Character Area description; Countryside Quality Counts (2003)

8.2 Main settlements

The main settlements within the NCA are; Derby, Loughborough, Tamworth, Burton-Upon-Trent and Long Eaton. The total estimated population for this NCA (derived from ONS 2001 census data) is: 327,403.

Source: Trent Valley Washlands Countryside Character Area description; Countryside Quality Counts (2003)

8.3 Local vernacular and building materials

Red brick and plain clay tiles are the typical building material in this area. Sandstone or other stones have been imported for building major structures such as churches.

Source: Trent Valley Washlands Countryside Character Area description; Countryside Quality Counts (2003)

9. Key historic sites and features

9.1 Origin of historic features

Evidence of Anglo-Saxon cemeteries has been found along the Trent Valley dating from the 5th and 6th centuries. The castle at Tamworth was built following the Norman Conquest. Shardlow, now a large village, was once a busy terminal port where the Trent and Mersey Canal joins the River Trent. Local coalfields of Derbyshire and Nottinghamshire, together with the transport network of canals and railways led to the rapid growth of the textile and engineering industries in the 18th and 19th centuries. This growth influenced settlements within the Washlands. The quantity of water available and the plentiful supply of coal led to the construction of several coal-fired power stations along the rivers; most have since been demolished. Ratcliffe-upon-Soar is the only one currently in operation. A new gas-fired power station is planned at Willington and the remaining cooling towers will be demolished.

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

9.2 Designated historic assets

This NCA has the following historic designations:

- 6 Registered Parks and Gardens covering 184 ha
- No Registered Battlefields
- 63 Scheduled Monuments
- 1,179 Listed Buildings

Source: Natural England (2010)



The Grade I listed Church of St Mary, Weston-on-Trent dates from the 13th century.

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

- Two per cent of the NCA, 909 ha, is classified as being publically accessible.
- There are 502 km of public rights of way at a density of 1.3 km per km².
- There are no National Trails within the NCA.

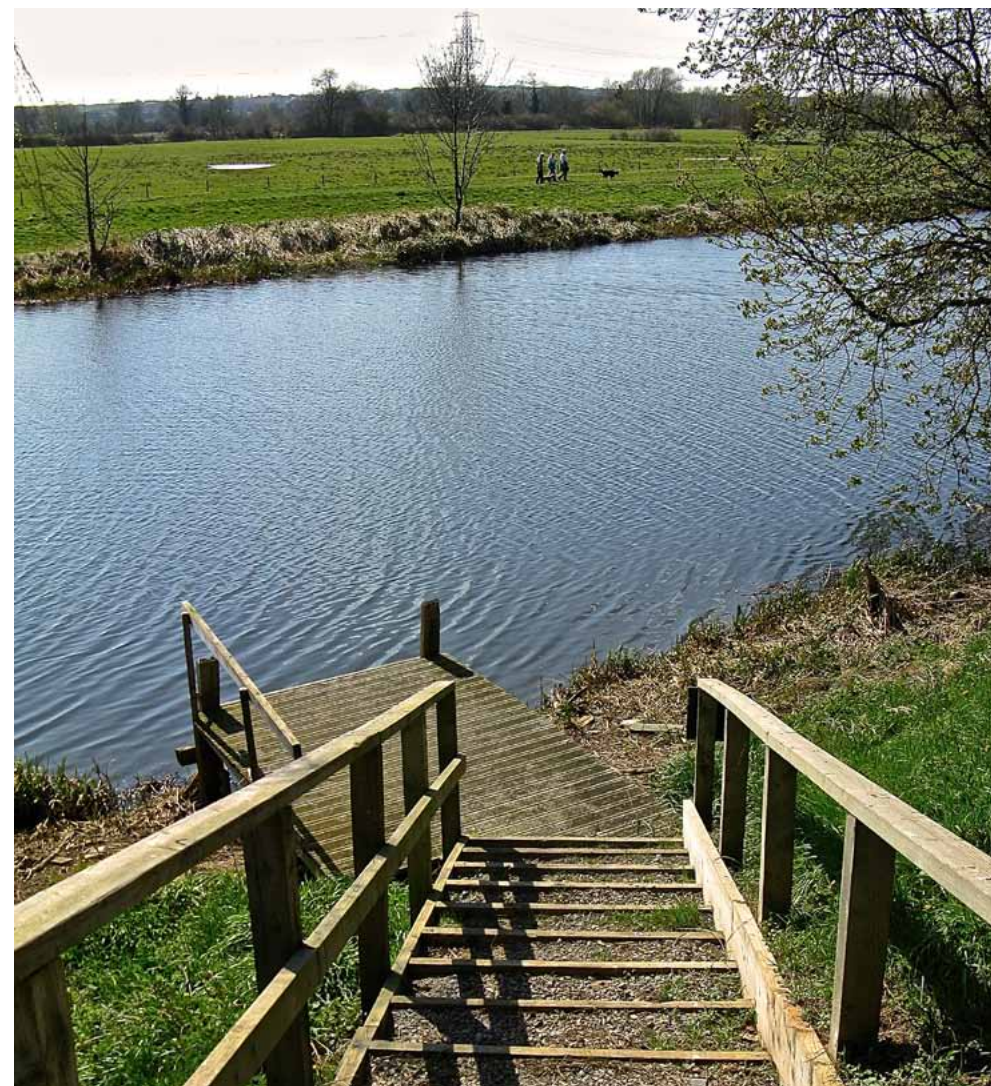
Sources: Natural England (2010)

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

Access designation	Area (ha)	% of NCA
National Trust (Accessible all year)	0	0
Common Land	60	<1
Country Parks	382	1
CROW Access Land (Section 4 and 16)	72	<1
CROW Section 15	66	<1
Village Greens	5	<1
Doorstep Greens	0	0
Forestry Commission Walkers Welcome Grants	69	<1
Local Nature Reserves (LNR)	128	<1
Millennium Greens	2	<1
Accessible National Nature Reserves (NNR)	0	0
Agri-environment Scheme Access	29	<1
Woods for People	545	1

Sources: Natural England (2011)

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



The River Soar at Normanton-on-Soar.

11. Experiential qualities

11.1 Tranquillity

Based on the CPRE map of tranquillity (2006) the least tranquil areas are found around the urban areas of Derby, Loughborough, Tamworth, Burton-upon-Trent and Long Eaton. This NCA is in one of the least tranquil areas of the country.

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

Tranquillity	Tranquillity Score
Highest value within NCA	21
Lowest value within NCA	-94
Mean value within NCA	-26

Sources: CPRE (2006)

More information is available at the following address:

<http://www.cpre.org.uk/what-we-do/countryside/tranquil-places/in-depth/item/1688-how-we-mapped-tranquillity>

11.2 Intrusion

The 2007 Intrusion Map (CPRE) shows the extent to which rural landscapes are 'intruded on' from urban development, noise (primarily traffic noise), and other sources of visual and auditory intrusion. This shows that this is a very disturbed area especially across the valley floor and along the numerous major roads such as the M42, M1, A38, A52. A breakdown of intrusion values for this NCA is detailed in the table below.

A breakdown of intrusion values for this NCA is detailed in the table overleaf.

Intrusion category	1960s (%)	1990s (%)	2007 (%)	Percentage change (1960s-2007)
Disturbed	63	80	75	12
Undisturbed	24	6	5	-19
Urban	13	13	20	7

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are an overall increase in the area of disturbed land, and a further decrease in the amount of land considered as being undisturbed.

More information is available at the following address:

<http://www.cpre.org.uk/resources/countryside/tranquil-places>

12 Data sources

- British Geological Survey (2006)
- Natural Area Profiles, Natural England (published by English Nature 1993-1998)
- Countryside Character Descriptions, Natural England (regional volumes published by Countryside Commission/Countryside Agency 1998/1999)
- Joint Character Area GIS boundaries, Natural England (data created 2001)
- National Parks and AONBs GIS boundaries, Natural England (2006)
- Heritage Coast Boundaries, Natural England (2006)
- Agricultural Census June Survey, Defra (2000,2009)
- National Inventory of Woodland & Trees, Forestry Commission (2003)
- Countryside Quality Counts Draft Historic Profiles, English Heritage (2004)*
- Ancient Woodland Inventory, Natural England (2003)
- Priority Habitats GIS data, Natural England (March 2011)
- Special Areas of Conservation data, Natural England (data accessed in March 2011)

- Special Protection Areas data, Natural England (data accessed in March 2011)
- Ramsar sites data, Natural England (data accessed in March 2011)
- Sites of Special Scientific Interest, Natural England (data accessed in March 2011)
- Detailed River Network, Environment Agency (2008)
- Source protection zones, Environment Agency (2005)
- Registered Common Land GIS data, Natural England (2004)
- Open Country GIS data, Natural England (2004)
- Public Rights of Way Density, Defra (2011)
- National Trails, Natural England (2006)
- National Tranquillity Mapping data, CPRE (2007)
- Intrusion map data, CPRE (2007)
- Registered Battlefields, English Heritage (2005)
- Record of Scheduled Monuments, English Heritage (2006)
- Registered Parks and Gardens, English Heritage (2006)
- World Heritage Sites, English Heritage (2006)
- Incorporates Historic Landscape Characterisation and work for preliminary Historic Farmstead Character Statements (English Heritage/Countryside Agency 2006)Detailed River Network, Environment Agency (2008)

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

Supporting document 2: Landscape change

Recent changes and trends

Trees and woodlands

- Total cover of woodlands over 2 ha in 1999 was 861 ha or 2 per cent of total NCA area. Figures for 2011 show that cover stood at 1,719 ha, 4 per cent of total area (partly due to greater accuracy in recording of woodland).
- The National Forest extends into the NCA from Burton-upon-Trent to Alrewas covering 13 per cent of the area. Farmland landscapes are changing as new woodlands establish.
- Between 1999 and 2003, 334 ha were approved for new planting under Woodland Grant Scheme agreements, much of this in the National Forest.
- Woodland planting has become established around former gravel workings.
- Landscaping associated with recent major road schemes such as the A50 upgrade, completed in the late 1990s, has introduced new tree cover.

Boundary features

- Intensification of arable cropping has created more open landscapes where traditional hedgerow pattern has weakened through removal and poor management of hedgerows.
- Assessment of hedgerows between 1999 and 2003 concluded that overall, the hedgerow resource of the NCA had probably been neglected.

- While the estimated boundary length for the NCA in 2004 was around 1,953 km, only 10 km of hedgerows were under hedgerow management agri-environment scheme agreements between 1999 and 2003.
- Management of hedgerows has improved in recent years with 89 km under agri-environment scheme hedgerow management and maintenance agreements as of January 2013. Hedgerows have also become fuller due to the single payment scheme which requires no cultivation within 2 m of their centre.
- Planting and restoration of hedgerows remains very limited. Between 1999 and 2003 only 31 km were planted and/or restored under agri-environment agreements and between 2006 and January 2013 it was less than 6 km.

Agriculture

- Countryside Quality Counts assessment between 1999 and 2003 concluded that landscape changes through agricultural change were diverging from the character of the area.
- This concluded that grassland area was declining and there was a loss of mixed and general cropping and, while agri-environment scheme uptake was above national average, with some enhancement of grassland habitats, overall agricultural character was continuing to weaken.
- This assessment also found that loss of agricultural land, especially permanent grassland and arable, as a result of built development on the Trent gravel terraces and through sand and gravel extraction, had been significant.

- Between 2000 and 2009 there were decreases in total farmed area from 18,098 ha to 14,990 ha, a decrease in the area of crops from 10,135 ha to 8,107 ha and a decrease in grass and uncropped land from 7,260 ha to 6,179 ha. There were declines in all livestock figures: pigs by 61 per cent, cattle by 34 per cent and sheep by 20 per cent.
- Decreases in farm labour also took place during the period with overall labour decreasing from 671 to 585 and the number of principal farmers dropping from 383 to 323.
- Other observable trends included:
 - More temporary grassland and less permanent pasture.
 - Riparian vegetation not as well managed as it used to be, becoming taller and more prominent due to less livestock to keep it in check. Willows tended to be left to grow or were removed rather than coppiced as previously.
 - Mixed farm holdings declined with an increasing polarisation to all livestock or all arable holdings.

Settlement and development

- Countryside Quality Counts assessment between 1999 and 2003 concluded that landscape changes through development had a profound impact on the area with character eroded and distinctive qualities being lost.
- This concluded that there had been a high rate of change from rural to urban land use with the area ranked sixth nationally despite about one quarter of the area identified as greenbelt land. Major road upgrading (A50) and significant expansion of commercial development on greenfield sites along its axis and along the A38 south of Burton-upon-Trent had taken place. Also expansion of urban fringe areas into peri-urban was evident around Derby.



The A50, opened in 1998.

- Similar recent peri-urban warehouse development is apparent beside the A5 at Tamworth and at the Hams Hall Distribution Park south of Lea Marston built on the former power station site. The last of three power stations built here was demolished in 1993.
- Other coal-fired power stations have been demolished at Castle Donington and Drakelow, radically changing their local landscape. Castle Donington closed in 1994 while the cooling towers of the third station on the Drakelow site

were demolished in 2006. Willington power station was demolished in 1999; however, the five cooling towers remain to date (2013). Only Ratcliffe-on-Soar remains in operation.

- The Drakelow and Willington sites remain empty to date (2013). The Castle Donington site, close to the M1 and A50, has attracted large scale prominent warehouse development such as the 25 m high retail distribution depot, opened in 2012.
- The removal of power stations from the landscape appears to be reflected in CPRE's levels of intrusion figures. Between the 1990s and 2007 the percentage of disturbed landscape had decreased from 80 per cent to 75 per cent. Despite this, the amount of undisturbed land decreased from 6 to 5 per cent and the amount of urban intrusion increased from 13 to 20 per cent.
- Work to dual the A453, which runs between the M1 and Nottingham, commenced in January 2013, and is planned to be completed in 2015. Initial works have changed the landscape along the route through the removal of trees, woodland and hedgerows.
- A new railway station and park and ride facility for the Midland Mainline Railway at Ratcliffe-on-Soar opened in 2009, known as East Midlands Parkway.

Semi-natural habitat

- Intensification of arable agriculture has resulted in the loss or damage of many typical landscape features, including riverside meadows, which would have traditionally defined the character of the riparian landscape, distinguishing it from surrounding farmland.

- Between 1999 and 2003 agri-environment scheme uptake for annual area features followed the national average. The most extensive annual agreements in 2003 were for lowland pastures on neutral/acid soils (155 ha) and regeneration of grassland/semi-natural vegetation (118 ha). Evidence suggests some enhancement of the resource.
- While these options no longer exist, area of grassland under annual agri-environment management/maintenance agreements as of January 2013 totalled 524 ha including management of permanent grassland with low inputs (175 ha), management of permanent grassland with very low inputs (112 ha) and maintenance of wet grassland for wintering waders and wildfowl (134 ha).
- The area of land under annual agri-environment grassland restoration agreements as of January 2013 was only 69 ha including 37 ha of restoration of species rich semi-natural grassland.

Historic features

- 1999 to 2003 data suggests neglect of historic parkland and historic farm buildings.
- Destruction of remnant ridge-and-furrow and other micro-topographical features from gravel extraction and conversion of permanent pasture to arable is a concern.
- For most Scheduled Ancient Monuments on English Heritage's register of heritage at risk, the principal vulnerability is from arable ploughing.
- Gravel extraction in the Trent Valley and elsewhere continues to be a concern for both above ground and buried archaeology.

Rivers

- River water quality in 1995 was predominantly poor.
- As of 2009, the ecological status of the Derwent was moderate, the Dove bad, the lower Trent and Erewash moderate, the Trent upstream of the Dove poor, the Tame poor and the Soar poor, but improving to moderate downstream of Loughborough.⁷
- Between 2009 and 2012 the £45 million Nottingham Left Bank flood alleviation scheme was constructed along a 27 km stretch of the River Trent, from Sawley to Colwick. Much of the works within the NCA consist of embankments with sections of flood wall in places such as at Sawley and Attenborough village. Some of Attenborough SSSI was destroyed by the scheme; however, compensatory habitat creation is being carried out.
- River braiding works were carried out on a stretch of the River Trent at its confluence with the Tame and the Mease in 2009. This has re-created a wider channel to reinstate natural river processes and improve the river habitat.

Minerals

- Ongoing extraction of sand and gravel alongside the rivers has dramatically changed and continues to change local landscapes from the opencast mining infrastructure and activity of working sites to the increasing legacy of water-filled pits.
- Active workings in 2013 take place near Barrow-upon-Trent, Newton Solney and beside the M1. Gravel processing and ready-mixed concrete operations take place at Attenborough.

- The area is one of the largest producers of sand and gravel in the country; however, since 2007 production levels have dropped quite dramatically reflecting the impact of the economic downturn with consequentially reduced extraction and processing activity.

Drivers of change

Climate change

Potential pressures from climate change include the following:

- Increases in river temperatures adversely affecting existing cool water invertebrate and fish species.
- Changes to river morphological and hydraulic characteristics.
- Changes in species abundance and habitat preferences which could mean more non-native invasive species but also could mean increased range and population of some native species.
- Changes to the timings of seasonal events (phenology), for example, tree budding and coming into leaf, eggs hatching, animals migrating, and a resulting loss of synchrony between species.
- Generalist species may benefit (through increased competitive advantage) over specialists – leading to a homogenisation of biodiversity.
- Increased flooding and waterlogging during wetter winters leading to a shift in community composition in wetland and lowland habitats.

⁷ Humber River Basin Management Plan. Environment Agency (2009)

- Pressure for more flood defence schemes in response to increased flood risk
- Changes in soil water, both increases and decreases, leading to loss of elements of soil biota reducing soil function leading to a loss of soil structure, and changes to nutrient cycling/fixing, and soil carbon storage.
- Increased episodic events – precipitation, flow rate, temperature – caused by extreme events with knock on effects on landscape character. Potential increased frequency of droughts, for example, could put some wetland sites at risk.
- The introduction of new and different crops and techniques in response to changing climate.
- Increased demands for food security and energy crops which may be in competition with extensive agriculture and habitat conservation.
- Re-intensification of agriculture due to longer growing seasons.

Other key drivers

The Washlands face considerable ongoing development pressure, the result of its importance for transport and communications and its high proportion of urban area. An indication of this pressure comes from planning applications between July 2010 and April 2013 including the following:

Housing:

- 157 dwellings at Rothley.
- 250 dwellings and construction of relief road on the south edge of Mountsorrel.
- 125 dwellings granted permission in 2012 at Quorn.
- Residential, business and retail development on the edge of Kegworth.

- 1058 dwellings at Boulton Moor on the south side of Derby and 58 dwellings west of Willington.
- 120 residential units at Rolleston.
- Up to 660 dwellings, employment and retail development next to the A38 between Barton and Burton-upon-Trent.

Industrial and commercial:

- Offices, multisports arena and a manufacturing building within the Derwent flood plain within Derby.
- Wind turbines at Derby Sewage works and Lea Marston Lakes.
- Waste incinerator appeal at Barrow-upon-Trent.
- A prison at Willington.
- A solar farm between Barton and Burton-upon-Trent.
- A crematorium on the east side of A38 near Fradley.
- A distribution warehouse at Rothley.
- A business development previously approved in outline on the west side of Chellaston.
- Mixed use development on the south side of Chellaston.
- Hotel and leisure development and phase 2 and 3 of the business park at Watermead Country Park.

Leisure:

- A large extension to the marina affecting Lockington Meadows SSSI.
- A holiday park on the west side of Willington.
- Conversion of agricultural land to a sports ground at Branston Bridge.
- Significant pressure to exploit gravel reserves remains, particularly along the Trent Valley, though very dependent on demand from the construction industry. There have been recent applications for quarries at Lockington, Weston and on the former power station site at Willington.

Development pressure also comes from major projects which include:

- The A453 dualing will adversely impact on tranquillity levels through increases in traffic disturbance while associated landscaping will mature introducing new vegetation into the landscape.
- Planning permission was granted in 2011 for a new gas-fired power station on the Willington power station site and if constructed the existing cooling towers will be demolished and a new gas pipeline would be constructed to connect the station with the national gas network near Yoxall in Staffordshire.⁸
- High speed rail network proposals (HS2) affect the Washlands. Line 1 is planned to run south of Tamworth and near Fradley. Line 2 follows the M42 south of Tamworth crossing the NCA again near Junction 24 of the M1 and on towards Long Eaton.
- There is likely to be pressure to expand East Midlands Airport which, although located outside the NCA, will create additional noise intrusion, further reducing tranquillity levels.

Landscape

- The area has been identified by a number of partnerships and organisations as a strategic area for landscape scale conservation and various initiatives are occurring with an overarching vision to address development pressures sustainably while enabling landscape, biodiversity and recreational enhancement including linking wetlands and reconnecting rivers with flood plains.
- The National Forest and good quality gravel pit restoration are likely to increase woodland cover in the area creating new landscape character. They are also drivers for biodiversity gain, providing opportunities for priority habitats to be created.

⁸ RWE website (accessed 24 May 2013)

- Green infrastructure is likely to develop in the future because of growth of urban areas and the accessibility to communities of the outdoor resource.
- Ash dieback caused by the fungus *Chalara fraxinea* could potentially have a significant impact as ash is a common species in the NCA.

Minerals

- Pressure for further sand and gravel extraction is likely to continue at levels dependant on demand for these resources from the construction industry.



Workings near Willington. The extraction of sand and gravel creates rapid landscape change.

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.



View west across the Washlands from Stanton-by-Bridge.

Statement of Environmental Opportunity	Ecosystem service																		
	Food provision	Timber provision	Water availability	Genetic diversity	Biomass provision	Climate regulation	Regulating water quality	Regulating water flow	Regulating soil quality	Regulating soil erosion	Pollination	Pest regulation	Regulating coastal erosion	Sense of place / Inspiration	Sense of history	Tranquillity	Recreation	Biodiversity	Geodiversity
SEO 1: Carefully plan and manage new development within the NCA to ensure that landscape character and ecosystem services are strengthened, that heritage features, wildlife habitats, woodland and the hedgerow network are enhanced, and that opportunities for creation of multifunctional green infrastructure are realised so that this landscape is resilient to the forces of change that it is experiencing.	↔*	↑**	↗**		↗**	↗*	↗*	↗*	↗**	↗**	↗**	↗**		↑***	↗***	↗***	↑***	↑***	↔***
SEO 2: Manage and enhance the Trent Valley Washlands' river and flood plain landscape to combine its essential provision and regulation of water role with landscape enhancement, nature conservation, climate regulation, farming, recreation and a resource for understanding geodiversity.	↔*	↗**	↗**		↗**	↗**	↑**	↑***	↗**	↗**	↗**	↗**		↑**	↗*	↔**	↗**	↗***	↗**
SEO 3: Protect, manage and enhance the pastoral landscape of the Trent Valley Washlands, seeking to join up and expand areas of pasture and associated attributes and habitats, to preserve heritage features, enhance biodiversity and geodiversity, protect farmland and provide additional recreational opportunities.	↗*	↗*	↗**		↔**	↗**	↑**	↑**	↗**	↗**	↗***	↗***		↑***	↑***	↗***	↑***	↑***	↗***
SEO 4: Protect and enhance the historic environment of the Trent Valley Washlands and their characteristic historic landscape. Increase awareness of the richness of this resource, protect it from neglect and physical damage, and ensure that future development complements and enhances the sense of history of the NCA.	↔**	↔***	↗*		↔***	↔*	↗**	↗**	↗**	↗**	↗**	↗**		↑***	↑***	↑**	↑***	↗**	↗**

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

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

Landscape attributes

Landscape attribute	Justification for selection
The pastoral landscape of the flood plains.	<ul style="list-style-type: none"> ■ The pastoral areas within the flood plains host a mosaic pattern of permanent pasture and flood plain grazing marsh with scattered willow pollards, wet ditches and small streams, some thick full hedgerows and slow-moving water of the wide meandering rivers. ■ Some of the most tranquil parts of the NCA are found in the pastoral areas beside the rivers often with a sense of enclosure formed by mature hedgerows, riparian vegetation and bordering higher ground with also a sense of permanence and history. ■ The pastoral areas supply grazing land for livestock while also providing an important water flow regulation role.
The rivers, canals and diverse range of wetland habitats.	<ul style="list-style-type: none"> ■ The rivers, their riparian vegetation and their flood plain habitats comprise the main semi-natural habitats of the Washlands, provide ecological connectivity and supply a strong unifying theme through the landscape. ■ The most extensive priority habitat is flood plain grazing marsh covering 11 per cent of the Washlands. ■ Well restored flooded former gravel extraction sites introduce new wetland habitats to the area supporting wetland species and providing opportunities for experiencing wildlife. ■ The high volumes of water provided by this middle reach of the Trent catchment supports extractions for agriculture, industry and for human consumption as well as supporting wetland habitats and biodiversity. ■ The rivers, canals, waterbodies and wetlands are important for recreation; for boating, angling, informal recreation and experiencing wildlife. They also provide a sense of tranquillity.
The sand and gravel deposits.	<ul style="list-style-type: none"> ■ The River Trent's gravel terraces are particularly important for archaeological remains. ■ Exposures of deposits in former and working extraction sites provide geodiversity interest and excavations unearth archaeological and palaeo-environmental remains. ■ The creation of important new wildlife habitats and recreational sites is made possible by the appropriately designed transformation of former extraction sites, several of which are SSSI designated.

Landscape attribute	Justification for selection
Waterside trees and vegetation.	<ul style="list-style-type: none"> ■ Riparian trees, especially of old willow pollards, are a characteristic feature. ■ While overall woodland cover is very limited, fringing trees and vegetation of the rivers, lagoons, streams, ditches and canals is a significant component which helps give the impression of a well furnished landscape in many places. ■ Withy beds, pollarded willows, ash, alder and poplar including the occasional black poplar mark the locations of dykes, streams and rivers and attest to a rural resource no longer managed.
The historical features.	<ul style="list-style-type: none"> ■ A rich history of human settlement and activity from earliest times with a particular focus on river crossing points, the gravel terraces and rising ground at the flood plain edges. ■ Bronze and iron-age cropmarks and earthworks and the occasional remains found in gravel workings. ■ The villages with their traditional vernacular architecture and historical sandstone churches, the towers and spires of which often act as landmarks. ■ Early Christian sites, the 13th century Swarkestone causeway, the castle at Tamworth and the scattered historical gentry houses and parkland. ■ The timeless quality of some pastoral riverside areas with their old willow pollards, some ridge-and-furrow, as well as other micro-topography features preserved on permanent pastures. ■ The 18th and 19th canal architecture of bridges, mileposts, locks and warehouse buildings, such as in Shardlow, provides a unified historical thread through the landscape.
The topography of the landscape.	<ul style="list-style-type: none"> ■ A near consistent topography throughout of rivers, flood plains, gravel terraces and rising ground at the edges which helps to define the NCA. ■ This definition helps to maintain a strong sense of place within, what is an area heavily fragmented by urban development, industry and transport infrastructure. ■ The generally flat, linear topography is used as corridors for transport and communication and it lends itself well to recreational pursuits, especially on and alongside the canals and rivers.

Landscape opportunities

- Plan for long-term action that will help ensure the established character of the Washlands is protected, enhanced and made more resilient to forces of change which have led to a divergence away from established character.
- Protect the pastoral landscape from further fragmentation by resisting inappropriate use and development, promoting traditional management practices, protecting existing pasture from conversion to arable use – especially those containing archaeological features including ridge and furrow – and seeking opportunities to create more permanent grassland.
- Strengthen the historic character of the pastoral riverside landscape through the re-instatement of traditional management including willow pollarding along traditional boundaries, planting of native black poplar and management of withy beds.
- Reconnect rivers with their flood plains and make space for natural geomorphological processes of rivers.
- Restore and enhance the mosaic of wetland and flood plain habitats including grazing marsh, pastures, fens, reedbeds, wet woodland and eutrophic standing waters including along urban river corridors. Link and extend existing habitats to reverse the fragmentation that has taken place over the years.
- Manage the exploitation of sand and gravel deposits carefully so that damage to landscape character, archaeology and existing habitats is minimised and that landscape, access, geodiversity and biodiversity enhancements are maximised such as through the creation of new wetland, woodland and other habitats.
- Protect and enhance the belts of trees and riparian habitats that demarcate watercourses, create new woodland on former sand and gravel extraction sites.
- Reduce cultivation damage to archaeology and geomorphological features by encouraging best practice such as direct drilling and shallow tilling and seek opportunities for their protection through reversion of arable land to pasture.
- Restore and manage hedgerows where they have been lost, to strengthen the historical field patterns, improve wildlife networks and enhance landscape character.
- Plan for a landscape depleted of ash by planting replacement characteristic hedgerow tree species.
- Protect the historical settlement pattern and vernacular character through informed spatial planning processes to secure high quality design standards in new development including the appropriate use of traditional building materials.
- Carefully control the location of new urban development to avoid further encroachment onto the valley floors. Similarly carefully control any development on the bordering slopes to avoid potential adverse visual impact on the Washlands landscape.
- Raise the design quality and appearance of new and existing development and screen intrusive urban influences with the use of substantial and appropriate woodland planting, earthworks and green roofs.

Ecosystem service analysis

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

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

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Food provision	Soils Geology Climate Topography Suitable land for growing crops Grassland for livestock	In 2009 the total farmland area was 14,990 ha (38 per cent of total area). In 2009 8,107 ha (54 per cent of farmland /21 per cent of total area) was used for growing crops while grass and uncropped land covered 6,179 ha (41 per cent of farmland /16 per cent of total area). Arable farming predominates on the free draining soils of the gravel terraces; pastures and grass leys are more commonly located along the alluvial river flood plains, where the soils are poor draining and/or subject to frequent flooding. The poorest quality agricultural land is concentrated along the rivers especially along the Soar, upper Trent and Dove.	Regional	Loss of agricultural land to built development and sand and gravel extraction has been significant in the area. Between 2000 and 2009 there were decreases in total farmed area from 18,098 ha to 14,990 ha; a decrease in the area of crops from 10,135 ha to 8,107 ha; a decrease in grass and uncropped land from 7,260 ha to 6,179 ha and decreases in livestock numbers. Intensive agriculture can have negative impacts on the viability of the natural elements that underpin food provision services. Raising soil organic matter improves nutrient retention and structure, provides more energy sources for soil organisms and lowers drought stress. Organic farming techniques increase soil organic matter as does conversion from arable to grassland use. Environmental Stewardship has the potential to enhance a range of ecosystem services of benefit to agricultural production. ⁹	Encourage management measures that increase organic matter levels in soils to increase fertility, structure and drought resistance, such as conversion from arable to pasture, organic farming methods and the use of grass leys in arable crop rotations. Retain existing pasture and seek opportunities to convert arable to pasture such as marginal arable land prone to flood damage where pasture and livestock production would be a better use of the land. Explore opportunities to sustainably use wetland habitats for food provision such as flood plain grazing marsh for cattle grazing. Promote holistic farming practices which benefit ecosystems and maintain viable agricultural production such as organic farming principles and many agri-environment scheme options.	Food provision Sense of place / inspiration Sense of history Regulating soil quality Regulating water quality Biodiversity Climate regulation Geodiversity

⁹Ecosystem Services from Environmental Stewardship that Benefit Agricultural Production, Natural England Commissioned Reports, Number 102, Food and Environment Research Agency (2012)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Timber provision	Woodland and plantations Trees	<p>Total woodland cover is limited at 1,719 ha – 4 per cent of the total area. 1,471 ha of this is broadleaved.</p> <p>There is greater tree cover around settlements, on boundary steep slopes, in parklands, along water courses and around former gravel extraction sites.</p> <p>Commercial timber production is very limited within the area.</p> <p>The National Forest initiative extends into the Washlands between Alrewas and the River Dove covering 13 per cent of the area.</p>	Local	<p>It may not be appropriate to plant large blocks for commercial woodland within the flood plains due to conflicts with wetland habitats and archaeological sites, however the restoration of sand and gravel sites provides opportunities for considerable woodland creation.</p> <p>The flood plain edges, gravel terraces (avoiding archaeological sites) and rising bordering ground is more suitable for extensive woodland planting.</p> <p>Belts of tree planting associated with waterbodies, short rotation coppice and black poplar planting are high priorities in the flood plain for the National Forest.¹⁰</p> <p>Screening of the considerable industrial and urban influences within the Washlands through tree planting would enhance the landscape.</p> <p>Woodland opportunity mapping guidance advises planting of small linear wet woodlands in the flood plains.¹¹</p> <p>Pollarding and coppicing of willow was commonplace in the past, providing resources for basket making for example.</p>	<p>Plan for continued tree planting programmes to enhance landscape character and biodiversity and to provide a potential source of commercial timber and biomass.</p> <p>Maximise tree planting opportunities that the National Forest initiative presents.</p> <p>Screen industrial and urban influences with tree planting, primarily to enhance landscape character but also to provide a timber resource.</p> <p>Seek opportunities for woodland planting within green infrastructure and relating to new development and the urban fringe.</p> <p>Re-instate traditional willow pollarding and coppicing to provide local timber resources.</p>	<p>Timber provision</p> <p>Climate regulation</p> <p>Regulating water flow</p> <p>Biodiversity</p> <p>Sense of place / inspiration</p> <p>Biomass energy</p>

¹⁰ National Forest Strategy

¹¹ *East Midlands Woodland Opportunity Mapping Guidance*, Natural England (April 2010)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Water availability	Rivers and watercourses Waterbodies Geology	<p>The rivers, watercourses and waterbodies are important water sources for the area providing large amounts of water for public consumption (both inside and outside the NCA), energy generation, agriculture, industry and recreation as well as supporting wetland habitats and biodiversity.</p> <p>Church Wilne water treatment works abstracts and treats water from the River Derwent to supply water to over half a million people in the Nottingham area.</p> <p>The average number of days per year that water is available for new licensed abstraction:</p> <ul style="list-style-type: none"> ■ River Derwent: 69 days¹². ■ River Dove: 139 days¹³. ■ River Trent - from the Dove to Shardlow - and the River Erewash: 329 days¹⁴. ■ River Trent upstream of the Tame: 295 days¹⁵. ■ River Soar: 329 days¹⁶. ■ River Tame downstream of the Blythe to the Trent and the River Trent downstream of the Tame to the Dove: 328 days¹⁷. <p>Discharges from sewage treatment works augment flows within the NCA.</p> <p>The Sherwood Sandstone aquifer partly extends under the area and is exploited by the brewing industry in Burton-upon-Trent.</p>	Regional	<p>Low flow levels, due to over-abstraction, are detrimental to the biodiversity of the rivers. The rivers Derwent and Dove in particular have considerable restrictions on new abstractions with flows frequently falling below the indicative flow requirement to help support good ecological status.</p> <p>Rainwater collection and storage reduces the need for abstraction.</p> <p>The River Tame is a net importer of water from the River Severn catchment. Public water supply for Birmingham comes from the Severn. Its sewage is then treated at the Minworth works and then discharged into the Tame at Water Orton.¹⁸</p> <p>There are few water resource pressures within the Soar catchment as the vast majority of public water supply is imported from neighbouring catchments.¹⁹</p>	<p>Maintain ecological flow levels in water courses by managing abstractions carefully.</p> <p>For over-abstracted catchments seek opportunities to create new habitat areas to slow the flow of water across the landscape to increase infiltration and increase groundwater stocks.</p> <p>Seek to reduce existing levels of licensed abstraction by working with licensees to manage a reduction in abstraction needs through for example in-situ rainwater harvesting, in-field water conservation and less water demanding agriculture and generally through more efficient use of water in all uses.</p> <p>In both rural and urban areas, adapt existing drainage schemes and design new sustainable drainage schemes to maximise infiltration levels and re-charge ground water to help maintain river levels.</p>	<p>Water availability</p> <p>Biodiversity</p> <p>Regulating water flow</p> <p>Regulating water quality</p> <p>Food provision</p> <p>Regulating soil erosion</p> <p>Regulating soil quality</p> <p>Recreation</p> <p>Sense of place / inspiration</p> <p>Geodiversity</p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biomass energy	Woodlands Miscanthus Short rotation coppice (SRC) Soils Grassland	<p>Other than some miscanthus planted in 2009 near J24 of the M1²⁰ there was no energy crop planting in the NCA under the Energy Crop Scheme. It is not known if there has been any planted outside of the scheme.</p> <p>Woodland covers only 4 per cent of total area.</p> <p>The National Forest initiative extends into the Washlands between Alrewas and the River Dove.</p>	Local	<p>There is a high potential yield for miscanthus throughout the NCA and generally a medium potential yield for SRC.</p> <p>Planting of miscanthus, SRC as well as trees in flood plains can help alleviate flood risk.</p> <p>There is some potential for the provision of biomass through bringing unmanaged woodland and trees back under small scale coppice and pollard management.</p> <p>There is potential for using silage cropped from grassland to generate biogas.²¹</p>	<p>Plant biomass crops where they do not adversely impact on semi-natural habitats and the character of the NCA, for example where they can complement existing riverside vegetation or around urban areas where they can help screen development and urban intrusion.</p> <p>Incorporate growing of biomass crops and woodland with the reinstatement of active flood plains.</p> <p>Improve management of woodlands and re-instate traditional willow pollarding and coppicing to provide biomass.</p> <p>Plan for continued tree planting programmes to enhance landscape character and biodiversity and to provide a potential source of commercial timber and biomass.</p> <p>Seek opportunities for grassland harvesting to produce biogas.</p>	<p>Biomass energy</p> <p>Climate regulation</p> <p>Regulating water flow</p> <p>Sense of place / inspiration</p> <p>Biodiversity</p> <p>Regulating soil erosion</p> <p>Geodiversity</p>

²⁰ Webmap

²¹ *Wetlands West Annual Report 2009/10*, Appendix C

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Climate regulation	<p>Trees, woodland and scrub habitats and their soils</p> <p>Permanent grassland and other semi-natural habitats</p> <p>Organo-mineral soils</p>	<p>The mineral soils which cover most of the NCA are generally low in organic matter (0-5%) especially where under continuous arable cultivation.</p> <p>Higher soil carbon content will be found under remaining semi-natural habitats, woodlands and areas of permanent pasture where organic-rich soils have been able to develop under the undisturbed vegetation.</p> <p>In general, the soils of the NCA currently provide low carbon storage partly due to cultivation and drainage leading to loss of organic content.</p> <p>There are some areas in the NCA with slightly higher carbon content (5-10 per cent) which may be associated with some components of the loamy and clayey flood plain soils with naturally high groundwater which can be peaty at depth or include small areas of peaty soils which have good levels of carbon storage.</p>	Local	<p>Reducing drainage and tillage and establishing permanent vegetation such as pasture, woodland and semi-natural habitats on soils increases capacity to store carbon.</p> <p>Land managed under organic arrangements tends to have higher soil organic carbon content.</p> <p>Raising soil organic matter increases the water holding capacity of soils and thus resilience to drought conditions.</p> <p>There is potential for sequestration of carbon through creation of wetland habitats following mineral extraction such as through the deposition of organic matter in reed beds.</p> <p>Production of inorganic fertilizer is particularly energy intensive with large volumes of greenhouse gases emitted during production. Nitrous oxide is emitted when nitrogen based synthetic fertilisers are added to the soil- a much more powerful greenhouse gas than CO₂.²²</p>	<p>Plan to increase tree cover, hedgerows and semi-natural habitats such as flood plain grazing marsh to improve carbon sequestration and storage.</p> <p>Plan to increase the amount of permanent pasture and other non-cultivation agricultural land uses to increase soil organic carbon content.</p> <p>Encourage agricultural management measures that increase soil organic matter levels including promotion of organic farming techniques.</p> <p>Plan for opportunities for carbon sequestration on former mineral extraction sites and elsewhere through creation of suitable wetland habitats such as reedbed.</p> <p>Seek to minimise use of nitrogen-based synthetic fertilisers to minimise nitrous oxide emissions for example by greater use of crops with lower fertiliser requirements; good in-field analysis to ensure correct application levels; adoption of relevant organic farming principles.</p>	<p>Climate Regulation</p> <p>Biodiversity</p> <p>Regulating water flow</p> <p>Regulating water quality</p> <p>Biomass energy</p> <p>Regulating soil erosion</p> <p>Regulating soil quality</p> <p>Water availability</p> <p>Sense of place / inspiration</p> <p>Geodiversity</p>

²² Nitrous oxide is a 300 times more powerful greenhouse gas than CO₂

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water quality	<p>Woodlands and woodland soils</p> <p>Permanent grassland and semi-natural habitats, especially where they lie close to watercourses</p> <p>Reedbeds and other wetland habitats that help filter water before it enters surface water</p>	<p>The NCA falls within nitrate vulnerable zones, other than an area along the course of the River Derwent.</p> <p>There are no priority catchments under the Catchment Sensitive Farming Initiative in the NCA - other than a small part of the River Mease catchment where it crosses into the area.</p> <p>Water quality is in need of improvement. The ecological status of the Derwent is moderate, the Dove is bad, the lower Trent and Erewash is moderate, the Trent upstream of the Dove is poor, the Tame is poor, and the Soar is poor but improves to moderate downstream of Loughborough.²³</p> <p>Large amounts of treated effluent are discharged into the catchment from a number of sewage treatment works – especially from Birmingham into the River Tame. During low flow periods, a large proportion of the river flow is made up of these discharges.²⁴</p> <p>The River Tame has been diverted to flow through a series of flooded gravel pits at Lea Marston to protect downstream quality from large pollution events – to enable settlement of pollutants into the waterbodies.²⁵</p>	Regional	<p>Actions, both positive and negative, anywhere within the Trent catchment have potential to impact on water quality downstream.</p> <p>The main factors affecting ecological status include; diffuse pollution from urban areas, especially on the River Dove; diffuse pollution from agricultural sources, especially on the lower Trent, Erewash and Soar; and point source discharges from sewage treatment works, especially on the River Tame. Physical modifications to the rivers in many places also reduce ecological potential.</p> <p>Improvements in the treatment of sewage at treatment works will improve water quality in the rivers.</p> <p>Pollution entering watercourses from urban areas can be reduced through implementation of sustainable drainage schemes. Incorporation of habitats helps purify water through ecological processes including the sequestration of heavy metals and sedimentation of particulates before it enters ground and surface water.</p> <p>Water quality is closely linked to soil erosion. All assets that reduce soil erosion also assist water quality.</p> <p>Continued over...</p>	<p>Target pollution prevention campaigns around industrial areas in the urban areas within the Trent catchment (mainly applies to areas outside the NCA such as Stoke and Birmingham).</p> <p>In both rural and urban areas, adapt existing drainage schemes and design new sustainable drainage schemes to incorporate habitats to purify water. Design these in conjunction with green infrastructure.</p> <p>Improve treatment of effluent at sewage works at locations throughout the catchment to reduce the input of nutrients and pollutants. Plan to incorporate new wetland habitats within sewage treatment works as well as downstream of effluent discharges to improve the quality of water entering watercourses.</p> <p>Maximise awareness of and compliance with nitrate regulations to minimise nitrate pollution.</p> <p>Continued over...</p>	<p>Regulating water quality</p> <p>Regulating soil erosion</p> <p>Biodiversity</p> <p>Regulating soil quality</p> <p>Sense of place / inspiration</p> <p>Geodiversity</p>

^{23 24 25} Humber River Basin Management Plan. Environment Agency (2009)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water quality continued				<p>...continued from previous.</p> <p>Diffuse pollution from agricultural sources can be reduced by minimising chemical applications and through applying principles which reduce soil erosion.</p> <p>Agri-environment scheme options such as provision of buffer strips close to water courses, as well as organic farming techniques can benefit water quality.</p> <p>The use of pesticides is greatly reduced through the conversion from arable to grassland and therefore risk to water quality is also reduced.</p> <p>Water quality is particularly important for the River Mease SAC. Currently it is adversely affected by point source and diffuse pollution from its catchment in the adjacent Mease/Sence Lowlands NCA.</p>	<p>...continued from previous.</p> <p>Expand the network of semi-natural wetland habitats adjacent to watercourses, field drains and waterbodies including; flood plain grazing marsh, fen and reedbeds, plus creation of grassland buffer strips and hedgerows to intercept nutrients (as well as soil in those areas prone to erosion) to improve water quality. Also resist conversion of pasture to arable, especially alongside watercourses.</p> <p>Seek to reduce fertiliser and chemical inputs to minimise risk to water quality for example through; greater use of crops with lower fertilisers and pesticides requirements; good in-field analysis to ensure correct application levels; conversion of arable to pasture; and use of appropriate organic farming principles.</p>	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water flow	Rivers and river channels	The area within the flood plains has a long history of periodic inundation and also a long history of flood alleviation.	Regional	Water flow is regulated through water infiltration, impediment of cross land flows and through water storage.	Implement rural and urban land management practices to increase water infiltration, control run-off, slow down flood flows and make more space for water storage.	Regulating water flow
	Functioning flood plains and their wetland habitats	Patterns of precipitation across the upstream Trent catchment heavily influence water flows and flooding events within the NCA		Natural washland and flood plain function is constrained by a range of engineered solutions to flood risk including levees, deepened channels and flood walls. While these reduce risk of flooding locally they reduce levels of in-situ storage and infiltration and increase flows downstream, potentially causing increased risk of downstream flooding.	Plan to restore a more naturally functioning flood plain and river morphology along with creation and expansion of flood plain habitats to increase water storage and attenuation of flows.	Biodiversity Regulating water quality
	Geomorphology	Flood banks in places protect farmland from frequent flooding whereas urban areas are protected from regular flooding by more significant defences.		Woodlands, tree belts and dense hedgerows increase water infiltration and impede cross land flows, including the flow of flood waters. Semi-natural habitats and extensively grazed permanent grasslands allow water infiltration and attenuate flows downstream. Increased soil organic matter and good soil structure increases water infiltration.	Plan to expand semi-natural habitats and extensively grazed permanent grassland to increase water infiltration and attenuate flows.	Regulating soil erosion Regulating soil quality
	Other semi-natural habitats	Within the Trent, Dove, Derwent and Erewash valleys, flood risk to properties and infrastructure is generally high with significant flood defence structures protecting urban areas. Flooding tends to occur due to heavy rainfall overwhelming channel capacity and due to surface water and urban drainage. Flood levels in urban areas can also be elevated by structures that restrict flows. ²⁶		With intense rainfall events becoming more frequent land management may need to focus upon increasing the absorption capacity of the area.	Seek opportunities to enhance the hedgerow network and tree cover to help regulate water flow.	Climate regulation Recreation
	Woodlands, tree belts and dense hedgerows	The River Tame channel has been heavily modified to improve flow capacity. Flood risk from the river is generally low, though medium around Tamworth which has a high number of properties behind existing flood defences. ²⁷		Continued over...	Use sustainable drainage techniques to reduce the rate and volume of run-off and increase water infiltration.	Geodiversity
	Extensively grazed permanent grasslands	Water flow from built up areas especially Birmingham can create rapid impacts on river flows, especially the Tame. Wetlands in the Tame Valley help buffer these flows by storing water to reduce flood risk downstream.			Where opportunities for growing of miscanthus and short rotation coppice exist ensure they are compliant with the re-instatement of active flood plains and avoid impacts on other services.	
	Soils with high organic matter	Continued over...			Continued over...	

²⁶ ²⁷ River Trent Catchment Flood Management Plan Summary Report, Environment Agency (December 2010)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water flow continued		<p>...continued from previous.</p> <p>There is a medium risk of flooding to properties and infrastructure from the River Soar in and upstream of Loughborough where flooding generally results from lack of river channel capacity and the flood plains becoming inundated.²⁸</p>		<p>...continued from previous.</p> <p>Sustainable drainage schemes regulate water flow through slowing it down, allowing greater water storage and enabling greater infiltration. They are particularly important in urban areas where run-off flows are high because most land is sealed.</p> <p>Multi-purpose urban 'blue' corridors are a component of green infrastructure in urban areas – adjacent to watercourses or along key overland flow paths – primarily for conveying water in times of flood and also providing a wide range of additional functions for example amenity, recreation and biodiversity.²⁹</p>	<p>...continued from previous.</p> <p>Encourage land managers to use soil management techniques which improve water infiltration.</p> <p>Maximise opportunities to enhance green infrastructure along urban river corridors for water flow regulation and other benefits.</p>	
<p>²⁸ River Trent Catchment Flood Management Plan Summary Report, Environment Agency (December 2010)</p> <p>²⁹ Working with Natural Processes to Manage Flood and Coastal Erosion Risk, Environment Agency (2010)</p>						
Regulating soil quality	<p>Woodland and woodland soils</p> <p>Permanent grassland and other semi-natural habitats</p> <p>Organo-mineral soils</p> <p>Geomorphological processes</p> <p>Continued over...</p>	<p>There are 6 main soilscape types in this NCA:</p> <ol style="list-style-type: none"> 1. Loamy and clayey flood plain soils with naturally high groundwater, covering 23 per cent of the NCA. These are mainly concentrated in the upper reaches of the NCA, are of loamy texture, moderate fertility and naturally wet. 2. Loamy soils with naturally high groundwater (20 per cent), (upper reaches). Loamy texture, low fertility, naturally wet. 3. Freely draining flood plain soils (16 per cent), (along Trent and Derwent lower reaches). Loamy texture, moderate to high fertility. <p>Continued over...</p>	Local	<p>Soil is fundamental to agriculture and thus protection of its quality by maintaining and enhancing organic matter content, avoiding compaction and preventing loss through erosion is essential for future food production.</p> <p>Soil types 1 and 2 have flood storage potential but wetness and flood risk means they have a low bearing strength and therefore are at increased risk of soil compaction in wetter conditions.</p> <p>Continued over...</p>	<p>Work with landowners and managers to improve the timing of agricultural activities on vulnerable soils, especially avoiding those times when the soil is very wet and easily damaged by compaction.</p> <p>Encourage management measures that increase soil organic matter levels such as conversion from arable to pasture, use of organic farming techniques and the use of grass leys in arable rotations.</p> <p>Continued over...</p>	<p>Regulating soil quality</p> <p>Regulating water quality</p> <p>Climate regulation</p> <p>Regulating soil erosion</p> <p>Food provision</p> <p>Continued over...</p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil quality continued	<p>...continued from previous.</p> <p>Superficial deposits of sands, silts, gravels, alluvium and clays</p> <p>Pasture and other uncultivated agricultural land</p> <p>Semi-natural habitats</p>	<p>...continued from previous.</p> <p>4. Slightly acid loamy and clayey soils with impeded drainage (16 per cent); (higher ground at edges of flood plains), loamy texture, moderate to high fertility.</p> <p>5. Freely draining slightly acid loamy soils (13 per cent) (middle reaches). Loamy texture, low fertility.</p> <p>6. Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (9 per cent), (on higher ground at edges of flood plains). Moderate fertility, loamy texture.</p> <p>In summary, soils are loamy in texture. The lower reaches tend to be freely draining compared with upper reaches - especially that of the Soar and Tame which tend to be naturally wet with high water tables.</p> <p>The soils of this NCA are low in organic matter.</p>		<p>...continued from previous. Diffuse pollution, for example from applied manures and very fine sediments, is possible as a result of run-off associated with persistently high groundwater levels and flooding.</p> <p>Soil type 3 also has good flood storage potential but may cause diffuse pollution. Although free-draining, some soils of this type have high silt content and where cultivated are prone to capping after heavy rain.</p> <p>Soil type 4 is easily poached and compacted when wet so careful timing of agricultural activities is required.</p> <p>Soil type 5 may be valuable for enabling recharge of the underlying groundwaters due to its permeability</p> <p>Soil quality can be increased through building up organic matter content while compacted soils can prevent this.</p> <p>Permanent grassland and semi-natural habitats managed without cultivation allow organic matter to build up.</p> <p>Where watercourses have been engineered to reduce inundation and flood risk, and therefore regular deposition of silts in the flood plain ceases, preventing the natural maintenance of soil quality.</p>	<p>...continued from previous.</p> <p>Work with the farming community to reduce compaction of vulnerable soils through changes in land management such as reduced stocking densities at times of the year when potential soil damage is greatest.</p> <p>Support measures on arable land to reduce levels of cultivation, such as direct drilling, to protect soil structure and conditions for soil fauna and to increase water infiltration.</p> <p>Seek opportunities to re-connect existing flood plain pastures with river flooding and create new flood plain pastures subject to river flooding to re-establish natural deposition processes to maintain soil quality.</p>	<p>...continued from previous.</p> <p>Sense of place / inspiration</p> <p>Biodiversity</p> <p>Geodiversity</p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil erosion	<p>Woodlands, tree belts and dense hedgerows</p> <p>Semi-natural habitats</p> <p>Extensively grazed permanent grasslands</p> <p>A generally flat or gently sloping topography</p>	<p>There are no priority catchments in the NCA. The main soil types covering the majority of the NCA are generally at low risk of erosion. Nevertheless, coarser textured variants of the loamy soils with naturally high groundwater (Soil 2 above) are at risk of erosion on sloping or uneven ground. Equally, the areas of slightly acid loamy and clayey soils with impeded drainage (Soil 4 above) are prone to compaction, capping and slaking, leading to increased risk of erosion by surface water run-off, especially on steeper slopes.</p> <p>In addition, the freely draining slightly acid loamy soils (Soil 5 above) are at enhanced risk of erosion on moderately or steeply sloping land where cultivated or bare soil is exposed and / or where organic matter levels are low after continuous arable cultivation or where soils are compacted.</p> <p>There is also the potential for wind erosion on some coarse textured cultivated variants.</p>	Local	<p>Assets that assist in combating soil erosion are very similar to those that assist in increasing water infiltration and reducing cross-land water flows.</p> <p>Better management of soils to combat erosion will lead to improvements in water quality and water flow management in and around watercourses and a likely corresponding improvement in biodiversity.</p> <p>Woodlands, tree belts and dense hedgerows increase water infiltration, impede cross land flows, and shelter from wind erosion. Semi-natural habitats and extensively grazed permanent grasslands also serve to reduce soil erosion, slow cross land water flows and allow steady water infiltration. In addition the use of grass buffer strips in areas of arable production intercept surface water run-off thereby reducing risk of soil erosion.</p> <p>Surface run-off from over-grazed permanent pasture can be double that from lightly grazed areas and twelve times greater than ungrazed areas.</p> <p>Compacted soils are susceptible to erosion by surface water run-off especially on steeper slopes. Building up organic matter in soils reduces the chance of compaction and therefore erosion.</p>	<p>Work with farmers and land managers to implement management practices to improve soil structure and drainage, increase levels of organic matter and reduce rates of soil loss.</p> <p>Seek and realise opportunities to increase areas of permanent pasture, semi-natural habitats, tree belts and hedgerows to intercept and reduce rates of surface water and particulate runoff, particularly on soils subject to erosion and on steeper slopes.</p> <p>Work with arable farmers and land managers to reduce the frequency and intensity of cultivation, increase use of direct drilling, increase field margins and grass buffer strips, maintain soil cover and increase soil organic matter.</p> <p>Work with farmers and land managers to ensure stocking regimes are appropriate and reduce compaction in areas where grazing is currently high. Also to time agricultural activities and livestock movements to avoid times when the soil is very wet.</p>	<p>Regulating soil erosion</p> <p>Regulating water quality</p> <p>Biodiversity</p> <p>Sense of place / inspiration</p> <p>Regulating soil quality</p> <p>Food provision</p> <p>Geodiversity</p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Pollination	<p>Semi-natural habitats</p> <p>Hedgerows and field margins</p> <p>Roadside verges</p> <p>Gardens</p>	<p>The 4,231 ha of flood plain grazing marsh and 125 ha of lowland meadow are likely to support a variety of pollinators and nectar sources. These cover 11 per cent of the total NCA area.</p> <p>In the arable areas the nectar sources for pollinating insects are likely to be very limited.</p> <p>Nectar sources will also be provided by hedgerows, field margins and road verges as well as by the gardens of the settlements across the NCA.</p>	Local	<p>A strong pollinator population supports production of a wide variety of food products and supports food production in the future.</p> <p>To maintain viable populations of pollinating insects a diverse range of semi-natural habitats with flowering plants is required.</p> <p>Poor networks of pollinator habitat away from the areas of flood plain grazing marsh limit the ability for pollinators to supply this service to a significant level in this NCA.</p> <p>Increases in habitat for pollinators in arable areas through creation of semi-natural habitats, increases in floristically enhanced field margins, new and enhanced hedgerows and appropriate road verge management will increase delivery of this service.</p> <p>Organic management favours pollinators such as bumble bees because it uses rotations involving legumes such as clover. Organic farms are also more likely to contain unimproved grassland - an ideal habitat for pollinators.</p>	<p>Enhance habitat networks for pollinator species within the agricultural landscape with particular emphasis on increasing the area of unimproved flower-rich grasslands and flood plain grazing marsh.</p> <p>Encourage use of nectar and forage mixes in arable land and planting of species-rich hedgerows as well as the take up of agri-environment schemes which floristically enhance field margins and hedgerow habitats, to increase the availability of nectar sources in proximity to food crops requiring pollination.</p> <p>Work with landowners to protect, manage and enhance existing pollinator habitats including road verges and green spaces. Manage them for structural diversity and allow flowering plants to flower and set seed.</p> <p>Encourage the principles of organic management of land to favour pollinators such as the use of rotations involving clover.</p>	<p>Pollination</p> <p>Biodiversity</p> <p>Regulating water quality</p> <p>Food provision</p> <p>Climate regulation</p> <p>Regulating soil erosion</p> <p>Pest regulation</p> <p>Sense of place / inspiration</p> <p>Sense of history</p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Pest regulation	<p>Semi-natural habitats</p> <p>Wetland habitats</p> <p>Hedgerows and field margins</p> <p>Roadside verges</p> <p>Gardens</p>	<p>The 4,231 ha of flood plain grazing marsh, 189 ha of fen, 135 ha of reedbed and 125 ha of lowland meadow are likely to support a variety of pest predators. These cover 12 per cent of the total NCA area.</p> <p>Pest predator habitats will also be provided by hedgerows, field margins and road verges as well as by the gardens of the settlements across the NCA.</p> <p>In the arable areas out of the flood plains areas of semi-natural habitat are very limited and fragmented and therefore habitats for pest predators are likely to be very limited. Also in these areas hedgerow quality tends to be poor, often tightly trimmed, gappy and species-poor, further minimising scope as pest regulator habitat.</p>	Local	<p>Wetlands provide good habitats for a range of pest predators such as dragonflies, arachnids and amphibians. Expanding and connecting areas of wetland habitat will boost numbers of these species.</p> <p>Increasing diversity in species and structure of field margins and hedgerows will increase the ability for these areas to support populations of pest regulating species such as invertebrates, birds and mammals.</p> <p>Improving the network of semi-natural habitats and linkages between them through creation of new areas of habitat, hedgerow planting and appropriate management of existing habitats and hedgerows will benefit pest regulating species.</p> <p>Pesticides and tillage can reduce the abundance and diversity of natural enemies of pests which require refuges free from disturbance.</p>	<p>Protect semi-natural habitats and seek opportunities to create new wetlands and other semi-natural habitats, species-rich hedgerows and wider field margins close to areas of agricultural production to create a network of habitats for pest regulating species.</p> <p>Encourage take up of agri-environment schemes especially those to enhance field margins and hedgerow habitats</p> <p>Encourage land management which reduces pesticide use and cultivation such as organic farming and pasture.</p>	<p>Pest regulation</p> <p>Pollination</p> <p>Biodiversity</p> <p>Sense of place / inspiration</p> <p>Food provision</p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of place/ inspiration	Pastoral landscape of the flood plains	In places, particularly beside the rivers, the Washlands provide a picturesque pastoral and wetland landscape.	Local	<p>The settlement pattern and quiet, pastoral qualities of the Washlands can be protected through the careful control and design of new residential and industrial development and by resisting further encroachment onto the valley floors. Local design initiatives could improve the quality of new building and its relationship with the landscape.</p> <p>Local partnerships are developing a vision for a landscape more resilient to the significant forces of change the NCA is experiencing.</p> <p>The sand and gravel industry creates rapid landscape change, active workings are intrusive and poorly restored sites detract from established landscape character, however when restored to a high standard they can provide new accessible places of inspiration and recreation.</p> <p>Agri-environment schemes can be used to protect, manage and enhance historic and landscape features thereby protecting and enhancing sense of place.</p> <p>Screening through tree planting of the considerable industrial and urban influences within the Washlands would benefit landscape quality and sense of place.</p>	<p>Carefully control new development by locating it within existing settlements and avoiding the valley floors and bordering slopes to avoid potential adverse visual impact on the Washlands landscape. Also, ensure that the location, form and design of new development be guided by landscape character assessment objectives, village design guidance and design briefs including use of characteristic materials.</p> <p>Work in partnership and develop masterplans to maximise opportunities to develop a landscape more resilient to the forces of change.</p> <p>Secure high quality restoration of gravel workings to appropriate after uses that will enhance the natural environment and its enjoyment.</p> <p>Seek opportunities for re-creating active flood plains, riverside pasture and other flood plain habitats to help define the rivers, the flood plains and strengthen sense of place.</p>	<p>Sense of place / inspiration</p> <p>Recreation</p> <p>Sense of history</p> <p>Tranquillity</p> <p>Biodiversity</p> <p>Geodiversity</p> <p>Regulating water flow</p> <p>Pollination</p>
	Quieter stretches of the flood plains	The pace of change through development in the Washlands has been rapid and has eroded sense of place, inspiration and feelings of escapism. Unsympathetic urban development forms a frequent presence, mainly on valley sides and along road corridors and in places across the flood plain.				
	River Trent and its tributaries	The excavation of sand and gravel within the flood plains has been extensive, impacting both positively and negatively on landscape character.				
	Diverse range of wetland habitats and wildlife	Around a quarter of the NCA is designated greenbelt land.				
	Sand and gravel deposits and restored extraction sites	In many places the scale and anonymity of major road infrastructure dominates the landscape and overpowers sense of place; for example the A50, the A38, the M1.				
	Waterside trees and vegetation	The bland architecture of distribution depots and out-of-town warehouses found in many places diminishes local distinctiveness, sense of place and inspiration.				
	Still and slowly moving waters					
	Canal network					
	Historical features					
	Topography					
Continued over...	Continued over...			Continued over...	Continued over...	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of place/ inspiration continued	<p>...continued from previous.</p> <p>Burton-upon-Trent brewing heritage</p> <p>Marmite and Branston Pickle</p> <p>Underlying geology and geomorphology</p>	<p>...continued from previous.</p> <p>The impact of power stations within the landscape has diminished with the demolition of several. While Ratcliffe-on-Soar power station and the retained cooling towers at Willington create a dramatic impact, their scale is dominant as are the giant pylons which run through the landscape.</p> <p>Habitats and landscape features have been lost through agricultural intensification diminishing sense of place. This includes drainage of flood plains, conversion of pasture to arable, removal of hedgerows, loss of old farm buildings and damage to historic remains.</p> <p>Old willow pollards and black poplar, alder and withy beds along watercourses have become neglected while arable intensification of the Trent terraces particularly has left a poor legacy of diminished and gappy field boundaries.</p> <p>Burton is strongly identified by its brewing industry and heritage as well as its associations with the well known Marmite and Branston Pickle brands.</p>		<p>...continued from previous.</p> <p>Promotion of Burton's brewing and food product heritage can add to the sense of local distinctiveness and identity of the Washlands</p>	<p>...continued from previous.</p> <p>Promote the management, restoration and reinstatement of hedgerows and hedgerow trees where they have been lost to restore field patterns and the historic hedgerow network.</p> <p>Conserve old willow pollards and black poplar, alder and withy beds along watercourses through improved management and seek opportunities to re-instate traditional management.</p> <p>Plan appropriate tree and woodland planting around settlement fringes and around intrusive urban influences to help integrate new and existing development into the landscape and to screen negative visual impacts.</p> <p>Raise the design quality, appearance and environmental performance of new and existing development.</p> <p>Raise awareness of the distinctive features and sites of interest of the NCA to raise the value that people place on them to help protect and enhance the area.</p> <p>Seek opportunities to promote and celebrate the distinctive brewing and food heritage of the area</p>	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of history	<p>Ancient earthworks buried remains and evidence of past landscapes and climates within and on the gravel terraces</p> <p>Historic bridges and crossing points</p> <p>Early Christian sites</p> <p>Canal heritage</p> <p>Tamworth Castle</p> <p>Halls and historic designed landscapes</p> <p>Villages and churches</p> <p>The pastoral landscape and the more tranquil stretches of the flood plains</p>	<p>The NCA has the following historic designations: 6 Registered Parks and Gardens covering 184 ha, 63 Scheduled Monuments and 1,179 Listed Buildings.</p> <p>Significant sites include the ice-age, stone-age, bronze-age and iron-age remains of the gravel terraces, the early Christian sites, the old village cores and their churches, the bridges and causeways, the castle at Tamworth, the scattered historical gentry houses and parkland and the extensive 18th and 19th architecture of the canals running through the landscape. In addition there is a sense of history lent by some pastoral riverside areas with their old willow pollards, some ridge and furrow, as well as other micro-topography features preserved on permanent pastures.</p> <p>1999 to 2003 data concluded that traditional hedgerow pattern has weakened through removal and poor management of hedgerows while landscape changes through agricultural change were diverging from the character of the area.</p> <p>Some of the most valuable historical sites and features occur on the gravel terraces; however these locations are also susceptible to mineral extraction. They also tend to be under arable crop production with the principle vulnerability of many earthwork Scheduled Monuments in the NCA coming from arable ploughing.³⁰</p> <p>Continued over...</p>	Regional	<p>Agricultural intensification and conversion of pasture to arable, has led to the loss of historic features such as hedgerows and ridge-and-furrow, as well as other micro-topography features, on former pastures. Traditional management techniques are no longer used which also impacts on sense of history.</p> <p>Many Scheduled Monuments within arable farmland will further degrade unless they are protected from ploughing. Ploughing gradually erodes earthworks and breaks up undisturbed archaeological remains. Agri-environment scheme options have been available to take archaeological features out of cultivation.</p> <p>Mineral extraction enables discovery of buried archaeology but also permanently destroys historical features. The planning of the exploitation of these mineral resources needs to be carried out very carefully to ensure the valuable historical assets are protected.</p> <p>Care is needed in the planning of new development to prevent further erosion of sense of history. Use of characteristic building materials and traditional styles will help strengthen sense of history as will the sensitive siting and integration of development into the landscape.</p> <p>Continued over...</p>	<p>Protect the pastoral landscape. Re-instate characteristic management of the pastoral riverside landscape to enhance sense of history including willow pollarding along traditional boundaries, planting of black poplar, management of withy beds. Also protect existing pasture from conversion to arable use – especially where they include archaeological features such as ridge and furrow.</p> <p>Protect and enhance existing hedgerows and replant hedgerows where they have been lost to strengthen historical field patterns.</p> <p>Reduce cultivation damage to archaeology by encouraging land managers to adopt best practice for example direct drilling and shallow tilling. Also seek opportunities to protect archaeology through reversion of arable land to pasture.</p> <p>Plan sand and gravel workings carefully to ensure that valuable historical assets are protected.</p> <p>Continued over...</p>	<p>Sense of history</p> <p>Recreation</p> <p>Sense of place / inspiration</p> <p>Tranquillity</p> <p>Biodiversity</p> <p>Geodiversity</p>

³⁰ English Heritage

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of history continued		<p>...continued from previous.</p> <p>Sense of history is severely compromised in many parts of the Washlands by the intrusion and disturbance of modern development such as major road infrastructure, the commercial, industrial and distribution developments, and massive electricity pylons.</p> <p>1999 to 2003 data suggests neglect of historic parkland and historic farm buildings in the NCA.</p>		<p>...continued from previous.</p> <p>Agri-environment scheme options have been available for protection and restoration of historic parkland and historic farm buildings to help strengthen sense of history.</p> <p>Promotion and interpretation of the historic assets of the NCA will raise awareness and understanding and lead to greater demand for their protection.</p>	<p>...continued from previous.</p> <p>Protect the historic settlement pattern and vernacular architectural character through informed planning and development control including requiring the use of traditional building materials and architecture in new developments.</p> <p>Protect the sense of history through strengthening of development control so that new development is sensitively designed and planned to minimise adverse impact on the historic environment. Also seek opportunities to enhance sense of history through the use of tree planting to screen existing intrusive development.</p> <p>Seek opportunities to bring neglected historic parkland and historic farm buildings into agri-environment schemes.</p> <p>Promote wider awareness of the historic environment to encourage its enjoyment, understanding and protection and where possible provide improved public access to sites of historic interest.</p>	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Tranquillity	<p>Flowing and still water</p> <p>Wetlands</p> <p>Pastoral riverside landscapes</p>	<p>In 2006 the minimum tranquillity score in the NCA was -94, the maximum was 21. This compares with the national (England) scores of -141 and 149 respectively. The mean value was -26. Between the 1960s and 2007 the total undisturbed area fell from 24 per cent to 5 per cent.</p> <p>This NCA is in one of the least tranquil areas of the country especially in and around the urban areas of Derby, Loughborough, Tamworth, Burton-upon-Trent and Long Eaton.</p> <p>The NCA suffers from high levels of intrusion from urban development, noise (primarily traffic noise), and other sources of visual and auditory intrusion, especially across the valley floors and along the numerous major roads; notably the M1, A38, A50, A52.</p> <p>East Midlands and Birmingham International airports, although located outside the NCA, creates noise intrusion reducing tranquillity.</p> <p>A sense of tranquillity is likely to be associated with small less developed areas alongside stretches of the rivers and canals and some wetland areas.</p>	Local	<p>The main threats to tranquillity include urban expansion and road traffic. Expansions of road, rail and airport capacity in and around the NCA will further adversely impact on tranquillity.</p> <p>Safeguarding areas of relative tranquillity is important for well being, quality of life, the rural economy and recreation.</p> <p>Visual intrusion can be mitigated through careful design, planning and screening.</p>	<p>Protect and enhance tranquillity through influencing land use, transport and development decisions in the NCA.</p> <p>Protect the most tranquil areas by resisting development, including new road and rail development, which would introduce high levels of noise, light and visual intrusion.</p> <p>Promote the use of measures that reduce noise and light pollution and visual intrusion in new and existing developments.</p> <p>Seek to screen insensitive development to reduce levels of visual intrusion.</p> <p>Protect tranquillity by focussing new residential development within existing settlements. Plan new developments carefully to minimise car use and seek development which is not dependent on car use.</p>	<p>Tranquillity</p> <p>Sense of history</p> <p>Recreation</p> <p>Sense of place / inspiration</p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Recreation	<p>Waterways and network of waterbodies</p> <p>Canals, towpaths and marinas</p> <p>Nature reserves</p> <p>The National Forest</p> <p>Villages, their pubs and teashops</p> <p>Public rights of way network</p> <p>Quiet lanes and minor rural road network</p> <p>Urban centres</p> <p>Visitor attractions</p> <p>Local green spaces (country parks and Local Nature Reserves)</p>	<p>Recreation is supported by a network of rights of way totalling 502 km at a density of 1.3 km per square km while 2 per cent (909 ha) of land is classified as being publically accessible.</p> <p>The watercourses of the rivers and canals, the flood plains and the large number of waterbodies created from sand and gravel extraction provide a major recreational resource offering a range of opportunities including boating, water sports, fishing, walking, informal recreation and experiencing wildlife.</p> <p>The canal towpaths provide extensive walking, cycling and informal recreation opportunities.</p> <p>Cycling opportunities are also provided by National Cycle Network routes and the network of minor roads.</p> <p>The National Forest is among a number of initiatives promoting recreation and access across various parts of the area.</p> <p>Visitor attractions include Drayton Manor Theme Park, the National Memorial Arboretum and the recreational provisions of the urban centres.</p> <p>The area's local green spaces such as Elvaston Castle County Park provide additional recreational opportunities.</p>	Regional	<p>A location of easy access to large numbers of people. Its function as a corridor for transport means huge numbers pass through on the major roads and railways.</p> <p>Recreation reconnects or maintains peoples' connection with the landscape and ecosystems that support them and encourages a valuing of their surroundings.</p> <p>Access to green spaces and the countryside is valuable for health and wellbeing, particularly mental health.</p> <p>Recreation opportunities are likely to increase with the progression of the National Forest Initiative, for example the strategy proposes promotion of canoeing on the River Trent and on the Trent and Mersey Canal.³¹</p> <p>Off-road accessibility tends to be very restricted in rural areas where access is limited by large arable fields</p> <p>Creating a safe access across the A38 is a key issue for improving the rights of way network.</p> <p>Extension of the non-road and green infrastructure network enables improved car-free access to green spaces and the countryside.</p> <p>Continued over...</p>	<p>Adopt recreational strategies that are compatible with nature conservation objectives that link with green infrastructure, settlements and public transport.</p> <p>Maximise promotion of access networks and recreational sites to local residents, workers and visitors.</p> <p>Seek opportunities to enable local communities to enjoy and take action to improve local green spaces.</p> <p>Promote opportunities for appropriate recreational activities including interpretation of biodiversity and geodiversity interests and those of the National Forest and other landscape initiatives.</p> <p>Seek opportunities to extend the access network, create new green infrastructure, links to green spaces and the countryside and to maximise non-car dependent access.</p> <p>Continued over...</p>	<p>Recreation</p> <p>Sense of place / inspiration</p> <p>Sense of history</p> <p>Biodiversity</p> <p>Geodiversity</p>

³¹ The National Forest Strategy 2004–2014

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Recreation continued				<p>...continued from previous.</p> <p>New recreational opportunities are presented by the restoration of gravel extraction sites while new developments require good quality green infrastructure to ensure they do not diminish already limited recreational opportunities.</p>	<p>...continued from previous.</p> <p>Seek opportunities to diversify the rural economy by promoting recreation and tourism to help sustain traditional farming practices and ecosystem beneficial land uses.</p> <p>Work with the minerals industry and local authorities to plan extraction and restoration to minimise environmental impacts and maximise opportunities for recreation, biodiversity, geodiversity and landscape character. Similarly, work with developers and local authorities in the planning of new development.</p>	
Biodiversity	<p>Network of protected wildlife sites</p> <p>Semi-natural habitats</p> <p>Wetland habitats</p> <p>River corridors</p> <p>Continued over...</p>	<p>There is one internationally designated site; approximately 3 km or 2.7 ha of the River Mease SAC flows within the Washlands.</p> <p>There are 14 SSSI in the NCA totalling 412 ha (1 per cent of the area). In 2011, 36 per cent of SSSI area was in 'favourable' condition; while 54 per cent was in 'unfavourable recovering' condition.</p> <p>There are 244 local sites covering 2,749 ha (7 per cent of the NCA).</p> <p>Continued over...</p>	National	<p>A network of connected habitat features, and particularly riparian habitats, supports biodiversity and enables species movement through the landscape boosting related ecosystem services such as pollination and pest regulation; however non-native invasive species may also benefit.</p> <p>There is considerable scope to improve biodiversity within the farmed landscape by working with land managers through agri- environmental schemes.</p> <p>Continued over...</p>	<p>Protect, enhance and expand semi-natural habitats across the NCA. Use biodiversity opportunity mapping to identify how this can be achieved across the landscape.</p> <p>Strategically plan areas of habitat creation to maximise connections between existing biodiversity-rich sites to enable greater movement of species through the landscape while seeking to address issues of invasive non-native species.</p> <p>Continued over...</p>	<p>Biodiversity</p> <p>Sense of place / inspiration</p> <p>Tranquillity</p> <p>Regulating soil erosion</p> <p>Regulating soil quality</p> <p>Pest regulation</p> <p>Continued over...</p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biodiversity continued	<p>...continued from previous.</p> <p>Ditches, hedgerows, copses and field margins</p> <p>Agri-environment schemes</p>	<p>...continued from previous.</p> <p>UK priority habitats within the NCA include flood plain grazing marsh, lowland meadows, mesotrophic lakes, reedbeds, rivers, wet woodland and arable field margins.³²</p> <p>Agricultural intensification coupled with urban development and the extensive transport infrastructure means semi-natural habitats are scarce and very fragmented, especially out of the flood plains.</p> <p>Gravel extraction has led to the loss or fragmentation of existing semi-natural habitats such as riparian scrub and meadows. However, numerous new wetland habitat sites have been created.</p> <p>Invasive species of crayfish are threatening white-clawed crayfish on the River Mease and Himalayan balsam could spread from the upper reaches. Invasive water pennywort and crassula are an issue on the Soar while American mink predation has reduced water vole numbers.</p> <p>The National Forest initiative extends into the Washlands between Alrewas and the River Dove covering 13 per cent of the area.</p> <p>The area has been identified by a number of partnerships and organisations as a strategic area for landscape scale conservation.</p>		<p>...continued from previous.</p> <p>The extensive sand and gravel deposits of the area continue to be exploited providing new opportunities for wetland habitat creation and increased habitat connectivity; however these need to be planned carefully to minimise impacts on existing biodiversity.</p> <p>National Forest woodland priorities within the Washlands are for belts of planting associated with lakes and pools, short rotation coppice and black poplar planting.</p> <p>Priorities for non-woodland habitat creation are wet grassland, reedbeds and flood plain grazing marsh.³³</p> <p>Weirs on the rivers prevent the migration of fish. Bypass channels (fish passes) can be built to allow fish such as eel, lamprey, salmon and sea trout to pass through to their spawning grounds.</p>	<p>...continued from previous.</p> <p>Work with landowners and farmers to ensure biodiversity features are incorporated into the farmed landscape to maximise value for biodiversity, pest regulation and pollination.</p> <p>Encourage land management practices that benefit farmland birds, such as overwintering stubble for winter food sources particularly for seed eating birds such as linnet and reed bunting.</p> <p>Seek opportunities to sustainably use wetland habitats for food provision such as flood plain grazing marsh for cattle grazing.</p> <p>Maximise biodiversity gains from the restoration of sand and gravel extraction sites while respecting intrinsic landscape character.</p> <p>Work with the Environment Agency and other riparian owners and managers to address barriers to fish passage.</p>	<p>...continued from previous.</p> <p>Recreation</p> <p>Sense of history</p> <p>Geodiversity</p>

³² Lowland Derbyshire Biodiversity Action Plan 2011–2020, Lowland Derbyshire Biodiversity Partnership (2011)

³³ The National Forest Strategy 2004–2014

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Geodiversity	Topography	There is 1 nationally designated geological site in the NCA (Boulton Moor SSSI) and 8 Local Geological (non-statutory) Sites.	Regional	Landforms and geological exposures are valued both directly for their educational use and as defining features in the landscape as well as underpinning the overall landscape character.	Protect and improve the condition and accessibility of geological and geomorphological sites that help in the understanding of the area's geodiversity.	<p>Geodiversity</p> <p>Sense of history</p> <p>Sense of place / inspiration</p> <p>Recreation</p> <p>Regulating soil quality</p> <p>Biodiversity</p>
	Bedrock geology					
	Superficial deposits	The landform expresses the link to the underlying geology and to the fluvial and glacial deposits of the Quaternary Period.		The superficial deposits in particular are a finite resource, which enable research into the climate and environment of the region during the Quaternary 'ice ages', the geographic evolution of the Trent Valley as well as potentially providing insights into the impacts of future climate change.	Seek opportunities to raise awareness of geodiversity and relate geodiversity to the character and development of the NCA's landscapes, settlement pattern, buildings and industries.	
	River gravel terraces	These deposits contain the fossil remains of fauna and flora as well as evidence of an ancient human presence in the landscape.				
	Local stone for building	The Trent flood plain displays meanders, relict channels and cut off meander lakes.		Extensive lengths of the river systems throughout the Washlands have been artificially manipulated to such an extent that natural geomorphological processes are severely impaired. Re-naturalisation of rivers would benefit other ecosystem services and provide more opportunities to witness active natural geomorphological processes.	Seek opportunities to re-naturalise sections of watercourses to provide more opportunities to understand geomorphological processes and also enhance their riverine character, wetland habitats and associated ecosystem services.	
	Exposed rock formations	Sand and gravel extraction for the construction industry continues, especially along the Trent Valley with reserves among the largest in the country. The large number of open water lagoons is a legacy of this demand for this resource.				
	Geomorphological features	Sherwood Sandstone hewn from bedrock geology in places on the edge of the NCA features widely as a building material in the churches and more substantial buildings. In the Soar Valley, limestone and igneous rocks from bordering areas, feature in buildings.				
Soils						

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