| Landscape attribute | Justification for selection |
|---|---|
| Six towns of the Potteries forming a major conurbation contrasting with a rural settlement pattern of scattered farmsteads and sheltered villages. | ■ Sprawling industrial towns representing 19 per cent of the NCA.<br>■ Historic centres of the six towns – Tunstall, Burslem, Hanley, Stoke, Fenton and Longton – comprising civic buildings and large Victorian churches which are now prominent features in the landscape.<br>■ Extensive areas of reclaimed land between the older urban areas which are now in residential, industrial, commercial and amenity use.<br>■ Large housing estates with significant urbanisation to the west of Newcastle-under-Lyme.<br>■ A landscape rich in industrial heritage; derelict extractive and industrial sites with occasional buildings, subsidence pools, canals and disused railway lines with fragmented areas of naturally regenerated vegetation.<br>■ Frequent dispersed hamlets, individual cottages, farms and clusters of houses along a dense network of lanes in rural areas. In the Churnet Valley, many of these lanes are sunken, evoking an enclosed feel to the character area. |
| Brick and sandstone older buildings with tile and slate roofs. | ■ Red brick and sandstone are the prominent building materials of the NCA, although Millstone grit is extensively used in upland areas as a material for farmhouses and drystone walls.<br>■ Plain clay and large numbers of Staffordshire blue tiles or Welsh slate used for roofing. Occasional occurrence of Westmorland slate or stone slates. |
| Extensive footpath and rights of way network linking population centres with rural areas, parks and open spaces. | ■ The Caldon Canal and Trent and Mersey Canal provide good access for recreation and tourism and link the population centres of the Potteries with the rural Churnet Valley.<br>■ In the urban area, landscape-scale reclamation of former mines and industrial sites has led to the creation of the Lyme Valley Park, Central Forest Park, Westport Lake, Chatterley Whitfield Heritage Country Park and the garden festival site at Etruria, providing a sense of tranquillity in the heart of the urban area. |

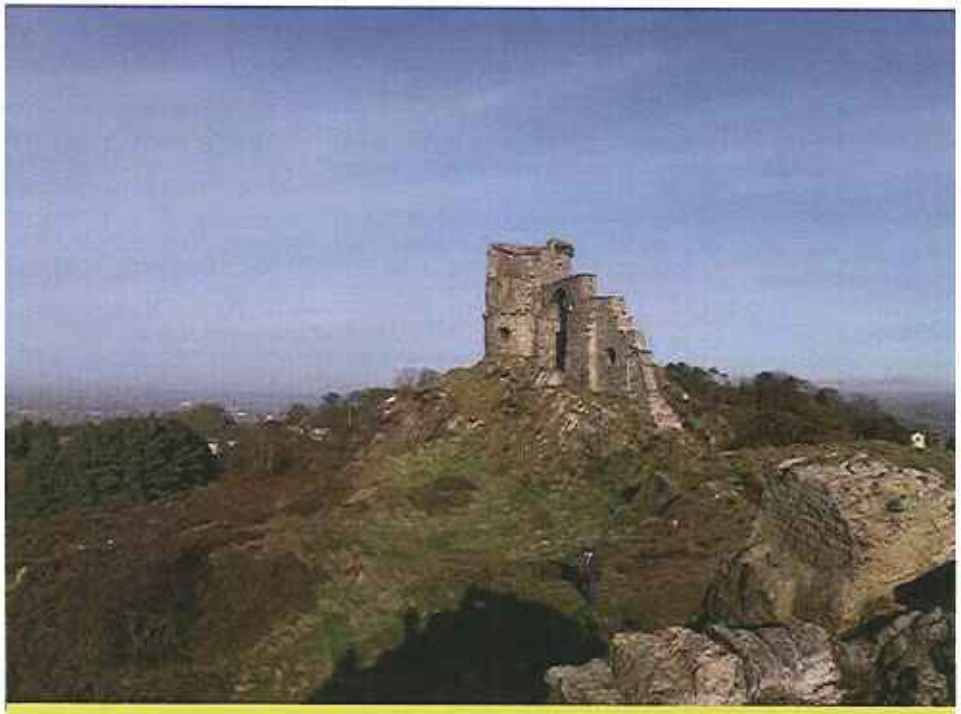
## Landscape opportunities

- Protect and enhance the many Local Geological Sites in the NCA by promoting sustainable management of sites that provide opportunities for volunteering, education and community involvement.
- Identify a stock of open mosaic habitats on previously developed land, to conserve these sites that often provide habitat that cannot be recreated and for their value to the sense of history they provide.
- Manage and protect the important river valley landscapes by maintaining the mosaic of riparian pasture and woodlands.
- Enhance the interpretation of post-industrial sites and conservation areas.
- Protect watercourses to reduce incidences of diffuse pollution entering surface water and groundwater.
- Protect from further loss and degradation of heathland and moorland habitats and reduce fragmentation of semi-natural habitats.
- Create new or extend areas of semi-natural habitats to reverse fragmentation and link them together to create a coherent habitat network.
- Manage core sites, for example SSSI, NNRs, LNRs and Local Sites network, to improve their connectivity and condition.
- Maintain and restore the pattern of small pastures and hedgerows with hedgerow oaks in the area, particularly around the Churnet Valley.
- Protect and enhance the historic landscape character comprising parkland and industrial heritage in and around the urban area and throughout the Churnet Valley.
- Conserve and enhance historic assets in the wider landscape; above and below ground archaeology and historic buildings.
- Maintain and buffer the areas of semi-natural woodland by creating and managing transitional scrub communities between woodland and adjoining habitats. Manage estate mixed woodland, parklands with veteran trees, throughout the NCA. Encourage successional planting of native mixed species to maintain the structural diversity and landscape character.
- Conserve and restore drystone walls in upland areas and restore traditional hedgerows in preference to stock-proof and ranch-style fencing where equestrian land use prevails.
- Manage public access sensitively throughout the river valleys and manage adjoining land to maintain the current levels of tranquillity.
- Restore traditional buildings and historic parklands and the surrounding hamlets and preserve features of remnant parklands and squatter enclosures.

**Continued on next page...**

## Landscape opportunities continued...

- Conserve and enhance the canal network that provides valuable wildlife and recreational corridors linking urban with rural areas.
- Conserve and enhance the heritage rail network in the Churnet Valley as a sustainable transport solution to link the valley with the urban centres.
- Ensure that the grouping and design of new developments should reflect the juxtaposition, scale and materials of traditional local buildings characteristic of the area; manage small-scale extraction of local building stone to this end.
- Create new or extend public rights of way and permissive access to improve the connectivity between population centres and rural areas and core sites, for example SSSI, NNRs, Local Nature Reserves and Local Sites.
- Create new or extend public rights of way, permissive access and circular routes and cycle routes through green spaces in urban areas to improve the connectivity between residential areas and places of work and between tourist attractions to encourage physical activity.



The folly at Mow Top is built on a prominent ridge of Millstone Grit in the Staffordshire Moorlands and the ridge forms part of the water-shed between the rivers Trent and Mersey.

## Ecosystem service analysis

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

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

| Service | Assets/ attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
|---|---|---|---|---|---|---|
| **Food provision** | Soils<br><br>Sheep and cattle rearing<br><br>Dairying<br><br>Cereals<br><br>Water availability | The majority of the NCA has poor-quality soil in terms of productivity. More than half of the NCA has Agricultural Land Classification Grade 4 and over one-quarter is Grade 3 and this is reflected in the land use.<br><br>Restored former industrial and extractive sites are generally poorly drained and support rough grazing.<br><br>Predominantly lowland mixed livestock and dairy farming, including beef and sheep production ranging from small-scale to larger holdings.<br><br>Small areas of cereal farming at lower elevations on the southern fringe of the NCA. | Regional | Over three-quarters of the NCA is permanent pasture. Brown earth and podzol soils dominate the central area. To the north, towards Biddulph Moor and Mow Cop, outcrops of grit stone produce free-draining mineral soils with areas of poorly drained and seasonally waterlogged soils and peat soils which support rough grazing.<br><br>Mixed livestock production is the dominant agricultural system in the NCA. Over-stocking and incidences of cattle directly accessing watercourses and woodland can be an issue in some moorland areas.<br><br>Farm economics and the demand for land for development, recreational and equestrian use on the urban fringe, have led to a decline in the number of dairy farms. | Safeguard food provision and promote sustainable land management techniques in moorland and arable areas that will protect the water and soil resources of the NCA.<br><br>Encouraging sustainable farming practices and promoting suitable management of arable land in the south of the NCA, to deliver habitat for farmland birds. | **Food provision**<br><br>**Regulating soil erosion**<br><br>**Regulating soil quality**<br><br>**Water availability**<br><br>**Regulating water quality**<br><br>**Biodiversity**<br><br>**Sense of history**<br><br>**Sense of place / inspiration** |

| Service | Assets/ attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
|---|---|---|---|---|---|---|
| **Timber provision** | Conifer plantations<br><br>Native woodlands | Some timber production from commercial conifer plantations, particularly in the southern Churnet Valley.<br><br>Native woodland is a significant feature of the NCA, representing seven per cent of the total area. Of this area, approximately 2 per cent is ancient semi-natural woodland. Significant areas of woodland include the Churnet Valley and Coombes Valley Nature Reserve. | Regional | The greatest concentration of woodland is in the Churnet Valley where there are large Forest Enterprise leaseholds and other coniferous woodlands, mostly comprising Corsican pine. The majority of commercial timber is processed outside the NCA for chip and wood pulp. Conifer plantations effectively increase fragmentation of semi-natural woodland. Many characteristic species of native woodland are unable to move through coniferous woodland, therefore the location of new conifer plantations needs to take this into account.<br><br>The management of native woodland throughout the NCA is variable. However, landscape partnerships, non-government organisations and voluntary sector organisations are bringing more hectares of woodland into positive management, resulting in more timber available for forest products.<br><br>The impetus towards restoring native species on plantation on ancient woodland sites (PAWS) currently populated by commercial softwood plantations will have a detrimental effect on the wood chip and pulp supply. | Opportunities to stimulate wood products and the wood fuel market in urban areas in order to sustain the management of native woodlands.<br><br>Managing more woodland for timber will benefit other services.<br><br>Ensure that new conifer plantations do not fragment areas of semi-natural woodland. | **Timber provision**<br><br>**Biodiversity**<br><br>**Sense of place / inspiration**<br><br>**Sense of history**<br><br>**Climate regulation**<br><br>**Water availability**<br><br>**Regulating water quality**<br><br>**Recreation** |

| Service | Assets/ attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
|---|---|---|---|---|---|---|
| **Water availability** | River Trent<br><br>River Churnet<br><br>River Dove<br><br>Minor aquifers<br><br>Rudyard Reservoir and canals<br><br>Mining subsidence pools and small ponds | The catchment supports limited abstraction for public water supply, spray irrigation and industrial purposes. The status of the rivers Churnet and Dove is 'over abstracted'[32] while the River Trent which, rises on Biddulph Moor has 'no water available.'[33]<br><br>Minor sandstone aquifers occur around Leek and Alton although abstraction licences 'will not be granted'.[32] The minor Foresbrook sandstone aquifer in Stoke is 'over abstracted'.[33]<br><br>Rudyard Reservoir was constructed as a feeder reservoir for the Caldon Canal. The Trent and Mersey Canal also passes through the NCA.<br><br>In the Churnet Valley, there are ponds associated with the many issues, field drains and ex-quarrying, as well as historic fish ponds. | Regional | During the summer months the volume of water in the River Churnet is insufficient to meet abstraction demands and the need to protect the river ecosystems and experiential qualities of the NCA. Therefore additional water is supplied from Tittesworth reservoir, located outside the NCA, to maintain flow levels in the Churnet.<br><br>Limited abstraction for public water supply takes place from the minor sandstone aquifers within the NCA and Tittesworth and Blithfield reservoirs in the neighbouring NCA.<br><br>Rudyard Reservoir is fed by a system of sluices and channels from the River Dane outside the NCA. Supplying canals with water and surface water transfers increases the demand for abstraction.<br><br>The Caldon Canal and the River Churnet share the same channel along a section of the valley and separate with a series of weirs at Consall Forge.<br><br>Mining subsidence ultimately resulted in forming what is now known as Westport Lake; the largest waterbody in the city of Stoke and a Local Nature Reserve managed by the Staffordshire Wildlife Trust. | Promote the sustainable use of water in domestic, industrial and agricultural sectors to reduce demand.<br><br>Where appropriate, encourage rainwater harvesting and the construction of winter water storage reservoirs in agricultural areas.<br><br>Identify and enhance areas for natural water storage, for example lowland wetlands. Slow the flow of surface water for example, by planting reedbeds, expanding flood meadows, creating ponds and scrapes. These measures have multiple benefits.<br><br>Maintain and extend riparian woodland along the Churnet Valley to increase interception rates and slow the flow of surface water.<br><br>More semi-natural habitats and permanent grassland along the Dove Valley will improve infiltration rates. | **Water availability**<br><br>**Regulating water quality**<br><br>**Biodiversity**<br><br>**Sense of history**<br><br>**Sense of place / inspiration**<br><br>**Recreation** |

[32] *Dove Catchment Abstraction Management Strategy, Environment Agency (2006)*

[33] *Staffordshire Trent Valley Catchment Abstraction Management Strategy*, Environment Agency (July 2007)

| Service | Assets/ attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
|---|---|---|---|---|---|---|
| **Genetic diversity** | Agri-diversity -rare breeds<br><br>Native species of fruit | In situ conservation of livestock in farming systems is the main conservation strategy to maintaining numbers of native and rare breeds. There are a small number of rare breed stock rearing farms in the NCA, thus maintaining populations on farms.<br><br>There are many hedgerows beside footpaths, old packhorse trails, tramways, canal towpaths and plateways, and old railway lines that criss-cross the NCA. | Local | Stock rearing has a long heritage in the NCA, mainly due to permanent pasture on the poor-quality soil. Breeding of native and rare breed livestock helps conserve the native genetic diversity; breeds include, short-horn and brown Swiss cattle.<br><br>Native breeds of livestock can also provide quality, local, niche, food products.<br><br>Hedgerows along old trade routes often contain uncultivated and feral species of fruit – for example in the Churnet Valley, apples, pears, damsons, plums, gooseberries and blackcurrants can be found along the many paths and were once harvested.<br><br>The genetic diversity that livestock, fruit and crops provide can make an important contribution to food security by retaining genes that are important for future livestock or crop breeding. | Native or rare breed livestock are can be used in a grazing regime associated with traditional land management required to conserve semi-natural habitats.<br><br>Protect and manage hedgerows beside the many trails and lanes that criss-cross the NCA to ensure that these provide linear connections for biodiversity and strengthen the sense of place. | **Genetic diversity**<br><br>**Biodiversity**<br><br>**Sense of place / inspiration**<br><br>**Sense of history**<br><br>**Recreation** |

| Service | Assets/ attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
|---|---|---|---|---|---|---|
| **Biomass energy** | Existing woodland<br><br>Energy crops<br><br>Forestry by-product | Nearly 10 per cent of the NCA is woodland, providing a resource for biomass in the form of; timber from forestry that is unsuitable for its intended purpose; arisings from arboricultural activities associated with woodland management, for example coppicing and pollarding.<br><br>There is a high potential yield for miscanthus and short-rotation-coppice (SRC) in the NCA except for the north west where potential miscanthus yield is medium and low for SRC.[34] | Local | The use of arisings from woodland and arboricultural management not suitable for timber provision could be used for biomass production.<br><br>The steep-sided valleys in the upper reaches of the Churnet make it unviable for commercial biomass production however the lower reaches of the Churnet and Dove valley could support SRC and or miscanthus. | Opportunities for landscape scale collection of arisings and timber waste in hubs, for supply to residential wood fuel market close to population centres and supply to biomass boilers in local amenity and civic buildings.<br><br>Encourage the installation of small-scale wood-fuel boilers in local buildings.<br><br>Opportunities to grow energy crops in the lower reaches of the Churnet and Dove valley where it is not detrimental to habitat or landscape character.<br><br>Bring more woodland in to positive management to provide wood fuel. | **Biomass energy**<br><br>**Biodiversity**<br><br>**Climate regulation**<br><br>**Sense of place / inspiration**<br><br>**Sense of history** |

[34] http://www.naturalengland.org.uk/ourwork/farming/funding/ecs/sitings/areas/default.aspx

| Service | Assets/ attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
|---|---|---|---|---|---|---|
| **Climate regulation** | Woodland<br><br>Heathland<br><br>Other semi-natural habitats<br><br>Carbon-rich peat soils<br><br>Wetland habitats | Woodland is likely to be the most significant contributor to carbon storage and sequestration in this NCA. Nearly 10 per cent of the NCA is covered by woodland. Significant areas include Churnet Valley and Coombes Valley nature reserve.<br><br>There is remnant Heathland in the NCA, for example Cheddleton Heath.<br><br>Carbon-rich peat soils occur in the uplands and moorlands in the NCA, for example Biddulph Moor. | Local | Good management of existing woodland can ensure their role in sequestering and storing carbon is optimised.<br><br>Trees planted in urban areas provide multiple benefits; shade, mitigation of the effects of the urban heat island, increased water infiltration rates and purifying the air.<br><br>Heathlands are characterised by a cover of 25 per cent of ericaceous dwarf shrubs. Woody shrub species play an important role in carbon sequestration in grassland ecosystems.<br><br>Peat soils are important because of their role in storing carbon and other greenhouse gases. | Maintain existing woodland and expand areas of woodland on suitable sites to increase carbon sequestration and storage. For example, encourage existing initiatives in the Churnet Valley and in the Potteries.<br><br>Maintain and enhance the existing areas of heath by arresting further losses or degradation; where appropriate, create secondary heathland on post-industrial sites.<br><br>On permanent pasture, encourage sustainable grazing regimes with appropriate stocking levels and adopting low input fertiliser systems. Prioritise the restoration of bare, eroded peatland habitats. | **Climate regulation**<br><br>**Biodiversity**<br><br>**Regulating soil erosion**<br><br>**Regulating water quality**<br><br>**Recreation**<br><br>**Sense of place / inspiration**<br><br>**Sense of history** |

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
|---|---|---|---|---|---|---|
| **Regulating water quality** | Rivers<br><br>Streams and brooks<br><br>Mine waters<br><br>Groundwater<br><br>Aquifers | Over-abstraction from rivers, modification of watercourses, point-source and diffuse pollution are issues in this NCA.<br><br>The chemical quality[35] of the rivers Churnet and Dove within the NCA is good. The chemical quality of the River Trent within the NCA is poor.<br><br>There are surface water safeguard zones around the area of Leek and extending along the eastern Trent valley from Stoke to Rugeley in the neighbouring NCA. The Churnet Valley lies within the Peak District Dales priority catchment for Catchment Sensitive Farming (CSF).[36]<br><br>The ecological status of the Lyme Brook is 'bad'.<br><br>The chemical status of the River Trent within the NCA is poor, reflecting widespread diffuse pollution in groundwater associated with the conurbation.<br><br>**Continued on next page...** | Regional | Climate change may result in falling water levels which would have a detrimental effect on water quality; affecting Biological Oxygen Demand; reducing flow rate; increasing the concentration and potency of pollutants and thus placing significant stress on the ecology.<br><br>Safeguard zones are a joint initiative between the Environment Agency and water companies contributing towards the objectives of the Water Framework Directive, while CSF delivers practical solutions to enable farmers and land managers to reduce diffuse water pollution.<br><br>The Lyme Brook is a tributary of the River Trent and has bad water quality and little aquatic life, due mainly to its misuse as a waste disposal route by industry and through domestic plumbing misconnections. Landscape partnerships are beginning to address these issues. | Support partners and communities to identify point-source and diffuse pollution, misconnections and discharges in urban areas, particularly around the Lyme Brook.<br><br>In agricultural areas, reduce foul runoff from outdoor feeding areas, silage clamps, yards and cattle tracks; prevent stock from entering streams and poaching stream banks and manage livestock to avoid poaching of fields by cattle movement.<br><br>Buffering watercourses from nutrient run-off, improved soil stabilisation and protection.<br><br>Ensuring that moorland habitats are well vegetated and under good environmental management to reduce areas of bare earth at risk of erosion leading to sedimentation of watercourses.<br><br>Rising mine water will need careful management involving a range of measures that will require an integrated approach from partners to minimise the impact on water quality. In areas of freely draining soils, measures should be taken to minimise fertiliser inputs and the use of pesticides to prevent groundwater pollution. | **Regulating water quality**<br><br>**Regulating water flow**<br><br>**Regulating soil erosion**<br><br>**Recreation**<br><br>**Biodiversity**<br><br>**Sense of place / inspiration** |

[35] *River Basin Management Plan: Humber River Basin District*, Environment Agency

[36] Catchment Sensitive Farming is a joint venture between the Environment Agency and Natural England, funded by Defra and the Rural Development Programme for England.

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
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| **Regulating water quality cont.** | | **...continued from previous page**<br><br>In the headwaters of the NCA, the water quality of the springs and streams is particularly high.<br><br>The legacy of coal mining particularly around Stoke-on-Trent, has led to issues with contamination of ground and surface water due to rising mine water. Mine waters are usually acidic and contain metal contaminants which can have significant ecological impacts. North of Stoke, the water in a length of the Trent and Mersey canal is an ochrous colour probably due to ferric oxide from mine water. | | | | |

| Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
|---|---|---|---|---|---|---|
| **Regulating water flow** | Rivers and watercourses<br><br>Bridges and weirs<br><br>Semi-natural vegetation<br><br>Riparian woodland<br><br>Sustainable urban drainage schemes (SUDS) | The Environment Agency's flood risk map indicates the risk of flooding in the Peaks and Moorlands area is 'low' although there are a number of locations where the risk is significant and moderate. These areas are along the Lyme Valley in Newcastle and at various locations in Stoke and throughout the Churnet and Dove Valleys.<br><br>Leek and Cheddleton are identified as being at significant risk of flooding. | Regional | Narrow valleys mean that settlements tend to be concentrated near rivers. Rapid run-off from the neighbouring Peak District and the Staffordshire Moorlands results in flooding in downstream towns and villages.<br><br>Bridges and weirs constrict the flow and tend to make the flooding worse.<br><br>Although flooding damages infrastructure, the Churnet Valley SSSI includes wetland habitats; mire, marsh and carr that benefit from flood events.<br><br>Riparian woodland is important along the valleys and cloughs of the NCA by providing an effective filter and buffer, helping to trap sediment and slowing the flow of surface water.<br><br>In urban areas, intense or prolonged rainfall can overwhelm drainage systems. Open areas with unsealed soil, as part of SUDS, can reduce the magnitude of flood events by allowing rainfall and run-off to infiltrate. The inclusion of greenspace in new developments can help alleviate flood risk. | Identify natural areas for floodwater storage to reduce the reliance on hard engineering solutions; widening where possible and ensuring flood plains are not inappropriately developed, reinstating flood meadows throughout the riparian environs and ensuring dual use of riparian open spaces in urban areas, for example flood-compatible playing fields and parks.<br><br>Using water supply reservoirs upstream of the NCA for floodwater storage.<br><br>Removing constrictions to flow, such as weirs. This will also benefit migratory fish.<br><br>Increase the length of open water corridors through the urban areas by de-culverting rivers and streams and creating riparian habitat, for example reedbeds that can reduce the rate of run-off and filter water.<br><br>Ensuring that new developments take into account the principles of SUDS by including green spaces and areas of land with unsealed surfaces. | **Regulating water flow**<br><br>**Regulating water quality**<br><br>**Regulating soil erosion**<br><br>**Recreation**<br><br>**Biodiversity**<br><br>**Sense of place / inspiration**<br><br>**Sense of history** |

| Service | Assets/ attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
|---|---|---|---|---|---|---|
| Regulating soil quality | Soils<br><br>Unimproved pastures and areas of semi-natural vegetation<br><br>Sustainable management of livestock<br><br>Sustainable systems of arable cultivation<br><br>Former industrial and extractives sites | The majority of the NCA has poor-quality soil. According to the Agricultural Land Classification system, over half the area of the NCA is Grade 4 and over one-quarter is Grade 3 and this is reflected in the land use; over three-quarters of the area being permanent pasture for grazing and stock rearing with some dairying and a small area of arable cropping in the south of the NCA.<br><br>Soils on spoil heaps and on former extractive sites are prone to compaction because of poor structure and drainage. | Local | Soils are a multi-functional resource that provides a range of ecosystem goods and services. The slowly permeable, seasonally wet acid loamy and clayey soils (covering 43 per cent of the NCA) are at risk of diffuse pollution and flooding as a result of poor water infiltration. Soils are easily damaged when wet and therefore it is important to minimise compaction and/or capping risk which will tend to exacerbate run-off problems.<br><br>In contrast, the freely draining slightly acid loamy soils (17 per cent) are valuable for aquifer recharge around Leek, requiring the maintenance of good soil structure to aid water infiltration.<br><br>Unimproved pastures and areas of semi-natural vegetation help to stabilise the soil and improve infiltration of rainwater.<br><br>Well-managed agricultural systems can alleviate the risk of damaging soil structure and can improve soil quality.<br><br>Mines and quarries disturb the natural soil profile and local hydrology. On colliery spoil, the loamy and clayey soils are prone to capping and compaction however well designed restoration schemes can avoid these conditions. | Well-managed livestock systems; appropriate stocking levels and preventing stock from entering wetland areas can alleviate the risk of poaching and compaction of the loamy and clayey soils.<br><br>In arable areas, ensure that organic matter is incorporated into cultivated soils to increase soil organic matter and use minimum tillage on areas where loamy soil occurs.<br><br>Improving soil structure by introducing recycled organic matter sourced from local recycling centres and installing appropriate drainage during the restoration of mineral extraction sites, can deliver benefits to ecosystem services. | **Regulating soil quality**<br><br>**Regulating soil erosion**<br><br>**Water availability**<br><br>**Sense of place / inspiration**<br><br>**Biodiversity** |

| Service | Assets/ attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
|---|---|---|---|---|---|---|
| Regulating soil erosion | Soils<br><br>Permanent grassland<br><br>Wetland vegetation<br><br>Field boundary features<br><br>Old spoil heaps and tips | Over one-quarter of the NCA has a free-draining light, sandy, soil. Free-draining soils in upland areas or in areas of steeply sloping land where bare earth is exposed are most at risk from wind erosion.<br><br>The more fertile soils in the valleys and cloughs are at risk from flood events. Permanent cover of vegetation stabilises exposed upland and steeply sloping areas. Wetland habitats stabilise soils in valleys and cloughs and slow water flow.<br><br>Hedgerows are prevalent at lower elevations, giving way to drystone walls at higher elevations and woodland encloses ancient woodland pasture in the Churnet Valley; all of which protect the soil resource from wind erosion.<br><br>Soils on spoil heaps and on former extraction sites are prone to capping, compaction, and erosion from rainfall. | Local | Well-managed livestock and arable systems can prevent soil erosion. For example, appropriate stocking levels and the incorporation of organic matter in arable fields.<br><br>Permanent pastures and leys predominate and measures that ensure minimal disturbance to the vegetation will reduce the risk of bare earth and thus soil erosion. In the valleys and cloughs, measures to protect the wetland vegetation should be adopted. Stabilisation of soils reduces the rate of siltation of watercourses.<br><br>Hedgerows and drystone walls offer resource protection to soils and maintain historic field patterns, but also provide wildlife corridors and strengthen the landscape character.<br><br>Fragments of naturally regenerated vegetation have developed around former spoil heaps, tips and industrial sites stabilising the soil and increasing infiltration rates. These areas are seed donor sites for colonising other former industrial areas. | Agri-environment schemes and Catchment Sensitive Farming schemes provide incentives to adopt sustainable farming practises that can prevent soil erosion.<br><br>Where appropriate in the landscape encourage the expansion of areas of semi-natural vegetation.<br><br>Protect the integrity of traditional field boundaries in preference to stock-proof fencing, to benefit resource protection, biodiversity and sense of place. | **Regulating soil erosion**<br><br>**Regulation soil quality**<br><br>**Regulating water quality**<br><br>**Biodiversity**<br><br>**Sense of place / inspiration** |

| Service | Assets/ attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
|---|---|---|---|---|---|---|
| **Pollination** | Species-rich grassland (lowland heath and meadow)<br><br>Registered Parks and Gardens<br><br>Formal public parks, residential gardens and allotments of the urban areas<br><br>Open mosaic habitat on previously developed land<br><br>Flower-rich roadside verges | The NCA contains areas of lowland heath, meadow and grassland.<br><br>The NCA contains nine Registered Parks and Gardens, covering over 500 ha.<br><br>In the urban areas, there are a number of public parks together with residential gardens and allotments.<br><br>Open mosaic habitats within Newcastle-under-Lyme and Stoke-on-Trent conurbation provided niche habitats for a range of vegetation that is important to invertebrates.<br><br>Flower-rich roadside verges also support this service and link together habitats both visually and naturally by providing wildlife corridors. | Local | Areas of lowland heath, meadow and grassland habitats provide sources of nectar for pollinating insects. Late flowering nectar sources, such as heather, are important in providing supply of nectar over an extended period of time.<br><br>An increase in the populations of pollinators may facilitate an increase in the types of crops that could be grown in the future thus expanding the range of food provision and increasing the resilience to the effects of climate change.<br><br>Registered Parks and Gardens often have a diverse range of flowering plants in formal gardens that provide a diverse source of nectar.<br><br>Residential gardens, allotment sites and open mosaic habitat on previously developed land provide important sources of nectar in the urban areas and often have more diverse sources of nectar than agricultural monocultures. | Manage areas of heathland and increase the area and connectivity of flower-rich lowland meadow and encourage the use of nectar and forage mixes in arable systems.<br><br>In urban areas, raise awareness of the benefits that open mosaic habitat, gardens and allotments can deliver.<br><br>Encourage the spread of flower-rich roadside verges. Increasing the areas that support sources of nectar would also result in a significant increase in biodiversity. | **Pollination**<br><br>**Biodiversity**<br><br>**Sense of place / inspiration**<br><br>**Sense of history**<br><br>**Food provision** |

| Service | Assets/ attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities |
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| **Pest regulation** | Areas of semi-natural habitat<br><br>Hedgerows<br><br>Headwaters | Flower-rich meadows and unimproved pastures.<br><br>The network of hedgerows at lower elevations.<br><br>The native white clawed crayfish is present in the high quality waters of the springs feeding the River Churnet. There are increased incidences of crayfish plague and invasive non-native species of signal crayfish. | Local | The contribution to pest regulation services is limited.<br><br>Semi-natural habitats and hedges proximal to areas of commercial arable agriculture may support species of predators that can regulate populations of pests that adversely affect crop yields, hence food provision.<br><br>The headwaters of the River Churnet are of particularly high quality and support metapopulations of native crayfish. It is important to protect the integrity of these headwaters from crayfish plague, a fungal disease, carried by the signal crayfish; itself an invasive species. | Introducing semi-natural habitats, in arable systems, in the south of the NCA, for example beetle banks, headlands and reinstatement of hedgerows. This would provide a mosaic of habitats in areas of monoculture, thus providing a more robust ecosystem.<br><br>Support measures to halt the spread of the signal crayfish into the headwaters. Encourage increased surveillance and re-introduction projects. | **Pest regulation**<br><br>**Biodiversity**<br><br>**Food provision**<br><br>**Sense of place/ inspiration** |

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| **A sense of place/ inspiration** | Varied topography with woodland, river valleys and wooded cloughs<br><br>Historic buildings and parklands including Registered Parks and Gardens boundary features and squatter enclosures<br><br>Industrial buildings and streamside mills<br><br>Rudyard Reservoir<br><br>Historic transport routes<br><br>Heritage-rich industrial townscapes | Contrasting sense of place is evoked by the pastoral, strongly dissected hills, cloughs and small plateaux which flank the Churnet valley and the heritage-rich, urban and industrialised landscape of the Potteries.<br><br>The grandeur of the scenery overlooking the Churnet Valley has inspired historians and authors to write about the landscape. The lush, rural landscape of the lower reaches of the Churnet Valley inspired the author George Eliot to christen the area 'Loamshire' in her novel *Adam Bede*. In contrast, the author Arnold Bennett immortalised the area of Stoke with his 'Five Towns' novels by describing the heavily industrialised towns. Burslem is 'Bursley' in the novels and many of the buildings mentioned are still standing.<br><br>The historic centres of the towns of Cheadle and Leek have been heavily influenced by the textile trade.<br><br>**Continued on next page...** | National | Historic parklands provide the settings for grand mansions, for example Biddulph Grange and Alton Towers, that evoke a strong sense of place, with the village of Alton having a distinct Italian style. Often, the surrounding countryside was managed to provide vistas; a characteristic of the Churnet Valley.<br><br>In the Churnet Valley, hedgerows with hedgerow trees and hedgerow banks aside sunken lanes evoke a sense of enclosure, epitomised by small-scale squatter enclosures.<br><br>The Potteries are characterised by the bottle kilns that were once widespread, for example the Grade II listed bottle kiln at Moorcroft. Canals, wharfages, disused railway lines and derelict land add to the sense of industry that once prevailed.<br><br>Along the River Churnet, water mills once powered flint mills for the pottery industry. Metal ores and minerals were processed at Froghall. The brick chimney of Bolton Copperworks still dominates the landscape. | Protect the historic parklands and country mansions and maintain the designed vistas associated with these estates.<br><br>Support the objectives of Conservation Areas. Encourage collaboration between landscape partnerships and English Heritage.<br><br>Restore hedgerows with typical species, by gapping up and planting their accompanying hedgerow trees; adopting appropriate cutting regimes and tagging to extend the age range and species diversity. Maintain drystone walls in upland areas in preference to using stock-proof fencing thus optimising their value to resource protection and sense of place and history.<br><br>Protect and manage the squatter enclosures, a distinctive indicator of historic land use that are directly associated with industrial expansion of the towns.<br><br>Protect and manage the historic buildings of the historic centres, seek alternative sustainable recreational uses for derelict sites. | **Sense of place / inspiration**<br><br>**Sense of history**<br><br>**Recreation**<br><br>**Biodiversity** |

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| **A sense of place/ inspiration cont.** | | **... continued from previous page**<br><br>Historic parklands including Registered Parks and Gardens provide a setting for grand country houses and their designed landscapes with vistas create local distinctiveness, for example Farley Hall, Alton Towers and Biddulph Grange.<br><br>Rudyard Reservoir; a feeder reservoir for the local Caldon Canal and Trent and Mersey Canal became a popular local pleasure resort from 1849 onwards. The writer Rudyard Kipling was named after the lake. | | The reservoir is still a popular tourist destination and continues to inspire artists and photographers with its Victorian properties, many with boathouses onto the reservoir.<br><br>A legacy of industrialisation is the network of transport routes that cross the NCA.<br><br>A legacy of early industrialisation in the Churnet Valley survives as earthworks and buried archaeology that needs protection and management. | Protect buried archaeological assets from disturbance. | |