What’s Special about the North Pennines?
The North Pennines AONB
The designation of the North Pennines AONB was confirmed in 1988 and at 1983km², it is the second largest of the 40 AONBs in England and Wales. One of the most remote and unspoilt places in England, it lies between the National Parks of the Lake District, the Yorkshire Dales and Northumberland with the urban centres of County Durham away to the east. The AONB crosses the boundaries of two English Regions, being in both the North East and the North West. It lies mostly within the political boundaries of Durham, Northumberland and Cumbria County Councils, and the districts of Eden and Carlisle, with 2.6km² in North Yorkshire around Tan Hill.

A UNESCO European and Global Geopark
In 2003 the North Pennines AONB became Britain’s first European Geopark and in 2004 the area became a founding member of the UNESCO Global Geoparks Network. Managed by the AONB Partnership Staff Unit, the UNESCO Geopark status indicates that the North Pennines not only has outstanding geological heritage, but is also at the forefront of places where geology is being used to support sustainable development through nature tourism, education and conservation. Outside Europe, a new Asia-Pacific Geoparks Network has arisen, alongside fledgling UNESCO Geoparks Networks in Africa and South America. Work in support of the Geopark status includes children’s geology clubs, interpretation and trails, geology festivals, evening classes, educational materials and more.

Introduction to this publication
This short publication, a companion to the AONB Management Plan, highlights the special qualities of the North Pennines, the things that make it different from other places, the things which everyone who cares about this place has a duty to conserve and, where we can, make even better.

If you are reading this publication as part of the AONB Management Plan 2009-2014, there are two further documents which form the whole plan:


In these pages you will see something of how special are our landscapes, wildlife, wild places and historic environment; you’ll also be able to find out a little more about how these special qualities of the North Pennines can be looked after and the kinds of services which high quality landscapes like ours provide for society.
Introduction to the North Pennines

“This country, though politically distributed among three counties, is one and the same in all its characteristic features. From it flow the Tyne, the Wear and the Tees and many branches which fall into these rivers. Along the banks of these and several other smaller streams which fall into them are dales or valleys, cultivated near the banks and for a short distance up the sides of the hills, but soon cultivation and enclosure cease, and beyond them the dark fells, covered with peat and moss and heath; and between one vale and another is a wide extent of high moorland, extending sometimes for a dozen miles. In these upland tracts are no inhabited homes but thousands of blackfaced sheep are scattered over them; and there breed the grouse which attract the sportsmen at the proper season of the year to this country.”

(Royal Commission into Children’s Employment in the Mines. W.R. Mitchell, 1842)

This description of the North Pennines from 1842 might equally have been written today, but it would be misleading to consider the North Pennines landscape as timeless and unchanging. From prehistoric times (when the clearance of the natural North Pennines forest began) to today, when pressures ranging from changes in agricultural policy to reservoir building and wind farm development have affected the landscape, change has been continuous. Today one of the main challenges for those who love and care for the North Pennines is making sure that the pace of change, and the nature of that change, don’t damage the essential character of the area as, in the eyes of many, the last wild place in England.

Remote, wild and tranquil
Much of the North Pennines is truly remote, wild countryside and it is precisely this sense of wildness and remoteness which gives much of the area its character. There are still truly dark skies here, and a relative freedom in places from human noise and modern visual intrusions; it has been recognised by CPRE as one of England’s most tranquil places. There are few places in England where you can walk all day without crossing a road, but it is still possible here. In spring and summer, high heather moors and blanket bogs are alive with the evocative calls of wading birds, black grouse dance on their leks and merlin and peregrine falcon race through the air.

People and place
The rise and fall of the lead and other mineral mining industries has shaped much of today’s landscape, not only in the physical remains that can be seen, but also in the pattern of local settlements. Weardale, Teesdale, and the South Tyne, Nent and Allen Valleys in particular, are some of the best places to see the remains of the lead mining industry and to see the ‘miner-farmer landscapes’ which grew out of it. In 1861, 27,000 people lived in the North Pennines orefield, but today the population is estimated to be around 12,000 people, less than half of what it was during the lead mining heyday.

The majority of the AONB population lives in the North Pennine dales, where settlements include small towns such as Alston and Allendale, together with relatively compact villages, isolated hamlets and a wide scatter of individual farmhouses. This landscape became enclosed by the miner-farmers from the 16th century, but beneath the surface of today’s pattern of fields, villages and moorland there is evidence for settlement and landscape change over the past 10,000 years. People have continually contributed to the development of the landscape through Stone Age, Bronze Age, Iron Age, Roman, Anglo-Saxon, Viking, medieval and post-medieval times, and continue to do so today.
**Landscape pattern**

In the dales, dry stone walls impose strong pattern on the landscape, where buildings on the valley sides are picked out by clumps of trees. Buildings and settlements are an integral part of the landscape, with most being built of local stone, reflecting the underlying geology, complementing the stone field walls and reflecting the surrounding countryside. Wading birds feed in the in-bye grassland, rushy pastures and hay meadows. These hay meadows are of international importance and are awash with wild flowers, many of them very rare.

**Tyne, Tees and Wear**

The world famous rivers, Tyne, Tees and Wear have their birthplace high up in the fells. They tumble, rock strewn, along the dales, clothed in woodland in their middle and lower reaches. Where the rivers cross the erosion-resistant dolerite of the Whin Sill, dramatic waterfalls are formed, such as those at High Force, Low Force and Cauldron Snout, in Upper Teesdale. In these rivers can be found the elusive otter, the water vole (Britain’s fastest declining mammal) and Atlantic salmon.

**Northern rocks**

The world renowned geology of the area has given rise to dramatic landscape features, most famously High Force and the sweeping valley of High Cup Gill, on the Pennine Way above Dufton, and our geodiversity also includes a world famous mineral wealth. The North Pennines AONB is Britain’s first UNESCO European Geopark and a founding member of the UNESCO Global Geoparks Network.

**Woods**

Though not extensive, the native woods of the North Pennines are themselves important examples of woodland types. They are distinctive features of the landscape, following the course of rivers or clinging to narrow gills. The North Pennine woodlands are also one of the last places in England where you can find red squirrels.

**Wildlife and habitats**

The North Pennines has a remarkably high concentration of nationally and internationally important conservation sites and areas. Fifty percent of the AONB is designated as Sites of Special Scientific Interest (SSSI). There are also two National Nature Reserves (NNR), five Special Areas of Conservation (SAC) under the EU Habitats Directive, and a Special Protection Area (SPA) under the EU Birds Directive. Moor House-Upper Teesdale NNR, Britain’s largest terrestrial NNR, supports more than 20 species of Europe-wide conservation importance and in this context it is the most important reserve in the country.

**Land and livelihood**

Farming and forestry play an important role in the lives of local communities and in managing the landscape. Careful management of our moors for shooting and our rivers for fishing benefits wildlife and supports the livelihood of local people. Many farmers are diversifying into new activities and many more are taking advantage of schemes which support environmentally friendly practices. Sustainable tourism is becoming an increasingly important aspect of the local economy, and the area offers a warm welcome for those who come to see its wildlife and wild places, to uncover its history and visit its many attractions.

**Explore**

You can read in this publication about the many important habitats and species of the North Pennines – the blanket bog, hay meadows and the oak/ash woodlands, the Teesdale Flora, the wading birds and the black grouse. But better still you can go out and explore them for yourself. This is perfect country for walking, cycling, horse-riding, wildlife-watching and following in the footsteps of artists and writers who have been inspired by this wild land. There are many footpaths and bridleways to explore, including the Pennine Way National Trail, the C2C National Cycle Route, the Pennine Cycleway and the National Byway. Derwent and other reservoirs offer opportunities for sailing, fishing, canoeing and even water skiing. The North Pennines is also the only AONB with its own ski slopes, though the trend towards warmer winters means that snow is less reliable than it once was.

**Pressures**

There is considerable pressure on the North Pennines landscape. This comes in many forms, including more obvious features like wind energy development, communications masts, new housing development, increasing traffic, changes in agriculture, mineral developments and military use of the area. There is also the gradual erosion of rural character that accompanies unsympathetic management of roads, out-of-keeping conversion of traditional buildings and the gradual loss of historic features. Communities are under increasing pressure from relatively low wages, loss of key services and limited employment opportunities. Tourism has the potential to be an important and positive force in the local economy, but needs to be managed sensitively to ensure that it complements the special qualities of the area. Future climate change will also place new pressures on the area’s character and natural beauty.

This booklet tells you about all of these distinctive qualities of the area in a little more detail and suggests some of the things which need to be done to keep the North Pennines special. If you want to know more about looking after the North Pennines you can read the other two parts of the AONB Management Plan, a Strategy document and an Action Plan available at www.northpennines.org.uk
A SIMPLIFIED GEOLOGICAL MAP OF THE NORTH PENNINES AONB

KEY

- **Pennian**: mainly limestones and dolomites with sands at the base (illustrated in cross section only)
- **Penno-Triassic**: mainly red sandstones, mudstones and some breccias
- **Westphalian - the Coal Measures**: shales, siltstones, sandstones and coal seams
- **Namurian**: alternations of thin limestones, shales and thick sandstones with thin coal seams, includes the Great Limestone
- **Dinonian**: alternations of limestone, sandstone and coal with conglomerates, shales and sandstones at the base
- **Devonian**: mainly conglomerates
- **Ordovician and Silurian**: mainly slates, impure sandstones and volcanic rocks
- **Igneous intrusions**: Dolerite, part of the Whin Sill suite of intrusions and the Cleveland-Arnside Dyke, and the Weardale Granite

Diagrammatic Cross-section. Vertical scale greatly exaggerated

N.B. For clarity, faults and mineral veins are omitted from this map.

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The special character of the North Pennines landscape has its foundation in the underlying rocks and the geological processes which have shaped it over hundreds of millions of years of Earth history. Tropical seas, deltas, rainforests, molten rock, deserts and ice sheets have all played a part in creating the bare bones of the landscape. People arrived in the North Pennines a few thousand years ago, heralding a new stage in the evolution of the area – a landscape that is continually evolving through natural processes and human activity.

**Foundations of the landscape**
The deep roots of the North Pennines are slates and volcanic rocks – akin to the rocks of the Lake District. They are mostly buried and are only exposed in part of Teesdale, and along the North Pennine escarpment, where they form a line of striking conical hills. Nearly 500 million years ago these rocks were muds and volcanic ash at the edge of a wide ocean. The ocean closed about 420 million years ago as the continents on either side collided. The muds and ashes were squashed, crumpled and altered to form the hard slaty rocks we see today.
Weardale Granite and the Alston Block
About 400 million years ago, a huge mass of molten rock rose up into the slates and volcanic rocks. It cooled and crystallized underground to form the Weardale Granite – a hidden but fundamental geological feature of the North Pennines. Granite is less dense than most other rocks in the Earth’s crust and is relatively buoyant. Because of this, the area above the granite – much of the North Pennines – has remained higher than surrounding areas for millions of years, and is known by geologists as the ‘Alston Block’. The North Pennines is an upland area today because of the effect of the Weardale Granite.

Tropical seas and swamps
About 350 to 300 million years ago – in the Carboniferous Period of Earth history – the North Pennines was near the equator and was periodically covered by shallow tropical seas. Skeletons of sea creatures accumulated as limy ooze on the sea floor. Rivers washed mud and sand into the sea, building up vast deltas on which swampy forests grew. In time, the limy ooze became limestone, the mud and sand became shale and sandstone, and the forests turned to coal. Periodically, the sea flooded in, drowning the deltas and depositing limestone again. This cycle happened many times, building up repeating layers of limestone, shale, sandstone and thin coal seams, known as ‘cyclothems’.

Limestone and sandstone are resistant to erosion, whereas the softer shales wear away easily. This contrast produces the distinctive terraced hillsides and flat hilltops of the North Pennines. Limestone also has its own special features. It dissolves gradually in rainwater creating ‘karst’ features such as sinkholes and limestone pavements.

Sandstone and limestone have been quarried in the North Pennines for centuries, and the use of local sandstone gives distinctive character to the area’s settlements and dry stone walls.

The Whin Sill
Stretching of the Earth’s crust 295 million years ago caused molten rock at over 1000ºC to rise up and be injected between layers of sandstone, limestone and shale. The molten rock cooled and solidified underground to form a roughly flat-lying sheet of rock, known as a ‘sill’. This is made of hard black dolerite or, as it is known locally, whinstone. While molten, its great heat baked and altered surrounding rocks, creating the unique ‘Sugar Limestone’ of Upper Teesdale. As the sill cooled it contracted, producing vertical cracks along which the dolerite breaks into rough columns. These columns can be seen in Whin Sill cliffs and quarry faces. After millions of years of erosion, the Whin Sill is now exposed at the surface where its cliffs form dramatic landscape features in Upper Teesdale and along the North Pennine escarpment.

Mineral riches
The North Pennines is world-famous for its remarkable mineral veins and deposits, known collectively as the Northern Pennine Orefield. The veins of lead ore and other minerals formed about 290 million years ago when mineral-rich waters, warmed by heat from the buried Weardale Granite, flowed through cracks and fractures deep underground. As the fluids cooled, their dissolved minerals crystallized within the fractures, forming mineral veins. Sometimes the fluids reacted with limestone on the sides of the fractures, altering the rock and forming mineral deposits known as ‘flats’.

Mining for lead ore in the North Pennines probably goes back at least to Roman times, but it had its heyday in the 18th and 19th centuries when the area’s lead mines were of world importance. Other commercially mined minerals include sphalerite (zinc ore), iron ores, fluorite (also known as fluorspar), and barium minerals such as baryte and wetherite. Mining for these minerals has had a profound effect on the landscape. Although the mines have all closed, the landscape is imprinted with the legacy of the area’s mining past – from shafts, hushes, spoil heaps and chimneys to the patterns of settlement and ‘miner-farmer’ landscapes.
Deserts and floods
The Eden Valley is underlain by red sandstones which give the villages at the foot of the North Pennine escarpment their distinctive character. These rocks formed between 290 and 210 million years ago, in the Permian and Triassic periods of Earth history, when the North Pennines baked in a hot desert environment just north of the equator. Sands from desert dunes, flash floods and rivers hardened into red sandstones. These rocks lie next to the much older slates and volcanic rocks of the distinctive ‘pikes’ and are separated from them by faults – cracks in the Earth’s crust along which there has been movement.

Ice age
From over 200 million years ago, we have little tangible evidence for what was happening in the North Pennines. We know that Britain drifted north to its present position, and that about two million years ago world climate cooled dramatically, heralding the start of a series of ice ages.

The landscape of the North Pennines owes much of its character to the action of ice and meltwater. About 20,000 years ago northern Britain lay frozen under a huge blanket of ice. A kilometre-thick ice sheet covered the North Pennines and streamed over the landscape, smoothing and scouring the hills and valleys. It dumped a mixture of clay, gravel and boulders known as ‘till’ and created streamlined mounds of glacial debris called drumlins. Some of the highest land in the North Pennines may have poked above the ice at times during the ice age. These hilltops would have been frozen wastes of frost-shattered rock.

After the ice
About 15,000 years ago the arctic conditions started to give way to a milder, wetter climate. The ice began to melt, leaving a landscape of bare rock, unstable slopes and piles of glacial debris. Torrential meltwaters carved drainage channels and deposited sand and gravel in the valleys. Amidst this rapidly changing landscape, arctic plants, grasses and dwarf shrubs began to colonise the bare land. These were eventually replaced by woodland – part of the great wildwood which once covered much of Britain. Sparse birch and Scots pine dominated the higher parts of the North Pennines. About 7,500 years ago, rainfall increased and blanket bog began to form on the waterlogged uplands. In these areas woodland cover decreased, leaving tree stumps buried and preserved in peat.

People and the landscape
Ever since people first came to the North Pennines, perhaps 10,000 years ago, human activity has profoundly influenced the landscape. The first settlers came to forage for wild resources in heavily wooded valleys, very different from today’s meadows and grassland. From about 5,000 years ago, early farmers began felling trees to create agricultural clearings, and the wildwood has been progressively cleared from this point.

Through the following millennia, many different peoples – Celts, Romans, Saxons, Vikings, Normans – left their mark in settlements, fortifications, field systems, graves and mines. But it is in the last few hundred years that people have had the greatest impact on the North Pennines landscape. Centuries of exploitation of the area’s rich mineral resources have not only left a rich heritage of mining remains, but have influenced the pattern of settlement and agriculture and even the shape of the fells and dales themselves.

Today’s landscape
Today’s North Pennines landscape is the product of millions of years of geological processes and just a few thousand years of human activity. All these have lent a hand in creating both the shape of the countryside and the intricate ‘quilt’ of land use and settlement draped over it.

Most people live in the dales which cut through the wild moorland landscape. Villages, farms and dry stone walls built of local stone reflect the underlying geology of the area. The imprint of lead and other mining activity is still strong, with chimneys, hushes, adits, mineshops and other features providing a reminder of our industrial past.
Landscape character types
This map shows the different landscape character types in the North Pennines AONB. These landscape types do not follow political boundaries and are best seen without reference to counties, districts or even specific dales. An example of this would be the ‘upper dale’ landscape type found at the top of all the main dales in the North Pennines. The defining characteristic of each landscape type are shown here.

Landscape character areas
Within these broad ‘landscape types’ we can find specific landscape character areas, which show some more subtle differences from place to place within areas of the same broad character type. Examples of this include Upper Teesdale and Upper Weardale, within the Character Type ‘upper dale’.

The AONB Partnership is undertaking a detailed landscape character assessment, with descriptions of landscape types and character areas, alongside some guidance for land managers and others on reinforcing the distinctive character of these different parts of the North Pennines.

This process does not attempt to set landscapes in stone, but aims to help us understand and reinforce their unifying characteristics and ensure that new development and land use change is in tune with the area’s character and quality.
Moorland Ridges

Broad divided ridges and high flat-topped summits • A strong horizontal grain to the topography • Grits and limestones outcrop locally in low grey crags and stone bands • The Whin Sill outcrops in some larger crags and scree slopes • Rocky, quick flowing Beckส or burns in steep sided gullies • Extensive tracts of blanket bog, with heather, cotton grass and sphagnum mosses • Deep peat exposed in eroded hags and peat edges • Drier slopes clothed in upland heath of heather and bilberry or acid grasslands • Extensive grazing by hardy hill sheep has created extensive areas of ‘white moor’ • Burning patterns on grouse moors create a patchwork of older and younger heather • Unfenced roads marked by snow poles with gates or cattle-grids at the moor wall • Occasional communications masts break the skyline as intrusive features • Relics of lead mining – shafts, hushes, spoil heaps, the courses of railways, reservoirs and water leats, smelt mill flues and chimneys • Few human made features other than occasional fences, grouse butts, cairns and sheepfolds • Panoramic long distance views out across unbroken moorlands or adjoining dales/valleys • A remote and elemental landscape with a near wilderness quality in places.

Examples of Landscape Character Areas within Moorland Ridges Character Type include Geltzale to Hartsisde, and the Teesdale/Weardale watershed.

Moorland Plateau

High moorland plateau, the legacy of a major ice sheet in the last glacial period • Gently rolling, almost flat, terrain cut into by steep-sided gullies • Occasional small, low, flat-topped, summits of resistant sandstones such as those of Shacklesborough and Goldsborough • Carboniferous rocks masked by deep peat which is exposed in eroded hags and peat edges • Continuous blanket bog of heather, cotton grass and sphagnum mosses • Upland heath and acid grassland in drier moorland fringes • Extensive grazing by hardy hill sheep promotes a shift towards grass or sedge dominated vegetation • Burning patterns on grouse moors create a patchwork of older and younger heather. Some of the wetter bogs are too wet for heather burning in most years • Few human made features other than occasional fences, grouse butts, cairns and sheepfolds • A remote and inaccessible landscape with few roads or tracks • A broad scale landscape with long distance views across open moorland to distant summits • An exposed, elemental and simple, often bleak, landscape with a near wilderness quality.

Examples of Landscape Character Areas within Moorland Plateau Character Type include Mickleton and Hundertwaite Moors, and Cotherstone Moor.

Moorland Summit

Wild remote places, with a severe climate • Extensive blanket bog vegetation • Openness and apparent naturalness and an almost total lack of human-made structures and an apparent lack of human influence • Sweeping interlocking ridges and prominent gritstone caps with blockfields on high summits • Dramatic distant views • Peat hags and hidden becks.

Within the AONB there is only one Landscape Character Area within the Moorland Summits Character Type, stretching from south east of Cow Green Reservoir to Cross Fell and towards the road at Hartsisde.
**Moorland Fringe**

Upland landscape of improved moorland fringes, intakes and allotments, between the open moors and settled dales. • Varied topography including valleys and upper dalesides. • The contrasting hardness of layers of limestone, sandstones and shales give the hillsides a stepped appearance. • The Whin Sill outcrops locally in low crags. • Shallow, infertile or waterlogged peaty soils. A pastoral landscape of wet, rusty pastures, rough grazing and enclosed moorland. • Large regular fields of Parliamentary enclosures bounded by low stone walls and wire fences. • Varying degrees of improvement and grazing creates a patchwork of muted and brighter greens. • Isolated farms built of stone with roofs of stone flag or slate, connected by straight roads from the enclosure period. The farms and field barns of the Raby Estate in Teesdale are painted white. • The landscape is generally open with few trees or woodlands. • There are occasional clumps of sycamore planted as shelter trees round exposed farms, and scattered conifer plantations and shelterbelts with occasional large tracts of commercial forestry on the fringes of the AONB. • Relics of the lead mining industry are common – mine buildings, waste heaps, smelting mill flues, reservoirs and hushes. • Visually open but enclosed by encircling moorland ridgelines. • A remote and tranquil landscape on the margins of settlement and agriculture, sometimes with a slightly neglected quality.

Examples of Landscape Character Areas within Moorland Fringe Character Type include Lunedale and Waskerley Moorland Fringes.

**Moorland Scarp**

Dramatic landforms. • A sweep of unimproved rough grazing contrasting with the lower landscape of the foothills and pikes. • Exposures of bands of Carboniferous limestone and sandstone. • A lack of enclosure. • Largely treeless. • Long views outwards to the Eden Valley and the Lake District and Howgill Fells.

There are three Character Areas within the Moorland Scarp Character Type: Middle Rigg – Brough; Stainmore; and Ladthwaite.

**Upper Dales**

A pastoral landscape at the limits of agriculture, high in the upper reaches of the North Pennine dales. • Varied valley topography, with most upper dales being relatively shallow and broad. • Carboniferous rocks bare of drift or covered by glacial till. • Fast flowing rocky streams. • Shallow, infertile or waterlogged soils. • Wet rusty pastures, upland hay meadows and rough grazing in the moorland fringes. • Few trees or woodlands, with occasional small streamside woods, sparse lines of alder and willow scrub following watercourses; occasional concentrations of regular conifer plantations several of which are in the process of being restructured. • Regular patterns of generally large fields with dry stone walls often in a poor state of repair. Scattered field barns and sheep folds. • Scattered small farms with occasional farm clusters and hamlets occasionally marked by wind-blown groups of sycamore or pine shelter trees. • In Teesdale the tenanted farms of the Raby Estate are painted white. • Relics of the lead mining industry – mine buildings, waste heaps, smelting mill flues, reservoirs and hushes. • Upper dales in Weardale and the East Allen Valley display a classic miner-farmer appearance of smallholdings. • Major reservoirs in several of the Durham dales. • Visually open but enclosed by encircling moorland ridgelines. • Remote and tranquil landscapes on the margins of settlement and agriculture, with a bleak and neglected quality.

Examples of Landscape Character Areas within the Upper Dales Character Type include Upper Weardale and the Upper South Tyne.

**Middle Dale**

Broad upland valleys with moderately sloping, often gently stepped valley sides, incised by narrow steep-sided gills. • Carboniferous rocks overlain on lower slopes by till give a gently stepped profile to the upper dale sides in places. • The Whin Sill outcrops locally in prominent scars and in Teesdale creates dramatic waterfalls. • Narrow floodplains of alluvium or glacial sands and gravels. • Rocky fast flowing rivers and streams. • Heavy, often waterlogged clay soils with more fertile brown earths on valley floors. • Improved and semi-improved pastures and flower-rich upland hay meadows. • Strong regular or sub-regular patterns of dry stone walls with occasional ash, oak and sycamore field trees. • Many walls have irregular stones from field clearances and river beds. • Sparsely wooded. Narrow ash and oak-birch woodlands along rivers and streams and dale side gills. Scattered plantations of pine, larch or spruce. • Small villages, hamlets and farm clusters follow valley floor roads - scattered farms and field barns on the dale side. • Buildings of local stone with roofs of stone flag or slate. • Active and abandoned limestone and whinstone quarries prominent on some dale sides. • Relics of the lead mining industry - mine buildings, waste heaps, smelt mill flues, reservoirs and hushes. • Major reservoirs in some dales. • Visually open but enclosed by encircling moorland ridgelines. • A settled and largely tranquil upland landscape that, with its vernacular buildings, field boundaries and traditionally managed meadows and pastures, has a strong sense of both visual unity and cultural continuity.
Examples of Landscape Character Areas within the Middle Dales Character Type include Mid Teesdale and the South Tyne downstream from Alston.

Lower Dale
Broad valleys with narrow floodplains or gorges on the valley floor • Winding, rocky fast flowing rivers • Carboniferous rocks covered by glacial drift, river gravels or alluvium • Limestones, sandstones and shales outcrop occasionally on the sides of gorges and dale side quarries • Heavy clay soils with more fertile brown earths and alluvial soils on the dale floor • Pastoral farmland of improved and semi-improved pastures • Old field systems with sub-regular or linear patterns of hedges and walls • Relics of rigg and furrow, and cultivation terraces • Frequent hedgerow oak, ash, sycamore and wych elm, tree lined watercourses and overgrown hedgerows • Ancient ash and oak woods in gorges and denes • Old villages of vernacular sandstone buildings on the dale floor • Scattered stone farmsteads and field barns • Limestone quarries are locally prominent on the dale side • Visually enclosed by woodlands, trees and hedgerows and defined by high moorland ridgelines.

There are few examples of Landscape Character Areas within the Lower Dales Character Type, the most notable examples being the Lower Allen Valley and Lower Derwent Valley.

Coalfield Upland Fringe
Broad ridges and shallow valley heads • Gently rounded topography of drift free, thinly bedded sandstones, mudstones, shales and coals • Occasional steep bluffs and incised denes • Heavy, seasonally waterlogged clay soils with pockets of peaty soils supporting heathland vegetation • Pastoral land use of improved or semi-improved pasture with some arable cropping on drier ridges • Regular grids of Parliamentary enclosures bounded by dry stone walls or overgrown hawthorn hedges • Few trees - scattered hedgerow oak, ash, rowan or birch • Sparsely wooded - scattered conifer plantations and shelterbelts • Isolated farms connected by straight enclosure roads • A visually open landscape with commanding views across adjacent valleys to distant ridges.

Within the AONB there are two Landscape Character Areas within the Coalfield Upland Fringe Character Type, Derwent Reservoir to Kiln Pit Hill, and Salter’s Gate to Castleside, west of the A68.
Upland Fringe Valleys
Shallow valleys with occasional narrow floodplains, low bluffs and incised denes • Gently rolling topography of thinly bedded sandstones, mudstones and shales overlain by glacial drift and river terrace gravels • Heavy, seasonally waterlogged, clay soils • Pastoral farmland of improved and semi-improved pasture and meadow • Sub-regular field patterns of old enclosures bounded by overgrown hedges, wire fences and occasional dry stone walls. Occasional regular Parliamentary enclosures • Scattered, locally abundant hedgerow and field trees - oak, ash and sycamore • Ancient oak woods in narrow denes, on riverside bluffs, and along watercourses • Scattered farms. Buildings are of local sandstone with roofs of slate or stone • Narrow winding lanes and occasional straighter enclosure roads • A well wooded and timbered landscape creating a high degree of enclosure in places • A tranquil settled rural landscape.

This Landscape Character Type is represented by a single Character Area, the Rowley Burn Valley which takes in the valleys of the Rowley Burn and its tributary the Ham Burn west of Whitley Chapel.

Upland Fringe Pikes
Distinctive strip of isolated, conical hills or ‘pikes’ lying between the escarpment and the Eden Valley • Character is strongly controlled by rock type and geological structure (Ordovician and Silurian volcanic and slaty rocks, akin to those of the Lake District) • The pikes form a strip which is separated from the Carboniferous rocks of the escarpment and the Permo-Triassic rocks of the Eden Valley, by major and complex geological faults (fractures in the Earth’s crust along which there has been movement) • There is little glacial material on the pikes, resulting in smooth grass-covered slopes with scattered small rock exposures • The steep pike sides are covered in close-cropped turf, with patches of bracken and sparse hawthorn bushes on the lower slopes • Small disused roadstone quarries on the lower pike sides • Land between and around the pikes is a mixture of rolling, improved grazing pasture, and patches of natural/semi-natural woodland and boggy ground along streams • Dry stone walls, some of which contain a mix of rock types, reflecting the pikes’ position between the escarpment and the Eden Valley • Glacial meltwaters have enhanced valleys which have formed along lines of geological faults, resulting in steep-sided valleys • Scattered farms and barns, commonly on the Eden Valley side of the pikes.

There is only one Landscape Character Area within this Character Type, stretching from Murton Pike to Burney Hill.

Upland Fringe Foothills
Rolling farmland with low hills • A transitional landscape, between the higher country of the Carboniferous limestones, sandstones and shales, (and in some places the older, more rounded, hills of the upland fringe pikes), and the Eden Valley to the west • Dispersed settlement pattern. Red sandstone villages reflecting underlying Permo-Triassic sandstones and served by narrow lanes • Field systems mainly the product of late enclosure and bounded mainly by stone walls with a small number of hedges • Pockets of semi-natural woodland in small valleys.

There is only one Character Area within this Character Type, stretching from near Tindale in the north, to Natesby in the south (where it is split in two by an area of moorland fringe and moorland).
The North Pennines AONB has more grassland of wildlife importance than most other areas in the country. Herb-rich grasslands are now very rare in the countryside in general, but the relatively less intensive farming practised here in recent decades has allowed more species-rich grasslands to survive. Some of these grasslands can have up to 40 species in a square metre of ground. This diversity in plant species in turn, provides excellent habitat for a wide range of specialised insects and other animals, many of which depend on particular uncommon plant species or the unusual habitat conditions provided. Some of these grasslands also support characteristic birds of the area, such as lapwing.

Some of the different types of important grasslands in the AONB are described below. Grassland habitats were created by traditional management practices and require continuing management in order to survive.

**Keeping our grasslands special**
- active management by grazing and/or cutting needs to be continued or adapted to enhance biodiversity
- no artificial fertilizer or slurry should be used on species-rich grassland
- no more species-rich grassland should be lost to ploughing and reseeding
- species-rich wet grassland should not be drained
- people’s understanding and enjoyment of these special grasslands should be encouraged
- species-rich, or potentially species-rich, grasslands should be enhanced or restored
- where rabbits are abundant they may need to be fenced out

**Upland limestone grassland**
Upland limestone grassland can occur wherever limestone is close to the surface. This type of grassland is often much richer in flowers than the surrounding grasslands and is characterised by lime-loving species such as wild thyme, common rock-rose and fairy flax.

In Upper Teesdale a unique type of upland limestone grassland occurs on crumbling ‘Sugar Limestone’. Not only is this grassland very flower-rich but it also includes a number of very rare arctic and alpine species such as false sedge, Teesdale violet, spring gentian, hoary rockrose, bird’s-eye primrose, mountain avens, and hoary whitlowgrass. Many of these plants are thought to have survived here since the last glaciation.
Another special type of limestone grassland, which is characterised by blue moor-grass, also occurs in the area along the banks of the Tees upstream from Wynch Bridge. In Britain, this type of grassland occurs only in northern England. Other types of upland limestone grassland are scattered around the AONB, especially in Teesdale, Weardale, South Tyndale and the Upper Eden Valley.

**Keeping our upland limestone grasslands special**
- the traditional grazing regime should be maintained, with only very light grazing in summer
- where rabbits are abundant they need to be controlled or fenced out

**Upland hay meadows**

Over 40% of all the UK’s upland hay meadows are in the North Pennines AONB! This is now a rare habitat throughout Europe and is recognized as of European importance. Livestock are removed from these fields in late spring and the fields are cut for hay in late summer to provide fodder for grazing animals over the winter.

The best upland hay meadows are very species-rich and differ from hay meadows in the lowlands in having several characteristic ‘northern’ species such as wood crane’s-bill, globeflower, marsh hawk’s-beard, and melancholy thistle. A very special group of upland hay meadow plants are the Lady’s-mantles. Nine of these Lady’s-mantles occur in the AONB, six of which are rare species and three of them occur nowhere else in Britain.

Our hay meadows are also of great importance for breeding birds such as yellow wagtail, redshank and lapwing, and as a feeding area for birds such as black grouse. They were once home to the enigmatic corncrake and with the right management, these special birds could return to the North Pennines each spring, as they did in the past.

The best upland hay meadows are now scattered around the dales of the AONB. Parts of the upper sections of Teesdale, Weardale and South Tyndale, as well as parts of Lune Dale, Baldersdale and East Allendale, support particularly good examples.

**Keeping our upland hay meadows special**
- meadows should be cut for hay rather than for haylage or silage, whenever the weather allows
- cuts should be late in the summer after most of the plants have flowered and set seed
- fields should be grazed in autumn (and lightly in spring if this has been traditional in the field)
- walkers should only access hay meadows using Public Rights of Way
- species-rich or potentially species-rich grasslands should be enhanced or restored

**Species-rich road verges and riverbanks**

Grasslands along roadside verges and riverbanks would have been an integral part of farm management in the past but now are often fenced off and unmanaged. Species-rich plant communities similar to those in hay meadows or limestone grassland sometimes survive in these areas, even when the special grassland within the adjacent fields has been lost. The best examples of these habitats are also scattered around the dales of the AONB. There is good access to the riverbanks in Upper Teesdale (upstream from Newbiggin) and in Upper South Tyndale (between Alston and Garrigill), which are particularly spectacular. Flower-rich road verges are relatively widespread along the roads through the dales.

**Keeping our species-rich road verges & riverbanks special**
- verges and riverbank grasslands have often been neglected in the past, and lost to scrub and woodland – to maintain their diversity, these areas need to be cut in late summer with the cuttings removed
- cutting once every few years, may be enough for some verges and banks, whilst others may need more regular cutting

**Allotments and pastures – a wader hotspot**

The large fields between the moorland and the more intensively managed fields in the valley bottom provide a gradual change in habitat and are particularly useful for black grouse and for breeding waders such as curlew, snipe and lapwing.

In the British context, the density of the breeding waders here is second only to the Outer Hebrides, and this habitat, allied to ground-predator control, is part of the reason why the wading birds do so well here. These fields are often a mosaic of wet areas with patches of rushes and drier areas providing an ideal range of habitat conditions for waders. The vegetation is often not very species-rich but some areas can be of botanical interest, especially where no fertiliser has been used or where lime rich water seeps to the surface from the underlying limestone.
Large numbers of breeding waders can be found in spring and early summer in this type of habitat in more or less every part of the AONB below the moorland wall. The upper reaches of Upper Teesdale and the Harwood Valley have particularly high densities of breeding waders.

**Keeping our allotments and pastures special for wading birds**
- the current balance of wet and drier areas needs to be retained. Re-wetting may be appropriate in certain locations
- overall rush cover needs to be managed in mosaics across the whole field, ensuring a range of vegetation heights

**Calaminarian (or heavy metal) grassland**
Due to the long history of mining for lead, zinc and other minerals in the North Pennines, there are many areas of land contaminated with heavy metals. These include spoil heaps close to old workings and flat gravelly areas alongside rivers, where the metals have been deposited in floods. Unusual plant communities develop in these areas, including some plants that are specially adapted to this habitat such as spring sandwort, alpine penny-cress and thrift (more usually found in coastal grasslands).

Mountain pansies are often very plentiful in these areas and there are often specialised mosses, liverworts and lichens on the less vegetated areas. A rare and unusual orchid, narrow-lipped helleborine, grows on contaminated soil under birch. This habitat is recognised as being of European-wide importance.

The best river gravel calaminarian grasslands occur in places along the South Tyne and the East and West Allen. Spoil heaps are widespread throughout the area but unfortunately on many of these the vegetation has developed so much that the specialised metal-tolerant plants have all but disappeared.

**Keeping our calaminarian grasslands special**
- as the vegetation develops in these areas, it tends to become more dense and a new layer of soil builds up on top of the contaminated soil, and may out-compete the specialised calaminarian grassland. Some form of disturbance is needed in order for the specialized metal-tolerant plants to survive
- in some places, light grazing or cutting may be enough to maintain this habitat, but more drastic management, such as topsoil stripping, may be needed in other areas

**Other valuable grasslands**
Other types of species-rich grassland occur in the North Pennines but are often less well known and understood than those mentioned above. There are occasional examples of species-rich types of vegetation that occur in other parts of the country, such as lowland meadows and pastures. These are valuable not because they are unique to this area, but because of the overall rarity of this habitat in the UK.

Steep or awkward banks within fields, being difficult to access with modern machinery, have often not received artificial fertiliser and some have retained species-rich, flowery habitats. Various different types of vegetation can occur, depending on the type of soil, but where these areas have a good cover of betony or bitter-vetch, it is often worth looking for rare plants such as small-white orchid, greater butterfly-orchid and field gentian.

There are many small abandoned quarries in the North Pennines and where these have been allowed to revegetate naturally they often develop into very rich habitats. Different plant communities and habitat conditions develop on different parts of the quarry floor and sides.

These types of grasslands are scattered around the North Pennines, often in quite small patches. Good places to look include streamside banks or ghylls and any of the accessible quarries e.g. Bowlees Quarry. Please be aware of hazards such as rough ground, loose rocks on cliffs and holes in quarries.

**Keeping our other valuable grasslands special**
- all grasslands benefit from some form of management through grazing or cutting or both – the intensity of the management needed varies depending on the precise conditions in each area
- vegetation should be allowed to develop naturally when quarries come to the end of their active life
Moorlands

From the high summits of Cross Fell and the wind swept expanses of blanket bog on the plateau above Lunedale, to the high ridges between the eastern and northern dales, the moorland landscapes of the North Pennines are England’s wildest places. They are home to some of our rarest and most charismatic wildlife and have an unspoilt sense of naturalness and remoteness found in few other places in our crowded country.

**Sense of wildness**

This sense of wildness is more imagined than real, as even the most remote summits have been affected by grazing animals under the control of humankind for centuries and also by burning and, latterly, the digging of drains (grips). Most of our moorland landscapes have also been shaped by management for grouse shooting and this continues to be a motive force in their conservation. There are few human-made structures on the moors and most of those that occur, such as the redundant mine shops and smelt mill chimneys, contribute to their wild character. This, and the often dramatic weather, can make them feel like a place apart from the world below. A walk on the moors offers a sense of tranquility and isolation that is difficult to find elsewhere in England.

Forty five percent of the AONB (almost 90,000 ha) is covered by wild expanses of peatlands, over 66% of which are SSSI. This represents over 20% of England’s SSSI blanket bog. A good quality tract of blanket bog in the North Pennines contains heather, cross-leaved heath, hare’s-tail cottongrass, bilberry, common cottongrass, cloudberry, deergrass, crowberry and bog asphodel, as well as many species of peat-building Sphagnum moss. In the past some areas have been damaged by overgrazing or inappropriate burning but it is hoped that new agri-environment schemes and the Heather and Grass Burning Code will reduce both of these problems.

**Peatland services**

Today one of the main issues regarding our uplands are the services that peatlands provide for society if they are well cared for and allowed to develop as functioning wetland ecosystems. These services, notably carbon storage, flood risk amelioration and drinking water provision, are of great value to us all as we face an uncertain future with the onset of climate change.

There is more carbon stored in the peatland of the UK than in all the forests of France, Germany and the UK combined, and in the North Pennines peatlands alone there is estimated to be stored 50 years worth of Drax Power Station emissions! Years of ‘gripping’ (the cutting of drains in the peat) has reduced their value as wetlands, led to significant erosion and threatened their future; but all is not lost, and the simple action of blocking these grips can begin to reverse the impact of years of drainage. There are 9600 km of grips criss-crossing our uplands, so there’s still a way to go to resolve this problem and ensure that our peatlands keep serving society into the future.
**Historic environment**

Peat preserves vital evidence for landscape change since the end of the last glaciation in the form of pollen grains and other organic remains which rarely survive in other environments. When the peat is disturbed or allowed to dry out, this evidence can be lost forever. The peat of the North Pennines has yielded 4000-year-old horns of aurochs (extinct wild cattle) and a mysterious 18th century coffin containing a body and a bullet. Many more extraordinary finds must still lie buried within the peat, but will only survive for future discovery if we maintain our peatlands in good condition.

**Heathland**

The moorland habitats include 36% of England’s upland heathland. Dry heath, which covers 14% of the AONB (almost 30,000 ha), is dominated by heather (ling) and bell heather and occurs on the steeper hill slopes and as mosaics with acid grasslands. Wet heath, characterised by cross-leaved heath and/or purple moor grass, occurs in waterlogged valleys and in association with blanket bog. Although this habitat is generally poor in plant species it supports a variety of dwarf shrubs and is rich in invertebrates.

**Montane heath**

The highest ground in England, outside the Lake District, can be found in the North Pennines and on the highest and most exposed land is a montane heath with prostrate, weather-beaten shrubs, mosses and lichens, more typical of parts of the Scottish Highlands. Seepages at these higher elevations support a montane ‘brown flush’ vegetation community found nowhere else in England. This includes common yellow sedge, yellow mountain saxifrage, Alpine meadow-rue and three-flowered rush. The North Pennines has one of the largest populations in the world of the endangered marsh saxifrage, which grows in flushes on the high moors.

**Acid grassland**

Our upland limestone grasslands are described on page 15 of this book, but there are also four main types of acid grassland in the North Pennines totaling 44,000 ha (almost 21% of the AONB), distinguished by their dominant species - mat grass, sheep’s fescue, common bent, wavy hair grass and heath rush. Large areas remain because they are difficult to improve for agriculture. It is possible to restore some of the less modified acid grasslands to heathland, though this must be balanced with areas where dwarf shrubs have been lost that are still important for breeding waders.

**Birds and animals**

Our moorlands are also important for a variety of specialised birds. Moorland management supports abundant red grouse, which feed on the young tips of heather. Large areas are covered by the Special Protection Area designation under the EU Birds Directive and Special Area of Conservation designation under the Habitats Directive. Eighty percent of England’s black grouse, and important numbers of other ‘Annex 1’ species including curlew, golden plover, merlin, peregrine and short-eared owl are also found here. Hen harrier breed in some years but in numbers much smaller than might be expected. Other birds breeding on or using our moors include dunlin, redshank, oystercatcher and meadow pipit. Adders are relatively common here, and the wetter areas of our moors are home to water voles and amphibians.

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**Keeping our moorlands special means**

- supporting moorland managers whose sustainable land management practices have helped shape today’s natural beauty
- supporting all moorland managers to achieve the highest standards of sustainable management
- ensuring our blanket bogs remain fully functioning wetlands – grip blocking on a landscape scale needs to continue for several years
- gaining a better shared understanding of burning management on grouse moors and implementing the Heather and Grass Burning Code
- guarding against accidental fire and arson
- managing grazing pressure (including having a better balance of sheep and cattle on the moors)
- providing conditions for birds of prey such as hen harrier to increase
- controlling bracken encroachment
- resisting pressure for developments which erode wildness and tranquility, such as large wind turbines, poorly sited telecom masts, tracks and more low flying military aircraft
- reducing rabbit grazing pressure on the special plant communities of flushes
Human activity over several thousand years has created the landscape we enjoy today, benefiting a whole range of species and habitats but greatly reducing our woodland cover. Upland woodland was once a much more common feature in the North Pennines landscape and episodic changes of land use by the miner–farmer communities permitted regeneration of trees and shrubs. However, neglect and persistent grazing by livestock has fragmented and diminished our woods.

There are 5,128 hectares of woodland in the AONB; 3,483 ha (68%) is coniferous, with 1,645 ha (32%) broadleaved; 930 ha (57%) of the broadleaved woodland is ancient and semi-natural.

Many of the ancient semi-natural woodlands occur in steep gills, which have been too difficult to clear for agriculture or graze with sheep. Others are found along river valleys, particularly the Allen and the South Tyne.

**Woodland types**

Four principal woodland types are found in the North Pennines: upland mixed ash woods, upland oak woods, wet woodland, and conifer plantations. Juniper scrub is also an internationally important feature of the middle dales, notably in Teesdale. The woodland communities of the North Pennines are important in their own right for their contribution to the landscape and for the biodiversity which they support, which includes red squirrels in several locations. Isolated trees and small groups of trees are also a distinctive feature in the landscape.

**Upland mixed ash woods**

Upland mixed ash woods occur on base rich soils and are dominated by ash and wych elm, with birch, sessile oak, hazel, rowan and bird cherry. The ground flora is herb rich and is notable for bright displays of flowers such as bluebell, primrose, wood crane’s-bill and wild garlic. Wood avens, common dog violet and wood sorrel are also regular features of the ground flora, which is often rich in ferns due to its higher humidity.
Good examples of these woodlands can be found in parts of Teesdale, Weardale, the Greta Valley and the Derwent Valley. The Helbeck and Swindale Woods Special Area of Conservation near Brough is considered to be one of the best examples of this woodland type in the UK.

**Upland oak woods**

Upland oak woods are found on free-draining more acidic soils. As well as sessile oak, downy and silver birch are also present as canopy species, with an understory of rowan, hazel and holly. Ground flora varies with soil type and degree of grazing, but typically includes species such as wavy hair grass, wood sorrel, wood anemone, bluebell and bilberry.

Birdlife in these woods is typical of many such woodlands in the northern and western UK, supporting migrant wood warbler, pied flycatcher, redstart and tree pipit, as well as a range of common resident species. These birds are undergoing significant national declines and in the North Pennines there are opportunities to contribute to their conservation. These woods also support a diverse community of lichens and bryophytes.

This woodland type now typically occurs as fragments, surviving in steep-sided gills, with few blocks in excess of five hectares in size. It is believed that approximately 845 ha of upland oak woodland remains in the AONB with over half of this being in the Allen and South Tyne Valleys. Derwent Gorge National Nature Reserve and the Gelt Valley also have significant areas of species-rich oak woodland.

**Wet woodland**

Wet woodlands are found on poorly drained soils across the AONB, particularly in river valleys, and are dominated by alder, birch and willows. They are an important winter food source for black grouse. Extensive floodplain and hillside wet woodland is now extremely rare and the alder-ash woodlands of the North Pennines are of national importance.

**Juniper scrub**

Juniper is one of Britain’s few native evergreen shrubs and juniper scrub is an increasingly scarce and fragmented habitat. Juniper stands occur at very scattered localities within the North Pennine dales, although the Moor House-Upper Teesdale NNR contains one of Britain’s largest stands, with at least 15,000 bushes, covering around 100 ha. What remains is often even-aged, dominated by older bushes, with virtually no regeneration occurring. Managing juniper is a notoriously difficult task and it will require considerable conservation effort to maintain the nationally important juniper scrub of the North Pennines.

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**Plantation on Ancient Woodland Sites**

A 2006 survey of the AONB identified 500ha of plantations on ancient woodland sites. These areas offer opportunities for broadleaved woodland restoration.

**Conifer plantations**

Coniferous plantation woodlands make up a substantial proportion of the area’s woodland cover. These plantations are widespread, but are concentrated along the upland fringes and lowland hills of Teesdale and Weardale. In the past semi-natural woods, heath, mire and grassland communities were planted with conifers; there is scope for the removal of this non-native stock where remnants of the original ground flora still exist. That said, it is important to take into account the need to retain those conifer plantations supporting red squirrel. Proposals for new native woodland planting should also take into account the need to minimise the potential for grey squirrels to colonise isolated red squirrel sites.

There is much scope for creating new native woodlands across the AONB, which can conserve and enhance landscape character and increase biodiversity.

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**To keep our trees and woods special we need to**

- reduce, or bring to an end, grazing in over-grazed woods
- bring management back to neglected woodlands
- promote diversity in existing conifer plantations by restocking with native broadleaves
- encourage markets for wood and wood products to foster woodland management
- create new areas of native broadleaved and juniper woodland
- control the spread of non-native species
- minimise risks to wet woodland caused by lowering of the water table through drainage and abstraction, poor water quality, some flood prevention measures and the water borne fungal disease Phytophthora
The world famous rivers Tyne, Wear and Tees all have their birthplace high in the North Pennine hills. Most of our rivers are both relatively unpolluted and free from hard engineering and are home to creatures including otter, water vole, brown trout and Atlantic salmon. The birdlife of our rivers includes dipper, common sandpiper, kingfisher and grey wagtail, with goosander where woodland provides opportunities for nesting.

The rivers also have a diverse range of features, such as riffles, shingle banks and pools, which each support a range of plants and animals. These channel features are complemented by bank features, such as earth or rock cliffs, stands of reeds, woodland or herb-rich grasslands.

The headwaters of rivers and streams are particularly important wildlife habitats and support species not found in other parts of river systems. Due to the upland nature of the North Pennines, we have more headwaters than other parts of England.

Riverbanks in the North Pennines often support species-rich terrestrial habitats which have largely disappeared from the adjacent agricultural landscape. Where these banks are formed on the Whin Sill or limestone the habitats can be particularly rich. Together, this range of wildlife and habitats and their generally wild and unspoilt nature, makes our rivers one of the greatest natural assets of the North Pennines.

**Remarkable recovery**

Our rivers have shown a remarkable recovery in fish populations, with the South Tyne, Wear and Tees having greatly improved stocks of salmon and sea trout and the Derwent having a regionally important brown trout fishery. The main River Tyne is now the best salmon river in England in terms of rod catches.

The continuing impact of pollution from historic mining activity on the water quality of the East and West Allen...
catchments (and that of the Nent) means that there are relatively few invertebrates and fish in these rivers. However, they have developed a riverside flora which is tolerant of heavy metal pollutants and this is in large part the reason for the designation of the Tyne and Allen River Gravels Special Area of Conservation (SAC).

Some of the tributaries of the River Eden arise in the North Pennine fells, forming part of an internationally important river system designated as a SAC for a number of species, including salmon and white-clawed crayfish.

**Wetlands**
Away from the rivers, other wetland areas, notably springs and flushes add much to the biodiversity of the North Pennines, with the base-rich flushes of Moor House-Upper Teesdale National Nature Reserve being of international conservation importance. These base-rich flushes are often covered by short vegetation comprised of a rich mixture of bryophytes, sedges, grasses and wild flowers. It is in this habitat that several of the famous ‘Teesdale rarities’ are found including Teesdale sandwort, alpine bartsia and false sedge.

**Reservoirs**
The North Pennines provides water from its reservoirs for many surrounding towns and cities; these reservoirs have become home to a range of bird and animal life, including otters and an important breeding population of wigeon. Our reservoirs have also become popular places for fishing and sailing and their banks are popular with walkers and cyclists.

**Dramatic waterfalls**
Several North Pennine rivers have attractive and sometimes dramatic waterfalls, notably High Force, Low Force, Cauldron Snout, Ashgill Force and Thortergill Force. As well as being of considerable geological interest, they make an important contribution to a sense of place and are popular places to visit.

**Looking after our rivers**
Despite the generally optimistic outlook for our rivers and streams, they are currently at risk from:

- pollution, including nutrient enrichment, toxic discharges and farm waste
- inappropriate channel and bankside management, including intensive grazing up to the river edge, unsympathetic engineering works and culverting
- unsympathetic catchment land use, including moorland drainage (gripping) schemes at headwaters, alteration of flows, water abstraction, agricultural intensification and developments within the floodplain
- species-rich habitats on riverbanks have been protected from the impacts of agricultural intensification, due to benign neglect, but as this neglect continues the habitats become more overgrown and lose a lot of their diversity.
- the spread of non-native species such as Himalayan balsam, Japanese knotweed and mink
The North Pennine landscape holds clues to the activities of people over the past 10,000 years, extending back to the Mesolithic (Middle Stone Age) when the first bands of hunters wandered into the area after the Ice Age.

**Hunters and gatherers**
Mesolithic people, often referred to as ‘hunters and gatherers’ lived a nomadic lifestyle, moving around the landscape to exploit available natural resources in a manner probably not greatly different from that of many nineteenth-century Native American communities. They have left few clues as to their presence in the North Pennines other than their flint tools and weapons, recovered from the surface of ploughed fields in many places throughout Weardale, Teesdale and elsewhere. A recent excavation on Birkside Fell, near Blanchland, recovered several hundred worked pieces of flint from a Mesolithic campsite.

**The first farmers**
Between 6,000 years and 4,000 years ago, during the Neolithic (New Stone Age) communities throughout the North Pennines gradually adopted farming alongside long-established practices of hunting, fishing and gathering. Many polished stone axes, beautiful leaf-shaped flint arrowheads and other stone tools provide evidence of Neolithic activity. Several little stone circles, like the fine example at Lunehead, probably stood within and around the AONB in late Neolithic/early Bronze Age times. These may have played a similar role to parish churches in later times, providing foci for ritual and possibly also for burial. The enigmatic rock carvings known as ‘cup-and-ring marks’, of which several survive on the fringes of the AONB, also date from this period.

**Round houses and round cairns**
During the Bronze Age, from about 4,000 years ago, permanent farmsteads of round houses and small fields appeared in the North Pennine landscape. A good example can be seen by the Hilton Beck, Scordale, where recent survey work has recorded a complex of house platforms, field walls and field clearance cairns extending over about 20 hectares. A Bronze Age settlement of about 1500BC has been excavated at Bracken Rigg in Teesdale, where a large timber roundhouse stood within an irregular enclosure of about 0.7 hectares. Much more common throughout the region are round cairns, roughly circular piles of stone built to cover burials and also as convenient repositories for stones cleared from fields. These are sometimes found in substantial cairnfields, such as at Crawley Edge above Stanhope in Weardale, where more than forty examples are recorded. A spectacular hoard of Bronze Age objects, dating...
from about 1000BC, was made in the 19th century within Heathery Burn Cave, Stanhope. This includes spearheads, axes, knives, tongs, bracelets and cheek pieces from a horse harness, all of bronze, together with jet rings and anklets and armlets of gold.

Romans and natives

From about 800BC, iron technology was introduced into the area, marking the onset of the Iron Age, but this seems to have had little effect on local settlement patterns. Settlement and agriculture continued to expand gradually throughout the lower slopes of the dales during the Iron Age and into Roman times. Two settlements were excavated in the 1970s at Forcergarth Pasture, Teesdale, both dating from about 250AD: finds included Roman and native pottery, quern stones, spindle whorls, loom weights and evidence of smithing.

During the latter half of the first century, a network of Roman roads, studded with forts and marching camps, was constructed to enable troops to pass unhindered across northern England. The North Pennines were effectively enclosed by such roads and the Maiden Way ran between the forts at Kirkby Thore and Carvoran (near Hadrian’s Wall) passing close by Alston where the fort of Whitley Castle was constructed, presumably to oversee lead and silver mining in the region. Two third-century altars from Weardale, dedicated to Silvanus (a woodland god often associated with hunting) suggest that many areas retained a woodland cover and were perhaps reserved for elite hunting expeditions.

Anglo-Saxons and Vikings

The North Pennines lay within the great Anglo-Saxon kingdom of Northumbria during the seventh and eighth centuries, but seems never to have been anything other than a peripheral zone. In 883, much of the land between the Tyne and the Tees was granted by King Guthred to the Community of St Cuthbert; thus it was owned and managed by the ecclesiastical authorities in an early version of what would become County Durham. Four fascinating settlement sites dating from the late eighth century have been partially excavated at Simy Folds on Holwick Fell (Upper Teesdale). These consist of rectangular buildings and small, enclosed yards: one of them produced evidence for iron smelting and smithing. Place-name evidence suggests that northern and eastern regions of the AONB were dominated by Anglo-Saxon communities, while Norse (Viking) influence was much greater to the south and west, in Teesdale and the Eden Valley.

Medieval times

After 1066, England was divided up amongst William the Conqueror’s loyal followers, many of whom built castles to protect their property. The area’s transport and communications network was still very much based on the Roman road network and some important Norman castles, of which Brough is a particularly good example, were built on the site of Roman forts. Other medieval castles were constructed at numerous places around the fringes of the AONB. During the three centuries preceding the Union of the Crowns in 1603, the region was constantly threatened with cross-border reiving associated with Anglo-Scottish border conflict; in response to this, in about 1600, several bastles (thick-walled defensible farmhouses with living accommodation at first-floor level over a byre) were built in the Allendale and on Alston Moor.

In medieval times, the land owned by the Community of St Cuthbert came under the jurisdiction of the immensely powerful Prince Bishops of Durham. Upper Weardale was maintained as a vast hunting forest, subject to special forest law rather than common law. Between 1250 and 1300, Stanhope deer park was set up within the forest, along with some 30 new vaccaries (seasonally occupied, tenanted cattle ranches). Several of these vaccaries grew into hamlets and villages, some of which still survive today. Other great medieval forests in the North Pennines included those of Teesdale, Gilsdale, Gilderdale, Milburn, Lune and Staninmore. In addition to Stanhope, many other deer parks existed in and around the AONB, for example at Wolsingham, Waskerley, Marwood (near Barnard Castle) and Thorngart (Lunedale).

Medieval villages consisted of rectangular houses clustered round a green or, more typically in the upper dales, set out along a road, each house having a long field known as a ‘toft’ behind it. Beyond the village were communal ‘ridge-and-furrow’ fields and hay meadows, and beyond these, communal grazing land and woodland. The upland pastures in the hills were occupied seasonally by herds who moved out from the villages in spring along with sheep and cattle, living in crude shelters known as ‘shielings’ through the summer before returning with their beasts the following autumn. The beasts would then be over-wintered in the fields, being fed largely on hay harvested from the village hay meadows.

An industrial landscape

From medieval times, the North Pennines became one of Britain’s most important lead mining regions. Mining was on a relatively small scale until the mid 18th century, but from this time until the early 20th century much of the area was dominated by lead mining and the landscape was transformed. Levels were driven miles underground to exploit the lead veins, and the ground surface became studded with mine complexes, dressing floors and smelt mills. The hills were criss-crossed by leats providing water power to various sites, flues taking noxious gases away from the smelt mills to chimneys high in the hills, and tracks and railways providing access to all the different sites.
Many lead miners lived in small farmsteads scattered throughout the dales, working their shifts in the mines and also growing produce to support their families. Limekilns were constructed to produce quicklime, used on the field to improve the fertility of the acidic soils and as lime mortar for the construction of buildings. Today's distinctive landscape of scattered homesteads (most with a single building that originally combined cottage, byre and hayloft) set within a patchwork of stone-walled fields, generally referred to today as the 'miner-farmer landscape', dates essentially from the 18th and 19th century heyday of the North Pennine lead industry, when at least a quarter of all Britain's lead came from the region.

Other miners lived in villages heavily influenced by the mining companies such as Nenthead, Garrigill, Allenheads and Carrshield, or in larger settlements, such as Stanhope, Middleton-in-Teesdale, Alston and Allendale, that survived from medieval times and contained the ancient parish churches. Lead-mining families throughout the region tended to be Methodists rather than Anglicans, and numerous Methodist chapels were built from the mid-18th century, both within villages and at isolated roadside locations for dispersed communities. The lead mining companies supported several new schools during the 19th century in Teesdale, Weardale and Allendale, alongside numerous institutes and reading rooms.

North Pennine industries received a great boost during the mid-19th century with the introduction of the railways, and the road network was also much improved. However, in more remote areas pack ponies continued to tread well-worn tracks to get ores to the nearest road or railway.

Although lead was the dominant industry, it was far from the only one. Iron was mined and worked on a local scale from medieval times, and from the mid-nineteenth century on an industrial scale at Tow Law and Stanhope Dene. Elsewhere, limestone, sandstone, whinstone and coal have all been worked on a large scale, and from the late 19th century the development of fluor spar, zinc, barytes and witherite mining helped to offset, albeit only to a small extent, the worst effects of the decline in lead mining.

**Historic houses**

Today, few domestic buildings from earlier than 1600 survive in anything like their original form, but many attractive 17th, 18th and 19th century houses collectively contribute much to the character of the AONB. Many still retain historic characteristics such as multi-pane sash windows, although others have been ‘improved’ over recent years through the addition of modern, plastic doors and windows that unfortunately detract markedly from the appearance of otherwise well-preserved historic settlements.

**Recent times**

Following the decline of the lead industry, the 20th century saw population levels decline throughout much of the AONB, with village shops, chapels, schools and pubs becoming redundant, sometimes being redeveloped for domestic use. Many isolated smallholdings in the dales lie abandoned, while others have been redeveloped as holiday homes.

Within the AONB today there are 16 Conservation Areas, 183 Scheduled Monuments and 13 Buildings at Risk. Of the 968 Listed Buildings, 15 are Grade I, 36 are Grade II and 917 are Grade III.

From the hunters and gatherers of prehistory to the miner-farmers of the 19th century, communities have continually left their mark on the historic environment of the North Pennines. Properly managed, this historic environment has much to offer the local economy, as well as being of great social and spiritual value to local people and visitors alike.

**Looking after our historic environment involves:**

- increasing our understanding of the area’s historic buildings and structures and its archaeological features, and sharing that knowledge widely
- using the planning system and other means to avoid the piecemeal erosion of the historic character of buildings and settlements
- ensuring the retention of the skills required to maintain historic buildings and structures
- encouraging greater community participation in identifying and conserving what is special about the North Pennines’ historic environment
- encouraging landowners and property owners to conserve and enhance archaeological features and buildings on their land
Although the landscape of the North Pennines AONB has an untamed and wild appearance, it has been very strongly influenced by people. The ubiquitous lead mining remains are one element of past industrial activity, while the burning patterns of the moorlands are just one way in which continuing human influence can be seen.

Approximately 12,000 people live within the boundary of the AONB. When the lead mining industry was at its peak 150 years ago, about 27,000 people lived in the North Pennines, but economic changes forced people to seek employment elsewhere. A number of larger market towns, the main service centres for the North Pennines, lie just outside the area. These include Hexham, Barnard Castle, Consett and Appleby-in-Westmorland.

Cultural associations
A landscape such as that of the North Pennines does not take on a national significance because of its physical characteristics alone, but also because of the special cultural associations it has with people or works of art and literature. Celebrating those cultural associations closely connected to the landscape and which contribute to a sense of place, helps to reinforce the identity of this area as somewhere special and distinctive. This local distinctiveness is a major attractor for visitors, helping to support the local economy. However, ‘sense of place’ in the North Pennines is not only celebrated through views from great artists, but as importantly, by people living and working here. It is the imprint of ordinary people’s lives on this landscape that give it its special character. There are in effect two different types of cultural associations: one which has grown from local people’s relationship between work, mining and land, and another which is a response to landscape (the work of Turner, Auden and others, as well as less well known figures such as Teesdale poet Richard Watson).

Buildings and structures
The legacy of buildings, structures, hushes and spoil heaps from the area’s lead mining heyday, and even more recent structures from the last attempts at fluorspar mining, have made a huge impact on the character of the area. A history of religious non-conformity is evident in the chapels that dot the landscape and even the Rights of Way network connects a heritage of chapel and mine. Many of these structures require conservation work, which cannot wait indefinitely.
Research carried out by the University of Cumbria in 2006 indicated that people living and working locally value the distinctive landscape of the North Pennines, the sense of openness and space. Previous work in Alston highlighted local people’s appreciation of their flower-rich hay meadows and their love of the rivers and streams in the area. As importantly, the communities themselves contribute hugely to sense of place.

Artistic inspiration
Artists of national and international significance who took their inspiration from the North Pennines include W.H. Auden and J.M.W. Turner. W.H. Auden is perhaps the central figure of English 20th century poetry and the North Pennines are to him what the Lake District was to Wordsworth. The lead mining landscapes of the area provided Auden with a never-failing source of reference and inspiration. Many of his poems of the ’20s and ’30s and two influential plays are set here. The landscapes around Rookhope in Upper Weardale and on Alston Moor had a particular impact on Auden and this is reflected in some of his best loved poems of the period, including ‘The North’, ‘Alston Moor’, ‘The Old Lead Mine’ and ‘The Engine House’. After the outbreak of war, Auden even declared to the American media his patriotic allegiance to the ‘North Pennine moors’, rather than to England as such. When we look to what Auden saw as his “great good place” we can see both the geographical area he defined and his particular places of fascination and affection, in this extract from New Year Letter (1940):

I see the nature of my kind
As a locality I love,
Those limestone moors that stretch from Brough
To Hexham and the Roman Wall,
There is my symbol of us all...
Always my boy of wish returns
To those peat-stained deserted burns
That feed the Wear and Tyne and Tees,
And turning states to strata, sees
How basalt long oppressed broke out
In wild revolt at Cauldron Snout
And from the relics of old mines
Dervies his algebraic signs...
The derelict lead-smelting mill,
Flued to its chimney up the hill,
That smokes no answer any more

J.M.W. Turner
Arguably Britain’s finest landscape painter, J.M.W. Turner was also inspired by the North Pennines, producing outstanding work in Teesdale in the late 1790s and between 1816 and 1836. He painted several scenes around Bowes and Greta Bridge, before travelling through Deepdale to Cotherstone and on to Middleton-in-Teesdale. Here he stayed and painted the town bridge and the river. He followed the route of the modern-day Pennine Way, visiting the upper dale to produce wonderful paintings of High and Low Force, Wynch Bridge (sketched from the Holwick side) and Cauldron Snout, before moving on through High Cup Nick to Dufaton.

Folk art and tradition
More local cultural activities developed roughly at the same time; built by lead miners to show off collections of fluorite and other minerals, spar boxes are a folk art unique to the North Pennines. A lively needlework tradition also continues to be important. Originally born out of necessity, exquisite quilts were made by women in the area. This tradition continues through a number of local groups and needlework has been used over recent years by groups such as ‘Craftworks’ to celebrate some of the special qualities of the North Pennines AONB, allowing new people to explore a living tradition.

Culture is of course about the present as well as the past; the Allenheads Tar Bar’l ceremony is a fixture of New Year’s Eve and the local agricultural shows are fixed points in local people’s calendars. But there is also a strong community of writers and particularly artists of all kinds, from new media to clay, paint, textiles and more, who draw their inspiration from the wildlife and wild places of the North Pennines.

Retaining cultural identity linked to landscape character means:
• recognising and celebrating the area’s artistic and literary heritage
• promoting the retention of people in rural communities
• encouraging new artistic and cultural activities
• maintaining the high quality landscape on which much of the area’s cultural heritage is built
Areas of Outstanding Natural Beauty (AONB)

The UK’s AONBs and National Parks are within a worldwide category of protected areas known as ‘Protected Landscapes’, which has been devised by the International Union for the Conservation of Nature. Areas of special countryside throughout the world have been given protection of various kinds so that their qualities can be enjoyed by present and future generations. Parallel landscapes in other countries include the French Parc Naturels and the National Parks of countries such as the USA and Germany.

There are 36 AONBs in England, covering 15% of the land area, and a further four in Wales. They range in size from the Isles of Scilly (16 km²) to the Cotswolds (2038 km²). AONBs have their roots in the same legislation that brought about the National Parks – the National Parks and Access to the Countryside Act (1949) which has been consolidated by the Countryside and Rights of Way Act (2000). AONBs have the same protection in the landuse planning system as our National Parks.

The purpose of AONB designation is to conserve and enhance natural beauty.

By ‘natural beauty’ we mean much more than just the look of the landscape; in the context of AONBs natural beauty includes landform, geology, plants and animals, landscape features and the rich history of human settlement over the centuries. These things, though of great importance, don’t of course occur in isolation; in conserving natural beauty in AONBs, it is essential to take account of the needs of agriculture, forestry, other rural industries and of the economic and social needs of local communities.

Local authorities have a statutory duty to act jointly to produce Management Plans for AONBs within their boundaries and to have regard for the purpose of AONB designation in the carrying out of their functions, a duty which is also placed on public bodies and other statutory agencies.

Each AONB has a ‘joint advisory body’ that brings together representatives of those organisations and groups with a major role to play in looking after the area. Each of these Partnerships has an AONB Staff Unit; as well as producing the AONB Management Plan on behalf of partner local authorities, the Staff Units co-ordinate the work of others, and take action themselves, to ensure that our AONBs remain special for present and future generations to enjoy, as places to live and work and as places to visit.

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