Allen Banks is looked after by the National Trust and is in the North Pennines Area of Outstanding Natural Beauty (AONB) and European & Global Geopark

Allen Banks and Staward Gorge – National Trust

For more information on Allen Banks and Staward Gorge visit www.nationaltrust.org.uk/allen-banks-and-staward-gorge or contact the National Trust office on 01434 321888 or allenbanks@nationaltrust.org.uk

European and Global Geoparks

The North Pennines AONB is Britain's first European Geopark, a status supported by UNESCO, and a founding member of the Global Geoparks Network. Geoparks are special places with outstanding geology and landscape, and where there are strong local efforts to make the most of geological heritage through interpretation, education, conservation and nature tourism. To find out more visit www.europeangeoparks.org

Find out more about North Pennine geology

This leaflet is one of a series of geological publications about the North Pennines. These are part of the North Pennines AONB Partnership's work to make the most of our special geological heritage. This work includes events, education resources, publications, displays and much more…

Above: Guided geological walk at Allen Banks
Front cover: Cliffs at Raven Crag

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NORTH PENNINES
Area of Outstanding Natural Beauty

The North Pennines is one of England's most special places – a peaceful, unspoilt landscape with a rich history and vibrant natural beauty. In recognition of this it is designated as an Area of Outstanding Natural Beauty (AONB). The area is also a Global Geopark – an accolade endorsed by UNESCO.

A 2¾-mile circular walk at Allen Banks, exploring landscape, rocks, plants and evidence of an industrial past.

North Pennines AONB Partnership
www.northpennines.org.uk
+44 (0)1388 528801
info@northpenninesaonb.org.uk

NorthPenninesAONB
@NorthPennAONB
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info@northpenninesaonb.org.uk
01388 528801

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Allen Banks Geotrail

Rocks, roots and rivers

Landscapes for life .org.uk

NORTH PENNINES
One of the AONB family

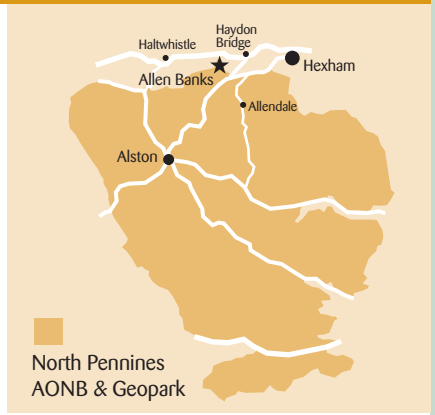
Welcome to a special landscape…

…shaped by millions of years of natural processes and centuries of human activity.

This lovely steep-sided valley along the River Allen has been looked after by the National Trust since 1942. It has extensive ancient and ornamental woodlands, rich in wildlife, and miles of waymarked paths.

The area has a fascinating geological story to tell – of tropical seas and deltas, molten rock, glaciers and river processes. There are also subtle imprints of an industrial past.

This circular walk will introduce you to some of the special features of the landscape at Allen Banks. By spotting clues in the woods, cliffs and river you'll discover more about its remarkable past. The sections opposite describe how the local rocks formed, and how the landscape has been shaped by ice, water and people.



Walk length/time: 4.4 km (2¾ miles) with around 40m of ascent, taking about 1½ hours

Start/finish: National Trust car park at Allen Banks Grid ref NY 798 640. Pay and display for non-NT members

Terrain: The walk is on footpaths and permissive paths through woodland, and 100m of minor country road. The route is relatively flat or gently undulating but there are a few short, fairly steep ascents and descents. Walking boots or strong shoes are recommended as some sections are uneven and can be muddy. Please be careful near the river, beneath cliffs and on sections with steep drops to the river. Dogs are welcome but please keep them under close control.

Public transport: For timetable information call Traveline on 0871 200 22 33 (www.traveline.info)

Facilities: Toilets and picnic area at Allen Banks car park

Useful maps:

Ordnance Survey

1:50 000 Landranger	86 Haltwhistle & Brampton or 87 Hexham & Haltwhistle
1:25 000 Explorer	OL43 Hadrian's Wall

British Geological Survey 1:50 000 Geological Sheet 19 Hexham

Tropical North Pennines

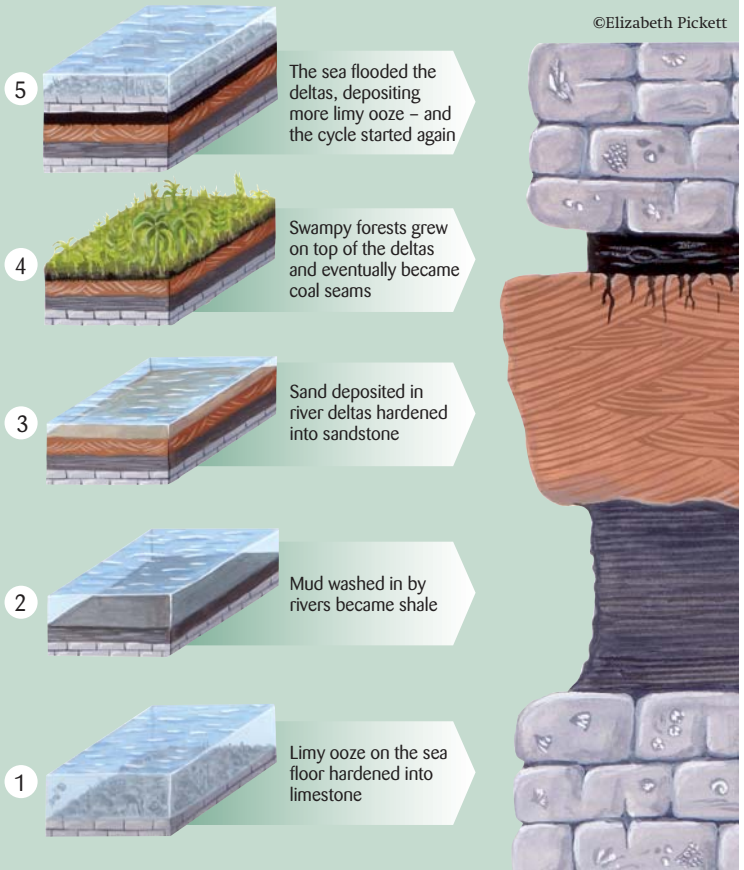
Most of the rocks you'll see at Allen Banks are layers of sandstone, shale and limestone. They formed in the Carboniferous Period, between 360 and 300 million years ago.

Back in those distant times, the North Pennines lay near the equator. The area was periodically covered by shallow tropical seas in which the skeletons of sea creatures accumulated as limy ooze. Rivers washed mud and sand into the sea, building up deltas on which swampy forests grew. In time, the limy ooze hardened to limestone, the mud and sand became shale and sandstone, and the forests turned to coal. Periodically, the sea rose, drowning the deltas and depositing limestone again.

This cycle happened many times, building up repeating layers of limestone, shale, sandstone and coal. Many of these rocks contain features and fossils which tell us about the seas and swamps and what lived in them.

Section of fossil root from Allen Banks

Formation of the layered Carboniferous rocks of the North Pennines

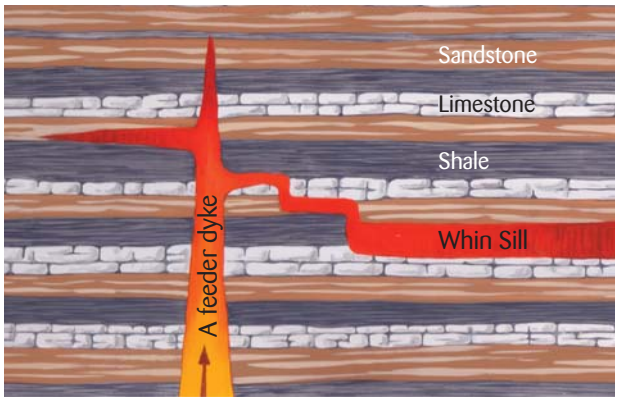


Molten rock and whinstone

At Allen Banks there is a small outcrop of a rock type that has a very different origin from the Carboniferous rocks. It is part of a feature known as the Haydon Bridge Dyke which is related to the Whin Sill, one of the most dramatic landscape features in the North Pennines AONB and Northumberland National Park.

About 295 million years ago molten rock rose up and spread out between the layers of Carboniferous rocks. It solidified underground to form hard, dark dolerite (or whinstone). This vast sheet of rock – the Whin Sill – is now exposed as crags in several places, including along Hadrian's Wall. The fractures up which the molten rock rose are preserved as narrow, vertical sheets of dolerite known as dykes. The Haydon Bridge Dyke, seen on this walk, may be one of these 'feeder' dykes.

Formation of the Whin Sill from molten rock



Sculpted by ice and water

This landscape owes much to the action of ice and water. About 20,000 years ago a thick ice sheet streamed across the area, scouring and smoothing the hills and valleys and dumping clay, gravel and boulders. Torrential meltwater carved gorges such as the one at Allen Banks. Water continues to shape the landscape today; the River Allen is eroding its riverbanks in some places and depositing material in others.

Industrial Allen Banks

It is hard to imagine now but until the mid-1800s parts of the peaceful woods of Allen Banks and Staward Gorge would have bustled with small-scale industry. There is evidence for quarrying, lime burning, mining for lead ore, iron ore and coal, and smelting.

Lead smelt mill ruins seen on this walk

Start: From the National Trust car park follow the riverside path south.

1 Delta rocks

About 30m beyond the stone steps that join the path on the right, you'll see layers, or 'beds', of buff-coloured sandstone and flaky grey shale. Look out for sloping lines in sandstone next to the path (see picture). Known as 'cross-bedding', these formed when sand was deposited in underwater dunes in ancient river deltas.

Continue along the path for another 50m.

2 Haydon Bridge Dyke

Look out for a mossy rib of rock to the right. Close up there's a small, freshly broken surface (see picture), which is dark and finely crystalline. This is dolerite (or whinstone) and is part of the Haydon Bridge Dyke which formed from molten rock around 295 million years ago. This may have been a feeder for the Whin Sill (see description overleaf).

Continue along the path, passing the suspension bridge, until you reach a right bend in the river with the cliffs of Raven Crag on your right.

3 Shingle banks

This is a good place to find pebbles of different rocks. Local Carboniferous rocks, especially buff-coloured sandstone, are the most common. You can also find grey limestone and dark grey shale. If you are lucky you may spot fossil plant remains or worm burrows in the sandstone, or white shelly fossils in the limestone.

But there are some rocks that could not have got here by the river alone. Finely speckled smooth grey cobbles are dolerite from the Whin Sill, brought here from Hadrian's Wall country by ice. Greenish grey pebbles are slates and volcanic rocks brought here by ice from the Lake District.

Continue along the path past a recently collapsed part of the riverbank, now fenced off.

4 Raven Crag

These impressive cliffs are made up of beds of sandstone which were once layers of sand in Carboniferous deltas. Weathering has picked out features that give clues to conditions 320 million years ago. The beds high in the face are very thick and probably built up quickly. Lower layers show fine layering and some cross-bedding (see Stop 1).

Continue until just past a junction with a path which joins on the right.

5 Living fossils

If you're here in summer, there's a stand of giant horsetails beside the path. These are related to the horsetails – some up to 10m high – that grew in Carboniferous times. Back then, the rocks at Allen Banks were being deposited as sand and mud in vast deltas, which were periodically covered in swampy forests.

6 Lead-tolerant plants

As you emerge from woods into a grassy glade, look out for mountain pansies in late spring and summer. This is one of several species that can tolerate metal-rich soil. Here, they may be related to nearby lead ore smelting (see next Stop 7).

7 Ancient woods and past industry

Briarwood Banks is an area of ancient woodland, managed by the Northumberland Wildlife Trust. By the Nature Reserve sign there is an overgrown ruin which was part of an old industrial complex, possibly related to lead ore smelting in the 1680s.

Cross the bridge over the river and join the road at Plankey Mill.

8 Plankey Mill

Originally an 18th-century corn mill, these buildings are built of local sandstone and are roofed with thin sandstone slabs.

Follow the road uphill for 100m. Turn left on to a track, keeping well clear of the steep drop to the left.

9 Roots – past and present

By the junction there's an oak tree with gnarled roots growing into rock. Less obvious are the fossil remains of plants in the rock itself. Look for black flecks and streaks in the crumbly sandstone – this is carbon from plants that died 320 million years ago and were caught up in delta sands.

Follow the track past the ruins of Plankey Farm and continue along the path. Descend a bank.

10 River terraces and floodplains

This steep bank is the edge of a river terrace, a relict floodplain from when the river flowed at a higher level, thousands of years ago. The river has cut down to a new level, leaving its old floodplain high and dry.

Continue along the riverside and into woods opposite Raven Crag.

11 Fallen blocks and outcrops

Along the path you'll weave around large mossy blocks of sandstone which have tumbled from the cliffs above. You'll also pass outcrops of sandstone, some of which show cross-bedding (as seen at Stop 1).

Follow the dark brown waymarkers, eventually descending to the suspension bridge. Just before crossing the bridge turn left and follow a path for a short distance and up some stone steps.

12 The Little Limestone

Look down to an area of flat rock in the river. This is limestone, which formed from the limy ooze that accumulated on a tropical sea floor 320 million years ago. Past miners and quarrymen called this layer the Little Limestone, to distinguish it from the thicker Great Limestone beneath it.

Cross the bridge and turn right to return to the car park.