

Geology along the Woodpecker (green) trail – up to 3.5 km/ 2.2 miles

The Wyre Forest is underlain by rocks belonging to an age that geologists call the Carboniferous (see GEOLOGICAL TIME SCALE text box). During this time at about 320 million years ago, Britain was part of a continent in the tropics of the southern hemisphere. The landscape was one of many rivers and streams with extensive flood plains, deltas and shallow lakes.

GEOLOGICAL TIME SCALE (start of periods in millions of years ago)

Quaternary	1.6
Neogene	23
Paleogene	65
Cretaceous	142
Jurassic	205
Triassic	248
Permian	290
Carboniferous	354
Devonian	417
Silurian	443
Ordovician	495
Cambrian	545
Precambrian	4600

When the rivers were in flood much silt and mud were deposited and in the river channels considerable volumes of sand accumulated (see SEDIMENTARY ROCKS text box). These formed rocks that you will see on this trail.

SEDIMENTARY ROCKS
Sedimentary rocks are made up of particles deposited in layers. They usually form beneath the sea, in lakes and rivers or in deserts. The particles may become cemented together by specks of mud or new minerals such as iron or calcium carbonate. Over millions of years the sediments become rock.

Please note that the location letters mentioned in the following text do not exist on the ground.

Start at the Forest Cafe and follow the main track down towards the Go Ape cabin. After passing the cabin an exposure of sandstone can be seen in the bank on your left - LOCATION A. Similar brown coloured sedimentary rock will be seen at other locations on the trail.

LOCATION A



Continue on the forest road for another 200m, (ignoring the right hand fork) and at the top of the hill turn sharp left, following the green/red waymarker posts. A little way along this path you will see dark grey and black chippings. This is **LOCATION B**. This aggregate is of the igneous rock dolerite (see **IGNEOUS ROCKS** text box). It formed beneath volcanoes from molten rock known as magma which was being forced upwards from deep within the Earth's crust. These intrusions happened at the end of the Carboniferous period.



IGNEOUS ROCKS are formed when molten material (magma) rises from deep within the Earth. As it cools it solidifies to form igneous rock. When magma is forced into spaces in existing rocks it is known as an intrusive igneous rock. Examples are granite and dolerite. When the magma reaches the surface and forms a volcano it is known as an extrusive igneous rock. Basalt is an example.

LOCATION B

A little further along the path the surface changes from dolerite aggregate to brown sandstone which is part of the underlying bedrock of the Forest. Continue along the path. Can you spot the point where the sandstone changes back to dolerite?

At Albert's Oak turn sharp right and continue northwards for 200m following the green waymarker posts and crossing the forest road. Just after the red and white 6K marker, you will see more sandstone in the path – **LOCATION C**. Look carefully from now on and see how many times you can spot sandstone on the ground (see **SANDSTONE** text box).



LOCATION C

SANDSTONE

As the land is eroded small particles of rock are carried away by wind and water to be deposited on river beds, in deserts or on the sea bed. Sand sized particles may accumulate to a thickness of many metres. Over time the sediment is buried, compressed and cemented into a hard rock called sandstone.

A little further along the path near the bench in remembrance of David Jules Randall, a different surface aggregate can be seen – LOCATION D. These light grey chippings are of limestone formed during the Silurian period (see LIMESTONE text box).



LIMESTONE was formed in a warm shallow sea such as today's great barrier reef off the east coast of Australia. The shell fragments of dead sea creatures fell to the bottom of the sea and these were eventually compacted and cemented into rock. The remains of the sea creatures are preserved as fossils.

LOCATION D

Keep to the green waymarked route. The limestone chippings continue all the way to the Arboretum. If you look carefully you may find fragments of fossils in the pieces of rock, especially brachiopods (see BRACHIOPOD text box).



BRACHIOPODS are a type of marine shellfish. They are filter feeders using a special feeding organ called a lophophore. They are one of the most common types of fossils found in the Silurian limestones. They still exist in the sea today but are much rarer than in the geological past. The fossil in this photo is 5cm across.

After another 30m from location D, a drainage ditch on your left begins. This continues for another 100m. This is LOCATION E. In the ditch there are good exposures of yellow-brown clays. This rock often occurs between the beds of sandstone and is the mud deposited in shallow lakes or on the flood plains of the rivers during the Carboniferous period. Look out for animal footprints in the clay.



LOCATION E





LOCATION F

Soon you will reach the main track and turn right, following the green waymarker posts. Just after joining the track you will see the first of a few exposures in the bank on your right-hand side. These are all of sandstone and siltstone. Can you find a small waterfall? This is LOCATION F. Here almost horizontal thin beds of rock have been exposed by the erosive force of running water.

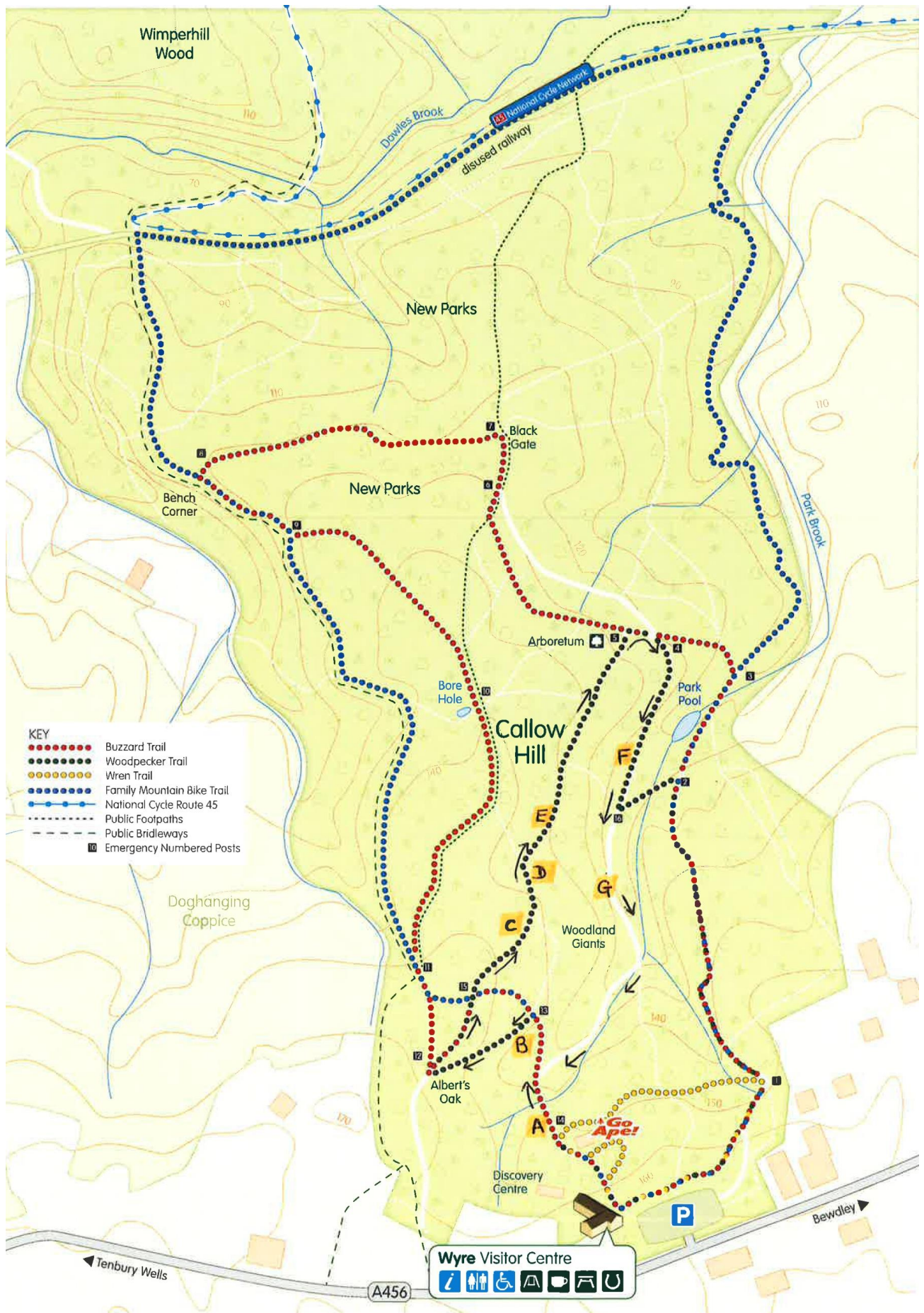
After a further 100m the Woodpecker Trail turns sharp left. You can follow this if you wish. If you do, look out for the more examples of the rocks that you have already seen.

This geology trail now continues southwards uphill on the main track back to 'Go Ape' and the Forest Cafe.

As you walk this final stretch look down at the track surface. You will see more dolerite; sometimes quite big pieces. If you look carefully you will also see light blue and black glassy fragments – LOCATION G. These are pieces of slag probably from the iron industry of the Black Country. Slag is a waste product from iron smelting and was often used as an aggregate and a walling stone. Also in the track bed look out for dark brown rounded pebbles. These are of a hard recrystallised sandstone called quartzite and are from the deposits of the nearby River Severn laid down at the end of the last Ice Age some 10,000 years ago. Rounded fragments like these always indicate considerable water transport over time or distance.

LOCATION G





We hope you have enjoyed this trail. To find out more about geology in the Abberley and Malvern Hills Geopark visit the Community Discovery Centre near the end of the trail or go to www.geopark.org.uk. You may also enjoy looking at the geological timeline along the base of the balcony of the Community Discovery Centre.