

The Ridgeway

NATIONAL TRAIL 

Beneath your feet

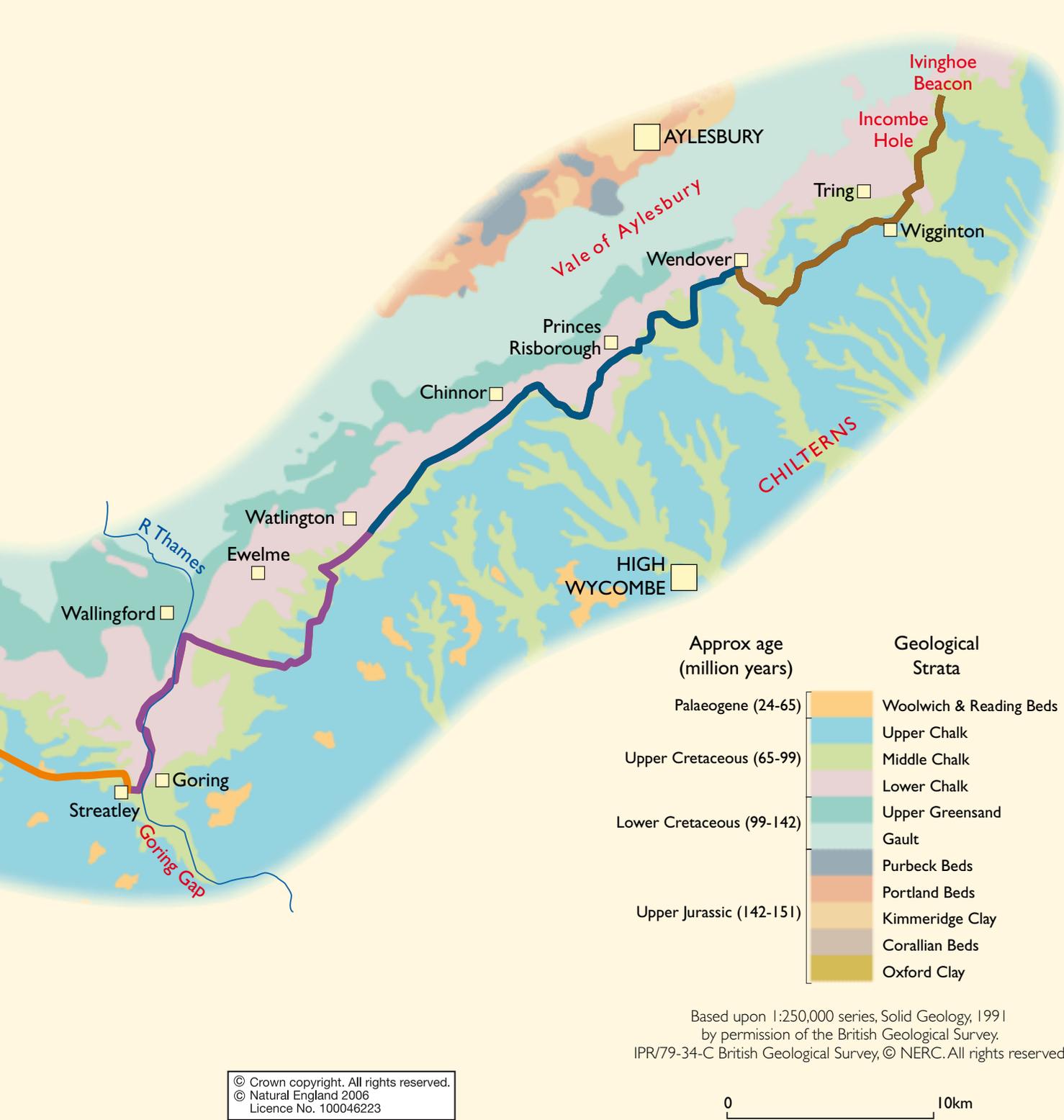


Geology and gradient profile



Scarp slope in the Chilterns





The Ridgeway National Trail follows the chalk ridge, from the North Wessex Downs in the west, across the Goring Gap and eastwards over the Chilterns. The chalk started to form around 100 million years ago. Since that time, climates have fluctuated, environments have changed, and the sea level has risen and fallen, each having an effect on the geology and landscape of the area.

The chalk landscape began to take shape around 30 million years ago, as Africa collided into Europe. This huge force pushed up the Alpine mountain chain, but also caused the rocks in this area of England to tilt very slightly towards the southeast, including the chalk that tilted slightly onto its side. Millions of years of erosion have since shaped the landscape. The northern edge of the chalk drops down as a steep hill, or scarp, to the flat valleys below while the chalk plateau declines gently away to the south.

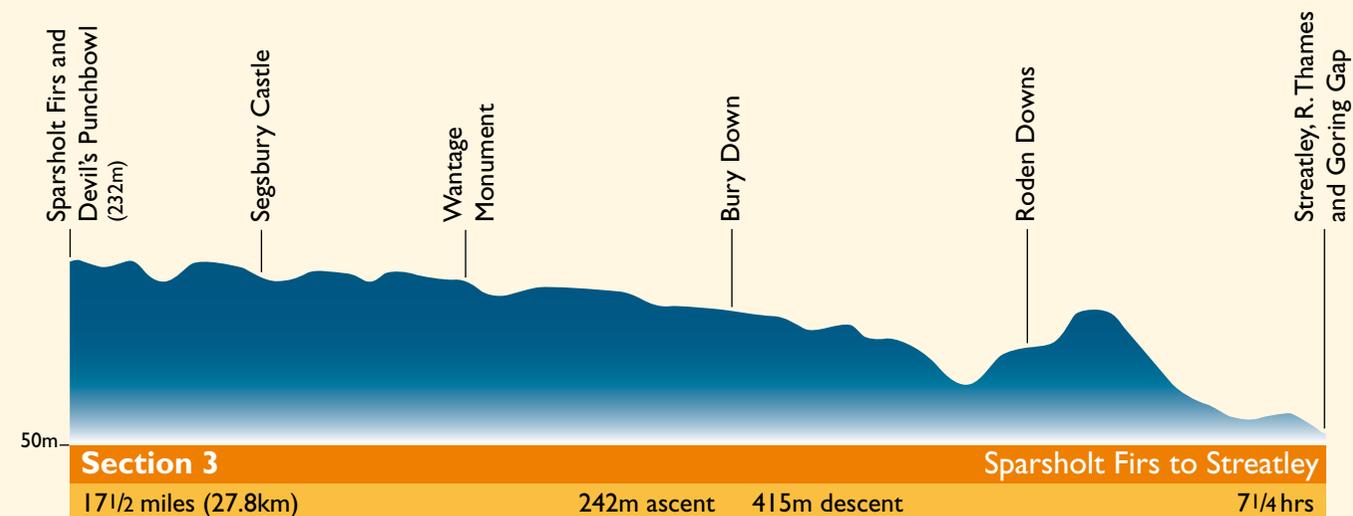
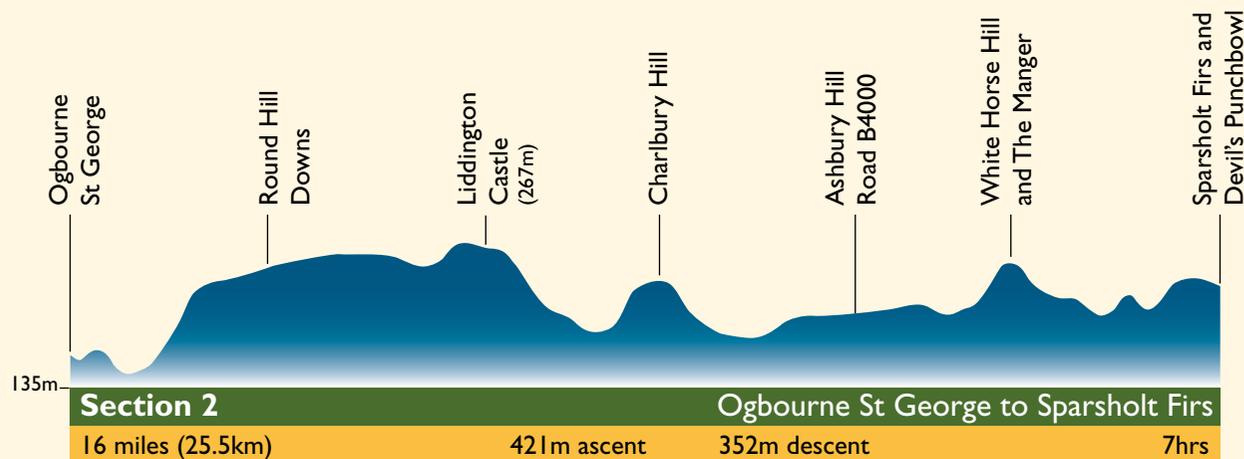
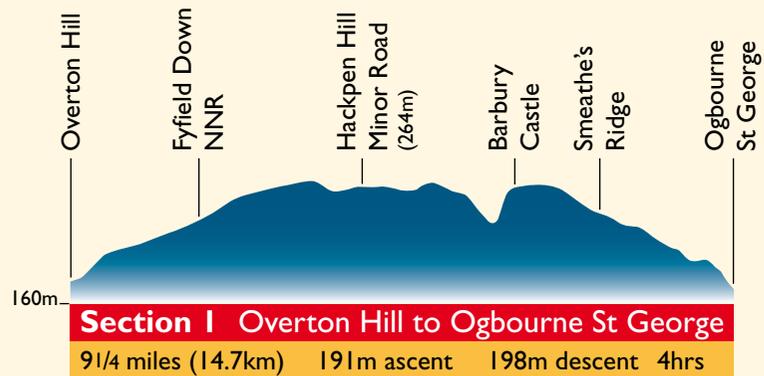


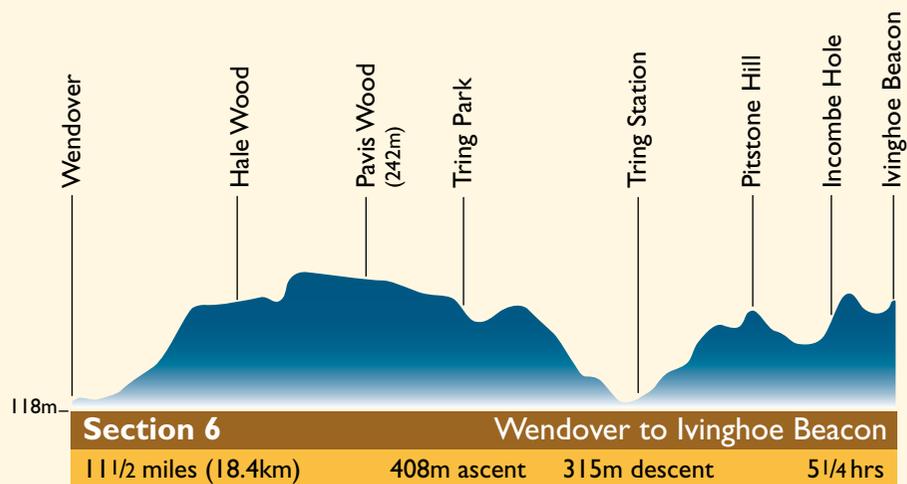
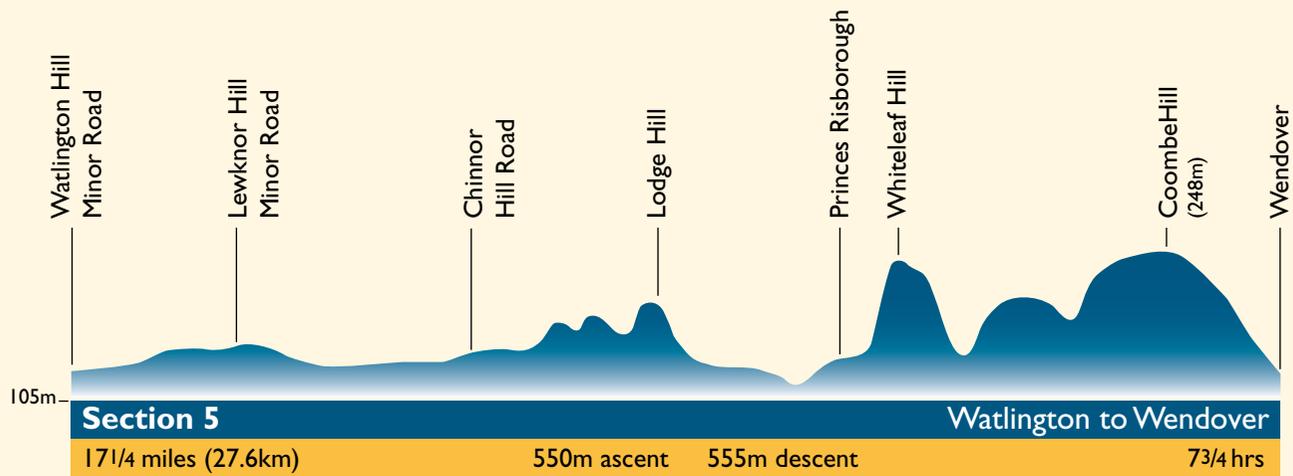
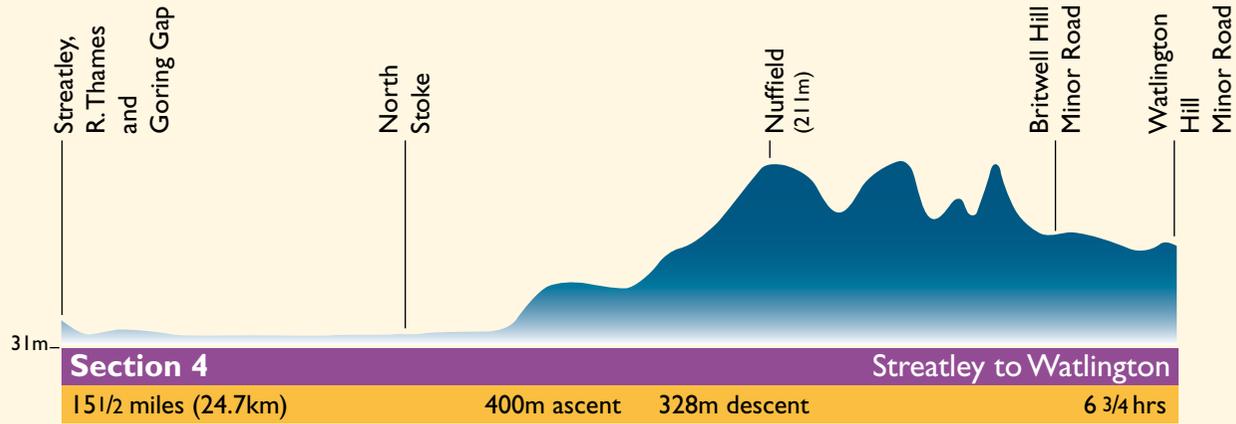
NATIONAL TRAILS
in England and Wales
and Scottish Equivalents

For a range of other information about The Ridgeway National Trail contact:
National Trails Office, Environment & Economy, Holton, Oxford OX33 1QQ
Tel: 01865 810224
Email: Ridgeway@oxfordshire.gov.uk
Website: www.nationaltrail.co.uk

Photographs: Natural England, Tina Stallard, Jos Joslin, Martin Trelawney, Ann Seth
Text: Oxfordshire Geological Trust; Design: Linda Francis.

The Ridgeway in profile





The Chalk

The chalk was deposited in Late Cretaceous times, from around 100 to 65 million years ago, when the sea level was very high and most of Britain was submerged under the sea. Chalk is mainly composed of the tiny fossil skeletons of algae, called coccoliths, that would have lived in this Cretaceous sea. Since each coccolith is only a few thousandths of a millimetre in diameter, it is estimated that it would have taken about 30 years to form just 1mm of chalk. The chalk sea was home to many Cretaceous creatures and, although they can be difficult to spot, it is possible to find fossils in the chalk, such as ammonites, echinoids (sea urchins), shellfish, and even lobsters. The chalk has been used as a building stone, particularly in the Downs, and can be seen in many of the buildings in villages such as Bishopstone, Ashbury and Uffington, as well as in the walls of Ashdown House. However, rainwater causes chalk to weather easily, so many chalk cottages have a thatched roof that overhangs the building to stop rain hitting the walls.



Ashdown House



Ashbury cottage

The Vales

From The Ridgeway it is easy to see how closely our landscape is related to the underlying rocks. To the north and northeast of The Ridgeway lies an extensive flat valley: the Vale of White Horse is north of the Downs, and the Vale of Aylesbury lies to the north of the Chilterns. These flat valleys are underlain by a series of sands and clays, including the Upper Greensand, Gault Clay and Kimmeridge Clay. Because these rocks are much softer than the chalk, they have eroded down rapidly to form these very flat valleys. From White Horse Hill it is possible to see the Golden Ridge about 6 miles (10km) away, a low-lying ridge underlain by Jurassic Corallian limestone. On a clear day it is even possible to see the Cotswold hills in the far distance, roughly 22 miles (35km) away, also underlain by Jurassic limestones. These limestones, like the chalk, are relatively hard and are more resistant to erosion, forming the higher ridges and upland areas of the landscape.



Vale of White Horse



Vale of Aylesbury



Perch and Pike,
South Stoke



Nuffield Church

Flints

Flint, a black or grey glassy mineral made up of microscopic crystals of silica, originates from the chalk. It is still uncertain what causes flint to form, but it is thought to have occurred within the sediment that was on the floor of the chalk sea. The kind of chemical conditions that enabled flint to form would have been around decaying organic matter, such as dead sea urchins and sponges, and especially in burrows made by lobster-like animals. The formation of flints in and around these burrows can be seen in the branched and knobby shapes of many flint nodules. Flint has proved to be a hugely important rock in this area as silica is exceptionally hard, so when it is struck it breaks with a shell-shaped fracture, leaving very sharp edges. Our ancient ancestors were therefore able to use flints to make hand axes, scrapers and arrowheads. It has also been used for building with, and can be seen in the walls of buildings in many of the towns and villages around The Ridgeway.

Dry Valleys

Under the present climate the porous chalk hills generally do not support surface streams, but there is plenty of evidence to suggest that this was different in the past. The chalk scarp has been sculpted into many unusual shapes by the action of water and, although the water has since disappeared, dry valleys, or coombes, have been left behind. One of the most distinctive examples is The Manger at White Horse Hill that is now a totally dry valley with its sides also scored by many old tributary valleys. Examples of other coombes include the Devil's Punchbowl west of Letcombe Bassett and Incombe Hole south of Ivinghoe Beacon.



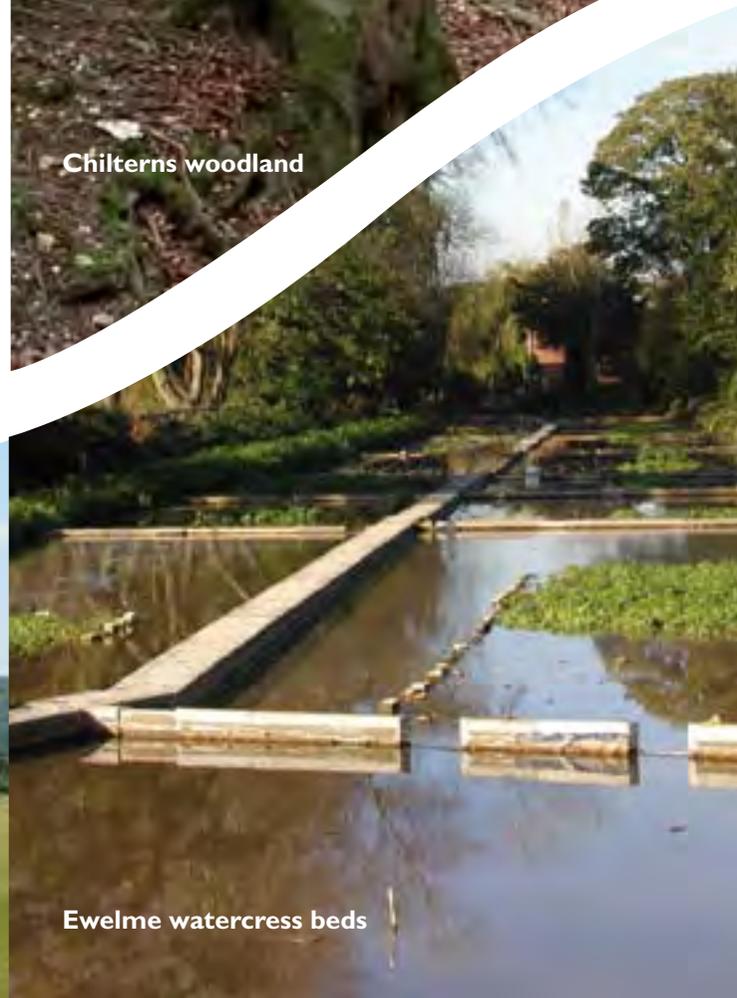
The Manger, White Horse Hill

Younger Deposits

Scattered over the top of the chalk are the remains of more recent deposits. These include the Reading Beds, which were deposited around 55 million years ago in channels of ancient rivers that once flowed across the chalk. They mostly consist of clays and sands, and often contain fossil leaves. The ridges of the Chilterns are also capped by a deposit called Clay-with-flints that formed much more recently, during the Ice Age, around one million years ago. As the name suggests, it consists of a sandy clay that contains fragments and nodules of flint. It probably once covered the entire surface of the chalk, but erosion has since weathered much of these softer, overlying deposits away, leaving only scattered patches. These patchy deposits occur in greater abundance on the Chilterns than the Downs and are what causes the contrast in vegetation between the two areas. Beech woodland, which is common on the Chilterns, prefers to grow on the sands and clays.



Chilterns woodland



Ewelme watercress beds

Rivers and Springs

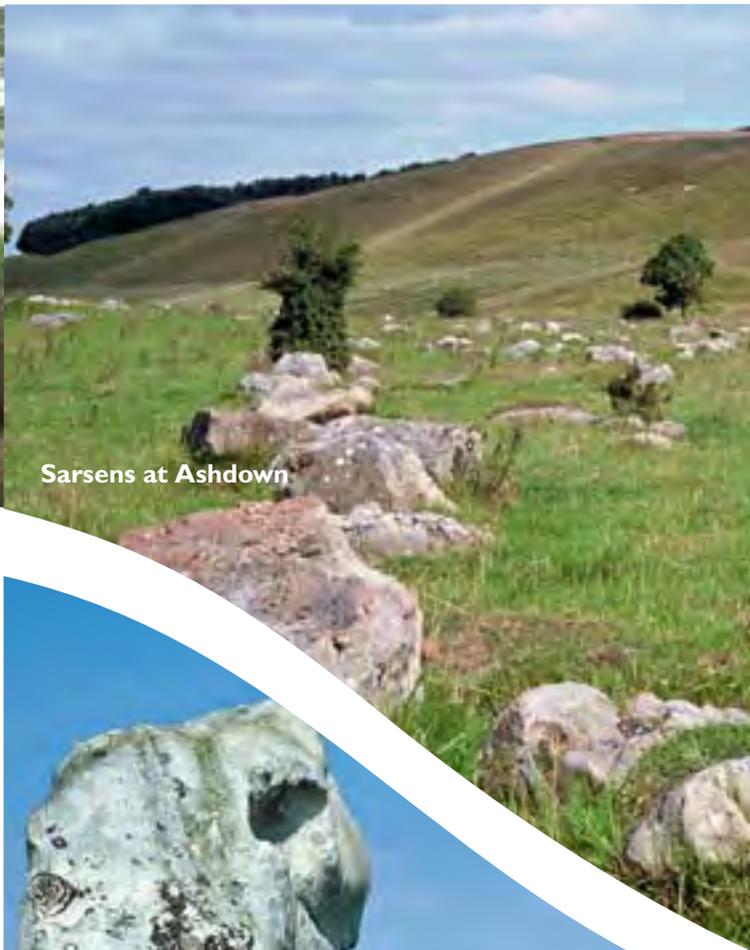
Chalk is porous, causing it to act a bit like a sponge, so when rain falls onto the chalk hills it soaks directly into the ground and slowly filters through cracks in the rock called fissures. These cracks often occur in the harder bands of chalk giving rise to springs that emerge lower down the slope. Many of the towns and villages at the base of the chalk scarp were established around these important water sources. Chalk spring water is clean, alkaline, mineral-rich and has a constant temperature which makes it ideal for the production of watercress. Watercress beds used to be found in several of the spring line villages beneath the chalk scarp, and still survive at Ewelme and Letcombe Bassett. The River Thames cuts straight through the chalk escarpment, and marks the boundary between the Chilterns and the Downs. As the Thames cut further down through the chalk, it formed the picturesque gorge of the Goring Gap.



Goring Gap



Wayland's Smithy



Sarsens at Ashdown

Sarsen Stones

Sarsen stones are scattered all over the chalk hills. They are surrounded by hundreds of years of legend and mystery, and have been used to build Wayland's Smithy, the Avebury Stone Circle and Stonehenge. One famous stone, the Blowing Stone in a cottage garden at the foot of the Downs near Kingston Lisle, is pierced with a number of holes. One of these, if you are able to close the hole completely with your mouth and blow, will resonate loudly and can be heard from a great distance. Legend says it once stood high up on Kingstone Down and was used by King Alfred the Great to call the local militia to fight at the Battle of Ashdown.



The Avenue, Avebury



The Blowing Stone

Sarsen stones are also known locally as Grey Wethers, as from a distance they can resemble flocks of sheep (a wether is a castrated ram). They are blocks of hard sandstone and may be the remains of the Reading Beds. Although their formation is not well understood, it is thought they formed when evaporation from the surface drew groundwater up through the Reading Bed sands, depositing silica around the sand grains to form a strong cement. Most of the soft Reading Beds sands have since been eroded away, but the harder, more resistant sarsen stones have been left scattered across the area. Sarsen stones can be seen in the Fyfield Down National Nature Reserve northeast of Avebury and at the foot of Kingstone Down near Ashdown House.