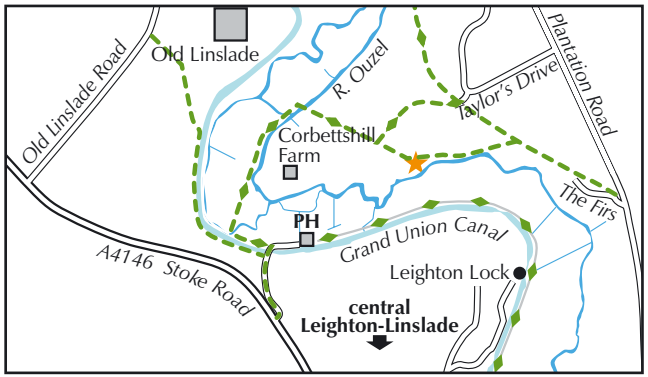
The Lower Greensand

The Greensand Ridge revealed in the sides of the Ouzel valley is an outcrop of the Lower Greensand, which was laid down in a seaway during the Lower Cretaceous around 100 million years ago. This was an exciting episode in Bedfordshire's geological history: after 40 million years as dry land, the area was suddenly flooded by the sea. The water burst across what is now southern England, forming a narrow channel running southwest from the Wash, across Bedfordshire, and onward to the Isle of Wight.

The flood that created the seaway was part of a world-wide event caused by global warming. Sea-level rose further; the Gault clay that lies above the Lower Greensand was deposited on the floor of a tropical ocean that covered the whole of Britain. After that we don't know what happened in this area until the Ice Age 2 million years ago: 95 million years of geological history is missing, stolen by erosion.

During the Ice Age frost, ice and meltwater sculpted the landscape of Bedfordshire. The clay vales to the north and south of the Greensand Ridge were worn away by ice and water, and the Greensand Ridge itself was shaped by the same forces.

Looking across the Ouzel floodplain to the far side of the valley carved in the Greensand by the Ice Age Ouzel. The fertile fine sediments (alluvium) *deposited on the floodplain by the modern Ouzel support a rich growth of grass; gorse is more characteristic of the infertile sandy soils of the Greensand exposed on the slope to the right.*



The steep slope and meadow described here is at SP916266, just north of Leighton-Linslade. Reach it from the Greensand Ridge Walk -◆--, or walk down the track over the cattle grid from Taylor's Drive towards the farm, turning left after *c.* 500m onto the path down the steep slope to the meadow. Look back to view the slope.

The Bedfordshire & Luton Geology Group exists to encourage understanding of the geology and geomorphology of the county and to undertake site recording, interpretation, advice and education

Regionally Important Geological and Geomorphological Sites (RIGS) are places that reveal our geological past and are considered important enough to deserve conservation. They include sites where rocks can be seen (such as quarries and road cuttings) or where the geology or geological processes can be inferred from the shape of the landscape. Official RIGS are recognised by county councils and by Natural England.

For more information about the BLGG and our events as well as the geology and geomorphology of your area visit our website at

www.bedsrigs.org.uk

or contact Chris Andrew c/o Bedford Museum, Castle Lane, Bedford, Bedfordshire MK40 3XD. Tel: 01234 353323; Fax: 01234 273401

ENGLISH NATURE

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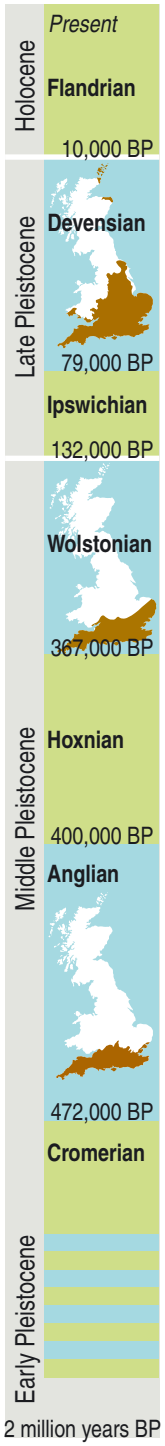
The River Ouzel
its wild past

Bedfordshire & Luton Geology Group

bringing landscape to life

The River Ouzel north of Leighton Buzzard.

Over the last 2.6 million years sheets of ice up to 2km thick crept south across Britain as the climate cooled, melted away as it warmed, only to grow and melt again as the climatic cycles continued. Today the gentle Ouzel meanders through a valley cut by torrents of water from one of these melting glaciers.



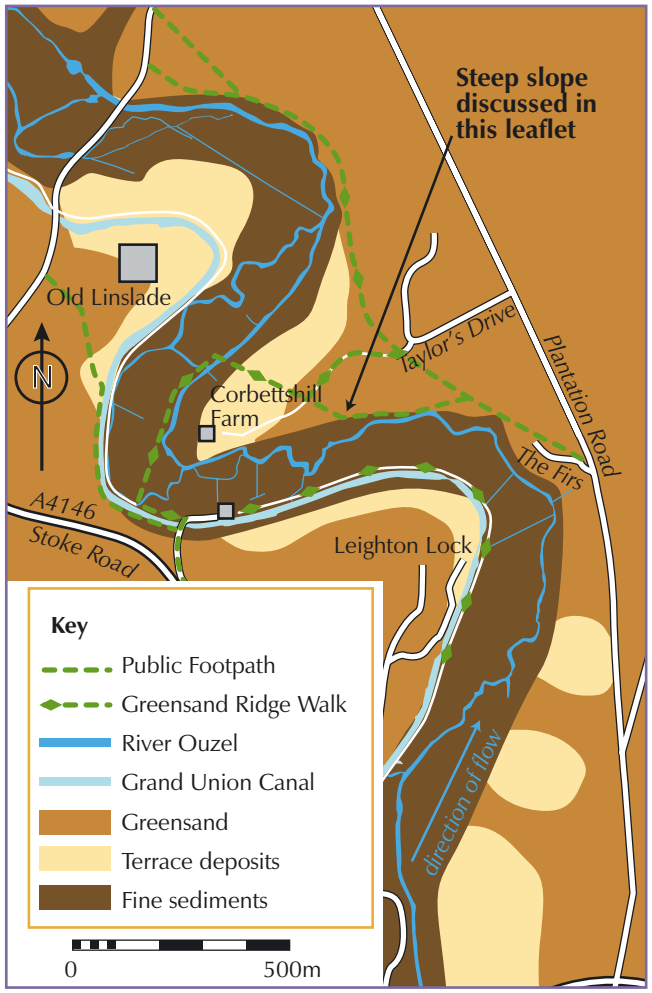
The River Ouzel and its valley

The Ouzel begins as a chalk stream rising from a spring near the Dunstable Downs. Between Leighton Buzzard and Stoke Hammond it is a pretty river flowing through a spectacular valley cut into the Greensand Ridge. The Ouzel *meanders* to and fro across the flat valley floor, leaving behind ox-bow lakes and an accumulation of fine sediments that build the fertile soil of the *flood plain*. Today's Ouzel is too small and gentle to cut the steep-sided valley through which it flows, or to deposit the gravels and sands that lie high on the river banks and buried under the fertile muds and silts. The Ouzel valley tells the story of a much wilder river that flowed here nearly half a million years ago.

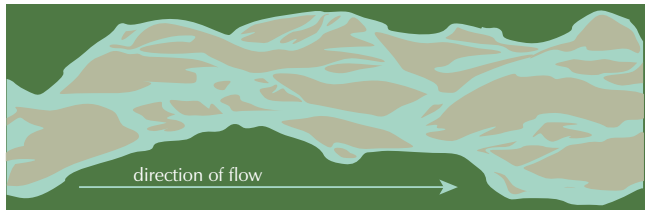
The Ice Age

Ice over 2km thick covered much of Britain during the Anglian cold phase. Tremendous amounts of water flowed into rivers as the ice began to melt, giving the rivers the power to carry vast amounts of gravel and other coarse sediments, and to cut down through harder rocks such as the sandstones of the Greensand Ridge. Look in the loose sands at the top of the slopes here, near Corbettshill Farm, and you may see large, rounded pebbles carried here by the wild waters of the Ice Age Ouzel.

Steps or *terraces* in the sides of the valley show that after this the Ouzel *cut down* into the valley. Two distinct steps can be seen in the sides of the valley, but there are probably three or more to be found. Sea-level falls when water is locked in ice sheets, so each cold phase (when ice sheets are advancing) is marked by a distinct step formed when the river cuts down to meet the lower sea-level.



Based on BGS sheet 220, Leighton Buzzard Solid & Drift Edition by permission of the British Geological Survey

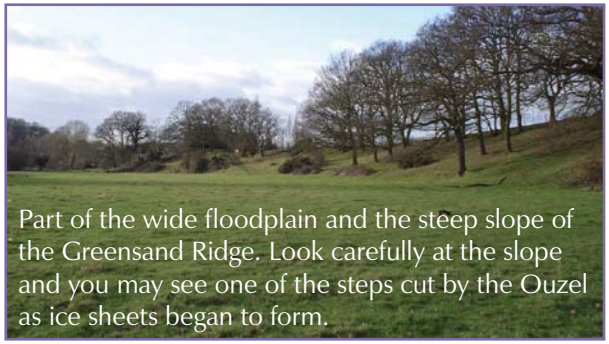


The braided streams of a glacial river fill its valley with shifting bars of sand and gravel. Today the only braided stream in Britain is in Glen Feshie, Scotland, but the Terrace deposits *in the Ouzel tell us that it was once a braided stream.*

Rocks make landscape

The course of the Ouzel – and the shape of the valley we see today – reflects the hardness of the rocks beneath it. To the south and north of the Greensand Ridge the Ouzel flows across soft clay which is easily worn away by the rushing water, but here a layer of sandstone in the Lower Greensand forced the Ice Age Ouzel to turn sharply west until it found a softer layer or flaw in the sandstone that the water could cut through to continue its journey north. Corbettshill Farm stands on a terrace of sands and gravels deposited as the meltwater Ouzel eddied and slowed behind this outcrop of sandstone.

Iron cements some layers of the Lower Greensand into a sandstone hard enough to change the course of a river. This small outcrop hints at what lies beneath the side of the valley shown in the picture below.



Part of the wide floodplain and the steep slope of the Greensand Ridge. Look carefully at the slope and you may see one of the steps cut by the Ouzel as ice sheets began to form.