

the lead legacy



Our Heritage, Our Environment, Our Future



Lead mining has significantly shaped the Peak District we see today.

There are many clues in the landscape: in villages such as Bradwell and Winster, in features such as engine houses and gin circles, in traditions such as the Barmote Courts and most of all in the characteristic patterns of old workings (lead rakes) that criss-cross the landscape. All of these tell a story of centuries of mining in the Peak District.

Lead rakes are the most obvious remains of past lead mining. These are the waste hillocks – the unwanted rock left behind by the miners as they extracted the lead ore. Today many support an intricate and complex mix of wildlife. 'Nature's response' to the harsh environment of the abandoned mines and workings has developed into a rich habitat for biodiversity.

Lead rakes are of high conservation value and irreplaceable. 75% have already been lost, many to modern farming practices and through reworking of the spoil heaps for fluorspar, barytes and other minerals.

If we do not all act now to protect sites, then an important part our heritage and wildlife could be lost forever.

The King's Barmaster and a group of miners at Moss Rake near Bradwell

Miners and Society

The organisation of the mining industry includes a complex series of laws and customs, which were first codified on paper in the Quo Warranto of 1288. Even by this date they were already ancient and may well have evolved in late Anglo Saxon times.

Lead mining in Derbyshire has been overseen by the miners' Barmote Courts since medieval times. Traditionally lead miners had been allowed to mine anywhere without hindrance from land owners except underneath gardens, orchards, highways and of course churchyards! Payments were made by 'lot' (a fraction of the dressed ore paid by lead miners to the owners of the mineral rights) and 'cope' (price per load of lead often paid to the crown).

The Peak's lead miners were extremely hard-working and in return indulged their fondness for cards and drinking, gathering at inns with names like the Pig of Lead, Miners' Standard and Miners' Arms. In fact ale was believed to give some protection against lead poisoning and Castleton miners took an extra glass to toast their luck.

2000 Years of History

Lead ore has been an extremely important industry since the Roman period. Hefty ingots, or 'pigs', of Roman lead marked the Peak District as their place of origin have been found as far away as Normandy. The Romans were particularly interested in lead as a source of silver.

Domesday Book of AD 1086 records lead works in the manors of Matlock, Wirksworth, Ashford and Bakewell. Lead was in great demand from the 11th to 13th centuries to provide roofs and plumbing for the many cathedrals and abbeys built throughout England at this time; a significant proportion came from the Peak District.

Mining continued on a small scale by miners/farmers throughout the Middle Ages, with most of the mining being surface and underground workings rarely more than 30 – 50m deep.

From the 16th century onwards, the use of gunpowder to extract the lead ore increased the efficiency of the mines. By the 17th century most mines were down to the water table. To remove the water, drains or 'soughs' were cut. Later steam pumps were introduced and mining became much more industrialised, inevitably controlled by the landed gentry and an emerging group of wealthy industrialists who could provide the necessary capital investment.

Lead mining in the Peak went into terminal decline in the mid 19th century as the ore field was no longer economically viable and the area found it difficult to compete with rich reserves exploited elsewhere in the world.

When the last big mine, Millclose Mine at Darley Bridge was closed in 1939 it brought an end to around 2000 years of Peak District lead mining history.



Woman did much of the surface work, such as ore dressing, whilst the men did the heavy work in the mines below'

(Lynn Willies collection)



Our Environment

What is there to look at?

Landscape Character

Drystone walled fields full of hillocks and hollows that follow mineral veins and pipe workings give the limestone landscape a unique character. These hillocks are the piles of waste materials – unwanted rock – left behind by the miners. They are known as ‘lead rakes’ and remind us of the many generations of farmers and miners who gained their livelihood from this upland area.

Surface Features

The physical remains of the lead mining industry tell the story of how our forebears shaped the landscape.

Amongst the hillocks or ‘lead rakes’, a number of ruined buildings remain. Magpie Mine near Sheldon is exceptionally well preserved with 19th century Cornish engine house and chimney. ‘Coes’ (small ruined buildings) surround some old shafts. Occasionally there are ‘soughs’ (drainage features) and ‘gin circles’ (where horses wound ore up a shaft). There is a good example of a crushing circle at Odin Mine near Castleton.

These archaeological features are reminders of the dangers and hardships miners endured in order to scrape a living from an often inhospitable environment.



Hurdlow End near Peak Forest

Geology

The Peak District orefield has a special geological character. Unusual features such as pipes and veins commonly include minerals such as fluorspar, calcite, barytes, galena (lead ore) and sometimes iron, zinc and copper ores. These often occur in complex combinations, resulting from sequences of mineralisation and are found as banded layers of different minerals. The best known and rarest of these minerals is the banded fluorite known as Blue John found around Castleton.

Underground Features

Imagine working underground, gradually chipping through the rock. Evidence of the miners’ toil can still be seen: pick marks and gunpowder shot holes being the most common. Often waste material, known as ‘deads’ was stacked and retained by drystone walling at passage sides. One of the most noteworthy features is the coffin level made with particularly fine pick work giving a coffin-shaped cross-section. Occasionally miner’s graffiti is found.

Exploration underground should only be attempted by those with the experience to assess the dangers.



Magpie Mine



Spring Sandwort



Arched levels at Ecton Mines



Mountain Pansy

Toxic Tolerants

Peak District lead rakes support an important mosaic of plant and animal life.

Soil and other conditions vary widely from hillock to hillock and this variety results in an unusual and amazing array of plants. Calcareous (lime tolerating), neutral and acidic grasslands can all be found.

But of most importance are the ‘metalophytes’ – plants that can tolerate high levels of metals in the soil. These incredible plants take up metals, such as lead, through their roots and are able to store them within their leaves and stems. Trials have been carried out to use metalophytes as a way of decontaminating land – by sowing and then later harvesting the plants along with the toxic metals they have extracted from the ground.

In the Peak District there are four key metallophyte species found on the lead rakes. These are the nationally scarce spring sandwort (known locally as leadwort) and alpine penny cress, and Pyrenean survy grass and mountain pansy. Vegetation supporting metallophytes is internationally scarce.

The hillocks and hollows have not been ploughed or fertilised intensively over the years and today provide a refuge for many once-common Peak District wild flowers, with exotic names like moonwort, frog orchid and restharrow.

The nectar-producing flowers provide food for invertebrates such as the local robber fly (*Leptarthrus brevivrostris*) and the ‘Nationally Scarce’ ground beetle (*Carabus monilis*). Seeds provide a resource for rare and declining mammals and birds.

In addition features such as old mine shafts can provide roosts for bats and the stony waste heaps offer hibernation sites for amphibians. A range of nationally-scarce lichens completes the picture.



Our Future?

Case Study 1

– Archaeological conservation opportunity – a success

Bateman's house is an example of successful archaeological recording and conservation.

It is a highly unusual 19th century house built directly over a mineshaft in Lathkill Dale. It housed a rare kind of pumping engine at its base. The house lies within a Scheduled Monument, a candidate Special Area of Conservation, a Site of Special Scientific Interest, a National Nature Reserve and a National Park.

The surviving parts of the building have been recorded archaeologically and the ruins and the shaft made good. The work revealed clear evidence of the evolution of the building over time from a purely industrial building into a mine agent's house.

Public access and interpretation, with a bridge over the river to the site and a staircase down the shaft, have been provided as part of the project.

The ruins of Bateman's house, a 19th century mine agent's house built over an impressive shaft, seen here in the foreground.



The Peak District National Park Authority, English Heritage and English Nature are working in partnership to halt the destruction of our Peak District Mining Heritage. Through the Lead Rakes Project they hope to raise awareness of the importance of these sites and encourage people to look after them for the future.

Case Study 2

– a missed opportunity

In 1999 an isolated hillock and associated shaft at Elton became the subject of a notification for removal of minerals under the Town and Country Planning (General Permitted Development) Order 1995.

Following assessment it was considered that the hillock was a significant remnant of the Derbyshire lead industry and an important landscape feature in its own right. The Authority issued a direction to prevent the extraction of minerals without first obtaining planning permission.

Meetings were held with the landowner to discuss the proposal and a grant was offered to help with the conservation of the hillock and to build a fence around it to stop animals coming in contact with the toxic lead waste.

Before further legal action to prevent any levelling of the hillock could take place, the landowner did just that and flattened the hillock. No minerals had been removed from the holding so he hadn't broken the law.

A valuable example of the lead mining legacy had been destroyed forever.





Lead Loss Dead Loss



If lead were missing from your life, how would it change?

1. Your car wouldn't start in the morning, because it needs a lead acid battery. 120,000 tonnes (more than half) of lead are used in the UK to make batteries and 90% of that is recovered and recycled to make more batteries.
2. Without the use of lead solders and leaded glass you would not be able to safely sit in front of your computer. Lead alloy solders enable your computer to send electronic data. Lead is the glue that binds our electronic world together. It plays a vital role in space exploration, energy conservation and telecommunications.
3. Lead-based materials are facilitating the development of hyper-fast computers and hi-definition TV, as well as cathode ray tubes used in viewing screens for television, computers and radar.
4. Lead glazes are used in the decoration of fine china. The china in the White House has a lead glaze.
5. Lead is used to shield medical workers from harmful X rays and as a shock absorber in Hi-tech buildings in Japan to absorb the impact of earthquakes.

Did you know?

1. Lead is harmful to your health and exposure can cause brain damage.
2. The biggest recycling plant in the UK is in Derbyshire in Darley Dale near Matlock.

Points to Consider

Do you think the limestone quarries of today will be the lead rakes of the future i.e. a part of our heritage to look after? How do we choose what should be looked after and what shouldn't be? What do you value in the landscape around you? What decisions is society making now that might affect the landscape in the future?



Useful Contacts

To find out more about the Peak District's lead mining heritage and the conservation of lead Lakes, check out the following websites:

www.peakdistrict.org

The official Peak District National Park website, more information from the Countryside and Economy Team.
Email: farming@peakdistrict-npa.gov.uk

www.peakdistrict-nationalpark.info

Visit the Time section to explore more about the Peak District's past or search the online archive.

www.english-heritage.org.uk

Aims to help people understand and appreciate why the historic buildings and landscapes around them matter.

www.english-nature.org.uk

Information on NNRS, Natural Areas and more. English Nature manages the Derbyshire Dales National Nature Reserve and also provides an education service.

www.pdmhs.com

The Peak District Mines Historical Society website has lots of information about Peak District mines, including Magpie Mine.

www.peakmines.co.uk/

This website is the official site for the PDMHS Lead Mining Museum in Matlock Bath. If you visit the museum, you can experience the forgotten world of a Derbyshire lead miner.

www.peakscan.freeuk.com/lead_mining_in_the_peak_district.htm

Some interesting pages on lead mining and lead processing, useful as background.

For more information on visiting Lead Rakes go to our Lead Rakes Leaflet