



For the next 300 million years, erosion got to work on the massive pile of rocks. The hard lavas north of the Campsie Fault were left upstanding as the Kilsyth Hills, and the hard whin sill formed Croy and Bar Hills. In between, the softer sedimentary rocks were eroded to form the Kelvin Valley.

A million years or so ago Earth entered an ice age and thick ice sheets built up, completely covering the hills as well as filling the valley. Moving slowly but powerfully from west to east the ice dug the Kelvin Valley ever deeper, to 50m below present ground level in the Kilsyth area. The ice also plastered the hills and valley with boulder clay.

When the ice finally melted over 1,000 years ago, torrential rains and floods eroded the bare landscape and filled the valley with thick deposits of sand and gravel. Eventually, forests returned and bogs covered the valley bottom.

A rich variety of wildlife came with the forests, followed by hunter gatherer people. These early people were followed by farmers who dramatically changed the landscape by clearing much of the forest, draining most of the marshes and creating the field system. Industry then took over with the construction of the canal, roads, railways, mines, quarries and communities. The last few decades have seen increasing restoration and woodland planting to put the finishing touches to the landscape of the Kelvin Valley that we see today.

From volcanoes to glaciers

VOLCANOES and tropical seas, earthquakes and glaciers, floods and the hand of man, have all helped create the Kelvin Valley we see today.

An awesome sight greeted the wildlife of the area 350 million years ago. Giant dragonflies and amphibians watched as great fissures opened up in the ground, pouring out sheets of flame and vast thicknesses of volcanic lava flows. Volcanoes erupted and hot rocks fell from the sky. By the time the earth's fires had died down, more than 500m of hard basalt lava covered the ground.

Over the next 50 million years warm shallow seas, great estuaries and dense tropical forests came and went, laying down limestones, sandstones, coals and ironstones of the carboniferous period. Around 2000m of these softer sediments were created, containing the remains of corals, sea shells and fossil trees.

In another fiery bout the molten lava of the Whin (Dolerite) Sill was injected into the newly formed sediments, forming a sheet of very hard dolerite. A series of earthquakes impacted on all these rocks, fracturing them with a network of faults, including the Campsie Fault. This massive fault, which runs along the northern edge of the Kelvin Valley, has a downthrow to the south of over 1000m. This brings the softer sediments up against the hard lavas.



AN AMAZING variety of landscapes feature in and around the upper Kelvin Valley, centred on the attractive town of Kilsyth. We have hills and glens, marshlands and woodlands, communities and farmland.

The three great forces of geology, nature and mankind have shaped the landscape we see today. A landscape which is still changing, still living.

In this leaflet, we describe the first of these forces, the geology which forms the bedrock of our landscape. See our other leaflets and guidebooks for the influences of nature and mankind.

On this page we introduce the dramatic earth history which has created our local geology. The centre pages give a 'top ten' review of places to visit. Our final panels give useful information. We hope this leaflet will add to your enjoyment of a stroll in the Kelvin Valley, and give some insight into how our landscape was formed, and what lies beneath.

Kelvin Valley Rocks! Our living landscape

VIEWPOINT

Enjoying our local heritage

THE UPPER Kelvin valley has a good path system from which views may be seen of the attractive and special landscapes provided by the broad valley, its misfit small river and the Campsie Fells and the Cumbernauld 'ridge' on either side.

The course of the Antonine Wall on Bar Hill and Croy Hill is strongly controlled by geology, and the rock consists of hard intrusive igneous rock (dolerite). This thick sheet is well seen in Croy Quarry and in the former aggregate quarries at North Barrwood and Auchinstarry. However the dolerite is the youngest local rock at only 300 million years old. Virtually the oldest are the Campsie Fells' lavas and volcanic ashes (about 335 million years).

The remaining rocks are sedimentary. Their presence is hinted at by coal and ironstone mine tips around Banton, and by the old sandstone quarries for building stone around Dullatur and the Garrel Burn. The sedimentary rocks in-situ are not that easy to see but in the Garrel you can see coal seams, ironstones, mudstones and sandstones.

The ice ages of the last 2 million years have also fashioned the landscape. Ice has eroded rocks, and deposited and shaped ground moraine (boulder clay) into drumlin hills. Glacial meltwaters deposited sand and gravel, historically quarried at Kelvinhead, and also cut meltwater channels, as seen around Cowden Hill. The Kelvin now flows to the Clyde rather than the Forth because of river capture.

There are therefore local geological highlights and processes that justify recognition as Local Geodiversity Sites in the planning system and therefore need surveying and recording. More to the point, by recognising they exist, we can enjoy learning more deeply about our local natural heritage and help conserve these sites.

Mike Browne
Chair,
Geoconservation UK



Mike examining the strata in the Garrel Burn

FACTFILE

Access – Getting here

By car M80 and A803/B802. Bus services to Falkirk, Stirling, Glasgow and Cumbernauld. Rail services to Croy Station. Bike route 754 along towpath. Boat by canal.

Walking

Much of our landscape can be enjoyed from our network of signed and surfaced paths. Other un-surfaced paths lead into the hills, requiring suitable equipment and experience. Be aware of your own safety and that of others.

Follow the code

The countryside is managed for farming and forestry. Always follow the Scottish Outdoor Access Code available from SNH, Countryside Code and the Scottish Fossil Code. Seek landowners' permission where appropriate and do not hammer out fossils from the solid rock.

Who does what?

British Geological Survey is responsible for mapping and other geo-data and publish a local geological map and memoir Airdrie, sheet 31(W) tel: 0131-667-1000.

Glasgow Geological Society run walks, talks and publish an excursion guide. They also host the volunteer body Strathclyde Geo-conservation who promote geo-conservation sites, including the Kelvin Valley. www.geologyglasgow.org.uk

Acknowledgements

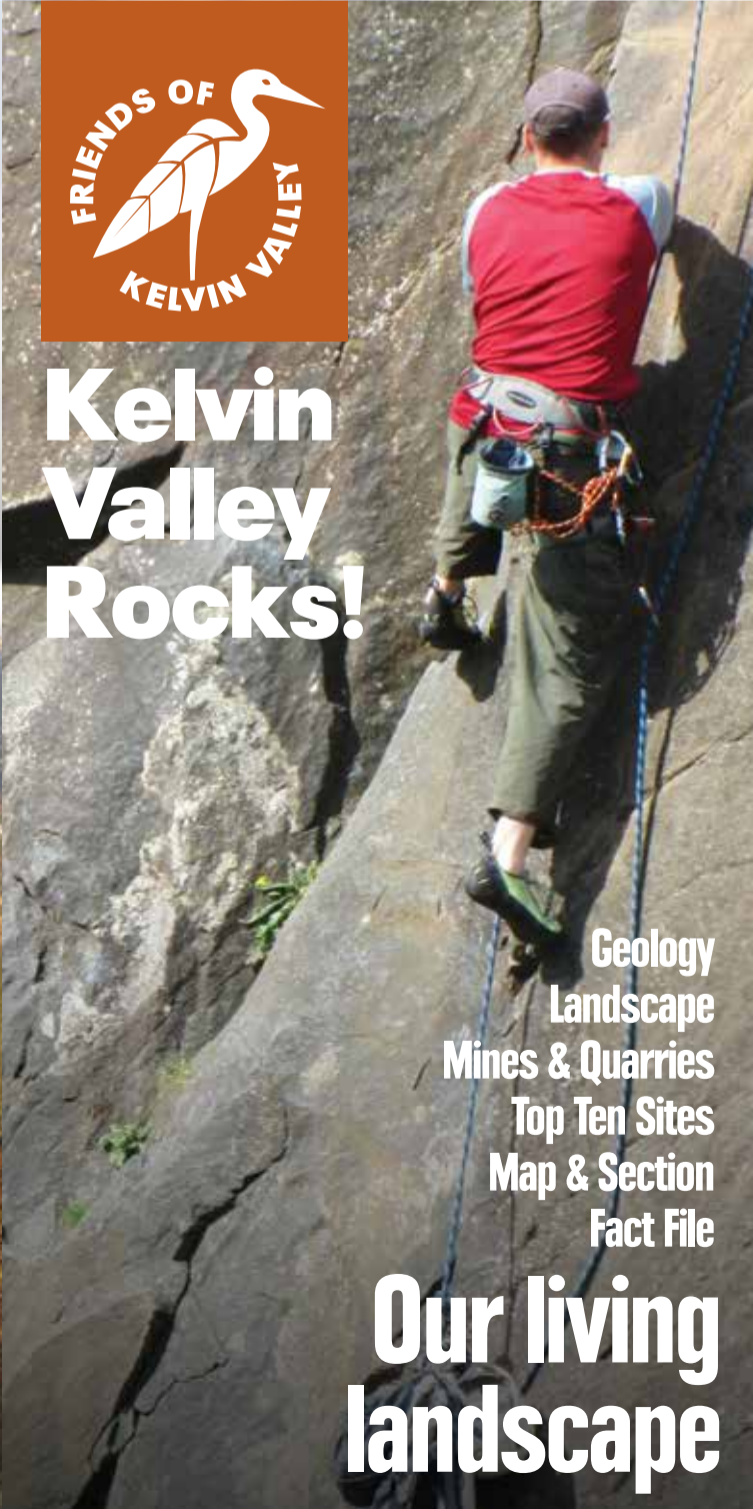
Thanks to Kelvin Valley Leader, NHS Lanarkshire, North Lanarkshire Council, Scotways and Central Scotland Forest Trust for funding.

Ourselves

Friends of Kelvin Valley publish this leaflet. We campaign for the Kelvin Valley and publish guidebooks and leaflets. All obtainable from ourselves or Kilsyth Library. We are happy to lead walks and give talks. Contact Paul Carter tel: 01236 – 822437 www.friendsofkelvinvalley.org.uk



Kelvin Valley Rocks!

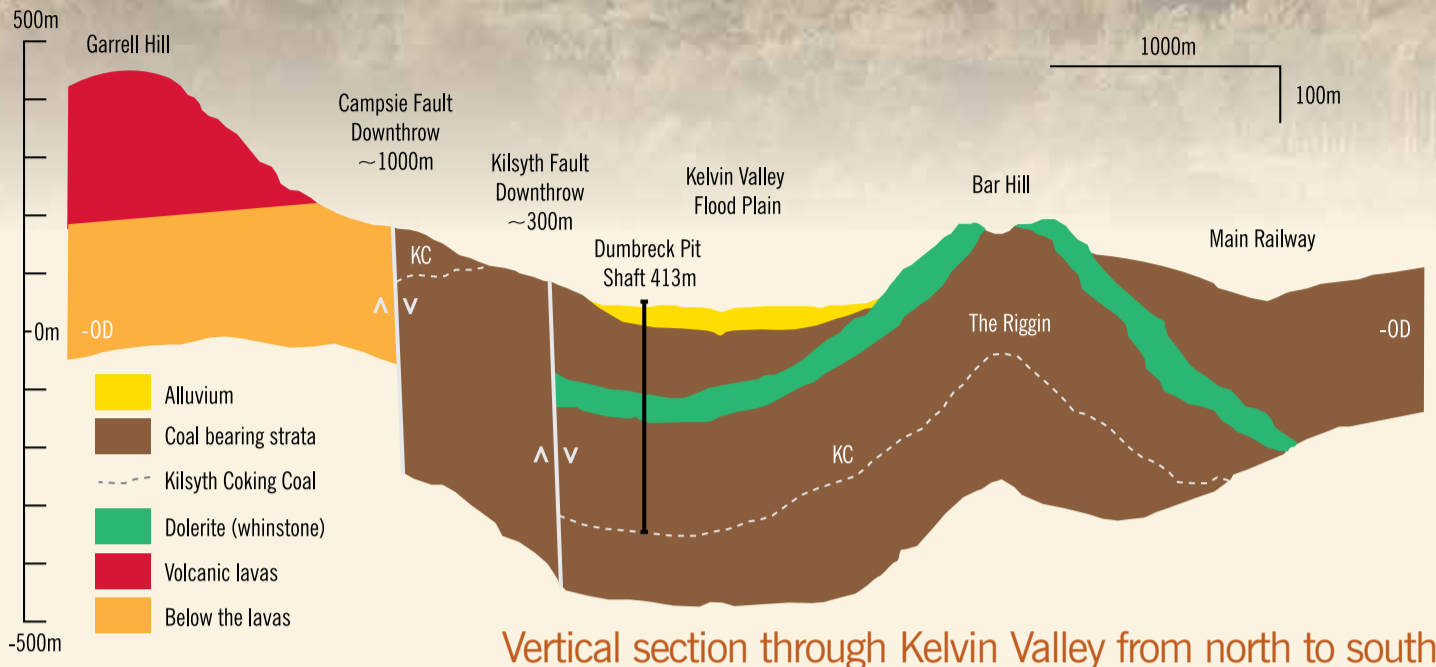


Geology
Landscape
Mines & Quarries
Top Ten Sites
Map & Section
Fact File

Our living landscape



Kelvin Valley Rocks – a living landscape



Vertical section through Kelvin Valley from north to south

Top ten places to enjoy our natural geology and landscape

Kilsyth Hills

Our hills are formed from the volcanic lavas which start our geological story. They were erupted flow upon flow, building up to a great thickness over millions of years. You can make out the individual flows in places as steps in the hillside. The hot lava solidified into hard black fine grained rock. Gas bubbles often formed. Look out for these in the crags and screes. Sometimes the rock looks like swiss cheese and sometimes the bubbles are filled with minerals. Peat layers and glacial moraines cover the lavas in places. All these materials form poor soils, usually covered in grazing or conifer plantations. The steep faces of the hills are covered in old landslides in places, formed when the last ice sheet melted away. Waterfalls like Corrie Spout, Lairds Loup and Berryhill Waterfall formed at the base of the hard lavas.

Queenzieburn Glens

Queenzieburn seems to have more than its fair share of glens, with at least four deeply cut wooded valleys cascading down from the volcanic hills to the flat bottom of the Kelvin Valley. These glens all cut down through sandstones, mudstones and coals, with waterfalls and gorges in the harder sandstones. At Joe Moses Road bridge the burn cuts a gorge through the Queenzieburn volcanic dyke, which has been quarried just below the bridge. Old mine workings can be found, including one open adit which may now be a roost for local bats. The Corrie Burn area above Cairnbog Farm is renowned for its outcrops of fossil rich limestone beds, now a Site of Scientific Interest. See the Geological Society of Glasgow guide for details, check with the farm for access and please leave the exposures as you find them. Coal, ironstone and limestone (the Lime Road) have all been mined. Sandstone and whinstone have been quarried. The burns supplied power for grain and textile mills.

Kilsyth hills from Croy Hill



Old mine entrance, Queenzieburn



Kilsyth Hills above Banton



Garrell Glen



Kilsyth

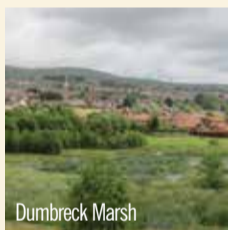
When you are not going up a hill in Kilsyth you are generally going down one. This is because the southern part of the town is on the hard Whin Sill and the northern part is on the slope up to the Kilsyth Hills. The Whin Sill is well seen in Auchinstarry Quarry where it forms a popular climbing wall. Vertical joints formed when the volcanic rock slowly cooled underground can be seen, almost columnar in places. The same rock is seen in the quarry face in Burngreen Brae. Whinstone (dolerite) sets were shipped out by canal to Glasgow and even Fort William. Carboniferous strata similar to Queenzieburn underlie the north part of the town, and are well seen in the Garrel Glen. Good exposures of the strata plus old stoop and room workings and old adit are seen just above Allanfauld Farm. Further up, the burn has carved some marvellous deep slots, pools and falls in sandstone. Water from the Garrel powered the grain mill on the Tak Ma Doon road and was used for bleaching during Kilsyth's days as a Weaving Burgh. For more than 100 years Kilsyth was an important mining town, with deep mines at Dumbreck, the Haughs, Craigends, Neilston and Curriemire amongst others. It is said a miner could go below ground at Curriemire and walk right under Kilsyth before coming back up at Dumbreck.

Dumbreck Marsh

The Nature Reserve was once the site of Kilsyth's biggest pit. From 1887 to 1963 up to 669 men worked from three shafts up to 413m deep, extracting coal, in particular the Kilsyth Coking Coal, and ironstone from beneath a large area of the Kelvin Valley. The massive bings, known locally as the Dumbreck Alps, were moulded to the present rounded land form in the 1970's and the old lagoons are now attractive ponds full of wildlife.

Colzium

Colzium Glen cuts its way through the Whin Sill in a series of waterfalls, and the same rock underlies the high ground of the arboretum. Sandstones can be seen in the lower part of the glen, dipping steeply eastwards. The estate hillside is covered in boulder clay, giving fertile soil for parkland trees, and the curling pond and lade have been built on a flatter area of alluvium and glacial gravels.



Dumbreck Marsh



Colzium House



Banton Loch



Dullatur Marsh



Bar Hill



Restored bing, Nethercroy

Banton Loch & Mines

Banton Loch was Scotland's largest reservoir when it was built to supply the new canal in 1770. The southern edge is formed by a natural dam of hard whinstone, and when the loch is overflowing there is a fine waterfall over the whinstone at the eastern spillway. Mining was a major industry for Banton from the 1770's. Coal and ironstone were won by longwall and 'stoop and room' workings and sent by canal to the new pioneering Carron Iron Works. The Banton Blackband Ironstone, Garibaldi Clayband Ironstone and Banton Smithy Coal were some of the seams worked, along with the Hosie and Index Limestones. Many small shafts and bings remain, often providing wildlife rich woodlands. Rocky outcrops and waterfalls can be seen in the Banton Burn glen. Water power was used for the Sickle Mill at High Banton and initially for the textile mill in Banton. Glacial boulder clay and outwash sand and gravel cover the bedrock over most of the Banton area, providing good soils for agricultural land and community woodlands.



Old Lime Kiln, Banton burn

Bar Hill

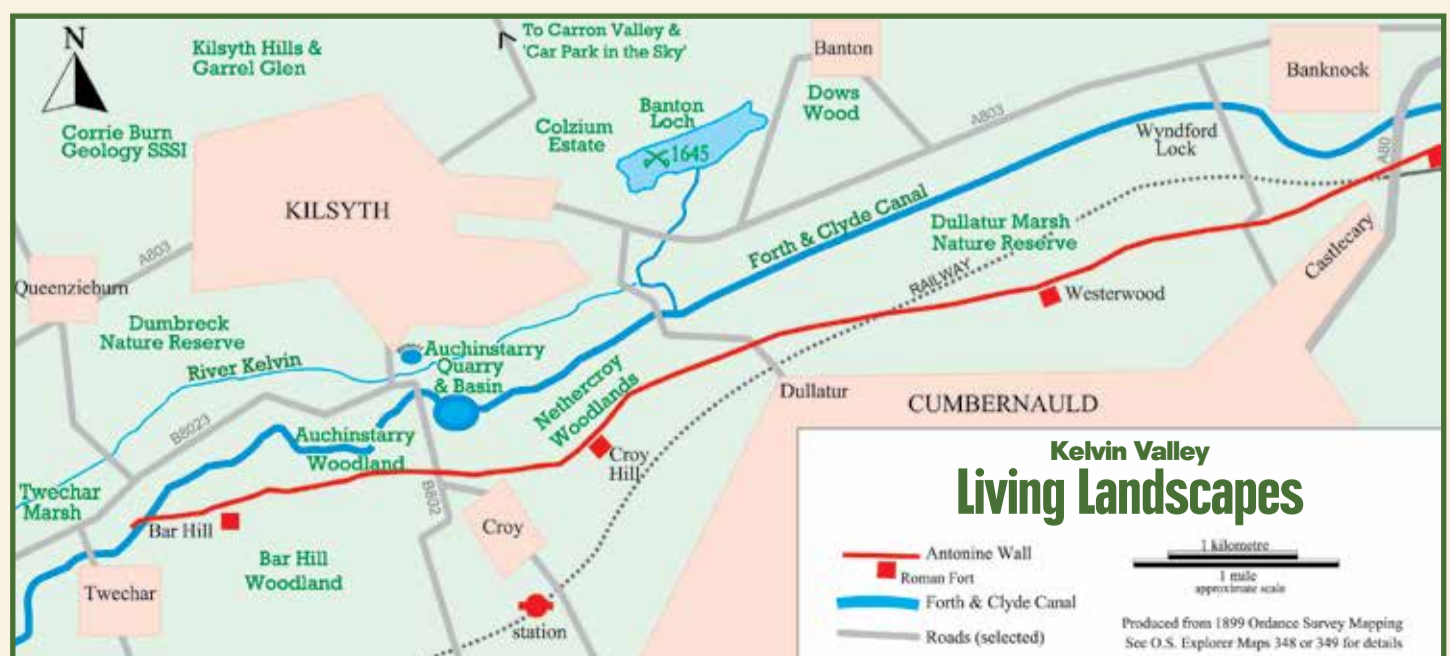
Bar Hill gives great views, the well displayed Bar Hill roman fort, and an excellent stretch of the Antonine frontier. Forestry Commission Scotland is gradually changing the woodlands from conifers to broadleaved trees. The hill itself is formed by a natural geological arch or anticline called "The Riggan" by local miners. The Whin Sill is swept up and over in a great fold, the hard dolerite forming the hill tops. Sedimentary rocks including valuable coal and ironstone were worked from the early 1800's on the flanks and core of the hill. Miners, including children, laboured in cramped wet workings, with injury and death commonplace.

Croy Hill

More great views, and another good stretch of the Antonine Frontier, can be seen on Croy Hill. Forestry Commission Scotland have planted the slopes as a community forest and cleared away the old bings. Croy Hill is also formed by the hard Whin Sill, with large quarries on the northern and southern slopes. The southern quarry is run by Amalgamated Quarries who intend to turn it into a community park. The Whin Sill shows strong columnar jointing and a thick bed of baked white sandstone, caught up in the volcanic rocks. The Nethercroy Mines operated mainly in the second half of the 19th century, mining ironstone and coking coal for the Carron Ironworks. Workings extended right beneath the hill from the canal-side down to 1000feet (300m) below the main railway.

Friends of Kelvin Valley

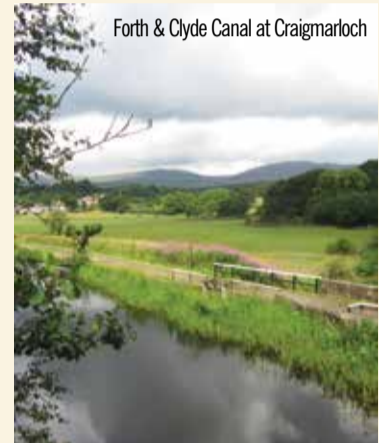
Tel: 01236 822437 www.friendsofkelvinvalley.org.uk



Forth & Clyde Canal

A stroll along the canal towpath is a great way to see the flat bottom of the Kelvin Valley and the hillsides either side. The canal itself was built from Grangemouth to Kirkintilloch 1768-1773. Now, reopened as the Millennium Link, it is a popular place for locals and tourists alike. Thick waterlogged sands, silts and clays form a buried valley under the Kelvin up to around 60m deep locally beneath the valley floor, laid down during and after the ice age, and forming a hazard to miners.

Landowners straightened the River Kelvin, just north of the canal, shortly after the canal was built. The beautiful old water lily filled meadows were lost, but valuable agricultural land was gained. Many of the old Kelvin Valley Marshes, which covered much of the valley bottom, were drained out of existence at this time. The agricultural boom was not to last however. More money was to be made in mining and this caused subsidence, re-creating some of the lost marshlands. Twechar Marsh is one of these, now a haven for hundreds of wintering wildfowl including greylag geese and whooper swans, escaping the Arctic. Kilsyth Marsh is another, home to summer migrants such as grasshopper warblers and reed buntings. Continuing east, Dullatur Marsh is another reborn wetland.



Forth & Clyde Canal at Craigmarloch

Dullatur Marsh

Dullatur Bog was a notorious bog shown on General Roy's map of 1750. When the canal builders dug through it they found the body of a trooper and his horse drowned when fleeing the battle of Kilsyth. After the canal builders had drained much of the bog, local landowners drained the rest, and no bog is shown on the first O.S. map of 1857. But with mining from the Hirst pits in the 1800's and Dullatur pit in the 1900's, subsidence and lack of drain maintenance resulted in marshland re-appearing. This is now a Site of Special Scientific Interest and is operated as a wildlife reserve by the Scottish Wildlife Trust. It is home to special wetland plants and animals. Dullatur mine bing is a good place to see pieces of coal, ironstone, shale and sandstone.