
2 East Dunbartonshire's geological heritage

2.1 The influence of geodiversity in the landscape

The diverse and attractive landscape and rich biodiversity of the East Dunbartonshire Council area is very much a product of the underlying geology and geological processes that have acted upon it. The Campsie Fells are made up of volcanic rocks belonging to the Clyde Plateau Volcanic Formation. These igneous rocks are as a rule hard wearing and resistant to erosion, so that when our present-day landscape was being sculpted during the last ice-age they resisted erosion resulting in high ground. Conversely, the Kelvin Valley is largely underlain by relatively soft sedimentary rocks from the Clackmannan Group, which were preferentially eroded by the ice and now form low ground which is used by the River Kelvin. Glacial and subsequent river processes have acted to form the valleys and meanders of the River Kelvin and Glazert Water, and rolling countryside or urban settings with rocky hills (e.g. Bar Hill), drumlin hills and lochs in hollows.

2.2 Bedrock geology

The East Dunbartonshire Council area has a diverse and attractive landscape with a rich biodiversity: the Campsie Fells, the picturesque steep slopes of the Campsie escarpment, The rocks that underpin the East Dunbartonshire Council area are all of Carboniferous age (310–350 million years old) belonging to the Inverclyde, Strathclyde, and Clackmannan groups (Map 1 and Table 1). Most of the formations (eight) in these groups of mainly sedimentary rocks occur in East Dunbartonshire, of which the youngest, the Passage Formation is not seen anywhere at surface. Extrusive igneous rocks (Clyde Plateau Volcanic Formation), lava flows and volcanic ashes occur forming the Campsie Fells and the Kilpatrick Hills. Intrusive igneous rocks, mainly in the form of sheets (sills) occur but locally dykes and volcanic neck (plug) intrusions are also found. There are two main types of sheets, the alkali-microgabbro (teschenitic) sills and the Quartz-microgabbro of the Midland Valley Sill complex (this also occurs as dykes). The former are generally almost contemporaneous in age with the sedimentary rocks they intrude, but the latter is significantly younger than other Carboniferous rocks occurring in East Dunbartonshire (300 million years old). Further geological details about the sedimentary formations and igneous rocks are to be found in Appendix 2.

2.3 Quaternary geology

The detailed physical shaping of the current landscape owes much to the work of ice sheets and the cycles of glaciation and deglaciation over the last two million years. The effects range from erosion of the bedrock by ice armoured with rock fragments into crag and tail (e.g. Bar Hill) landforms, deep sediment filled bedrock depressions (down to 60 m below O. D.) scoured out by the ice and/or by meltwaters flowing under pressure under the ice, to small rock features like roche moutonee and glacial striae.

Ice sheets and glaciers also laid down sediments that now largely bury the bedrock. The chief and most widespread deposit is glacial till (formerly known as boulder clay) that is laid down at the base of the ice and consists of a mix of boulders, cobbles and stones in a plentiful matrix of clay, silt and sand. It is this material (Wilderness Till Formation) that is subsequently sculpted by the ice sheet into drumlin landforms (basket of eggs topography) that characterise much of this area and the rest of the Glasgow conurbation.

Glacial meltwaters laid down sand and gravel (Broomhouse Sand and Gravel Formation) in the form of mounds (where melting ice decayed in the sediment), deltas and terraced spreads and such landforms are present in and around the Kelvin and Glazert valleys. Such sand and gravel deposits (Cadder Sand and Gravel Formation) also occur buried under glacial till (Wilderness Till Formation) in the Kelvin valley and date from before the last main ice age. The bones of woolly rhinoceros have been found in these sediments in the Cadder area and date to about 30 000 years ago just prior to the last major ice age.

Lake deposits and river alluvium have been laid down since the last ice left the area about 14 000 years ago. Some lakes have completely silted up whilst others form attractive areas of open water and wetlands and with peat present locally (e.g. Bardowie Loch). On the relatively steep slopes of the Campsie Fells, there are vegetated and unvegetated areas of scree (talus) associated with ancient and active rockfall and landslide. A wide range of soils have formed including gleys in wetter parts and podsols on the better draining sandier materials.

2.4 Geological resources and the built heritage

The mineral resources of East Dunbartonshire have a long history of exploitation. Bulk minerals extracted have included the two types of microgabbro sill (and dykes) and lavas for hard rock aggregate (roadstone and concrete), sand and gravel and the quartz-conglomerate on Douglas Muir (high specification aggregate). Mudstones have been quarried for the manufacture of bricks with colliery spoil also similarly used. Mining and opencast extraction has taken place over

100's of years particularly for coal, limestone and ironstone. In particular, the Hurler Limestone, Alum Shale and Hurler Coal formed the basis for an industry which included the Campsie Alum Works at Lennoxton. Over the centuries sandstone quarries provided raw materials for buildings including both blocks and flagstones. The Roman Bath House at Bearsden has a few flagstones showing beautiful ripplemarks. The very limited outcrops of limestone and the associated waste in quarries for lime manufacture provide little oases for lime-loving flora. Heather thrives on the restored areas of rock in the quartz-rich workings of Douglas Muir.

[Bibliography](#)