



Purpose



This is a public statement prepared by SNH for owners and occupiers of the SSSI. It outlines the reasons it is designated as an SSSI and provides guidance on how its special natural features should be conserved or enhanced. This Statement does not affect or form part of the statutory notification and does not remove the need to apply for consent for operations requiring consent.

We welcome your views on this statement.

Description of the site

Dumbarton Rock Site of Special Scientific Interest (SSSI), located south of the town of Dumbarton, is a well-preserved and nationally important example of a volcanic plug of Lower Carboniferous age (around 340 million years ago) composed of hawaiitic basalt.

During the Lower Carboniferous volcanoes were widespread within the Midland Valley of Scotland. This is seen in the Glasgow area as the lavas of the Campsie and Kilpatrick Hills to the north, and those of the Renfrewshire heights to the south. It is thought that these lavas were erupted from localised volcanic vents, such as Dumbarton rock. Vents are the openings through which a volcano ejects molten rock or magma, forming igneous rocks on cooling.



All that remains of the volcanic vent today is layers of volcanic ash and coarse debris, termed 'agglomerate', together with a 'plug' of igneous rock, called basalt, a fine-grained basic volcanic rock. Chemical analysis of this rock shows it to be a variety of basalt that is called 'Hawaiite' after a type that is common on the island of Hawaii. This basalt represents once molten rock that was on its way to be erupted onto the surface but which solidified within the pipe feeding the vent. The ash and agglomerate represent explosively fragmented lava that accumulated within the vent as eruptions took place.

Once the volcano became extinct layers of sediment covered it but millions of years of erosion have re-exposed the volcano and worn most of it away. However, the occurrence of volcanic ash and the pattern of the 'hexagonal cooling joints' in the basalt, suggests that the level exposed may only be 100 metres or so from the top of the once active volcano.

Carboniferous sediments exposed in the site represent the rocks that lay beneath the volcano and through which the volcanic pipe erupted. The occurrence of the minerals 'chlorite' and 'albite' within the vent margin rocks, indicate that ground water superheated by the volcanic activity, affected the rock around the volcano, leaching and depositing minerals.

Dumbarton rock is in a favourable condition but vegetation growth (scrub and ivy) has been recorded as being a threat to the visibility of the key rocks.

Natural Features of Dumbarton Rock SSSI	Condition of feature (date monitored)
Carboniferous-Permian Igneous	Favourable, maintained (May 2000)

Vegetation threatening visibility	View from north side of Dumbarton Rock looking west. Part of the flat shore area where sediments are preserved may be seen, bottom right.
	

Past and present management

Dumbarton Rock has been a fortified site for at least 2000 years and its historic structures are owned and run by Historic Scotland. A path runs around the rock from the castle entrance at the south side to an area of intertidal exposure in the north. The rock is visited frequently by geological groups and is used by rock climbers. Dumbarton Rock also represents a key feature of the landscape and is an important focal point within Dumbarton and the surrounding area.

Objectives for Management (and key factors influencing the condition of natural features)

We wish to work with the owner to protect the site and to maintain and where necessary enhance its features of special interest. SNH aims to carry out site survey, monitoring and research as appropriate to increase our knowledge and understanding of the site and its natural features.

- 1. To maintain the condition and extent of the geological exposures of Dumbarton Rock SSSI** by ensuring sampling from exposures only takes place in accordance with the Geological Code. Outcrops should also remain accessible and visible, free from obstruction by vegetation and graffiti. Access to the site should follow the Scottish Outdoor Access Code (SOAC).
- 2. To facilitate the use of the site as an educational and research resource** by liaising with the owners regarding on-site interpretation.

Front page photograph: Columnar cooling joints at Dumbarton rock.

Date last reviewed: 2 November 2007