

## CITATION

### RIVER ESK, GLENCARTHOLM SITE OF SPECIAL SCIENTIFIC INTEREST

Dumfries and Galloway

Site code: 1360

NATIONAL GRID REFERENCE: NY 376796

OS 1:50,000 SHEET NO: Landranger Series 85

1:25,000 SHEET NO: Explorer Series 323

AREA: 3.86 hectares

## NOTIFIED NATURAL FEATURES

### Geological:

Igneous Petrology : Carboniferous - Permian Igneous

Palaeontology : Arthropoda (excluding insects and trilobites)

Palaeontology : Palaeozoic Palaeobotany

Palaeontology : Permian - Carboniferous Fish/Amphibia

## DESCRIPTION

River Esk, Glencartholm is located approximately 3.5km northwest of Canonbie. The western part of the Scottish Borders provides evidence of three periods of chronologically distinct and increasingly violent magmatic activity in the Lower Carboniferous (Dinantian) period. The youngest of these, dominantly pyroclastic in nature, is known as the Glencartholm Volcanic Beds and is important in any comprehensive understanding of the regional stratigraphy and the evolution of the Northumberland Basin. Lithologically the beds are extremely variable in detail – interstratified crystal and lithic tuffs, tuffaceous sediments, shales, sandstones and rare limestones and corals; locally lavas are found at the base of the sequence. Some of the intercalated sediments have yielded an important early Carboniferous vertebrate fauna. The section in the River Esk is the type locality for the Glencartholm Volcanic Beds.

The Visean marine shales of Glencartholm yield a compression flora of unusual diversity for their age. Over 25 species, mainly of pteridosperms and lycopods, are known – more than from any other site of this age in Britain. The pteridosperm specimens include large pieces of foliage, providing important data on frond architecture, whilst the lycopods have yielded stem cuticles, rarely found elsewhere. The site is invaluable for understanding the Lower Carboniferous floras, and is of prime national significance.

This locality yields a remarkably diverse fauna of ancient arthropods. Lower Carboniferous rocks here contain twenty-one species of eurypterids, xiphosurans, scorpions, crustacea and other arthropods. This fauna is considerably earlier than those in deposits at Bear Gulch and Mazon Creek in the USA which have comparably rich faunal assemblages. A key site in studies of Carboniferous biotas and arthropod history.

Glencartholm is one of the most important Carboniferous fish sites in the world. Important differences in faunal content exist between here and the other two Carboniferous Lagerstätten at Bear Gulch and Mazon Creek in the USA which have comparable palaeoenvironments and many genera in common. Glencartholm lacks several elements which are present at the two later sites. The horizon is very low in the Visean, and the fish are found in a thin bed within the Glencartholm Volcanic Group. The fauna is remarkable because of the numbers of complete specimens found and for the variety of types contained; about 35 species are so far recorded. The assemblage contains both marine and freshwater forms. It has been suggested that these remains accumulated in a creek, shut off at intervals from the sea. Glencartholm is the only known locality for 20 species and the type locality for a further 6 species which are also found elsewhere; the majority are palaeoniscids (24 species), with sharks and holocephalians making up 7 species. *Rhadinichthys canobiensis* is the most common fish here, many other species are known only from one or two specimens. *Rhabdoderma huxleyi* is unique to this site and is the oldest known coelacanth. Glencartholm also yields the earliest platysomids, earliest *Elonichthys* and earliest members of the Amphicentridae.

#### **NOTIFICATION HISTORY**

First notified under the Wildlife and Countryside Act 1981: 3 February 1989.  
Notification reviewed under the Nature Conservation (Scotland) Act 2004:  
19 June 2009.

#### **REMARKS**

Measured area of site corrected (from 4.4 ha).