
2 Geodiversity and its importance

International recognition of the need to conserve biological diversity led to the UN Convention on Biodiversity agreed at the Rio Earth Summit in 1992 and the subsequent signing by over 160 countries. Since the UK government published 'Meeting the Rio Challenge' in 1995, most local authorities or regions in the UK have prepared and implemented Biodiversity Action Plans (BAPs) for their areas, and biodiversity is now accepted as an essential element in sustainable development planning and management strategies.

Until relatively recently the parallel concept of geodiversity had attracted little interest, despite its fundamental importance in underpinning biodiversity by providing the substrates.

Geological and landscape features, other than those already afforded some measure of protection such as SSSIs, are often seen as sufficiently robust not to require active management or action planning. All geological features are potentially vulnerable. In addition to threats posed by inappropriate site development and the infilling of quarries, the encroachment of vegetation, natural weathering and general deterioration with time may threaten to damage or obliterate important geological features. This situation would not be tolerated in wildlife or archaeological sites of comparable scientific or educational value.

The geodiversity of an area may be considered as one of its chief natural resources. A key starting point is an appreciation of the most up to date available understanding of the area's geology, landforms and soils, together with the processes and phenomena which have formed them and continue to influence them. An area's geodiversity thus encompasses:

- sites or natural features which are deemed worthy of some form of designation or protection for the quality of Earth heritage features displayed
- sites or natural features where representative examples of the area's Earth heritage may be seen
- sites and natural features currently employed in interpreting Earth science
- resource potential for geotourism and education
- the whereabouts and nature of past and present working of mineral products
- the influence of earth science in shaping the man-made environment, urban landscapes and architectural heritage
- natural hazard management
- the inter-relationship and inter-dependence between Earth heritage and other interests, for example biodiversity, archaeology, history

Documentation of an areas' geodiversity may include:

- sites with geological exposures
- materials collections and sites and other records such as borehole logs
- published literature and maps
- the historical legacy of research within the area

2.1 Geodiversity — why is it important?

Geodiversity is fundamental to almost every aspect of life – all raw materials that cannot be grown and all energy that cannot be generated by renewables have to be found using geological science.

A clear understanding of geology is also vital to the design and location of buildings, roads, railways and airports as well as to the safe control of waste disposal, and the management of a wide range of natural and man-made natural hazards. All are aspects of geodiversity.

An awareness of geodiversity helps us to understand our environment and predict environmental change in the future. Geological research demonstrates that surface environments are continually evolving through natural self-regulating systems involving the Earth's crust and mantle, oceans, atmospheric processes and life forms. Human activity imposes further pressures and changes to these natural cycles, which pose great challenges to modern society. Exhaustion of finite resources such as fossil fuel and global climate change are two of the most pressing. Only by studying the geological record can we hope to predict the earth's response to these changing conditions.

The recognition of natural and cultural heritage features and their sustainable management are today accepted as important functions within a civilised society. The importance of the range and diversity of Earth heritage features – the 'geodiversity' - of any area is as important a facet of its natural heritage as its wildlife interests. Conservation, sustainable management, educational use and interpretation of geodiversity are thus as important as that of biodiversity or archaeology.

However, geodiversity is not, or should not be regarded merely as concerned with conservation of Earth heritage sites or features – it has a vital place in all aspects of natural heritage and impacts in fields as varied as economic development (for example, supporting the development of geotourism in the new UNESCO European Geopark Network), building stone resource development, education and lifelong learning, archaeology, art and wildlife. Geodiversity may be one of the most significant areas of heritage interest in areas of high landscape value, or areas previously or currently affected by significant mineral extraction.

Geodiversity interests need to be integrated into other policies and processes relating to sustainable development including:

- Strategic Environmental Assessment
- Local Development Framework and mineral plans
- The Water Framework Directive
- EU Soil Protection Directive
- Local Biodiversity Action Plans

An appreciation of geodiversity is important for a comprehensive understanding of many aspects of biodiversity. It also offers substantial opportunities to enhance the conservation, management, educational use and interpretation of such related features. Because it has hitherto received little serious consideration, geodiversity needs to be addressed and evaluated by expert earth scientists.