Chapter 7 The Geological Conservation Review in the context of the wider Earth heritage conservation effort

One of the aims of this volume has been to show that Great Britain contains a varied, fascinating and scientifically invaluable Earth heritage, which also contributes a great deal to Britain's landscape, wildlife, economy and scenic beauty. Our Earth heritage is, therefore, not only a scientific resource, but also a part of our economic, cultural and ecological inheritance.

Countless geologists, professional and amateur, have sharpened their scientific minds by studying the rocks and landscapes of Britain. As a result, many conceptual advances in the Earth sciences were made here. It might be argued that all of the sites which have played a significant part in the development of the Earth sciences should be conserved. This would be impractical. Thus the conservation of the Earth heritage resource of Great Britain has focused on selecting a series of sites that geologists consider important for the Geological Conservation Review.

For the first time it has been possible to take stock of the geological resource of Britain in a comprehensive way using standard criteria. The published results of the Geological Conservation Review provide not only a thorough science-based foundation for practical Earth heritage conservation within the series of notified Sites of Special Scientific Interest, but also a comprehensive account of the geology and geomorphology of Britain.

Earth heritage conservation strategy

In 1990, the Nature Conservancy Council published Earth Science Conservation in Great Britain — A Strategy, which provided a detailed and practical guide to meeting the challenge of Earth heritage conservation. It gave an overview of the problems that needed to be addressed, the means by which conservation can be effected, and the organisations best placed to take an active role. It provided a platform for taking Earth heritage conservation forward. Since its publication, the majority of its themes have been carried out successfully and developed, and have made valuable contributions to the conservation and promotion of our Earth heritage.

The strategy highlighted six areas for action:

- maintaining the SSSI series through the mechanism of the Geological Conservation Review
- expanding the RIGS network
- developing conservation techniques
- improving documentation and conservation of geological samples
- increasing public awareness
- developing international links.

Since 1990, there have been changing emphases on the approaches to Earth heritage conservation. The creation of new conservation agencies, the Countryside Council for Wales, English Nature, Scottish Natural Heritage and the Joint Nature Conservation Committee, has provided a new institutional framework. Increased public awareness and participation in local groups, the expanding RIGS network, the growth of geological leisure pursuits, the incorporation of geological sites into local authority plans and the development of new conservation techniques, have all influenced the ways in which Earth heritage conservation is perceived. The latest developments regard the Earth heritage as an integral part of our natural heritage.

For the continuing success of Earth heritage conservation strategies, it is important that all sectors of the community participate. This requires the involvement of local authorities and other statutory bodies, landowners and site managers, Earth science societies, museums, county wildlife trusts and other local and national conservation bodies, the higher education sector, schools and field centres and, of course, the general public. It is hoped that industry, which relies upon raw materials, and public utilities, which use the resources of the land and water, will continue to support the aims of

Earth heritage conservation.

Progress and developments in earth heritage conservation

Maintaining the SSSI series through the mechanism of the GeologicalConser vation Review

As our understanding of geology and geomorphology changes with the insights provided by new discoveries and advances in Earth science theory, so new sites may need to be considered as Earth heritage SSSIs. Moreover, if a site has deteriorated or been lost, a replacement will need to be identified and notified in its place. The mechanism of the Geological Conservation Review and its criteria are still applied when new or replacement sites are being considered. In view of this, the existing Geological Conservation Review blocks and networks will need to be reviewed and updated from time to time.

In the years since the strategy was published, it has become clear that future developments in statutory Earth heritage conservation will probably require attention to focus on a number of new areas, such as culturally and historically important sites, soils, hydrogeology and sea-bed localities.

Expanding the RIGS network

Interest in sites outside the SSSI framework of statutory protection is increasing and there is already a recognised need to mobilise voluntary bodies to take responsibility for sites of regional importance, such as RIGS. Greater participation in local groups has extended the RIGS networks, and this has been accompanied by an increase in geological leisure pursuits. There are now active RIGS groups in all the counties in England and Wales, and many in Scotland.

Developing conservation techniques

As well as developing and refining Earth heritage conservation practice (*see* Chapter 6), recent developments to find technical solutions to key problems threatening sites include the investigation and evaluation of 'soft' engineering techniques to reduce coastal erosion, as alternatives to 'hard coastal defences' that can obscure geological exposures and disrupt the transport of sediment along coasts. New engineering and blasting techniques are also being developed which can provide safe, stable exposures of rocks. Similarly, landfill schemes, which are sympathetic to the need for Earth heritage site conservation, have been further refined, so that the requirements of society are balanced with the need for conserving rock outcrops for study.

Quaternary geology can help us to understand the effects of processes such as climate change and its interaction with ecology. This knowledge can assist us in planning conservation responses in a changing world.

Geomorphologists with their specialist knowledge of active sites have an important role to play in the development of new conservation approaches. They can advise on the practical use and management of natural resources, based on a sound understanding of geomorphological principles, and the physical and chemical changes which are taking place as the result of interaction between human land use and natural systems.

Improving documentation

Besides Geological Conservation Review publications, a programme of preparing site management plans (*see* Chapter 6) for all Earth science sites is continuing. These are designed to assist local staff in the statutory nature conservation agencies to appreciate the Earth heritage significance of sites and to enable them to pursue ways of enhancing the scientific and cultural values of sites in the light of any threats. Publications with wider appeal are also being produced, which will contribute to a greater public awareness of Britain's Earth heritage.

Increasing public awareness

There is need for a greater public understanding and awareness of environmental matters. The place of Earth science conservation in nature conservation needs greater and continuing exposure, through education and joint action.

The increasing circulation of the magazine Earth Heritage (formerly Earth Science Conservation) indicates an enhanced awareness of Earth heritage issues. This is a reflection of the publication of articles with more popular appeal; also, there is a general increase in the place of Earth heritage issues on the wider conservation scene. The series of publications Landscape Fashioned by Geology, published by Scottish Natural Heritage in association with the British Geological Survey, aims to describe Scotland's geology in more accessible terms and is a model for others to follow.

Since 1990, two national conferences have considered specific problems of conserving our Ice Age heritage ('Evolving landforms and Ice Age Heritage', held in May 1992 in Crewe) and the special needs of mineralogical sites ('Conserving Britain's Mineralogical Heritage', held at Manchester University in March 1992).

At a site-specific level, a number of information boards and interpretation panels have now been erected at sites across Britain to carry messages to the public; more will follow.

Developing international links

Throughout the United Kingdom, and indeed internationally, there is a growing interest in Earth heritage conservation. As well as the

national conferences mentioned above, there have been two international meetings, at Digne, in France (1991), and Great Malvern (1993).

A debate on the merits of developing international guidelines to address geological and landscape conservation issues was held at the Malvern Conference and is continuing via an international group, the 'Malvern Task Force'. A central issue (which is directly relevant to the Geological Conservation Review) is that of protecting and managing internationally important sites to agreed international standards.

These activities take place in a context of increasing environmental awareness and action following the United Nations Conference on Environment and Development (UNCED) at Rio de Janeiro in 1992. They reflect a growing awareness of the interdependence between the well-being of the Earth and its peoples.

Earth heritage and nature conservation

The Rio Conference gave an impetus to efforts to manage natural resources in a sustainable way. As a result, attention is focused on the management of natural ecosystems to prevent environmental deterioration.

For example, sediments from catchments and coastal cliffs are naturally transported into the coastal zone, and these are essential for the maintenance of sand dunes, beaches, mud flats and saltmarshes. Linking into the coastal system is the fluvial transport system, where sediment is carried from a river catchment area to the floodplain, estuary and adjacent sea areas. The artificial stabilisation of any part of these dynamic natural processes could drastically interfere with their balance and so impoverish the natural environment.

Recent geological history, hydrology, soil type and soil moisture, topography and aspect all influence plant and animal habitats. The herb-rich grassland vegetation characteristic of the many upland limestone areas is very different from the moorland and bog vegetation which develops on upland acid soils overlying sandstone or granite. Any alteration to the acidity of these soils and their patterns of drainage can have fundamental effects on their local ecosystems.

These examples show how important it is to understand 'whole' systems and the relationships between processes at work in the Earth and life sciences. English Nature has developed a concept based on the identification in England of Natural Areas. These are defined largely on the basis of their underlying geology, landforms and soils, together with the characteristic natural vegetation types and wildlife species they support. This concept will provide a new foundation for establishing conservation objectives based on the 'whole-environment' approach to which local people can contribute. A

parallel series of Natural Areas, based largely on sediment erosion, transport and deposition systems, has been developed for coastal regions in England. In Scotland, Scottish Natural Heritage is developing a similar concept using geology, landforms and soils to identify a series of biogeographic zones. The importance of soils, somewhat neglected hitherto in nature conservation, is now gaining increased prominence and their study within the concept of sustainability is likely to become an important task for the future. In Wales, the Countryside Council for Wales is also developing a landscape strategy to integrate geological, geomorphological and biological conservation, allied to public awareness and enjoyment.

Today, in the light of international, national and local activities dedicated to the conservation of the Earth heritage of Britain, it is now possible to take effective steps to safeguard the legacy of the past for future generations. The Geological Conservation Review has made this possible.

References and further reading