

Geoconservation Values of Quaternary Features

Geoconservation is the conservation of those elements of geodiversity that have significant intrinsic, scientific, educational, cultural, aesthetic, ecological or ecosystem service values. Together these elements form our geoheritage.

1. Geodiversity is an integral part of nature, and in the same way that plants and animals merit conservation for their intrinsic value, so too do abiotic features.
2. Conserving Quaternary sites (geosites) of international, national or local significance for science and education (at all levels from schools to life-long learning) is vital for: current and future research; developing new techniques and theories; educating and training the scientists of the future; and historical value (history of science). Quaternary sites in this category include type or reference localities for particular time periods or events; reference sites for sediments, landforms, deposits or fossils indicative of past environmental conditions; sites with features representative of particular periods of the Earth's Quaternary history or particular geomorphological processes or landforms, or that are unusual or distinctive; and classic textbook features and landscapes.
3. Culturally significant Quaternary sites are places where geological features or landscapes played a role in cultural or historical events, or have close links with archaeology. Aesthetically significant sites include natural features or landscapes that are visually appealing. Many Quaternary sites are tourist attractions and provide economic benefits.
4. Geodiversity is a vital component of ecosystems in which biotic and abiotic components form an interacting system. Most species depend on the abiotic 'stage' on which they exist, not only rare or specialised ones (e.g. those associated with limestone pavements), and there is a close connection between flora and fauna, the soil and the underlying rocks, and the topography and water and other nutrients on which they depend for growth and survival.
5. Geodiversity also provides many environmental goods and ecosystem services that deliver valuable economic, social and environmental benefits for society, including carbon sequestration, water quality regulation, natural forms of coastal defence and assets for recreation. Understanding Quaternary geodiversity and developing Quaternary science to enable benefits for society through understanding and mitigating natural hazards and informing the management of land (including soils) and water (e.g. providing evidence for geotechnical engineering and data on historical flooding); use of Quaternary information on climate and environmental change and forecasting, including rates of change, extreme events and impact on marine and terrestrial systems (e.g. sea-level change); evaluation of past human impacts (e.g. pollution, changes in land use using palaeoenvironmental archives).

Recognition of the value of conserving Quaternary features and sites is therefore vital both for the field-based research and education that are essential to advance Quaternary science, and also for the wider benefits for the environment and society.

The focus of geoconservation is usually on sites (geosites), but may also include museum collections and specimens (e.g. of fossils). Quaternary geosites can be small but scientifically significant areas, such as a disused quarry (e.g. Four Ashes Pit SSSI) or a coastal exposure (e.g. Happisburgh Cliffs SSSI), or extensive areas with landforms, such as the Parallel Roads of Lochaber SSSI or the Cairngorms SSSI. They may be located on privately owned land, or on land in public ownership. Many are vulnerable to a range of threats, including urbanization, infrastructure development, agriculture, aggregate extraction, neglect, erosion or lack of understanding of their value. Moreover, the values of such sites are often underestimated or overlooked in national and local planning and policy.

For further information, see:

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