

Executive Summary

Introduction

Some 400 million years ago, the geology in Cornwall and the Isles of Scilly evolved in a completely different manner to the rest of Britain; giving rise to a distinctive suite of rocks (slates, greenstones, serpentine, gabbro and granites) and generating one of the world's classic mineralised orefields.

As a result Cornwall and the Isles of Scilly have a great diversity of rocks, soils, landscapes and mineral deposits, reflecting their rich and varied geological heritage. Geodiversity is the name given to the variety of rocks, minerals and fossils (geology), together with the variety of soils, natural processes and landforms (geomorphology).

Geodiversity is important to Cornwall and Isles of Scilly because:

- Geology and landscape are the basis for much of Cornwall and Isles of Scilly's beautiful scenery and provide the resources for a variety of recreational and leisure activities.
- Within our towns, villages and workplaces, geodiversity provides the building materials, architectural heritage and physical landscape. Our natural heritage and historic environment are seen by many as major benefits of living and working in Cornwall and Isles of Scilly.
- Soils, rocks and landscapes are an integral part of the natural history of Cornwall and Isles of Scilly. They provide the raw materials for active processes to shape our moors, rivers and coasts; creating varied habitats and ecosystems and having an underpinning control on the diversity of wildlife.
- Cornwall and Isles of Scilly's geodiversity is important in the historical development of geology and mining and retains its importance today as a scientific, cultural and economic resource of national and international significance.
- Many locations in Cornwall and Isles of Scilly are recognised as Sites of Special Scientific Interest (SSSI) or County Geology Sites (RIGS) for their geological significance, and their conservation and continued protection is a responsibility we have to future generations.

There is a pressing need to conserve and manage geodiversity, in the same way that biodiversity conservation has already been incorporated into all levels of national and local policy making, industrial and economic development and education/lifelong learning.

Framework

The aim of this Geodiversity Action Plan (GAP) is to provide both a strategic framework for geodiversity in Cornwall and Isles of Scilly and to identify projects and actions which take the development or conservation of geodiversity forward in a

sustainable manner. The GAP includes an audit of Cornwall and Isles of Scilly's geodiversity, in order to identify and summarise the current status of our geological assets, and develops targets and action plans to help manage future work.

There are considerable resources and geological skills within Cornwall and the Isles of Scilly, but they are dispersed in various organisations and need harnessing and coordinating to effectively implement the Geodiversity Action Plan. The most critical action required from this GAP is to establish a network of partners willing to support its aims and objectives; with a shared and agreed view on how the action plans will be delivered and funded. The positive feedback received at the consultation stage suggests that establishing a steering group of key partners will be achievable.

Considerable progress on geological conservation in Cornwall and the Isles of Scilly has been made through the dedicated efforts of part-time, largely voluntary groups (in particular the Cornwall RIGS Group) and individuals; and work towards the aims and objectives of this GAP will continue. If geodiversity and its conservation is to reach parity with that now enjoyed by biodiversity and the historic environment, however, it needs proper funding and a more full time approach. This Geodiversity Action Plan therefore assumes that there is an individual (nominally called the Geodiversity Officer) tasked with its implementation. The absence of such an appointee should not, however, invalidate attempts to pursue the targets and actions outline in this Geodiversity Action Plan.

Whether future funding to support implementation of the Geodiversity Action Plan comes from a single, or a variety of sources, it is important that no one organisation should be seen to have ownership of the GAP and that responsibility for promoting, enhancing and conserving geodiversity in Cornwall and Isles of Scilly is shared by all partners.

Range & status of geodiversity sites

For almost all aspects of Cornwall and Isles of Scilly's geodiversity there are representative exposure and integrity sites available, although for reasons of safety (for example in relation to underground exposures or mineral resources) or land management (e.g. soils in cultivation) not all may be visible or accessible.

Away from the coastal regions and granite tors, the main sites for hard-rock features are provided by current mineral extraction activities and by abandoned mines and quarries. Soils, geomorphological features and the various landscape characters are largely under the stewardship of major landowners and/or agricultural interests. These natural resources achieve regional, national or even international importance in their own right; providing considerable geodiversity value and requiring good management and sustainable development.

Existing planning policies for minerals, environmental protection, character areas and use of resources are all aimed at maintaining this range of natural resources and promoting their sustainable development.

Although sufficient sites exist in Cornwall and Isles of Scilly to provide representative coverage of almost all aspects of geodiversity, this does not correlate directly with the range and number of sites protected under legislation, various conservation designations or planning policy.

Geodiversity Audit: key issues

1. Good designated site coverage for:
 - i. Trevone-South Devon Basin in west Cornwall
 - ii. Tavy Basin along north coast
 - iii. Culm Basin
 - iv. regional metamorphic effects on sediments and volcanics
 - v. Lizard Complex
 - vi. Cornubian granite batholith and associated rocks (exceptions shown in 2.iii.)
 - vii. key mineral species locations
2. Under-represented or poor designated site coverage for:
 - i. Trevone-South Devon Basin in east Cornwall
 - ii. Tavy Basin away from the north coast
 - iii. Carnmenellis and Isles of Scilly granite plutons; lamprophyres
 - iv. styles of mineralization and alteration
 - v. Tertiary sediments
3. Insufficient work carried out to date to confirm coverage for:
 - i. Gramscatho Basin
 - ii. Variscan and sedimentary basin structural geology
 - iii. integrity sites of the Quaternary
 - iv. soil sites, (particularly soil sub-groups and types)
 - v. geomorphological sites
 - vi. fossil fauna and assemblages
4. Revise and update County Geology Site (RIGS) descriptions. Review descriptions on SSSI citation sheets to identify any additional features of geodiversity interest that could be designated at regional (RIGS) level.
5. There are a number of issues relating to the collection and management of County Geology Sites (RIGS) data:
 - i. lack of standardised information collected,
 - ii. lack of up-to-date survey information for each site,
 - iii. lack of adequate computerised information for each site,
 - iv. lack of management plans/recommendations for each site.
6. Systems for the recording and wider reporting of temporary exposures of geological significance are not well developed. Formal watching briefs, such as those required for archaeological interests, could be established.
7. There is currently insufficient information pertaining to sites outside of the designated sites system i.e. sites in the wider landscape.
8. The audit has not established whether the museum and academic collections contain a comprehensive record of all the key mineral, rock and fossil specimens or species in Cornwall.
9. There is a need to audit and review the resources and skills available within existing partners, potential partners and other organisations or individuals.

Issues, opportunities and threats

Major Geodiversity Issues in Cornwall and Isles of Scilly				
Issue	Positive aspects	Negative aspects	Opportunities	Threats
Planning and conservation policies	Conservation designations protect reported sites. Planning policies restrict development on sites and promote prudent development of mineral resources.	Concept of geodiversity not fully integrated into policies. Perception that geodiversity is only valued if sites are designated.	World Heritage Site status could offer further promotion and protection of geodiversity. Geodiversity input into Mineral Development Framework.	Working practices and management plans overlook geodiversity.
Public awareness and appreciation	General appreciation of Cornwall and Isles of Scilly's natural heritage is widespread. Strong, enthusiastic base of skills/activities to build on.	Sustained improvement to awareness requires long term plan and numerous activities.	Informal branding of publicity literature to reinforce a common message.	Public fails to engage with message that geodiversity is important.
Minerals extraction and restoration	Geodiversity value of Cornwall's resources is of national/international significance. Quarries provide valuable exposure sites.	Loss of landscape features in areas of high sensitivity. Perception that all mining damages the environment.	Conservation and educational potential can be recognised as part of restoration plans.	Waste rock disposal impacts on land take. Poor management practices damage/neglect integrity sites.
Agriculture and forestry	Good land management practices promote soil conservation and landscape geodiversity.	Intensification of farming impacts on soil quality and structure.	Agri-environmental schemes to assist conservation	Poor working practices lead to soil erosion. Large plantations reduce geological exposure.
Waste disposal and derelict land	Many abandoned mine sites are significant for geodiversity as well as biodiversity and industrial archaeology.	Visual impact of derelict sites increases pressure for redevelopment.	Survey of old quarries may provide valuable geodiversity data and highlight sources of stone for building or hedging projects.	Unregulated waste disposal in abandoned quarries.
Built development	Use of local, distinctive building materials encouraged.	Loss of exposures and landforms, impact on soils and landscape.	Recording of geological features during temporary exposures.	Any decline in environmental quality threatens economy.
Tourism, amenity use and access	Key promoters of Cornwall and Isles of Scilly's natural environment. Many landowners have positive attitude towards geodiversity.	Concept of geodiversity not widely understood. Little direct involvement in geoconservation.	Potential to develop geotourism. WHS bid raises awareness of mining landscape.	Increased visits to geodiversity sites cause damage or exceed management capacity.
Coastal erosion and climate change	Cornwall and Isles of Scilly's geodiversity is valuable for research into sea-level and climatic changes.	Increased rates of erosion in coastal areas. Changes to fluvial systems.	May change range of geomorphology features and processes available for study .	Flood and coastal defence plans in conflict with protection of geodiversity.

Major Geodiversity Issues in Cornwall and Isles of Scilly				
Issue	Positive aspects	Negative aspects	Opportunities	Threats
Mineral and specimen collecting	Public collections provide excellent educational resource to introduce geodiversity	Excessive hammering and collection damages exposures.	Private collections may provide untapped source of conservation potential.	Lack of policy or code of practice to regulate collection.
Biodiversity and Historic Environment Links	Conservation bodies placing increased emphasis on linking geology to biodiversity. Protection of historic environment has a high profile in Cornwall and Isles of Scilly.	Some landowners, businesses respond poorly to nature and heritage conservation approach.	Develop geodiversity aspects to the watching brief archaeologists have for major and temporary excavations. Collaborative projects broaden potential funding sources. GAP could be linked with the Cornwall BAP process through the Biodiversity Initiative.	Geodiversity does not develop separate identity

Recommendations and action plans

The Geodiversity Audit and qualitative assessment of the main issues, opportunities and threats facing geodiversity has allowed targets and recommendations to be developed for future geological conservation work in Cornwall and the Isles of Scilly.

Action plans have been drawn up from each of the recommendations and targets identified. Action Plans delivering Recommendations 1 and 2 are the highest priority tasks and need to be addressed with immediate effect.

Recommendations are summarised on the following page.

Recommendations

Recommendation 1: Set-up infrastructure to deliver the GAP

Whilst this GAP will provide the framework for taking forward work related to geodiversity conservation, a robust infrastructure needs to be established if the GAP is to be delivered, including the creation of a small steering group representing the key partners.

Recommendation 2: Complete resources and skills audit

Audit and review the resources and skills available from existing partners, potential partners and other organisations or individuals. This should also include identifying areas (both topic-based and geographical) for future research.

Recommendation 3: Improve data coverage

Improve and extend data collection, analysis and designation of County Geology Sites to close gaps in conservation coverage, complete the assessment of status for various geodiversity aspects and enhance the storage of data.

Recommendation 4: Improve policy and working practices

Further enable organisations to incorporate geodiversity conservation into policy and strategic documents, management plans and working practices.

Recommendation 5: Raise public awareness

The key priority for promoting geodiversity must be to raise awareness of the wider significance of rocks, soils and physical processes as a key part of our natural heritage, landscapes and scenery. This will require a more co-ordinated approach, using action plans to help guide development of a whole range of activities.

Recommendation 6: Promote geotourism and amenity use

Work with the tourism sector to promote geotourism and a greater understanding of the landscape. The quality of the natural (and built) environment is the main attraction which brings visitors to the region and geotourism could allow the shoulder months of the tourist season to be extended.

Recommendation 7: Increase corporate awareness

Develop links with companies and businesses, highlighting their impact on geodiversity conservation and increasing their awareness of key issues.

Recommendation 8: Improve links with the biodiversity and historic environment sectors

Highlight areas where links exist between biodiversity, geodiversity and the historic environment, as a means of promoting closer working relations and collaboration.