

**Recommendation Rec(2004)3
on conservation of the geological heritage and areas of special geological interest**

(Adopted by the Committee of Ministers on 5 May 2004 at the 883rd meeting of the Ministers' Deputies)

The Committee of Ministers of the Council of Europe,

Recalling the United Nations' Millennium Declaration, in particular the assertion of the fundamental value of "respect for nature" in the management of all living species and natural resources;

Recalling that geological heritage constitutes a natural heritage of scientific, cultural, aesthetic, landscape, economic and intrinsic values, which needs to be preserved and handed down to future generations;

Recognising the important role of geological and geomorphological conservation in maintaining the character of many European landscapes;

Recognising that the conservation and management of geological heritage need to be integrated by governments in their national goals and programmes;

Noting that some areas of geological importance will deteriorate if they are not taken into account in planning and development policies;

Aware of the need to promote the conservation and appropriate management of the geological heritage of Europe, in particular areas of special geological interest;

Considering the philosophy and practice of geological and geomorphological conservation (see Appendix 1 to this recommendation);

Recognising the need to strengthen the regional co-operation in Europe in the field of geological heritage conservation,

Recommends that governments of member states:

- identify in their territories areas of special geological interest, the preservation and management of which may contribute to the protection and enrichment of national and European geological heritage; in this context, take into account existing organisations and current geological conservation programmes (see Appendix 2 to this recommendation);
- develop national strategies and guidelines for the protection and management of areas of special geological interest embodying the principles of inventory development, site classification, database development, site condition monitoring and tourist and visitor management, to ensure sustainable use of areas of geological interest through appropriate management (see Appendix 3 to this recommendation);
- reinforce existing legal instruments or develop new ones, to protect areas of special geological interest and moveable items of geological heritage, making full use of existing international conventions (see Appendix 4 to this recommendation);
- support information and education programmes to promote action in the field of geological heritage conservation (see Appendix 5 to this recommendation);
- strengthen co-operation with international organisations, scientific institutions and NGOs in the field of geological heritage conservation (see Appendix 6 to this recommendation);
- allocate adequate financial resources to support the initiatives proposed above;
- report to the Council of Europe on the implementation of this recommendation five years after its adoption, so that an assessment of its impact may be carried out.

Philosophy and practice of geological and geomorphological conservation

Geology and geomorphology, as Earth sciences, describe the history and form of our planet. Geology helps us to understand this history in terms of how the face of the planet has changed over time, as traced via the evidence of rocks, sediments in all forms, fossils and minerals that reveal past climates, environments, mountain construction, and continent movement. The history of life itself is also revealed – how it began and evolved, how new species appeared and how species became extinct. Geomorphology interprets the landforms we see today – deserts, glaciers, coastlines and others – and the conditions under which they were formed, and also provides a record of the recent past and current processes operating on our planet.

Rocks, minerals and fossils are the archives of the history of our planet and the history of life itself. They are evidence of the passage of geological time, revealing the changes that have shaped the Earth's surface over millions of years. These archives make it possible for us to understand the way our planet looks today and the diversity of its fauna and flora. As with archaeological artefacts, geological sites, minerals and fossils are vulnerable and are a non-renewable heritage that belongs to humanity.

Human society interacts with geology and geomorphology in many ways: through direct exploitation of mineral resources, through reshaping the landscape by industrial or agricultural activity, and through the development of infrastructure links. In some cases (for example by quarrying, mining, cutting of new roads) these activities reveal geological or geomorphological information of scientific, educational or cultural value. In other ways our activity destroys this information: the removal of glacial landforms for use as building material, armouring (and obscuring) of rock sections on coasts and infilling of old quarries with waste, are all examples of destructive activities.

Europe has a rich geological heritage. The scientific principles that founded the science of geology were developed in Europe, where the varied geology and geomorphology provided an inspiration for original thought. Protecting this heritage is the objective of geological conservation ("geological" being taken here to relate to all branches of geology, including paleontology and mineralogy, as well as all aspects of geomorphology), an activity that works in parallel with the protection of biodiversity and landscapes. The term "geodiversity" has been used to describe the nature of the diverse heritage we are seeking to protect and enhance through this work.

Although not as well developed in practice as biodiversity conservation, and not as well known to the public, geological conservation is being actively promoted in Europe through a number of programmes and the activities of many individuals. The programmes that promote geological conservation seek to identify areas ("sites") of geological or geomorphological interest, educate the public about their value and develop management plans or strategies that will not only protect but also enhance this value. These areas may be natural or man-made. Naturally created features include river gorges, caves, coastal rocks, sand dunes, remnant features of past glaciation, glaciers, arid terrains and volcanic landforms. Man-made features include road cuttings, quarries and waste heaps from mines, which may also be of geological heritage value since they reveal new geological information.

Protection of the European geological heritage in all its forms requires consistent and persistent efforts by governments and non-governmental organisations on a pan-European scale. Programmes exist within Europe to promote the protection of geological and geomorphological features and the heritage values with which they are associated, but there is a need to further develop these programmes and create closer links between them. There is also a need to increase awareness of the importance of geological conservation to allow it to rank alongside and fully support biological conservation. Opportunities now exist to work towards these aims at European level, via the Council of Europe and the involvement of member states and the various inter-governmental and non-governmental international organisations operating within Europe, such as Unesco, the International Union of Geological Sciences (IUGS), the World Conservation Union (IUCN), etc.

Appendix 2

Existing conservation programmes, and criteria for selecting areas of special geological importance

General criteria

Many European countries have developed – or are developing – inventory programmes to identify, describe and protect their important geological areas. These schemes reflect national attitudes to the science of geology in particular, and to the landscape in general. They share, however, some common features, seeking to incorporate a number of criteria into national inventories and then protect important areas through their designation as national parks, reserves, sites of geological interest, etc. Common elements taken into account by these national programmes when listing sites, are;

- the extent to which an area or site represents an important geological phenomenon;
- the scientific value of the area;
- the pedagogical value of the area;
- rarity of geological/geomorphological phenomena within the area;
- degree of disturbance and potential threats;
- area size.

The IUGS GEOSITES project

The GEOSITES project was an initiative of the International Union of Geological Sciences (IUGS) and is designed to support identification of geological areas (sites) of international importance. The project was started in 1996 to help redress the imbalance between biological and geological conservation. This perceived imbalance derives from the national and international efforts directed towards biological conservation - which often have no geological counterpart. GEOSITES supports national efforts and encourages the systematic development of site inventories at the national and regional levels and allows comparative studies. A key objective of the programme is to ensure scientifically based justification for sites selected for protection.

Geosites (both geological and geomorphological) are being selected and documented by regional groupings of geoscientists, each country contributing to the selection process by choosing and justifying its own sites in a regional geological context. Specialist groups provide additional advice in relation to the assessment and documentation of particular topics, in support of national efforts.

The development of a global inventory and database of geological sites was the aim of GEOSITES, and a Global Geosites Working Group was established to achieve this. The programme is active in Europe and is promoted by the European Association for the Conservation of the Geological Heritage (ProGEO).

The International Union of Geological Sciences has recently decided to replace its existing Task Group on Global Geosites and to create a new body to deal with geological heritage. IUGS now feels that the increasing public interest in these fields should be channelled into an international initiative with a proper geoscientific dimension to avoid further separation between economic development and scientifically oriented conservation issues of the geoenvironment. To this end, IUGS is proposing to co-operate closely with Unesco's "Geopark" activities and the Council of Europe's initiative in the field of geological heritage and the protection of geological sites.

Proposed action

Governments of member states should support the work of IUGS, ProGEO, NGOs and other relevant organisations within their areas of jurisdiction, encouraging collaboration with statutory national authorities. In particular, they should support the work of ProGEO working groups to develop pan-European inventories of sites of scientific interest and the creation of associated databases and should seek ways in which to support the new IUGS initiative to promote geological conservation in Europe.

European Geoparks

The European Geoparks programme, designed in co-operation with Unesco, is another tool to promote geological heritage in Europe, but seeks to include social and economic factors. The programme has the following aims and principles:

- a European Geopark is a territory which includes a particular geological heritage and has a sustainable territorial development strategy supported by a European programme to promote development. It must have clearly defined boundaries and a sufficient surface area for true territorial economic development. A European Geopark must comprise a certain number of geological sites of particular importance in terms of their scientific quality, rarity, aesthetic appeal or educational value. The majority of sites present on the territory of a European Geopark must be part of the geological heritage, but their interest may also be, in addition, archaeological, ecological, historical or cultural;
- the sites in a European Geopark must be linked in a network and benefit from protection and management measures. A European Geopark must be managed by a clearly defined structure able to enforce protection, enhancement and sustainable development policies within its territory;
- a European Geopark has an active role to play in the economic development of its territory through enhancement of a general image linked to the geological heritage and the development of geotourism. A European Geopark has direct impact on the territory by influencing its inhabitants' living conditions and environment. The objective is to enable the inhabitants to reappropriate the values of the territory's heritage and actively participate in the territory's cultural revitalisation as a whole;
- a European Geopark develops, tests and enhances methods for preserving the geological heritage;
- a European Geopark also has to support educational programmes on the environment, the training and development of researchers in the various disciplines of the Earth sciences, the enhancement of the natural environment and sustainable development policies.

A critical difference between "Geosites" and "Geoparks", is that the latter seek to include socio-economic factors and to encourage and recognise opportunities for rural regeneration within Europe.

Proposed action

Governments of member states should work with the European Geoparks programme to identify territories within their jurisdiction that may merit this form of recognition.

European Landscape Convention

The aims of this convention are to promote landscape protection, management and planning, and to organise European co-operation on landscape issues. The convention sets out general and specific measures for States

parties to undertake. In general the convention seeks to ensure that landscapes are recognised as an essential component of people's surroundings, with specific measures to be taken to analyse landscape characteristics and pressures transforming them.

Geological and geomorphological features form the structural framework for all landscapes, and are essential characteristics of landscapes that need to be considered when applying the Landscape Convention. Landscape assessments made in this way will take account of the particular values assigned to them by populations concerned, and in many instances these values will relate directly to the geological features of the landscape and their heritage value.

European Diploma of Protected Areas

The European Diploma of Protected Areas was established by the Council of Europe to protect the natural and landscape heritage, seeking to recognise protected areas that are of truly European, rather than national or regional, significance. The diploma is awarded on the basis of the natural heritage or landscape value of the site, its level of protection and state of conservation. Conditions for the award of the diploma are strict but it can be awarded to natural or semi-natural areas that have an important biological, geological or landscape value. These values may be of a scientific, cultural or aesthetical nature. In all cases appropriate protection systems must be in place.

The award is time-limited so regular monitoring and re-assessment are needed to ensure renewal of the diploma. This regular review encourages a high level of protection for diploma sites. The diploma also encourages networking of managers and sharing of experience. The diploma also provides – through its recognition of biological and geological phenomena – a useful model for integration of a range of natural heritage values into a protected area system.

Sites awarded diploma status include "strictly" geological sites such as the palaeontological site of the Ipolytarnoc Nature Conservation Area (Hungary) but extends to wider landscapes with important geological features such as the karst landscape at Karlstejn in the Czech Republic and the volcanic terrains of Mount Teide in Spain.

The Council of Europe acknowledges, by awarding the diploma, that productive collaboration between protected-area programmes is important at the European level, and recognises that its cooperation with Unesco and the IUCN paves the way for fruitful joint action.

World Heritage Convention

Background

In 1972 the General Conference of Unesco adopted the Convention concerning the Protection of the World Cultural and Natural Heritage. The convention provides for the creation of the World Heritage Committee, its Bureau and the World Heritage Fund. The Operational Guidelines for the Implementation of the World Heritage Convention allow for identification, on the basis of nominations submitted by States parties, of cultural and natural properties "of outstanding universal value" which are to be protected under the convention and to list those properties on the World Heritage List.

The Operational Guidelines for the Implementation of the World Heritage Convention define "natural heritage" as follows:

- "natural features consisting of physical and biological formations or groups of such formations, which are of outstanding universal value from the aesthetic or scientific point of view;
- geological and physiographical formations and precisely delineated areas which constitute the habitat of threatened species of animals and plants of outstanding universal value from the point of view of science or conservation;
- natural sites or precisely delineated natural areas of outstanding universal value from the point of view of science, conservation or natural beauty".

The convention is therefore capable of recognising a wide range of geological and geomorphological phenomena, including the relationship between cultural and natural values at landscape level.

European World Heritage sites

The World Heritage List currently contains the following European sites of specific geological and/or geomorphological interest. Many other European World Heritage sites have such features of interest but they are not explicitly recognised in site descriptions.

European World Heritage sites of important geological and geomorphological interest (natural criteria (i))	
Site name	Country
Messel Pit Fossil Site (Palaeontological site)	Germany
Caves of the Aggtelek Karst and Slovak Karst (Cave systems)	Hungary and Slovakia
Aeolian Islands (Volcanic island systems)	Italy
The High Coast (Post-glacial coastline)	Sweden
Dorset/East Devon Coast (Palaeontological and Earth history site)	United Kingdom
Giant's Causeway and Causeway Coast (Volcanic coastline)	
Pirin National Park (Limestone landscape)	Bulgaria
Lake Baikal (Ancient lake system)	Russian Federation
Kamchatka Volcanoes (volcanic processes and landforms)	
Jungfrau-Aletsch-Bietschorn (Glacial processes and landforms)	Switzerland
Monte San Giorgio (Fossil site)	

The objective of the World Heritage Convention is to recognise natural and cultural sites of "outstanding universal value". As a consequence, the convention will identify a limited number of geological sites within Europe. It does serve, however, as a model for identifying the scientific, cultural and economic value of conserving geological and geomorphological phenomena. The model can be used to encourage other site- and landscape- based conservation approaches.

The first step for nomination of a World Heritage site is the preparation of a national tentative list of sites of potential World Heritage status. The preparation, or revision, of national tentative lists provides an opportunity to recognise the role of geology and geomorphology within World Heritage. This can apply to sites that are of explicit geological or geomorphological interest or sites where geology and geomorphology underpin biological or cultural values.

Proposed action

Governments of member states should:

- review the geological heritage of their areas of jurisdiction to identify geological/geomorphological sites of potential World Heritage status and add these to their national tentative lists of potential World Heritage sites;***
- ensure that any underlying geological/geomorphological values of importance for a site are made explicit in the nomination documents for cultural and natural World Heritage sites.***

Linking existing European programmes

There is no formal relationship between the various international or European programmes designed to recognise geological heritage. The respective roles of the various programmes are summarised below.

- the Geosites project (IUGS and ProGEO) in Europe assists in the development of national site inventories and regional (trans-boundary) networks of sites;
- the European Diploma of Protected Areas recognises protected areas of European significance, including sites important for geological, biological and landscape values;
- the European Geoparks programme (Unesco and others) seeks to link geological and geomorphological features at landscape level to social and economic development;
- the World Heritage Convention (Unesco) recognises sites of global significance but also provides a model for recognising geological heritage and linking it to biodiversity and cultural heritage.

Proposed action

Member states should work with each of these programmes to identify areas of special geological significance and promote their recognition by the most appropriate programme.

Governments should ensure that the work of these programmes is linked through an appropriate national body to ensure the most effective recognition and promotion of these areas of nature conservation.

Governments may also wish to recognise that the existing European Diploma of Protected Areas should be used as, or developed into, a model for protecting geological heritage in a European context.

Managing areas of special geological interest

Management of areas (sites) of special geological interest must be appropriate to the scientific interest and physical nature of the area concerned. Management of geological areas of interest must also take account of biodiversity issues and cultural considerations.

Effective management of areas of geological interest requires certain basic levels of information and understanding as to the nature, distribution and condition of sites. Clear scientific understanding of the value of areas of interest is an important prerequisite to effective management.

Management of geological areas of interest within a national and European context will require the following:

1. recognition of the distribution and nature of this resource through development of national area (site) inventories;
2. classification of area (site) types according to:
 - a. scientific value (geological or geomorphological features and their scientific importance);
 - b. physical characteristics (coastal, river valley, mountain, quarry, roadside exposure, etc.);
 - c. specific management requirements of individual areas (sites);
3. development of indicators to identify threats and monitor degradation of geological heritage;
4. implementation of site-condition monitoring programmes based upon management requirements of specific area (site) types; these programmes should be linked to existing biodiversity monitoring programmes where possible;
5. creation of national/regional databases, to include inventory and monitoring information. Such databases are essential for management of areas (sites) and the dissemination of information relating to their scientific and educational value. Internet-based databases should be the standard, to ensure the maximum dissemination of information;
6. linking national "areas of special geological interest" databases to:
 - a. regional and local planning to ensure that planning authorities are aware of, and take into account, these special areas in creating/implementing plans;
 - b. biodiversity databases to ensure consistency of approach when managing natural heritage.

Proposed action

Governments of member states should develop national guidelines for managing areas of geological interest embodying the above principles of inventory development, site classification, database development and monitoring programmes linked to existing programmes.

Legislation for protecting areas of special geological interest and moveable geological heritage

Management of areas of special interest in terms of geology, geomorphology or biodiversity requires a combined approach, using education, the development of management plans and the use of appropriate legal protection measures. Education (awareness-raising) and effective management planning are essential but need to be underpinned by the law.

Legal measures to protect "environmental capital" in the form of biodiversity or geodiversity will vary according to individual national approaches. These approaches will reflect:

- national legal systems;
- different cultural approaches to protection of the environment;
- the physical differences in national landscapes;
- the different historical perspectives underlying current legal measures;
- traditional rights and activities.

Protecting areas of geological importance

Areas of geological importance are subject to a range of threats that may damage or totally destroy them. Such threats may come from such sources as rural or urban development projects, coastal engineering work, or excessive visitor pressure and usage.

Protected areas or "natural monuments" falling into IUCN Category III are managed mainly for conservation of specific natural features, and this definition is appropriate for the protection of geological heritage areas. Category III protected areas are defined as "containing one, or more, specific natural or natural/cultural feature which is of outstanding or unique value because of its inherent rarity, representative or aesthetic qualities or cultural significance".

Legal measures for area (site) protection should define the nature of the environmental resource to be protected, fix penalties for committing damaging acts and assign responsibility to the appropriate agencies.

Proposed action

Governments of member states should consider:

- ***developing and implementing new laws if such areas cannot be protected by existing laws;***
- ***strengthening existing laws to increase protection;***
- ***integrating the legal protection of geological areas of interest into the protection of biodiversity;***
- ***using the existing range of international instruments to protect sites including the World Heritage Convention, the European Landscape Convention and the EU Habitats Directive;***
- ***the implementation of new or existing laws for the protection of areas of geological importance, to be linked to national site inventories and national site databases.***

Protecting moveable geological heritage

The legal protection of areas of special geological interest (geosites, geoparks, geotopes, etc.) will provide protection from a variety of damaging activities, including protection from damage due to removal (collecting) of materials of scientific interest. Moveable geological materials may be collected for various reasons, such as:

- scientific study;
- commercial sale;
- educational use;
- curiosity value.

In certain circumstances, collection from areas of geological importance may be damaging to the area itself, or cause loss of valuable scientific information, for various reasons:

- physical damage may be caused to rock formations by excessive, inexpert or careless collecting;
- specimens may be destroyed or damaged during the act of collection;
- collection of rare/unusual specimens by non-specialists or commercial collectors may result in the disappearance of important scientific specimens into private collections;
- specimens collected in one country may be exported to collectors or museums in another country, with a perceived loss of "cultural" heritage for the country of origin.

Many European countries make use of wildlife legislation, nature conservation legislation, monument protection legislation or other legal instruments to protect areas (sites) from damage through collecting. In other cases control is exercised by educational programmes and voluntary codes of conduct.

Proposed action

Governments of member states should review their existing legal and voluntary supervision methods to ensure that moveable geological heritage is protected by appropriate legal means, in the national and international context.

Information and education programmes to promote action in the field of geological heritage conservation

Access to information and public participation in environmental decision-making is now understood to be an important part of sustainable development (Aarhus Convention). The Council of Europe has recognised the importance of educational activities through programmes aimed at well-defined target groups. The objectives of such programmes are to raise awareness and develop partnerships for the conservation and enhancement of natural and cultural heritage. The Working Group on the Geological Heritage emphasises in this recommendation that the geological heritage of Europe is an important and integral part of the region's natural heritage.

The concepts of geological and geomorphological conservation remain less well publicised than those relating to the conservation of biodiversity or the protection of landscapes. The Council of Europe is actively involved in nature conservation and landscape initiatives through such programmes as the Pan-European Biological and Landscape Diversity Strategy and the European Landscape Convention. Its "Europe: a common heritage" campaign aimed to ensure the recognition of the importance of natural and cultural heritage, and to make the most of the economic and social potential of this heritage.

The purpose of any geological conservation information and education programme should be parallel to that described above, and should complement information/educational initiatives designed to raise awareness of landscape and biodiversity issues. Geological conservation in all its forms and features and all its scientific, social and economic aspects represents an important part of the European common heritage. Geological conservation is directly relevant to biodiversity conservation and to landscape protection, and the proposed programme should emphasise integration with these other conservation/protection programmes.

Proposed action

Governments of member states should promote action in the field of geological heritage conservation by identifying and utilising opportunities to develop and support information and education programmes, both within their own jurisdictions and regionally, acting via the Council of Europe and other relevant international or European organisations.

Strengthening co-operation with international organisations, scientific institutions and NGOs in the field of geological heritage conservation

The Working Group on the Geological Heritage recognises the importance of a regional approach to the conservation of Europe's geological heritage, and advocates cross-boundary co-operation between organisations and institutions that are working throughout Europe in this field. Relevant organisations currently involved in, or having an interest in, geological heritage include the World Conservation Union (IUCN), Unesco's Division of Earth Sciences, Unesco's World Heritage Centre, the International Union of Geological Sciences (IUGS), European Palaeontological Association and ProGEO. A wide range of European institutions are also involved in geological conservation work.

In the framework of the Committee for the activities of the Council of Europe in the field of Biological and Landscape Diversity (CO-DBP), the creation of the Working Group on the Geological Heritage has established a basis for future co-operation, as it includes representatives from the organisations listed above and institutions participating in conservation work. Several states have also sent participants to the Working Group, with the result that many interest groups are represented, ensuring that a wide range of views are expressed. Discussion of pan-European co-operation in the field of geological conservation between organisations and institutions has been initiated by this Working Group.

Proposed action

Governments of member states should strengthen co-operation with international organisations, scientific institutions and NGOs in the field of geological heritage conservation by encouraging participation by state institutions in the geological conservation programmes identified in this recommendation and promoting collaboration between the relevant institutions and organisations.