

# Convention on the Conservation of European Wildlife and Natural Habitats



## Standing Committee

### **Recommendation No. 36 (1992) on the conservation of underground habitats**

*(Adopted by the Standing Committee on 4 December 1992)*

The Standing Committee of the Convention on the Conservation of European Wildlife and Natural Habitats, acting under the terms of Article 14 of the convention,

Recalling that under Article 4 of the convention each Contracting Party shall take appropriate and necessary legislative and administrative measures to ensure the conservation of the habitats of the wild flora and fauna species, especially those specified in Appendices I and II, and the conservation of endangered natural habitats;

Having regard to Resolution No. 1 (1989) of the Committee concerning the provisions relating to the conservation of habitats, and to Recommendations No. 14 (1989) and No. 15 (1989) on the conservation of endangered natural habitats;

Recalling that underground habitats are very rich in endemic species and are often of very great biological importance because they contain flora and fauna characteristic of Europe's natural heritage;

Noting that, too often, underground habitats, especially accessible caves, are deteriorating, and that some caves have already reached a biologically critical stage,

Recommends that Contracting Parties:

1. compile national inventories of underground habitats of high biological value, using in particular the selection criteria set out in Appendix I to this recommendation; the inventories should include, in particular:
  - all types of underground habitat (including caves, shallow underground habitats, water course interstices, alluvial layers, hydrothermal sites, anchihaline caves, lava tunnels);
  - habitats of biotic communities representative of the various biogeographical regions of Europe, of climatic zones and of various altitudes;
  - habitats containing key species of great heritage and zoological interest which contribute in retracing evolutionary and palaeo-ecological history;
  - endangered habitats and species;
2. list underground habitats which are already protected;
3. identify underground invertebrate species requiring special conservation measures and draw up lists of such species for protection;
4. compile a list of the most endangered sites in each country for troglodytic species protected in Appendix II of the convention, especially bats (wintering and rearing sites in caves, mines and quarries), selected because they are permanent breeding and rearing sites and on the criteria of size of colony, diversity of species and their importance in the cave network used during migration, including transborder movements;

5. grant the appropriate status of protection to a selection of biotopes representative of underground habitats and manage them, bearing in mind the proposals included in Appendix II to this recommendation;
6. compile a list of protected underground sites of European importance and propose their inclusion in the European Network of Biogenetic Reserves.

## Appendix I to the recommendation

### Criteria for selecting underground habitats of biological value

Subsequent to the Colloquy on Biospeleology held in Liège in 1992 and the proposals made by Sket (Slovenia), Skalski (Poland) and Juberthie (France), criteria were proposed for selecting underground habitats of value for the heritage.

Selection of habitats should be based on one or more of the following criteria:

1. *Presence of species adapted to subterranean life*

They are characterised by morphological and physiological traits, the chief being regression or disappearance of the eyes, depigmentation of the body and K-type reproduction strategy.

2. *Presence of vestigial species*

These are the survivors of fauna which have disappeared from terrestrial and aquatic surface ecosystems.

3. *Presence of vulnerable species*

All endemic aquatic underground species are vulnerable. They are sensitive to pollution and filling in of the habitat.

4. *Presence of endemic species*

It may be necessary to make a choice where they are abundant; priority should be given to the species most representative of the biotic community, the group or the region in question. There is a large number of biogeographical regions which differ considerably with regard to terrestrial and aquatic species because of their diverse history and origins.

5. *Presence of rare species*

These are generally endemic species which exist in very small numbers in the biotic communities.

6. *Presence of bats*

Most European bats use underground habitats as winter and/or summer roosts. All European bat species of the Microchiroptera for which underground habitats are important are protected in Appendix II of the convention.

7. *Relatively high biodiversity*

The choice of habitats to protect should focus on biotic communities of considerable and specific richness which are representative of a biogeographical region; at least one biotic community should be selected in each biogeographical region.

8. *Originality of the habitat*

Besides the most common underground habitats, there exists a small number of particular habitats such as hydrothermal caves, ice caves and lava tubes having particular biotic communities.

9. *Scientific value*

Some of these habitats which have been the subject of very thorough ecological study can either serve as a reference or be used for long-term follow up of populations and biotic communities.

10. *Vulnerability of habitats*

Vulnerability may result either from danger of destruction of the habitat itself (quarrying, filling in, development) or from the destruction of its fauna by chemical or organic pollution, over-visiting or thoughtless hunting.

## Appendix II to the recommendation

### **Proposals for procedures of protection and management of underground habitats**

#### 1. *Potentially vulnerable zone*

Concerted hydrogeological and biospeleological studies should aim at defining a potentially vulnerable zone in the catchment basin of subterranean networks and their outlets (springs).

In the case of a system consisting of a water catchment area including karst and its caves and non-karstic impermeable zones upstream (crystalline rock, marl, etc.), protection of the area upstream has to be taken into account; in particular, an attempt must be made to restrict pollution.

The sensitivity perimeters as defined for the alluvial layers should be applied to the karstic and non-karstic zones surrounding underground habitats which warrant protection or are endangered.

#### 2. *Priority areas for protection*

Protection should be applied on the basis of principles resulting from the observations below:

- the distribution of underground populations is not restricted to caves but extends to a whole area of the living and fossilised hydrogeological network;
- the resources of the underground ecosystem come from surface plant and animal production.

Consequently, protection should be given to the cave, the peripheral zone, a zone upstream of greater or lesser extent according to the topography of the underground system, the distribution of fauna and the type of biocenosis, terrestrial or aquatic. This surface zone is designed to control the impact of agricultural and forestry practices and possible pollution. For habitats of great heritage value in Europe, maximum protection should be sought.

#### 3. *Protection according to type of underground habitat*

##### 3.1 Karstic caves and underground networks

The difficulty of protection is due to the length and complexity of certain karstic networks. Pollution may come from far upstream and hydrogeological tracing and studies may therefore be required to determine the places of origin.

When national parks and reserves are created in middle and southern Europe, greater attention to underground habitats should be given to complement the data relating to botanical and ornithological richness.

##### 3.2 Shallow underground habitats

Protection should be based on a good knowledge of the areas of distribution of the species to be protected. Since discovery of this new underground habitat is fairly recent (12 years ago), the distribution areas are mapped only for a few regions.

They have been identified for part of the Ariège, part of the Eastern Pyrenees (French and Spanish Catalonia), some regions in the Italian Pre-Alps, in the Bihor Mountains in Romania and in the Rhodopes in Bulgaria.

The central Pyrenees contain a site which is exceptionally rich in its biodiversity and the abundance of its populations. This is station S.100 «Ravin de la Tir», located on a scree slope in a state forest. This site deserves to be placed on the inventory of natural underground habitats of value in Europe.

In general, protection of shallow underground habitats on valley sides is incorporated in protection against hillside erosion linked with deforestation and involves forestry management with natural regeneration and without intensive planting of coniferous species.

### 3.3 Watercourse interstices

Protection of interstice habitats forms part of the general protection of underground water against:

- diffuse chemical pollution;
- organic pollution;
- accidental pollution of all types;
- land consolidation linked with water projects or locks which modify underground water flows, controlled flows which are too weak and excess pumping during periods of low water levels;
- aggregate extraction which destroys the habitat and modifies water flows.

This concerns chiefly the southern half of Europe because of its great wealth in very localised endemic species.

One solution may be to afford greater protection to this type of habitat in laws to safeguard inland water sources.

#### 4. *Control of water projects*

Impact studies: impact studies prior to development should not be restricted to a survey of benthic fauna but take into account underground interstitial fauna and be accompanied by permeability and piezometric measuring.

#### 5. *Control of development in caves*

Impacts studies: any development project should be preceded by an impact study which is not restricted to climatic and aesthetic aspects aimed at conserving underground concretions and various formations. Fauna should be mapped, if possible by biospeleologists being experts on terrestrial fauna (including bats), and experts on aquatic fauna, to identify the sensitive areas of major interest for conservation. For example, certain species of the *Coleoptera Aphaenops* are most generally localised on certain sweating mural concretions; very small endemic crustaceans may be restricted to a few cave pools fed by percolated water running off stalactites or mural concretions.

This procedure should be implemented systematically as a priority in the part of Europe where the greatest endemism is observed, namely in the south and middle of the continent.

#### 6. *A well-ordered policy of cave cleaning*

Campaigns for cleaning up caves are conducted by speleologists with the aim of restoring the site to its pristine state and to combat pollution from toxic waste left in caves. This is a matter for congratulation.

Total cleaning, however, consisting of removing all biodegradable organic debris round counter to the maintenance of underground populations. In fact, the following message should be propagated: the most numerous underground species are detritus eaters which feed on organic plant and animal debris carried underground by water, gravity, animals and man. Branches, planks, various pieces of wood and leaves left in damp places rot after a few years and provide resources for Collembola, Campodea and Diploda and contribute to maintaining a carnivorous fauna around these saphrophages. The same holds good for the pieces of wood left in underground pools and lakes; there is the case of the lake in the Lestelas cave in the Pyrenees, the well-known Stenasellus site, where old, rotting branches are lying on a clayey bottom.

So cleaning should be selective and biodegradable plant debris must be left in damp places and water collection points that are unobtrusive, thus making a compromise between maintaining the appearance and conserving underground populations.

#### 7. *Prevention of localised discharge*

This may have come under the promulgation and application of laws on the protection of underground water.

#### 8. *Control of access to underground habitats*

Where access to caves has to be controlled using physical barriers (grills, fences, walls, doors, etc.), these should be designed to avoid climatic changes in the cavity and permit the free passage of all bats species that may roost in it.

9. *Prevention of diffuse pollution by pesticides and organic pollution*

Prevention depends on general anti-pollution measures. The law relating to water should not be restricted to the consideration of underground water exclusively as a water resource but should take into account the fact that it represents habitats of great value in European regions having a high degree of endemism.

10. *Non-introduction of non-native species*

In the Mediterranean zone or in times of drought it might be tempting in the future to use karst regions for storing water from other catchment areas containing species not native to the karst area. These non-native species might enter into competition with the endemic native species and eradicate them. An impact study should therefore be carried out for any project of this type. It should be noted that plans for underground dams to store water of the same geological water system do not, *a priori*, constitute a danger for underground aquatic fauna.