

## CAVE & KARST WORKING GROUP (CKWG)

### NEWSLETTER #2, OCTOBER 2019



Cerkniško polje in Slovenia is at the center of the "Classical Karst" property which has recently been nominated as a World Heritage Site.

#### MEMBERSHIP OF THE CKWG

Those who are familiar with the IUCN will know that it is a large international organisation and as such has a somewhat complex bureaucracy. One aspect of this is that in order for IUCN to accept someone as a formal "Member" of the CKWG they must first be a member of GSG – and to be a member of the GSG one must first be a member of the WCPA (the World Commission on Protected Area). Since the last newsletter we have checked the names of everyone on our email list and classified them as:

- 1) member of GSG. Great - you are now formal members of CKWG!
- 2) member of WCPA but not GSG - dont worry we are contacting the leaders of GSG to try to sort this out!
- 3) member of IUCN but not of WCPA. This group mainly comprises members of the IUCN SSC Cave Invertebrate Specialist Group. We very much want to keep you as members of CKWG and are looking into ways of formalising the link between our groups. For the moment we are classing you as "Supporter of the CKWG"
- 4) not a member of IUCN. We have simply given you the status "Supporter of the CKWG" and will continue to include you on all our emails.

If you want to know more then please email

#### CKWG WORK PROGRAMME

As the name implies WCPA is focussed on Protected Areas and as a part of WCPA the CKWG must have a primary interest in the management of caves and karst in protected areas, particularly World Heritage Sites and Global Geoparks but also in other global (for example Ramsar Sites and MAB Reserves) and national protected areas. At Vilm the CKWG was given two primary goals

- 1) revision of IUCN Guidelines for Cave and Karst Protection first published 1997.
- 2) producing a report on Caves and Karst in international protected areas other than WHS, specifically Global Geoparks, MAB Biosphere Reserves and Ramsar sites.

Progress with both of these aims is reported below.

## SECOND EDITION OF GUIDELINES FOR CAVE AND KARST PROTECTION

This project is being co-ordinated by Professor David Gillieson who has submitted the following report:

### **General comments:**

The IUCN-WCPA Guidelines for Cave and Karst Protection were published in 1997 and although they have been widely used by PA managers it is time for a Second edition. As one of the authors of the original guidelines I am aware that in addition to geoheritage there needs to be an effective coverage of the biological issues involved in cave and karst conservation.. Biological issues were not covered in the first edition and it is important for us to collaborate with the IUCN SSC Cave Invertebrate Specialist Group, as well as the Biology Commission of the International Union of Speleology. The original version had an Antipodean bias which we tried to reduce by gaining comments on the draft from a wide global community of karst specialists (about 300 in total). This inclusive process of review worked well for the first edition and we plan to have a similar approach to the 2nd edition.

As Dr John Watson has pointed out, the original guidelines did not restrict the coverage to protected areas alone. It is critically important to take a whole of landscape approach to cave and karst conservation, management and protection. This will make the new guidelines more useful for planning at local, regional or national scales.

I think we need to have a clear idea of the target audience and thus write the guidelines to improve readability, reduce use of technical terms and facilitate translation. Since the primary mode of dissemination is likely to be online, we can use colour effectively with a few good diagrams to illustrate key concepts. The use of boxed case studies and high quality photographs will also improve readability.

I look forward to hearing from people who are interested in being involved in writing the new edition, and receiving general comments from members of the Cave & Karst Working Group within the Geoheritage Specialist Group. I'm happy to coordinate this and contribute to the writing, but we need to be global in coverage and local in effective action. I've taken the liberty of putting down some of my ideas so you have something to consider and respond to.

Best Wishes,

Professor David Gillieson

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### **Draft Contents for Discussion:**

- Introduction: The need for karst protection
- Some values of karst and caves
- The special nature of karst environments and cave systems
- Environmental impacts on caves and karst
- A landscape approach to karst protection
- Some basic management principles
- Developing effective monitoring

- Information exchange and training
- Conclusions
- Further reading

Appendices:

- The IUCN-WCPA-GSG-Cave & Karst Working Group (brief summary and TOR)
- Guidelines in English (below are the present guidelines which will be substantially revised)
  - 1) Effective planning for karst regions demands a full appreciation of all their economic, scientific and human values, within the local cultural and political context.
  - 2) The integrity of any karst system depends upon an interactive relationship between land, water and air. Any interference with this relationship is likely to have undesirable impacts, and should be subjected to thorough environmental assessment.
  - 3) Land managers should identify the total catchment area of any karst lands, and be sensitive to the potential impact of any activities within the catchment, even if not located on the karst itself.
  - 4) Destructive actions in karst, such as quarrying or dam construction, should be located so as to minimise conflict with other resource or intrinsic values.
  - 5) Pollution of groundwater poses special problems in karst and should always be minimised and monitored. This monitoring should be event-based rather than at merely regular intervals, as it is during storms and floods that most pollutants are transported through the karst system.
  - 6) All other human uses of karst areas should be planned to minimise undesirable impacts, and monitored in order to provide information for future decision-making.
  - 7) While recognising the non-renewable nature of many karst features, particularly within caves, good management demands that damaged features be restored as far as is practicable.
  - 8) The development of caves for tourism purposes demands careful planning, including consideration of sustainability. Where appropriate, restoration of damaged caves should be undertaken, rather than opening new caves for tourism
  - 9) Governments should ensure that a representative selection of karst sites is declared as protected areas under legislation which provides secure tenure and active management.
  - 10) Priority in protection should be given to areas or sites having high natural, social or cultural value; possessing a wide range of values within the one site; which have suffered minimal environmental degradation; and/or of a type not already represented in the protected areas system of their country.
  - 11) Where possible, a protected area should include the total catchment area of the karst.
  - 12) Where such coverage is not possible, environmental controls or total catchment management agreements under planning, water management or other legislation should be used to safeguard the quantity and quality of water inputs to the karst system.
  - 13) Public authorities should identify karst areas not included within protected areas and give consideration to safeguarding the values of these areas by such means as planning controls, programs of public education, heritage agreements or covenants.
  - 14) Management agencies should seek to develop their expertise and capacity for karst management.

- 15) Managers of karst areas and specific cave sites should recognise that these landscapes are complex three-dimensional integrated natural systems comprised of rock, water, soil, vegetation and atmosphere elements.
- 16) Management in karst and caves should aim to maintain natural flows and cycles of air and water through the landscape in balance with prevailing climatic and biotic regimes.
- 17) Managers should recognise that in karst, surface actions may be sooner or later translated into impacts directly underground or further downstream.
- 18) Pre-eminent amongst karst processes is the cascade of carbon dioxide from low levels in the external atmosphere through greatly enhanced levels in the soil atmosphere to reduced levels in cave passages. Elevated soil carbon dioxide levels depend on plant root respiration, microbial activity and a healthy soil invertebrate fauna. This cascade must be maintained for the effective operation of karst solution processes.
- 19) The mechanism by which this is achieved is the interchange of air and water between surface and underground environments. Hence the management of quality and quantity of both air and water is the keystone of effective management at regional, local and site specific scales. Development on the surface must take into account the infiltration pathways of water.
- 20) Catchment boundaries commonly extend beyond the limits of the rock units in which the karst has formed. The whole karst drainage network should be defined using planned water tracing experiments and cave mapping. It should be recognised that the boundary of these extended catchments can fluctuate dramatically according to weather conditions, and that relict cave passages can be reactivated following heavy rain.
- 21) More than in any other landscape, a total catchment management regime must be adopted in karst areas. Activities undertaken at specific sites may have wider ramifications in the catchment due to the ease of transfer of materials in karst.
- 22) Soil management must aim to minimise erosive loss and alteration of soil properties such as aeration, aggregate stability, organic matter content and a healthy soil biota.
- 23) A stable natural vegetation cover should be maintained as this is pivotal to the prevention of erosion and maintenance of critical soil properties.
- 24) Establishment and maintenance of karst protected areas can contribute to the protection of both the quality and quantity of groundwater resources for human use. Catchment protection is necessary both on the karst and on contributing non-karst areas. Activities within caves may have detrimental effects on regional groundwater quality.
- 25) Management should aim to maintain the natural transfer rates and quality of fluids, including gases, through the integrated network of cracks, fissures and caves in the karst. The nature of materials introduced must be carefully considered to avoid adverse impacts on air and water quality.
- 26) The extraction of rocks, soil, vegetation and water will clearly interrupt the processes that produce and maintain karst, and therefore such uses must be carefully planned and executed to minimise environmental impact. Even the apparently minor activity of removing limestone pavement or other karren for ornamental decoration of gardens or buildings has a drastic impact and should be subject to the same controls as any major extractive industry.
- 27) Imposed fire regimes on karst should, as far as is practicable, mimic those occurring naturally.
- 28) While it is desirable that people should be able to visit and appreciate karst features such as caves, the significance and vulnerability of many such features means that great care

must be taken to minimise damage, particularly when cumulative over time. Management planning should recognise this fact and management controls should seek to match the visitor population to the nature of the resource.

- 29) International, regional and national organisations concerned with aspects of karst protection and management should recognise the importance of international co-operation and do what they can to disseminate and share expertise.
- 30) The documentation of cave and karst protection/management policies should be encouraged, and such policies made widely available to other management authorities.
- 31) Data bases should be prepared listing cave and karst areas included within protected areas, but also identifying major unprotected areas which deserve recognition. Karst values of existing and potential World Heritage sites should be similarly recorded.

### **CAVES AND KARST IN INTERNATIONAL PROTECTED AREAS OTHER THAN WHS**

Databases have been assembled listing Global Geoparks, MAB Biosphere Reserves and Ramsar sites that contain, or are thought to contain, features of cave and / or karst interest. The "and / or" is because some caves in protected areas are not associated with surface karst landforms because they were not formed by dissolution (for example lava caves). It is intended to update the databases at the end of 2019 and to present a report at the UNESCOkarst 2020 meeting in Mammoth Cave further details of which are given below. The databases have been compiled using information on the internet and anyone wishing to assist in checking the accuracy of them is asked to contact John Gunn [ j.gunn.1 at bham.ac.uk ].

### **ISO TECHNICAL COMMISSION ON KARST**

In 2018 China proposed to the International Standardisation Organisation ISO a Technical Commission on Karst. The intention was that this commission would cover standards for everything related to karst including terminology, sustainable development of karst resources, environmental protection and management of karst environment, investigation and assessment (including modeling methods and mapping of karst systems). Despite some reservations the TC Karst ISO Commission was approved with China taking the leading role and Austria, Canada, Lithuania, Portugal, Russian Federation and Saudi Arabia claiming to be active. Observing countries are: Argentina, Australia, Bulgaria, Croatia, Czech Republic, France, Germany, India, Indonesia, Iran, Italy, Japan, Latvia, New Zealand, Norway, Poland, Serbia, South Africa, Spain, Switzerland, Thailand and the USA. In the resolutions of the first meeting in September 2019 in China two topics were listed: karst terminology and specification of monitoring technology for karst critical zones. UIS has a liaison status and future collaboration with IRCK (the International Research Center on Karst at Guilin), IAH (International Association of Hydrogeologists), IUGS (International Union of Geological Sciences), ISCA (International Show Cave Association) and the IUCN are mentioned although at the time of writing it is not clear who in IUCN had been approached.

In the light of the ISO initiative revision of the IUCN guidelines on cave and karst protection will be very important to set efficient standards.

### **FUTURE MEETINGS**

The CKWG is one of the sponsors of UNESCOkarst 2020 (Conservation of Fragile Karst Resources: A Workshop on Sustainability and Community) which is being held at the Mammoth Cave Area

Biosphere Reserve, Kentucky, USA from 18-22 May 2020 [ see <https://unescokarst2020.com/> ]. This promises to be a very interesting meeting with participation from international groups and organisations that have an interest in cave and karst conservation and we would encourage members of the CKWG to attend.

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