

## The Karst Biosphere Reserve in Slovenia

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### Abstract

The UNESCO Man and the Biosphere programme has proven to be a highly efficient tool for the conservation of natural and cultural heritage and an incentive for efforts towards sustainable development at the Karst Biosphere Reserve in Slovenia. Since the Reserve was established in 2003, the Škocjan Caves Park Public Service Agency, as the managing authority, has gradually developed a system that attempts to link the scientific and research sphere to the local community, while actively involving the community in the Biosphere Reserve's long-term management through education, awareness raising and participatory approaches. Taking into consideration the human dimension in the environment is essential for the preservation and sustainable use of the ecosystem.

### Profile

Protected area

Karst Biosphere Reserve

Mountain range

Dinaric Alps, Slovenia

### Introduction

On 29 October 2004, the extended area of Škocjan Caves Regional Park was designated as the Karst Biosphere Reserve in UNESCO's MAB (Man and the Biosphere) and included in the world network of biosphere reserves.

Biosphere Reserves (BRs) are a concept and tool designed under the auspices of UNESCO's Intergovernmental Scientific Programme and represent a key element for achieving a sustainable balance between the often conflicting goals of biodiversity conservation, human development and the preservation of related cultural values. They are places where relevant goals are set and implemented, and where interaction between man and nature is found. BRs apply a practical approach to finding an answer to one of the most pressing and frequent questions of today's world: how are biodiversity conservation and sustainable use to be combined? In BRs, emphasis is placed on people as an integral and basic element. The integrated approach of the BRs examines, evaluates and manages ecosystems that are subject to human influence, and stresses the importance of education in preserving the quality of life of inhabitants, developing continuous scientific and educational activities that promote sustainable management of natural resources.

The MAB programme is of immense significance for the Škocjan Caves Park Public Service Agency, which manages the Karst Biosphere Reserve (KBR). The Škocjan Caves Park has adopted the programme because of the attitudes it embodies to ecosystems and the human dimension in the environment. Through its activities, the Park aims to preserve its biodiversity and cultural heritage, while also seeking to enhance the quality of human life and its development.



Figure 1 – Core area of the Karst Biosphere Reserve – Collapsed dolina in the Škocjan Caves. © Borut Lozjej

### Zonation implies actions

The KBR encompasses the Škocjan Caves Regional Park, the Škocjan Caves system itself together with its buffer zone, as well as the BR's own transition area. The area as a whole is well known for its outstanding natural features, and geological and hydrological peculiarities.

The core area of the KBR is located in the protected area of the Škocjan Caves Regional Park (Figure 1). The buffer zone covers the entire Reka River basin. The river is an important factor in forming the underground features of the karst, including ecosystems. The transition area covers the surface above the underground course of the Reka in the Municipality of Divača (Figure 2).



Figure 2 – Location of the Karst Biosphere Reserve.

The KBR's core area was designated a UNESCO World Heritage Site in 1986, and the underground course of the Reka River is a Ramsar wetland of international importance. In order to preserve and research its outstanding geomorphological, geological and hydrological formations, rare and threatened plant and animal species, palaeontological and archaeological sites, ethnological and architectural characteristics and the cultural landscape, and to ensure conditions for appropriate development, the region of the Škocjan Caves was declared the Škocjan Caves Regional Park by the Parliament of the Republic of Slovenia in 1996. Two legal documents were enacted in the same year: the Škocjan Caves Regional Park Act and the Decree of the Škocjan Caves Park Public Service Agency (Official Gazette of the Republic of Slovenia, No. 68/96). The core area is part of the Natura 2000 Karst site and is a Category III protected area of the International Union for Conservation of Nature (IUCN). The underground area extends to 13.5 ha; the protected surface area measures 403 ha.

A buffer zone was created by the Škocjan Caves Regional Park Act; this zone encompasses the Reka River basin, an area of 45 000 ha (Figure 3). The geological structure is mainly flysch, allowing the Reka and its tributary torrents to flow on the surface as far as the limestone region near Vreme where, on contact with the limestone layer, typical karst phenomena evolve (see Figure 4). Five municipalities are responsible for administering different parts of the buffer zone: Divača, Pivka, Postojna, Hrpelje-Kozina and Ilirska Bistrica.

The administrative borders of the municipality of Divača (which itself comprises 31 settlements organized into five communities) define the transition area (14 780 ha), which is characterized by typical karst features, underground water pools and several caves which attract speleologists. One of the largest underground rivers is the Reka, which flows into the sea near Trieste, close to the town of Sistiana in Italy. Many cave systems run beneath the state border between Slovenia and Italy, and are connected underground by water.

Activities carried out within the core area include biodiversity protection, natural and cultural heritage conservation, and monitoring and research in the caves and surface area. Since the Škocjan Caves are a UNESCO World Heritage Site and a Ramsar Site, tourism activities in the core area are regulated and monitored. Activities in the buffer zone are related to the tasks performed within the core area and are based on environmental best practices. In the transition area of the KBR, activities are related to agriculture, small businesses, craft and trade infrastructure, housing and other land uses.

The main reason for the buffer zone is to safeguard the water quality of the Reka. In the transition area of the KBR, care is taken to ensure the quality of the Reka's underground stream, which is directly dependent on the activities carried out on the surface.

In order to ensure the successful and efficient functioning of the BR in the long term, it is vital to involve the public in planning and decision-making processes and other management activities. The KBR will be

subject to zonation changes in the future. This challenging project will include enlarging the transition area and buffer zone. We have already started work on the project with the municipality of Pivka, which borders on the buffer zone in the north, by fostering sustainable practice in business activities in the area.

### Local people as important trigger for actions

As responsible for the management of the BR, Škocjan Caves Park Public Service Agency has always embedded the interconnections of nature, culture and man in all its projects and activities with local people and stakeholders in the area.

The international challenges that the Škocjan Caves Park took over present a serious responsibility for the country of Slovenia and for the people who live and work in the Park and its BR. The Park was faced with including education among its activities as a precondition for the development of the wider society, local communities and each individual. These educational activities are in line with the provisions of the UNESCO World Heritage Convention, the MAB programme and the Ramsar Convention, and have two dimensions: (a) by educating schoolchildren, visitors and other individuals who are eager for knowledge, the Park aims to raise awareness of the valuable natural features and cultural heritage; (b) by gathering local knowledge that exists within the BR, the Park aims to preserve and recognize the knowledge passed down from previous generations.

In 2000, the Škocjan Caves Park Public Service Agency concluded the PHARE project *The Reka River – From Snežnik to the Sea*. Through joint activities, the project linked schools in Slovenia (Podgora Primary School in Kuteževu, Anton Žnideršič and Dragotin Kette Primary Schools in Ilirska Bistrica, Dr. Bogomir Magajna Primary School in Divača, and the branch primary school in Vreme) and in Italy (Pinko Tomažič Primary School in Trebče/Trebiciano, and Istituto Comprensivo Reiner Maria Rilke in Sestian). With an emphasis on education for environmentally responsible living, the project represents an unprecedented model in Slovenia, combining the work of experts in hydrology, biology and speleology, the pedagogical work of mentors, and practical work carried out by schoolchildren. Committed to continuing this cooperation, we established the Škocjan Caves Park Network of Schools in 2003, a new form of cooperation that contributes to better quality and content of educational programmes, both in schools and in the Park, with the aim of presenting the area's outstanding heritage in line with the World Heritage Convention and MAB principles. The Škocjan Caves Public Service Agency coordinates the activities of schoolchildren and their work on different research assignments both in the Park and on international projects in the domains of the natural or social sciences. Schoolchildren are thus enabled to carry out school activities in a



Figure 3 – Top: Cultivated terraces in Brkini in the buffer zone © Katja Mihelj; Bottom: Beehives © Kastelic Tomaž

broader social environment, while strengthening social and intergenerational ties.

Since 2001, the Park has marked International Women's Day with educational project activities. At the beginning of the school year, the specific topic and activities are determined in agreement with the mentors from the Network of Schools. In general terms, the schoolchildren compare the past and present roles of women in society and in the home, and the values, local knowledge of the area, cultural practices and use of natural resources today and in the past. They are encouraged to obtain information from their grandparents, who can explain the meaning of archaic words and remember many tasks that have disappeared in the modern technological and supermarket era, tasks that stemmed from nature and the immense respect people had for it. Such projects strengthen intergenerational ties and increase awareness of interconnectedness among people in the community.

Since 2009, the Park has marked World Environment Day by the presentation of research assignments carried out by schoolchildren. At the beginning of June each year, the Park hosts the Congress of Young Researchers of the KBR. The schoolchildren critically explore phenomena in their environment and present



Figure 4 – Top: Lynx (*Lynx lynx*). © Marjan Artnak; Bottom: The olm (*Proteus anguinus*), which lives exclusively in the Dinaric Karst. © Borut Ložej & Marko Aljančič

their findings to their peers at the congress. Their presentations are also heard by renowned experts, who further encourage them to carry out research work through their own presentations of professional knowledge from the fields of natural and human sciences. Other educational activities relating to nature or culture take place every school year for teachers and pupils.

The educational programmes of the Škocjan Caves Park Public Service Agency received special commendation in the 2015 periodic report on the implementation of the MAB programme, when the programme's International Co-ordinating Council highlighted the Park's educational activities for sustainable development as a model for other BRs worldwide. We are very proud that the quality and importance of our work has also been recognized at national level. On 4 October 2016, the Ministry of Education, Science and Sport of the Republic of Slovenia presented the Škocjan Caves Park with an award from the Republic of Slovenia for outstanding achievements in the field of primary school education.

In 2017, our school network was enlarged to include two schools from our buffer zone: Košana El-

ementary school in Dolnja Košana, and Rudi Mahnič-Brkinc Elementary school in Pregarje.

The title *Karst Biosphere Reserve Ambassador* was introduced in 2012. It is granted to individuals who have significantly contributed to the promotion, development and functioning of the KBR. The title also acknowledges a commitment to continuing to promote the KBR and to respecting the principles of sustainable development. In 2012, it was awarded to the mentors working in the Network of Schools who had cooperated with the Škocjan Caves Park since 1999 in implementing its educational programmes. In 2014 and 2016, it was awarded to local stakeholders, academics and national administration officers for their support of the MAB programme, their activities to raise public awareness of sustainable living and development, and of biodiversity conservation in the KBR, their active contribution to establishing connections between the scientific and social spheres, and their dedicated and persistent efforts for the conservation of natural and cultural heritage. There are now 42 ambassadors supporting our efforts and promoting the BR.

For the good implementation and coordination of activities related to biodiversity conservation, sustainable development and promotion of research, it is vital to ensure cooperation between the scientific and research sphere on the one hand and the local community on the other. With the aim of promoting cooperation between universities and the Park, a Network of Universities was established in December 2014. Its founding charter – which commits the Park to enabling researchers to work in the area of outstanding heritage, connects the work and life of local people with nature and culture, and helps establish connections between the scientific and the local communities – was signed by the Rector of the University of Ljubljana, and the universities of Nova Gorica and Primorska.

Several interesting projects with universities have been implemented, concerning tourism and nature interpretation. The Park encourages students to carry out research for their seminar papers, and undergraduate and Master's dissertations related to the conservation and development of natural and cultural heritage, and to sustainable development in the KBR. The Park is looking forward to collaborating with foreign universities and to joint research projects with BRs in other countries. In addition to the scientific work that it wishes to develop in collaboration with researchers and other stakeholders in the KBR, the Park strives to strengthen solidarity and cooperation among inhabitants, which are crucial for dealing with the new challenges posed by modern society.

## Committees

The management body of the Škocjan Caves Park Public Service Agency includes representatives from the municipality of Divača and other local communities. The involvement of local people took on a new

dimension in 2014 with the establishment of committees aimed specifically at involving local communities in the participation process and work of the BR. The committees are composed of interested individuals and experts, who participate on a voluntary basis. The Park currently coordinates the work of the Nature Protection Committee, the Cultural Heritage Protection Committee and the Committee for Sustainable Tourism. All the committees take part in professional training courses, thematic walks and public awareness campaigns.

Members of the Nature Protection Committee have actively participated in the monitoring of bats (Figure 5). They have also made a film about bat research, carried out inventories of orchids, and prepared a photography exhibition entitled *Orchids in the Karst and Reka River Basin Biosphere Reserve*. (On the creation of the name *Karst and Reka River Basin Biosphere Reserve*, see the section *Benefits for future challenges reflecting past work* below.)

The Cultural Heritage Protection Committee curated an exhibition, in 2015, entitled *Water Resources and the Southern Railway in the Karst and Reka River Basin Biosphere Reserve*. In 2016, the exhibition was supplemented with the Gornje Ležiče water pump and presented as a contribution to the Railway Festival in Divača. At the beginning of 2016, the *Our treasures from the past for the future* exhibition was opened. It was created by 18 volunteers interested in preserving the cultural heritage of their villages and towns. The volunteers were of all ages and numerous professions, and came from places ranging from Vrbsica to Gradišče pri Divači and Ljubljana. Each volunteer was responsible for creating a section of the exhibition on a feature, of their choosing, of tangible or intangible heritage in the Karst and Reka River Basin BR. A brochure was published to accompany the exhibition. So far, the activities of the Committee dealing with professional training have placed special emphasis on the traditional housing, archaeology and cultural landscape of the BR through lectures, research and popularization pamphlets prepared in conjunction with experts and disseminated across the BR. Their awareness-raising activities were very successful not only in promoting the area for local people, but also in gathering funds for the maintenance of monuments, in revitalizing the Railway festival, and in fostering local people's sense of identity.

Our committee for entrepreneurs started with the aim of fostering social inclusion by involving disabled people in our activities. Between 2014 and 2015, the Škocjan Caves Park and the Divača unit of the Koper Occupational Activity Centre participated in illustrating the folktale *How the Škocjan Cave Came into Being* (*Kako je nastala škočjanska jama*). Based on the presentation of individual characters in the folktale, the participants made their own illustrations. The booklet was listed among the 15 best books of literature for young people in Oton Zupančič Library in Ljubljana. Between 2015 and 2016, the Committee for Sustain-



Figure 5 – Greater horseshoe bat (*Rhinolopus ferrumequinum*) © Borut Lozej

able Tourism of the Karst and Reka River Basin BR together with local caterers designed and carried out a promotional activity entitled *Precious Flavours of our Old Local Dishes*. This was based on the list of typical local dishes that was produced in collaboration with an expert on traditional Slovenian cuisine, Dr. Janez Bogataj. The aim was to present the diversity of traditional local cuisine, promote local dishes, encourage sustainable development, enable the networking of local caterers, and contribute (as far as possible) to the conservation of local agriculture and landscape. In 2016, three catering providers responded to the initiative. The BR's menu was presented during the biodiversity week and *A Taste of Nature* event organized by the Europarc Federation. We hope that other caterers will join the initiative in the future.

### Experiences shared with the world

The KBR's cooperation at international level dates from 2005, when it presented its educational programmes and site management at the EuroMAB congress in Austria. Every second year, it attends the meetings of European BRs, where it presents its work and organizes workshops. In 2011 in Sweden, it organized a workshop entitled *Partnerships in Small Projects*, and in 2015 in Estonia, it held a workshop on *Sustainable education in a biosphere reserve, with an emphasis on the participation of local communities*, which was organ-

ized in cooperation with Dyfi BR (Wales), Urdaibai BR (Spain) and the UNESCO Extea Centre, Bilbao. Based on its successful work, in 2015 Slovenia was proposed and elected to the EuroMAB Steering Committee. At the invitation of Alpe Ledrensi e Judicaria BR, the Italian Ministry for the Environment, Land and Sea, and the UNESCO Office in Venice, we attended a presentation of selected European and Italian BRs at Expo 2015 in Milan. Italian BRs have established special partnerships with BRs in other countries with the aim of exchanging knowledge and experience and carrying out joint projects. At the beginning of 2016, we became a member of the Mediterranean BRs Network, which numbers 60 reserves in 14 countries and is based in Castellet Castle, Barcelona, the International UNESCO Centre on Mediterranean BRs and headquarters of the Abertis Foundation.

We have also established cooperation with the other two Slovenian BRs: the Julian Alps BR, and Kozjansko and Obsotelje BR. Following the EuroMAB 2011 congress, we organized a joint celebration of the 40<sup>th</sup> anniversary of the MAB programme together with local schools. All three BRs presented themselves with a special puzzle map which was made by schoolchildren. At the end of 2011, the Slovenian government adopted the Decree on green public procurement, which represented the first step of the European Union to implement the United Nations initiatives for sustainable social development based on production and consumption balanced with the Earth's capacity. In 2012, the Škocjan Caves Park organized a series of lectures for Slovenian BRs and interested members of the public, the aims of which were to present the Decree on green public procurement and good practice cases, and to define the conditions for better and easier implementation of the Decree. In 2015, a seminar on the significance and promotion of ecosystem services was organized for BRs and other Slovenian parks. On that occasion, we also presented the United Nations sustainable development goals (the Global Goals), and together with the participants carried out a promotional campaign that was published on social networks. In October 2016, we organized an expert panel entitled *Biosphere reserves in the light of new MAB strategy*, where good practice cases were presented from the Nockberge and Wienerwald BRs in Austria and the Czech Dolni Morava BR.

This year (2019), three one-minute videos were produced to demonstrate our efforts in fulfilling the Global Goals for sustainable development (goal 5 for biodiversity conservation with bats research; goal 4 for education; goal 17 for partnership). The video about education, demonstrating ethno-meteorology researched by the schools network, was selected as one of 30 videos to be presented by the MAB programme's Secretariat, UNESCO at the UN Science Technology and Innovation (STI) forum in New York, 5 June 2018. All three videos can be seen on our YouTube channel, Park Škocjanske jame, Slovenija.

In order to contribute a new asset to the network, we have started to develop a Cave MAB working group, along with friends from Brazil, the USA, Hungary, the Czech Republic and South Africa. The group will join BRs with caves in joint interdisciplinary research tasks, and in sharing best practice in tourism management and water resource protection.

### Benefits for future challenges reflecting past work

In recent years, local inhabitants of the KBR buffer zone presented an initiative to expand the name of the BR in order to reflect their geographic location and enable all local people to identify themselves with the Reserve's mission. Thus in 2012 and 2013, discussions with stakeholders and a workshop were held, and eventually the name Karst and Reka River Basin BR was proposed. In 2013, a graphic image for the BR was designed by primary schoolchildren together with a graphic designer, which marked their contribution to the community on the BR's 10<sup>th</sup> anniversary.

In the framework of the MAB programme, the Škocjan Caves Park is slowly but steadily developing a brand representing trust, quality, guaranteed origin, sustainable management, nature protection and local tradition. The idea for the Park's brand stems from its mission to protect the natural and cultural heritage, realized by the relevant institutions in cooperation with the local communities. This cooperation represents the cornerstone of sustainable development to ensure a sound future for generations to come and for society as a whole.

The Committee for Providers and Producers is the successor of the former Stakeholders Network established in 2012. It is composed of producers and providers of sustainable products and services in the KBR, who will be eligible to apply for the Park's brand. Criteria for granting the Park's brand are currently being prepared. For promotional purposes, a printed and electronic map was prepared, showing the KBR's stakeholders, cultural and natural sights, footpaths, exhibitions, and private collections. Since 2007, the *Bela-jtnga* cave festival has been organized every year in the context of the Škocjan Caves Park Day together with the local population and stakeholders. This festival is an opportunity to present selected producers of traditional and sustainable products and services as well as the educational and cultural activities in the KBR. It is based on the festivity that was celebrated in the village of Matavun in the years 1886–1911, 1923–1933 and 1946.

In 2012, a technical commission was established to prepare the criteria for individual products and services, to grant the right to use the brand, and to monitor the quality of its holders' products and services. This body is preparing criteria at three levels, for basic, advanced and innovative standards, which will encourage stakeholders to promote sustainable

development in line with environmental, cultural heritage and social aspects. The criteria, evaluation lists and scoring systems have already been prepared for fruits and vegetables, apiculture products and catering services. Currently, the criteria are being laid down for accommodation services. In 2016, the brand label was granted for the first time – to beekeeper Marko Gombač, from Naklo.

Upon the 10<sup>th</sup> anniversary of implementing the MAB programme, our activities were extended beyond the Park's borders by promoting a unique example of the coexistence of man and nature. At the Park's initiative, a consortium for drystone wall construction was established on 27 February 2015 in the wider cross-border Karst area. The founding members of the consortium are 11 scientific, research and educational institutions, 3 municipalities, 3 other managing institutions, 2 architecture studios, 2 civil society groups, 2 private institutions, and 19 individuals, of whom 9 are from Italy. Two municipalities have declared themselves allies in the partnership. The consortium is an informal, voluntary, non-profit association of natural and legal persons who have come together with the aim of protecting and preserving traditional Karst drystone wall craftsmanship, exchanging expertise, knowledge and information, and raising public awareness about the heritage value and importance of Karst drystone walling. The Škocjan Caves Park Public Service Agency has coordinated the consortium's activities for four consecutive years and, together with the Nova Gorica Regional Unit of the Institute for the Protection of Cultural Heritage of Slovenia, in 2016 prepared the entry of drystone wall construction techniques in the Register of Intangible Cultural Heritage of Slovenia. Simultaneously, the Škocjan Caves Park Public Service Agency was actively involved in Slovenia's joint work with Croatia, Cyprus, France, Greece, Italy, Spain and Switzerland on the nomination of *Art of dry stone walling, knowledge and techniques* for inclusion in UNESCO's Representative List of the Intangible Cultural Heritage of Humanity, which was approved in November 2018.

The Park's educational programmes have gained international repute on the basis of numerous presentations, publications and lectures delivered in Slovenia and abroad, as well as through the participation of the Park's representatives in EuroMAB working groups. Two special acknowledgments took place in 2018 making the celebration of the 15<sup>th</sup> anniversary of the schools network a special event. In 2018, WWF Adria initiated a project with Dinaric Parks to implement our model of a schools network in all protected areas in Serbia, Montenegro, Bosnia and Herzegovina, and elsewhere. A book of guidelines is currently being prepared for publication. The schools network was also recognized as a special European Talent Point and

thus became a member of the European Talent Support Network. This gives us new challenges, related to innovative approaches in the education of talented children and young adults.

## Conclusion

The MAB programme has proven to be a highly efficient tool for the successful conservation of natural and cultural heritage, and an incentive for dedicated efforts that enable the sustainable development of humanity and society. In line with the 2015–2025 MAB strategy, the Park's future efforts will be dedicated to developing and strengthening sustainable development models, raising awareness, acting as a responsible institution with good management practices, researching and testing innovation for the conservation of biodiversity and natural resources, and taking alleviation and mitigation measures in relation to climate change. With other BRs, we share a vision of the world in which people are aware of their different cultures while sharing a common future – a future of interaction with their planet, and of joint, responsible, action to create a successful society that functions in harmony with the biosphere.

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