IUCN Conservation Outlook Assessment 2017 **(archived)**
Finalised on 10 November 2017

Please note: this is an archived Conservation Outlook Assessment for Škocjan Caves. To access the most up-to-date Conservation Outlook Assessment for this site, please visit https://www.worldheritageoutlook.iucn.org.

Škocjan Caves

SITE INFORMATION

Country:
Slovenia
Inscribed in: 1986
Criteria:
(vii) (ix)

Site description:

This exceptional system of limestone caves comprises collapsed dolines, some 6 km of underground passages with a total depth of more than 200 m, many waterfalls and one of the largest known underground chambers. The site, located in the Kras region (literally meaning Karst), is one of the most famous in the world for the study of karstic phenomena. © UNESCO

SUMMARY

2017 Conservation Outlook

Good with some concerns

The management of the property itself is effective, with good management personnel and a good management system in place. A combination of different designations and protection regimes covers most of the watershed and helps ensure conservation of the site’s values. However, given the small size of the property with a very narrow buffer zone near the western boundary, urban encroachment and intensification of development in the vicinity is a serious problem. It is not clear if legal statutes and political will can, in practice, confront and effectively contain the threats. Global climatic changes (temperature rise, changes in water regime) are beyond the control of management authorities, but might affect the property in the long term.

Current state and trend of VALUES

Low Concern
Trend: Deteriorating

Values like natural physical phenomena and karst processes are very resilient. Threats to these within the site are limited and are well managed in the cave, but the general environment is subject to increasing impact on the surface through development in the buffer zone, including in the Reka basin, and visual intrusion and noise introduced by encroaching development, especially along the motorway corridor (IUCN Consultation, 2017). In addition, global climatic changes introduce gradual low level threats that are beyond control of site management. The trend was one of improvement as the problem of the water quality of the Reka River was addressed, but now urban/commercial/transport development has emerged as a major threat.

Overall THREATS

High Threat

Threats to the World Heritage values of the site are still contained, but the property is small and surrounded by encroaching development that impacts the aesthetics by visual intrusion and noise, and affects the quality and quantity of water infiltrating underground. Urban encroachment and intensification of development in the vicinity is a serious problem, especially if it occurs in the upstream Reka catchment.
Global changes (temperature rise, changes in water regime) are beyond the control of management authorities, but might also affect the property in the long term, although the rate of change is slow compared to human processes.

Overall PROTECTION and MANAGEMENT

Mostly Effective

A very good management system is in place, supported by highly qualified staff. However, there is limited ability to influence what occurs in the surrounding area. Statutes provide legal protection, but in practice encroachment of urban and commercial development poses serious threats.

FULL ASSESSMENT

Description of values

Values

World Heritage values

► **Exceptional natural karst phenomenon**
Criterion:(vii)

This exceptional blind valley and cave system comprises almost 6 km of underground passages with a total depth of about 250 m, many waterfalls and one of the largest known underground chambers. The site is located in the Kras region (Karst in German) and is one of the most famous districts in the world for the study of karst phenomena, arguably part of the cradle of karstology. The Reka River, with an average flow of 8.2 m3/s and flood flows to 387 m3/s, suddenly disappears underground into a canyon passage averaging 20-30 m wide and 30-110 m high. The river roars down cascades and over waterfalls passing through the huge Martel Chamber, 2.1 million cubic metres in volume, beyond which exploration is limited by the river flowing into a sump where the ceiling descends to river level. The halls and chambers are profusely decorated by speleothem formations. Upper level cave passages provide evidence of stages in the development of the cave network.

► **On-going geological karst processes**
Criterion:(viii)

Some changes (construction of reservoirs, industry) occurred upstream in the past and affected water quality and flow regime (IUCN, 1986). These problems are now largely resolved. Land use and cover over the cave are largely natural vegetation, so percolation processes into the cave are

maintained in an essentially natural state. Global climate changes are likely to affect water balance gradually in the future.

► History of cave exploration

Criterion:(viii)

Ever since the first explorations and scientific studies were carried out in the 19th century, the cave system has been considered one of the most important karst features in Europe. Since then, all organisations responsible for it have maintained the cave system in good condition. The caves were first explored by Svetina in 1839, who descended 100 m into the Reka. Speleological research began in 1851 (and continues to date), and was followed by exploration in 1893 and in 1894 by the famous speleologist Martel, who published accounts in the book ‘Les Abimes’. The explored cave system is 5,800 m long and 250 m deep.

Other important biodiversity values

► Combination of alpine and Mediterranean ecosystems and species

A mixture of habitats is represented corresponding to the floras of Central Europe, the Mediterranean, Submediterranean, Ilyrian and Alpine, all of which are present side by side. In the property there are some endemic, rare and threatened species including Orobanche hederae, Lamium wettsteinii and Campanula justiniana.

► Underground fauna with endemic species

Skocjan Cave is located within the Classical Karst, a region of exceptionally high subterranean biodiversity. Subterranean habitats are available in narrow fissures and voluminous cave passages and rivers. The wider region has more than 200 species of troglobitic animals specialised for subterranean environments, about 115 being terrestrial creatures and 90 being aquatic. Cave beetles are especially common. The cave also has three species of bats. The surface flora and fauna are also rich, because of the diverse landscape and special microclimatic conditions associated with enclosed

depressions in karst terrain.

Assessment information

Threats

Current Threats

High Threat

Current threats to the World Heritage values come mostly from outside (urbanisation, infrastructure development, water use and quality). Tourism pressure is under control. The natural beauty and natural phenomena of the site are at present hardly affected, but very noticeable changes in land development are occurring around the park.

▶ **Dams/ Water Management or Use**

Low Threat
Inside site, widespread(15-50%)

Use of hydropower and reservoir construction upstream. Developments took place during the former communist period: two reservoirs were built upstream (IUCN, 1986), including Klivnik and Mola. Construction of a dam and creation of a water reservoir (drinking water) on a tributary of the River Reka, the Padež, has been discussed for decades. If it were constructed, then river discharge into Skocjan Cave would be directly affected. At present, there is no indication that the construction of the reservoir might be approved in the short term (World Heritage Committee, 1996).

▶ **Renewable Energy**

Low Threat
Inside site

Wind farm construction in the area of the Vremscica ridge has not progressed, the negotiation process for construction at the Volovja Reber

ridge is still ongoing (World Heritage Committee, 1996).

► Tourism/ visitors/ recreation

Low Threat
Inside site, localised(<5%)

There is a significant flow of visitors (approaching 100,000), but the situation is under control (IUCN Consultation, 2017; IUCN, 1995; World Heritage Committee, 1995) and the management of tourist traffic is efficient. However, north of the park there has been expansion of airport facilities and completion of a vehicle racing track that adds to traffic and noise (IUCN Consultation, 2017).

► Habitat Shifting/ Alteration, Other

Low Threat
Inside site, throughout(>50%)
Outside site

Ongoing global climate change will bring changes to the local water regime (IUCN, 1995). Cave flooding intensity and frequency could change, although it is essentially a natural process similar to that which has happened in the past. As air and water temperatures rise, surface flora and underground fauna will be forced to adjust (World Heritage Committee, 1995). This may impact on relict Alpine plant species that grow together with Mediterranean species thanks to locally particular climatic conditions.

► Water Pollution

Low Threat
Inside site, scattered(5-15%)
Outside site

Development of industrial plants upstream: a formerly very polluting factory in Ilirska Bistrica has reduced pollution by ceasing to use the ‘wet method’ in 1986. Two purifying stations have been built upstream (IUCN, 1986). Pollution is currently somewhat reduced (World Heritage Committee, 1995), but continuing regional development, including an expanding wood industry, adds an unknown continuing threat that requires ongoing monitoring (IUCN Consultation, 2017). The settlement of Ilirska Bistrica is in the buffer zone and in the catchment of the Reka River and the basin is also crossed by a

railway corridor.

▶ Commercial/ Industrial Areas

High Threat
Outside site

There is limited development in the property, but ongoing developments in the buffer zone, as well as encroaching urban and commercial development nearby. Given the small size of the property (413 ha), urban expansion and intensification in the vicinity are a serious problem, especially because the western boundary of the core zone abuts a motorway corridor at Divača. Two industrial zones have been constructed close to the World Heritage area. Plans for setting up the third such zone have temporarily been abandoned, mainly for commercial reasons (low success of the previous two zones) (World Heritage Committee, 1996).

Potential Threats

High Threat

Various developments outside the property have serious potential to negatively affect its World Heritage values by impacting severely on aesthetics (visual impacts and noise up to the park boundary), by damaging the quality of natural processes (water flow, water pollution) and by reducing the resilience of the natural ecosystem, including its flora and fauna (terrestrial and aquatic), because of habitat destruction in the buffer zone and neighbourhood. Global climate changes might also affect the biological values of the site, but more gradually.

▶ Roads/ Railroads

High Threat
Outside site

New motorways have been constructed adjacent to the core zone of the World Heritage site. A second railroad track has also been completed. Expansion of other corridors may be under consideration, as well as continuing expansion of urban and commercial zones (World Heritage Committee, 1996).

► Renewable Energy

Data Deficient
Inside site, throughout(>50%)

There is potential for construction of further freshwater reservoirs in the Reka basin because of interest in further freshwater supplies. Construction of a dam with a water reservoir on the Padež River has been discussed for decades, but no recent information is available on the status of this proposal.

► Housing/ Urban Areas

Very High Threat
Inside site, widespread(15-50%)
Outside site

Development pressure from neighbouring Trieste, Divača and other areas has been high over the last few decades (housing, industrial and commercial areas, motorways, etc.) and will inevitably continue into the future. The property is very vulnerable because it is small (4.1 km2), has no effective buffer zone on its western boundary, and has an actively occupied buffer zone with increasing development on its eastern (upstream) boundary; so urban expansion and encroachment cannot be sustained without seriously damaging World Heritage values: there is almost no margin for further encroachment (IUCN Consultation, 2017).

Protection and management

Assessing Protection and Management

► Relationships with local people

Highly Effective

There is good integration of local villages in the planning and operation (UNESCO,1993; World Heritage Committee, 1995). The management of the property has stimulated an effective collaboration with the local community and excellent collaboration between the site authorities and the communities should be highlighted (World Heritage Committee, 1996). Local inhabitants also formally take part in the park’s activities through the Skocjan Caves

Public Service Agency and selected boards and events (IUCN, 1995).

► Legal framework

Some Concern

A good legal framework exists, but land and water resources limitations may influence effective implementation (IUCN, 1995; World Heritage Committee, 1995):
• Acts: The Nature Conservation Act; The Cultural Heritage Protection Act; The Act Providing Funds for Certain Urgent Programmes of the Republic of Slovenia in Culture; The Promotion of Balanced Regional Development Act
• Laws: The Škocjan Caves Regional Park Act
Decision on the Establishment of the Škocjan Caves Park Public Service Agency
• Other: Ordinance amending the ordinance on spatial components of the long-term and medium-term social plan of the Republic of Slovenia; Ordinance amending the ordinance on spatial components of the long-term and social plan of the Sežana Municipality for the area of the Divača Municipality; Natura 2000 (IUCN, 1995).

Given the active encroachment of development around the property, the effectiveness of the implementation of this legislation is in doubt (IUCN Consultation, 2017).

► Enforcement

Data Deficient

No data were available.

► Integration into regional and national planning systems

Data Deficient

Reportedly good planning at state level (World Heritage Committee, 1995).

► Management system

Mostly Effective

Good and efficient system in place (World Heritage Committee, 1996; World Heritage Committee, 1995). Responsibility for overseeing the implementation

of the management plan and monitoring its effectiveness lies with the Slovenian Ministry of Environment, Spatial Planning and Energy; the Council of the Škocjan Caves Park Public Service Agency; and the Expert Council of the Škocjan Caves Park Public Service Agency (IUCN, 1995).

► Management effectiveness

Highly Effective

Very competent and dedicated staff within the park who implement the Management plan (World Heritage Committee, 1995).
Number of staff: 18 (IUCN, 1995; State Party of Slovenia, 2006)
Rate of access to adequate professional staff across the following disciplines:
• Very good: education
• Good: conservation, promotion, interpretation; education
• Average: management, visitor management.
The site also benefits from a substantially large group of volunteers, derived from the local community and conservation specialists.

The Skocjan Caves Park, despite limitations in staffing and funding, is still achieving its conservation objectives at a high level (IUCN Consultation, 2017; World Heritage Committee, 1996).

► Implementation of Committee decisions and recommendations

Data Deficient

Improvement of the legal situation after the political changes in the 1990s has taken place according to the World Heritage Committee’s recommendation (IUCN, 1995); environmental threats are taken into consideration (World Heritage Committee 1996; IUCN, 1995). However some of the requests from the committee have not been fulfilled (World Heritage Committee, 1996).

► Boundaries

Some Concern

The core boundary of the property is adequate, but the buffer zone, established by the Regional Park law in 1996, is inadequate along the west near the motorway and Divača, although there is little scope for its

improvement (IUCN Consultation, 2017).

► Sustainable finance

Mostly Effective

The state budget is the main source of financing (IUCN, 1995; World Heritage Committee, 1995). Sources of funding also include revenues from the park's own activities, co-financing and donations, and international financing from PHARE, INTERREG and the Ramsar Convention (IUCN, 1995). However, despite shortages in staffing and funding, Skocjan Caves Regional Park is still achieving its conservation objectives at a high level (World Heritage Committee, 1996).

► Staff training and development

Highly Effective

Well qualified staff in various fields of management; strong participation in international conferences and workshops (World Heritage Committee, 1995), especially those related to World Heritage, MAB and Ramsar Conventions.

► Sustainable use

Mostly Effective

There is limited scope for sustainable use of natural resources within the property, although tourism appears to be managed sustainably. Most activities occur within the surrounding cultural landscape (buffer and transition zones).

► Education and interpretation programs

Mostly Effective

There is adequate awareness of World Heritage among visitors, local communities, businesses and local authorities (IUCN, 1995). Frequent school activities and special events (World Heritage Committee, 1995) are held in the caves and in the surrounding villages. There is an education strategy in place.
As well, a number of conferences organise excursions to the park from other parts of Slovenia. There are seasonal and thematic excursions and public

events on a regular basis (IUCN, 1995).

► Tourism and visitation management

Highly Effective

There is an efficient management system for the control of visitors and the quality of their experience (World Heritage Committee, 1995). The infrastructure within the caves has recently been renovated. There is a museum and tourist information centre. The park has walking and cycling trails as well as a specialised education trail (IUCN, 1995, World Heritage Committee, 1995). A building with conference room has been purchased and equipped (World Heritage Committee, 1995). Signage to the World Heritage site is adequate and the World Heritage emblem is used on publications (IUCN, 1995).

► Monitoring

Highly Effective

A strong formal monitoring programme exists, in particular, for water quality and environmental factors, as well as tourist traffic (IUCN, 1995, World Heritage Committee, 1995), and new technologies have recently been established. It is very important that this be maintained given the surrounding development pressures.

The Škocjan Caves Park cooperates with the Environmental Agency of the Republic of Slovenia and the Karst Research Institute ZRC SAZU in the performance of measurements and analyses of a complex system of ecosystems. The Research and Development Service, which operates within the framework of the park, aims to establish the park’s infrastructure for the performance of measurements and, in combination with national monitoring, prepares more detailed inspections and monitoring of the state of the park.

► Research

Mostly Effective

The area has a long tradition of cave research (> 150 years) and there are several ongoing research programmes (IUCN, 1995). These have included risk assessment, studies relating to the value of the site, monitoring exercises, archaeological surveys, visitor management, rural sociology

studies and occupational safety studies. In addition there are international projects aimed at detailed archaeological, hydrological, sociological and educational research. Some hydrological measurements were performed under the framework of the Slovene programme of the International Hydrological Programme – UNESCO and International Geoscience Programme.

Overall assessment of protection and management

Mostly Effective

A very good management system is in place, supported by highly qualified staff. However, there is limited ability to influence what occurs in the surrounding area. Statutes provide legal protection, but in practice encroachment of urban and commercial development poses serious threats.

▶ Assessment of the effectiveness of protection and management in addressing threats outside the site

Some Concern

There is a certain level of legislative protection applied to the whole watershed, including the Biosphere Reserve. Protection within the property is effective, but outside and adjacent to the site active land development and commercial activity are occurring with apparently little regard to the impacts on World Heritage values.

State and trend of values

Assessing the current state and trend of values

World Heritage values

▶ Exceptional natural karst phenomenon

Low Concern
Trend:Deteriorating

The natural beauty of the site is hardly affected for the time being, but encroaching development around the property (visual and noise intrusions from construction and infrastructure) may seriously affect aesthetic

conditions within the core zone of the park (IUCN Consultation, 2017; World Heritage Committee, 1996; World Heritage Committee, 1995).

► On-going geological karst processes

Low Concern
Trend:Stable

Some changes (construction of reservoirs, industry) occurred upstream in the past and affected water quality and flow regime (R 14). These problems are now largely resolved. Land use and cover over the cave is largely natural vegetation, so percolation processes into the cave are maintained in an essentially natural state. Global climate changes are likely to affect water balance gradually in the future.

► History of cave exploration

Good
Trend:Stable

Exploration and scientific research are ongoing and are efficiently regulated (IUCN Consultation, 2017; IUCN, 1995; World Heritage Committee, 1995) and a good monitoring programme is in place.

Summary of the Values

► Assessment of the current state and trend of World Heritage values

Low Concern

Trend: Deteriorating

Values like natural physical phenomena and karst processes are very resilient. Threats to these within the site are limited and are well managed in the cave, but the general environment is subject to increasing impact on the surface through development in the buffer zone, including in the Reka basin, and visual intrusion and noise introduced by encroaching development, especially along the motorway corridor (IUCN Consultation, 2017). In addition, global climatic changes introduce gradual low level threats that are beyond control of site management. The trend was one of improvement as the problem of the water quality of the Reka River was addressed, but now

urban/commercial/transport development has emerged as a major threat.

▶ **Assessment of the current state and trend of other important biodiversity values**

Low Concern

Trend: Data Deficient

The plant and animal populations in the dolines and caves appear to be stable and resilient to natural events (floods, water regime variation). However, global changes might modify the climatic conditions in the dolines, and thus affect the relict plant species as well as the rare and endemic underground fauna (IUCN, 1995, World Heritage Committee, 1995). Pollution in the Reka River seems under control, and the situation may be improving in the subterranean environment, although probably not on the surface as development is changing land cover in the region around the park.

Additional information

Benefits

Understanding Benefits

▶ **Outdoor recreation and tourism, Natural beauty and scenery**

Extensive and well maintained walking path network above and below ground, villages with tourist facilities, restaurants, information centres, etc.

An excellent site for both passive and active recreation.

▶ **Importance for research, Contribution to education**

The site has long been important for speleological research, understanding karst processes and the geological history of cave development in the region. The site offers a location where these can be studied and where they can be

explained to students and the general public.

The quality of the cave environment and its ecosystem directly reflects the quality of the external environment to which it is connected.

▶ **Tourism-related income, Provision of jobs**

With up to about 100,000 visitors coming to the World Heritage area each year, significant income is generated, both directly by the park and indirectly by service providers in the surrounding area. This supports permanent and seasonal jobs in the park and in the surrounding community.

Summary of benefits

Inspiring, beautiful and awe-inspiring natural scenery and phenomena worthy of a World Heritage property, together with a well-conserved natural environment that lends itself to active and passive recreation and scientific research. Associated tourism provides a sustainable economic benefit to the local community.

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects
1	.		Habitat survey of glacial and thermal relicts.
2	.		Birds and cave invertebrate monitoring.
3	.		Cave microclimate monitoring, Visitor flow monitoring.
4	.		Water quality monitoring.

Compilation of potential site needs

№	Site need title	Brief description of potential site needs	Support needed for following years

1	.	Ongoing speleological research to improve knowledge of the cave’s development history and hydrological processes.
2	.	Visitor-related studies concerning benefits and impacts of tourism.
3	.	Monitoring of cave wildlife, including bats, to establish activities and trends.

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