

- waste, dumping systems, etc. penetrate karstic systems;
- chemical variations of the waters in karstic reservoirs, in relation to different types of pollution;
 - definition of hydrological balances and modifications caused by the introduction of recycled or allochthonous water.

Only careful analysis of environmental dynamics may supply basic information for correct planning and management of water resources, so that many of the errors made in the past may be avoided in the future.

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NATURAL HERITAGE OF THE CLASSICAL KARST (KRAS)

by

Daniel Rojšek*

ABSTRACT

At The Institute for Conservation of Natural and Cultural Heritage Gorica in Nova Gorica inventories of natural heritage in Karst communes Sežana and Nova Gorica have been made up. The inventories are basis for presentation of the natural heritage of the classical Karst. In the beginning of the paper administrative activities for protection of natural heritage are described in few words. On the following pages all kinds of the natural heritage are characterized. On the natural heritage list 190 sites are nominated, out of which 48 will be proclaimed natural features.

RÉSUMÉ

L'HÉRITAGE NATUREL DU KARST CLASSIQUE

A l'Institut de la protection du patrimoine, naturel et culturel Gorica en Nova Gorica nous avons préparé l'inventaires du patrimoine naturel en communes Sežana et Nova Gorica. A leur base il a été préparé le sommaire du patrimoine naturel du Kras classique. Au commencement du cet papier sont présentés les activités administratives et techniques pour la protection. Ensuite toutes les sortes du patrimoine sont caractérisées. Il y a 190 biens du patrimoine naturel, qui sont inscrits sur la liste du patrimoine du Kras classique, d'entre 48 seront proclamé les curiosités naturelles.

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1.0. INTRODUCTION

At The Institute for Conservation of Natural and Cultural Heritage Gorica in Nova Gorica inventories of natural heritage in Karst communes of Sežana (Gorkič M., M. Puc, 1983) and Nova Gorica (Gorkič M., D. Rojšek, M. Sušnik, 1985) have been made up. I should like to present the world famous and rich natural heritage of classical Karst. This paper is based on above mentioned inventories and my own knowledge.

2.0. NATURAL HERITAGE

Natural heritage is composed of natural phenomena, which have been inherited from our ancestors and which we wish to save as witnesses of natural processes and human and social development. We have special relationship, which does not admit any vestiges of consumptive mentality. Natural heritage as a part of human environment, is important for cultural and creative life.

A natural phenomenon can be nominated to the natural heritage list, if it has cultural, scientific, historical or aesthetical worth for Slovenia or its parts. One or more of the following criteria or aspects must be fulfilled:

- frequency (rarity of phenomena in Slovenia),
- exceptionality (dimensions, forms...),
- typicalness,
- complexity (complex of phenomena or complex of criteria),
- ecological aspect,
- aesthetical aspect,
- landscape aspect,
- symbolic aspect,
- endangerment.

The legislation which applies to natural heritage in Slovenia

is the following: in the first place is the Law of Protection of Natural and Cultural Heritage, followed by The Constitution of the Socialist Republic of Slovenia, the Directives and Resolutions for Regional Planning and the Convention concerning the Protection of the World Cultural and Natural Heritage. The Law of Regional Planning protects natural heritage in plans of communes, republic and selfmenage interestical communities.

The valorization and inventories of natural phenomena are made by the republic and the regional Institutes for Protection of Natural and Cultural Heritage. All evaluated natural phenomena are protected in the communal and republical regional plans as natural heritage, and the most important are proclaimed natural features by decrees. According to their importance the features can be divided into national parks, regional parks, natural parks, natural (botanical, zoological, geomorphological) reserves, natural monuments, protected cultivated gardens and endangered botanical or zoological species.

3.0. THE CLASSICAL KARST NATURAL HERITAGE

The classical Karst, the region between the Gulf of Trieste and the Vipava valley, borders on the state frontier in the west and in the south, the Glinščica valley and the Materija karst valley in the southeast, the Mts Brkini and the Vremška dolina (blind valley) in the east, the Mt Vremščica and the Senožeče karst valley in the northeast and on the valleys of the rivers Raša, Branica and Vipava in the north.

In the classical Karst 190 phenomena have been nominated to the natural heritage list, 48 of them will be proclaimed natural features by the communal decree.

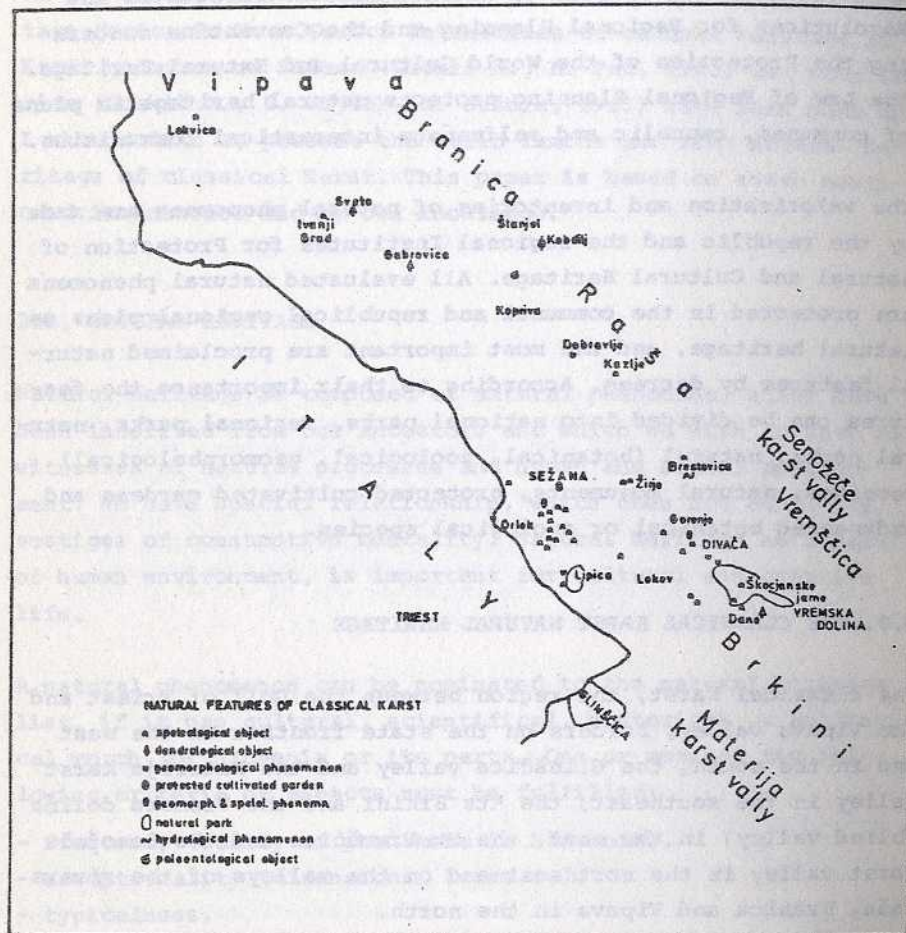


TABLE 1: Kinds of Natural Heritage of the Classical Karst

kind of heritage	number	proclaimed
speleological object	129	32
dendrological object	36	4
geomorphological phenomenon	11	5
protected cultivated garden	5	1
geomorph. & speleol. phenomenon	4	2
natural park	2	2
hydrological phenomenon	2	1
paleontological object	1	1
together	190	48

3.1. Speleological Objects

In the cave cadastre of The Institute of Karst Research in Postojna were in June 1987 registered 437 speleological objects of classical Karst.* On the natural heritage list are nominated 129 caves and potholes, out of which the following 32 sites will be proclaimed natural monuments: Petnjak near Brestovica pri Povirju, Jama nad Škrinjarico, Mejjame and Velika jama na Prevali near Dane pri Divači, Divaška and Kačja (Kačna) jama near Divača, Jama na Konjičih near Gorenje pri Divači, Preserska jama near Ivanji grad, Komihcova jama near Kazlje, Lipiška jama and Lipiško brezno near Lipica, Jama pod Gaugami and Vilenica near Lokev near Divača, Leopardova jama near Lokvica, Škocjanske jame, Golokratna jama near Orlek, Čebulcova jama, Jami v Sežanskem Dolu I in II, Jama Bukovnik, Jama na Gropajskem, Jama na Trebanjskem, Jama v Golokračini, Jama v Kanjeducah I, Jama v Ukmarjevem dolu, Jama v partu "Pri ogradi", Koblarska jama, Orleška jama, Škamprlova jama and Ulčarjeva jama

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near Sežana and Belinca jama and Podjunčna jama near Žirje.

The protected area of NATURAL AND CULTURAL MONUMENT ŠKOCJANSKE JAME extends over 340 ha. In november 1986 it was inscribed on the World Heritage list by U.N.E.S.C.O. as a natural property. It comprises a cave system with surface above it, four collapse dolines and canyons of the river Notranjska Reka and the brook Sušica. Vremška dolina, the greatest blind valley of Slovenia terminates at Škocjanske jame, the ponor caves of the river Notranjska Reka, the longest sinking stream of Slovenia. In Vremška dolina it represents at the distance of 7.5 km an example of allogenic Karst river. In dry period discharge drops under one cubic meter per second and all water of the river sinks in the ponor Požiralnik pri Gornjih Vremah, which collapsed in September 1982. The river channel is dry between the ponor and the first mill dam, where waters from many small springs are collected. In this situation only few liters per second flow through the Škocjanske jame.

The 2.5 km long underground canyon is unique in the world. By methods of P. Jakopin (1981) in the 54.5 m long part of Martel hall were surveyed up volume of 0.22 million cubic meters and height of 145 m above the river.

The protected area has the status of cultural monument for many reasons: there are areas of archeological excavation sites revealing that the area has been settled for more than 10,000 years, some ethnological monuments - villages Škocjan, Betanja and Matavun, a monument of history of art - the church of Škocjan and a monument of special caving technics - discoveral and turistical paths cut in rocks and fitted with steel-wires dated from the end of last and beginning of this century (Škocjan caves, The original nomination submitted by Yugoslavia to U.N.E.S.C.O., 1985).

KAČJA (KAČNA) JAMA near Divača represents the continuation of the active cave system of the river Notranjska Reka, which be-

gins in the Škocjanske jame. During dry periods, when the river Notranjska Reka sinks in the ponor Požiralnik pri Gornjih Vremah, flow through the Kačja jama only a few liters of water per second, too (Mihevc A., 1984: 18).

The galleries are spread at least in five levels. They have great dimensions and big quantities of sediments such as boulder blocks, flowstone, loam, sand, gravel... Flowstone and dripstone are sedimented in all passages except in active galleries. The most beautiful is Zahodni rov, which is practically completely covered with colourful flowstone and dripstone.

In clear, current water of two passages many specimen of endemic *Proteus anguinus* have been found.

Kačja jama is the greatest speleological object of classical Karst. It is 8,470 m long and 278 m deep (o.c.: 11).

DIVAŠKA JAMA lies 100 to 200 m higher than the nearby Kačja jama. Galleries are filled with sediments, in the first place with huge colourful dripstone and fluvial loams such as have not been known from neighbouring caves (Gospodarič R., 1985: 8).

The cave was opened to visitors in 1885 (Žiberna J., 1981: 138), one year after the discovery (in the ending hall is the name Gregor Žiberna and date 11. 5. 1884 cut into flowstone). Opening to public has degraded the cave, paths were strewn with black ashes of steam locomotives. Dust and soots from torches and burning straw blackened flowstone and dripstone. Visitors have cut out and taken away stalagmites. Lately digging and taking away of pure red clay under great stalagmite have been observed, what endangers the cave, too.

LEOPARDOVA JAMA is among the smallest speleological monuments, but it is rich in great helectites, macaroni and other dripstone and in the terminal breakdown some parts of Pleistocene leopard (*Panthera pardus*) skeleton were found.

The most common cause of degradation of speleological objects is their pollution with different kinds of waste from industries, households and even some cavers. The most effective prevention from pollution is mostly at industries, the others keep unknown. Recently, only the cavers have prevented pollution of caves, more or less successfully, but now the inspectors and the institutes of conservation of natural and cultural heritage organize prosecution of pollutants. This action will not solve the problem, unless the communes determine suitable dumping-grounds for all settlements and maintain waste removal. In the same time must continue great propaganda against degradation of speleological objects and nature in general. Very important is to recognize worths of the underground world and its features.

3.2. Dendrological Objects

On the classical Karst 36 dendrological objects are registered. The limetrees near the church of St. Peter in Gabrovica pri Komnu (the biggest has 4.24 m of circuit at breast height), the mulberrytree near famous architect Fabiani birthhouse (circuit 6.42 m) in Kobdilj, the oaktree *Quercus pseudosuber* (unique specimen in Slovenia) near Škocjan and limetree near the church of St. Giles (circuit 5.30 m) in Sveto, will be proclaimed the natural monuments.

3.3. Geomorphological Phenomena

There are 11 geomorphological phenomena on the list, out of which the following 5 will be proclaimed natural monuments: the dripstone in Lipje jame near Divača (unique specimen of dripstone on surface; it represents the 2.88 m high top part of a great stalagmite, which was dug out during exploitation of quartz sand in a filled up, partly denudated cave), the perched blocks near Lipica (the best specimen of perched blocks in Slo-

venia), Orleška Draga near Orlek (probably the largest collapse dolina of the Karst; also the habitat of relict and protected plant *Primula auricula*), Risnik near Divača (the immense, picturesque collapse doline) and Debela peč near Dobravlje (the unusual limestone block).

3.4. Geomorphological and Speleological Phenomena

Two collapse dolines with speleological objects will be proclaimed natural monuments. In the bottom of Bukovnik chasm is a collapse cave, which comes near to the galleries of Kačja jama. There are two potholes in Sežanski Dol.

3.5. Protected Cultivated Gardens

Among the 5 protected cultivated gardens the garden of the villa Mirasasso in Sežana is the most important, because there grow Slovenia's rarest alogenical trees.

3.6. Natural Parks

The Lipica Natural park is spread over 310 ha of the stud farm estate, established in 16th century. There is in the park a large area of ameliorated meadows and pastures for horses. At the stud farm hotels, bars and a golf area have also been built up. The Glinščica Natural park has been founded on the contact of flisch and limestone, so many contact forms can be found there. The most attractive is the canyon of the brook Glinščica. Part of the drainage area of Glinščica, that lies on Italian territory is protected, too.

3.7. Hydrological Phenomena

Near Brestovica pri Povirju there are two hydrological phenomena: Lempurjevka and Globočaj. Both are small lakes with springs and ponors in neighbourhood.

3.8. Paleontological Monument

In the unactive stone pit of "the Karst marble" between Štanjel and Kopriva the upper Cretaceous limestone rich in rudists was quarried. On the rock surface are well presented the cuts of rudist shells.

4.0. SUMMARY

In the Institute for Conservation of Natural and Cultural Heritage Gorica in Nova Gorica inventory of natural heritage of the classical Karst have been prepared. On the heritage list 190 objects and areas have been nominated, 48 of them will be proclaimed natural features.

Most (129) are speleological objects, 32 of them will be proclaimed natural monuments. The most important site is the protected area of Škocjanske jame, also inscribed on the World Heritage list by U.N.E.S.C.O. In Škocjanske jame there is the beginning of the river Notranjska Reka active cave system, which continues in Kačja jama. It is the greatest speleological object of the classical Karst. There are 36 dendrological objects on the list, among them 4 will be natural monuments. The dripstone near Divača, the perched blocks near Lipica, collapse dolines Orleška Draga near Orlek and Risnik near Divača and limestone block Debela peč near Dobravlje are the natural monuments, among the 11 sites of the geomorphological heritage. The garden of the villa Mirasasso in Sežana is the most important protected cultivated garden, among 5 of them. Collapse dolines Bukovnik

with a cave near Divača and Sežanski Dol with two potholes near Sežana are natural monuments within 4 sites of geomorphological and speleological heritage. The Lipica Natural park is spread on the stud farm estate, the Glinščica Natural park has been founded on the contact of flysch and limestone. The park is protected in Italy, too. Near Brestovica pri Povirju are inscribed on the heritage list even small lakes, with springs and ponors. In a unactive stone-pit between Štanjel and Kopriva, the rudist shell cuts are presented.

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