

ACTA CARSOLOGICA	30/1	10	143-164	LJUBLJANA 2001
------------------	------	----	---------	----------------

COBISS: 1.02

## **KARST CONSERVATION IN SLOVENIA**

### **VAROVANJE KRASA V SLOVENIJI**

**TANJA KEPA<sup>1</sup>**

<sup>1</sup> Uprava RS za varstvo narave, Vojkova 1a, 1000 LJUBLJANA, SLOVENIJA

Prejeto / received: 5. 3. 2001

**Izvleček**

UDK: 551.44:502.7(497.4)

**Tanja Kepa: Varovanje krasa v Sloveniji**

Kras zavzema 44 % površine Slovenije. Poleg obsega ima kras velik pomen kot naravna vrednota ter ekonomsko vrednost zaradi bogatih zalog kraških vodnih virov. Kras vse bolj ogrožajo intenzivna kmetijska in industrijska dejavnost ter vplivi poselitve in razvoja infrastrukture. Velik pomen krasa, njegova ranljivost in vse večja ogroženost zahtevajo učinkovito varstvo kraškega površja, podzemlja in voda. Pregled zakonodaje na področju okolja, narave in voda kaže na nizko stopnjo normativnega varovanja krasa. Zakonsko je zavarovanih le 40 % kraških vodnih virov v javni uporabi in 13 % jam. V okviru zavarovanih območij je zavarovanega 13 % vsega krasa v Sloveniji. Stanje se bo izboljšalo z razglasitvijo petih predlaganih regijskih parkov na krasu, ko bo skupaj zavarovanega skoraj 60 % slovenskega krasa. Čeprav v okviru obravnavane zakonodaje ni vgrajenih splošnih varstvenih režimov za varstvo krasa, novejša okoljska zakonodaja omogoča boljše instrumente varovanja. Nujno pa je čim prej sprejeti novih zakonov glede voda in varstva podzemnih jam.

**Ključne besede:** krasoslovje, varstvo krasa, varstvo okolja, varstvo narave, Slovenija.

**Abstract**

UDC: 551.44:502.7(497.4)

**Tanja Kepa: Karst conservation in Slovenia**

Karst areas cover 44 % of Slovenian territory. As well as for the area it covers, karst is important for its natural and economic value, specially due to its storage capacity of water. To date, karst areas are increasingly threatened by intensive agriculture practices and industrial activities as well as settlement and infrastructure developments. Due to its overall value on the one hand, and risks and threats to the karst systems on the other, an effective protection of the surface and subterranean areas and karst water is required. To date, 40 % of karst water sources and 13 % of caves are protected by law, and 13 % of all karst is included in the system of protected areas in Slovenia. This situation will improve when the five proposed regional parks in the karst areas are established. 60 % of the Slovenian karst areas will be then legally protected. Although the current legislation in nature conservation has no protection measures specifically for karst systems, it still provides some instruments for their conservation. For a comprehensive conservation of karst systems, both water and cave laws have to be passed in parliament as soon as possible.

**Key words:** karstology, karst conservation, environment protection, nature conservation, Slovenia.

## INTRODUCTION

According to the speleological map of Slovenia about 9000 km<sup>2</sup> (44 %) of its territory is karst (Habič, 1982). As well as for the area it covers, karst is important for its natural and economic value, specially due to its storage capacity of water. Characteristic of karst are numerous karst phenomena, especially karst caves. In the Cave cadastre are listed already 7405 known caves. According to the List a quarter of the most important natural heritage objects in Slovenia are on karst. Karst springs contribute 43 % of all water resources to the water supply of Slovenia (Lah, 1998, p. 39), and our karst has also three quarters of all water that is reachable during the longer dry season (Habič, 1989).

Karst areas are, especially in times of all-round economic and urban development, increasingly threatened by different activities: above all the use of natural and artificial fertilizers, storage and transport of agricultural waste and the problems of big stockbreeding farms, change in land use, unregulated outflow of uncleaned communal and industrial sewage, uncontrolled depositing of waste (about 20 % caves are polluted), various construction activities (165 kilometres of motorways are planned to run through karst areas) and sudden outflow of dangerous substances in the case of traffic and industrial accidents.

Due to its overall value on the one hand, and risks and threats to the karst systems on the other, an effective protection of the surface and subterranean areas and karst water is required.

## HISTORICAL REVIEW OF KARST CONSERVATION

The first initiatives for karst conservation which appeared just before World War I were connected with the protection of caves. At that time the two biggest problems were vandalism and plundering of dripstone for sale (Simić, 1998). Cave tourism started to develop intensively in the 19th century, concurrently with concern about cave protection.

In 1825 some civic conscious citizens of Postojna founded a Cave Committee under the leadership of Postojna's provincial governor. The Committee on the one hand enacted an Ordinance on the Prevention of Breaking Drip-stones but however the Cave Committee itself permitted sale of dripstone due to the constant rise in demand. They were broken in secondary non-tourist passages and caves, the Committee defined the price and fed a profit into the cave fund while individual trade with dripstone was strictly forbidden. After Ivan Andrej Perko in 1909 had become director of Postojna cave he prohibited the sale of dripstone on the stalls in front of the cave but not yet the sending of them to the various exhibitions (Habe, 1989).

Taking away of dripstone in Svinjska jama near Cerknica lake was described in 1908 by Badiura and Brinšek who also expressed the first initiative for cave protection (Badiura et al., 1908). A clearly defined suggestion for cave protection was given by a journalist Franjo Pirc in the newspaper »Jutro« in 1911. In an article with the heading »Conservation for our underground kingdom« he also wrote that besides the cave fauna also dripstone had to be protected. He publicly called on the provincial president, baron Schwarz, that he had seriously to take care of conservation of all »underground kingdom« (Simić, 1998; Habe, 1975).

A society for cave research in Kranjska also started to strive for cave protection (Habe et al., 1981). In the report about Society's work from its foundation in 1910 till the first general meeting

in January 1912 they warned about the devastation which was being carried out in numerous dripstone caves on Karst by private people while, some of the caves known for scientific research of flowstone formation had already been destroyed. Trade in dripstone and *Proteus Anguinus* was in some parts of the karst an extra profitable side-income. The general meeting itself proposed that the Society's committee address to the imperial-royal agriculture ministry a resolution with a request for limitation of trade in dripstone under the natural monuments conservation (Simić, 1998).

Implementation of above-mentioned initiatives for cave protection did not occur before the first World War and in addition to that the war brought also a new way of destroying karst, two and a half years of fighting along the Soča river which strongly marked the image of Karst. More than one hundred caves were heavily modified for military use. Military defeat of Austrian-Hungarian army resulted in decay of a monarchy, Slovenia lost mostly karst Primorska and Istria for almost 30 years, and in the Kingdom of Serbs, Croats and Slovenians the solving of questions linked with karst or cave conservation was again at its start (Simić, 1998).

A Section for nature conservation and conservation of natural monuments had been organised in Ljubljana in 1919 by the Museum society which on 20th January addressed to the Regional authority for Slovenia »Spomenica« that contained proposals for different aspects of nature conservation (Piskernik, 1965) and presented also the first complete Slovene nature conservation programme (Peterlin, 1995). Caves were treated in the third part of »Spomenica«: first of all a control for »underground caves with interesting cave fauna and flora« was required and »entrance was allowed only for scientific purpose«. A chapter in »Spomenica« was analysed also in greater details. Caves should become state property and under the care of the Section (Society) for nature conservation and conservation of natural monuments. The Society should protect the entrances of the most famous caves and give permission only for scientific purposes. In continuation it was written that our caves became famous in the scientific world due to the cave fauna which was severely endangered by collecting and trading.

On 19th February 1921, two and a half years after the overthrow of the monarchy, the Regional Authority for Slovenia of Kingdom of Serbs, Croats and Slovenians enacted Order of the Land Authorities for Slovenia on the Protection of Rare or Typical Slovenian and Scientifically Important Animals and Plants and on the Protection of Caves (Uradni list deželne vlade za Slovenijo, 25/21). This order was enacted in 1922 as an Act Regulating the Protection of Rare or Typical Slovenian and Scientifically Important Animals and Plants and the Protection of Caves in the Area Governed by Regional Authority for Slovenia (Službene novine Kraljevine SHS, 238/22, priloga XXXII). In the order and the latest act the demands from »Spomenica« were recorded according to the article 6, which said that »caves came under the control of the Regional Authority for Slovenia, Department of forestry and should be supplied and profited only in a way which was approved by the control authority after investigation by the Museum association for Slovenia«. Besides this, in the first article cave fauna was also mentioned so it was forbidden »to hunt, exterminate, sell, offer to buy and export« among other animals all cave beetles, spiders and molluscs.

»Spomenica« had also launched the establishment of the Alpine protection park Dolina Triglavskih jezer in the year 1924, which was the beginning of the Triglav National Park. Later there were no major responses, but it was an important fact that there was no organised state administration for systematic work in the field of conservation which could realise the ideas of Spomenica (Skoberne, 1995).

From the contents of Spomenica and Order it followed that cave protection was treated exclusively from the biological point of view while an appeal for stopping dripstone robbery on which cavers had already warned before the war, stayed without a real answer (Simić, 1998).

In practice it was shown that provisions in connection with cave protection from the Act of 1922 were too general but above all there was no answer to two basic problems: the relation to an owner of a land on or under which the cave was situated, and the relation to an owner of a land across which a cave entrance was reachable. Due to the above-mentioned problems the Museum association for Slovenia tried to supplement the provisions with »Rules for Protection, Maintenance and Supplying of Caves in Slovenia«. A draft of the Rules was sent to the Lord Mayor of Ljubljana in a further procedure in May 1929 by the Museum association for Slovenia and it showed a progress of the cave protection position due to the specialists of other sciences who also started to strive for protection. The proposal of Rules expanded cave protection in such a way that karst springs and sinkholes were also included among caves, which presented a step more to the comprehension of karst as a system. But there was still no comprehension of karst phenomena in the sense of heritage so a preservation of caves in the state in which they were then was defined as a purpose of protection, and conservation of features »for which particular natural sciences were interested in« (Simić, 1998). In further procedure the State custodian in January 1930 found out that it was not allowed to manage the relations with cave owners and owners of land across which a cave entrance was reached under the Rules because in this way their unlimited ownership would be invaded. He proposed to amend Act in a way that the owners who could not or would not be responsible of caves according to the directives of Ban's administration (or of the Rules) were owed to permit to be responsible an association or a person for an appropriate compensation. In the same amendement Ban's administration would be authorised to regulate the question of access to caves but there was no alteration of the legislation (Simić, 1998).

During the World War II in the Natural History museum of Ljubljana there functioned an Advisory working group for nature conservation and those natural monuments which composed the List of nature conservation important objects (Šivic, 1944). Except indirectly with the springs of the Ljubljanica river, there were no caves on the list, and the reason for this situation were special, wartime and also the fact that the Cadastre of caves was hidden all the time during the war (Simić, 1996; 1998).

The first service for nature conservation was established in the year of 1944 under the Italian Occupying Authority and then continued to work immediately after the war in 1945 as a Section for Nature Conservation in the Institute for Conservation and Scientific Research of Cultural Monuments and Natural Features (Skoberne, 1995).

After the liberation Democratic Federation of Yugoslavia in 1946 and within it the Slovenia of that time passed the laws (Act Approving and Amending the Protection of Cultural Monuments and Outstanding Natural Features Act, Uradni list DFJ, 81/46 and Protection of Cultural Monuments and Outstanding Natural Features Act, Uradni list LRS 23/48 ) which discussed also conservation of natural features, but both laws were markedly orientated in a heritage way and so inconvenient for conservation of karst as a hydrogeological system (Simić, 1998). Already during the defining for common law on conservation of monuments in 1945 (Puc, 1985) it was clear that at first also the factors which were competent for it were not aware of the great importance of the nature conservation service. Opinions about the question of what should come under the protection were different, from natural rarities, natural points of interest, natural beauties to outstanding

natural features, which also won. So there was a possibility to protect only these natural objects which were famous for some speciality, while the other European and non-European countries had nature conservation acts (Piskernik, 1965).

Cave protection and karst conservation were, till the acceptance of the Nature Conservation Act (Uradni list SRS, 7/70), not even mentioned and even this law had mentioned cave protection only in the article 15, which managed the problems of speleological objects which occurred during construction (Simić, 1998). Cave wealth was so left to exploitation, an exception being only a few caves in which visits were organised, and Rakov Škocjan which came under protection with a special ordinance (Ordinance on the protection of surroundings of Rakova basin near Rakek in Notranjska, Uradni list LRS, 27/49). Only the Community of Postojna had enacted community ordinance on protection of some of the most important caves in the territory (Puc, 1985). Cave animals were protected in 1951 with an ordinance on protection (Ordinance on Protection of Rare Fauna, Uradni list LRS, 29/51) which prohibited also hunting, destroying, removing or other estranging of *Proteus anguinus* and all other cave arthropoda and molluscs (Golob, 1966). Under Austria it had already protected the caves in 1928 with a special act and also established special federal office for protection of underground world (Habe, 1974).

The 4th International Speleological Congress in Ljubljana in 1965 was also very important for the protection of the underworld. In its frame a special Symposium on Cave Tourism was organised. There was given an initiative for establishing a Commission for managing and protection of caves in each national speleological association (Habe, 1974). In connection with this initiative the Executive Committee of the Association for Cave Research of Slovenia in December 1966 addressed to the Institute for the Protection of Heritage of SRS a special suggestion for cave protection. It included general protection for all caves, including those not discovered yet. All activities without consent of the Institute for Karst Research in Postojna, the Association for Cave Research of Slovenia and the Institute for the Protection of Heritage of SRS should be prohibited. Caves should be visited only by organised cavers, workers of the Institute for Karst Research in Postojna and nature conservationists, while individuals and non-speleological groups were allowed entry only under control. Owing to dripstone richness, geological, biological, hydrological and other specialities 46 caves with their surroundings, all ice caves and caves of palaeontological and archaeological importance were proposed for a special protection by the Association. Incorporation of the surroundings of caves into the proposal indicated the awareness of cavers that caves could not be protected without the protection of the surface above them and without the protection of water catchments. Linking of conditions in the cave and preservation of surroundings is most evident with the ice caves in which ice is retained all the year round at relatively low altitude. They proposed a special protection with a protection of forest around the entrance for all ice caves, especially for Velika ledena jama v Paradani and Ledena jama na Stojni. Protection of collapse dolines together with a forest at least 10 meters from the edge and protection of all karst springs and sinkholes before pollution was also proposed. Caves and other karst features should be divided among natural monuments, natural parks, protected monuments and special protected monuments, and for each of these categories a special regime would be valid. Due to the unsuitable and inoperative conservation legislation the above mentioned proposal did not go through (Habe, 1974; Simić, 1996, 1998).

Soon after that a geographer and nature conservationist Rok Golob brought out in the journal Nature Conservation a new proposal - individual protection of 56 caves according to the list

which was mainly in accordance with the list of the Association for Cave Research of Slovenia. A novelty in this new proposal was the initiative for the protection of two karst areas. Eastern Karst Park should occupy Planinsko polje, Postojna and Cerknica lake, while Western Karst Park the surroundings of Divača with Vremščica and the southern part of the surroundings of Sežana (Golob, 1966). The proposal was very important owing to the fact that the protection in the frame of natural parks gives proper possibilities for protection of karst areas as a system. On a relatively limited area, with appropriate instruments which should be given by act on protection, it is much more easy to consider all the complexity of a karst system than on the state level. Only the Eastern Park was seriously treated, later renamed Notranjski or Notranjsko - Snežniški Regional Park. The Institute for the Conservation of Natural and Cultural Heritage in 1985 prepared professional grounding for the designation of the park but because of non-reconciliation of interests of different land users the proposal fell through already at the beginning of the process (Simić, 1998). Today both parks are proposed as regional parks (Regional Park Snežnik and Karst regional Park). In the field of cave protection Golob's proposal meant a step backward because it was oriented only to the protection of the most important caves which were selected by undefined means (Simić, 1996).

In May 1973 the Association of Speleologists of Yugoslavia organised a Symposium on Cave Protection and Cave Tourism and there was proposed again the protection of the existent speleological objects. In connection with this a Symposium the Commission for Cave Protection and Cave Tourism of the Speleological Association of Slovenia was proposed once again to the Institute for Conservation of Monuments of SRS a list of caves with special protection, among them 11 tourist caves, 19 endangered caves, some ice caves, caves with polluted waters, all archaeological caves and famous caves from NOB (Habe, 1974).

In 1981 the basic law in the field of nature conservation from 1970 was replaced by the Natural and Cultural Heritage Act (Ordain list SRS, 1/81, 42/86 in Ordain list RS, 26/92), which altogether discussed natural and cultural heritage, museum's activity and archives. The idea of natural heritage was introduced by Act, which originated in Convention on Conservation of World Cultural and Natural Heritage, passed in Paris 1972. Due to the very extensive contents there was no space for the specificity, and the operative instruments were also lacking (Skoberne, 1995). Once more there was a completely general law which treated seriously only outstanding objects with underground karst phenomena again only mentioned. In fact it was even less than in the first nature conservation law from the year 1922, because not even the demand for prohibition of breaking and removing dripstone proposed by Putick in 1922 was achieved. This Act was so again too general and at the same time too specific for direct protection of karst areas and so protection in practice was again limited to the outstanding caves and to the parks (Simić, 1998).

In article 2 of the Natural and Cultural Heritage Act natural heritage included explicitly also surface and underground karst features. The Act, in article 15, allows a designation of parts of heritage with a special value for outstanding natural features. A designation shall be done with the instrument of protection of a valuable natural feature which shall be adopted by the local assembly or republican assembly if there is a natural feature of great value for Slovenia (article 18 and 21). The instrument of protection contains also protection regime and development orientations. It was proved that protection regimes in the instrument of protection presented at least theoretically a good basis for protection, while the other heritage without defined protection regime was being left to declarative protection which in practice meant trust (Simić, 1990; 1998).

An advantage of this law was a foundation of the regional institutes, while its weakness from a general point of view was above all that it was not operative and depended too much on the good will of investors and local administrative bodies (Skoberne, 1989, 1995).

The act on Spatial Planning which was enacted in 1984 (Uradni list RS, 18/84) was also a general law, because planned decisions were not based upon scientific and professional comprehension but there were too much accepted »on trust« due to lack of knowledge, time, money, and understanding. Despite all this, considered features and areas of natural heritage became obligatory for activities affecting nature in the republic plan. In the level of local autonomy, communities should accept local conditions (Hlad, 1998).

Endeavours for karst conservation did not attain more important legislation solutions, neither with an eventual complete law on general protection of karst areas nor with law on cave protection.

### **CURRENT SITUATION IN THE FIELD OF CONSERVATION OF KARST AREAS AND CAVES**

With the independence of Slovenia and its incorporation into the European integration, a progress in environment and nature conservation legislation could be seen. In 1993 the Environmental Protection Act took effect and had an importance as the major law which deals with questions of interaction of people with other parts of the environment. The law and regulations referred to it contain some good instruments about water pollution problems that are based on the principle that consequences costs of polluting water are paid by the causer. A system of environmental protection was established with the Environmental Protection Act which at the same time included also the field of nature conservation with no details on karst conservation.

In 1999 the Nature Conservation Act entered into force which also does not include general protection regimes for karst conservation but enables a good way of protecting karst areas also in the frame of the protected areas.

On the basis of the Natural and Cultural Heritage Act (valid till 1999) with local ordinances on protection of outstanding natural features, 190 caves were individually protected, among them nine cave systems with more than one cave or entrance. Individually protected therefore is only 2.6 % of all the known caves in Slovenia. To these caves protected with ordinances we have to add also caves on protected areas. On protected areas are altogether situated 804 caves from which 20 are already individually protected. Thus are protected only 13.2 % of caves, either individually (as the outstanding natural features) or in the frame of national, regional and landscape parks.

Not just the low number of protected caves is alarming but Simić (1998) also warns about the fact that the list of designated objects do not accord with the list of the most important and the most endangered caves. Local communities mainly protected only caves where there were no opposing interests. Beside this there was a contradiction because there was no designation on the republic level due to decision that the protection had to be put into force exclusively on local level. So Škocjan caves were protected only with a local ordinance up to November of 1996 but nevertheless were placed in the List of the World Natural Heritage by UNESCO.

Already the mentioned extensive topics of Natural and Cultural Heritage Act, did not deal with the specific field of the cave protection in detail, therefore even breaking and removing of



flowstones were prohibited only indirectly as damaging of a heritage. A deficiency of this act were also some other questions (ownership of caves, status of managers, guiding in non tourist caves, ...). Due to legally undefined minimal standards which each cave should fulfil for achievement of status of tourist cave in Slovenia everyone can deal with managing of caves for tourist visit, also on completely non-professional bases. This situation is reflected also in the condition of some »tourist« caves because most of these activities are achieved without proper documentation and research of effects (Simić, 1996).

Caves are, according to the Environmental Protection Act (1993, 1996) as undeveloped parts and components of ecosystems, a natural public good in public property which is equally accessible to all. This Act also determines that a natural public good is in ownership of the Republic or the local authorities and therefore not of a physical person (article 5 and 16).

A decree on the Protection of Endangered Animal Species due to rarity, changes in the environment, natural decreasing of populations or influence of man, defines the methods of dealing with endangered animal species and as an outstanding natural feature protects all animal species which permanently live in caves or underground waters (real cave animals). Protected animal species are forbidden to be chased, killed, poisoned, sold, bought or donated, exported or carried abroad and intentionally disturbed in their natural environment. In the habitat of protected species it shall not be allowed to introduce new species which could endanger animals of protected species.

In the procedure of enforcing, there is still an Act on Cave Protection which had first proceedings already in 1996 and which designation is necessary for stopping degradation processes in the karst underground. The fact that, except in rare protected caves, there is no legal prohibition of removing dripstone from caves says a great deal. The first proposal of law emphasises the importance of protection and use of underground caves (also tourist) and the importance of determination of a general protection regime for all caves.

In the field of water legislation, the Waters Act from 1981 is still in force with latest amendments which enable the protection of water resources for drinking water, while its faultiness is that there are no definite regulations about the methods of protection and defining protection regimes. Therefore local communities passed ordinances on protection of water resources with no uniform criteria. Furthermore there was a problem of a contradiction with administrative borders which did not coincide with the protection zones that were based on the catchment areas. Data on protection of water resources in public use with ordinances on protection from 1993 (Kranjc, S., 1995) show that only a low (40 %) proportion of water resources was protected. After 1993 there have been some more ordinances on protection passed but they were actually for the same water resources on the territory of new local communities. We have to stress also the fact that numerous local waterworks are not checked at all. For a considerable number of sources the proposals and professional grounding for protection were prepared but only a few of them got legal protection. Even less settled is the protection of potential water resources which are actually protected only in protected areas of parks. The reason for this situation is a difficult constant implementation of protection measures because there are often exacting activities in human work. Due to the difficulties in implementation of protected measures also in some legally protected sources protection is not being entirely executed (Prestor et al., 1998).

In process of passing is a new Waters Act which will provide better instruments for protection of karst underground water, and will remove the defectiveness of the current law with methodolo-

gies and instructions for determination of protected areas. The proposed act is based on the concept of sustainable development and is placed in the general frame of the Environmental Protection Act.

## **KARST AND CAVE CONSERVATION WITHIN PROTECTED AREAS**

The nature conservation act, which took effect on July 15, 1999, divides protected areas into small protected areas which include a natural monument, strict nature reserves, and large protected areas, which are national, regional or landscape parks (Article 53). In Slovenia in the year 1981 entered into force the Act on the Triglav National Park, by which there was protected altogether 83807 hectares of almost entirely karst landscape with a number of karst phenomena, including 586 caves (7.9 % of all known caves). The Act has especially for the inner part of the national park, protection regimes with enough strict restrictions, which at least theoretically enable the conservation of almost the entire west part of the Julian Alps as a united system (Simić, 1998). With the area of the Triglav National Park there is thus protected 9.3 % of karst. Due to the demand that nature in its original state is present in the major portion of a national park, there is little possibility for establishing another national park (Simić, 1995).

For karst areas especially convenient are the regional parks, where large portions of nature in its original state are interwoven with parts of nature where human influence is relatively large but in harmony with it. Generally these parks are of larger extent, which is in the karst areas good for protection of karst water resources, because the hinterlands of karst springs are normally rather extensive. According to the Nature Conservation Act regional parks have well defined instruments for conservation of areas. Every regional park shall have a well-conceived management plan and its own manager. The management plan shall have both developmental and nature conservation orientations, while development and protection is discussed from the point of view of different activities, which form the area. Intersector reconciliation is due to the connection of karst as a system a necessary base for appropriate and effective conservation. The development has to be directed in a way that people living in a protected area shall maintain a typical cultural landscape, and at the same time feel at home there.

The regional park has been used as a protected area category on the karst landscape only on a small territory of 400 hectares, around the Škocjan caves, which entered into force with the Škocjanske jame Regional Park Act in the year of 1996.

*Map 1: Cave protection in Slovenia (on the page 153).*

*Legend:*

*Zavarovane jame - Protected caves*

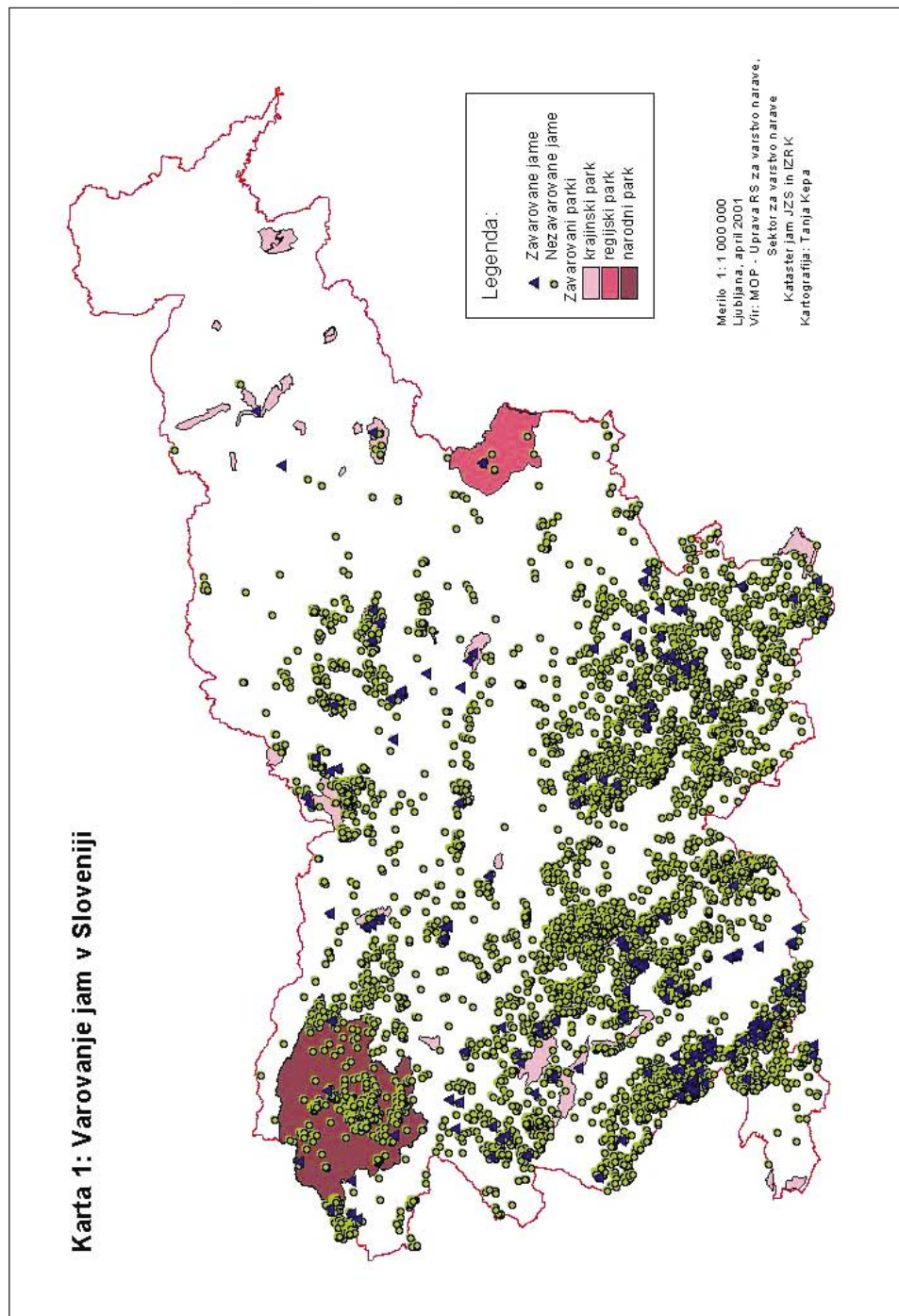
*Nezavarovane jame - Unprotected caves*

*Zavarovani parki - Protected parks*

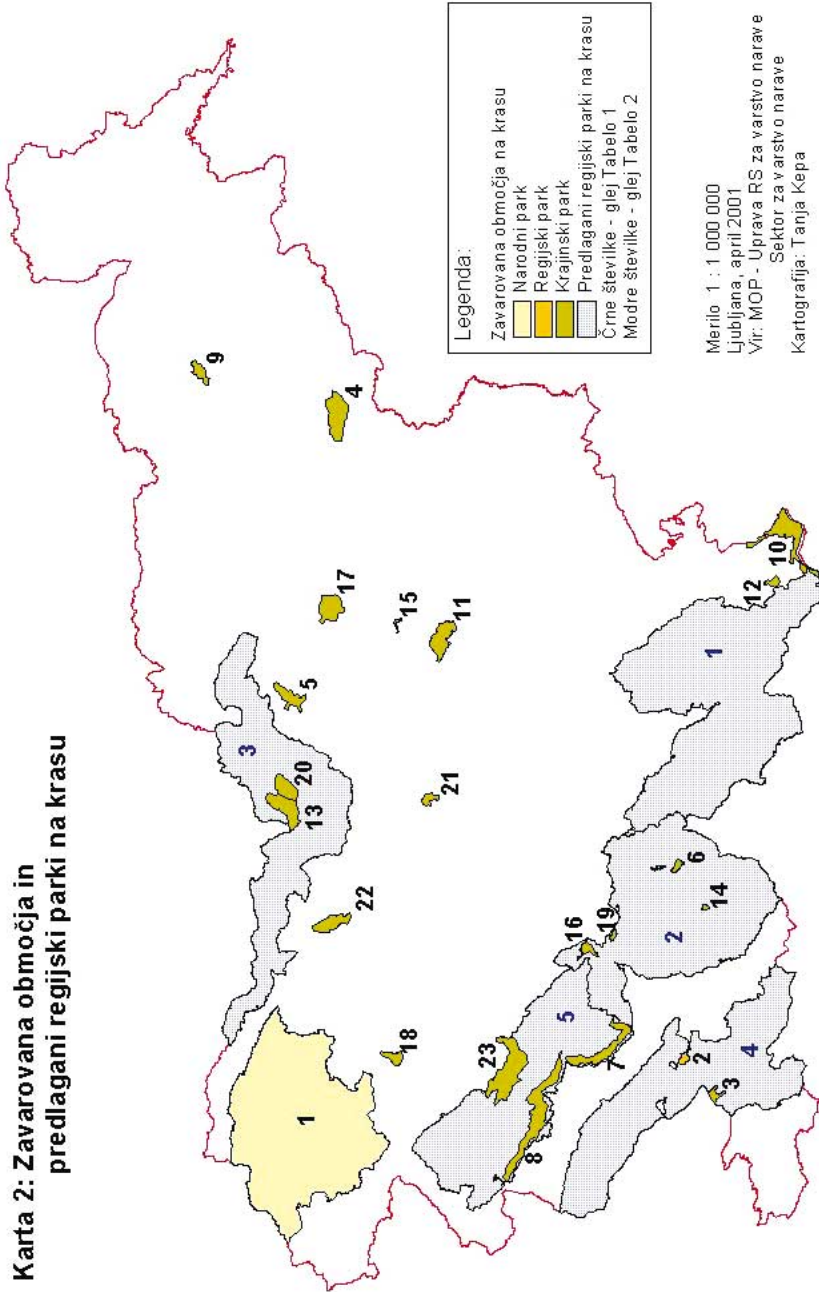
*krajinski park - landscape park*

*regijski park - regional park*

*narodni park - national park*



**Karta 2: Zavarovana območja in predlagani regijski parki na krasu**



All protected areas where predominate karst type of relief can be seen in table 1, while proposed regional parks for protection are in table 2. Besides already mentioned national and regional parks there are also 21 landscape parks on the karst areas of Slovenia, the most extensive among them being Južni obronki Trnovskega gozda Landscape Park. If we suppose that all the above-mentioned protected areas are situated completely on karst relief, in total they occupy an area 1189.89 km<sup>2</sup>, which is only 13.2 % of all karst in Slovenia. Real estimation is a bit lower due to some other types of relief present inside the karst areas.

All protected areas in Slovenia (the Triglav National Park, the Kozjansko Regional Park, the Škocjanske jame Regional Park and 40 landscape parks) occupy an area of 1521.13 km<sup>2</sup>. Otherwise a low part of protected areas of Slovene karst landscape, at the same time this is as much as 78.2 % of all protected areas in the state which indicates the great nature conservation value of karst. For the last statement speaks also the fact that the Škocjan caves have been accepted as the only Slovene locality in the register of the World Natural Heritage of UNESCO, and also in the Ramsar list of wetlands with international importance. According to the estimation of karst conservation level on the base of the share of protected karst areas we have to emphasise that the real level of protection in a discrete area can be seen especially in the consideration and the implementation of prescribed protection regimes.

The main reason for a low number of protected areas within parks is the fact that till 1999 valid Natural and Cultural Heritage Act had otherwise good and very contemporary definition of the regional park, but the problem was in the lack of almost all instruments for development directions as protection goals (Simić, 1998).

Conservationists plan that they will gradually protect remaining nature conservation areas with the category of regional park and in this way reach the European average that is 20 % of protected territory. Otherwise, we shall according to the expected plans in the next years, from today's 7.4 % protected areas achieve 39 % of protected areas in all Slovenia.

Nowadays in process of establishing six regional parks, in five of which karst landscape predominates:

- Snežnik Regional Park
- Kras Regional Park, that is an enlargement of Škocjanske jame Regional Park
- Kočevje - Kolpa Regional Park
- Karavanško - kamniško - savinjski Regional Park
- Trnovski gozd Regional Park

*Map 2: Protected areas and proposed regional parks on karst (on the page 154).*

*Legend:*

*Zavarovana območja na krasu - Protected areas on karst*

*Narodni park - National park*

*Regijski park - Regional park*

*Krajinski park - Landscape park*

*Predlagani regijski parki na krasu - Proposed regional parks on karst*

*Črne številke - glej Tabelo 1 - Black numbers - see Table 1*

*Modre številke - glej Tabelo 2 - Blue numbers - see Table 2*

Table 1: Protected areas where predominate karst type of relief.  
 Tabela 1: Zavarovani naravni parki, v katerih prevladuje kraško površje.  
 Source: Ministry of Environment and physical Planning, Nature Conservation Authority of the Republic of Slovenia.  
 Vir: Ministrstvo za okolje in prostor, Uprava RS za varstvo narave.

N. ŠT.	NAME OF THE PARK IME NARAVNEGA PARKA	SURFACE POVRŠINA* (ha)	COMMUNITIES ON THE TERRITORY OF THE PARKS OBČINE NA OBMOČJU NARAVNIH PARKOV	PUBLISHED OBJAVLJENO	YEAR OF PROTECTION LETO ZAVAROVANJA
1.	Triglavski narodni park	83807	Bled, Bohinj, Bovec, Kobarid, Kranjska Gora, Tolmin	UL SRS, 17/81 UL SRS, 42/86	(1924), 1981
2.	Škocjanske jame	413	Divjača	UL RS, 57/96	1996
3.	Beka - soteska Glinščice	454	Hrpelje-Kozina	Sežana, Primorske novice - UO, 13/92	1992
4.	Boč - Donačka gora, Plešivec	2953	Rogaška Slatina, Slovenska Bistrica	Šmarje pri Jelšah, UL SRS, 35/90 Slovenska Bistrica, UL RS, 21/92	1990, 1992
5.	Golte	1440	Ljubno, Mozirje	Mozirje, UL SRS, 27/87	1987
6.	Graščinski kompleks Snežnik	338	Loška dolina	Cerknica, UL SRS, 1/87	1987
7.	Južni in zahodni obronki Nanos	2640	Postojna, Vipava	Postojna, Primorske novice - UO, 29/84 Ajdovščina, UG, 4/87	1984, 1987
8.	Južni obronki Trnovskega gozda	5163	Ajdovščina, Nova Gorica	Nova Gorica, UG, 8/85 Ajdovščina, UG, 4/87	1985, 1987
9.	Kamenščak - Hrastovec	821	Duplek	Maribor, MUV, 17/92	1992
10.	Kolpa	3608	Črnomelj	Črnomelj, UL RS, 82/98	1998

11. Kum	2200	Trbovlje	Trbovlje, UV Zasavja, 4/96	1996
12. Lahinja	391	Črnomelj	Črnomelj, Skupščinski dolenski list, 3/88; 1988, 1998 Črnomelj, Uradni list RS, 73/98	1998
13. Logarska dolina	2328	Solčava	UL SRS, 27/87	1987
14. Mašun	131	Iliška Bistrica	Iliška Bistrica, Primorske novice - UO, 6/69	1969
15. Mirzlica	291	Trbovlje	Trbovlje, UV Zasavja, 4/96	1996
16. Planinsko polje	434	Postojna	Postojna, Primorske novice - UO, 29/84	1984
17. Ponikovski kras	2078	Polzela, Žalec	Žalec, UL RS, 77/98	1998
18. Porezen - Davča	728	Cerkno, Tolmin	Tolmin, UG občin Ajdovščina, Nova Gorica, Tolmin, 5/90	1990
19. Rakov Škocjan	180	Cerknica	UL LRS, 27/49	1949
20. Robanov kot	1495	Solčava	UL LRS, 7/50 Mozirje, UL SRS, 27/87	1950, 1987
21. Spominski park revolucionarnih tradicij Domžale	509	Domžale	Uradni vestnik občine Domžale, 7/84	1984
22. Udin Boršt	1606	Kranj, Naklo, Tržič	Kranj, Tržič, UV Gorenjske, 20/85	1985
23. Zgornja Idrija	4981	Idrija	Idrija, UL RS, 11/93 Idrija, UL RS, 37/95	1993
<b>Skupaj</b>	<b>1189,89 km<sup>2</sup></b> <b>(= 13,2 %</b> <b>krasa v Sloveniji)</b>			

\*: data got with the digitalization of the parks borders from the maps (1 : 250 000) except for TNP and regional park

\*: podatki so pridobljeni z digitalizacijo meja parkov iz kart M 1 : 250000, razen pri TNP in regijskem parku



Table 2: Proposed regional parks where predominate karst type of relief.  
 Tabela 2: Predlagani regijski parki, v katerih prevladuje kraško površje.  
 Source: Ministry of Environment and physical Planning, Nature Conservation Authority of the Republic of Slovenia.  
 Vir: Ministrstvo za okolje in prostor, Uprava RS za varstvo narave.

N ŠT.	NAME OF REGIONAL PARK IME REGIJSKEGA PARKA	SURFACE POVRŠINA* (km <sup>2</sup> )	COMMUNITIES ON THE TERRITORY OF THE PARKS OBČINE NA OBMOČJU PARKOV	PREDVIDENA RAZGLASITEV
1.	Kočevsko - Kolpa	1048	Novo mesto, Žužemberk, Bloke, Ribnica, Sodražica, Dolenjske toplice, Kočevje, Loški potok, Semič, Črnomelj, Osilnica, Kostel	2001
2.	Snežniški regijski park	878	Logatec, Cerknica, Postojna, Bloke, Sodražica, Pivka, Loška dolina, Loški potok, Ilirska Bistrica	2001
3.	Karavansko - Kamniško - Savinjski regijski park	803	Ravne na Koroškem, Prevalje, Slovenj Gradec, Mežica, Kranjska gora, Črna na Koroškem, Jesenice, Šoštanj, Solčava, Tržič, Luče, Žirovnica, Jezersko, Radovljica, Ljubno, Kamnik, Preddvor, Kranj, Gornji grad, Cerklje na Gorenjskem	še ni osnov za zavarovanje
4.	Kraški regijski park	687	Nova Gorica, Ajdovščina, Miren-Kostanjevica, Komen, Sežana, Divača, Pivka, Ilirska Bistrica, Hrpolje-Kozina, Koper	2003
5.	Tmovski gozd	595	Tolmin, Kanal, Nova Gorica, Idrija, Logatec, Ajdovščina, Vipava, Postojna	še ni osnov za zavarovanje
<b>ALL TOGETHER / SKUPAJ</b>		<b>4011 km<sup>2</sup></b> <b>(44.6 % of karst)</b>		

\*: data got with the digitalization of the parks borders from the maps (1 : 25 000)

\*: podatki so pridobljeni z digitalizacijo meja parkov iz kart M 1 : 25000



With the establishment of five proposed regional parks on the karst landscape there will be protected altogether almost 60 % of Slovene karst. The nearest to establishment is Snežnik Regional Park which has been prepared in the frame of Program MATRA of Dutch government a project named »Setting up a model of local support in Notranjska Regional Park« (1996 - 1999). The project started on the initiative of Notranjska Ecological Centre, and from July 1998 the following coordination was led by the Nature Conservation Authority at the Ministry of Environment and Physical Planning of the Republic of Slovenia. On the Dutch side the project was carried out by the Royal Dutch Society for Nature Conservation. In the frame of two »under« projects the fundamentals for the management and development plan were carried out which are one of the groundings for future protection. The management plan does not have only nature conservation orientations but is also distinctly developmental. The establishment of the regional park shall, besides necessary restrictions, bring above all new developmental possibilities (in the field of agriculture, tourism, services) (Ogorelec et al., 1999, p. 10).

There have been already some problems in establishing proposed regional parks, the most frequent being especially an adjustment of economical activities of local people and other users of the area to mostly strict protection regimes or restrictions.

All above mentioned laws do not contribute much to the conservation if there is no permanent and efficient inspection over individual determinations, especially over protection regimes. For all discussed laws the control is being carried out by the Inspectorate for Environment and physical Planning of the Republic of Slovenia, which started to work in January 1995.

In addition to karst conservation within protected areas there is also a great importance of conservation outside protected areas especially because of great connection of the karst system. Berginc (1996) pointed out the significance of state planning, which is an important instrument for carrying out nature protection orientations, especially because of its role in regulation of activities outside the protected areas. In the field of planning it is very important to check and reconcile the sector's plans in the meaning of nature conservation goals, orientations and guidelines. Individual sectors shall use and establish nature protection guidelines (orientations, bases and conditions for biodiversity conservation and the protection of valuable natural features) during preparation of their own sector legislation, strategies and implementation plans in the sense of sustainable development. For reinstatement of such systems we need a high level of informing people, political will and agreement that entire nature is a value (Vidic, 1996).

## CONCLUSION

Attempts to include a general protected regime for karst conservation in the Nature Conservation Act did not succeed, due to the connection and intersector position of the problem. Karst conservation cannot be solved only in the frame of nature conservation but there is a need to adjust it with individual laws on specific fields of karst (environment, water, agriculture land, forests, economic activities). Also in the future it probably cannot be expected that will come into force an integral act on karst conservation. Conservation in the frame of protected areas is in this situation the most rewarding solution. Clearly defined and legally accepted management plans of protected areas offer a good base for protection of bounded karst areas.

More attention has to be put into conservation outside the protected areas; therefore we need

to work out unified strategy of karst conservation for the whole state. Because of the great national value of karst it should be also reasonable to establish a unified institution, which would sufficiently adjust and control the protection of karst areas.

Besides the proper legislation and integral control of inspectorate of environment and physical planning, an important factor of effective conservation is also a proper documentation. The latter is based on registering and evaluating natural features and on assessment of threats. Collected data bases present the base for determination of protection methods and measures. Especially important for effective protection of karst areas are inter-sector cooperation, reconciliation of different ministries (of environment and physical planning, of agriculture, forestry and nutrition, of schools, science and sport, of economics...) and incorporation and consideration of environmental and nature conservation principles also inside the other sector laws. For protection of karst water resources we need to check their quality and implement water tracing research continually.

The very first recognition of each individual on the importance of karst conservation is in fact positive but filled with deep feelings could bring also negative (bad) solutions. Adequately informed and trained local people are the only guarantee for karst protection. Due to that, we should put as much effort as possible into raising public awareness on karst protection, training at all levels, as on building up cooperation between different sectors, scientists, local communities and non-governmental organisations who could have positive, bottom-up, influence on decision makers.

Realisation of karst conservation is a relatively long-term process; therefore the adequacy and the effectiveness of already passed and proposed laws and the establishment of new protected areas will not be proved before years and decades.

## REFERENCES

- Badiura, R., Brinšek, B., 1908: Nove jame ob Cerknškem jezeru.- *Planinski vestnik*, 6-7, 96-99, 124-126, Ljubljana
- Berginc, M., 1996: Sistem varstva narave v Sloveniji.- *Varstvo narave zunaj zavarovanih območij: zbornik mednarodne konference*, Urad RS za prostorsko planiranje, Ministrstvo za okolje in prostor, Inštitut za krajinsko arhitekturo, Biotehniška fakulteta, 181-185, Ljubljana
- Golob, R., 1966: Predlog za zavarovanje slovenskega krasa.- *Varstvo narave* 5, 29-38, Ljubljana
- Habe, F., 1974: Zaščiti podzemlja bije plat zvona!- *Proteus*, 36, 8, 361-365, Ljubljana
- Habe, F., 1975: Naloge jamarjev pri zaščiti kraškega podzemlja.- *Naše jame*, 17, 173-178, Ljubljana
- Habe, F., Kranjc, A., 1981: Delež Slovencev v speleologiji.- *Zbornik za zgodovino naravoslovja in tehnike*, 5-6, 1-93, Ljubljana
- Habe, F., 1989: Plat zvona za podzemlje.- *Slovenija 88: okolje in razvoj*. Ljubljana, Slovenska akademija znanosti in umetnosti, 95-99, Ljubljana
- Habe, F., 1995: Karst Regional Parks in Slovenia and their Ecological Problems.- *Acta carsologica*, 24, 261-265, Ljubljana
- Habič, P., 1982: Pregledna speleološka karta Slovenije.- *Acta carsologica*, 10, 5-22, Ljubljana
- Habič, P., 1989: Slovenski kras in njegovo vodno bogastvo.- *Slovenija 88: okolje in razvoj*. Slo-

- venska akademija znanosti in umetnosti, 89-94, Ljubljana
- Hlad, B., 1998: Varstvo geološke dediščine - stanje in usmeritve.- Geološka naravna dediščina: zbornik posveta. Ministrstvo za okolje in prostor, Uprava RS za varstvo narave, 12-28, Ljubljana
- Kranjc, S., 1995: Bilanca podzemnih vod R Slovenije.- Inštitut za geologijo, geotehniko in geofiziko, p. 31 (non published report), Ljubljana
- Lah, A., 1998: Voda - vodovje: poglavitni življenjski vir narave in gospodarstva.- Svet za varstvo okolja Republike Slovenije, str. 63, Ljubljana
- Ogorelec, B., Mastnak, M. (ur.), 1999: Regijski park Snežnik - Izhodišča za načrt upravljanja. Uprava RS za varstvo narave, str. 181, Ljubljana
- Peterlin, S., 1995: 75 let po Spomenici Odseka za varstvo prirode in prirodnih spomenikov pri Muzejskem društvu za Slovenijo.- 75 let Spomenice Odseka za varstvo prirode in prirodnih spomenikov. Uprava RS za varstvo narave, 17-20, Ljubljana
- Piskernik, A., 1965: Iz zgodovine slovenskega varstva narave.- Varstvo narave, 2-3, 59-74, Ljubljana
- Prestor, J., Kranjc, S., 1998: Hidrogeologija in varstvo okolja/narave.- Geološka naravna dediščina: zbornik posveta. Ministrstvo za okolje in prostor, Uprava RS za varstvo narave, 53-59, Ljubljana
- Puc, M., 1985: Varstvo jam pri nas.- Naše jame, 27, 3-4, Ljubljana
- Simić, M., 1990: Varstvo naravne in kulturne dediščine in problematika varovanja turističnih jam v Sloveniji.- II. Jugoslovenski simpozij o zaščiti krasa in o turističnih jamah, Komisija za zaščito krasa in turistične jame pri Jamarski zvezi Jugoslavije, 60-62, Sežana
- Simić, M., 1996: Prispevek k poznavanju zgodovine varstva jam na Slovenskem ob pripravi nove naravovarstvene zakonodaje.- Tipkopis, Uprava RS za varstvo narave, str. 11, Ljubljana
- Simić, M., 1998: Naravovarstveni pogled na varstvo Krasa.- Geološka naravna dediščina: zbornik posveta. Ministrstvo za okolje in prostor, Uprava RS za varstvo narave, 35-46, Ljubljana
- Skoberne, P., 1989: Varstvo naravne dediščine v Sloveniji.- Slovenija 88: okolje in razvoj. Slovenska akademija znanosti in umetnosti, 118-121. Ljubljana
- Skoberne, P., 1995: Varstvo narave v Sloveniji.- Vesela znanost o okolju: zbornik predavanj 1993/1994, 1. del. KUD France Prešeren, 39-44, Ljubljana
- Šivic, A., 1944: Domovinski prirodni spomeniki.- Prirodoslovna izvestja, knjiga I: 189-197, Ljubljana
- Vidic, J., 1996: Naravne vrednote zunaj zavarovanih območij.- Varstvo narave zunaj zavarovanih območij: zbornik mednarodne konference. Urad RS za prostorsko planiranje, Ministrstvo za okolje in prostor, Inštitut za krajinsko arhitekturo, Biotehniška fakulteta, 197-199, Ljubljana

## SOURCES

- DARS d.d., Družba za avtoceste v Republiki Sloveniji, izpostava Ljubljana
- Kataster jam IZRK ZRC SAZU, Postojna in JZS, Ljubljana
- Kranjc, S., 1995: Bilanca podzemnih vod R Slovenije. Ljubljana, Inštitut za geologijo, geotehniko in geofiziko, 31 str. in 11 prilog

- Naredba deželne vlade za Slovenijo o varstvu redkih ali za Slovenijo tipičnih in za znanstvo pomembnih živali in rastlin in o varstvu špilj. 1921, Uradni list deželne vlade za Slovenijo, 25, 143-144.
- Odlok o razglasitvi Doline sedmerih jezer za Triglavski narodni park. 1961, Uradni list LRS, 18, 247
- Odlok o razglasitvi Krajinskega parka Kolpa. 1998, Uradni list RS, 82, 6930-6935
- Odločba o zavarovanju okolice Rakove kotline pri Rakeku na Notranjskem. 1949, Uradni list LRS, 27, 196-197
- Odločba o zavarovanju redke favne. 1951, Uradni list LRS, 29, 170
- Predlog zakona o varstvu podzemnih jam (ZVPJ). 1996, Poročevalec, 16, 65-80
- Predlog zakona o vodah (ZV). 2000, Poročevalec, 21, 3-59
- Spomenica. 1920, Glasnik Muzejskega društva za Slovenijo, 1, 1-4, B: 69-75
- Uredba o spremembah in dopolnitvah uredbe o taksi za obremenjevanje vode. 1996, Uradni list RS, 8, 621
- Uredba o spremembi uredbe o taksi za obremenjevanje vode. 1995, Uradni list RS, 44, 3501-3502
- Uredba o vrstah posegov v okolje, za katere je obvezna presoja vplivov na okolje. 1996, Uradni list RS, 66, 5498-5507
- Uredba o taksi za obremenjevanje vode. 1995, Uradni list RS, 41, 3215-3218
- Uredba o zavarovanju ogroženih živalskih vrst. 1993, Uradni list RS, 57, 2851-2854
- Zakon o dopolnitvi zakona o vodah. 2000, Uradni list RS, 52, 6948
- Zakon o naravni in kulturni dediščini. Uradni list SRS, 1981, 1, 16-27; 1986, 42, 2900-2901; 1990, 8; Uradni list RS, 1992, 26, 1945
- Zakon o narodnih parkih. 1959, Uradni list LRS, 6, 30-31
- Zakon o ohranjanju narave (ZON). 1999, Uradni list RS, 56, 7146-7175
- Zakon o potrditvi in spremembah zakona o zaščiti kulturnih spomenikov in prirodnih znamenitosti. 1946, Uradni list DFJ, 81
- Zakon o regijskem parku Škocjanske jame. 1996, Uradni list RS, 57, 4761-4767
- Zakon o Triglavskem narodnem parku. 1981, Uradni list SRS, 17, 1367-1374; 1986, 42, 2900
- Zakon o urejanju prostora. 1984, Uradni list RS, 18, 1127-1133
- Zakon o varstvu kulturnih spomenikov in naravnih znamenitosti. 1959, Uradni list LRS, 22
- Zakon o varstvu kulturnih spomenikov in prirodnih znamenitosti. 1948, Uradni list LRS, 23
- Zakon o varstvu narave. 1970, Uradni list SRS, 7, 76-80
- Zakon o varstvu okolja (ZVO). 1993, Uradni list RS, 32, 1750-1769; 1996, Uradni list RS, 1, 5
- Zakon o varstvu redkih ali za Slovenijo tipičnih in za znanstvo pomembnih živali in rastlin in o varstvu špilj na področju Pokrajinske uprave za Slovenijo. 1922, Službene novine Kraljevine SHS, 238, priloga XXXII
- Zakon o vodah. 1981, Uradni list SRS, 38, 2308-2320; 1986, Uradni list SRS, 29, 2040; 1991, Uradni list RS, 15, 493-494

## VAROVANJE KRASA V SLOVENIJI

### Povzetek

Kras zavzema 44 % površine Slovenije, poleg samega obsega pa je njegov pomen predvsem v veliki vrednosti krasa kot naravne vrednote ter ekonomski kvaliteti bogatih zalog kraških podzemnih voda. Značilnost kraškega sveta so številni kraški pojavi, med katerimi izstopajo predvsem podzemne jame, ki po Inventarju najpomembnejše naravne dediščine v Sloveniji predstavljajo kar četrtno najbolj pomembnih objektov naravne dediščine v Sloveniji. Kraški izviri prispevajo 43 % vodnih virov k oskrbi s pitno vodo v Sloveniji, hkrati pa naš kras hrani kar tri četrtine vseh voda, ki so dosegljive v daljših sušnih obdobjih.

Kras zlasti v dobi vsestranskega ekonomskega in urbanega razvoja vse bolj ogrožajo različne dejavnosti, predvsem uporaba naravnih in umetnih gnojil, skladiščenje in prevažanje kmetijskih odpadkov ter problemi velikih živinorejskih farm, spremembe v rabi tal, neurejeno odtekanje neočiščenih komunalnih in industrijskih odpadkov, nekontrolirano odlaganje odpadkov (okoli 20 % onesnaženih jam), različni gradbeni posegi (165 kilometrov avtocest bo potekalo po krasu) in nenadni izlivi nevarnih snovi ob prometnih in industrijskih nesrečah.

Velika pomembnost krasa kot kompleksnega sistema, njegova velika ranljivost in prikazana vse večja ogroženost narekujejo nujno in učinkovito varstvo kraškega površja, podzemlja in voda.

Pregled zakonodaje na področju okolja, narave in voda kaže na nizko stopnjo varovanja krasa, saj je zakonsko zavarovanih le 40 % kraških vodnih virov v javni uporabi. Z občinskimi odloki o zavarovanju naravnih znamenitosti je poimensko zavarovanih 2,6 % vseh znanih jam Slovenije, pravnega varstva pa so jame deležne tudi v okviru zavarovanih območij, tako da skupni delež zavarovanih jam znaša 12 %. Kras v Sloveniji je zavarovan v okviru Triglavskega narodnega parka, regijskega parka Škocjanske jame in 21 krajskih parkov. Skupna površina zavarovanih območij na krasu je 1190 km<sup>2</sup>, kar je le 13 % vsega krasa v Sloveniji. Kar 70 % tako varovanega krasa predstavlja visokogorski kras Triglavskega narodnega parka. Sicer nizek delež zavarovanih območij slovenskega krasa pa hkrati pomeni skoraj 80 % vseh zavarovanih površin države, kar upravičeno poudarja njegov velik naravovarstveni pomen. Za slednje govori tudi podatek, da so Škocjanske jame kot edina slovenska lokaliteta uvrščene na seznam svetovne naravne dediščine pri UNESCO, pa tudi na Ramsarsko listo mokrišč mednarodnega pomena.

Ob oceni stanja varovanja krasa na podlagi deleža zavarovanih kraških območij je pomembno poudariti, da se resnična stopnja zavarovanja v konkretnem prostoru kaže predvsem v upoštevanju in izvajanju predpisanih varstvenih režimov.

Z osamosvojitvijo Slovenije in njenim vključevanjem v evropske integracijske tokove se kaže napredek tudi v okoljski zakonodaji. Leta 1993 sprejeti Zakon o varstvu okolja ima pomen krovnega zakona, ki ureja vprašanja interakcije človeka z drugimi deli okolja. Zakon in njegovi podzakonski predpisi vsebujejo nekatere dobre instrumente glede vprašanja onesnaženja voda, ki temeljijo na načelu, da stroške posledic obremenitev voda plača povzročitelj. Z Zakonom o varstvu okolja je bil vzpostavljen sistem varstva okolja, ki je hkrati pojmovno zajel tudi varstvo narave, ne spušča pa se v področje varovanja krasa.

Leta 1999 je bil sprejet Zakon o ohranjanju narave, ki prav tako nima vgrajenih splošnih varstvenih režimov za varstvo krasa, vendar pa omogoča dobre načine varovanja tudi kraških območij v okviru zavarovanih območij. Za kras so posebej primerni regijski parki, kjer gre navad-

no za relativno velike območne enote, kar je pri krasu ugodno s stališča varovanja vodnih virov, saj so zaledja kraških izvirov navadno precej obsežna. Poleg tega naj bi bili načrti upravljanja, ki jih morajo imeti regijski parki, zasnovani tako naravovarstveno kot razvojno, pri čemer varstvo in razvoj obravnavajo z vidika različnih dejavnosti, ki oblikujejo prostor. Medsektorsko usklajevanje je zaradi povezanosti krasa kot sistema nujna osnova za ustrezno in učinkovito varstvo.

Izboljšanje stanja se obeta z razglasitvijo petih predlaganih regijskih parkov na krasu, s čemer bo skupaj zavarovanega skoraj 60 % slovenskega krasa. Večjo pozornost je v prihodnje potrebno nameniti tudi varstvu izven zavarovanih območij, za kar bi bila potrebna izdelava enotne strategije varstva krasa za vso državo. Glede na velik nacionalni pomen krasa bi bila smiselna tudi ustanovitev enotne ustanove, ki bi primerno usklajevala in nadzorovala varstvo kraških območij.

Žal še vedno ni prišlo do sprejetja Zakona o varstvu podzemnih jam, ki je imel prvo obravnavo že v letu 1996 in katerega razglasitev je nujna za zaustavitev procesov degradacije v kraškem podzemlju. Veliko pove že dejstvo, da razen v redkih zavarovanih jamah sedaj ni zakonsko prepovedano niti odnašanje kapnikov iz jam. Prvi predlog zakona poudarja pomen ureditve varstva in rabe (tudi turistične) podzemnih jam ter določitev splošnega varstvenega režima za vse jame.

Na področju vodne regulative je še vedno v veljavi Zakon o vodah iz leta 1981 s kasnejšimi dopolnitvami, ki omogoča zavarovanje virov pitne vode, njegova pomanjkljivost pa je predvsem ta, da ni določenih natančnih predpisov o načinu zavarovanja ter določevanju varstvenih režimov. V postopkih sprejemanja je nov zakon o vodah, ki bo uvedel boljše mehanizme za varovanja kraške talne vode, preko metodologij in pravilnikov pa bo skušal odpraviti pomanjkljivosti obstoječega zakona. Predlagani zakon izhaja iz koncepta trajnostnega razvoja in se uvršča v splošni okvir Zakona o varstvu okolja.

Poleg ustrezne zakonodaje in celovitega nadzora inšpektorata za okolje in prostor je pomemben dejavnik učinkovitega varstva tudi ustrezna dokumentacija, ki temelji na evidentiranju in vrednotenju naravnih pojavov ter ugotavljanju ogroženosti le-teh. Zbrane baze podatkov so podlaga za določitev varstvenih metod in ukrepov. Za učinkovito varstvo kraških območij je še posebej pomembno medresorsko sodelovanje, usklajevanje različnih ministrstev (za okolje in prostor, za kmetijstvo, gozdarstvo in prehrano, za šolstvo in šport, za turizem in malo gospodarstvo,...) in vključevanje ter upoštevanje okoljevarstvenih in naravovarstvenih načel tudi znotraj drugih sektorskih zakonov. Za varovanje kraških vodnih virov je potrebno stalno spremljanje njihove kvalitete in izvajanje sledenj podzemne vode. Vsekakor pa je pri varstvu krasa prvo zavedanje vsakega posameznika, kako pozitivno, žal pa velikokrat tudi negativno prispeva k reševanju teh problemov. Ustrezno obveščen in osveščen prebivalec je prvo zagotovilo za dejansko varstvo krasa. Zato bi bilo potrebno več poudarka dajati ozaveščanju javnosti, izobraževanju na vseh stopnjah, pa tudi sodelovanju in dopolnjevanju med sektorji, znanstveniki, lokalnimi skupnostmi ter drugimi družbenimi in nevladnimi skupinami, ki lahko »od spodaj« vplivajo na tiste, ki imajo glavno besedo pri odločanju.

Uresničevanje varovanja krasa je razmeroma dolgoročen proces, zato se bodo primernost in učinkovitost že sprejetih in predlaganih zakonov ter razglasitev novo zavarovanih območij pokazali šele v naslednjih letih in desetletjih.