## Information Sheet on Ramsar Wetlands

Categories approved by Recommendation 4.7 of the Conference of the Contracting Parties.

NOTE: It is important that you read the accompanying Explanatory Note and Guidelines document before completing this form.

1. Date this sheet was completed/updated:

15 January 2001

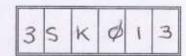
2. Country: Slovak Republic

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DO MM YY



Designation date



3. Name of wetland: Domica

(part of Domica-Baradla Cave System)

Geographical coordinates: 48° 290 N, 20° 280 E

5. Altitude: (average and/or max. & min.) 424 m (339-508 m)

6. Area: (in hectares) 621.76

Site Reference Number

7. Overview: (general summary, in two or three sentences, of the wetland's principal characteristics)
Sub-surface wetlands (permanent subterranean streams, lakes, wetlands with diverse subterranean fauna) in a part of the 25 km long cave system, the largest subterranean hydrological system of the plateau karst shared by Slovakia and Hungary. The site represents the watershed of the Domica cave system (buffer zone of the National Nature Monument, Domica cave) in SW part of the Silická Planina Mts. It is listed as a representative part of a bilateral UNESCO Biosphere Reserve and a World Cultural and Natural Heritage site in the Slovak Karst Protected Landscape Area and Aggtelek National Park.

8. Wetland Type (please circle the applicable codes for wetland types as listed in Annex I of the Explanatory Note and Guidelines document.)

marine-coastal:

A • B • C • D • E • F • G • H • I • J • K • Zk(a)

inland

L • M • N • O • P • Q • R • Sp • Ss • Tp  $\underline{Ts}$  • U • Va • Vt • W • Xf • Xp • Y • Zg •  $\underline{Zk(b)}$ 

man-made:

1 · 2 · 3 · 4 · 5 · 6 · 7 · 8 · 9 · Zk(c)

Please now rank these wetland types by listing them from the most to the least dominant:Zk(b),Ts

9. Ramsar Criteria: (please circle the applicable criteria; see point 12, next page.)

1 . 2 . 3 . 4 . 5 . 6 . 7 . 8

Please specify the most significant criterion applicable to the site:

10. Map of site included? Please tick yes √-or- no o

(Please refer to the Explanatory Note and Guidelines document for information regarding desirable map traits).

11. Name and address of the compiler of this form:

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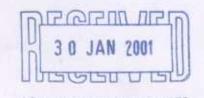
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Please provide additional information on each of the following categories by attaching extra pages (please limit extra pages to no more than 10):

12. Justification of the criteria selected under point 9, on previous page. (Please refer to Annex II in the Explanatory Note and Guidelines document).

1 - The site is a particularly good representative example of a natural wetland, characteristic of the Carpathian region; it is a particularly good representative example of a wetland which plays a substantial hydrological, biological and ecological role in the natural functioning of a major hydrological system in a trans-border position between Slovakia and Hungary; it is also a good example of a specific type of wetland - karst subterranean wetland;

2 - The site is of special value for endemic and rare plant and animal species, especially

subterranean hydrobionts.

13. General location: (include the nearest large town and its administrative region)
Southern Slovakia in the territory of the Slovenský kras Mts. (Slovak karst Mts.), Kosice Region.
District town Rožňava - 20 km N of the site.

14. Physical features: (e.g. geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; catchment area; downstream area; climate)

Geology: The area consists of light massive organodetritic limestones of wetterstein type. Dolomites occur only in a small area. Geomorphology: The Domica cave system was created in Middle-Triassic limestones of the Silica Nappe along the tectonic dislocations by corrosive and erosive activities of the subterranean rivers Styx and Domický potok in the SW margin of the Silická planina Plateau. Three evolutionary levels gradually descend 8-12 m. The lowest level is filled with gravel and clay. The entrance is situated at 339 m a.s.l. The dominant features are horizontal oval tunnels with conspicious ceiling troughs (Panenská chodba, Suchá chodba, Vstupná chodba, Diamantová plavba) and enlargements (chambers Majkov dóm, Dóm indických pagod, Hrnčiareň, Prales, Gotický dóm, Kyetnica). There is a rich flowstone filling in the cave with typical shields and drums, cascade pools (Rímske kúpele, Plitvické jazierka), onion-shaped stalactites and pagoda stalagmites. The flowstone forms also occur. Of the 25 km long system, 5.6 km is in Slovak territory (Domica Cave). Other features include the smaller caves Čertova diera and Líščia diera, Jašteričie jazierko pool and several ponors and sinkholes. Origin: Natural. Hydrology: The site includes an area which has the most significant direct impact on the cave system. There is no hydrographic network on the surface. The Domica Cave is located in the contact zone of the karstic and non-karstic area with relatively welldeveloped fluvio-karstic relief. The cave system is formed by the Styx River, flowing for 15 km in both caves (Domica-Baradla) and is genetically connected with the Čertova diera cave in Slovakia. The Styx River has a catchment area estimated at 2.3 km<sup>2</sup>, a mean annual discharge of 1.769 l.s<sup>-1</sup> and a specific subterranean runoff of 1.26 l.km2.s1. The river has several percolation and sink areas in a lateral tributary system. One of the recharge areas is the depression of the Smradl'avé jazierko Lake (0.28 km2 on surface). Others recharge areas include ponors of the Čertova diera Cave (0.62 km2) and ponors of the Kečovské údolie valley (0.56 km²). In the Domica Cave, the Domický potok River flows from the South with a catchment of 1.25 km<sup>2</sup> and a mean annual discharge of 3.82 1.s<sup>-1</sup>. The specific subterranean runoff is 1.66 l.km<sup>2</sup>.s<sup>-1</sup>. The last tributary in Slovak territory flows into the river from sink E of the cave. The river receives other tributaries from the south in Hungary in the Baradla Cave (the Acheron, the Retekág, the Török mecset). The river emerges on to the surface as a permanent spring near Jósvafő. The catchment area of the tributaries is formed by non-karstic Pliocene gravel and clays of the terra rossa type. The tributaries are oriented almost exclusively from S, except for the ponors around the Čertova diera Cave and the Kečovské údolie valley, which is caused by the contact of non-karstic and karstic areas. The hydrographical asymmetry caused by the gradient of the limestone layers to the North causes the diversion of precipitation infiltrating from the surface along the gradient of layers into the hydrographical network of the Kečovský potok brook. In the contact zone of the limestone massif and the Poltár formation, a peripheral polje, depressions, wide sinks and broadened blind valleys have been created. These depressions have only seasonal streams. Hydrogeology: The area is a part of the hydrogeological district MQ-129 - Mesozoic of the central and eastern part of the Slovak karst. The district is divided by tectonic faults into four hydrogeological sub-districts. This site is located in the SW part of the district. The determining factor is the synclinal layering of a limestone-dolomite complex on Triassic sediments of low permeability. The entire area is without a hydrographical network. It is drained to the subsurface by a system of fissures and sinkholes. The site is situated in the Kečovská hydrogeological structure lying in the W part of the tectonic unit spreading from Hungary. Water quality and chemistry: Results of sporadic chemical observations of water in the Domica Cave during 1981-1983 referred to pollution of surface and subsurface water mainly as a result of agricultural activities. Chemical pollution was projected in levels of COD - Mn, K+, NH4+, NO3+, PO4+3, and in bacteriological-biological indicators, which are manifestation of agricultural pollution. During heavy rains, 5-10% of unsoluble components could be found in the water in granular form. Climate: The Domica cave: Air temperature 10.2-11.4° C, relative humidity 95-98%. Surface: The area is situated at the border between two climatic zones. The adjacent area of the Rimavská kotlina Basin belongs to the warm climatic zone. The karst area, representing a slope of the Silická planina plateau, belongs to the moderate warm zone, the moderately wet, warm district, with cold winters. The average air temperature is 7-8° C, annual rainfall is 650-700 mm (maximum rainfall is in July - 85-95 mm, minimum is in January - 30-35 mm). The warmest month is July with an average temperature of 18-19° C. The coldest is January with a temperature of -3° C. The average air temperature during vegetation season is 15° C, and annual rainfall is 400 mm. Maximum rainfall is in June and July during the most intensive agricultural activities. The amount of 15 minutes rain can reach 150 mm.

Hydrological values: (groundwater recharge, flood control, sediment trapping, shoreline stabilisation etc)
 Groundwater recharge

Ecological features: (main habitats and vegetation types)

On the surface: The most represented are grassland habitats on limestones and dolomites (Festucetalia valesiacae, Seslerio-Festucion glaucae), with communities of rich biodiversity. Warm and dry limestone hillsides and terraces with south-facing slopes are inhabited by xero-thermophilic communities of the class Festuco-Brometea and edge-communities of xerotherm brushwoods and oak forests of the class Rhamno-Prunetea. Forest communities of the class Querco-Fagetea belong mostly to oak-hornbeam woods.

Non-forest communities: alliances Poo badensis-Potentilletum arenariae-tomasiniana, Poo badensis-Caricetum humilis, Erysimo erysimoides-Festucetum valesiacae. Edge xerotherm herb communities - class Trifolio-Geranietea. Forest communities - forest types Fageto-Quercetum, Corneto-Quercetum. Alliances: Quercetum virgilianae assoc. nova prov., Mercuriali-Tilietum, Ceraso mahaleb-Quercetum pubescentis.

17. Noteworthy flora: (indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc)

Endemic and sub-endemic species on surface: Alyssum montanum subsp. brymii (EN), Carduus collinus, Cyanus triumfettii subsp. domini, Thalictrum minus, Dianthus pontederae, Seseli osseum, Campanula sibirica subsp. divergentiformie, Melitis melissophylum subsp. carpaticum, Linum flavum, Pseudolysimachion orchideum subsp. carpaticum, Tromsdorfia maculata.

Rare and threatened species: Dracocephalum austriacum (CR), Lathyrus pannonicus (CR), Asyneuma canescens (EN), Crupina vulgaris (EN), Danthonia alpina (EN), Echium russicum (EN), Stipa pulcherrima (EN), Adonis vernalis (VU), Allium sphaerocephalum (VU), Cleistogenes serotina (VU), Cynoglossum hungaricum (VU), Draba nemorosa (VU), Iris pumila (VU), Lathyrus nissolia (VU), Ornithogalum pyramidale (VU), Platanthera bifolia (VU), Pulsatilla grandis (VU), Sempervivum marmoreum (VU), Trinia glauca (VU), Acer tataricum, Aconitum anthora, Anemone sylvestris, Cerasus mahaleb, Clematis recta, Cornus mas, Fraxinus ornus, Jurinea mollis, Lilium martagon, Linum tenuifolium, Rosa gallica, Silene longiflora.

18. Noteworthy fauna: (indicating, e.g., which species are unique, rare, endangered, abundant or biogeographically important; include count data, etc.)

Oligochaeta: Rhyacodrilus carsticus, R. falciformis; Crustacea: Niphargus tatrensis, Mesoniscus graniger, Diacyclops languidoides, Microcyclops rubellus; Arachnida: several troglophile and troglobiont species: Lepthyphantes nebulosus, Meta menardi, M. merinae, Necticus c. cellulanus, Tegenaria ferruginea, Porrhomma profundum, P. convexum, P. rosenhaueri, endemic species Necticus cellulanus affinis; Opilionida: Mitostoma chrysomelas; Acarina: Oribella cavatica, Uroovobella advena; Insecta - cave and subterranean species: Collembola: Arrhopalites slovacicus, Onychiurus troglophilus; Coleoptera: Agabus guttatus, A. bipustulatus, Hydroporus palustris, H. planus, Ouedius mesomelinus; surface species: Mantodea: Mantis religiosa, Orthoptera: Saga pedo (VU-IUCN Red List);

Amphibia: Salamandra salamandra; Reptilia: on surface: Ablepharus kitaibelii, Lacerta agilis, Coronella austriaca; Mammalia: 11 bat species, the most important is a large colony of Rhinolophus euryale.

19. Social and cultural values: (e.g. fisheries production, forestry, religious importance, archaeological site etc.)

The Domica cave was discovered on 3 October 1926 and has been opened for visitors (guided tours) since 1932. Some parts of the cave were laid out for passing and shipping on a boat, as well as for electric lighting. It is an important subject of research - geological (study of Triassic stratigraphy, calcareous algae (Diplopora) development), spelaeological, hydrological, hydrochemical, geophysical, zoological, palaeontological, archeological, etc. The entrance hall serves also as a visitors centre. The cave was inhabited by Palaeolithic man and is one of the most important archeological sites. Findings include a Neolithic settlement of material culture of eastern Linear Pottery makers and a multiphase settlement by the makers of palmy-ornamented Bukk Pottery. Remains of large mammals (e.g. Ursus spelaeus) were also found there.

## 20. Land tenure/ownership of:

(a) site

Most of the land in protective zone of the Domica Cave National Nature Monument is used by agricultural organizations (270.73 ha), state ownership is on 231 ha (mainly forests, urban land) and private ownership is on 120 ha (arable land, vinyards, orchards, grassland).

(b) surrounding area

Similar structure of land tenure/ownership

## 21. Current land use:

(a) site

The subterranean cave is used for tourism - guided tours. The surface is used partly for timber production (managed forests - 26.8 ha), most is covered by protective forests (152.1 ha). Agricultural land is used as arable land (190 ha), vinyards and orchards (2 ha), grassland (183.5 ha). There is also a road to the border crossing and a network of primitive field and forest roads.

(b) surroundings/catchment

Agricultural production, livestock grazing, forestry, hunting. The site lies in a cadastre of two villages - Kečovo (population 460) and Dlhá Ves (640). Springs surrounding the area are used as a domestic water supply.

## 22. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land use and development projects:

(a) at the site

After the Domica cave was discovered in 1926 and a lower entrance was constructed in 1930, a period of adverse effects began. The entrance was situated at the lowest point of a blind, periglacial valley of the Domický potok brook near its sinkhole. The flow rate of the stream is normally low and its water disappears into the sinkhole. During extreme precipitation the sinkhole capacity was not sufficient and it used to be stuffed and flooding resulted. In 1954 the entrance was broken and the cave was flooded. Floods were repeated until 1984, when a new entrance was built and a drainage tunnel was opened. Floods caused damage to technical facilities in the cave and its features and archeological values. At

that time problems with mismanagement of forests and agricultural land adjacent to the cave were happening (non-sustainable use of arable land, improper crop management causing soil erosion). Silt filled the cave spaces and agricultural chemicals polluted the water. Heavy rains still pollute water with chemicals (alkali, chlorides, sulphates, phosphates, nitrates etc.). Opening of the cave for tourists resulted in the construction of better walking surfaces (concrete footpath, stairs) and shipping (artificial dams). The surface features include a network of roads, a car-park near the entrance area and several buildings. These are a potential oil pollution threat.

(b) around the site

Agriculture, forestry, infrastructure - road traffic, network of forest and field roads

23. Conservation measures taken: (national category and legal status of protected areas - including any boundary changes which have been made: management practices; whether an officially approved management plan exists and whether it has been implemented)

The site is a part of a core area of the Slovenský kras Protected Landscape Area, declared in 1973 (decree of the Ministry of Culture of SR No. 110/1973 of 31 august 1973). It was designated in 1977 as UNESCO Biosphere Reserve (1 March 1973). Caves of the Slovak karst and Aggtelek were listed as a World Cultural and Natural Heritage site on 6 December 1995. The Domica cave has been protected since 1972 (decree of the Ministry of Culture No. 9279/1972-OP of 28 December 1972) with a buffer zone of 624,68 ha. According to the Slovak Act on Nature Conservation and Landscape Protection No. 287/1994, the cave is now protected in the highest category as a National Nature Monument. Two National Nature Reserves (NNR) have been designated in the area of the site: Domické škrapy (24.44 ha), protected since 1973, and Kečovské škrapy (6.61 ha), protected since 1981.

To prevent soil erosion and destruction of the Domica cave, about 42 ha of arable land was converted to grasslands around the cave in 1988. A management plan for the Domica cave was developed and adopted by the District Authority in Rožňava in 1990. A Management Plan for the Slovak part of the World Heritage site was developed and approved by the Ministry of Environment of the Slovak Republic in 1996. A new proposal for the National Nature Monument Domica Cave was developed in 1999 and its area (621.7613 ha) and border is the same as the Ramsar site. The Administration of the Slovenský kras PLA and the Administration of Slovak Caves work together to protect the transborder system with partners in the Aggtelek National Park in Hungary. In 1998 an agreement on partnership as a part of the EUROPARC Expertise Exchange international project was signed. It is a part of the Important Bird Area in Europe No. 025 Slovak karst (KAŇUCH 2000).

24. Conservation measures proposed but not yet implemented: (e.g. management plan in preparation; officially proposed as a protected area etc.)

A land-use plan for the zone Domica - Aggtelek was developed in 1977, but it has not been implemented. In 1991, a long-term management plan for the Slovenský kras Protected Landscape Area was made, but it has not been officially adopted. A scheme for a new protective zone of the Domica Cave National Nature Monument was prepared for adoption in 1998-1999.

25. Current scientific research and facilities: (e.g. details of current projects; existence of field station etc.)

During 1986-1990, a special complex research project of the Slovensky kras Protected Lag

During 1986-1990, a special complex research project of the Slovenský kras Protected Landscape Area was coordinated by the Nature Conservancy. Research in the Domica Cave "Hydrochemical and Hydrological Monitoring in the Domica Cave" was done in 1995 as a part of the PHARE project Conservation of Natural Resources in Karst, implemented by the Slovak Environment Agency. It was aimed at determining the movement of pollution in the cave watercourse and possibilities for its reduction or accumulation. During this project measuring equipment for measurement of basic indexes of water quality and continuous survey of parameters of hydrochemical regime was installed. Continuation of the monitoring in 1996-1998 was aimed at characterizing the hydrological regime of water in the cave system Čerova diera - Domica, to specify possible changes in the Styx River discharge and to localize water leakage. In 1993 the measurement and analysis of qualitative coefficients of the air, water and soils in the cave was conducted. In 1996 there was a geophysical survey in selected parts of the cave of the cave sediment thickness and the possible continuation of the

cave system. In 1997-1998 research of aquatic fauna of the area was done. In 1998 an ombrometer was installed near the entrance of the Domica cave to measure climate outside the cave.

26. Current conservation education: (e.g. visitors centre, hides, information booldet, facilities for school visits etc.)
The Domica cave is used as an educational site and the entrance area serves as a visitors centre.
Information booklets on the site and the karst were produced by the Administration of Slovak Caves and the Administration of the Slovenský kras Protected Landscape Area. A transborder nature trail around the site with information panels and text guide was built in 1986 with the starting point on the Slovak-Hungarian border Domica-Aggtelek.

27. Current recreation and tourism: (state if wetland is used for recreation/tourism; indicate type and frequency/intensity)

The accessible passages of the Domica Cave reach 1315 m, of which 140 m is cruising on a boat. The cave has 252 electric lamp-lights. The new entrance hall was built in 1981-1984. The cave is opened 11 months a year (except for January) and the peak attendance is during the summer (June-August 5,000-7,000 visitors a month). The annual number of tourists using guided tours has varied during the last few years between 26,957 (in 1996) and 23,464 (1998) and its trend is decreasing.

28. Jurisdiction: (territorial e.g. state/region and functional e.g. Dept of Agriculture/Dept. of Environment etc.)
Ministry of the Environment, Department of Nature and Landscape Protection, Bratislava
Ministry of Agriculture, Forestry and Water Management, Bratislava
Regional Office, Department of Environment, Department of Forestry and Water Management,
Košice

District Office Rožňava

Municipal Bureaus Kečovo and Dlhá Ves

29. Management authority: (name and address of local body directly responsible for managing the wetland)

Slovak Caves Administration, Hodžova 11, 031 01 Liptovský Mikuláš

Slovak State Nature Conservancy, Centre for Nature and Landscape Protection, Lazovná 10, 974 01 Banská Bystrica,

Slovak Sate Nature Conservancy, Administration of the Protected Landscape Area and Biosphere Reserve Slovenský kras, Biely Kaštieľ 188, 049 51 Brzotín

30. Bibliographical references: (scientific/technical only)

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