

# Information Sheet on Ramsar Wetlands (RIS) – 2006 version

Available for download from [http://www.ramsar.org/ris/key\\_ris\\_index.htm](http://www.ramsar.org/ris/key_ris_index.htm).

*Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8<sup>th</sup> Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9<sup>th</sup> Conference of the Contracting Parties (2005).*

## Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2<sup>nd</sup> edition, as amended by COP9 Resolution IX.1 Annex B). A 3<sup>rd</sup> edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

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### 1. Name and address of the compiler of this form:

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DD MM YY

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Designation date

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Site Reference Number

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### 2. Date this sheet was completed/updated:

01 June 2006

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### 3. Country:

Hungary

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### 4. Name of the Ramsar site:

The precise name of the designated site in one of the three official languages (English, French or Spanish) of the Convention. Alternative names, including in local language(s), should be given in parentheses after the precise name.

Csongrád-bokrosi Sóstó sodic-alkaline pans

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### 5. Designation of new Ramsar site or update of existing site:

This RIS is for (tick one box only):

- a) Designation of a new Ramsar site ; or  
b) Updated information on an existing Ramsar site

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### 6. For RIS updates only, changes to the site since its designation or earlier update:

#### a) Site boundary and area

The Ramsar site boundary and site area are unchanged:

or

If the site boundary has changed:

- i) the boundary has been delineated more accurately ; or  
i) the boundary has been extended ; or

iii) the boundary has been restricted\*\*

and/or

**If the site area has changed:**

i) the area has been measured more accurately ; or

ii) the area has been extended ; or

iii) the area has been reduced\*\*

\*\* Important note: If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

**b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:**

No major change has occurred in the area since designation.

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**7. Map of site:**

Refer to Annex III of the *Explanatory Note and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

**a) A map of the site, with clearly delineated boundaries, is included as:**

i) a hard copy (required for inclusion of site in the Ramsar List): ;

ii) an electronic format (e.g. a JPEG or ArcView image) ;

iii) a GIS file providing geo-referenced site boundary vectors and attribute tables ;

Maps provided upon designation.

**b) Describe briefly the type of boundary delineation applied:**

e.g. the boundary is the same as an existing protected area (nature reserve, national park etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The boundary follows the land parcel boundaries that contain the wetland and the surrounding natural habitats.

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**8. Geographical coordinates** (latitude/longitude, in degrees and minutes):

Provide the coordinates of the approximate centre of the site and/or the limits of the site. If the site is composed of more than one separate area, provide coordinates for each of these areas.

46°45'N 20°00'E

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**9. General location:**

Include in which part of the country and which large administrative region(s) the site lies and the location of the nearest large town.

The site is located in middle part of Hungary in the eastern part of Danube-Tisza Interfluvial area, nearby River Tisza basin. The major part of the site belongs to the Bács-Kiskun county, and southern part belongs to Csongrád county. The site lies close to the villages of Tiszaalpár-Bokros village. The nearest large town is the capital of county Kecskemét.

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**10. Elevation:** (in metres: average and/or maximum & minimum)

average 89 m above Baltic sea level

**11. Area:** (in hectares) 770 ha

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**12. General overview of the site:**

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

In limnological terms these very shallow intermittent waters are not lakes but rather a characteristic type of wetlands with physical and ecological features similar to coastal pan ecosystems. The sodic-alkaline pans, marshes, and meadows of the Danube-Tisza Interfluvium area give a good special example of continental saline ecosystems and are characteristic of the Pannonic biogeographic region. It hosts several noteworthy plant species and communities, including e.g. the regionally endemic *Aster tripolium Pannonicus*. The site is a very important area for waterbirds during both breeding and migration season. The site includes two isolated major pools, the bigger one name is Nagy-Sóstó, the smaller one name is Kis-Sóstó.

### 13. Ramsar Criteria:

Tick the box under each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11). All Criteria which apply should be ticked.

1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9

### 14. Justification for the application of each Criterion listed in 13 above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

**Crit 1:** The wetland comprises a wide range of unique types of Pannonic calcareous-sodic saline lake habitat types (Habitats Directive Annex I: Pannonic salt steppes and salt marshes), furthermore, specific saline aquatic ecosystems living in these habitats. Besides these, there are many typical species that characterize the saline grasslands (“puszta”). Such saline lakes and grasslands with the representative saline communities are fairly rare in Central Europe. This also underlies the international importance of the wetland. The grasslands around the lake also support the different stages of vegetation from salt berms till closed saline swards and reedbeds along the water edges. Reedbeds form contiguous units as well.

**Crit 2:** The site is home to rare, sensitive and threatened species and communities in the Pannonic biogeographic region, including Fire-bellied Toad *Bombina bombina*, Warty Newt *Triturus cristatus*, Bittern *Botaurus stellaris*, Ferruginous Duck *Aythya nyroca*, Spoonbill *Platalea leucorodia*, Saker Falcon *Falco cherrug*, European otter *Lutra lutra* and Soudanese *Citellus citellus*, and *Cirsium brachycephalum* included on Annex II of the Habitats Directive.

#### *Amphibians:*

*Bombina bombina* LC IUCN Red list + Annex II Habitat Directive  
*Triturus cristatus* LC IUCN Red list + Annex II Habitat Directive

#### *Breeding birds:*

*Acrocephalus melanopogon* LC IUCN Red list + Bird Directive Annex II  
*Ardea purpurea* LC IUCN Red list + Bird Directive Annex II  
*Egretta alba* Annex I Bird Directive  
*Ixobrychus minutus* LC IUCN Red list + Annex I Bird Directive  
*Platalea leucorodia* LC IUCN Red list + Annex I Bird Directive  
*Aythya nyroca* NT IUCN Red list + Annex I Bird Directive  
*Botaurus stellaris* LC IUCN Red list + Annex I Bird Directive  
*Circus aeruginosus* LC IUCN Red list + Annex I Bird Directive  
*Porzana parva* LC IUCN Red list + Annex I Bird Directive  
*Porzana porzana* LC IUCN Red list + Annex I Bird Directive  
*Himantopus himantopus* LC IUCN Red list + Annex I Bird Directive  
*Recurvirostra avosetta* LC IUCN Red list + Annex I Bird Directive  
*Philomachus pugnax* LC IUCN Red list + Annex I Bird Directive

*Chlidonias hybridus* LC IUCN Red list + Annex I Bird Directive  
*Chlidonias niger* LC IUCN Red list + Annex I Bird Directive  
*Coracias garrulus* LC IUCN Red list + Annex I Bird Directive  
*Lanius minor* LC IUCN Red list + Annex I Bird Directive

*Migrating birds:*

*Ciconia nigra* LC IUCN Red list + Annex I Bird Directive  
*Haliaeetus albicilla* NT IUCN Red list + Annex I Bird Directive  
*Falco cherrug* EN IUCN Red list  
*Tringa glareola* LC IUCN Red list + Annex I Bird Directive

*Wintering birds:*

*Circus cyaneus* LC IUCN Red list + Annex I Bird Directive

*Mammals :*

*Citellus citellus* VU IUCN Red list + Annex II Habitat Directive  
*Lutra lutra* NT IUCN Red list + Annex II Habitat Directive

**Crit 3:** Moreover, due to its uniqueness, the site has an outstanding role in conservation of genetic and ecological diversity in the region. Due to the specialities of the site (chemistry, water coverage, depth of water, location) the biodiversity is high, and there are numerous rare species. At national level the site hosts priority animal and plant species. Characteristic species of the site include *Aster tripolium ssp. pannonicus* and *Puccinellia limosa*.

**Crit 4:**

The site is part of the migration route along the valley river Tisza and plays an important role as a resting, feeding and breeding site for waterfowl. The site is a natural and characteristic nesting site for significant populations of several threatened bird species (Avocet, Black-winged Stilt) in the region. Notable breeding, migrating, wintering and resident birds including in 79/409/EGK Annex I.:

*Acrocephalus melanopogon, Ardea purpurea, Aythya nyroca, Botaurus stellaris, Chlidonias hybridus, Chlidonias niger, Ciconia nigra, Circus aeruginosus, Circus cyaneus, Coracias garrulus, Egretta alba, Falco cherrug, Haliaeetus albicilla, Himantopus himantopus, Ixobrychus minutus, Lanius minor, Philomachus pugnax, Platalea leucorodia, Porzana parva, Porzana porzana, Recurvirostra avosetta, Tringa glareola*

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**15. Biogeography** (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

**a) biogeographic region:** Pannonic

**b) biogeographic regionalisation scheme** (include reference citation):

The biogeographic regionalisation scheme applied is the same used by the European Union (according to the Habitats Directive)

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**16. Physical features of the site:**

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

*Geology, hydrogeology, pedology*

Following the withdrawal and the sedimentation of the last lake, the so-called Late Miocene Lake Pannon in this region on the Great Plain, approximately 4.5 million years ago, the ancestor structures of the Danube, the ancient Tisza and the tributaries of the latter appeared. From this point on the previous lake sediment supply was replaced by river sedimentation (primarily by the Danube). Until the Günz-Minden Interglacial Episode in the Pleistocene Ice Age following Pliocene Epoch the Danube run southeast-bound towards Szeged, cutting the region in half, and supplied river sedimentation in a width of some 1000 metres. In the Günz-Minden Interglacial Episode of the Ice Age a major change occurred: with the development of the region's southwestern depression (Kalocsa depression) the Danube gradually started to drift westward by leaving its previous diagonal flow direction and took over its present north-south position. The Danube had already filled up the previous areas. River sedimentation ceased on the alluvial fan replacing these, situated east of the region, which remained higher than the Transisza region, and a thick eolic sedimentary layer were deposited on it (in the areas undisturbed by water).

This sedimentary layer consists of sand blown out of the Danube valley in the ice-free periods of the Ice Age, which was structured as a series of sand piles in the north-south direction according the dominant wind direction, as well as loess developed during the ice formation periods, their transformed (e.g. soil) varieties and sediments washed out by local precipitation.

The sediment pattern delivered by the Danube-Tisza interfluvial winds protrudes slightly east of the current Tisza route, between the river layers of the Tisza. Therefore a geological situation developed in the smaller eastern section of the region where the Tisza, through its westbound movement, entered the alluvial fan of Danubian origin and in certain locations cut up and destroyed the surface of Danubian origin from the late Pleistocene period and enriched it with its own sediments (occasionally in an astonishing width of several hundred metres).

Based on geological evolution, the geological structures covering the surface and the morphological conditions the region can be divided into three major geological units:

- Danube-Tisza Interfluvial Ridge. An area with a varied surface protruding some 30 m above the Danube Valley and almost 40 m above the Tisza sedimentary layer smoothing into the loess Bácska plain in the SW direction. The region so characteristic of the plain territories of the Carpathian Basin in terms of geology and climate offered settling opportunities for the natural continental fauna, including elements of both steppe and mediterranean nature. In addition, due to its geographical location (e.g. as a basin centre surrounded by mountains) and its other features it became a place for the development of numerous endemic plant and animal species.

Under the given geological situation and under homogenous climate conditions the varied fauna is primarily the result of the abundance of pedological, hydrological and micro-relief conditions.

Based on the large scale geological and climate features of the region and based on the morphological, pedological and biological characteristics of smaller regions we can classify the proposed habitats according to the more „refined” categories below.

As a result of its pedological (mainly calcareous-sodic plains developed on a fine granule rock bed) and geological structure (the significant presence of a fine waterproof clay layer) precipitation filter downwards with difficulty and may remain permanently in the depressions. It is generally true that due to the winter precipitation and the high ground water level in the spring significant water volumes appear in the depressed areas (in the isolated depressions of lake beds and old water flows).

The total solute content of the region's ground water is relatively high. Even the smallest values are around 1000 mg/l. The highest values vary between 2-10.000 mg/l. In the event of high ground water levels the ground water also brings solutes to the surface via its capillary ascent.

The most important cations and anions in the ground water are  $\text{Na}^+$ ,  $\text{Ca}^{2+}$ ,  $\text{Mg}^{2+}$  and  $\text{HCO}_3^-$ , according to predominance  $\text{Na}^+$ ,  $\text{HCO}_3^-$  couple with high pH values (sodic water).

The soil types developed here are:

- Chernozem meadow soil types, which are surfaces developed on a sandy loess base situated in the highest level layers in the region, with a high humus content. Their layer thickness varies between 20-40 cm. Generally the salty ground water already does not impregnate these layers. In cases where these highest locations are relatively expansive, tillage activities are carried out on them, and if they are smaller

in size (a few 100 m<sup>2</sup>), they form islands on the saline steppe, partly conserving the old sand and loess steppe flora of these areas.

- Solonetz meadow or carbonated solonetz soils, which appear in non-classical forms, in patches, and are more of a transition between the meadow and sodic soils in various combinations,
- Solonchak-solonetz soils, sodic solonchak soils, solonchak soils of eroded salt berms. Among these calcareous-sodic solonchak-solonetz soils are the most common, giving the character of the sodic plains found here.

The cause of salination in all cases is the salty ground water with a high Na(Mg,Ca)HCO<sub>3</sub> content. The Pannonic salt steppes, and marshes have developed by characteristic salt composition and continental climate, and wind-formed depressions.

It can be generally stated that the water permeability capacity of the sand dunes blown onto the loess of late pleistocene origin or of the original loess in the depressions of sand-covered areas is low. Due to their isolation and weak runoff conditions such depressions and low areas promoted the accumulation of periodic waters, which, as a result of the known salt composition of ground water, led to the formation of sodic wetlands and higher level sodic areas.

#### *Climate*

The climate variations are limited in the region of the Carpathian Basin. The macroclimate can be considered a homogenous basic feature in terms of surface and fauna evolution, as well.

The region has a temperate continental climate. Its unique features are limited cloudiness, a relatively high number of sunshine hours, high daily and annual temperature variation, relative dryness and very low humidity values.

This region is the area with the least cloudiness in Hungary. The annual average cloudiness is 52-57%. The annual average number of sunshine hours is approx. 2050. At the same time this is one of the warmest areas in the country. No significant variations exist in this region. The annual average temperature is between 10-11°C. The mean temperature of the coldest month (January) is between minus 1.5 and minus 2°C, while that of the warmest month (July) is 21-22°C. Characteristically of areas with a continental climate, the annual average temperature variance is quite significant (23-24°C). The region can be classified within Hungary as one with a short winter and a long summer. The number of winter days is only 26-31, however, major frosts are common. Spring comes early, and the average temperature rises above 10°C in the whole region between 7-12 March. The number of summer days is 81-84. In the fall the daily average temperature falls below 10°C again generally between 17-21 October.

The region is one of the parts of the country having the least precipitation. Under normal conditions the annual precipitation is between 500-600 mm in the region. The rainfall of the summer semester (April-September), the so-called breeding period, is around 300-350 mm. The winter precipitation occurs mainly in the form of snow. The number of snow-cover days is 30-40. The precipitation conditions therefore are relatively disadvantageous. This is further intensified by low humidity values, with an annual average of many years at 71-74%. Based on this data we may declare that the balance of precipitation and evaporation is negative in the region. The wetlands that have developed and exist can thank their subsistence to supplementary water influences (e.g. ground water).

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#### **17. Physical features of the catchment area:**

Describe the surface area, general geology and geomorphological features, general soil types, and climate (including climate type).

The site belongs to River Tisza catchment area. The physical features of the site is characteristic for almost whole catchment area of the pans, but have to put emphasis on sodic wetlands have more extensive groundwater catchment area than on the surface. It is generally true that due to the winter precipitation and the high ground water level in the spring significant water volumes appear in the depressed areas (in the isolated depressions of lake beds and old water flows).

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#### **18. Hydrological values:**

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

The sodic-alkaline alkaline pan is a special type of continental salt waters, which is a typical Pannonic wetland type in Hungary. These pans have primarily groundwater and rainfall supplied water bodies.

These are seasonal intermittent shallow waters (max. depth = 0.4-0.5 m), because there is notable seasonal water level fluctuation and frequently dries out entirely to middle of summer or autumn. The salinity varies between hypo- (3-20 g.l<sup>-1</sup>) mesosaline (20-50 g.l<sup>-1</sup>) ranges corresponding with water level. The total dissolved solids is dominated in sodium (Na<sup>+</sup>), calcium (Ca<sup>2+</sup>), carbonate (CO<sub>3</sub><sup>2-</sup>) ions, and high grey-brown coloured holomictic turbidity being permanently by colloidal suspended ion complex. The very high turbidity is in opened pans attributed to the daily re-suspension of the sediments by the winds coupled with its shallowness.

The susceptibility to re-suspension of sediments is different for each lake as it depends on the sediment type and on the shape and depth profile of a lake. Hypothetically, wave re-suspension occurs depending on the critical fetch (F<sub>crit</sub>) at which the wavelength exceeds twice the depth, relative to the total length of the lake measured in the direction of the wind. It causes that generally at lower wind velocity there can be found a lower turbidity less re-suspended belt (F<sub>crit</sub>) around the shoreline below a critical water depth. The lowest turbidity can be found every time among emergent marshland vegetation. The non-turbid transparent sodic-alkaline waters have brown colour.

## 19. Wetland Types

### a) presence:

Circle or underline the applicable codes for the wetland types of the Ramsar "Classification System for Wetland Type" present in the Ramsar site. Descriptions of each wetland type code are provided in Annex I of the *Explanatory Notes & Guidelines*.

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 • Ts • U • Va •  
Vt • W • Xf • Xp • Y • Zg • Zk(b)

Human-made: 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • Zk(c)

### b) dominance:

List the wetland types identified in a) above in order of their dominance (by area) in the Ramsar site, starting with the wetland type with the largest area.

R, Ss = 300 ha

3 = 5 ha

Agricultural lands = 551 ha

Forested lands = 10 ha

9 Canals < 5 ha

## 20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

The sodic alkaline wetland habitat structures have strength depending on water levels and seasonal fluctuation, which may be very variable year to year.

Lepidio-Puccinellietum and Astero-Agrostetum albae sodic marshes: The feature of this habitat is that it has only temporary or ephemeral saline water-flooding zone (0-10 cm), usually from later autumn to later spring. After it has dried out saline crystals often occur high density on the bare surface, this reason is that the plants growing are strength hampered here. The characteristic vegetation, which can thrive in these extreme condition mainly terrestrial halophyte and succulent plants as: *Lepidio crassifolium*, *Puccinellia limosa*, *Camphorosma annua*, which occur sporadically on the surface. This habitat is one of the most important shorebird feeding zone because it has seasonal shallow (0-10 cm) water coverage and bare surface, often only the surface is wet and the muddy ground is soft. This feeding habitat exists mainly in spring and autumn for the waterbirds, when there is higher water level on the site.

Puccinellietum limosae sodic marshes: This habitat is similar as Lepidio marshes, but it has longer and a bit deeper saline water-flooding (0-20 cm), usually from early autumn to beginning of summer, due to more vegetation biomass can be found here, especially high dominant of halophyte *Puccinellia limosa*. The sodium

crystal accumulation is not so expressed on the surface only in the deeper level of the soil. The vegetation coverage abundance may be very variable.

Bolboschoenus-Phragmitetum sodic marshes: This habitat regularly is covered with shallow water (0-30 cm) or wet all over the year. Due to here can overgrow more abundant halophyte vegetation as on saline marshes 2. zone. The characteristic dominant plants are *Bolboschoenus maritimus* and saline ecotype of *Phragmites communis*, these may occurrence in very different coverage proportion.

Open bed of pans: This habitat regularly is covered with deeper saline shallow water (10-50 cm) all over the year. According to there is not important emergent vegetation only few sporadic saline submerged water plants as *Potamogeton pectinatus*. This habitat is the major importance for waterbirds. In hot summer, when the water level may be dropped seriously, so pool-bed surfaces can be become only wet or dried out.

Other not characteristic wetlands types can be also found such as *Alopecuretum pratensis* meadow and *Caricetum acutiformis ripariae* marshes.

Continental Pannonic sodic affected steppes are extensively scattered around the wetlands such as *Artemisio-Festucetum pseudovinae danubiale*, and *Achilleo-Festucetum pseudovinae*. Fragmented Pannonic loess steppic grasslands are also such as *Salvio-Festucetum rupicolae*.

### 21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14, Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

*Aster tripolium ssp. pannonicum* - Pannonic subendemic  
*Centaurea sadleriana* - Pannonic endemic, biogeographically important  
*Cirsium brachycephalum* – including in 92/43/EGK directive Annex II  
*Lepidium crassifolium* - Pannonic endemic, biogeographically important  
*Limonium gmelini ssp. hungaricum* – Pannonic endemic, biogeographically important  
*Puccinellia limosa* - Pannonic subendemic, biogeographically important  
*Suaeda pannonica* – Pannonic endemic, biogeographically important

### 22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

*Bombina bombina* – including in 92/43/EGK directive Annex II  
*Triturus cristatus* – including in 92/43/EGK directive Annex II

### 23. Social and cultural values:

a) Describe if the site has any general social and/or cultural values e.g., fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values:

No fisheries, forestry production, religious importance, archaeological sites corresponding with the wetlands. Social relations with existing wetlands can be understood by traditional Hungarian extensive farmland lifestyle especially with regard to domestic semi-nomadic animals grazing.

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? No.

If Yes, tick the box  and describe this importance under one or more of the following categories:



- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:
- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:
- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

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**24. Land tenure/ownership:**

- a) within the Ramsar site:  
privately owned
- b) in the surrounding area: mostly privately owned

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**25. Current land (including water) use:**

- a) within the Ramsar site:  
The extensive grassland, and agricultural uses are involved.
- b) in the surroundings/catchment:  
mainly the extensive agricultural, grassland and planted forest uses are involved.

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

- a) within the Ramsar site:  
groundwater decreasing, water regulation, extensive agricultural pollution and disturbing factors, drying out, low grazing pressure, waterfowl hunting, increasing of natural mammalian (fox) and avian (crows) predators, burning.  
The melioration measures in the catchment area decreased the extension of wetlands through lowering the groundwater table. From arable lands there is a nutrient source that may accelerate or cause eutrophication.
- b) in the surrounding area:  
groundwater decreasing, water regulation, intensive agricultural pollution and disturbing factors, artificial forest planting, drying out, low or high grazing pressure, waterfowl hunting, increasing of natural mammalian (fox) and avian (crows) predators, burning.

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**27. Conservation measures taken:**

- a) List national and/or international category and legal status of protected areas, including boundary relationships with the Ramsar site:

In particular, if the site is partly or wholly a World Heritage Site and/or a UNESCO Biosphere Reserve, please give the names of the site under these designations.

There are 250 ha nature conservation reserve and ca. 500 ha Natura 2000 Special Protection Area (SPA) and the same part of the site has been proposed for Site of Community Importance (pSCI) with regard to the Habitats Directive Annex I habitat (Pannonic salt steppes and marshes) within the site.

- b) If appropriate, list the IUCN (1994) protected areas category/ies which apply to the site (tick the box or boxes as appropriate):

Ia ; Ib ; II ; III ; IV ; V ; VI

The nature conservation reserve is categorised in IUCN IV.

- c) Does an officially approved management plan exist; and is it being implemented?:

No available site specific management plan.

**d)** Describe any other current management practices: Further habitat restoration programmes are planned. Wildfowl hunting has been restricted since May 2004, when a new national decree on hunting entered into force: wildfowl hunting season has been shortened to 1 November – 31 January, only one occasion per month and no hunting at dawn.

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**28. Conservation measures proposed but not yet implemented:**

e.g. management plan in preparation; official proposal as a legally protected area, etc.

Site is proposed as Site of Community Importance (pSCI). Unnecessary draining canals should be eliminated or plugged. The site should be purchased by the state in order to turn arable lands into grasslands and thus eliminate chemical pollution. Breeding islands could be created for Avocets (*Recurvirostra avosetta*).

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**29. Current scientific research and facilities:**

e.g., details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

There are no current scientific research and facilities on the site.

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**30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:**

e.g. visitors' centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

There are no visitors' centre, observation hides or nature trails, information booklets about the site.

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**31. Current recreation and tourism:**

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Generally the site is not used for recreation or tourism.

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**32. Jurisdiction:**

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept of Agriculture/Dept. of Environment, etc.

The Alsó-Tisza-vidéki Authority for Environmental Protection, Nature Conservation and Water Management is the first instant authority of the Ministry for Environment and Water.

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**33. Management authority:**

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Kiskunsági Nemzeti Park Directorate

Hungary

H-6000 Kecskemét, Liszt F. u.19.

[borose@knp.hu](mailto:borose@knp.hu)

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**34. Bibliographical references:**

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.

*Only in English written or Hungarian with English summary or abstract*

Boros, E. (1999): Ecological state of sodic water bodies in Hungary. Acta Biol. Debr. Oecol. Hung. 9: 81-105, 1999.

Boros, E.<sup>1</sup> & Biró, CS.<sup>2</sup> (1999): A Duna-Tisza közti szikes tavak ökológiai állapotváltozásai a XVIII-XX. századok időszakában, Acta Biol. Debr. Oecol. Hung. 9: 81-105, 1999.

*others*

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Borsodi, A.<sup>1</sup> – Reskóné Nagy, M.<sup>2</sup> – Gedeon, G.<sup>3</sup> – Vladár, P.<sup>1</sup> – Boros, E.<sup>4</sup> – Márialigeti, K.<sup>1</sup> (2003): Szikes tavak baktériumközösségeinek szénforrás értékesítési vizsgálata BIOLOG rendszerrel. Hidrol. Közl. 2003. 83.évf. 25-28p.

Iványosi-Szabó, A. (1996): A KNP természetföldrajzi környezete. 20 éves a KNP 1975-1995 (Szerk. Dr. Tóth Károly), pp. 17-29.

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