

Information Sheet on Ramsar Wetlands (RIS) – 2006 version

Available for download from http://www.ramsar.org/ris/key_ris_index.htm.

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX.22 of the 9th 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, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd 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.

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

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Designation date

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Site Reference Number

2. Date this sheet was completed/updated:

December 2006

3. Country:

Hungary

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.

Upper Kiskunság Alkaline Lakes

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

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 since the previous RIS for the site.

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 .

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.

Follows the boundary of the Felső Kiskunsági Alkaline Lakes unit of the Kiskunság NP, with the addition of the Böddi-szék (Lake Böddi) area, where the boundary follows the shoreline of the lake.

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°49'N 019°11'E

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 middle Hungarian reach of the River-Danube basin. Belongs to the Bács-Kiskun county of Hungary, close to the villages of Fülöpszállás, Szabadszállás, Dunatetőten territories. The nearest large town is the capital of county Kecskemét.

10. Elevation: (in metres: average and/or maximum & minimum) average 94 m above Baltic sea level

11. Area: (in hectares) 6637 ha

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 lymnological terms these very shallow intermittent waters are not lakes but rather comprise a characteristic type of wetlands with physical and ecological features similar to coastal pan ecosystems. The sodic-alkaline pans, marshes, and meadows of Kiskunság give a good special example of continental saline ecosystems and 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 comprises four major characteristic shallow open water sodic-alkaline pans (Büdös-szék, Zab-szék, Kelemen-szék, Böddi-szék) and three major sodic-alkaline reedbeds (Szántó-szék, Kis-rét, Fehér-szék). There are many intermittent and temporary smaller sodic wetland pools among six major wetland units of the site.

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
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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).

1. It contains a representative and unique example of natural sodic-alkaline type wetlands within the Pannonic biogeographic region. It is the largest, and most important salt area between the Danube and Tisza rivers in the Great Hungarian Plain. The so-called "szoloncsák" and "szoloncsák-szolonyec" types of these salt habitats and sodic soils are characterised by salt accumulation levels on or close to the soil surface, but they differ from the famous salt lands of the Hortobágy. (In the latter region salt accumulation level is more distant from the soil surface, and there are also differences in chemical composition of soils.) This is a vast sodic lowland plain of the Great Hungarian Plain, the former flood area of the River Danube, second in size only to the Hortobágy. The sodic plain has a rather variegated micro-relief. Differences of just a couple of dozen inches in elevation can produce different types of soils with distinctive floras to go with them. The high salinity and poor water economy of the soil allow only halophytic grass. It presents a nice variation of sodic meadows, grazing lands, sodic terraces and sodic barrens with a typical vegetation consisting of various salt-resistant and halophyte species. The sodic pans and salt marshes are the other important habitat types of the site from the point of view of birds and invertebrates as well. The shallow pans hold high salinity sodic water. Most of them regularly dry up because of the summer drought. The site is important not only from the point of view of natural inland salt habitats, but is important for birds as a nesting, feeding and roosting site as well.

Habitat types listed on Annex I of the Habitats Directive:

1530 Pannonic salt steppes and salt marshes

6250 Pannonic loess steppic grasslands

6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (important orchid sites)

2. It supports vulnerable, endangered species and threatened ecological communities.

Phascum floeckeanum – nationally protected moss

Desmatodon cernuus - nationally protected moss

Entbostodon hungaricus – Pannonic endemic, nationally protected moss

Cirsium brachycephalum – included in 92/43/EGK directive Annex II

Ophrys sphegodes EU-CITES BII;
Orchis coriophora EU-CITES BII;
Orchis morio EU-CITES BII;
Spiranthes spiralis EU-CITES BII;

Dorcadion fulvum cervae Annex II Habitats Directive

Aspius aspius DD IUCN Red list + Annex II Habitats Directive
Cobitis taenia LR/nt IUCN Red list + Annex II Habitats Directive
Rhodeus sericeus amarus LR/lc IUCN Red list + Annex II Habitats Directive
Triturus dobrogicus NT IUCN Red list + Annex II Habitats Directive
Bombina bombina LC IUCN Red list + Annex IV Habitats Directive
Bufo viridis Bern Convention Appendix II + Habitats Directive Annex IV
Hyla arborea Bern Convention Appendix II + Habitats Directive Annex IV
Rana ridibunda Bern Convention Appendix III + Habitats Directive Annex V
Rana esculenta Bern Convention Appendix III + Habitats Directive Annex V
Rana dalmatina Bern Convention Appendix II + Habitats Directive Annex IV
Lacerta agilis Bern Convention Appendix II + Habitats Directive Annex IV
Lacerta viridis Bern Convention Appendix II + Habitats Directive Annex IV
Natrix natrix Bern Convention Appendix III
Emys orbicularis LR/nt IUCN Red list + Annex II Habitats Directive
Lutra lutra NT IUCN Red list + Annex II Habitats Directive
Mustela eversmannii LR/lc IUCN Red list + Annex II Habitats Directive
Spermophilus citellus VU IUCN Red list + Annex II Habitats Directive
Acrocephalus melanopogon LC IUCN Red list + Annex I Birds Directive
Alcedo atthis LC IUCN Red list + Annex I Birds Directive
Anser erythropus LC IUCN Red list + Annex I Birds Directive
Anthus campestris LC IUCN Red list + Annex I Birds Directive
Ardea purpurea LC IUCN Red list + Annex I Birds Directive
Ardeola ralloides LC IUCN Red list + Annex I Birds Directive
Aythya nyroca NT IUCN Red list + Annex I Birds Directive
Botaurus stellaris LC IUCN Red list + Annex I Birds Directive
Branta ruficollis LC IUCN Red list + Annex I Birds Directive
Burhinus oedicephalus LC IUCN Red list + Annex I Birds Directive
Charadrius alexandrinus LC IUCN Red list + Annex I Birds Directive

Chlidonias hybridus LC IUCN Red list + Annex I Birds Directive
Chlidonias niger LC IUCN Red list + Annex I Birds Directive
Ciconia ciconia LC IUCN Red list + Annex I Birds Directive
Ciconia nigra LC IUCN Red list + Annex I Birds Directive
Circus aeruginosus LC IUCN Red list + Annex I Birds Directive
Circus cyaneus LC IUCN Red list + Annex I Birds Directive
Circus pygargus LC IUCN Red list + Annex I Birds Directive
Coracias garrulus LC IUCN Red list + Annex I Birds Directive
Egretta alba Annex I Birds Directive
Egretta garzetta LC IUCN Red list + Annex I Birds Directive
Falco cherrug EN IUCN Red list
Falco columbarius LC IUCN Red list + Annex I Birds Directive
Falco peregrinus LC IUCN Red list + Annex I Birds Directive
Falco tinnunculus LC IUCN Red list
Gelochelidon nilotica Annex I Birds Directive
Grus grus LC IUCN Red list + Annex I Birds Directive
Haliaeetus albicilla NT IUCN Red list + Annex I Birds Directive
Himantopus himantopus LC IUCN Red list + Annex I Birds Directive
Ixobrychus minutus LC IUCN Red list + Annex I Birds Directive
Lanius collurio LC IUCN Red list + Annex I Birds Directive

Lanius minor LC IUCN Red list +Annex I Birds Directive
Larus melanocephalus LC IUCN Red list +Annex I Birds Directive
Larus minutus LC IUCN Red list
Luscinia svecica LC IUCN Red list +Annex I Birds Directive
Mergus albellus LC IUCN Red list +Annex I Birds Directive
Nycticorax nycticorax LC IUCN Red list +Annex I Birds Directive
Otis tarda VU IUCN Red list + Annex I Birds Directive
Pandion haliaetus LC IUCN Red list +Annex I Birds Directive
Phalaropus lobatus LC IUCN Red list +Annex I Birds Directive
Philomachus pugnax LC IUCN Red list +Annex I Birds Directive
Platalea leucorodia LC IUCN Red list +Annex I Birds Directive
Plegadis falcinellus LC IUCN Red list +Annex I Birds Directive
Pluvialis apricaria LC IUCN Red list +Annex I Birds Directive
Porzana parva LC IUCN Red list +Annex I Birds Directive
Porzana porzana LC IUCN Red list +Annex I Birds Directive
Recurvirostra avosetta LC IUCN Red list +Annex I Birds Directive
Sterna caspia LC IUCN Red list +Annex I Birds Directive
Sterna hirundo LC IUCN Red list +Annex I Birds Directive
Sylvia nisoria LC IUCN Red list +Annex I Birds Directive
Tringa glareola LC IUCN Red list +Annex I Birds Directive

3. It supports populations of plant and animal species important for maintaining the biological diversity of Pannonic biogeographic region. Due to its geographical location (e.g. as a basin centre surrounded by mountains) and its other features (see section 12, point 1 above), it became a place for the development of numerous endemic plant and animal species.

4. Notable breeding, migrating, wintering and resident birds included in 79/409/EGK Annex I:

Acrocephalus melanopogon, *Alcedo atthis*, *Anser erythropus*, *Anthus campestris*, *Ardea purpurea*, *Ardeola ralloides*, *Aythya nyroca*, *Botaurus stellaris*, *Branta ruficollis*, *Burhinus oedipnemus*, *Charadrius alexandrinus*, *Chlidonias hybridus*, *Chlidonias niger*, *Ciconia ciconia*, *Ciconia nigra*, *Circus aeruginosus*, *Circus cyaneus*, *Circus pygargus*, *Coracias garrulus*, *Egretta alba*, *Egretta garzetta*, *Falco cherrug*, *Falco columbarius*, *Falco peregrinus*, *Falco vespertinus*, *Gelochelidon nilotica*, *Grus grus*, *Haliaeetus albicilla*, *Himantopus himantopus*, *Ixobrychus minutus*, *Lanius collurio*, *Lanius minor*, *Larus melanocephalus*, *Larus minutus*, *Luscinia svecica*, *Mergus albellus*, *Nycticorax nycticorax*, *Otis tarda*, *Pandion haliaetus*, *Phalaropus lobatus*, *Philomachus pugnax*, *Platalea leucorodia*, *Plegadis falcinellus*, *Pluvialis apricaria*, *Porzana parva*, *Porzana porzana*, *Recurvirostra avosetta*, *Sterna caspia*, *Sterna hirundo*, *Tringa glareola*.

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): European Commission DG

Environment webpage

Bern Convention/ EU Habitats Directive

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

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 ran 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 Trans-Tisza 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 Valley (a tectonic and erosional depression along the Danube river in a width of some 20-30 km) with an average height of 90-100 m above sea level.

Pedology

Prior to the river control of the Danube the Danube Valley used to be the river's normal floodplain, then it was an area covered with inland waters on a regular basis subsequently, as well. Also, 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 2000-10.000 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 Na^+ , Ca^{2+} , Mg^{2+} and HCO_3^- , according to predominance Na^+ , 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 m²), 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. 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.

The cause of salination in all cases is the salty ground water with a high $\text{Na}(\text{Mg,Ca})\text{HCO}_3$ content. The Pannonic salt (sodic) steppes, wetlands and marshes have developed by characteristic salt composition and continental climate.

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).

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.

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 sodic plain belongs to River Danube catchment area. The general 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. The local wetland catchment area has two main part, on the major part is the lowland River Danube basin, and on the eastern part is the plain sandy ridge plateau.

Prior to the river control of the Danube the Danube Valley used to be the river's normal floodplain, then it was an area covered with inland waters on a regular basis subsequently, as well. Also, 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).

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⁻¹) mesosaline (20-50 g.l⁻¹) ranges corresponding with water level. The total dissolved solids is dominated in sodium (Na⁺), calcium (Ca²⁺), carbonate (CO₃²⁻) 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 depends on the critical fetch (F_{crit}) 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_{crit}) 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 = 4307 ha

4 = 2909 ha

Forested lands = 178 ha

1, 3 = 41 ha

9

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 – included in 92/43/EGK directive Annex II
Desmatodon cernuus – nationally protected moss
Entostodon hungaricus – Pannonic endemic, nationally protected moss
Lepidium crassifolium - Pannonic endemic, biogeographically important
Limonium gmelini ssp. hungaricum – Pannonic endemic, biogeographically important
Phascum floekeanum – nationally protected moss
Plantago schwarzenbergiana – Pannonic endemic, biogeographically important and protected in Hungary
Puccinellia limosa - Pannonic subendemic, biogeographically important
Suaeda pannonica – Pannonic endemic, biogeographically important

For a full list of plant species under international protection, see section 12, point 2.

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.*

Dorcadion fulvum cervae – Pannonic endemic, included in 92/43/EGK directive Annex II
Saragossa porosa kenderiensis – Pannonic endemic
Aspius aspius – included in 92/43/EGK directive Annex II
Cobitis taenia – included in 92/43/EGK directive Annex II
Rhodeus sericeus amarus – included in 92/43/EGK directive Annex II
Bombina bombina – included in 92/43/EGK directive Annex II
Triturus dobrogicus – included in 92/43/EGK directive Annex II
Emys orbicularis – included in 92/43/EGK directive Annex II
Lutra lutra – included in 92/43/EGK directive Annex II
Mustella eversmannii – included in 92/43/EGK directive Annex II
Spermophilus citellus – threatened and included in 92/43/EGK directive Annex II

Notable breeding, migrating, wintering and resident birds included in 79/409/EGK Annex I:

Acrocephalus melanopogon, Alcedo atthis, Anser erythropus, Anthus campestris, Ardea purpurea, Ardeola ralloides, Aythya nyroca, Botaurus stellaris, Branta ruficollis, Burhinus oedicnemus, Charadrius alexandrinus, Chlidonias hybridus, Chlidonias niger, Ciconia ciconia, Ciconia nigra, Circus aeruginosus, Circus cyaneus, Circus pygargus, Coracias garrulus, Egretta alba, Egretta garzetta, Falco cherrug, Falco columbarius, Falco peregrinus, Falco vespertinus, Gelochelidon nilotica, Grus grus, Haliaeetus albicilla, Himantopus himantopus, Ixobrychus minutus, Lanius collurio, Lanius minor, Larus melanocephalus, Larus minutus, Luscinia svecica, Mergus albellus, Nycticorax nycticorax, Otis tarda, Pandion haliaetus, Phalaropus lobatus, Philomachus pugnax, Platalea leucorodia, Plegadis falcinellus, Pluvialis apricaria, Porzana parva, Porzana porzana, Recurvirostra avosetta, Sterna caspia, Sterna hirundo, Tringa glareola.

For a full list of animal species under international protection, see section 12, point 2.

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 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:

24. Land tenure/ownership:

(a) within the Ramsar site: 54 % of the site is state owned by Kiskunság National Park Directorate, others are in private owned

(b) in the surrounding area: mostly private owned

25. Current land (including water) use:

(a) within the Ramsar site: The extensive grassland, reedbed cutting and agricultural using are involved.

(b) in the surroundings/catchment: mainly the extensive agricultural, grassland and planted forest using are involved.

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, eutrophication, low grazing pressure, invasion by a alien species (e.g.

Eleagnus angustifolia), waterfowl hunting, increasing of natural mammalian (fox) and avian (crows) predators, burning.

(b) in the surrounding area: groundwater decreasing, water regulation, intensive agricultural pollution and disturbing factors, artificial forest planting, drying out, eutrophication, low or high grazing pressure, invasion by a alien species (e.g. *Eleagnus angustifolia*), waterfowl hunting, increasing of natural mammalian (fox) and avian (crows) predators, burning.

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.

The whole site is protected by Hungarian nature conservation laws and Natura 2000 Special Protection Area (SPA), furthermore 90 % part of the site is proposed Site of Community Importance (pSCI) with regard to Pannonic sodic (salt steppes and marshes) habitats within the site. The 70 % of the site belongs to Kiskunsági National Park, and 30 % of it is nature protection reserve (as alkaline lake protected by power of the act on nature conservation). The national park part of the site is UNESCO Biosphere Reserve (Kiskunsági Biosphere Reserve). There are 1823 ha strictly protected area within the site in the national park territory.

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

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

The technical management plan is in place and is implemented, although legally it has not been approved according to most recent legislation.

d) Describe any other current management practices:

A few small-scale habitat restorations programmes were also carried out on the site.

28. Conservation measures proposed but not yet implemented:

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

Site specific management plan needs to be improved and implemented. Expanding of the national park territory is in progress towards to south direction by ca. 2000 ha sodic marshland and grassland habitat systems.

29. Current scientific research and facilities:

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

General Hungarian biodiversity and bird monitoring program is running on the site. Other current research programmes are running, e.g. waterbird nutrient contribution to water quality, waterbird food resources, ecological factors of primary production, algae population dynamics, quantitative and qualitative food web structures of the characteristic sodic pans.

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.

Observation hides, nature educational trails, information tables and booklets are available on the site.

31. Current recreation and tourism:

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

Generally not important, only fishing tourism is intensive along the western border and eastern part of the site at the main regional irrigation channel, and a little ecotourism and bird watching tourism are involved.

32. Jurisdiction:

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

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

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

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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

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