Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7, as amended by Resolution VIII.13 of the Conference of the Contracting Parties.

Note 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. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Bureau. Compilers are strongly urged to provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of maps.

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DD MM YY
Designation date Site Reference Number

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

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2. Date this sheet was completed/updated:

September 2003

3. Country:

Serbia and Montenegro

4. Name of the Ramsar site:

Slano Kopovo

5. Map of site included:

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

b) digital (electronic) format (optional): yes

6. Geographical coordinates (latitude/longitude):

Greenwich 45^{o} 37’ 51’’ N / 20^{o} 12’ 40’’ E

Gauss-Krieger 5054.300 / 7438.500

7. General location:

Slano Kopovo is situated in Serbia, the Autonomous Province of Vojvodina, in the northwestern part of district Banat, in the vicinity of town Novi Bečej and the river Tisa. It is about 55 km from Novi Sad and about 32 km from Kikinda.

8. Elevation: (average and/or max. & min.)

76.6-86.8 meters above sea level

9. Area: (in hectares)

976.45 ha

10. Overview:

Slano Kopovo represents one of the last preserved ponds on salty ground of Vojvodina in Serbia, that is, the salty lakes within the paleomeanders. In the ancient past, Tisza River used to change its bed often, leaving the previous bed and flooding the neighboring lowlands. One of the ancient meanders of river Tisza is Slano Kopovo, which is a leftover from draining the swamps in the area of Vojvodina and erection of embankments in XVII and XVIII century.

Slano Kopovo is not only a too rich to be properly estimated center of special biological diversity of wildlife in area of Vojvodina, but also a representative example of salt habitats that are on the verge of complete disappearance. Slano Kopovo represents one of the most important and best characterized bird habitats in Serbia. Its value is visible through breeding of species that are atypical for Pannonian Plain but characteristic for Pont-Caspian salt soil and sea coasts, as well as though the fact that this is a unique migration point for certain migratory bird species. Slano Kopovo is especially suitable for cranes, ducks, geese and shorebirds. In 1989, area of 700 ha was proclaimed as an internationally important bird habitat in Europe according to the IBA project (Grimmet and Jones 1989), while in 2000 there was a revision and an IBA area was proclaimed on 2660 ha (Heath and Evans 2000). In the area of Slano Kopovo there are specific salt communities *Thero-Salicornietea* that are, not only in Serbia, but also in whole of the Pannonian plain, in phase of extinction. A special feature of Slano Kopovo is the dominant halophyte vegetation(plants growing naturally in very salty soil), connected with solonchaks and made out of succulent and in a lesser degree out of half-succulent halophytes. Therefore it belongs to the type of ancestral plant cover that has already almost disappeared from the greatest part of Pannonian area. Many plant species

characteristic for this type of vegetation today represent real rarities, so they are protected by law.

11. Ramsar Criteria:

1	2	3	4	5	6	7	8

12. Justification for the application of each Criterion listed in 11. above:

Criterion 1: Slano Kopovo is a unique example of specific and prominent wetland saline habitat, extremely rare and threatened within the biogeographic region it belongs to.

Criterion 2: Slano Kopovo provides the habitat for a significant number of vulnerable, threatened and critically endangered species as well as threatened ecosystems, such as: **IUCN RED LIST (2000)**: *Numenius tenuirostris* (Critically Endangered), *Anser erythropus* (Vulnerable), *Branta ruficollis* (Vulnerable), *Aythya nyroca* (Near Threatened), *Oxyura leucocephala* (Endangered), *Aquila heliaca* (Vulnerable), *Falco naumanni* (Vulnerable), *Otis tarda* (Vulnerable), *Phalacrocorax pygmeus* (Near threatened), *Haliaeetus albicilla* (Near Threatened) and the Rodent, European Souslik *Spermophilus citellus* (Vulnerable).

Criterion 3: Slano Kopovo provides survival for valuable populations of plants and animals important for conservation of biological diversity within the biogeographical region it belongs to, such as: *Salicornia europaea, Suaeda maritima, Crypsis aculeata, Puccinelia limosa, Salsola soda, Kochia prostrata, Plantago schwartzenbergiana, Ixobrychus minutus, Nycticorax nycticorax, Egretta garzetta, Ardea purpurea, Ciconia ciconia, Anser erythropus, Anser albifrons, Anser fabalis, Branta ruficollis, Anas querquedula, Anas clypeata, Anas crecca, Anas acuta, Aythya ferina, Aythya nyroca, Haliaeetus albicilla, Pandion haliaeetus, Circus pygargus, Grus grus, Oxyura leucocephala, Recurvirostra avosetta, Charadrius alexandrinus, Tringa totanus, Vanellus vanellus, Numenius arquata, Limosa limosa, Panurus biarmicus, Luscinia svecica, Spermophilus citellus, Mustela erminea etc.*

Criterion 4: Slano Kopovo provides survival in the lean period of life cycle for the Common Crane *Grus grus*, as well as for some other birds of the wetland habitats, and is especially important as the former most important and last breeding site of White-headed Duck *Oxyura leucocephala* in Serbia.

Criterion 5: Slano Kopovo regularly every year ensures survival of more than 20 000 individuals of wetland birds, both in migration period and the reproduction period. These birds belong to orders *Podicepidiformes, Ciconiiformes, Anseriformes, Accipitriformes, Gruiformes* and *Charadriiformes.*

Criterion 6: Slano Kopovo for a significant number of birds of wetland habitats ensures presence of 1% of relevant biogeographical population of certain species, primarily during the period of migration.

Species	Breeding pairs	Wintering individuals	Individuals during the spring migration	Individuals during the autumn migration	**1% level**
Anser erythropus	-	300		15	110
Grus grus	-	50-100	15,000	13,000	600
Recurvirostra avosetta	15-20	-	200-250	400-500	470
Numenius tenuirostris	-	-	-	1-5	1

13. Biogeography

a) biogeographic region:

Region of Slano kopovo is situated in Vojvodina, northern province of Serbia. This area belongs to Pontic biogeographic region which includes steppe and forest-steppe biomes of European sector. Inside that region, Slano kopovo belongs to Pannonian province with steppe, forest-steppe, saline and sands ecosistems.

b) biogeographic regionalisation scheme (include reference citation):

Stevanović, V. (1995): Biogeografska podela Jugoslavije (*Biogeographic regionalisation of Yugoslavia*) - In: Stevanović, V.,Vasić, V. (eds): Biodiverzitet Jugoslavije sa pregledom vrsta od međunarodnog značaja (*Biodiversity of Yugoslavia with review of internationaly significant species*)-Biološki fakultet i Ecolibri, Beograd

14. Physical features of the site:

Slano Kopovo is situated in northern Banat on the alluvial plain of Tisza and Galacka, bordered by highways Novi Bečej-Novo Miloševo and Novi Bečej-Bašaid. It includes the half-crescent, elongated depression in direction northwest - southeast, and

actually represents the fossil meander of Tisza. One of the proofs of the former bed of river Tisza is about a dozen smaller or larger mounds in the vicinity, that used to follow the riverbed. Sedimentation since the very days of the Pannonian sea, and later also the Aeolian and especially water erosion, made a hollow with shallow sides and a wide bottom, which subsequently filled up with water. In the similar way there were numerous hollows and ponds in this region, which are together with marshes and swamps called "kopovi" ("pits") by Banatians, and if water holds a larger quantity of salt, they are also called "slane" ("salty ones"). This led to the name Slano Kopovo, although the feature is also known as Slana, Kopovo, Šoškopo or Lesino Kopovo.

The Lake Slano Kopovo or Veliko Kopovo is situated to the northeast from Novi Bečej, from which it is about 5 km as the crow flies. The absolute altitude of the lake's mirror is 77 m. Slano Kopovo is situated on a loess terrace. Its basin occupies the deepest part of the former bed of river Tisza. Therefore, according to its origin, it belongs to the group of geomorphologic features made by activity of river water, and to the group of river or fluvial lakes.

Basin of Slano Kopovo occupies the largest part of the eastern arm of the mentioned meander, whose shape reminds of the horseshoe with arms pointing toward southeast. In a parallel line to Slano Kopovo, on its eastern side, runs a smaller depression called Poštaš Kopovo or Malo Kopovo, which in contrast to Slano Kopovo does not have salty water. Poštaš Kopovo is a freshwater ecosystem with mirrors of open water and the floating vascular plants. These two Kopovos are separated by a higher loess boundary called Između Kopova ("In between of Kopovos"). The distance between two lakes is 350-900 m.

The eastern side of basin of Slano Kopovo has a very gentle slope. Above the western side there is a segment of the loess terrace, up to 6 m in relative height, including a down called Veliki Pesak, with the highest point on Maslar mound being 86.8 m above sea level. Toward the north and the south the lake basin gradually changes into the dry or occasionally flooded bottom of the fossil meander.

The lake Slano Kopovo stretches in direction southeast - northwest and is ellipsoid in shape. Toward the longer axis, at a medium water level, it is 3 km deep. The greatest width is in the northwestern part (625 m). The southeastern part of Slano Kopovo finishes at a narrow point where the width is only 50 m. The shoreline length is 7 km. The greatest depths of the lake are closer to the western shore. There in several places are so called "oka" ("eyes") where depths are greatest. They also include "živa blata" (quick mud) which may be dangerous for life of humans and livestock that thread in there. The eastern half of the basin is shallower. The area of Slano Kopovo is 1.45 square kilometers.

In cases when the water balance of Slano Kopovo is negative, there is a regression, that is, negative movement of the water line. These fluctuations also manifest themselves in the dimensions of the lake: length, width, depth, length of coastline and the surface area. The most prominent movement of the coastline is in the parts where Slano Kopovo is shallowest, that is, east, southeast and northwest.

The whole depression whose deepest part is occupied by the lake basin is filled with very salty soil – solonchak and solonetz. According to the literature data, the bottom of the basin is filled with clay and has a very gentle scope.

15. Physical features of the catchment area:

Dominant landscapes are plains of Pannonian valley, with open habitats, without forests except nearby river Tisa. Catchment area is inside of alluvial plain of river Tisa, and in the past it was regularly flooded. Elevation ranges from 76 to 91 metres above sea level. Main rock types are alluvial deposit and loess of terrace (partially hidromorphic). Dominant soil types are chernozem calcareous, hydromorphic Black soils limeless, solonetz, solonchak, hydromorphic Smonitza soil and alluvial loam-clayish soils. Main human activity is agriculture, hence land is covered with fields and pastures. Climate type is continental (semi-arid continental pannonian climate type VII- zonal steppe climate), characterized with dry and hot summer period and great seasonal oscillation of rainfall.

16. Hydrological values:

Functioning and survival of the area of Special Nature Reserve "Slano Kopovo" greatly depends on presence of water. Veliko Kopovo and Poštaš Kopovo get their water through direct influx of atmospheric water on its aquatorium, the surface influx of water and the underground water – the frett well. The sublacustrian feeding is also done through the mentioned "oka". There are no watercourses flowing out, so water is lost by evaporation. The greatest intensity of evaporation is in the summer months. As in the same time there is a primary minimum in the yearly schedule of atmospheric water, the consequence of evaporation and the deficit of the atmospheric water is the negative water balance of the lake. This area is characterized by continental climate, with dry and hot summers and cold winters. Slano Kopovo used to have much more convenient water regime previously. When the main tract of channel Danube-Tisza-Danube was dug 2 km toward the south, and the Kikinda channel was dug 4.5 km to the east, Slano Kopovo found itself at the intersection of their junction. These channels lowered the level of the frett waters. Therefore, feeding of Slano Kopovo by frett waters is diminished, and the survival of the whole area is threatened.

On the edges of basin bottom of Veliko Kopovo, due to gentle slope, as soon as the water level falls down, there are large visible surfaces of the bottom. In the deepest places at the maximum water level, depth of water does not exceed 1.2 m. The depth is usually 0.70 m, and in the largest part of the basin it does not exceed 0.20 m. When the water level decreases, on the edges of the water starts the sedimentation of a whitish skim

of crystallized salts, which is visible from afar and gives a specific feature to the area in autumn. The great salinity of the soil is the cause of the greater salinity of lake water. The atmospheric waters dissolve the salt from the salt soil, and that salty water then flows into the lake. Water mostly contains sodium chloride and sodium-sulphate.

Depending on the quantity of water that feeds into it, and the water that is in the same time lost through evaporation and evapotranspiration, the level of the lake is susceptible to fluctuations, which in extreme cases may be significant. That means that in the part of the year when the water balance is positive (when the influx of water is greater than the loss) there is a transgression of the lake, that is, the positive movement of the coastline. In the opposite case, when the water balance is negative, there is a regression, that is, a negative movement of the coastal line and decrease in surface area of the lake.

17. Wetland Types

a) presence:
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:
R, Ts, Ss

18. General ecological features:

The area of Slano Kopovo was in 2001 protected in Serbia as a rarity example of salt habitats and a non-renewable point of special biological diversity. Slano Kopovo is one of the representative, still well preserved Pannonian types of landscapes, whose salt groundl, marsh and aquatic ecosystems are important for preservation of the whole biodiversity of Serbia, as well as the global diversity of wildlife. Besides, this salty lake represents a significant natural value from geomorphologic, hydrologic and microclimatic aspect.

The Special Nature Reserve “Slano Kopovo” represents an authentic and unique ecosystem of salt ponds, pastures and downs with other types of wetland habitats, surrounded by arable land and small hills. Slano Kopovo is characterized by extremely

rich ecosystem and species diversity. Due to its well-known values, it has a verified international status, as it is included in the list of areas of extreme importance for the birds of Europe (IBA, 1989-2000). Specificity and uniqueness of this area is manifested in presence of unique salt habitats, associations and species, which have almost completely disappeared in that way and on such a surface in the other parts of the Pannonian plain. Slano Kopovo enables either permanently or temporarily survival to a large number of species and their communities. Only among the birds, 210 species were recorded so far, and there are also about 25 species of mammals.

Slano Kopovo has extraordinary biocenological characteristics. It is recognizable by the specific salt communities from the classis *Thero-Salicornietea*. The recorded plant associations of this area have the following syntaxonomic position:

Classis *Phragmitetea* R. Tx. Et Preising 1942,

Ass: *Bolboschoenetum maritimi continentale* Soo (1927) 1957

Classis: *Thero-Salicornietea* Tx. 1955 ex Oberd. 1958

Ass: *Salicornietum prostratae* Soo (1924) 1964 (syn. : *Salicornietum europeae* Soo 1945): In Serbia it is developed only in this locality.

Ass: *Salicornieto-Suaedetum maritimae continentale* Knežević, Boža 1988: Also the only locality in Serbia.

Ass: *Suaedetum maritimae* Soo 1927: Subass: *bolboschoenetosum* prov. and Subass.: *asteretosum pannonicae* prov. Čapaković 1984.

Ass: *Suaedeto-Kochietum prostratae* Knežević, Boža 1988: It was recorded on the surface of only several square meters and composed of only 3 species.

Characteristic of micro- and macrorelief, as well as interdependence of influence of earth moisture and salinity, influenced the nature of the ecological array of communities, as well as the formation of floristic content and the synecology of association complex. The azonal marsh vegetation is developed in the shore zone of Slano Kopovo and is represented either by typical reed beds (ass. *Scirpo-Phragmitetum phragmitetosum*), or the subassociation *bolboschoenetum,* which indicates a lightly salty substrate or flooding water. In the half-dry period, after the retreat of flooding water from the coastal areas, when the water level in the bed of Slano Kopovo is still high, there is breaking of parts of the shore due to waves. Humans accelerate this process, either by passage of agricultural machines or herding the cattle over that area. In these places, water is somewhat shallower and saltier due to quicker evaporation, so in time there are overgrowths of the association *Bolboschoenetum maritimi continentale* (syn: *Scirpetum maritime* Tx. 1937), that demands this type of habitat. The mentioned associations are important as a habitat for many animal species, and especially as nesting places for numerous bird species. In the same time, reed is indispensable in the process of stabilizing the coastline, and it has a phytofiltering and phytosanitation role.

The special characteristic of Slano Kopovo is the dominant halophytic vegetation. It is the component of biodiversity that makes the area recognizable in national and international scope. The main ecological factors, salt and water, directly or indirectly influence all the ecological parameters, and through that create the specific conditions for

creation of the mentioned halophytic vegetation. It is tied to solonchak and composed out of succulent and in lesser measure half-succulent halophytes, so it belongs to the type of ancestral plant cover that already almost completely disappeared from the Pannonian area. These are the associations of various salt phytocenoses from the classes *Thero-Saklicornietea*.

19. Noteworthy flora:

The plant species, cenoelements, belong mostly to one-year, succulent halophytes. Depending on concentration of sodium-chloride in the substrate and the degree of its water content, that is, degree of salification process, 4 plant communities can easily be recognized in the field. Species characterizing the classis *Thero-Salicornietea* are among others *Salicornia europaea*, *Suaeda maritima*, *Suaeda pannonica*, and today they are real rarities. The species *Suaeda pannonica* is a Pannonian endemic species and is included in the Red Book of Serbian flora, together with *Salicornia europaea* as a critically endangered taxon (CR) (Stevanović 1999).

The species *Salicornia europaea* (Common Glasswort), due to its morphological features (succulent plant with no leaves) and dominance, determines the physiognomy of the association. This species is characteristic for the maritime salt soil of the Mediterranean. As in Serbia it grows only on Slano Kopovo, where in a certain array of dry years it was threatened by lack of water, it is proclaimed a natural rarity protected by law. Besides it, as species specifically adapted to the extreme habitat conditions, there are euhalophytes *Crypsis aculeata* and *Puccinella limosa* (sometimes there is also *Spergularia media*). Before the soil become completely dry, Common Glasswort finishes its life cycle, and the role of builder of the scarce plant cover is taken by Annual Sea-blite *Suaeda maritima*. It appears fairly late, at the end of half-arid and beginning of arid phase (August-September). It spatially extends into the association of Common Glasswort and covers the habitats that are bare and well drained, as a second vegetation belt. When during the dry period water disappears, and the bottom of Kopovo becomes visible and covered with whitish, salty film, Annual Sea-blite makes a circle around this huge white depression. *Suaeda maritima* is on the Red List of Serbian Flora.

According to the botanical literature, Common Glasswort *Salicornia europaea* and Annual Sea-blite *Suaeda maritima* replace each other in the field. However, the special feature of the vegetation of Slano Kopovo is actually their specific combination. Therefore, in 1988 a special association *Salicornieto-Suaedetum maritimae continentale* was recorded scientifically for the first time.

The association *Suaedetum maritimae* is characterized by increased general cover, which is related to the relative floristic richness of this phytocenosis. In smaller numbers it also includes species *Salicornia europaea* and *Salsola soda*.

The association *Suaedeto-Kochietum prostratae* is floristically poor as it is made out of only three species: *Suaeda maritima*, *Kochia prostrata* and *Puccinelia limosa*.

The recorded flora of Slano Kopovo includes the Schwarzenberg's Plaintain (*Plantago schwarzenbergiana*), a Transylvanian-Pannonian endemic species from the World Red List of Plants (IUCN, 1998), which is included in the list of species of FR Yugoslavia with international importance for preserving the global biodiversity (Stevanović and Vasić 1995).

20. Noteworthy fauna:

Slano Kopovo is well known for its richness of animal life, especially the representatives of bird and animal fauna. Slano Kopovo is one of the most important and most specific habitats for birds in Serbia (IBA area). Although the surface of the area is relatively small (about 1000 ha), 210 bird species were recorded so far, representing 63% of the total number of species known for Vojvodina (320 species). Out of the total recorded number of species, 73 species were found breeding or may be assumed to be breeding species with great probability, while 12 species (5.9%) were recorded more than 30 years ago and may be considered extinct species, and 6 species (8.4%) may be considered former breeding species. The zonality of ornithofauna of Slano Kopovo is very well pronounced. The most important habitats for birds re: open waters of lake and rivulet, the floating and emerging vegetation, muddy and sandy banks, wet and marshy meadows, dry meadows, downs and unused ground, scrub, orchards and cultivated fields.

Slano Kopovo represents a unique migration stop for migratory bird species. As it is in vicinity of river Tisza, the species who when migrating follow the watercourse and its forest belt eagerly land on this wide open water surface and the surrounding open spaces easy to scan. Slano Kopovo is especially suitable for migration and dispersion stop for Common Cranes (*Grus grus*), ducks and geese (*Anseriformes*) and shorebirds (*Charadriiformes*).

A significant number of species and individuals of birds gather on Slano Kopovo even during the winter months, at the condition that there is enough water and that it is not frozen. On the spacious water surfaces and surrounding fields and downs, in the period of most intensive passage of birds, up to 20 000 individuals of various wetland birds appear regularly every day. The most impressive number is that of ducks and geese, which traditionally gather in this part of Vojvodina in autumn and occasionally in winter in flocks of several tens of thousands individuals, also using the open water surfaces of Tisza river as well as the carp fishponds in the vicinity.

Slano Kopovo was previously known after the White-headed Duck *Oxyura leucocephala*. This area was for the first time recorded as a habitat for this species in 1953, and the last recorded breeding was in 1962.Although this species was occasionally seen in later period, as for example in 1980, it is now considered to be extinct as a breeding species. Avocet (*Recurvirostra avosetta*) breeds in population numbers from 10 to at most 40 breeding pairs, while during the autumn migration 300-400 individuals gather in the area, representing the greatest concentration of this species in Serbia.

Huge herds of Common Cranes (*Grus grus*) regularly use shallow water of the lakes and the surrounding depression for their nightly rest. In the same time, this is the main place of gathering during migration for this species in whole of Vojvodina. Therefore, Kopovo is of priceless importance for conservation of northern breeding population, but also because of possibility to repopulate the southern habitats where this species used to breed previously. It is estimated that during the autumn migration over 10 000 birds pass over Slano Kopovo, greatly depending on weather conditions. The greatest concentration of birds recorded in one moment was about 5000 individuals. During the day, birds linger along the depressions and fields in the wider area, sometimes up to 4-5 km away from Kopovo, as their main feeding places are in those areas. At the dusk, all the Common Cranes return in groups to Slano Kopovo to spend the night there.

Fauna of mammals (*Mammalia*) is also one of basic natural values of Slano Kopovo. This area is characterized by presence of 25 mammal species from orders *Insectivora*, *Lagomorpha*, *Rodentia*, *Carnivora* and *Artiodactyla* (**Tvrtković and Džukić** 1977), and to that list should be added the numerous species of order *Chiroptera*.

On the most saline parts of the site, in the belt around the very bed of Slano Kopovo, present mammal species include: Common Shrew – *Sorex araneus*, Pygmy Shrew- *Sorex minutus*, Common Mole - *Talpa europaea*, Eastern Hedgehog - *Erinaceus concolor*, Common Vole - *Microtus arvalis*, Muskrat - *Ondatra zibethica*, Pygmy Field Mouse - *Apodemus microps*, Red Fox - *Vulpes vulpes* and Weasel - *Mustela nivalis*. The area of Malo Kopovo, which is characterized by presence of lumpy vegetation, is also inhabited by increasingly rare species Northern Water Vole - *Arvicola terrestris*, while in the meadows on higher ground there are *Pitymys subterraneus* – Common Pine Voles. On the cultivated areas between Kopovos there are mammal species typical in agrobiocenoses, such as Common Hamster - *Cricetus cricetus*, Wood Mouse - *Apodemus sylvaticus* and House Mouse - *Mus musculus*, while in the hedges along the fields and roads as well as near now already devastated deserted haciendas, the recorded species include: Lesser White-toothed Shrew - *Crocidura suaveolens*, Bicoloured White-toothed Shrew - *Crocidura leucodon*, Harvest Mouse - *Micromys minutus*, Striped Field Mouse - *Apodemus agrarius* and Norway Rat – *Rattus norvegicus*. On the northern part of the higher shore of Kopovo, on salty pastures, lives the certainly most important representative of mammal fauna in this area, European Souslik *Spermophilus citellus*. Also important is presence of Western Polecat - *Mustela putorius* and Steppe Polecat - *Mustela eversmanni*. Most mammals recorded in this area belong to the group of natural rarities and are protected by law. They are included in the list of the Red Book, that is, the preliminary list of vertebrate species for Red Book of Serbia.

The European Souslik *Spermophilus citellus* is a typical steppe representative of teriofauna. In this area and throughout Vojvodina, survival of the Souslik is threatened both by disappearance of steppe and salt habitats and the change in utilization of village pastures and downs, caused by decreased use of pastures by sheep herders. Therefore, this is one of the most threatened species in whole Pannonian plain. European Souslik is on Red List of the world (IUCN 1996) placed in the vulnerable species (VU). The high abundance of Souslik, recorded on Slano Kopovo in spring of 1974, is significantly reduced in further decades, causing the necessity of measurements of active conservation.

21. Social and cultural values:

Slano Kopovo and its vicinity have a very high importance for the local community and the wider region from the aspect of existing (realized) and potential social and cultural values. The main means of human activity were, and mostly remained in the modern times, livestock husbandry and agriculture. Today the arable lands are sown with agricultural cultures, while pastures are reduced to the remaining meadows. In this area, there used to be numerous haciendas, which today are torn down and are replaced by weekend bungalows and vineyard houses.

The traditional means of utilization of this area is hunting. This activity is today done in the way regulated by law and is based on principles of household management, with limitations brought in by projected protection, not threatening the main natural values of the area. It is important to mention the former use of mud on Slano Kopovo for curing ailments.

Due to the combination of natural characteristics, Slano Kopovo and its surroundings also represent a unique Pannonian area. The contribution to the complete landscape is church Arača, which is, like its forerunner from the period IX-XI century, built on the peninsula on formerly flooded area of Tisza. Arača used to be surrounded by aquatoria of Crna bara with the meander Mali Begej, Veliko Kopovo, Poštaš Kopovo and Bikaš. Around the remnants, which are the only witnesses of the former monumental beauty, there is the old preserved bed of Crna bara, that even today fills up with water in the spring.

In the area of Protected Natural Property Slano Kopovo, up to now there is no specially organized ecological tourism, but it is one of the special possibilities of development of whole area, and the matching of the interests of nature conservation and the prosperity of the local community. Tourism must be rigorously controlled, with mandatory expert guide and a limited number of visitors, and special care should be taken that birds are not disturbed. The visits should be only on paths specified in advance and the special observation points.

The science research activities were in recent years quite intensive regarding the following of the bird fauna, but should be intensified in problems connected with the other groups of living things, their communities and especially the questions of environmental protection and programs of sanitation and revitalization of main ecological conditions, wise and sustainable management of the area, with the development of continuous monitoring system.

22. Land tenure/ownership:
(a) within the Ramsar site:

Structure of the area according to the ownership of the land shows dominance of state and private property. Private areas of the enclaves are mostly in the eastern and northern part of the area, with agricultural areas. In the state property there is 442.32 ha (45.3%), in public property 50.1 ha (5.1%) and in private property 481.9 ha (49.3%), and the percentage of church land is insignificant - 2 ha (0.2%).

(b) in the surrounding area:

The property of the area around the protected area of Slano Kopovo is mixed in structure, with dominance of private property on agricultural areas and state-public property in other areas.

23. Current land (including water) use:
(a) within the Ramsar site:

Slano Kopovo was until now used for human needs in small intensity primarily due to its physical and chemical characteristics that were unsuitable for any kind of agricultural activity. Most of the area of Slano Kopovo has extremely unsuitable edaphic and other conditions for growth of cultivated plants. This is one of the main reasons why Slano Kopovo mostly conserved its ancient natural look and why it is not brought to some use like most of the surrounding area.

The main means of human activity were, and mostly remained, livestock husbandry and, later on, agriculture. Today the arable lands are sown with agricultural cultures (cereals, alfalfa, sunflower, sugar beet). Pasturing with sheep, and in lesser degree with cattle, is limited to the existing meadows and downs. From the numerous haciendas, only two remained active. Today, agriculture in the area of the protected natural property is relatively extensive, due mostly to the fact that these are smaller plots in private property.

However, the agricultural production in the broader region, through enlargement of the plots, sowing monocultures in large areas and especially through the hydromelioration activities (draining), managed to significantly negatively influence the protected area of Slano Kopovo. This is not only visible in the pronounced loss of water in the lake, but also in disappearance of ponds and pits that used to stretch from Slano Kopovo all the way to Melenci and therefore form an interconnected system of habitats of important flora and vegetation, especially ornithofauna.

Hunting is a traditional means of utilizing the area and the resources of game animals, present in this area from time immemorial. The Hunting Society from Novi Bečej is one of the best in Serbia, and due to pronounced results on protecting the nature of Slano Kopovo and the game animals, was proclaimed an official caretaker of the protected natural property.

(b) in the surroundings/catchment:

The ages-long way of utilizing the area and the influence of the humans on the nature of the wider region around Slano Kopovo are pronounced primarily in the change of

landscape look and the purpose of the area. Most of the space is used for agricultural production, while a very small area under pastures remained. There is a highway infrastructure connecting the surrounding settlements, and there is also the channel web of system Danube-Tisza-Danube. The intensive utilization of chemicals in protection of crops, as well as mineral fertilizers, caused many years of negative influence on Slano Kopovo, Poštaš Kopovo and the surrounding meadows.

About 5 km from Slano Kopovo there is a local center, town Novi Bečej, while in the vicinity of the boundaries of the reserve there is Agricultural Enterprise "Sokolac" with all the necessary adjoining facilities, as well as clay pits used for brick making. The clay pit is situated in the southwestern part of the depression near Novi Bečej and will be active until 2010, when it will be turned into an artificial lake for recreation use, while the clay pits will be placed to the northeast toward Novo Miloševo. In recent history, there were occasional plans of using the broader vicinity of Slano Kopovo for a healing spa, fishpond, or for exploitation of oil and natural gas. Although these activities remained the unrealized plans, it is necessary in the future to pay attention to emergence of these or similar ideas and to redirect them in due time according to the prescribed regimes and protection measurements.

24. 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:

Anthropogenic factors and natural processes are from time immemorial present in areas of Slano Kopovo and the broader vicinity, and in a certain degree they had the negative influence in conservation of main natural properties of the area. Before the proclamation of the Special Nature Reserve "Slano Kopovo" in December 2001, the negative factors were more pronounced, while already in 2002 there was an important progress in their removal and application of strategy of active space management and matching the needs of environmental protection and human activities.

During the last decade, an important negative factor is the disturbance of the water balance, as the drying up of Slano Kopovo and Poštaš Kopovo during summer and autumn is becoming more and more common. It is assumed that these drying ups are consequence of change of level of underground water (due to development of Channel Danube-Tisza-Danube and the artificial dam on the river Tisza). The drying up of the lake is one of the main problems of conservation of bird fauna in water habitats. For example, Avocets *Recurvirostra avosetta* did not breed in 1989 due to the low water levels of Slano Kopovo at the beginning of the breeding season.

Destroying of the autochthonous habitats by occasional plowing of pastures, waste ground and downs is one of the problems of protection of birds and the natural values as a whole. During the last several years there was some return of land to private

use, even in the area within the newly made protected property. Inside the protected area there are several hectares of autochthonous habitats that are transformed into agricultural land, and such a trend is visible even in the present, although the ordinance on conservation of the area forbids that. In the area of the protected natural property there are 2-3 haciendas and this leads to certain negative factors – plowing the land (loss of autochthonous habitats), pasturing, disturbing the birds, pollution of land and water etc.

On the western shore of the area there are orchards, vineyards and cereal fields with several bungalows and cottages. As they are in the zone III and were built earlier, their presence does not present a special problem at this time. However, it is necessary to further follow the happenings in this area in order to do the revitalization measurements. Inside of the protected property there are several small paths. Their existence is negative due to destroying of the habitat, disturbing birds and other species, and polluting the soil, so the interest of conservation is control of use of these paths.

The destroying of reed beds (burning or chopping) was previously a regular negative factor within the protected area, and in recent times it occurs sporadically in Poštaš Kopovo. Burning leads to the loss of habitat for birds and other organisms that live in the zone of emerging vegetation.

The insufficiently controlled utilization of chemical means to protect the plants (destroying pests and weeds), as well as artificial fertilizers, represents a very important problem in conservation of birds and other natural values of Slano Kopovo. In the process of circulation of matter, these harmful materials get into the depressions, and either directly or indirectly get introduced into the body of the birds and other living things, causing negative consequences for their life and health. Two decades ago, it was recorded that 45 Common Cranes (*Grus grus*) died due to improper use of a zinc-phosphide chemical for poisoning rodents in agricultural use. These factors were not recorded recently.

(b) in the surrounding area:

Building of certain objects in the wider area is one of the problems for nature protection. Dumping various poisonous materials, mainly agriculture pesticides, around and partly within the protected property was present in several places. This included building material, various bottles (including packages of poisonous chemicals), utensils and tools from households, plastic matter etc. All this garbage represented a negative influence on the reserve, especially the water mirror of the lake. There is still an illegal waste dump in the depression of Kopovo in immediate vicinity of the settlement Novi Bečej, representing one of the greatest ecological problems of the whole region.

25. Conservation measures taken:

During 2001, a Special Nature Reserve "Slano Kopovo" was proclaimed on the surface of 976.44 ha. Reserve is divided into three degrees of protection: I degree on 217 ha with the strictest regulations, II degree on 220 ha, and III degree on 539 ha. The area is managed on two levels: a) caretaker of the protected natural property Hunting Society from Novi Bečej; b) Government of Republic of Serbia with the appropriate ministries and the specialized Institute for Protection of Nature of Serbia. The protected natural property is well marked with appropriate tables.

In the area under I degree of protection, it is forbidden to use natural resources and all other means of using the area and activities are forbidden, except for scientific studies and controlled education. In the area under II degree of protection, there is a limited and strictly controlled utilization of natural resources while the activities in the area may be undertaken in the scope that enables the improvement of the status and presentation of the natural property without the consequences for its primary values. In the III degree of protection, there is a selective and limited use of natural resources and controlled interventions and activities in the area, if they are in accord with the functions of the protected natural property or are connected with the inherited traditional means of doing the industry activities and dwelling, including building of tourist objects. The described regimes of protection are prescribed by the Law on Protection of Environment (Sl. Glasnik RS No. 66/91).

The Special Nature Reserve "Slano Kopovo" is a natural property of especial importance – I category in Serbia. According to IUCN classification, it belongs to category IV – Habitats and other management areas. In 1992, the caretaker of the protected natural property made the temporary program of activities, and after that the suggestion of mid-term Program of protection and development of Slano Kopovo for the period 2003-2007.

First initiatives for protection of Slano Kopovo started in 1971, from the experts of the Institute for biology in Novi Sad. Even then it was announced that this area represents one of the most important habitats of rich and specific ornithofauna, especially during spring and autumn migration. Institute for Protection of Nature in Novi Sad, after the prepared expert base and the research, sends in 1973 the Parliament of Bečej District an initiative and the suggestion of the Act of placing Slano Kopovo under protection. Unfortunately, there was no understanding for that suggestion, as at the time it was planned to make a large fishpond in the area of Slano Kopovo. Since then, there were several initiatives and tries to put this area into the status of a protected region. Since 1989, with a surface area of about 700 ha, Slano Kopovo was placed on the list of most important areas for birds in Europe (IBA). Suggestion that Slano Kopovo should be included in the list of Yugoslav marshes of international importance was also sent from Ornitology Instutute in Zagreb.

Although this area got the status of strict protection only in 2001, during the last two decades it enjoyed the informal protection, as an important natural resource, due to Spatial Plan of Vojvodina Until 2000, which predicted putting this area under protection, as well as due to existing Spatial Plan of Republic of Serbia until 2010. In these documents, such areas enjoy a special treatment, as interesting from the viewpoint of nature protection, and represent areas reserved for these uses.

During the last decade, there was a whole array of individual concrete activities on protection and improvement of conditions of survival of wetland birds. Mud mounds were made in order to enable better breeding of Avocet *Recurvirostra avosetta*, reed was tied into bunches to enable nest building for Bearded Tits *Panurus biarmicus*, presence of domestic swine in the zone of main breeding grounds of wetland birds was discouraged in order to decrease the percentage of destroyed nests.

The main assumptions for efficient doing of protection measurements are: 1) providing the pool of experts; 2) providing the trained guard service, 3) providing the investments for setting and maintaining the area, 4) work on proposed program and plan documents, their expert and social support, 5) cooperation with all users of the area, as well as expert and scientific institutions, 6) maintaining an efficient system of financing.

26. Conservation measures proposed but not yet implemented:

One of the most important activities on protection of Slano Kopovo is sanitation and improvement of water regime. For a long array of years, certain activities were planned, but so far no concrete activities were done, in the first place due to delicateness of the problem, especially considering the achieving the desired salinity of input water, lack of appropriate data on water regime of surrounding channels, the present level of underground waters, and especially the lack of financial means. During the September 2002, experts from Euronatur and Frankfurt Zoological Society visited Slano Kopovo, and the main activities were directed to over viewing the protected natural property and discussion of possibility of development of an adequate project of sanitation and revitalization, which would financially and expertly be supported by relevant international institutions. During the solving of the problem of supplying the area with water, experience from similar areas of Hungary should be used.

The general concept of planned activities in the future is based on the necessity of conservation of this natural property of especial national and international importance. That includes primarily protection of existing unique ecosystems with the surroundings that present the typical lowland area of Pannonian plain, with the mark of traditional existence of humans in this area.

Besides the protection projected by proclaiming the Special Nature Reserve, it is necessary in the upcoming period to value and in appropriate way conserve the broader area, not only as a space that represents the migratory stop for Common Cranes (*Grus grus*) but also as an important landscape of typical Pannonian features. With that goal in mind, the traditional way of utilization of space and rural features (haciendas) should be stimulated, and the active protection in future should include the cultural and historic monument Arača.

In order to conserve the protected natural property in its ancestral way with the broader vicinity, it is necessary to activate and direct the scientific research, as well as the appropriate promotion and propaganda of the area. In accord with the main goals of protection of the area, it is planned to constantly monitor the activities on following

measurements: respecting the existing regimes of protection, monitoring, peace in animal habitats, protection of nests of birds of prey, management with number of predators, stopping the use of chemical protective chemicals on the cultivated areas within the boundaries of the reserve, setting the artificial nests, increase of forest in edge parts on western side of the reserve, control of number of visitors etc.

Taking in account the previous human activities that happened in this area, all the future activities, development and use of goods must be in accord with the main goal of protection and conservation of the space. The development of the protected natural property must be directed into the direction of gradual turning of the cultivated areas into pastures and meadows. The possible solution of returning the authenticity to the protected natural property is buying the private cultivated plots by the state or with the help of international funds.

Hunting will in future management of the protected natural property be done in accord with the existing hunting base and with prescribed regimes and protection measurements. The existing and future offer of hunting tourism should be improved with the possibility of photo-safaris not only of game animals but also other very attractive bird species.

One of the priorities is setting a system of making compensations for use of natural property, so it would be additional way to gather means for planned goals on protection and development of the Reserve. In order to realize the program, there are yearly plans of protection and development, and if needed, there are special action plans with the goal that the planned goals are done with full engagement of official and interested subjects.

It is necessary to intensify the cooperation on the international level, in order to implement the foreign experiences on protection of similar areas and getting the extremely needed financial and expert help.

It is necessary to return the agricultural land in the area between Kopovos into the primary state, that is, to revitalize the autochthonous vegetation. This may be done through buying or replacement of land from the private and public owners by caretakers. In the III zone of protection, it is necessary to completely stop the use of chemicals, in order to escape the effects of direct or indirect poisoning or pollution of soil, water, plant and animal species of the protected property.

27. Current scientific research and facilities:

Slano Kopovo represents an excellent science polygon, which is testified by numerous research and scientific works, primarily by geographers, ornithologists and botanists. In the future, it should be insisted that scientists and experts of various profiles be gathered together for further interdisciplinary work in this area. The coordinated planning and following of science research would result in answers on many questions of

fundamental importance (solving the problem of supplying the water), directions and the practical solutions for future management of the protected natural property.

The content of scientific research at the protected natural property is determined primarily by present diversity and richness of fauna, and specific flora characteristic for salty lakes. An especial care should be paid to valorisation of natural values of the area in the immediate vicinity of the Reserve, especially in the direction of remains of the monastery Arača as an important space for Cranes.

Having in mind the status of the protected natural property, directions and the goal of science research in the program of research of the Reserve that will be made in cooperation with the Institute for Protection of Nature of Serbia and the scientific research institutions, should be planned so they include an array of scientific research themes.

In order to fulfil these goals, the following activities are planned: 1) initiating and organizing the appropriate plan documents for arranging a half-functional object for scientific research activities, functions of accommodating the visitors, the ecological station, and other needs of the service of managing the reserve in the area of former pheasant pen. 2) Arranging three tall and one low lookout tower, for needs of monitoring, scientific research, educational and tourist activities. 3) Providing the protection service with a vehicle, computer equipment, video and photo equipment.

28. Current conservation education:

An important activity in area of Slano Kopovo should be directed toward the education of visitors and especially the local community. The natural properties of the area in function of education will be presented through appropriate information in media and publications, promotions and other views of propaganda, as well as on expert and scientific meetings. Therefore following things will be made: a coat of arms and a sign of the protected property, special prospects and posters, postcards and guide, audio-visual propaganda material, website and popular scientific publications.

Taking in account all the natural values and the scientific importance of this area, the education potential of Slano Kopovo is extremely great, but still not completely used, especially from the reason of its uniqueness and specificity, and also easy access and the vicinity of large towns. This area has special importance as a space for realization of educational activities. The programs of education development will use experience and directions of organizations such as Europarc Federation, through the cooperation with the Yugoslav section of that organization.

Education activities may be realized through organized visits of smaller groups from elementary and high schools as well as colleges. It is especially important that college students of natural sciences (biology, forestry, agriculture) should be introduced to these unique and especially vulnerable ecosystems. This activity represents an investment into the future and making the consciousness about the necessity of real

household relationship toward the natural heritage, and should have a priority in programs of protection and development. With the goal of improvement and use, matched with the basic use of protected natural property, it is necessary to, besides presenting the material means, thoughtfully and permanently work on education of local community and the possible users of the area, and especially on the promotion and propaganda of existing natural values as development potential of broader area and the whole country.

The Hunting society Novi Bečej will, with the expert help of Institute for protection of Nature of Serbia, be equipped with workforce and technical things to start process and take care of documentation and data, with the goal of developing the information system of natural properties of Serbia. Information system with a database will be used in order to lead the program of education, protection measurements and improvement of natural values of the protected property, as well as monitoring of their effects, further research, information exchange on national and international level, for planning, arranging and utilization of space, and making of information-propaganda material.

In the area of the Reserve there will be organized eco-camps for researchers, as well as "schools in nature". The natural conditions and the proximity of larger education centers (Novi Sad, Zrenjanin, Kikinda) make a possibility of organization of one-day visits to the Reserve, together with lectures, for which an expertise program will be prepared. It will include different versions for various school levels (grades K-12). The existing object at the edge of the reserve will be rearranged for the needs of research, popularization and education.

29. Current recreation and tourism:

Tourist arrangement and organizing, matched with the protection of natural values, with the adequate promotion, is an important potential of the sustainable development of Slano Kopovo. In order to properly develop the tourist potential, it is necessary to make an Action Plan for Sustainable Tourism in SRP "Slano Kopovo", arrange presence of a guide and the other conditions for the expert program of presentation of natural values, tidy up the information center, admission points and eco-paths on the terrain, for group and individual visits, prepare the information tables, mark the directions of visitors' movement on observation points.

An important potential of sustainable development of Slano Kopovo is primarily the tourism, based on planning and organizing of primarily the special, so-called ecological tourism. An advantage to this is the fact that Slano Kopovo represents one of the last conserved ponds on salt ground of Vojvodina, with a typical halophyte vegetation, which is, not only in our country but in whole of Pannonian plain, in phase of extinction. In the same time, this area also represents a very important and significant center of biological diversity of wildlife in our area, as well as one of the most important and most characteristic habitats for birds in Serbia. We should also not forget the fact that this is a unique migration stop for migratory birds, especially the Common Crane. This

natural property is also characterized with presence of very rare plant and animal species that can be seen only here.

With that in mind, investment into tourist arrangement and organization, with the adequate promotion, should contribute to placing this activity together with all the others into one of the main ones in the future development, matched primarily with conservation of main natural values.

One of the more important means of utilization of Slano Kopovo is hunting. The most important game species in this area are birds, primarily Pheasant, Grey Partridge, Quail and Mallard. Of the mammals, subjects of hunting are Hare and Roe Deer. The existing and future offer in hunting tourism should be improved with a possibility of "hunting with a camera", not only of official game animals, but also other very attractive bird species. We consider this a very important aspect of hunting in the future.

The cultural and educational function of the protected natural property will be accomplished according to the specialized programs and the target groups of visitors and users of the Reserve. The main goal is the arrangement of these programs and a suitable technical arrangement.

30. Jurisdiction:

It depends of the authority and the level of management and utilization of the area. The area is managed on two levels:

a) Government of Republic of Serbia with the appropriate Ministries and the Institute for Protection of Nature.

b) The caretaker of the protected natural property the Special Nature Reserve "Slano Kopovo", Hunting Society "Novi Bečej" from Novi Bečej.

31. Management authority:

Hunting Society from Novi Bečej (the official caretaker of the Special Nature Reserve "Slano Kopovo")

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