

3SK004

# Information Sheet on Ramsar Wetlands

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

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

1. Date this sheet was completed/updated:  
20 June 1998

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3SK004

Designation date

Site Reference Number

02/07/90

2. Country: Slovak Republic

3. Name of wetland: Senné - rybníky (Senné Fish-ponds)

4. Geographical coordinates: 48° 41' N, 22° 04' E  
48° 40' 40" - 48° 42' 10" N, 22° 03' 30" - 22° 05' 50" E

5. Altitude: (average and/or max. & min.) 100 - 102 m a.s.l.      6. Area: (in hectares) 424.6 ha = 425

7. Overview: (general summary, in two or three sentences, of the wetland's principal characteristics)  
The site is located in Senianska Mokrad', a formerly seasonally-inundated large, flat depression within Východoslovenská Rovina Lowland (East Slovakian Lowland) that lies on an important waterbird migration route. The site includes one large pond with adjacent seasonally-flooded grasslands and shrub swamps and 28 fish-farming ponds. It is one of the most important breeding and resting sites of rare, endangered and vulnerable waterbirds in Slovakia, including globally threatened and migratory species.

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

- marine-coastal: A . B . C . D . E . F . G . H . I . J . K
- inland: L . M . N . O . P . Q . R . Sp . Ss . Tp . **(Ts)** .  
U . Va . Vt . **(W)** . Xf . Xp . Y . Zg . Zk
- man-made: **(1)** . **(2)** . **(3)** . **(4)** . 5 . **(6)** . 7 . 8 . 9

Please now rank these wetland types by listing them from the most to the least dominant: 2, 1, W, 4, Ts, 6, 3

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

- 1a . 1b . 1c . 1d | **(2a)** . **(2b)** . 2c . 2d | 3a . **(3b)** . 3c | 4a . 4b

Please specify the most significant criterion applicable to the site: 2a

10. Map of the site included ? Please tick **yes**  -or- **no**

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

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

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02 NOV 1998

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

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

2 a - The site supports an appreciable assemblage of waterbirds (144 species), including rare, vulnerable and endangered species

2 b - The site is of special value for maintaining the genetic and ecological diversity of the East Slovakian Lowland because of the composition of its fauna, especially birds, and flora (32 threatened species)

3 b - The site regularly supports substantial numbers of individuals from particular groups of waterfowl: *Podiceps cristatus* (20-40 breeding pairs, p.), *Podiceps nigricollis* (20-100 p.), *Phalacrocorax carbo* (80-120 p.), *Botaurus stellaris* (4-8 p.), *Ixobrychus minutus* (3-5 p.), *Nycticorax nycticorax* (20-70 p.), *Egretta alba* (10-15 p.), *Ardea purpurea* (10-15 p.), *Platalea leucorodia* (0-5 p.), *Anas strepera*, *A. crecca*, *A. platyrhynchos*, *A. querquedula*, *A. clypeata*, *Aythya ferina*, *A. nyroca*, *A. fuligula*, *Circus aeruginosus* (5-20 p.), *Recurvirostra avosetta* (1-12 p.), *Charadrius dubius* (5-20 p.), *Vanellus vanellus* (10-80 p.), *Gallinago gallinago*, *Limosa limosa* (5-30 p.), *Tringa totanus* (5-20 p.), *Chlidonias hybridus* (20-200 p.).

Migratory birds: *Anser fabalis* (tens of thousands during migration), *Anser albifrons*, *Anas penelope*, *Bucephala clangula*, *Haliaeetus albicilla*, *Pandion haliaeetus*, *Circus cyaneus*, *Grus grus*, *Phuivialis apricaria*, *Calidris minuta*, *C. alpina*, *C. ferruginea*, *Limicola falcinellus*, *Philomachus pugnax* (tens of thousands), *Numenius phaeopus*, *Tringa stagnatilis*, *Phalaropus lobatus*, *Sterna caspia*, *Chlidonias leucopterus*.

**13. General location:** (include the nearest large town and its administrative region)

The site is located in the East Slovakian Lowland, 13 km SE of district town Michalovce (41,000 inhabitants).

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

The East Slovakian Lowland had begun to evolve in the Neogene because of tectonic sinks. In the early Pleistocene, there was a conspicuous tectonic depression filled with deposits of volcanic and Flysch origin. **Geology:** Holocene fluvial clayey sediments on Neogene clays and gravel. **Soil type:** eutric fluvisols, fluvi-eutric gleysols, eutric gleysols and verti-haplic chemozems. **Geomorphology:** alluvial floodplain with large wetland depression between the (aggradational) levees; neotectonic movements (sinks) still active. **Origin:** artificial. **Hydrology:** The fish-ponds are supplied by the Okna River (catchment area 150.7 km<sup>2</sup>) with diversion construction near Blatná Polianka and a system of canals which flow into the Čierna Voda River. The area is in the Laborec River catchment. The amount of water taken for the system of fish-ponds from Okna River was set to a maximum of 2.5 m<sup>3</sup>·s<sup>-1</sup>. **Water quality** in the recipient Čierna Voda River was measured by means of BSK<sub>5</sub>, CHSK<sub>MN</sub>, chemical and physical indices and biological/microbiological indicators; it was categorized into class II and/or III (water clean and/or polluted). **Water depth:** The maximum is 2 m. In the main fish-pond the mean depth is 0.7 m. In the largest pond (the reserve) there is permanent water, and the maximum seasonal variation in water levels is 0.4 m. Fish-farming ponds are discharged according to a fishery management plan. The adjacent meadows are seasonally flooded. Groundwater levels move up to 0.5 - 0.0 m below the surface or even slightly above the surface; average groundwater level in the area is between 0.89 - 1.71 m. **Climate:** warm, moderately dry to moderately wet climatic district with cold winters (average air temperature in January over -3 °C, in July 19.7 °C, mean annual air temperature 9.1 °C); mean annual rainfall 593 mm (range 304 - 1,050 mm) with maximum in July (79 mm) and minimum in March (31 mm).

**15. Hydrological values:** (groundwater recharge, flood control, sediment trapping, shoreline stabilisation, etc.)

The artificial system of fish-ponds substitutes for the former flooded area eliminated by the construction of reservoirs, canals and drainage network in the lowland. This system provides permanent surface water on a year-round basis.

**16. Ecological features:** (main habitats and vegetation types)

The site belongs to the phytogeographic province of Pannonian flora (*Pannonicum*), a district of true Pannonian xerophytic flora (*Eupannonicum*) and a region of the Východoslovenská Nížina Lowland. Several habitat types are present in the site: canals, ponds (1 non-farming pond and 28 fish-farming ponds and tanks), wet meadows and pastures with a wide variety of plant communities. In the catchment of Čierna Voda River, pastures of the alliance *Cynosurion cristati* (mostly association *Trifolium repentis* - *Lolietum lotetosum tenuis*) are dominant; some transition types that depend on groundwater level regime also occur. Communities of the alliance *Loto-Trifolion* at the edge of open water with *Orchis laxiflora* subsp. *palustris* are preserved as native vegetation units. Mesic meadows are represented by the alliance *Alopecurion pratensis*, associations *Alopecuretum pratensis* and *Festucetum pratensis*. These are valuable because of the occurrence of *Fritillaria meleagris* and *Leucosium aestivum*. The dominant type of riparian vegetation is dense reed-bed of alliance *Phragmition* with species as *Phragmites australis*, *Typha latifolia*, *T. angustifolia*, *Glyceria maxima* (it forms also distinct facies), *Phalaroides arundinacea*, *Galium palustre*, *Lysimachia vulgaris*, *Schoenoplectus lacustris*, *Scutellaria galericulata*, *Lythrum salicaria*, *L. virgatum*, *Lycopus europaeus*, etc. Important diagnostic species include *Sparganium erectum*, *Sagittaria sagittifolia*, *Butomus umbellatus*, *Alisma plantago-aquatica*. Phytocoenoses with dominant *Typha laxmanii* are valuable. The inner edge of the reed communities consists also of species of the alliance *Oenanthion aquaticae*. Floating macrophytes belong to the alliance *Lemnion minoris*, noteworthy species include *Lemna minor*, *L. trisulca*, *Trapa natans*, *Utricularia vulgaris*, *Hottonia palustris*, *Najas marina*, *Ceratophyllum submersum*, *Hydrocharis morsus-ranae*. A major part of the littoral tall-sedge stands is of the alliance *Caricion gracilis* (homogeneous communities with dominant *Carex gracilis* and *C. vulpina*). In the transition zone *Carex vesicaria*, *C. riparia*, *Phalaroides arundinacea*, *Sium latifolium* and *Iris pseudacorus* also are found. The edges of these stands are inhabited by the communities of the alliance *Phalaridion arundinaceae*. Wet depressions are occupied by alluvial meadows and wetland shrubs with dominant *Salix cinerea* which belong to the alliance *Salicion cinereae*. Other shrub/tree species are represented by *Salix alba*, *S. caprea*, *Populus nigra*, *P. tremula*, *Sambucus nigra*, *Alnus glutinosa*, *Cerasus avium*, *Betula pendula*, *Padus avium*, etc. Along the N bank and dike an avenue of allochthonous *Populus canadensis* was planted during the pond construction.

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

Approximately 300 species of vascular plants have been found in the site and 14.5 % of them are considered rare or threatened. The most vulnerable species include *Ceratophyllum submersum*, *Gratiola officinalis*, *Thalictrum flavum*, *Veronica anagalloides*; endangered and rare are *Orchis laxiflora* subsp. *palustris*, *Fritillaria meleagris*; vulnerable *Allium angulosum*, *Berula erecta*, *Butomus umbellatus*, *Cicuta virosa*, *Eryngium planum*, *Juncus atratus*, *Hottonia palustris*, *Lathyrus hirsutus*, *Leucosium aestivum*, *Myosotis palustris* subsp. *palustris*, *Schoenoplectus tabernaemontani*, *Stachys palustris*, *Trapa natans*, *Utricularia vulgaris*, *Viola palustris* subsp. *palustris*, *Xanthium strumarium*, etc.

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

**Fishes:** *Carassius carassius* (EN). **Amphibians:** *Triturus vulgaris*, *T. cristatus*, *Rana esculenta*, *Bufo bufo*, *B. viridis*, *Bombina bombina*. **Birds:** One of the most important breeding and resting sites of waterbirds in Slovakia is found here; 144 species of waterbirds have been found, 52 of them (36.1 %) are migrant, 41 (28.5 %) regularly breed (see also section 12), 31 (21.5 %) species are accidental, e.g. *Pelecanus onocrotalus*, *P. crispus* (VU), *Anthropoides virgo*, *Glareola nordmanni*, *Calidris melanotos*, *C. maritima* (the only Slovakian finding place), 16 (11.1 %) breed sporadically, e.g. *Phalacrocorax pygmeus*, *Charadrius alexandrinus* (the only breeding site in Slovakia), 3 species (2.1 %) occur as non-breeding spring/summer visitors (*Ardeola ralloides*, *Plegadis falcinellus*, *Larus cachinnans*) and 1 species (0.7 %) is a rare visitor (*Glareola pratincta*). The area is also an important wintering site for *Cygnus olor*, *Haliaeetus albicilla*, *Circus cyaneus* and *Asio flammeus*. Characteristic non-breeding species include *Limicola falcinellus*, *Philomachus pugnax*, *Tringa stagnatilis*, *Phalaropus lobatus*, *Sterna caspia*, *Anthus cervinus*. Other globally threatened species found in the site, mainly during migration, are *Anser erythropus* (VU), *Aythya nyroca* (VU - sporadic breeding), *Numenius tenuirostris*

(CR), *Crex crex* (VU), *Acrocephalus paludicola* (VU - sporadic breeding) (for details see also appended list of species). Mammals: *Lutra lutra*.

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

A part of the site is used for fish-farming and for cattle grazing. The site is also an important subject of scientific research (hydrological, ornithological, botanical) and education for students and members of non-governmental organizations. All these activities are consistent with the maintenance of the site (vegetation depends on grazing and mowing, fishery and suitable management of fish-ponds support waterbirds, research is under guidance of environmental authorities).

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**20. Land tenure/ownership of:**

- (a) site - surface water is owned by the state and managed by the state authorities Bodrog and Hornád River Catchment Administration at Košice and the East Slovakian Fishery Enterprise at Michalovce; meadows and pastures are private (owners unknown), used by Cooperative Farm at Iňačovce.  
 (b) surrounding area - the same owners.
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**21. Current land use:**

- (a) site - Most of the site is protected as a nature reserve (213.31 ha) and its buffer zone (211.28 ha). The reserve is not used and is comprised of one large pond and adjacent meadows and marshes. The buffer zone includes fish-farming ponds that produce several fish species (mainly carp - 80 %, but also introduced herbivores *Hypophthalmichthys molitrix*, *Ctenopharyngodon idella*, and other species such as pike, bream, wels etc.) in a 2 - 3 year cycle, but current fish production has decreased due to fish-eating bird (mainly cormorant) predation (211,277 kg of fish produced in 1990 vs 9,050 kg in 1996). Adjacent pastures are used for cattle grazing.  
 (b) surroundings/catchment - fish-farming (total area of fish-farming ponds 482.74 ha), livestock grazing, mowing, other agricultural production (10 - 15 % of arable land), irrigation. Population in the area is dispersed in small villages: Blatná Polianka (192 inhabitants), Blatné Revištia (207), Blatné Remety (460), Iňačovce (567), Senné (691).
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**22. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land use and development projects:**

- (a) at the site - The fish-pond system was built in two periods - in 1970 - 1976 and in 1983 - 1987; water is supplied from the system of canals, river diversions and outlets. Water quality is affected by agriculture in the catchment; eutrophication and siltation in the main pond can be seen. Secondary succession because of reduced grazing and reduced fish production has caused changes in the structure of both grassland and pond macrophyte vegetation. Direct human disturbance and fish poaching also occurs. Two allochthonous fish species (*Hypophthalmichthys molitrix* and *Ctenopharyngodon idella*) were introduced for fish-farming purposes. Allochthonous trees (*Populus canadensis*) were planted in 1970s along N dikes. Some fish-farming practices influence breeding of waterbirds.  
 (b) around the site - The Senné wetland depression was the subject of drainage activities since 19<sup>th</sup> century, and construction of the system of canals, pumping stations, dikes and drainage network began in the 1850s. Complex water management plans for the East Slovakian Lowland were elaborated since 1949 and during 1950 - 1970 considerable changes in discharge and groundwater regimes took place. In 1965, a large water reservoir, Vihorlat (Zemplínska šírava), with river diversion was built in the catchment and floods were mitigated (during over flow stages, the water level in the Senné depression reached up to 3 m and a lake 12 km long and 5 km wide appeared). Water pollution from industrial and agricultural sources in the catchment is an important adverse factor.
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**23. Conservation measures taken:** (national category and legal status of protected areas - including any boundary changes which have been made; management practices; whether an officially approved management plan exists and whether it has been implemented)

The site has been protected since 1974 (Decree of Ministry of Culture No. 3582/1974-OP on 27 May 1974), and it was declared a State Nature Reserve with an area of 213.31 ha (the area of non-farming pond and meadows) with buffer zone 211.28 ha (fish-farming ponds). According to the Act on Nature and

Landscape Protection No. 287/1994 the site was categorized as a National Nature Reserve. Fish-farming practices have been consulted with the manager so as to be beneficial to waterfowl. In 1987 - 1988 the first environmental management activities in the reserve were carried out (removal of sediments, vegetation management, dike and outlet reconstruction, management of islands, etc.). A draft management plan was prepared in 1992 and 1995, but it is necessary to finalize it according to new legislation on nature conservation documentation. However, some proposed measures have been implemented (dike reconstruction, research facilities, guarding of the site, fish stocking, education, mowing of meadows, establishment of an Advisory Board of representatives of the owners, managers, agencies, government authorities and NGOs) in cooperation with governmental and non-governmental organizations. The site is included in the Regional Territorial System of Ecological Stability of the Michalovce district (1994) as an important biocentre. It was proposed to exclude the fish farm from the privatization. The site is listed as an Important Bird Area in Europe No. 028 (GRIMMETT, JONES 1989).

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

In 1989 a proposal for enlargement of the buffer zone area to 323.1 ha and of the reserve itself to 4.21 ha was made by the Nature Conservancy, but legislative obstacles occurred. The draft management plan also includes measures as monitoring, water quality analyses, stimulation of educational use, vegetation management, water regime improvement, support of waterfowl populations and financing.

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

The site has been a subject of interest for ornithologists for a long time, and some studies have been published since 1955. Detailed research and banding of waterbirds was carried out in 1970 - 1974, and since 1975, with the Museum of Zemplin Region at Michalovce, nature conservation agencies, ornithological societies and foreign specialists have been involved with these activities. A detailed study on the Cormorant (*Phalacrocorax carbo*), its status and predation on fish in the farm was carried out in 1996 - 1997. A botanical study was made in 1997. A bird-watching tower was constructed in 1997, and a field station was established.

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**26. Current conservation education:** (e.g. visitors centre, hides, information booklet, facilities for school visits, etc.)

The site is used sporadically for education of students and guided tours are organized by the ranger and NGOs. Basic information on the site is provided in the administrative buildings of the fish farm. An educational path with information panels is planned using the field station also as visitors centre. The area is closed to the public because an increasing number of visitors can disturb the breeding birds.

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

The site is not used for recreation and tourism and their development is not advisable.

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**28. Jurisdiction:** (territorial e.g. state/region and functional e.g. Dept. of Agriculture/Dept. of Environment, etc.)

Ministry of Environment, Department of Nature and Landscape Protection at Bratislava  
 Ministry of Agriculture, Forest and Water Management at Bratislava  
 Regional Office at Košice, Department of Environment and Department of Agriculture  
 District Office at Michalovce, Department of Environment and Department of Agriculture  
 Municipal authorities at Iňačovce and Blatná Polianka

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

Slovak Environment Agency, Centre of Nature and Landscape Protection, Garbiarska 2, SK-040 01  
 Košice; tel./fax: +421 95 6335909  
 Bodrog and Hornád River Catchment Administration, Ďumbierska 14, SK-040 01 Košice,  
 tel.: +421 95 6333711

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**30. Bibliographical references:** (scientific/technical only)

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- TOMAŠOVIČ, ZATKALÍK, 1990: Iňačovce - bilancia povodia toku Okna ŠPR Senné-rybníky - Štúdia. Technická správa. Hydrounion Bratislava, 24 pp. (Manuscript).
- other titles see enclosed Annex II
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