# 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:

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

maps.
1. Name and address of the compiler of this form: Ákos Gáborik conservation officer Duna-Dráva Nemzeti Park Directorate Hungary H-7625 Pécs, Tettye tér 9.  FOR OFFICE USE ONLY.  DD MM YY  DD MM YY  Designation date Site Reference Number
2. Date this sheet was completed/updated: 8 June 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.  Gemenc
<ul> <li>5. Designation of new Ramsar site or update of existing site:</li> <li>This RIS is for (tick one box only):</li> <li>a) Designation of a new Ramsar site □; or</li> <li>b) Updated information on an existing Ramsar site ☑</li> </ul>
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: $\Box$
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and/or If the site area has changed: i) the area has been measured more accurately  $\square$ ; or ii) the area has been extended  $\Box$ ; or iii) the area has been reduced\*\* The area size on the RIS follows the officially (nationally) designated site size (which is based on the land registration data). Unfortunately, the map submitted previously was very poor and the outlines did not follow precisely the land parcel boundaries. So only the map was improved and the area size did not change. \*\* 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): □; iii) a GIS file providing geo-referenced site boundary vectors and attribute tables  $\Box$ ; 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 Gemenc unit of the Duna-Dráva National Park. **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°06'-46°23'N - 18°45'-18°57'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 County: Tolna and Bács Kiskun Towns: Szekszárd, Baja **10. Elevation:** (in metres: average and/or maximum & minimum)

# 11. Area: (in hectares) 16873 ha12. General overview of the site:

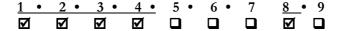
86-94 m asl (Baltic)

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

There is a variety of floodplain biotopes along the river Danube. The floodplain forests and dead branches of the river support a high number and dense populations of important and/or protected species and communities.

# 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



# 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).

**Criterion 1:** Gemenc is a typical middle Danube floodplain. Considering its size and close to natural status it has a special value because it supports the species richness of the river Danube and its floodplain communities.

3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the *Isoëto-Nanojuncetea* 

3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition – type vegetation

3270 Rivers with muddy banks with Chenopodion rubri p.p. and Bidention p.. vegetation

6440 Alluvial meadows of river valleys of the Cnidion rubii

91E0 Alluvial forests with Alnus glutinosa and Fraxinus excelsior

91F0 Riparian mixed forests of *Quercus robur, Ulmus laevis* and *Ulmus minor*, *Fraxinus excelsior* or *Fraxinus angustifolia*, along the great rivers

#### **Criterion 2:** Gemenc supports a considerable population of the vulnerable species :

Fire-bellied toad (Bombina bombina) conservation dependent IUCN Red list + Annex II Habitat Directive

Common otter (Lutra lutra) Vulnerable A2cde IUCN Red list + Annex II Habitat Directive

European pond turtle (Emys orbicularis) Near Threatened IUCN Red list + Annex II Habitat Directive

Medicinal leech (Hirudo medicinalis) Near Threatened IUCN Red list

European tree frog (Hyla arborea) Near Threatened IUCN Red list

Danube crested newt (Triturus dobrogicus) data deficient IUCN Red list + Annex II Habitat Directive

Eurasian beaver(Castor fiber) Near Threatened IUCN Red list + Annex II Habitat Directive

Weatherfish (Misgurnus fossilis) IUCN Red list + Annex II Habitat Directive

Sterlet (Acipenser ruthenus)IUCN Red list

White-tailed Eagle (Haliaeetus albicilla) Near Threatened IUCN Red list + Annex I Bird Dir.

Black Stork (Ciconia nigra) Annex I Bird Directive

Black Kite (Milvus migrans) Annex I. Bird Directive

Ukranian Brook Lamprey (Eudontomyzon mariae) DD IUCN Red list + Annex II Habitat Directive

Saker (Falco cherrug) Endangered IUCN Red list + Annex I Bird Directive

Honey Buzzard (Pernis apivorus) Annex I Bird Directive

Black Woodpecker (Dryocopus martius) Annex I Bird Directive

Ferruginous duck (Aythia nyroca) Near Threatened IUCN Red list + Annex I Bird Directive

Smew (Mergus albellus) Annex I Bird Directive

Wildcat (Felis silvestris) Annex IV Habitat Directive

Harvest mouse (Micromys minutus) Low Risk/ Near Threatened IUCN Red list

Barbastelle bat (Barbastella barbastellus) Vulnerable IUCN Red list +Annex II Habitat Directive

Pond bat (Myotis dasycneme) Vulnerable IUCN Red list + Annex II Habitat Directive

Natterer's bat (Myotis nattereri) Annex IV Habitat Directive

Whiskered bat (Myotis mystacinus) Annex IV HabitatDirective

Brandt's bat (Myotis brandti) Annex IV Habitat Directive

Leisler's bat (Nyctalus leisleri) Low Risk/Near threatened IUCN Red list + Annex II Habitat Directive

Long-eared bat (Plecotus auritus) Annex IV Habitat Directive Grey long-eared bat (Plecotus austriacus) Annex IV Habitat Directive Serotine (Eptesicus serotinus) Annex IV Habitat Directive

**Criterion 3**: Gemenc supports populations of plant and animal species important for maintaining the biological diversity of the particular biogeographic region (as listed under Criterion 2).

**Criterion 4:** Gemenc supports breeding grounds and migration stopovers of threatened and strictly protected bird species (Birds Directive Annex I)

Black Stork (Ciconia nigra) 38-40 breeding pairs, 400-500 on migration

Aythya nyroca 5 pairs

White-tailed Eagle (Haliaeetus albicilla) 12-13 breeding pairs, 60 wintering

Black Kite (Milvus migrans) 24 breeding pairs

Saker (Falco cherrug) 2-5 breeding pairs

Grey Heron (Ardea cinerea) 400-500 breeding pairs

Honey Buzzard (Pernis apivorus) 15-20 breeding pairs

Alcedo atthis 100 pairs

Black Woodpecker (Dryocopus martius) 30-40 breeding pairs

The area is an important migration stopover and wintering site. The most important non-breeding bird species of the area are:

Anser anser

Anser fabalis

Anser albifrons

Aythya nyroca (in addition to the breeding population)

Aythya ferina(in addition to the breeding population)

Anas platyrhynchos (in addition to the breeding population)

Anas querquedula

Bucephala clangula

Mergus merganser

Mergus albellus

**Criterion 8:** Gemenc is an important spawning and nursery ground for different fish species.

Eudontomyzon mariae, Annex II Habitats Directive

Aspius aspius, Annex II Habitats Directive

Gobio albipinnatus, Annex II Habitats Directive

Gymnocephalus baloni, Annex II Habitats Directive

Gymnocephalus schraetzer, Annex II Habitats Directive

Misgurnus fossilis, Annex II Habitats Directive

Pelecus cultratus, Annex II Habitats Directive

Umbra krameri, Annex II Habitats Directive

Cyprinus carpio

Silurus glanis

Esox lucius

Acipenser ruthenus

Stizostedion lucioperca

**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 and geomorphology: the site is on the alluvial reach of the river Danube. Deep and surface layers are deposited river sediments, high proportion of sand, smaller of gravel, silt and clay. Surface morphology is characterised by dead river branches, some of which are already only temporarily flooded meadows in depressions, due to silting up. The apparent deepening of the stabilized riverbed of the Danube and sediment deposits during inundation are the most typical ongoing geomorphological processes.

The climate is continental, the zone is semi-arid. Precipitations mainly occur in spring and late summer. Yearly average precipitation summa is around 500-600 mm, annual mean temperature is 11 degrees Centigrade.

The hydrology is determined by that of the river Danube. Annual average flooding durability is between 50 and 60 days. Flooding occurs if water level on the Baja gauge exceeds 600 cm. The water level of the Danube on this stretch is strictly depending on the precipitation of the catchment upstream Devin (Austrian and German catchment) with high runoff rates. The difference between the lowest and highest water levels of the Danube at the Baja gauge is about 10 m.

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

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

The site has very small own catchment that doesn't play an important role in the hydrology, nor the water quality of the floodplain. Water supply comes practically a hundred percent from Danube floodings. The site is situated on the active floodplain of the Danube river, the water regime of the branches, oxbow lakes and other backwater types depend on the main course of the river. The floodplain is formed by alluvial sediments, sand and clay. The water bodies mostly surrounded by forest (hardwood and softwood gallery forest and tree plantations. Some water are bordered by reedbeds. The climate is continental.

#### 18. Hydrological values:

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

The area is a floodplain, the groundwater regime of which is directly dependent of the water levels of the Danube. The water levels of different observation wells follow the changes of the Danube level, the dependence is decreasing with distance from the river.

The floodplain with its more than 16000 ha area plays an important role with its natural retention capacity in case of high flood waves.

Considerable amounts of both suspended sediment and bed-load enter the floodplain during high floods, and are deposited there. This has an adverse effect because sediment deposition leads to a continuous rise of the elevation and thus to decrease of inundation frequency and durability of the floodplain. In addition, in the main riverbed of the Danube there is continuous sediment deficiency caused by river regulation, so there is erosion in the main riverbed.

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

Human-made: 1 • 2 • 3 •  $\underline{4}$  • 5 • 6 •  $\underline{7}$  • 8 •  $\underline{9}$  •  $\underline{7}$  • 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.

Xf, Ts, M, P, O, 7, 4, 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.

Habitats:

**Forests** – dominant tree species: Quercus robur, Salix alba, Populus alba, Populus nigra, Ulmus laevis, Fraxinus angustifolia, Populus x euramericana, Juglans nigra

**Water bodies** – permanent water coverage in the river Danube and some side branches and oxbows, seasonal/temporary water coverage in some old oxbows, marshy depressions, reedbeds, wet meadows, willow bushes and forests.

The most characteristic vegetation associations are the following:

- o Calamagostri-Salicetum cinereae
- o Caricetum elatae
- o Scirpo-Phragmitetum
- o Hydrochari-Strationetum
- o Moinetum coerulae
- o Perucedano-Asterertum sedifolii
- o Salvio-Festucetum rupicolae
- o Agrostio-Alopecuretum pratensis
- o Achilleo-Festucetum pseudoinae

#### 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*.

Crataegus nigra is the biogeographically most important endemic species

Leucojum aestivum

Nymhoides peltata

Trapa natans

Nymphaea alba

Salvinia natans

Sagittaria sagittifolia

#### 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*.

The following red-list animal species have considerable populations in the area:

- o Fire-bellied toad (Bombina bombina) conservation dependent
- o Common otter (Lutra lutra) Vulnerable A2cde
- o European pond turtle(Emys orbicularis) Near Threatened
- o Medicinal leech (Hirudo medicinalis) Near Threatened
- O European tree frog (Hyla arborea) Near Threatened
- o Danube crested newt (Triturus dobrogicus) data deficient

o Eurasian beaver(Castor fiber) Near Threatened

The following fish species have biogeographically important populations and spawning/nursing grounds in Gemenc:

- o Misgurnus fossilis
- o Cyprinus carpio
- o Silurus glanis
- o Esox lucius
- o Acipenser ruthenus
- o Stizostedion lucioperca

The following bird species have biogeographically important populations here:

- o White-tailed Eagle (Haliaeetus albicilla) 12-13 breeding pairs, 60 wintering
- o Black Stork (Ciconia nigra) 38-40 breeding pairs, 400-500 on migration
- o Black Kite (Milvus migrans) 30-35 breeding pairs
- o Saker (Falco cherrug) 2-5 breeding pairs
- o Grey Heron (Ardea cinerea) 400-500 breeding pairs
- o Honey Buzzard (Pernis apivorus) 15-20 breeding pairs
- o Black Woodpecker (Dryocopus martius) 30-40 breeding pairs

The area is an important migration stopover and wintering site. The most important non-breeding bird species of the area are:

- o Anser anser
- o Anser fabalis
- o Anser albifrons
- o Aythya nyroca
- o Aythya ferina
- o Anas querquedula
- o Bucephala clangula
- o Mergus merganser
- o Mergus serrator
- Mergus albellus

The following rare and/or protected mammal species are characteristic for the habitat

- o Wildcat (Felis silvestris)
- o Eurasian common shrew (Sorex araneus)
- o Eurasian pygmy shrew (Sorex minutus )
- o Mediterranean water shrew (Neomys anomalus)
- o Barbastelle bat (Barbastella barbastellus)
- o Pond bat (Myotis dasycneme)
- o Natterer's bat (Myotis nattereri)
- o Whiskered bat (Myotis mystacinus)
- o Brandt's bat (Myotis brandti)
- o Leisler's bat (Nyctalus leisleri)
- o Long-eared bat (Plecotus auritus)
- o Grey long-eared bat (Plecotus austriacus)
- o Serotine bat (Eptesicus serotinus)

#### 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:

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.

- b) If Yes, tick the box  $\square$  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:
- 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:

Mostly state owned, only small parts are private property.

(b) in the surrounding area:

Typically private and municipal ownerships.

# 25. Current land (including water) use:

(a) within the Ramsar site:

Forestry, hunting, fishing, angling, recreation, tourism.

(b) in the surroundings/catchment:

Various, characterised by agriculture and aquaculture.

# 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:

Past: river regulation of the Danube river and flood protection of the surrounding, intensive forest management.

Present: intensive forest management, overfishing of natural waterbodies, navigation.

Future: development of transportation, infrastructure and increasing human pressure (resulting mainly from increasing water-related recreation and tourism).

(b) in the surrounding area:

Agricultural activities, development of transportation, infrastructure, insufficiently treated wastewater disposal in the vicinity.

# 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.

National Park since 1996, before Landscape Protection Area.

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

Ia □;Ib □; II □; III □; IV □; <u>V ☑;</u> VI □

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

The management plan exists in draft version only. It is not approved yet.

d) Describe any other current management practices:

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

e.g. management plan in preparation; official proposal as a legally protected area, etc. Wetland restoration measures are planned (technical interventions in order to improve the water regime).

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

e.g., details of current research projects, including biodiversity monitoring; existence of a field research station, etc. Different monitoring activities have been carried out during the past 15 years in relation to Hydrology, Bird fauna, Flora, Amphibian, Reptile and Fish fauna, Water quality, Groundwater regime. There is no field research station. The monitoring activities are carried out by different NG organizations and institutions in co-operation with the Directorate.

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

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

There are visitors' centres, observation towers and nature trails, as well as information booklets and tourists' maps available.

#### 31. Current recreation and tourism:

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

There is an official tourist trail across the area. There is a biking route around the site. Waterbodies are very popular for rowing. Angling is also very popular where allowed.

#### 32. Jurisdiction:

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

The Dél-Dunántúli 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.

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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

PMMF Vízgazdálkodási Intézet: Revitalisation du systeme hydraulique et de L'ecosysteme du foret de Gemenc (Összefoglaló jelentés az Equipe Cousteau megbízásából), PMMF Vízgazdálkodási Intézet, Baja, 1992

- Stalpers, I.- Rosmalen, T.: A study of hydrological possibilities of revitalisation of the ecosystem in the Keselyüs-area (Concept report), BME, Agricultural University Wageningen, PMMF Vízgazdálkodási Intézet Baja, 1993
- Kalweit, H.-Buch, W. et all.:Der Rhein unter der Einwirkung des Menschen-Ausbau, Schiffahrt, Wasserwirtschaft, Internationale Kommission für die Hydrologie des Rheingebietes, Lelystad Niederlande, 1993
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  - Kalocsa B. Tamás E. (2004): Conservation Measures of the Black Stork (Ciconia nigra) in Hungary, particularly in the Gemenc Region of the Danube-Drava National Park, 1996-2000. les Actes de la IIIéme Conference Internationale sur la Cigogne noire, Forneau-Saint Michel, Belgique, 2001. "AVES" vol. 40/1-4., Dépot Liége X-P302132, BE ISSN 0005-1993
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- Kalocsa B. Tamás E.(2004): Addendum to the diet of the Black stork (Ciconia nigra) in the Gemenc Region of the Danube-Drava National Park, Hungary 1996-2000. les Actes de la IIIéme Conference Internationale sur la Cigogne noire, Forneau-Saint Michel, Belgique, "AVES" vol. 40/1-4., Dépot Liége X-P302132, BE ISSN 0005-1993
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- Tremolier, M.-Schnitzler, A.:La vegetation terrestre et aquatique des zones alluviales du Danube, Université Louis Pasteur, Strasbourg, 1992
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- Munkacsoport: Revitalisation of Gemenc floodplain forest (project jelentés), Delft University of Technology, 1991
- Munkacsoport: Revitalization of the Gemenc (összefoglaló jelentés), Delft University of Technology, 1992
- Castella, E.-Fruget, J. F.-Amoros, C.-Roux, A. L.: Les fonctions des zones humides et des milieux aquatiques des plaines alluviales en relation avec le cours principal des fleuves, Université Claude Bernard, Lyon,1992
- Delft Hidraulics RIZA -VITUKI: Floodplan rehabilitation Gemenc (Final report), Delft Hydraulics, RIZA, VITUKI, 1993
- Equipe Cousteau: The Danube... for whom and for what? (Final report ), . Equipe Cousteau, Paris, 1993

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