Information Sheet on Ramsar Wetlands (RIS) – 2009-2012 version

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

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

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.

2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 14, 3rd edition). A 4th edition of the Handbook is in preparation and will be available in 2009.

3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

1. Name and address of the compiler of this form:
Estonian Wetland Society
Pärnu mnt 40, Häädemeeste, 86001 Pärnumaa
Kai Kimmel (kkimmel@hot.ee)

FOR OFFICE USE ONLY.
DD MM YY
Designation date | Site Reference Number

2. Date this sheet was completed/updated:
21 February 2012

3. Country:
Estonia

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.

Alam-Pedja

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

This RIS is for (tick one box only)**:**
a) Designation of a new Ramsar site ❑; or
b) Updated information on an existing Ramsar site ☑

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

a) Site boundary and area

The Ramsar site boundary and site area are unchanged: ❑

or
If the site boundary has changed:

i) the boundary has been delineated more accurately ❑; or
ii) the boundary has been extended ☑; or
iii) the boundary has been restricted** ❑

and/or

If the site area has changed:
i) the area has been measured more accurately ❑; or
ii) the area has been extended ☑; or
iii) the area has been reduced** ❑

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

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

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

a) A map of the site, with clearly delineated boundaries, is included as:
i**) a hard copy** (required for inclusion of site in the Ramsar List): ❑;

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

iii) **a GIS file providing geo-referenced site boundary vectors and attribute tables** ❑.

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

The boundary is the same as an existing protected area – the Alam-Pedja Nature Reserve

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8. Geographical coordinates (latitude/longitude, in degrees and minutes):
Provide the coordinates of the approximate centre of the site and/or the limits of the site. If the site is composed of more than one separate area, provide coordinates for each of these areas.

58°28'N 26°13'E

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

The site is located in Central Estonia, in Tartu, Jõgeva and Viljandi Counties, 30 km northwest of the town Tartu.

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

32 - 47 m

11. Area: (in hectares)
34 220 ha

12. General overview of the site:
Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

Alam-Pedja Nature Reserve is a large, mostly flat wilderness area comprised of complex of raised bogs, fens and transition mires separated by unregulated rivers with floodplain meadows, alluvial and swamp forests. Being one the largest areas left in Estonia with nearly no human influence the wetland is important as a stopover site for many waterbirds and as spawning site for various fish species. Several wet habitats are of special botanical value.

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

1	2	3	4	5	6	7	8	9
☑	☑	☑	☑	☐	☑	☐	☑	☐

14. Justification for the application of each Criterion listed in 13 above:
Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Criterion 1
The site is a particularly good representative of mosaic wetland complex including natural non-forested peatlands (bogs and fens), forested peatlands (peatswamp forests), freshwater swamp forests, permanent rivers, floodplains and oxbow lakes characteristic of the Boreal Biogeographical region. The area is the largest one left in Estonia without any or almost no human influence.

Wetland habitats occurring in Alam-Pedja Nature Reserve and listed in Annex I if the Habitat Directive are: active raised bogs (*7110), transition mires and quaking bogs (7140), bog woodland (*91D0), Fennoscandian deciduous swamp woods (*9080), northern boreal alluvial meadows (6450), rivers and streams (3260), alkaline fens (7230), alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (91E0) and riparian mixed forests of *Quercus robur, Ulmus laevis, Fraxinus excelsior* along the great rivers (91F0). The wetland complex plays a substantial hydrological, biological and ecological role in the region and it is identified both as an IBA and Natura 2000 site.

Criterion 2
The site supports a number of vulnerable and endangered species which are under protection or listed in the Red Data Book of Estonia including species of I protection category White-tailed Eagle *Haliaeetus albicilla*, Golden Eagle *Aquila chrysaetos*, Spotted Eagle *Aquila clanga*, Lesser Spotted Eagle *Aquila pomarina* and Black Stork *Ciconia nigra.*
See also justification of criteria 3 and 8 and points 21 and 22.

It supports bird species of EU conservation interest, listed on Annex I of Council directive 2009/147/EEC:
Golden Eagle *Aquila chrysaetos*, Spotted Eagle *Aquila clanga*, Lesser Spotte Eagle *Aquila pomarina,* Black Tern *Chlidonias niger*, Black Stork *Ciconia nigra*, Marsh Harrier *Circus aeruginosus,* Hen Harrier *Circus cyaneus*, Montagu´s Harrier *Circus pygargus*, Corncrake *Crex crex*, Bewick´s Swan *Cygnus columbianus*

bewickii, Great Snipe G*allinago media*, Crane *Grus grus*, White-tailed Eagle *Haliaeetus albicilla*, Red-backed Shrike *Lanius collurio*, Little Gull *Larus minutus*, Bar-tailed Godwit *Limosa lapponica*, Osprey *Pandion haliaetus*, Ruff *Philomachus pugnax*, Golden Plover *Pluvialis apricaria*, Spotted Crake *Porzana porzana,* Black Grouse *Tetrao tetrix*, Capercaillie *Tetrao urogallus*, Wood Sandpiper *Tringa glareola.*

Criterion 3
The site supports populations of plants and animal species important for maintaining the biological diversity of the Boreal Biogeographical Region.

Plants: Meadow-sword Lily *Gladiolus imbricatus*, Baltic Marsh Orchid *Dactylorhiza baltica*, Coralroot Orchid *Corallorhiza trifida*, Slender Cotton-grass *Eriophorum gracile*, etc.

Birds: Great Snipe *Gallinago media*, Corncrake *Crex crex*, Spotted Eagle *Aquila clanga*, White-tailed Eagle *Haliaeetus albicilla*, Honey-buzzard *Pernis apivorus* , Black Tern *Chlidonias niger*, Black Grouse *Tetrao tetrix*, Common Crane *Grus grus*, etc.

Mammals: Otter *Lutra lutra* (Annexes II and IV of EU Habitats Directive), Beaver *Castor fiber*, Wolf *Canis lupus*, Brown Bear *Ursus arctos*, Lynx *Lynx lynx*, Flying Squirrel *Pteromys volans* (Annexes II and IV of EU Habitats Directive), European Mink *Mustela lutreola* (Annexes II and IV of EU Habitats Directive), Pond Bat *Myotis dasycneme* (Annexes II and IV of EU Habitats Directive), Particoloured Bat *Vespertilio murinus* (Annex IV of EU Habitats Directive).

Criterion 4
The site supports species at a critical stage of their life cycles and provides refuge during adverse conditions, serving as a feeding and breeding ground and a shelter for animal species with large habitat requirement such as Brown Bear *Ursus arctos*, Wolf *Canis lupus* and Lynx *Lynx lynx*.
It is the most important breeding area for Great Snipe *Gallinago media* in the Baltic States (50-75 males). See also point 22.
The floodplains are an important stopover site for several species of waterbirds: Eurasian Wigeon *Anas penelope*, Common Teal *Anas crecca*, Mallard *Anas platyrhynchos*, Northern Pintail *Anas acuta*, Common Pochard *Aythya ferina*, Tufted Duck *Aythya fuligula*, Common Goldeneye *Bucephala clangula*, and Smew *Mergus albellus.*
The site supports one of the largest breeding colonies of *Myotis dascycneme* Pond Bat in Europe (600-700 individuals in a summer colony).

Criterion 6
Wetland regularly supports during migration 1,5 - 3% of the individuals of the NW Europe (non-br) population of Bewick´s Swan *Cygnus columbianus bewickii* (300-600 ind.)

Criterion 8
The floodplains and old river beds are very important as spawning sites for fish species such as Bream *Abramis brama*, Pike *Esox lucius* and also rare Asp *Aspius aspius* (Annex II of EU Habitats Directive) and Wels *Siluris glanis.*

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15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):
Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:
A: Boreal Biogeographic region according to the EEA
B: terrestrial area Sarmatic mixed forests

freshwater area Southern Baltic Lowlands temperate floodplain rivers and wetlands

b) biogeographic regionalisation scheme (include reference citation):

A: EEA, European Environment Agency,
http://www.eea.europa.eu/publications/report_2002_0524_154909

B: Olson, D. M, E. Dinerstein, E.D. Wikramanayake, N.D. Burgess, G.V.N. Powell, E.C. Underwood, J.A. D'amico, I. Itoua, H.E. Strand, J.C. Morrison, C.J. Loucks, T.F. Allnutt, T.H. Ricketts, Y. Kura, J.F. Lamoreux, W.W.Wettengel, P. Hedao, & K.R. Kassem. 2001. Terrestrial Ecoregions of the World: A New Map of Life on Earth. - BioScience 51:933-938.

Abell, R., Thieme, M. L., Revenga, C., Bryer, M., Kottelat, M., Bogutskaya, N., Coad, B., Mandrak, N., Contreras Balderas, S., Bussing, W., Stiassny, M., Skelton, P., Allen, G., Unmack, P., Naseka, A., Ng, R., Sindorf, N., Robertson, J., Armijo, E., Higgins, J., Heibel, T.J., Wikramanayake, E., Olson, D., Lopez, H. L., Reis, R. E., Lundberg, J.G., Sabaj Perez, M.H., Petry P., 2008, Freshwater Ecoregions of theWorld: A New Map of Biogeographic Units for Freshwater Biodiversity Conservation. - BioScience 58: 403-414.

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16. Physical features of the site:

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

The wetland, situated in the north-eastern part of the vast lowland of Lake Võrtsjärv, in the basin of the River Emajõgi is of natural origin. Hydrology is largely influenced by river floods. At the heighest water level one third of the territory of the wetland is flooded. Bedrock is formed by Devonian sandstones and is covered by limnoglacial sediments (varved clay, sand and silt), lake marl, gyttja and peat. Alluvial and peat soils dominate.

Climate is transitional from the sub-maritime to the sub-continental. Mean annual temperature is 4.5°C, precipitation averages about 590 mm per year and snow cover lasts approximately 115 days, with rivers and lakes covered with ice from December until April.

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17. Physical features of the catchment area:

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

The wetland is a part of an inland paludified lowland, the Lowland of Lake Võrtsjärv (1750 sq.km). In the sparsely populated region forests dominate, agricultural land forms about 10%. Due to the extremely small slope the only outflow through the Suur-Emajõgi River is very slow and big floods are characteristic. Dystric and Eutric Histosols, Calcaric Luvisols, Calcaric Cambisols and Eutric Gleysols dominate. The climate is transitional from sub-maritime to sub-continental type.

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18. Hydrological values:

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

The paludified and forested site acts as a natural regulator of the runoff and the water regime of the rivers. Together with Lake Võrtsjärv the accumulation area of the River Emajõgi is the largest (900 sq.km) naturally regulated area of river runoff in Estonia.

The site plays an important role in the maintenance of water quality, acting as a natural buffer zone to the Emajõgi River and the town of Tartu.

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19. Wetland Types

a) presence:

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

Marine/coastal: A • B • C • D • E • F • G • H • I • J • K • Zk(a)

Inland: L • M • N • O • P • Q • R • Sp • Ss • Tp Ts • U • Va •
Vt • W • Xf • Xp • Y • Zg • Zk(b)

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

b) dominance: Xp U Xf W Ts M Tp Ss 9 2
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.

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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.

Mires are represented by bogs (Põltsamaa, Umbusi) and fens (Karisto, Ulila), transition bogs, and their complexes (Laeva). The bogs are of a continental type, with numerous bog-pools. The extensive un-drained forests include birch-dominated swamp forests and carrs. Alluvial broad-leaved forests with elm, ash and oak in tree layer (*Humulus* floodplain forest site type) and with high species diversity are of special botanical value. As relicts of warmer climatic periods they have been preserved in Estonia in very few fragments, mainly on the territory of Alam-Pedja. In the lower part of the floodplains, the *Carex elongata* floodplain swamp forests grow.
In the open floodplain meadow of River Emajõgi thick bushes of *Betula humilis* are found in places.

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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.*

Totally 485 species of vascular plants have been recorded. Rare and protected species are represented by Slender Cotton-grass *Eriophorum gracile*, Early Marsh Orchid *Dactylorhiza incarnata* and Fragrant Orchid *Gymnadenia conopsea* in mires and by Baltic Marsh Orchid *Dactylorhiza baltica*, Greater Butterfly Orchid *Platanthera chlorantha* and Twayblade *Listera ovata* in floodplain meadows.

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22. Noteworthy fauna:
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., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

196 bird species have been recorded, 153 of this breeding bird species including: Black Stork *Ciconia nigra* (1-2 pairs), White-tailed Eagle *Haliaeetus albicilla* (2 pairs), Golden Eagle *Aquila chrysaetos* (2 pairs), Spotted Eagle *Aquila clanga* (2 pairs), Lesser Spotted Eagle *Aquila pomarina* (2-3 pairs), Montagu´s Harrier *Circus pygargus* (2-3 pairs), Hen Harrier *Circus cyaneus* (2-4 pairs), Capercaillie *Tetrao urogallus* (50-60 males), Common Crane *Grus grus* (>20 pairs), Black Tern *Chlidonias niger* (150-200 pairs), and Willow Grouse *Lagopus lagopus*. It is the most important breeding area for Great Snipe *Gallinago media* (50-75 males) in Estonia.

The floodplains are an important stopover site for several species of waterbirds: Eurasian Wigeon *Anas penelope*, Common Teal *Anas crecca*, Mallard *Anas platyrhynchos*, Northern Pintail *Anas acuta*, Common Pochard *Aythya ferina*, Tufted Duck *Aythya fuligula*, Common Goldeneye *Bucephala clangula*, and Smew *Mergus albellus*.

At least 43 mammal species have been recorded including Wolf *Canis lupus*, Brown Bear *Ursus arctos*, Lynx *Lynx lynx*, Flying Squirrel *Pteromys volans*. Breeding colonies of Particoloured Bat *Vespertilio murinus* and also one of the largest breeding colonies of Pond Bat *Myotis dascycneme* in Europe has been registered (600-700 individuals in a summer colony). The water-bodies offer good habitats to semi-aquatic mammal species, especially Beaver *Castor fiber* (130-150 individuals) and Otter *Lutra lutra* (over 30 individuals).
19 fish species are known incluging rare Wels *Silurus glanis* and Asp *Aspius aspius*.

32 species of dragonflies are known (of which 3 species are especially rare - *Anax imperator*, *Aeshna mixta* and *Sympecma paedisca*).

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:

In 1952-1991 a half of the area was closed as a shelling range of the Soviet Air Force. Now the site is an important area for traditional berry-picking (*Oxycoccus palustris*).
The rivers have been important for local fishery and some traditional fishing forms (fishing with fish-garts) have been in use.

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning?

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

i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:

ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:

iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:

iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:
a) within the Ramsar site: About 95% of the site is state-owned

b) in the surrounding area: state, municipal and privately owned land

25. Current land (including water) use:
a) within the Ramsar site: Only about 10 permanent inhabitants. Agricultural activities have almost ceased. An important area for the traditional berry-picking and small-scale fishing, mainly at River Emajõgi.

b) in the surroundings/catchment: The land is used for forestry, peat excavation and agriculture.

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26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:
a) within the Ramsar site: Almost one-half of the area was occupied by the Soviet army (until 1991); a minor part of the reserve was used as a bombing range. The remainder has been subjected to almost no human influence and was closed to the public for 40 years. Now the main threat lies in the overgrowth of flood-plain meadows with scrub, also the mowing of the meadows was resumed in 2000. Potential threats are the uncontrolled access to the area (including motorboats on rivers and jeeps in forests), unlegal hunting, and the intensification of fishery.

b) in the surrounding area: pollution from the peat excavation industry reaching the floodplains and old riverbeds at the Emajõgi River, and agricultural pollution coming via rivers. There have been plans to regulate of water level of Lake Võrtsjärv to create more favourable conditions for valuable fish, it is essential to clarify the potential effect of the water level rise to the ecosystems of River Emajõgi and Alam-Pedja wetland.

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27. Conservation measures taken:
a) List national and/or international category and legal status of protected areas, including boundary relationships with the Ramsar site:
In particular, if the site is partly or wholly a World Heritage Site and/or a UNESCO Biosphere Reserve, please give the names of the site under these designations.

Some mineral bog "islands" (473 ha) of Laeva Mire were taken under local (municipal) protection in 1990. In 1994 the 26,000 ha Alam-Pedja Nature Reserve was established. The protection rules were approved by the Estonian Governmental Regulation in 1995. In 2007 new protection rules were approved and the area of the reserve was extended to 34,220 ha.

The area is identified as an Important Bird Area by BirdLife International and as Natura 2000 site (the boundaries largely coincide).

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

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

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

The first management plan was prepared already in 1999. The second management plan (2003-2007) was not officially approved.
The management plan 2012-2021 has been drafted and will be approved in 2012.

d) Describe any other current management practices:
LIFE+ project "Saving life in meanders and oxbow lakes of Emajõgi River on Alam-Pedja Natura 2000 area (HAPPYFISH).

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28. Conservation measures proposed but not yet implemented:

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

29. Current scientific research and facilities:

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

The biodiversity of the wetland was thoroughly studied and documented during the preparation of management plans.
Several stations of state monitoring programme are located in wetland including meteorological monitoring, biological monitoring of rivers, monitoring of rare and protected plant communities. As Alam-Pedja consists one of Estonia´s biggest preserved floodplain grasslands, the monitoring of management effectiveness has high priority: changes in floral composition and plant cover, communities of dragonflies, butterflies, bumble-bees and birds are monitored
The site belongs also among the permanent landscape satellite monitoring sites in Estonia.

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.

The visitor´s centre in Kirna was opened in 2008. Two nature trails (Selli-Sillaotsa study trail and Kirna hiking trail with tower) have been set up in the marginal areas of the reserve about which information booklets are available. Special book introducing the wetland was published in 1997. One of the main tasks is to promote nature conservation education, special nature camps for schoolchildren are organized in the nature school at Palupõhja.
Since 2009 the visiting management is the responsibility of the State Forest Management Centre.

31. Current recreation and tourism:

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

Extensive recreation and tourism are not expected in the reserve. 2 nature study tracks are opened for visitors. The Põltsamaa - Kärevere water track is suitable for canoe-trips. Seasonally the area is visited by berry-pickers. Some former farm-houses are used as summer cottages.

32. Jurisdiction:

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

Territorial: Tartu County, 4 local municipalities: Laeva, Puhja, Rannu and Tähtvere; Jõgeva County, 2 local municipalities: Puurmani, Põltsamaa; Viljandi County, Kolga-Jaani municipality
Functional: Environmental Board under the Ministry of Environment (Narva mnt 7a, 15172 Tallinn, ESTONIA)

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.

Environmental Board, Jõgeva-Tartu Region (Aleksandri 14, 51004 Tartu, Estonia)
Mr. Rainis Uiga (rainis.uiga@keskkonnaamet.ee), director of the Jõgeva-Tartu Region of Environmental Board

34. Bibliographical references:

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

Aaviksoo, K., Paal, J., Dislis, T. 2000. Mapping of wetland habitat diversity using satellite data and GIS: an example from the Alam-Pedja nature reserve, Estonia. - Proc. Estonian Acad.Sci.Biol.Ecol., 49 (2), 177-193.

Ader, A., Tammur, E. (comp.) 1997. Alam-Pedja looduskaitseala. Alam-Pedja Nature Reserve. Tallinn, 64 pp.
Alam-Pedja looduskaitseala. 2001. Special issue devoted to the Alam-Pedja Nature Reserve. Eesti Loodus 9-10. (in estonian with english summaries)
Alam-Pedja looduskaitseala kaitsekorralduskava 1999-2001. Compiled by NC Society "Kotkas". 1998. Tartu (in estonian).
Alam-Pedja looduskaitseala kaitsekorralduskava 2003-2007. Compiled by NC Society "Kotkas".2002. Tartu (in estonian).
Kalamees, A. (ed.) 2000. Important Bird Areas in Estonia. – Eesti Loodusfoto, Tartu, 114 pp.
Lõhmus, A. ***et al.*** 1994. Laeva-Palupõhja linnustikust. *Hirundo Supplementum*, 35 pp. (in estonian with english summary).
Lõhmus, A., Kalamees, A., Kuus, A., Kuresoo, A., Leito, A., Leivits, A., Luigujõe, L., Ojaste, I., Volke, V. 2001. Bird species of conservation concern in the Estonian protected areas and important bird areas. *Hirundo Supplementum* 4, 37-167.
Mäemets, A. (ed.) 1968. Eesti järved (Estonian Lakes). Tallinn, 548 pp. (in estonian with english summary)
Orru, M. 1995. Eesti sood (Estonian mires). Eesti Geoloogiakeskus, Tallinn. 240 pp. (in estonian with english sumamry).
Ristkok, J. 1969. Emajõe vanajõed. - Tartu Riikliku Ülikooli Toimetised, 231. Zooloogia-alaseid töid V, lk. 3-87.

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