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.

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

Mr Ugis Bergmanis
Nature Reserve Teici
Aiviekstes – 3, LV – 4862 Laudona, LATVIA
e-mail: Bergmanis.teici@apollo.lv;
ugis.bergmanis@teici.gov.lv

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DD MM YY

Designation date | Site Reference Number

2. Date this sheet was completed/updated: 12 November 2003

3. Country: LATVIA

4. Name of the Ramsar site: LUBANA WETLAND COMPLEX (LWC)

5. Map of site included:

Refer to Annex III of the *Explanatory Note and Guidelines*, for detailed guidance on provision of suitable maps.

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

b) digital (electronic) format (optional): *yes* ✓ -or- *no* □

6. Geographical coordinates (latitude/longitude): N 56° 48'58, 7" E 026° 54'26,2"

7. General location:

The area is situated in four administrative regions - Madona, Rēzekne, Balvi and Gulbene. It covers ten municipalities of the region (Please see Table 6 in Annex).

8. Elevation: (average and/or max. & min.)
Average 80 m above sea level

9. Area: (in hectares)
48 020 ha

10. Overview:

The area maintains the largest of all wetlands in Latvia; it includes a shallow freshwater lake, 7 raised and transitional bogs and fens, the biggest area of inundated grasslands, fish-ponds and wet forests. These sites have a significant importance for bog specific and rare bird species maintaining, as well as for maintaining wetland characteristic plant species and communities; these are significant migrating waterfowls feeding and resting sites too.

11. Ramsar Criteria:

Circle or underline 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).

1 • 2 • 3 • 4 • 5 • 6 • 7 • 8

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

Criterion 1. According to the boreo-temperate zone of Palearctic biogeographic region the most prevalent wetland types are raised and transitional bogs with dystrophic lakes, inundated grasslands, wet peat forests and small areas of wet mineral forests, too. The LWC is one of key areas in Latvia for maintaining habitats and species of national and international importance. In total 15 protected habitats of European importance are found at the LWC. The LWC is particularly important for preservation of hydrophilous tall herb communities of plains and alluvial meadows of river valleys, comprising the largest homogenous areas of these habitats in Latvia. *Gallinago media*, a globally threatened species, depends on these meadow habitats. In comparison with other parts of Latvia, LWC has also significant areas of Active raised bogs, Fennoscandian hemiboreal natural old broad-leaved deciduous forests, Bog woodland and Riparian mixed forests of *Quercus robur, Ulmus laevis* and *Ulmus minor*, *Fraxinus excelsior* or *Fraxinus angustifolia* along the great rivers. The forest habitats have particular importance for breeding and feeding of rare birds of prey and several species of woodpeckers. The largest fishpond areas, which have a significant importance for protection of waterfowls, are located in LWC. Wetland types according to Convention classification system are represented in Table 2 in Annex.

Criterion 2. There are significant numbers of vulnerable and endangered species in this area, the largest and even only known localities in Latvia for some species are found in here.
From the 187 species, breeding in the area, 51 are included in the Red Book of Latvia, which makes 27% of the bird species, nesting in the LWC. 48 species are threatened in Europe (Category 1-3 SPEC). 46 species or 25% of all the breeders of the LWC are listed in the Birds Directive. 4 species (*Haliaeetus albicilla, Aquila clanga, Gallinago media* and *Crex crex*) are on the World List of Threatened Birds. For 14 breeding species LWC maintains more than 15% of the total population of Latvia (Table 3 in Annex.).

The LWC territory has a high importance for maintaining some particularly protected bird species. 5 of 30 *Haliaeetus albicilla* pairs and 1 of 8 *Aquila clanga* pairs, nesting in Latvia, are found at the LWC. LWC hosts approximately a half of *Gallinago media* population of Latvia (110-150 rutting males out of 300). 2000 out of 3000 breeding *Larus minutus* in Latvia are found at the LWC. LWC is the only breeding site in Latvia for *Chlidonias niger* (200 pairs), *Tringa stagnatilis* and *Xenus cinereus*. The highest breeding density in Latvia for *Crex crex* is at the LWC. Protected mammal species are represented in Table 4 in Annex.

Criterion 3. The biodiversity of species corresponds to inland habitats and it is comparatively high. Sufficient and objective species information is available only on bird fauna and fish fauna. 224 species of birds are found at the LWC, from them 186 are breeding (it is 85% of the total number of breeding bird's species in Latvia). 24 fish species are registered at the LWC. The number of the registered mammal species is 23, although it may be similar to the neighbouring Teici area, where 47 species are known. Beavers play an important role in the territory since they contribute to stabilisation of the hydrological regime. The area of the LWC maintains comparatively large numbers of otters and wolves for the Eastern Latvia.

Criterion 5. At least 26 000 waterfowl birds are resting in area during spring migrations (see Table 5 in Annex).

Criterion 6. The individuals of 3 species are observed in numbers that exceed 1% of the world population (Table 1 in Annex).

Species	Together observed number of individuals in the period of migrations		1% of Population (migrating individuals)
	Spring	Autumn	
Bewick's Swan *Cygnus columbianus*	940	?	290
Whooper Swan Cygnus cygnus	2433	?	590
Pintail *Anas acuta*	3527	?	600

13. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

a) biogeographic region:
Area is belonging to the Boreo-nemoral vegetation zone, i.e. North European mixed forest region (*Udvardy, 1975*.).

b) biogeographic regionalisation scheme (include reference citation):
Area is belonging to the Boreo-nemoral vegetation zone (*Udvardy, 1975*.). The original boreo-nemoral vegetation comprises a mixture of coniferous and deciduous trees, although conifers have probably always predominated. This zone is wide in Baltic States and together with Sweden and western Russia contains a comparatively large proportion of Europe's boreo-nemoral regions.

14. Physical features of the site:

Geology, geomorphology. Present relief was established during Quartar period. Upper Devon sediments are covered with 7-20 m thick layer of Quartar sediments. Development of Lubana Lowland during Quartar period is connected with impact of last glacier. At the end of glacier period limnoglacial sediments developed in Lubana Lowland. In the period after glacier (ca last 10 000 years) intensive development of freshwater calcium and sapropel was taking place in Lubans lake. Lake became more shallow and smaller, lake was overgrowing rapidly.

Hydrology. Hydrological net of the area is comprised by Lake Lubans (largest lake in Latvia, 8000 ha), 5 smaller (1.6 – 67.5 ha) dystrophic/dyseutrophic lakes, 9 rivers (only Aiviekste river and artificially made Meiranu canal are starting in Lake Lubans, other rivers are tributaries of river Aiviekste). There is also a dense net of old rivers, cannels and melioration ditches, as well as the largest fishponds in Latvia (2700 ha). Bogs and mires are widespread in the area (23%); they have significant impact on maintenance of hydrological regime. Lake is bordered by polder from all parts. It used to be that all 6 rivers were entering the Lake directly. Nowadays only one is entering the lake, others are re-directed to Aiviekste and entering the lake via Aiviekste. Sluices are constructed to regulate water inflow/outflow from the lake.

Soil type and chemistry. Accumulation of organic matters is taking place due to high moisture level. Changes in deeper layers of soil have been taking place. Horizon of gley is indicating the lack of oxygen in the soil.

Water quality, depth, fluctuations. The overall water quality of the rivers in the area, except for the Rezekne River, was found to be good, according to the ambient water quality standards for rivers. Lake Lubans and most fishponds belong to alpha- or beta-mesosaprobic conditions indicating moderate eutrophication levels and progress of organic oxidation and decay. Concentrations of total coliform bacteria and oil are not significant. The concentrations of phenol, however, did not meet the mandatory requirement in Lake Lubans and many fishponds and rivers. A spring flood usually starts in April and continues for several weeks.

Climate. The area belongs to Lubana Lowland, Latgale Highland climatic zone. The most continental and warm climate is registered here. No-frost period is lasting for 135-145 days; winter is stable with 25-35 cm layer of snow, average minimal temperature reaching minus 26-27 degrees Celsius. Precipitation – 600mm/year, that is 103 mm less than average in Latvia.

15. Physical features of the catchment area:

The area belongs to Lubana Lowland, Latgale Highland climatic zone. The most continental and warm climate is registered here. No-frost period is lasting for 135-145 days; winter is stable with 25-35 cm layer of snow, average minimal temperature reaching minus 26-27 degrees Celsius. Precipitation – 600mm/year that is 103 mm less than average in Latvia. Accumulation of organic matters is taking place due to high moisture level. Changes in deeper layers of soil have been taking place. Horizon of gley is indicating the lack of oxygen in the soil.

16. Hydrological values:

Bogs and mires are widespread in the area (23%); they have significant impact on maintenance of hydrological regime. The area is very flat: this factor, together with limited flow of River Aiviekste and large amount of inflowing water in spring is contribution to regular floods in the area (every year).

To minimize the threat of regular floods and increase area of agriculturally used lands, first hydro technical works started in beginning of 19th century. Significant drainage of area was done later, in 1926. Drainage works finished in 1981 and as a result, ecosystems, structure and dynamics of hydrological net were changed. The flood situation was greatly mitigated in area after construction of the flood prevention facilities done from 1950s to the beginning of the 1980s. In the 1980s, the dyke system on the northern edge of Lake Lubans and the sluice way were constructed to control water levels in the lake. In addition, the dredging of 9, 7 km of the Pededze lower was executed. After construction of the dike system, the inundation duration in the northern part of the wetland decreased.

Depending on intensity of floods, 30 to 60% of areas are still flooded.

17. 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:

U, Ts, Xf, Xp, 1, M, O, W, 4, 9.

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18. General ecological features:

According to geo-botanical classification, Lubana plain is one of the four sub-regions of the Eastern Latvia geo-botanical region containing 14 micro-regions. LWC contains the highest habitat diversity for an inland wetland area in Latvia.

Habitat types in Lubana Wetland complex

Main habitat types	**Area, ha**	**%**
Raised/Transitional bogs	9768	20
Fens	1453	3
Bogs in total	*11221*	*23*
Inundated grasslands	*4743*	*10*
Coniferous forests	10183	21
Deciduous forests (small-leaf forests)	9566	20
Broad leaved forests	153	0,3
Forests in total	*19902*	*41*
Dry grassland/Agricultural lands	*1322*	*3*
Lakes, rivers and canals	8141	17
Fishponds	2685	6
Inland waters total:	*10826*	*23*

Forests. Forests at the LWC belong to 3 vegetation classes: Eurosiberian alder woods (*Alnetea glutinosae*), European broad-leaved forests (*Querco-Fagetea*) and boreal coniferous forests (*Vaccinio-Picetea*). Boreal coniferous forests cover the largest areas. Although Eurosiberian alder wood and broad-leaved forests cover comparatively small areas, these are areas of national significance. Forest growing conditions are mainly on wet peat, drained peat and drained mineral soils. Forests on wet mineral soils are of highest importance for maintaining of biological diversity.

Bogs. There are 14 bogs in the area of the LWC, making it one of the largest bog complexes of Latvia. Ombrogenous *Sphagnum fuscum* bogs with some fen areas prevail at the LWC. LWC maintains one of the largest fens of Latvia.

Inundated grasslands**.** Inundated grasslands of the LWC are the largest non-fragmented habitat of this type in Latvia. It is the only habitat of the LWC where detailed vegetation research has been carried out. 279 species of vascular plants have been registered here.

Lakes, rivers, canals and fishponds. Please see in chapter 14. Physical features/Hydrology

Most important habitats in LWC are listed below.

Code	**Natural Habitat types ANNEX I 92/43/EEC**	**Code**	**Natural Habitat types ANNEX I 92/43/EEC**

3150	Natural eutrophic lakes	9010	Western taiga
3160	Natural dystrophic lakes and ponds	9020	Fennoscandian hemiboreal natural old broad-leaved deciduous forests
6430	Hydrophilous tall herb fringe communities of plains	9080	Fennoscandian deciduous swamp woods
6450	Northern boreal alluvial meadows	91D0	Bog woodland
6530	Fennoscandian wooded meadows	91E0	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*

7110	Active raised bogs	91F0	Riparian mixed forests of Quercus robur, Ulmus laevis and Ulmus minor, Fraxinus excelsior or Fraxinus angustifolia along the great rivers
7120	Degraded raised bogs still capable of natural regeneration	7150	Depressions on peat substrates
7140	Transition mires and quaking bogs		

19. Noteworthy flora:

34 protected species (listed below) have been registered in the area.

Species	**Species**	**Species**
1. Carex aquatilis	*13. Onobrychis arenaria*	*25. Salix myrtilloides*
2. Equisetum scirpoides	*14. Primula farinosa*	*26. Salix phylicifolia*
3. Juncus stygius	*15. Viola persicifolia*	*27. Scirpus radicans*
4. Ligularia sibirica	*16. Allium ursinum*	*28. Scolochloa festucacea*
5. Saxifraga hirculus	*17. Cinna latifolia*	*29. Dactylorhiza baltica*
6. Thesium ebracteatum	*18. Gladiolus imbricatus*	*30. Dactylorhiza incarnata*
7. Carex scandinavica	*19. Glyceria lithuanica*	*31. Dactylorhiza maculata*
8. Cnidium dubium	*20. Hammarbia paludosa*	*32. Diphasiastrum complanatum*
9. Cypripedium calceolus	*21. Liparis loeselii*	*33. Platanthera bifolia*
10. Galium schultesii	*22. Malaxis monophyllos*	*34. Pulsatilla patens*
11. Gentiana pneumonanthe	*23. Nuphar pumila*	
12. Iris sibirica	*24. Orchis mascula*	

20. Noteworthy fauna:

The LWC is one of key areas in Latvia for maintaining habitats and species on national and international importance.

From the 187 bird species, breeding in the area, 51 are included in the Red Book of Latvia, which makes 27% of the bird species, nesting in the LWC. 48 species are threatened in Europe (Category 1-3 SPEC). 46 species or 25% of all the breeders of the LWC are listed in the Birds Directive. 4 species (*Haliaetus albicilla, Aquila clanga, Gallinago media* and *Crex crex*) are on the World List of Threatened Birds. For 14 breeding species LWC maintains more than 15% of the total population of Latvia.

The LWC territory has a high importance for maintaining some particularly protected bird species. 4 of 20 *Haliaetus albicilla* pairs and 1 of 8 *Aquila clanga* pairs, nesting in Latvia, are found at the LWC. LWC hosts approximately a half of *Gallinago media* population of Latvia (110-150

rutting males out of 300). 2000 out of 3000 breeding *Larus minutus* in Latvia are found at the LWC. LWC is the only breeding site in Latvia for *Chlidonias niger* (200 pairs), *Tringa stagnatilis* and *Xenus cinereus*. The highest breeding density in Latvia for *Crex crex* is at the LWC. The total number of *Crex crex* in the territory of LWC is approximately 300 singing males, equal to ca.1% of the total population in Latvia.
Protected Mammals of the Lubana Wetland Complex

Species	**In Red Data Book of Latvia (1)**	**EU Directive 92/43/EEC**
Castor fiber		II
Canis lupus		II
Ursus arctos	2	II
Lynx lynx		II
Lutra lutra		II
Mustella erminea	2	
Mustella nivalis	2	

21. Social and cultural values:

Agriculture. Agricultural sector is of great importance in LWC. The effectiveness of farming is influenced by peculiarities of local relief and soils. In this sense, more convenient situation is in Lubana lowlands, although hydrological route is rather risky for agriculture with poor fertile and moisture areas. The farms predominate among agricultural land users. Main activities are production of wheat, rye, barley, potato and flax as well as cattle breeding for meat and milk. But, there is a lack of meat processing enterprises around LWC. Agricultural land division in LWC reflects economical situation in the country. The present agriculture is mostly subsistence farming, which is not engaged into agricultural processing route. This kind of management is unprofitable and endangers the existence of many farms. However, it has an important role in the local economy, decreasing unemployment rate.

Forestry. Forests cover about 30% and idle land comprises about 15% of Latgale region. The dominating tree species are pine (40% of the inventory), spruce (20%) and birch (25%). The timber is mainly used for the paper and construction industries. Modern manufacturing facilities, such as paper-mills and sawmills, are beginning to develop. Wood products represent the largest group of exports, reaching about a third of total exports in 1997. Forests are a great part of natural resources in LWC, protecting biological habitat and providing working places. The part of production is sown materials for export needs. Woodcraft industry exists around LWC, being mainly oriented to the domestic market.

Fishery. Fishery in LWC is largely connected with Lubana lake. However, catching of fish is now an additional activity mostly for home consumption and also for sales on the local market. The aquaculture is limited to the Nagli fishponds. In 1980s, about 700 to 1,000 tons of carps were produced. Due to privatization and lack of capital and market development, the production decreased to about 150 tons in 1998. The demand for carps is quite good but the decreasing purchasing capability resulted in lower prices and poor profitability. In the mid and long term, perspectives are rather good and restocking is necessary. In this way the managers of Nagli look for foreign direct investment. In addition, good infrastructure and facilities for angling around the lake are important for further development including eco-tourism and rural tourism.

Tourism. Tourism in LWC and even in the entire Latgale region is not well developed. Geographical situation, nature values, culture objects, and unpolluted environment of the area provides great potential for eco-tourism and rural tourism industry. In particular, there are possibilities to develop water active tourism around Lake Lubana. But there is a lack of trained staff in tourism industry, and limited knowledge of languages is an obstacle. There are information centers in the four districts concerned, which were established by each district council. They are dealing with the information distribution and the research of tourism objects. The main problem of the centers is lack of any united information system on tourism in the entire area.

22. Land tenure/ownership:

(a) site
raised/transitional bogs – state property
forests – mainly state property, small areas are private
fens – mainly state property, small areas are private
inundated grassland – mainly private, small areas are municipality property
agricultural land – private property
Lakes – state property
Fishponds – mainly private, partly municipality property

(b) surrounding area: agriculturally used land mainly private, forests ca. 50% state and 50% private owned.

23. Current land (including water) use:

(a) site: the greatest treasure in LWC is natural resources. Forests cover 41% of the area, which is similar to the national forest ratio of 45% in 2000. Water bodies (Lake Lubans and fishponds) account for 23%. The rest of the area is bogs (23%), inundated grasslands (10%) and agricultural lands (3%). The water bodies are located in the southern half of the area, with Lake Lubans in the center and fishponds eastwards. The major part of forests is in the north half of the area, while some patched woodland is scattered around the lake. The wetlands mainly spread on the northeastern part and the south side of Lake Lubans.

(b) surroundings/catchment:

Main influencing factors are cultivation, mowing, grazing, use of pesticides and minerals, general forestry management (cutting and replanting), leisure fishing, hunting, drainage. There are large areas to the north from the site with large extent forestry taking place. From the west, east and south, agricultural lands border the site. Most of lands are meliorated, rather intensive agriculture is taking place there – crop growing and cattle grazing. To increase the yield, pesticides, minerals and manure are used. Intensity of hunting does not differ from the LWC, there are no significant waters in the area.

24. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

There are specific drainage and surface run-off conditions in Lubana lowland, where the area is located. Tributaries of Lubans Lake and Aiviekste River gather a lot of surface run-off waters from the surrounding higlands, especially during spring floods. But due to the very flat area and the fact that Aiviekste River is the only discharge with little decline in the upper part, it cannot

divert those floodwaters quickly enough. Long periods of flooding have caused development of bogs and wetlands in Lubans Lake vicinity, and different types of wetlands occupy the largest part of LWC:

⇒ bogs, fens and transitional bogs,

⇒ wet grasslands or so called marshy grasslands,

⇒ wet forests.

Presence and dynamics of those biotopes depend on water changes and duration of flood period.

Due to huge drainage and hydro-technical measures, surface water run-off from wetland areas has accelerated; thickness of water saturated soil layer has decreased as well as area of flooded territories. Changes in hydrological conditions cause changes in typical structure of wetlands, transformation of phytocenose is observed. Biodiversity of the area is influenced by other human activities as well.

Following human activities and impacts should be mentioned:

- Decrease of the area of flooded territories – marshy (flood) grasslands due to delimitation of Lubans Lake with dams. Average water level in the lake has risen resulting in changes of typical water plant communities in the lake.

- Simultaneously with construction of dams around Lubans Lake, fishponds were established in large areas (3145 hectares). They increased diversity of bird species in the Study area.

- Due to drainage of bogs by large ditches, changes in vegetation types were observed in some areas – in the belt of wet forests, typical for periphery of bogs, growing conditions of forests and composition of tree species have changed. Increased invasion of trees into the bog is observed. Territories with small lakes/pools have disappeared in some places in the bogs.

- Drainage of marshy grasslands has facilitated the decrease of moisture content in those grasslands and their overgrowing with trees and bushes. The most intensive development of trees and bushes is taking place along the drainage ditches.

- Decrease of grass cutting activities in the beginning of 90ties resulted in overgrowing of marshy (flood) grasslands.

- Due to drainage activities in wet forests in huge areas, these types of forests' growing conditions have changed to forests' growing conditions on drained soils (mineral or peat soils). Drainage of forests has facilitated construction of roads via forests resulting in increase of anthropogenic pressure on the forest.

- Several rivers that once discharged in Lubana Lake now discharge in Aiviekte River as a result of dam construction around Lubana Lake. Therefore flow and hydrological regime of the lake is changed (limited).

- Due to blocking of Pededze River in one spot, water flow has stopped in about 6 km long stretch in the lower part of the river. This matter facilitates contamination of riverbed with organic matter that leads to worsening of water quality in this river stretch.

Actual threat on nature values by human activities could be summarised as follows:

⇒ Water gates and their construction at Aiviekste River source from Lubana Lake have stopped traditional fish migration routes.

⇒ Due to the shortened flood period in Lubana Lake surrounding areas, fish spawn in marshy grasslands along Aiviekste River is unsuccessful. Therefore fish resources in Aiviekste River have decreased significantly.

⇒ Due to forestry activities the only recorded breeding place of Spotted Eagle (World Threaten Status) in Latvia was destroyed. Still there are some possibilities that this pair breeds in some other forest stand, but there is no data about that.

25. Conservation measures taken:

As a result of biological investigations carried out by the Institute of Biology, the Teici nature reserve, Latvian Fund for Nature and Latvian Ornithological Society, the areas to be protected were proposed to the Cabinet of Ministers. The proposal was adopted by the Cabinet of Ministers of the Republic of Latvia on June 15, 1999 (Regulations N^{o}. 212/199). The locations and the areas of the current nature protection territories are shown in the following table, nature reserves cover 74% from total area of LWC.

Name of Nature Protected Territories in LWC	**Area (ha)**
Bērzpils bog	3319
Īdiņu bog	818
Īdeņas and Kvāpānu ponds	1116
Lagažas-Šņitku bog	3386
Lubānas depressions	5905
Lubānas ans Sūļagala bog	2899
Pārabaine	9822
Pededzes river lower stretch	4147
Salas bog	3862
Tīrumnieku bog	266
Total	35602

Individual protection and use rules, as well as management plans have been prepared for 3 nature reserves. In response to a request from the Government of the Republic of Latvia, the Government of Japan decided to conduct a master plan study on Environmental Management Plan for Lubana Wetland Complex and entrusted the study to the Japan International Cooperation Agency (JICA). This plan presents the results of all works conducted in both Latvia and Japan during a total period of 17 months from August 1999 to December 2000. This is an environmental management plan to achieve sustainable development in the Lubana Wetland Complex area for the target year 2010. This management plan includes the wetland conservation projects, the water level management projects, and the development projects for eco-tourism and fishery.

To implement this management plan, project proposal was submitted by Madona regional council to LIFE-Nature fund. It was approved in 2003. Several activities to protect species and habitats, reconstruct hydrological regime and improve ecotourism infrastructure will be carried out from October 2003 to September 2007.

26. Conservation measures proposed but not yet implemented:

2 management plans for 2 nature reserves have been proposed in 2004. In the framework of Natura 2000 network, it is proposed to join all 10 nature reserves in one Natura 2000 site. Thus it would help to ensure protection of areas between nature reserves that are currently unprotected.

27. Current scientific research and facilities:

Botany. Description of habitats and inventory of vegetation have been started by Latvian Fund for Nature within the project "Inventory and evaluation of the most valuable peatlands of Latvia". Vegetation was also studied during preparation of management plan for nature reserve "Lubana depressions".

Ornithology. Most detailed and long term are the studies of waterfowl, done by University of Latvia, Institute of Biology. Since 1975 studies of waterfowl and waders are continued in Nagli fisheries. Counts of hunted waterfowl have been done in Lubans Lake and Nagli fishery in 1967-1969, 1993-1999.

Systematic research of rare birds of prey is carried out since 1981. First information about distribution of waders in mires was collected in 1981-1989 (Bergmanis 1989).

Inventory of waders is continued in 1996 and 2000 within the framework of mire inventories (Pakalne et al 1996) and project "The study on environmental management plan for Lubana wetland complex" (Nippon Koei, Kokusai Kogyo 1999, 2000).

Special attention is paid to the globally threatened Great Snipe. First detailed counts were done during preparation of protection plan for the species (Latvian Ornithological society 1999) and followed within the framework of project "The study on environmental management plan for Lubana wetland complex".

Entomology. Studies are not systematic. Within the framework of project "The study on environmental management plan for Lubana wetland complex", an inventory of Lepidoptera and Coleoptera species was done. Inventory of protected insect species in nature reserve zones in 2001-2003 was done by project "Preparation for Latvia's Compliance with the EMERALD and Nature 2000 Networks of Protected Areas".

Hydrology. Data on water quality was obtained in 1999-2000 within the framework of project „The study on environmental management plan for Lubana wetland complex" (Nippon Koei, Kokusai Kogyo 2000); regular inventories have not been done.

28. Current conservation education:

Within the framework of LIFE project „Management of the Lubana Wetland Complex, Latvia" booklet and home page have been created about nature values, protection and management of the site.

Rezekne Regional Council and Japan International Cooperation Agency (JICA) have issued the informative booklet about LWC and project "The study on environmental management plan for Lubana wetland complex".

Latvian Nature Film studios have prepared a film in Latvian, English and Japanese about nature values, ecological problems and possible solutions in the site.

29. Current recreation and tourism:

During the project „The study on environmental management plan for Lubana wetland complex", we have implemented the ecotourism project – 4 bird watching towers and nature path have been set up. Several guesthouses are available for ecotourists. There is no information about numbers of visitors, but they have seasonal character – mainly anglers, waterfowl hunters, tourists and people that like spending their free time at the waters. Intensity of visiting the area is low; visits are mainly connected with fishponds, Lake Lubans and rivers/ditches.

30. Jurisdiction:

State owned forests, bogs and waters are managed by State Stock Company "Latvian forests"; private owners are responsible for management of their properties. Municipalities manage part of fishponds and Lake Lubans.

Control over use and protection regime are ensured by Regional Environmental Board and State Environmental inspectorate; management and use of forests are supervised by State Forest Service.

31. Management authority:

Nature Conservation Board, Eksporta iela 5, Riga LV-1010, Tel: +371 7509545,
e-mail: dap@dap.gov.lv

32. Bibliographical references:

Anon. 1999. The study on environmental management plan for Lubana wetland complex. Progress report(1). Nippon Koei co., LTD., Kokusai Kogyo co., LTD

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Annex

Table 1. Bird species in Lubana Wetland complex corresponding to Ramsar convention Criterion 6

Species	Together observed number of individuals in the period of migrations		1% of Population (migrating individuals)
	Spring	Autumn	
Bewick's Swan *Cygnus columbianus*	940	?	290
Whooper Swan Cygnus cygnus	2433	?	590
Pintail *Anas acuta*	3527	?	600
Smew *Mergus albellu*s	364	?	400

Table 2. Wetland Type Lubana Wetland complex (according to Convention classification system)

Wetland Type (codes)	Area (ha)	% from total area
Permanent rivers, canals, ditches (M; 9)*	40	0,1
Permanent freshwater lakes (O)	8099	16,9
Aquatic ponds (1)	2685	5,6
Non-forested peat lands, includes open bogs and swamps (U)	11221	23,4
Seasonal/intermittent freshwaters marshes/pools on inorganic soils, includes sloughs, seasonally flooded meadows, sedge marshes (Ts)	4743	9,9
Shrub-dominated wetlands, shrub swamps, shrub dominated freshwater marshes, alder thicket on inorganic soils (W)	present	nonsignif.
Forested peatlands, peatswamp forests (Xp)	14937	31,1
Freshwater, tree dominated wetlands, includes freshwater swamp forests, seasonally flooded forests, wooded swamps on inorganic soils (Xf)	present	nonsignif.
Seasonally flooded agricultural land (4)	present	nonsignif.
TOTAL Inland Wetlands	**41725**	**86,9**

* - rivers and ditches are not separated due to the fact that rivers are partly ditched.

Table 3. Bird Species, for which Lubana Wetland Complex maintains more than 15% of the total breeding population of Latvia:

Species	Red Data Book of Latvia	Protected Species in Latvia	SPEC category	World Threat Status
Black-necked Grebe *Podiceps nigricollis*	2	+		

White-tailed Eagle *Haliaeetus albicilla*	1	+	3	NT
Spotted Eagle *Aquila clanga*	1	+	1	V
Golden Eagle *Aquila chrysaetos*	1	+	3	
Willow Grouse *Lagopus lagopus*	1	+		
Great Snipe *Gallinago media*	1	+	2	NT
Whimbler *Numenius phaeopus*	3	+	4	
Marsh Sandpiper *Tringa stagnatilis*	3	+		
Little Gull *Larus minutus*		+	3	
Whiskered Tern *Chlidonias hybridus*		+	3	
Black Tern *Chlidonias niger*		+	3	
White-winged Black Tern *Chlidonias leucopterus*	3	+		
Short-eared Owl *Asio flammeus*	1	+	3	
Middle Spotted Woodpecker *Dendrocopos medius*	3	+	4	

Table 4. Protected Mammals of the Lubana Wetland Complex

Species	In Red Data Book of Latvia	EU Directive 92/43/EEC
Beaver *Castor fiber*		II
Wolf *Canis lupus*		II
Brown bear *Ursus arctos*	2	II
Lynx *Lynx lynx*		II
Otter *Lutra lutra*		II
Stoat *Mustella erminea*	2	
Weasel *Mustella nivalis*	2	

Table 5. Most common Waterfowl species during spring migration

Species	Observed number of individuals in the period of spring migrations
Mute swan *Cygnus olor*	253
Whooper Swan *Cygnus cygnus*	2433
Bewick's Swan *Cygnus columbianus*	940
Bean Goose *Anser fabalis*	800
White-fronted Goose *Anser albifrons*	3000
Wigeon *Anas penelope*	8560
Teal *Anas crecca*	1866
Mallard *Anas platyrhynchos*	2542
Pintail *Anas acuta*	3527
Pochard *Aythya ferina*	810
Tufted Duck *Aythya fuligula*	1006
Goldeneye *Bucephala clangula*	137
Smew *Mergus albellus*	364

Table 6. The Locality of Area, Inhabitants

Region Centre	Community	The nearest distance from inhabited areas	Inhabitants	
			In the Centre of Town/Community	Total in Region/Community
Madona		80 ^{0} 32 km	9400	45500
	Ošupe	50 ^{0} 3 km	534	1500
	Barkava	100 ^{0} 5 km	980	1700
	Indrāni	90 ^{0} 5 km	1934	1200
Rēzekne		300 ^{0} 28 km	37800	42800
	Dekšāres	0 ^{0} 10 km	278	1000
	Gaigalava	330 ^{0} 3 km	415	1200
	Nagļi	On border of the area	404	600
Balvi		220 ^{0} 23 km	8400	29500
	Rugāji	255 ^{0} 8 km	620	1800
	Lazdukalns	240 ^{0} 4 km	181	1200
	Bērzpils	270 ^{0} 2 km	194	1100
Gulbene		160 ^{0} 19 km	9500	27700
	Dauksti	150 ^{0} 8 km	130	1400