Voluntary reports for the in-depth review of implementation of the programme of work on the biological diversity of inland waters ecosystems.

Simplified overview on status and trends of inland water ecosystems in Finland

Inland waters in Finland

The total surface area of inland waters in Finland is approximately 3.4 million hectares, making inland waters the fourth most extensive habitat type in the country. There are almost 190 000 lakes and ponds of over 0.1 hectares in size and 600 rivers with a mean flow over 2 m3/s. In addition to lakes and rivers, Finnish inland waters include a great number of brooks, springs and ponds. Of all well-known species 6% have inland waters as their primary habitat.

Changes in regulation and structure

The most important factors affecting inland waters have been changes in water quality as well as the construction and regulation of water bodies. With decreasing loading from point sources the nutrient concentrations of many larger lakes and rivers have declined, whereas smaller rivers and lakes next to extensive areas of arable land continue to eutrophicate (Räike et al. 2003). Airborne acidification, which formerly affected many clear-watered watershed lakes, is no longer considered a threat to biodiversity (Mannio and Vuorenmaa 2004).

Most Finnish rivers were cleared of rocks for timber floating in the late 19th and early 20th centuries, and most large rivers were dammed for hydropower between 1930 and 1980 (e.g. Yrjänä 2003). Water level regulation also affects almost one third of Finnish lakes by area and a much larger proportion of the water volume, since most of the larger watercourses are regulated (Marttunen et al. 2001). One of the greatest changes regarding inland waters has been the clearing and straightening of small streams and brooks to improve forest drainage. Many springs have also been altered mainly for water supply. In addition to the alteration of stream courses, forestry practices have also affected biodiversity associated with small water bodies by changing the light conditions and microclimate of the habitat.

Inland waters today

In 2006 the Ministry of the Environment approved the National Strategy and Action Plan for Conservation and Sustainable Use of Biodiversity in Finland 2006-2016. The National game husbandry and wetland strategy, however, is being drawn up by the Ministry of Agriculture and Forestry.

During the Action Plan period steps have been taken both in agriculture and forestry to decrease the amount of nutrients entering inland waters. These have included leaving buffer strips along waterways and better practices in the use of fertilizers. The positive development in terms of decreasing nutrient loading from point sources has continued (Niemi et al. 2004). There have been a multitude of projects for restoring built and eutrophicated rivers and lakes, although most of these have had some other primary goal besides safeguarding biodiversity (Eloranta 2004, Keto et al. 2004). During the Action Plan period the first biodiversity-oriented restoration projects were carried out alongside many studies to this end (e.g. Jormola et al. 2003). Less detrimental water level regulation practices have also been developed and studied (e.g Marttunen and Järvinen 1999, Hellsten 2000, Yrjänä et al. 2000, Marttunen et al. 2004a, b). The network of protected inland water and shore areas has expanded as a result of Natura 2000 and is now considered representative in many respects(Toivonen et al. 2004). The situation concerning the conservation of small water bodies remains less satisfactory, albeit no comprehensive survey of their state has been con-

ducted. Recently there has been growing concern for these habitats within forestry and, for example, the survey of key biotopes has improved the situation to some degree (Yrjönen 2004).[1]

Threatened habitat types

The first national assessment of threatened habitat types in Finland was carried out during 2005-2007 by more than 80 habitat experts. The assessment was based on two criteria: change in quantity and change in quality. As an outcome of this assessment process was the Red List Category for each habitat type (RE regionally extinct, CR critically endangered, EN endangered, VU vulnerable, NT near threatened, LC least concern, DD data deficient).

Wetland habitat types did not form their own habitat group in the assessment, but were included mainly in four habitat type groups: Baltic Sea and its coast, Inland waters and shores, Mires and Traditional rural biotopes. In addition one wetland type was included in Forest group (inland flooded forests). About 150 wetland habitat types or habitat complex types were assessed.

Approximately half of the number of the assessed wetland habitat types or habitat complex types were classified as threatened (VU, EN, CR) in following habitat type groups: underwater habitats of the Baltic Sea, coastal wetlands, rivers and streams, mires. The most alarming situation is in the traditional rural biotopes (wet meadows) where over 80 % of the assessed types are threatened and in the freshwater spring complexes with both assessed types threatened. Freshwater lakes and ponds seem to have survived best, so far, with little over 20 % of the types being threatened. Only 31 wetland habitat types or habitat complex types were classified as least concern (LC). Most of them represent poorest and/or wettest peat land types that are still common, or habitats restricted to northern Finland.

In the list of the Finnish habitat types of international responsibility, wetland types are well represented. Approximately 70 % of the listed international responsibility habitat types are wetland habitats, mainly underwater and coastal habitats of the Baltic Sea, mire habitats and habitats related to the land uplift coast. The Finnish mire habitat types of international responsibility relate to cool and humid climate and relatively flat topography, both factors favoring the development of large, wet mire habitat and habitat complex types. The habitats of the Baltic Sea are characterized by globally exceptional combination of features: low salinity, abundance of hard rock bottoms, lack of tidal influence and very fast post-glacial land uplift on the coast.

Studies on the status of wetlands

Comprehensive inventories were conducted for the Bird Wetlands Conservation Programme (1981) and IBA (1996-1997, 2000), and new studies are in progress, such as the Bird Atlas (2006-2010) and updating of IBA (2007-2008). Long term census (surveillance) of winter bird in marine habitats has been conducted since the 1960's.

Natura 2000 and Ramsar networks

The most comprehensive wetland related policy is the Natura 2000 network. All the 49 Finnish Ramsar sites are also part of the Natura 2000 network. Most of the Finnish Ramsar sites are also in the Finnish Bird Wetlands Conservation Programme, which includes 287 sites (1982) and in the Finnish Mire Conservation Programme (1980), which includes over 600 sites. FINIBA assessment includes 414 sites, 96 of them are IBA sites (1996-1997). All Ramsar sites are in the IBA list. The Prioritisation list of Finnish Wetlands includes 162 sites (2003), which are also part of the Natura 2000 network and include all Ramsar sites. Finland is also committed to HELCOM work and 22 sites in Finland are part of Baltic Sea Protected Areas, 15 of which are also Ramsar sites.

[1] **The text and the references quoted above are from the Draft of the 4th Finnish National Report for the Convention on Biological Diversity (2009), Ari-Pekka Auvinen (Finnish Environment Institute)**

Restoration projects and maintenance measures

Eutrofication in general is the greatest adverse change affecting all Finnish bird conservation areas. In many Ramsar sites there have been major restoration projects and ongoing maintenance measures. The following seven LIFE III (2000-2006) programme funded projects include restoration and maintenance activities in several Ramsar sites: 1) Protection and usage of aapamires with a rich avifauna, (2000-2005) 2) Protection of aapa mire wilderness in Ostrobothnia and Kainuu (2001-2005), 3) Protection of wetlands of ornithological value in Central Finland (2001-2006), 4) Restoration of boreal forests and forest-covered mires (2002-2007), 5) Management of wetlands along the Gulf of Finland migratory flyway (2003-2007), 6) Natural Forests and mires in the "Green Belt" of Koillismaa and Kainuu (2004-2008), 7) Conservation of Anser erythropus of the European migration route (2005-2009).

Also in the following Structural Funds projects, restoration and maintenance activities have been implemented: Endangered Species in Common: condition and impacts on conservation and society (2003-2006), Reed Strategy in Southern Finland (2005-2008) and BIRD-project: Bird rich wetlands, nature reserves and heritage landscapes as resources in rural areas (2004-2007). More information about BIRD-project in English can be found at www.eurowetlands.org. Lack of funding has been a challenge for Finnish wetland conservation.

The Mire Conservation Programme (1980) includes about 600 sites, of which 98 % have been implemented (1.1.2007). A total of 13 % of remaining Finnish mires are protected. (Sources: National evaluation report of mire conservation (2001). Management Effectiveness Evaluation of Finland´s Protected Areas (2005). State of Parks - Finnish protected areas and their management 2000-2005 (2007). Monitoring, assessment and reporting of the conservation status of habitats and species, Habitats Directive (2007).

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