

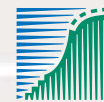
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Waterbirds around the world

A global overview of the conservation,
management and research of the
world's waterbird flyways

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Wetlands as part of the natural heritage: the educational response

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Wetlands are not only a human resource but are also part of the natural heritage. Public awareness, through high quality environmental education, is needed to generate adequate protection of these areas. The *UN Decade of Education for Sustainable Development* is an opportunity for a radical 'greening' of educational curricula so that wetland studies are included. This paper explains the authors' experience of teaching wetland conservation issues as part of a course on heritage studies.

Wetlands have long been perceived as unimportant habitats or even as 'badlands'. It is only since the 20th century that their huge ecological importance has been highlighted, and conservation actions undertaken. However, this recognition is still not widespread among the general public, and the best way to change this situation is through education, notably by providing a new vision of wetlands as a special part of nature.

In Russia, wetlands are now seen as a natural resource, and the main reason for establishing nature reserves e.g. Zapovednik in the Volga River delta in 1919, was to save waterbirds, sturgeon and to provide clean drinking water. Gradually, this approach has been changing, as a result of academic research, to one of conserving biological and landscape diversity, e.g. the Great Arctic Reserve on the Taimyr Peninsula and other protected areas in Russia (Ebbinge *et al.* 2000). This has been largely due to changes in the global view of wetlands, (e.g. UNESCO, which seeks to encourage the identification, and preservation of world heritage sites as irreplaceable sources of life and inspiration). This is embodied in the 1972 UNESCO World Heritage Convention. The World Heritage List contains many wetlands of importance, e.g. Danube Delta in Romania, Everglades National Park in the USA, Greater St Lucia Wetland Park in South Africa, and the Tasmanian Wilderness in Australia. This list has contributed to a new vision for nature and wetlands as a common heritage, rather than just as a natural resource.

Unfortunately, this new recognition has been only by professionals in environmental studies and policy (Mazourov 2002, 2003). In 2003, the 57th Session of the United Nations General Assembly adopted Resolution 57/254 *United Nations Decade of Education for Sustainable Development*. This has helped academics make radical changes to the way they teach ecology to the general public and so to raise ecological culture and heritage awareness.

At Moscow State University, the basic course structure is multi-disciplinary and has been modified to incorporate a wetland theme into a one-term lecture course on heritage studies at the Faculty of Geography with an integrated module 'Wetlands as a natural heritage'. Students study wetland conservation, particularly in areas of natural heritage. Specific wetland issues are studied within the traditional courses of biology, ecology, etc. Students are being trained to work in research and planning institutions, state agencies, government bodies, committees, in secondary schools, private enterprises, and other organizations

involved in analysis, assessment, training and decision-making in the fields of environmental and nature resource management. Students are being taught that wetlands must be considered as unique and important parts of the regional natural heritage, and wise use is essential for sustainable regional development to provide economic and environmental well-being.

In computer related courses such as 'Remote Sensing in Environmental Research', students learn the potential for ecological interpretation of remotely sensed images to assess wetland status. For example the waterlogged landscapes of Meshchera National Park are used as a demonstration and field study area. Peatlands which had been excavated between 1930 and 1990 are now flooded, and are important habitats for many rare species. Students determine conservation or restoration measures on the basis of the current ecological status of habitats. Students learn digital image processing methods and thematic interpretation of Earth Observation data so as to recommend further wetland restoration and wise use.

Post-graduate students participate in international wetland ecology research undertaken by Russian research institutes together with the ALTERRA-Green World Institute, DLO-Institute for Forestry and Nature Research (the Netherlands). Field research in the Kola Peninsula is an important component of the training and research for wetland studies. This area holds about 100 000 lakes and 21 000 rivers, with peatlands and swamps occupying 37% of the area.

Wetlands are important for nesting, staging, and wintering waterfowl, but industrial developments have brought significant environmental changes to many. The Lapland State Nature Biosphere Reserve, supporting 190 species of terrestrial and migratory waterbirds, is studied as an area mostly unaffected by anthropogenic changes, where students study habitats of species listed in the Russian Red Data Book. Ecosystem changes are studied in areas exposed to industrial emissions from the Severonickel and Apatit Co. industrial plants, with students carrying out visual observations, satellite imagery, lichen and bryophyte identification, geobotanical and geochemical studies, and hydrological and hydrochemical measurements.

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