



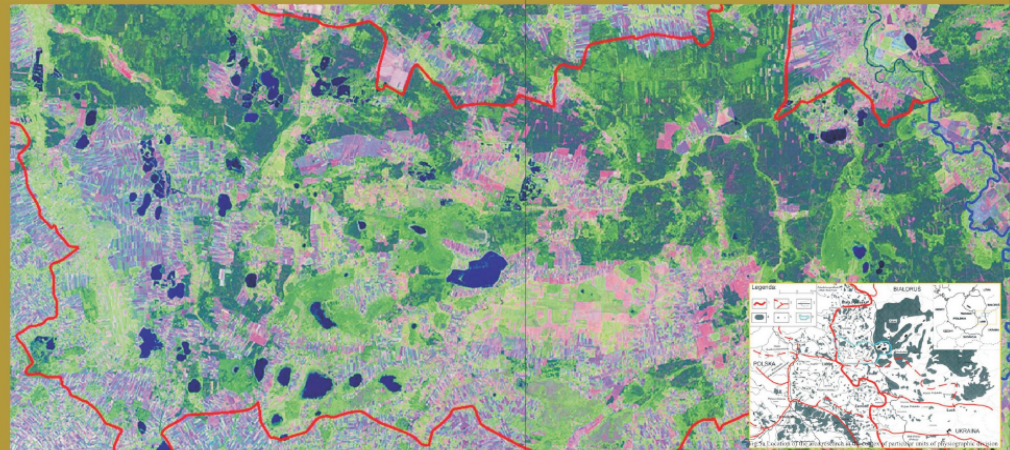
INTEGRATED MANAGEMENT SYSTEM OF THE 'WEST POLESIE' BIOSPHERE RESERVE



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Fig. 1 The River Bug (T. J. Chmielewski)



PROFILE OF THE "WEST POLESIE" BIOSPHERE RESERVE

The West Polesie Biosphere Reserve was created in April 2002 on the area of 139,917 ha. It includes almost the whole physiographic subregion: Leczna – Włodawa Lakeland and small fragments of three other subregions. It stretches from the River Bug in the south-east to the Tymienica River valley in the north-west.

One of the most important reasons for this biosphere reserve creation was the unique variety of nature in this part of Polesie and its location on the border of contrast physiographical and ecological structures, the abundance of lakes, bogs, moors and forests, the presence of many relict and rare species and the unique importance of this region in the ecological structure of Europe. Forests (59.6 %) and fields (25.23 %) dominate in the land use structure, but a meaningful share is taken by meadows (7.79%), moors (4.54%), lakes, ponds and rivers (2.84%).

Until present day 61 lakes with the surface over 1 ha have survived. Particular lakes are in various stages of succession and contain water of different trophy. Land and water assemblies of macrophytes are extremely interesting. Parts of this area are a miniature of European tundra and forest-tundra which is here the farthest advanced to the south-east in Europe (Fijałkowski, ed. 1960). This is the area of unusual variety of highmoors, transitional moors, lowmoors and in some places – very unique carbonate moors. Large collection of northern plant species (150 species) and simultaneous presence of many plants from Atlantic zone (25 species), east continental zone (43 species) create a curiosity on the European scale (Fijałkowski, ed. 1986). In the region of Leczna – Włodawa Lakeland there appear 1466 species of vascular plants, including 12 species from European CORINE list and 10 species from "Polish Plant Red Data Book".

The animal life is also abundant here: 98 species of the region's fauna are listed on the European CORINE list and 25 are in the "Polish Red Book of Animals" (Chmielewski, ed. 1999).

Central part of the Biosphere Reserve constitute the Polesie National Park. It is surrounded by 3 landscape parks: Leczna Lakeland L.P. in the west, Polesie L.P. in the center and Sobibor L.P. in the east, joined together with the Polesie Landscape Protected Area.



ELEMENTS OF THE SYSTEM AND EXAMPLES OF EACH FUNCTION

The nature resources management system in the Biosphere Reserve is based on 4 interconnected subsystems (Fig. 6) (Chmielewski, Domagala 2004).

1) **Subsystem of diagnosis** of the space condition, relying on ecosystems and their landscape compositions inter-processes. The key role played by the Lublin scientific center. The co-operation of the services managing the Biosphere Reserve West Polesie with universities and research institutes, and also with Scientific Councils of Polesie National Park, Chelm Landscape Parks and Lublin Landscape Parks, plays the main role in the functioning of the subsystem of diagnosis. For example "Fuzzy Cognitive Mapping" as a tool to facilitate and analyse the process of public participation.

2) **Planning subsystem**, which main element was working out the nature conservation plans for the national park and the landscape parks as well as the sustainable development strategy for the communes of the West Polesie. Nature conservation plans were worked out by the governmental nature conservation service. Also local government representatives took part in the process of their preparation. In the process of working out the nature conservation plan for the Sobibor Landscape Park, the all-day workshops were organized, during which the chairman of the local communities together with the author's team (planners and scientists) were working out the general policy of wildlife and landscape conservation strategy for this park. For example Nature Conservation Plan for the Sobibor Landscape Park (Fig. 7) and Nature Conservation Plan for Polesie National Park (Fig. 8).

3) **Decision-making subsystem**, where – on the basis of plans' resolutions – the proper entries to the local spatial management plans were introduced. Using these two types of plans, the administrative decisions concerning conservation actions for specified types of ecosystems were being issued. These include for example: water damming, stand reconstruction, moors plant succession control, and also decisions concerning architecture objects building, tourists' facilities, creating tourist routes and educational paths, etc.

In the case of the West Polesie Biosphere Reserve, realization of several wetlands' restoration projects has been particularly important, including the Pionowa river and the Nadrybie - Bikezy - Cieszein lake complex restoration, with the total area of 600 ha. This was a pioneer project in Poland, realized in 1992 – 1995 (Chmielewski, Krogulec 2008). Local governments plays the main role in the functioning of the decision-making subsystem concerning the way of area development, using the resources of waters, peat and local rock resources deposits, and in the scope of green areas protection and planning play local governments. The beginning of this co-operation was difficult in West Polesie, because people were afraid of economic bans and restrictions connected with the introduction of various forms of nature protection, especially with the creation of a national park. Practice however showed that the national park contributed to a great promotion of the region and a significant improvement of the inhabitants' life conditions. Many key investments for the region were realised by communes together with the national park.

4) **Control subsystem**, which combines among others: building inspection, environment quality control and nature monitoring. All these three links of this subsystem do not work in Poland properly, and the nature monitoring is still in the organization stage (Chmielewski, Krogulec 2008). The control subsystem is till now the most problematic, especially the control of spatial development plans realisation and the monitoring of environmental transformation, although this situation is improving gradually. In particular it is necessary to organise a network of biodiversity and landscape diversity monitoring as well as urban monitoring urgently. It is also necessary to systemize gathering of these data, by a common introduction of Spatial Information Systems based on advanced computing technologies. Such systems are one of the key instruments facilitating effective protection and sustainable management of resources of unique natural values areas on a world scale.

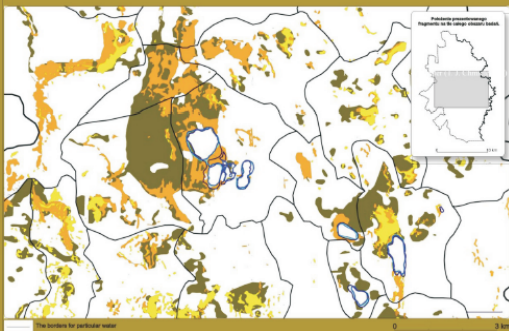
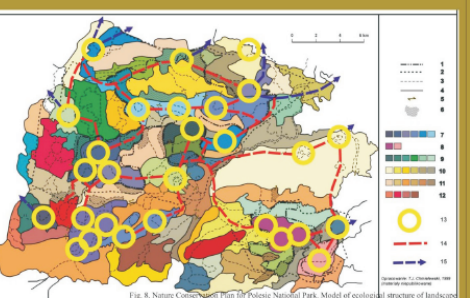
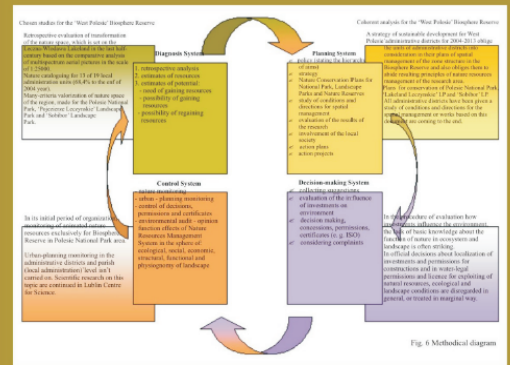


Fig. 3 The process of peatbog flora communities disappearance in 1933, 1952 and 1978

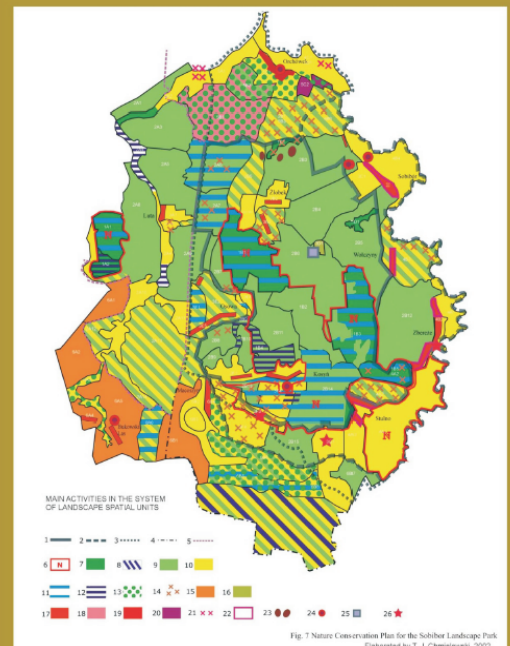


Fig. 7 Nature Conservation Plan for the Sobibor Landscape Park Elaborated by T. J. Chmielewski, 2002



Fig. 4 Remnants of peatbog area, 2, in disappearance, the Młocznik, 2002 (T. J. Chmielewski)

LEGEND:
1-The border of national park, 2-The border of national park protecting zone, 3-The border of basic natural spatial units (biota), 4-The border of phytozones, 5-Strong functional connections between biota, 6-Ecological biota, 7-Biota with domination of peatlands, 8-Biota with domination of water-saturated ecosystems, 9-Biota with forest connections, 10-Biota with domination of meadow ecosystems, 11-Biota with domination of agricultural, 12-Biota with domination of mosaic structure, 13-Ecological biota, 14-Ecological corridors, 15-Main natural connections with surrounding sites.

CONCLUSIONS:

- Local bottom-up nature conservation initiatives are good solution for building an effective sustainable development management system.
- Large-scale biosphere reserves could be a good training areas for testing this idea
- Good cooperation of research workers and nature conservation staff with local communities and NGOs plays the crucial role in achieving success. Platforms of this cooperation should be built very early, in the beginning of local nature conservation initiatives.
- The main elements of local nature conservation management system should be:
 - sub-system of diagnosis,
 - planning sub-system,
 - decision-making sub-system,
 - ecosystem (especially wetlands) restoration,
 - strengthening of landscape ecological structure,
 - cultural heritage revitalisation,
 - monitoring of changes in landscape system,
 - socioecological and environmental education.
- West Polesie Biosphere Reserve is a good example of practical implementation of such a system.

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