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FLORISTICAL DIVERSITY OF WETLANDS IN CENTRAL POLAND – CONDITIONS AND CHANGES

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Summary. Wetlands of Central Poland cover up to 8% of the area. Over 700 species of vascular plants have been found there, 400 of which are connected to wetlands. Drainage of wet areas causes that 46% of species characteristic of this habitat are included in the national list of endangered species. In Central Poland numerous peatland-halophytes are already extinct. Conservation of hygrophilous plants in seven natural reserves protects the wetland flora of Central Poland only to a certain degree.

Key words: flora, diversity, wetlands, Central Poland

INTRODUCTION

Central Poland is poor with wetlands. The areas including highmoors, transitional moors and lowmoors, water reservoirs, wet and damp meadows, swamp forests as well as swamps and marshes take about 8% of the total region area. Moors cover approximately 3.5 thousand hectares, which makes 2.5% of wetlands.

The subject of the research is floristical diversity of wet non-forest habitats. Flora of such habitats belongs to the most endangered representatives of vegetation not only in the region but in the whole country. The main factors causing extinction are: drainage of wetlands, using intense agricultural methods on meadows and giving up the extensive cultivation of wetlands.

The main objects of the research are:

– to present the current state of hygrophilous vegetation in Central Poland;

– to determine the degree of threat;

– to determine the effectiveness of protection of hygrophilous species in protection zones.

STUDY AREA, MATERIAL AND METHODS

Central Poland is here understood as a region the area and borders of which were established in Mowszowicz's work [1978]. It comprises the whole (before 1999 reform)

voivodships: łódzkie, skierniewickie, sieradzkie, piotrkowskie and partly włocławskie, płockie, konińskie, kaliskie and kieleckie (Fig. 1).

The research refers only to wetlands covered by non-forest vegetation. The incended data have been based on floristical-phytosociological research carried out in this

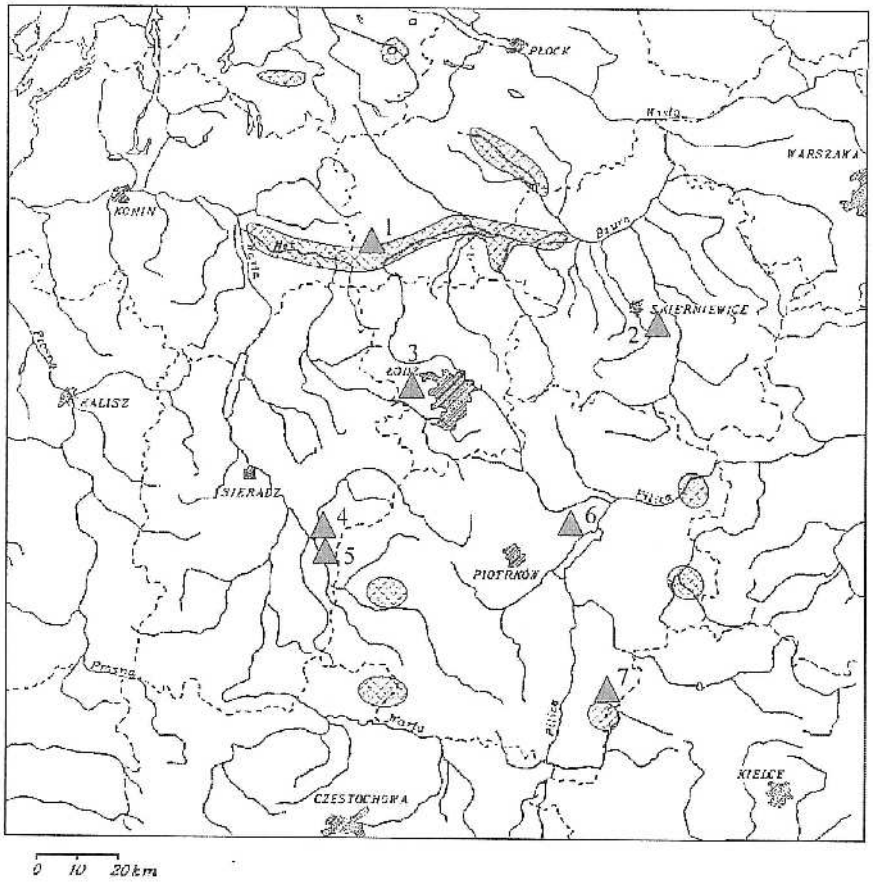

Fig. 1. Distribution of the largest peat-bogs and peat-bog reserves in Central Poland; 1 – „Błonie"; 2 – „Polana Siwica"; 3 – „Torfowisko Rąbień"; 4 – „Korzeń"; 5 – „Grabica"; 6 – „Czarny Ług"; 7 – „Piskorzeniec"

Rys. 1. Rozmieszczenie największych torfowisk i rezerwatów torfowiskowych w Polsce Środkowej

region from 1980 to 2003. The determination of floristical diversity of the characterized habitat has been based on data obtained from wetland inventory [Kucharski and Pisarek 1996, 2001]. Moreover, we have taken into consideration about 1500 relevés taken during studies on meadow vegetation [Kucharski 1999]. The mentioned relevés were taken in habitats of the following classes: *Scheuchzerio-Caricetea nigrae*, *Oxycocco-Sphagnetea*, *Phragmitetea*, *Lemnetea*, *Bidentetea tripartiti*, *Potametea*, *Isoëto-Nanojuncetea*,

Table 1. Diversity and land cover of vegetation on Central Poland's wetlands
Tabela 1. Zróżnicowanie i powierzchnia roślinności na mokradłach Polski Środkowej

Type of vegetation Typ roślinności	Type of wetland – Typ mokradła				Total area Razem powierzchnia
	Low moors Torfowisko niskie	Transitional moors Torfowisko przejściowe	High moors Torfowisko wysokie	Wetland Inne mokradła	
Rushes – Szuwary	417	0	8	661	1086
Tall sedge vegetation Turzycowiska	966	11	3	3122	4102
Moss-sedge vegetation Mechowiska	1722	20	0	407	2149
Transitional moor moss vegetation Mszary przejściowe	35	138	0	18	191
High moor moss vegetation Mszary wysokie	16	0	71	21	108
Wet and moist meadows Mokre i wilgotne łąki	18111	123	62	31640	49936
Others – Inne	12119	438	159	50315	63031
Razem – Total	33386	730	303	120885	120603

Asteretea tripolium and *Molinio-Arrhenatheretea* (order *Molinietalia*). The above data have been supplemented by information coming from floristical inventory and study on peat-bog vegetation carried out from 1998 to 2002 on over 200 stands in Wyżyna Radomszczańska (Radomszczańska Highland), Kotlina Szczercowska (Szczercowska Valley) and in south-eastern part of Pojezierze Kujawskie (Kujawskie Lakeland). In the years 2000-2003 reserves in which the main object of protection is hygrophilous vegetation were inspected and the gathered information has been used for evaluation of protection method efficiency for peat land vegetation in protection zones.

RESULTS

Wet, non-forest habitats of Central Poland are covered by rich and diversified vegetation. It is represented by over 700 species of vascular plants. However, only about 400 taxons are strictly connected with non-forest plant communities of wetlands. They make over 30% of the flora in Central Poland. Due to the specific location of the region, occurrence limits of various plant species belonging to different geographical elements cross here. The following boreal hygrophilous plants have been noticed here: (*Chamedaphne calyculata*, *Scheuchzeria palustris*, *Ledum palustre*, *Salix myrtilloides*, *Saxifraga hirculus*, *Carex chordorrhiza*, *C. limosa*, *C. atheroides*) as well as Atlantic ones: (*Pedicularis sylvatica*, *Cladium mariscus*, *Carex pulicaris*, *Rhynchospora fusca*, *Drosera intermedia*). The location on the border of highlands and lowlands causes the

Table 2. Participation of endangered and threatened species in the syntaxonomical groups
Tabela 2. Udział gatunków zagrożonych i ginących w grupach syntaksonomicznych

Syntaxonomical groups Jednostka syntaksonomiczna	Cathegories of threat – Kategorie zagrożenia							Total Ogółem
	EX	EW	CR	EN	VU	LR	DD	
Lemnetea, Potamogetonetea, Montio-Cardaminetea	2	0	8	0	6	7	3	26
Littorelletea, Utricularietea	3	0	0	0	3	2	1	9
Oxycocco-Sphagnetea	0	0	1	0	3	3	0	7
Scheuchzerio-Caricetea fuscae	8	1	9	4	6	3	0	31
Isoeto-Nanojuncetea Bidentetea	0	0	4	3	4	2	4	17
Asteretea tripolium, Thero-Salicornietea	4	0	5	1	1	1	0	12
Phragmitetea	0	0	3	2	9	2	2	18
Molinio-Arrhenatheretea	0	2	16	5	9	5	1	38
Total – Ogółem	17	3	46	15	41	25	11	158

fact that in Central Poland there are plants typical of both highlands of mountainous regions (*Tofieldia calyculata, Carex davalliana, Huperzia selago*) and lowlands. Diversification of the chemical composition of soil created good conditions for plants typical of poor and acidic peats and basic moors (*Liparis loeselii, Epipactis palustris*), as well as saline soils (*Salicornia europaea, Samolus valerandi, Blysmus rufus, Glaux maritima*).

The described habitats are refuge for 47 taxa of legally protected vascular plants. They include 50 species from Red List of Plants [Zarzycki and Szeląg 1992] and 20 from Polish Red Book of Plants [Kazimierczakowa and Zarzycki 2001].

DISCUSSION

Agricultural drainage made the wetland area shrink by over a half in the 20th century. All big moors in Central Poland have been drained and cultivated. The phenomenon is so widespread that less than 10% of lowmoors area is covered by natural vegetation. The values for transitional moors and highmoors are respectively 10% and 24% (Tab. 1). Drainage of moors results in a reduction of typical wetland flora. In the area of Łódź voivodship halophilous species are practically extinct although on the turn of the 1950's and the 1960's they covered large areas of wetlands near Łęczyca [Kucharski 1994]. At present, the population of last halophytes occupies areas of several square meters only. In Central Poland in the second half of the 20th century the last following hygrophilous species disappeared: *Pedicularis sceptrum-carolinum, Tofieldia calyculata, Pinguicula vulgaris, Malaxis monophyllos, Juncus atratus, Nymphoides peltata, Stellaria crassifolia, Schoenus nigricans, Orchis palustris, Viola epipsila, Trapa natans* and *Salvinia natans*.

The list of endangered species of the area comprises 158 species connected with wetlands, which makes 46% of taxa present in the „red list" of endangered species of Central Poland [Jakubowska-Gabara and Kucharski 1999] (Tab. 2). In recent years yet another threat for vascular flora of vetlands has appeared. It is giving up the cultivation of vegetation wetlands. Succession of forest vegetation supersedes plants that are typical of open wetland areas, substituting them with forest plants.

CONCLUSIONS

In Central Poland there are 7 reserves which protect vegetation typical of highmoors and transitional moors, rushes and inland salt soils. Unfortunately, they are not helpful in accomplishing the tasks for which they have been founded. In „Błonie" halophyte reserve the main protected species is extinct. Hygrophilous vegetation in „Piskorzeniec", „Polana Siwica" and „Torfowisko Rąbień" reserves is on the brink of extinction. Only in newly established reserves such as „Korzeń", „Grabica" and „Czarny Ług" the protected species are not endangered. The main reason for the above mentioned process is the lack of active protection in the areas.

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RÓŻNORODNOŚĆ FLORYSTYCZNA MOKRADEŁ POLSKI ŚRODKOWEJ – JEJ STAN I ZMIANY

Streszczenie. Mokradła zajmują w Polsce Środkowej około 8% powierzchni regionu. Stwierdzono na nich ponad 700 gatunków roślin naczyniowych, z których 400 związanych jest z mokradłami. Osuszanie siedlisk podmokłych spowodowało, że 46% gatunków związanych z tymi siedliskami znajduje się na regionalnej liście roślin zagrożonych i ginących. W Polsce Środkowej wyginęły gatunki związane z śródlądowymi solniskami oraz liczne gatunki torfowiskowe. Ochrona roślinności wilgociolubnej w 7 rezerwatach tylko w niewielkim stopniu chroni florę mokradeł Polski Środkowej.

Słowa kluczowe: flora, różnorodność, mokradła, Polska Środkowa