



LIVERWORTS OF THE NATURE RESERVES IN WIELKOPOLSKA.
6. “KOZIE BRODY”, “WILCZE BŁOTO”, “JEZIORO CZARNE” AND “BRZEZINY”

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ABSTRACT. Current state of hepaticoflora in four nature reserves in Wielkopolska was described. The flora in the reserves is unusually poor compared to other law-protected areas in the region. This is partially due to disappearing of protection objects for which the reserves were established. In all reserves changes in hydrological state triggered succession; peat-bogs are overgrown by bushes, mainly willows, or pines.

KEY WORDS: liverworts, “Kozie Brody”, “Wilcze Błoto”, “Jezioro Czarne”, “Brzeziny”, nature reserves, Wielkopolska, Poland

INTRODUCTION

This paper continues studies on hepaticoflora of nature reserves in Wielkopolska. Compared to previously described materials (GÓRSKI 2006 a, b, c, 2007 a, b), part six concerns objects of poor liverworts flora.

The “Kozie Brody” reserve has been established “for protecting low peat-bogs with their relict vegetation” upon a rationale which was an island locality of *Betula humilis*. Other rare species recorded in the reserve were *Stellaria crassifolia* and *Saxifraga hirculus* (JASNOWSKA and JASNOWSKI 1991 a, b). Recent studies have not confirmed any of these two species; however, a glacial relict *Helodium blandowii* has been found (URBAŃSKI 2005). The “Wilcze Błoto” reserve protects a small area in a forest depression with swamp and peat-bog vegetation. The most valuable fragments of peat-bog ecosystems concentrate near a natural dystrophic reservoir. A floristic peculiarity is the presence of three sundew species (*Drosera rotundifolia*, *D. anglica*, *D. intermedia*) and a number of peat-bog plants: *Carex limosa*, *Scheuchzeria palustris*, *Andromeda polifolia* and others (KOŚCIŃSKI 2005). The “Brzeziny” reserve has been established to protect one of few aggregations of royal fern (*Osmunda regalis*) in Wielkopolska. Current condition of the population of *Osmunda regalis* is good. The “Jezioro Czarne” reserve protects water ponds with their vegetation, including a transitional peat-bog and *Cladietum marisci*.

Field studies were carried out in 2005-2007. Species nomenclature and depiction was applied according to SZWEYKOWSKI (2006). Plant communities were depicted according to BRZEG and WOJTERSKA (2001).

PROFILE OF THE NATURE RESERVES

Kozie Brody

The “Kozie Brody” nature reserve functions under the regulation of Ministry of Forestry and Timber Industry from 23 October 1965 (Monitor Polski No. 65, pos. 372 and 373), kept by the announcement of Wielkopolski Voivod from 4 October 2001, regarding the line up of nature reserves established by 31 December 1998 (Dz. Urz. Woj. Wlkp. No. 123, pos. 2401).

The reserve is situated in Wielkopolskie Voivodship, Złotów district, and Jastrowie commune (Fig. 1). According to physico-geographical classification of Poland, the reserve belongs to macroregion of Pojezierze Południowopomorskie and mesoregion of Pojezierze Szczecińskie. In geobotanical classification (SZAFER 1977) the reserve is situated in Wysoczyzna Złotowska District.

The entire area (0.72 ha) is the property of the Treasury under management of Agricultural Property Agency (Agencja Nieruchomości Rolnych) in Piła.

The “Kozie Brody” reserve encompasses a low peat-bog suspended over a mineral edge of lowland. The peat-bog is located in a depression and is affected by exudation waters, which gives it seepage spring character. The reserve belongs to soligenic peat-bogs which habitat specificity is created by subsoil waters running down from higher situated lowland areas (JASNOWSKA and JASNOWSKI 1991 a, b).

The biggest part of the reserve is covered by willow thickets *Salicetum cinereae* Kobendza 1930 that overgrow preserved, small-area peat-bog and meadow phytocoenoses. Forest ecosystems are arranged by agglomerations of *Betula pubescens*.

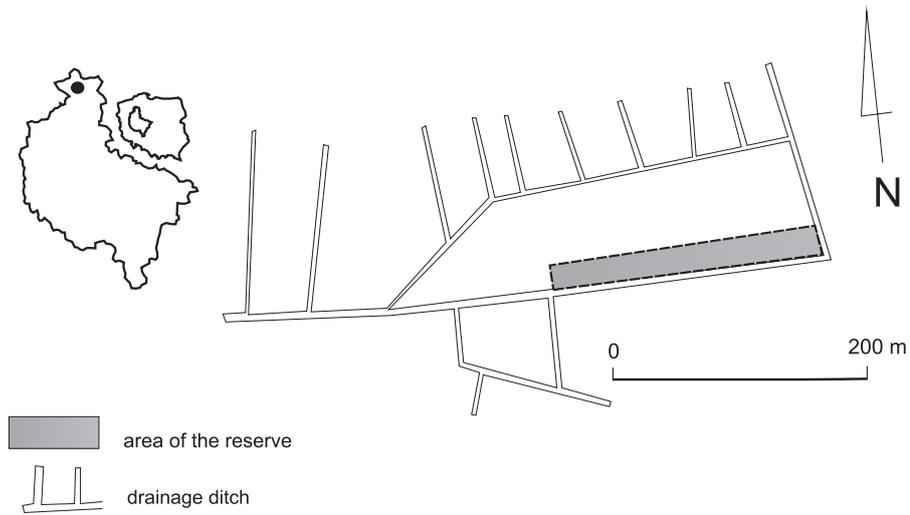


FIG. 1. Survey map of the “Kozie Brody” nature reserve

Wilcze Błoto

The “Wilcze Błoto” nature reserve functions upon the regulation of Ministry of Forestry and Timber Industry from 5 October 1968 (Monitor Polski No. 43, pos. 304), kept by the announcement of Wielkopolski Voivod from 4 October 2001, regarding the line up of nature reserves

established by 31 December 1998 (Dz. Urz. Woj. Wlkp. No. 123, pos. 2401).

The reserve is situated in the Wielkopolskie Voivodship, Czarnków-Trzcianka district, Wieleń commune (Fig. 2). In geobotanical classification (SZAFER 1977) the reserve is in the Notecki District. The entire area of the

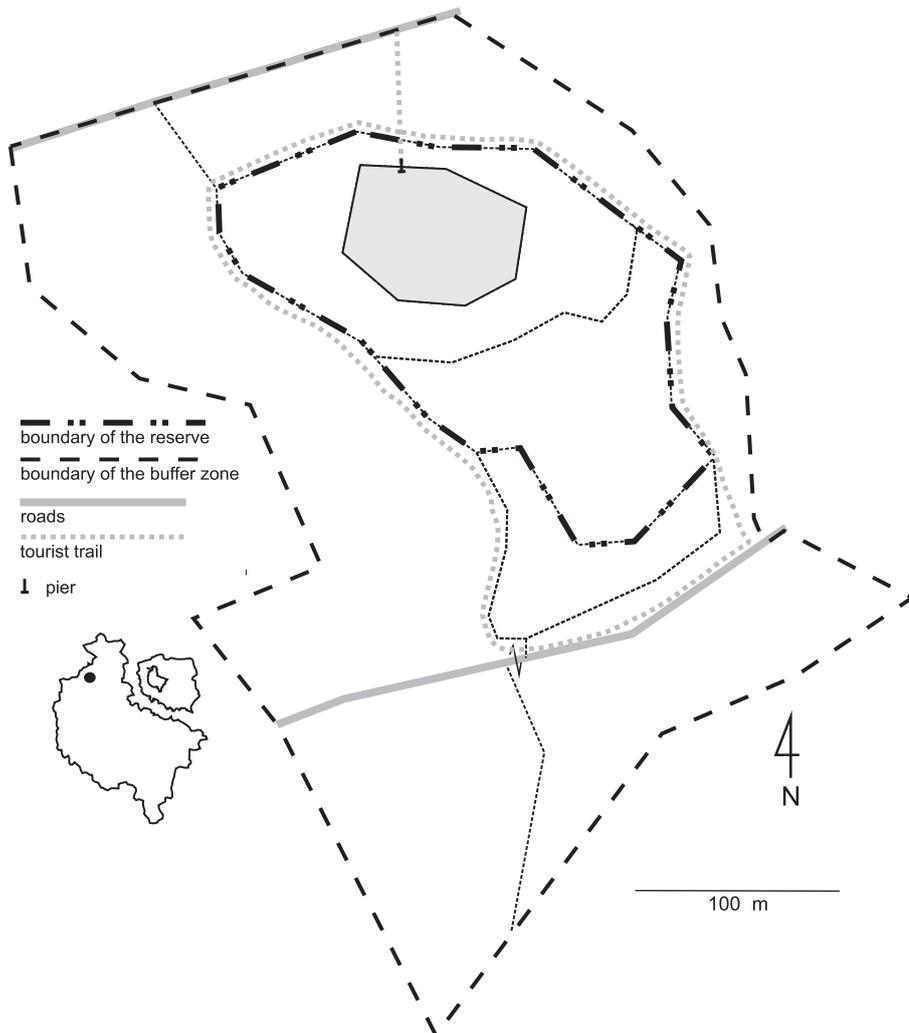


FIG. 2. Survey map of the “Wilcze Błoto” nature reserve

reserve is the property of the Treasury under management of National Forest Authority (PGL Lasy Państwowe), Forest Inspectorate Krucz.

The actual vegetation in the reserve consists of phytocoenoses of transitional peat-bogs connected with a **dystrophic water pond**, i.e. *Caricetum limosae* Br.-Bl. 1921, *Rhynchosporium albae* W. Koch 1926, *Sphagno apiculati-Caricetum rostratae* Osvald 1923 em. Steffen 1931, *Caricetum lasiocarpae* Koch 1926 and *Carici canescentis-Agrostietum caninae* R. Tx. 1937. Alder forests and willow thickets *Ribes nigri-Alnetum* Sol.-Görn. (1975) 1987 and *Salicetum auritae* Jonas 1935 em. Oberd. 1964 grow at the borders of the reserve.

Jezioro Czarne

The "Jezioro Czarne" nature reserve functions under the regulation of Ministry of Forestry and Timber Industry from 2 July 1959 (Monitor Polski No. 77, pos. 409), kept by the announcement of Wielkopolski Voivod from 4 October 2001, regarding the line up of nature reserves established by 31 December 1998 (Dz. Urz. Woj. Wlkp. No. 123, pos. 2401).

The reserve is situated in Wielkopolskie Voivodship, Poznań district, Murowana Goślina commune (Fig. 3). In geobotanical classification (SZAFER 1977) the reserve

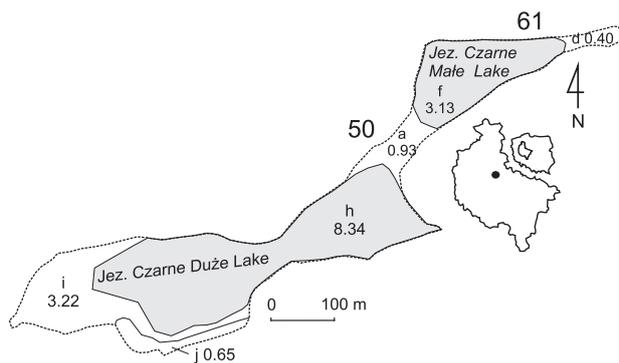


FIG. 3. Survey map of the "Jezioro Czarne" nature reserve

belongs to Poznańsko-Gnieźnieński District. The entire area of the reserve is the property of the Treasury under management of the Experimental Forest Station of August Cieszkowski Agricultural University, located in Murowana Goślina.

Vegetation of the reserve consists of communities of macrophytes (including *Cladietum marisci*) growing at shorelines of water ponds, and parts of transitional peat-bogs overgrown by willow thickets.

Brzeziny

The "Brzeziny" nature reserve functions under the regulation of Ministry of Forestry and Timber Industry from 15 July 1958 (Monitor Polski No. 61, pos. 347), kept by the announcement of Wielkopolski Voivod from 4 October 2001, regarding the line up of nature reserves established by 31 December 1998 (Dz. Urz. Woj. Wlkp. No. 123, pos. 2401).

The reserve is situated in south-eastern part of Wielkopolskie Voivodship, southern part of the Kalisz district, in Brzeziny commune (Fig. 4). In geobotanical classification (SZAFER 1977) the reserve is situated in

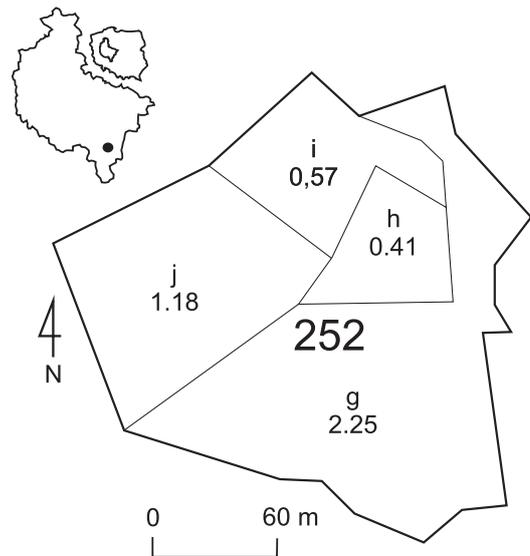


FIG. 4. Survey map of the "Brzeziny" nature reserve

the Kaliski District. The entire area of the reserve is the property of the Treasury under management of the Forest Inspectorate Kalisz.

The actual vegetation of the reserve are phytocoenoses of moist coniferous forest *Molinio caeruleae-Pinetum* (Juraszek 1928) W. et J. Mat. 1973, fresh coniferous forest *Leucobryo-Pinetum* (Libbert 1933) W. Mat. 1962 em. W. et J. Mat. 1973, and distorted forms of alder-ash forest (*Fraxino-Alnetum* W. Mat. 1952) and transitional peat-bogs (*Carici canescentis-Agrostietum caninae* R. Tx. 1937).

RESULTS

Liverwort flora

The liverwort flora of the investigated nature reserves is exceptionally poor. Altogether, 12 species were found in four reserves. The reason for such a situation can be significant anthropogenic changes in the flora of the reserves and, partially, small area of the reserves. In every reserve, changes in hydrological state triggered succession: peat-bogs are being overgrown by bushes and thickets of willows and pines. There is an urgent need for active protection in the reserves "Jezioro Czarne" and "Kozie Brody". The subjects of protection in those reserves either disappear or have already even vanished. Most of liverworts in the reserves are species that are common in lowlands.

List of species

Abbreviations: 52hx, 252h – nos. of forest units

B – "Brzeziny" nature reserve, JCz – "Jezioro Czarne" nature reserve, KB – "Kozie Brody" nature reserve, WB – "Wilcze Błoto" nature reserve

Calypogeia muelleriana (Schiffn.) Müll. Frib.

B: on peat and mineral soil, 252g, 252h, 252j
JCz: peat-bog being overgrown by willows, 50a

Cephalozia bicuspidata (L.) Dumort.

B: on rotting wood log, 252g

Cephalozia connivens (Dicks.) Lindb.

WB: on peat and rotting wood, comm. with *Betula pubescens*, 52hx

JCz: in thickets of *Salicetum cinereae* with *Sphagnum* sp. div., 51i

Chiloscyphus pallescens (Ehrh. ex Hoffm.) Dumort.

KB: on soil, in thickets of *Salicetum cinereae*

JCz: on peat in alder forest, 61d

Lepidozia reptans (L.) Dumort.

B: on rotting wood, 252h

Lophocolea bidentata (L.) Dumort.

KB: on soil, comm. with *Betula pubescens*

Lophocolea heterophylla (Schrad.) Dumort.

B, JCz, KB, WB: common in the entire reserve, on rotting and live wood, less frequent on soil

Marchantia aquatica (Nees) Burgeff

JCz: on peat, in *Cicuto-Caricetum pseudocyperi*, 61d

Pellia epiphylla (L.) Corda

B: on mineral soil, 252j

Ptilidium pulcherrimum (G. Weber) Vanio

B: on birch, 252h

KB: on bark of pine and birch (comm. with *Betula pubescens*, *Salicetum cinereae*)

WB: on bark of birch and alder, 52hx

Riccardia latifrons (Lindb.) Lindb.

JCz: on a log of *Alnus*, in *Cicuto-Caricetum pseudocyperi*, 61d

Riccardia palmata (Hedw.) Carruth.

JCz: peat-bog being overgrown by willows, 50a

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