

DENDROFLORA OF THE PLANNED “BIELISZOWSKIE ŁĘGI” RESERVE SITUATED ALONG THE Odra RIVER IN THE REGION OF LOWER SILESIA

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Abstract. The planned “Bieliszowskie Łęgi” reserve along the Odra River is to cover the area of about 240 ha. The main objective of its establishment is the protection of the riparian forest sites as well as the river valley itself. The total of 63 species of arborescent plants was inventoried which derive from 19 families. Indigenous taxons (51) were found dominant with various plant species of fertile broad-leaved forests represented most abundantly. Since forests in the region are commercially managed, the majority of trees growing in the area are characterized by medium breast height diameters with only a small proportion of large diameters. The most valuable trees include: 3 legally protected species as well as 25 trees with monumental diameters and 27 trees with breast height diameters close to monumental and 62 trees with splendid diameters. 18 trees were selected to be placed under protection as nature monuments. The area of the planned reserve has been changed by human activity (river regulation, forest and meadow management) and placing the area of “Bieliszowskie Łęgi” under protection would allow gradual restoration of the natural character of these riparian forests.

Key words: dendroflora, nature preservation, “Bieliszowskie Łęgi”

INTRODUCTION

There are still river valleys in Poland that are characterized by a considerable degree of naturalness. In comparison with large European rivers, our rivers, such as Wisła and Odra, can still be considered as ‘natural’ and there are sections of river valleys where natural hydrological processes can still be found. This is where live, dynamic segments of rivers with rare, valuable and threatened plant communities occur whose existence is strongly connected with the existence and activities of rivers. Such segments frequently act as ecological corridors [Ekologiczna... 2003]. The growing awareness of the importance of forest riparian communities is confirmed by protection recommendations found in the Dyrektywa... [1992], Polityka leśna... [1996] and Rozporządzenie... [2001].

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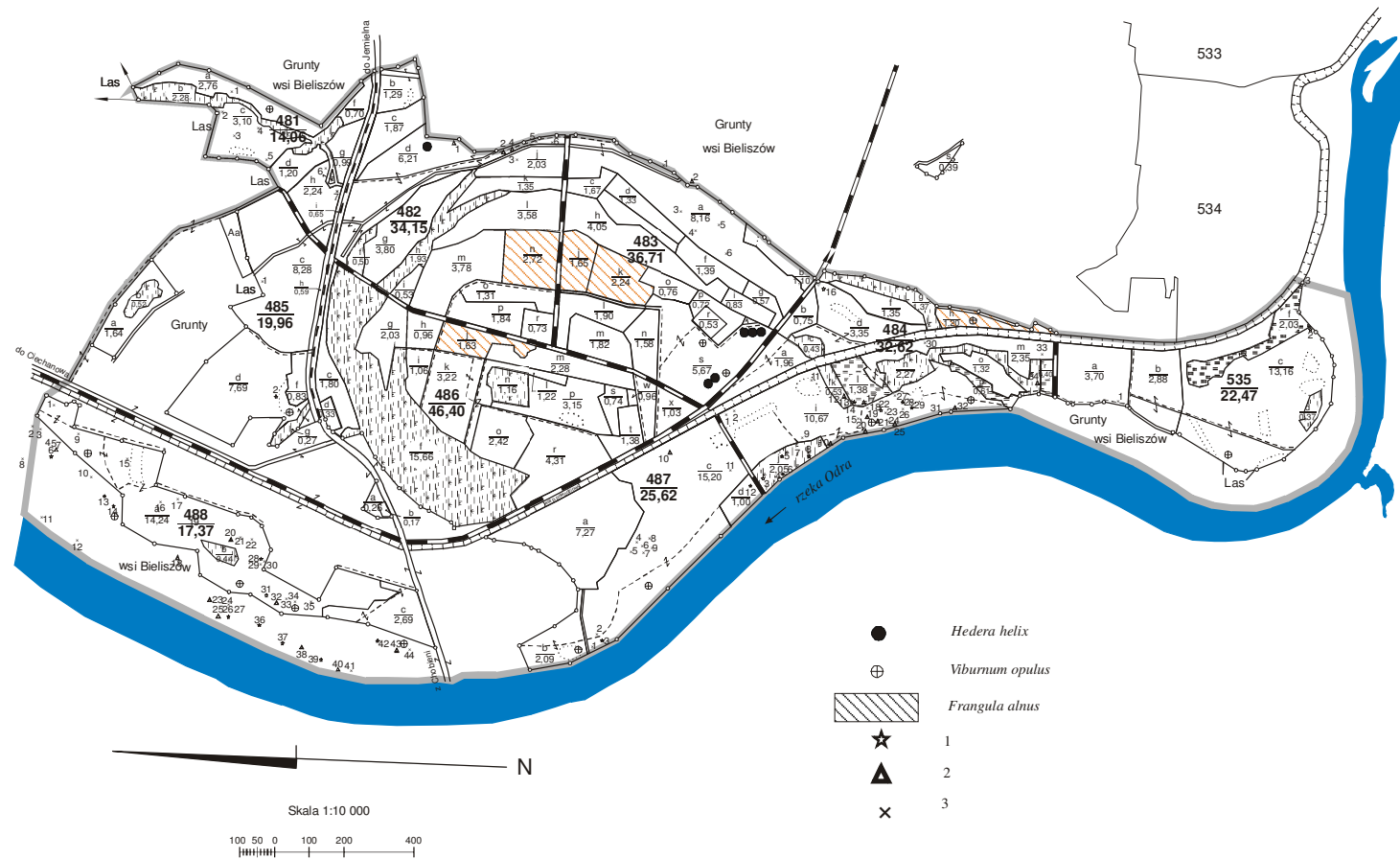


Fig. 1. Borders of the planned Nature Reserve and distribution of the species covered by legal protection and the widest trees: 1 – monumental measurement trees, 2 – trees with measures close to monumental, 3 – trees with splendid diameters

Rys. 1. Granice planowanego rezerwatu oraz rozmieszczenie gatunków chronionych i najcenniejszych drzew: 1 – drzewa o wymiarach pomnikowych, 2 – drzewa o wymiarach zbliżonych do pomnikowych, 3 – drzewa okazałe

The proposed "Bieliszowskie Łęgi" reserve is situated in the Obniżenie Ścinawskie Mesoregion. According to Bobrowicz [1995] and Łonkiewicz and Świerkosz [1995], this is, alongside the Lower Odra River Valley, the segment of the river with the best preserved wet broad-leaved forests that forms, together with the adjacent Wrocław Pradolina, the longest afforested fragment situated along the entire length of this river. That is why Bobrowicz and Konieczny [2000] suggested the establishment of a reserve here whose goal would be to protect both the riparian forest sites and the river valley. The proposed object is situated within the confines of the Protected Landscape Park Dolina Baryczy which was established in 1992 [Rozporządzenie... 1992]. Moreover, it would also form a part of the planned Protected Landscape Park Nadodrzański Lubiąsko-Głogowski which was declared a European Bird Refuge – Łęgi Odrzańskie [Important... 2000].

With regard to Obniżenie Ścinawskie, Macicka and Wilczyńska [1988, 1993] mention the following plant associations: *Salici-Populetum* (R. Tx. 1931) Meijer Drees 1936, *Galio silvatici-Carpinetum* Oberd. 1957, *Circeo-Alnetum* Oberd. 1953, *Ribo nigri-Alnetum* Sol.-Górn. 1975 oraz *Salicetum pentandro-cinerae* (Almq. 1929) Pass. 1961.

The objective of the performed investigations is to prepare the dendroflora inventory of the planned "Bieliszowskie Łęgi" reserve and later on to indicate the existing threats and put forward the most important protection recommendations.

STUDY AREA

The planned Nature Reserve is situated in the dolnośląskie voivodeship, in the commune Jemielno (Góra Śląska Forest District, Jemielno Forest Working Circle, Majówka Forest Range). The examined object is situated on the right side of the Odra River on the section between 346-352 km of the river course, in the neighbourhood of Chobienia village (Fig. 1). The boundary of two mesoregions Obniżenie Ścinawskie and Pradolina Głogowska runs in this region. Łonkiewicz and Świerkosz [1995] maintain that Pradolina Głogowska begins where the river changes its course from the meridian one (characteristic for Obniżenie Ścinawskie) to north-westerly, below Chobienia. Atlas... [2000] places the border near the village of Chobienia, at about 350 km of the river length where the ferry crossing is situated. In this study, it was assumed that the investigated area is situated in the Obniżenie Ścinawskie mesoregion because the Odra River flows here towards the north.

The area of the proposed reserve is to cover about 240 ha and include eight compartments of the Majówka Forest Range as well as non-forest land that belongs to the Bieliszów village. In addition, it is also envisaged to create a protection zone of the reserve which would comprise some compartments of the Majówka and Lubów Forest Range [Bobrowicz and Konieczny 2000].

According to climatic regionalisation based on the frequency of days with different types of weather, the discussed area was classified as a part of the Południowopolski Region (R-XVI) [Woś 1995]. Region Obniżenie Ścinawskie is considered as one of the warmest regions in Poland. The mean long-term annual temperature is 8.1°C and the mean annual amplitude 19-20°C. The mean duration of thermal winter ranges from 60 to 70 days and that of thermal summer – 90 to 100 days. The vegetation period lasts approximately 220 days and the mean long-term total precipitation is at the level of 550 mm with the snow cover lying on the fields for the average of 40 days [Czerny et al. 1994, Woś 1995].

The following types of soil were found to occur in the examined region: alluvial soils, gley soils, rusty soils and true brown soils [Operat... 2005].

Broad-leaved forests are dominant in the examined region with the riparian forest covering 64% of the planned reserve area. Fresh broad-leaved forest and fresh mixed broad-leaved forest take up 19% of the object and alders and ash alders constitute 17% [Plan... 1996].

METHODS

The dendroflora inventory was compiled in years 2003-2005. A group of most valuable species was identified which included: species covered by legal protection [Rozporządzenie... 2004], rare species as well as species threatened in the entire country and in Lower Silesia [Kącki and Szczęśniak 2003].

The geographic-historic and sociological-ecologic statuses were determined in accordance with Jackowiak [1993]. The following frequency classes were determined: I – very rare (1-10), II – rare (11-20), III – frequent (21-50), IV – very frequent (51-100), V – common (> 101 localities).

In order to examine the breast height diameter structure of trees, 14 test plots of 0.25 ha each were established. The above test surfaces were established on the following forest site types: riparian forest – 8 plots, fresh mixed broad-leaved forest – 3, alder forest – 2 and ash alder forest – 1. Measurements were carried out on trees whose breast height diameter exceeded 7 cm. In the breast height diameter interval from 7 to 26.9 cm, the diameters were measured every 2 cm, from 27 to 42.9 cm – every 3 cm and when the breast height diameters exceeded 43 cm – each 4 cm.

The above classification was adopted according to regulations applied in the State Forests. Within individual compartments, continuous numeration of trees was adopted. Trees which forked at the height of more than 1.3 m from the ground were treated as single trees. The height of 2 to 5 trees with 1 m accuracy was measured on each test plot.

The approximate age of trees was determined on the basis of Plan... [1996] and updated to 2006 years, while their health condition was assessed with the assistance of classification Kamiński and Czerniak [2000]. Names of plant species were given after Mirek et al. [2002] and Seneta and Dolatowski [2004].

The inventory of trees characterized by a considerable circumference was carried out in sub-compartments of the entire object on strips approximately 50 m wide running from north to south. Individual tree species were included into one of three groups: trees with monumental diameters [Instrukcja... 1996; species not included in the Instrukcja – after Ruciński 1998], trees with breast height diameters close to monumental: *Ulmus laevis*, *Populus tremula* from 200 to 219 cm, *Alnus glutinosa* from 200 to 224 cm, *Quercus robur*, *P. nigra* from 340 to 379 cm and trees with splendid diameters: *U. laevis* from 180 to 199 cm, *A. glutinosa* from 175 to 199 cm, *Q. robur* from 290 to 339 cm. Moreover, an additional inventory was made of trees and bushes which were considered 'interesting', i.e. specimens with original shapes.

Detailed data about the inventoried plants as well as maps showing the distribution of individual specimens are given in the manuscript Spurtacz and Polowczyk [2005].

RESULTS

General characteristics of dendroflora

The species composition of stands of the proposed "Bieliszowskie Łęgi" reserve is dominated by broad-leaved trees associated with riparian and oak-hornbeam forests. Riparian forests of the *Alno-Ulmion* association are represented, among others, by: *Alnus glutinosa*, *Fraxinus excelsior*, *Ulmus minor*, *U. laevis*, *Prunus avium*, *Pyrus pyra-ster*, *Prunus spinosa*, *Rosa canina*, *Rubus caesius*, *Cornus sanguinea*. *Salix alba*, *S. fragi-lis*, *S. triandra*, *S. viminalis*, *Populus alba*, *P. nigra* and *P. × canescens* are associated with riparian willow and poplar forests, while *Carpinus betulus*, *Tilia cordata*, *Quercus robur* and *Corylus avellana* represent species of hornbeam communities (Table 1).

Table 1. The list of taxons of arborescent plants in the planned Nature Reserve "Bieliszowskie Łęgi"
Tabela 1. Wykaz taksonów roślin drzewiastych planowanego rezerwatu „Bieliszowskie Łęgi”

Species name Nazwa gatunkowa	Family Rodzina	Raunkiaer's group Grupa Raunkiaera	Częstość – Frequency	Geographical-historical group Grupa historyczno-geograficzna	Sociological-ecological group Grupa socjologiczno-ekologiczna
1	2	3	4	5	6
<i>Acer campestre</i> L.	<i>Aceraceae</i>	M	III	Ap	1
<i>Acer negundo</i> L.	<i>Aceraceae</i>	M	II	Kn	1
<i>Acer platanooides</i> L.	<i>Aceraceae</i>	M	III	Ap	1
<i>Acer pseudoplatanus</i> L.	<i>Aceraceae</i>	M	II	Ap	1
<i>Aesculus hippocastanum</i> L.	<i>Hippocastanaceae</i>	M	I	Kn	18
<i>Alnus glutinosa</i> (L.) Gaertn	<i>Betulaceae</i>	M	IV	Ap	6
<i>Alnus incana</i> (L.) Moench	<i>Betulaceae</i>	M	I	Sp	6
<i>Berberis vulgaris</i> L.	<i>Berberidaceae</i>	N	I	Sp	1
<i>Betula pendula</i> Roth	<i>Betulaceae</i>	M	III	Ap	2
<i>Carpinus betulus</i> L.	<i>Corylaceae</i>	M	III	Sp	1
<i>Cornus alba</i> L.	<i>Cornaceae</i>	N	I	Ef	18
<i>Cornus sanguinea</i> L.	<i>Cornaceae</i>	N	V	Sp	1
<i>Corylus avellana</i> L.	<i>Corylaceae</i>	N	IV	Ap	1
<i>Crataegus × macrocarpa</i> Hagetschw.	<i>Rosaceae</i>	N, M	I	Ap	1
<i>Crataegus × media</i> Bechst.	<i>Rosaceae</i>	N, M	I	Ap	1
<i>Crataegus laevigata</i> (Poir.) DC	<i>Rosaceae</i>	N, M	IV	Sp	1

Table 1 – cont.

1	2	3	4	5	6
<i>Crataegus monogyna</i> Jacq.	<i>Rosaceae</i>	N, M	IV	Ap	1
<i>Crataegus rhipidophylla</i> Gand.	<i>Rosaceae</i>	N	I	Sp	1
<i>Euonymus europaeus</i> L.	<i>Celastraceae</i>	N	II	Sp	1
<i>Frangula alnus</i> Mill.	<i>Rhamnaceae</i>	N	III	Sp	6
<i>Fraxinus excelsior</i> L.	<i>Oleaceae</i>	M	II	Ap	1
<i>Fraxinus pennsylvanica</i> Marshall	<i>Oleaceae</i>	M	II	Kn	18
<i>Hedera helix</i> L.	<i>Araliaceae</i>	Ch, N	I	Ap	1
<i>Larix decidua</i> Mill.	<i>Pinaceae</i>	M	I	Kn	2
<i>Malus sylvestris</i> Mill.	<i>Rosaceae</i>	M	I	Sp	1
<i>Picea abies</i> (L.) H. Karst.	<i>Pinaceae</i>	M	II	Kn	2
<i>Pinus sylvestris</i> L.	<i>Pinaceae</i>	M	III	Sp	2
<i>Populus × canadensis</i> Moench	<i>Salicaceae</i>	M	II	Kn	18
<i>Populus × canescens</i> (Aiton) Sm.	<i>Salicaceae</i>	M	II	Ap	1
<i>Populus alba</i> L.	<i>Salicaceae</i>	M	II	Ap	1
<i>Populus nigra</i> L.	<i>Salicaceae</i>	M	II	Ap	7
<i>Populus tremula</i> L.	<i>Salicaceae</i>	M	IV	Ap	2
<i>Prunus avium</i> (L.) L.	<i>Rosaceae</i>	M	I	Sp	1
<i>Prunus padus</i> L.	<i>Rosaceae</i>	M	IV	Sp	1
<i>Prunus serotina</i> Ehrh.	<i>Rosaceae</i>	M, N	II	Kn	2
<i>Prunus spinosa</i> L.	<i>Rosaceae</i>	N	IV	Ap	1
<i>Pyrus pyraister</i> (L.) Burgsd.	<i>Rosaceae</i>	M	III	Sp	1
<i>Quercus petraea</i> (Matt.) Liebl.	<i>Fagaceae</i>	M	I	Sp	2
<i>Quercus robur</i> L.	<i>Fagaceae</i>	M	V	Ap	1
<i>Quercus rubra</i> L.	<i>Fagaceae</i>	M	II	Kn	2
<i>Rhamnus catharticus</i> L.	<i>Rhamnaceae</i>	N	IV	Sp	1
<i>Ribes rubrum</i> L.	<i>Grossulariaceae</i>	N	I	Ef	18
<i>Robinia pseudoacacia</i> L.	<i>Fabaceae</i>	M	I	Kn	3
<i>Rosa canina</i> L.	<i>Rosaceae</i>	N	III	Ap	1
<i>Rubus caesius</i> L.	<i>Rosaceae</i>	Ch, N	III	Ap	12
<i>Rubus idaeus</i> L.	<i>Rosaceae</i>	N	III	Ap	1
<i>Rubus plicatus</i> Weihe et Ness	<i>Rosaceae</i>	N	III	Ap	2
<i>Salix alba</i> L.	<i>Salicaceae</i>	M	II	Ap	7
<i>Salix aurita</i> L.	<i>Salicaceae</i>	N	I	Sp	6
<i>Salix caprea</i> L.	<i>Salicaceae</i>	M, N	III	Ap	3
<i>Salix cinerea</i> L.	<i>Salicaceae</i>	N	III	Ap	6
<i>Salix fragilis</i> L.	<i>Salicaceae</i>	M	II	Ap	7
<i>Salix pentandra</i> L.	<i>Salicaceae</i>	M, N	I	Sp	6
<i>Salix purpurea</i> L.	<i>Salicaceae</i>	N	II	Ap	7
<i>Salix triandra</i> L.	<i>Salicaceae</i>	N	I	Ap	7

Table 1 – cont.

1	2	3	4	5	6
<i>Salix viminalis</i> L.	Salicaceae	N	IV	Ap	7
<i>Sambucus nigra</i> L.	Caprifoliaceae	N	III	Ap	3
<i>Sorbus aucuparia</i> L.	Rosaceae	N, M	III	Ap	2
<i>Tilia cordata</i> Mill.	Tiliaceae	M	III	Ap	1
<i>Tilia platyphyllos</i> Scop.	Tiliaceae	M	IV	Kn	1
<i>Ulmus laevis</i> Pall.	Ulmaceae	M	V	Ap	1
<i>Ulmus minor</i> Mill. emend. Richens	Ulmaceae	M	II	Ap	1
<i>Viburnum opulus</i> L.	Caprifoliaceae	N	II	Sp	1

The most valuable stands of the examined object include compartments (481 a, 482 o, 484 d, i, j, k, m, n, o, 487 a, c, 488 a, 535 a) of over 100 years old pure oak forest as well as forests in which oak trees constitute a significant proportion.

The age of stands vary [Plan... 1996]; the youngest trees are just a few years old and the oldest – 135 years, with some trees reaching the age of 160 years.

The dendroflora of the proposed reserve comprises 63 taxons from 19 families (Table 1). Almost half of the above number (30) belongs to xx families with the remaining families represented to a much lower degree.

From among the inventoried plants 33 taxons assume the form of trees, 20 are bushes, 8 can occur in both forms and 2 species are chamephytes of which one takes the form of a climber (Table 1).

The majority of the identified plants (51) are of indigenous origin (81%) with a clear predominance of apophytes (33) over spontaneophytes (18). Out of 12 taxons of foreign origin, which make up 19% of the entire dendroflora, ten are permanent kenophytes and two are ephemerophytes which occur sporadically for short periods of time (Fig. 2).

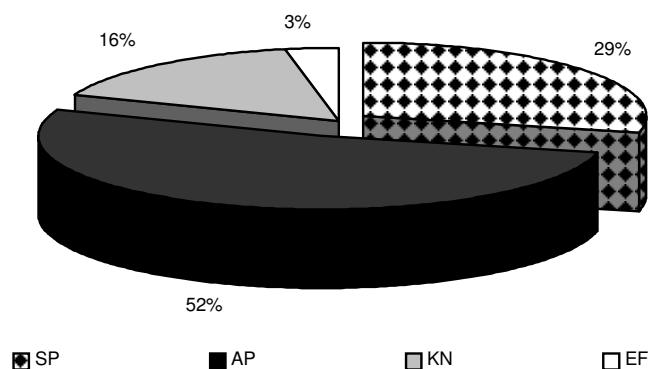


Fig. 2. The percentage participation of species in the geographical-historical groups: Sp – spontaneophytes, Ap – apophytes, Kn – kenophytes, Ef – ephemerophytes

Rys. 2. Procentowy udział gatunków w grupach geograficzno-historycznych: Sp – spontaneofity, Ap – apofity, Kn – kenofity, Ef – efemerofity

More than half of the inventoried specimens represent rare and very rare plants (17 taxons each – 54%), 16 frequent taxons (25%) are frequent, whereas very frequent (10 – 16%) and common (3 – 5%) species constitute the smallest groups.

Taxons that occur in the area of the proposed reserve were classified into seven sociological-ecological groups [Jackowiak 1993, Fig. 3]. Half of them (32 taxons) can be found in fertile broad-leaved forests and bush communities. Species of acid oak forest, mixed and mixed coniferous forests as well as post clear-cutting communities and turfs substitutional for them are fairly frequent (10). The remaining five sociological-ecological groups are represented by 1 to 6 species.

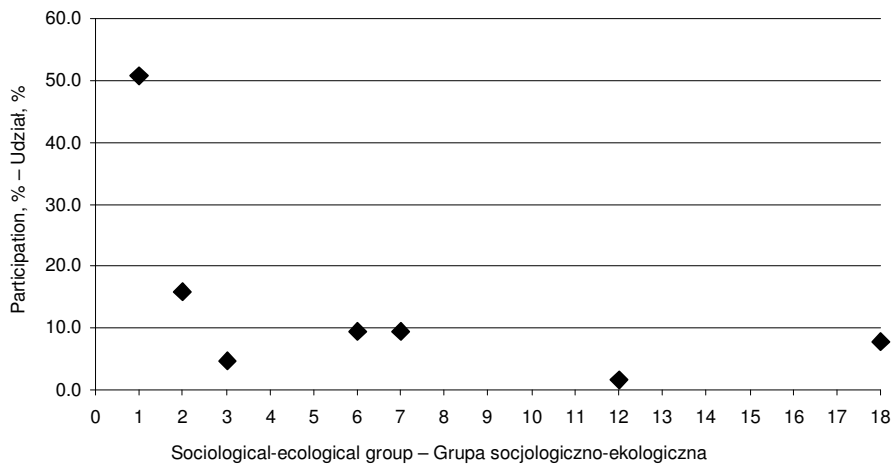


Fig. 3. The percentage participation of species in the sociological-ecological groups [Jackowiak 1993]

Ryc. 3. Procentowy udział gatunków w grupach socjologiczno-ekologicznych [Jackowiak 1993]

Results of measurements on test surfaces

Sixteen taxons were inventoried on 14 test plots and the majority of them are deciduous trees with the exception of *Pinus sylvestris*. *Quercus robur* (39.3%) and *Alnus glutinosa* (21.4%) make up the greatest proportion, while *Betula pendula* (11.1%), *Pinus sylvestris* (9.2%), *Tilia cordata* (7.8%) occur fairly frequently. On the other hand, *Ulmus laevis* (3.6%), *Populus tremula* (2.3%) and *T. platyphyllos* (2.2%) make up a relatively small proportion, while *Crataegus × macrocarpa*, *Carpinus betulus*, *Populus × canescens*, *P. alba*, *Alnus incana*, *Ulmus minor*, *Pyrus pyraster* and *Acer platanoides* occur very rarely (0.1-0.7%). Breast height diameters of 1173 trees were measured on test plots. More than half of them were characterized by diameters ranging from 23 to 41 cm (673 – 57.4%). Relatively many trees were found to have diameters of up to 22 cm (381 – 32.5%), with only 50 trees (4.3%) characterized with the greatest diameters of over 49 cm (Fig. 4).

Heights of 58 trees were determined and it was found that they ranged from 10 to 26 m. The highest number of trees measured from 18 to 21 m (48.3%), but there were also

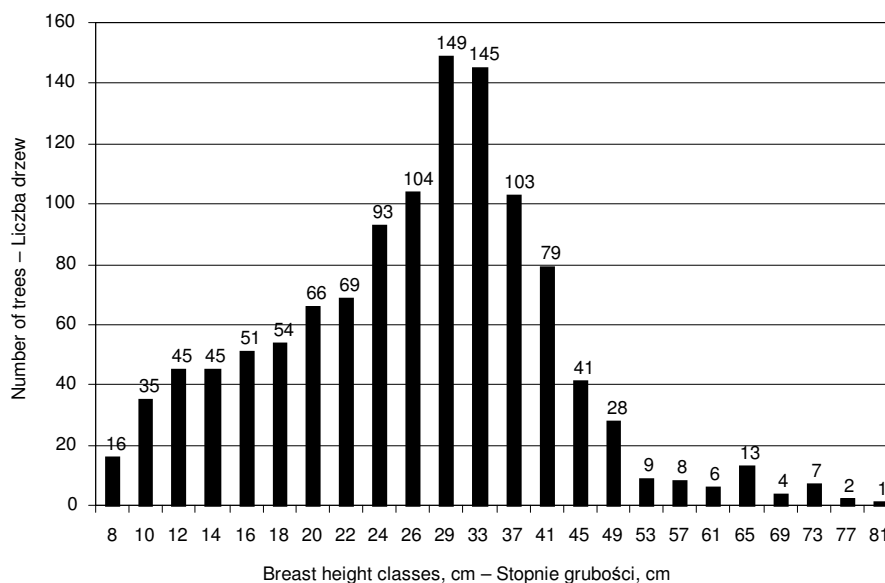


Fig. 4. The DBH structure of trees, defined on the basis of 14 test plots

Ryc. 4. Struktura pierśnic drzew przedstawiona na podstawie 14 powierzchni próbnych

numerous trees with the height of 14 to 17 m (20.7%) and of 22 to 25 m (17.2%). The height of 10 to 13 m was attained by 12.1% of specimens. Only 1.7% of the examined trees were taller than 25 m.

Protected as well as rare and threatened species

The performed inventory failed to identify arborescent plants which are rare and threatened in the entire country [Lista... 1992] or in the area of Lower Silesia [Kącki and Szczeńiak 2003]. The following legally protected species were found to occur in the examined area: *Hedera helix*, *Viburnum opulus* and *Frangula alnus* [Rozporządzenie... 2004]. Their distribution is shown in Figure 1.

The most valuable trees

No trees which would come under monumental protection [Program... 2001] were identified in the area of the planned "Bieliszowskie Łęgi" reserve. The following valuable trees were inventoried: 25 trees with monumental circumference, 27 trees with the circumference close to monumental, 62 magnificent trees and 7 trees distinguished for their interesting shape (Table 2, Fig. 1).

Trees with monumental circumferences include primarily *Ulmus laevis* but *Populus nigra*, *Salix alba* and *Malus sylvestris* were also classified into this group. Their health condition varies but mostly it is either good or very good – classes 4 and 5 (Table 2).

Trees with circumferences close to monumental include most often *Ulmus laevis* and *Quercus robur*, with *Populus nigra*, *Alnus glutinosa*, *Populus tremula* represented less numerously. Most trees are either in good or very good condition (Table 2).

Table 2. The monumental measure trees and trees with measures close to monumental
Tabela 2. Drzewa o obwodach pomnikowych i zbliżonych do pomnikowych

Compartment Oddział	Species name Nazwa gatunkowa	Circumference, cm Obwód, cm	Health condition Stan zdrowotny
1	2	3	4
488	<i>Populus nigra</i>	404	2
488	<i>Populus nigra</i>	394	1
488	<i>Populus nigra</i>	392	1
484	<i>Salix alba</i>	381	0
484	<i>Ulmus laevis</i>	367	4
488	<i>Ulmus laevis</i>	365	4
484	<i>Ulmus laevis</i>	362	4
488	<i>Ulmus laevis</i>	355	4
487	<i>Ulmus laevis</i>	346	4
488	<i>Ulmus laevis</i>	340	3
488	<i>Salix alba</i>	337	3
488	<i>Ulmus laevis</i>	300	4
484	<i>Ulmus laevis</i>	295	5
488	<i>Ulmus laevis</i>	288	4
484	<i>Ulmus laevis</i>	283	4
484	<i>Ulmus laevis</i>	281	3
488	<i>Ulmus laevis</i>	262	5
487	<i>Ulmus laevis</i>	257	4
484	<i>Ulmus laevis</i>	240	5
484	<i>Ulmus laevis</i>	227	4
484	<i>Ulmus laevis</i>	225	4
488	<i>Ulmus laevis</i>	223	4
488	<i>Ulmus laevis</i>	221	5
535	<i>Ulmus laevis</i>	220	4
485	<i>Malus sylvestris</i>	125	4
488	<i>Populus nigra</i>	375	1
488	<i>Populus nigra</i>	365	2
484	<i>Quercus robur</i>	360	4
488	<i>Quercus robur</i>	355	4
488	<i>Populus nigra</i>	355	1
488	<i>Populus nigra</i>	355	1
488	<i>Quercus robur</i>	350	3
488	<i>Populus nigra</i>	350	2
484	<i>Quercus robur</i>	345	4
484	<i>Quercus robur</i>	342	4
484	<i>Quercus robur</i>	341	3

Table 2 – cont.

1	2	3	4
488	<i>Quercus robur</i>	340	4
488	<i>Quercus robur</i>	340	4
482	<i>Alnus glutinosa</i>	220	4
484	<i>Ulmus laevis</i>	216	5
482	<i>Alnus glutinosa</i>	214	4
487	<i>Populus tremula</i>	210	5
484	<i>Ulmus laevis</i>	214	4
484	<i>Ulmus laevis</i>	207	5
484	<i>Ulmus laevis</i>	205	4
484	<i>Ulmus laevis</i>	204	5
488	<i>Ulmus laevis</i>	203	5
482	<i>Alnus glutinosa</i>	203	3
483	<i>Alnus glutinosa</i>	203	4
484	<i>Ulmus laevis</i>	201	4
484	<i>Ulmus laevis</i>	200	4
488	<i>Ulmus laevis</i>	200	4

Highlighted – the trees proposed as nature monuments.

Cieniowanie – drzewa proponowane do objęcia ochroną w formie pomników przyrody.

The most numerous group of trees is that of magnificent trees (62 specimens) which include: 51 *Quercus robur* trees, 9 specimens of *Alnus glutinosa* and 2 *Ulmus laevis*. The health condition of 35 trees is good (class 4), of 14 trees – moderate (class 3), 9 – very good (class 5) and 4 trees are in poor condition (class 2).

It is also worth drawing attention to trees characterized by interesting forms as they can constitute an additional advantage of the object. These trees include four specimens of *Quercus robur* as well as one specimen each of *Alnus glutinosa*, *Crataegus laevigata* and *Populus nigra*. Eighteen most valuable trees with monumental circumferences in good or very good health condition should be placed under protection as nature monuments (Table 2).

RECAPITULATION AND CONSERVATION RECOMMENDATIONS

Dendroflora of the proposed "Bieliszowskie Łęgi" reserve varies with regard to species. Native taxons associated with fertile broad-leaved forests are dominant which match site condition prevailing in the examined area. No species which are rare or threatened in the entire country or region were identified.

Forests in the area of the examined object fulfil both water-protecting and production functions. The performed river regulation (groins, flood embankments) resulted in changes in water relations and, consequently, led to the intensification of the process of soil impoverishment and partial incompatibility of the real and potential vegetation. Forest economy caused that the existing dendroflora exhibits considerable anthropo-

genic influences as indicated by, among others, impoverished species composition of the tree and bush layer, occurrence of monocultures, dominance of apophytes over spontaneophytes, interference into the natural species composition by the introduction of geographically or ecologically foreign species or disturbance of stand age structure.

The described conditions indicate that there is a need to place the examined object under protection which would result in gradual restoration of its natural character of valuable native riparian forests. In order to obtain a full picture of the value of the proposed reserve, the obtained results should be supplemented with data derived from a comprehensive natural inventory comprising characterization of the soil, the remaining flora as well as fauna.

On the basis of the above described observations, as well as general Aktualna... [1993], Olaczek [2000], Danielewicz et al. [2004] and Łonkiewicz and Świerkosz [1995] recommendations elaborated for forests situated along the Odra River, the following measures could be recommended:

- appropriate formation of the target structure and species composition of stands and plantations by taking into consideration in detailed plans of the direction, time scale and technique of the tending treatments carried out in them, preference of natural regenerations including additional plantings of species appropriate for a given site, refraining from the introduction of species of foreign origin and elaboration of lists of trees and bushes which would identify the following species: protected – appropriate for the adopted forest type, tolerated – ecologically and geographically alien (to be eliminated, especially from the group of invasive neophytes),

- maintenance of the existing alders, riparian and oak-hornbeam forests by ensuring their periodical flooding, maintenance of proper ground water levels and dynamics of their level variations and by carrying out proper forest management focused on the development of the mature succession stages of these forests with special emphasis on riparian forests,

- protection of the existing stands as the life habitat of many plants and animals. With this target in mind, it would be necessary to determine the most valuable stands (old-growth forest) and their total or partial exclusion from anthropogenic pressure,

- maintenance of forests in areas between embankments in the category of water protection forests,

- resignation of clear cuttings and elevation of the felling age by 20 years,

- restriction of the use of heavy equipment during timber harvesting and carrying out all operations during the autumn-winter season,

- leaving at least part of dying and dead trees, both those lying and standing,

- monument-type protection of selected, most valuable trees and taking care of the remaining valuable specimens by regular tending and sanitary treatments. When selecting monumental trees, foreign, expansionist species of arborescent plants should be omitted,

- reduction of thinning operations and limiting the removal of the undergrowth, protection of tree and bush species which form the natural range of the forest.

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DENDROFLORA PLANOWANEGO REZERWATU „BIELISZOWSKIE ŁĘGI” NAD ODRĄ W WOJEWÓDZTWIE DOLNOŚLĄSKIM

Streszczenie. Rezerwat „Bieliszowskie Łęgi” nad Odrą jest planowany na powierzchni około 240 ha. Celem ochrony mają być siedliska lasów nadrzecznych oraz doliny rzecznej. Zinventaryzowano 63 gatunki roślin drzewiastych z 19 rodzin. Dominują taksony rodzime (51). Najliczniej reprezentowane są gatunki żyznych lasów liściastych. Na badanym terenie prowadzona jest gospodarka leśna, dlatego przeważają drzewa o średnich pierśnicach, a okazy o znacznych obwodach mają stosunkowo niewielki udział. Do najcenniejszych należą: 3 gatunki prawnie chronione, a także 25 drzew o obwodach pomnikowych, 27 drzew o obwodach zbliżonych do pomnikowych oraz 62 drzewa o obwodach okazałych. Do objęcia ochroną w formie pomników przyrody wytypowano 18 drzew. Planowany rezerwat jest obszarem zmienionym przez działalność człowieka (regulacja rzeki, gospodarka leśna i łąkowa). Objęcie terenu „Bieliszowskich Łęgów” ochroną pozwoliłoby na stopniowe przywrócenie naturalnego charakteru tamtejszych lasów nadrzecznych.

Słowa kluczowe: dendroflora, ochrona przyrody, „Bieliszowskie Łęgi”

Accepted for print – Zaakceptowano do druku: 22.01.2007

For citation – Do cytowania: Polowczyk A., Polowczyk J., Wrońska-Pilarek D., 2007. Dendroflora of the planned “Bieliszowskie Łęgi” reserve situated along the Odra River in the region of Lower Silesia. Acta Sci. Pol., Silv. Colendar. Rat. Ind. Lignar. 6(1), 51-64.