

DENDROFLORA OF THE “OLSZAK I, II” ECOLOGICAL SITE IN POZNAŃ

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Abstract. The dendroflora of the “Olszak I, II” ecological site includes 108 taxons from 25 families. Tree stands are dominated by stands with *Pinus sylvestris* and *Betula pendula* but there are also significant numbers of deciduous bushes and trees associated with oak-hornbeam forests, flood plain forests and alder forests. Stand fragments with species composition closest to the natural one can be found in flood plain forests, alder forests and oak-hornbeam forests, primarily in the valley of the Cybina River and the adjacent areas. Although the dendroflora of this land is under a strong anthropogenic pressure, it should be considered as one of the most valuable dendrofloric objects in Poznań. We can find here 4 species under legal protection, 7 species from the regional red list, 20 plants from the list of threatened species in Poznań and 76 trees selected for protection as monuments of nature.

Key words: dendroflora, magnificent trees, ecological site, Poznań

INTRODUCTION

The valley of the Cybina River is one of the most valuable natural areas of Poznań. One of the objects ensuring the protection of forest flora, in particular, the flood plain and oak-hornbeam forests, as well as waters of the Cybina River and the Malta Lake is the “Olszak I, II” ecological site. In the system of the Poznań green areas, it belongs to the eastern Cybina wedge of greens [Hoffmann et al. 1996, Kurek 1997].

The history of this part of Poznań is connected with the Mycielski family who built their family residence here, which no longer exists, together with an extensive park. Another small park is situated in Antoninek and it belonged to the Stablewski family [Szafran 1959, Maluśkiewicz 2000].

The area of the present ecological site “Olszak” was the object of interest, already from the mid-19th century, of numerous naturalists whose published and unpublished articles and herbariums provide a rich source of information about the flora of the Cybina River valley and its surroundings, i.e. Malta, Olszak, Młyn, Nowy Młyn and Kobylepole.

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However, only few of them were concerned with arborescent plants and, generally speaking, trees and bushes were mentioned only within the framework of more comprehensive floristic or phytosociological studies. Information about them can be found in studies by: Schönke senior [1855], Szafarkiewicz [1846-1864], Ritschl [1850], Pfuhl [1895, 1900, 1904], Mielke [1888], Miller [1885, 1888], Vorwerk [1883, 1889], Paczowski [1928], Krawiec [1930, 1935, 1951], Łukowska [1936, 1937], Wodziczko et al. [1938], Szulczewski [1951] and Szafran [1959] [according to Jackowiak 1993]. New and most recent data can be checked in papers by: Jackowiak [1993], Śliwa and Jackowiak [2002], Wrońska-Pilarek et al. [2002], Gruszczyńska [2004], Wrońska-Pilarek [2004].

The objective of the authors was to make an inventory of woody plants found in the “Olszak I, II” ecological site with a special emphasis on trees of monumental nature and later, on the basis of the obtained data, to assess the condition of the dendroflora of this object and to elaborate the most essential conservation recommendation.

STUDY AREA

The “Olszak I, II” ecological spot is situated in the valley of the Cybina River in the eastern part of Poznań. The majority of the object lies in the commune and district of Poznań called Nowe Miasto and only 16 ha of the “Olszak II” site is situated in the Swarzędz commune. The site is divided into two parts: Olszak I and Olszak II by Browarna Street. The entire object occupies the area of 229.5 ha (of which “Olszak I” takes up 93.75 ha and “Olszak II” – 136 ha). The main water course of the region is the Cybina River with two small tributaries: the Bielinka with its own tributary – Kaczeniec and the Struga with its former tributary the Darzybka. The existing water reservoirs include four ponds situated along the course of the Cybina (Antoninek, Młyński, Browarny and Olszak), two clay-pits and four fishponds situated in the New Zoological Garden. The only natural reservoirs are periodical floodings, which develop in the upper course of the Struga. A comprehensive characteristic of waters of the object was prepared by Gołdyn [Wrońska-Pilarek et al. 2002]. Boundaries and waters of the two parts of the site are presented in Figure 1 A and 1 B. The majority of the site is administered by the Board of Urban Green Areas in Poznań and only in the central part of the “Olszak II” site, there is a small part which is the property of the State Forests and belongs to the Babki Forest Division and Working Circle.

METHODS

The inventory of dendroflora was conducted from July to October 2002. A group of most valuable species was identified which comprised species under legal protection [Rozporządzenie 2004], rare and threatened species in the region of Wielkopolska [Żukowski and Jackowiak 1995] and the City of Poznań [Jackowiak 1993]. The geographic-historic and sociological-ecologic statuses were determined in accordance with Jackowiak [1993], while that of the frequency class – according to Żukowski et al. [1995].

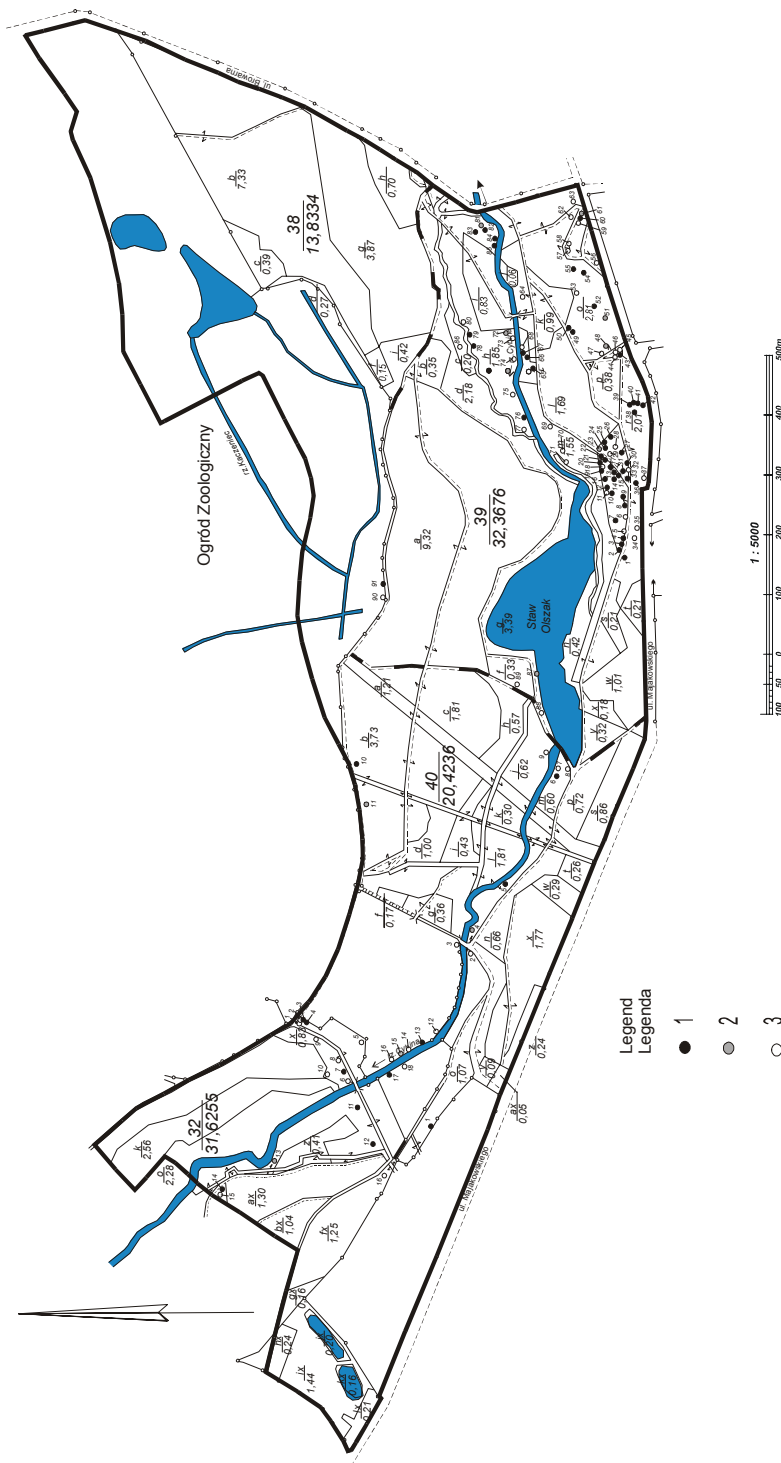


Fig. 1 A. Borders and waters "Olszak I" ecological site also distribution of the widest trees. 1 – trees proposed as nature monuments, 2 – monumental measure trees, 3 – trees with measures close to monumental

Rys. 1 A. Granice i wody użytku ekologicznego „Olszak I” oraz rozmieszczenie najgrubszych drzew. 1 – drzewa proponowane na pomniki przyrody, 2 – drzewa o wymiarach pomnikowych, 3 – drzewa o wymiarach zbliżonych do pomnikowych

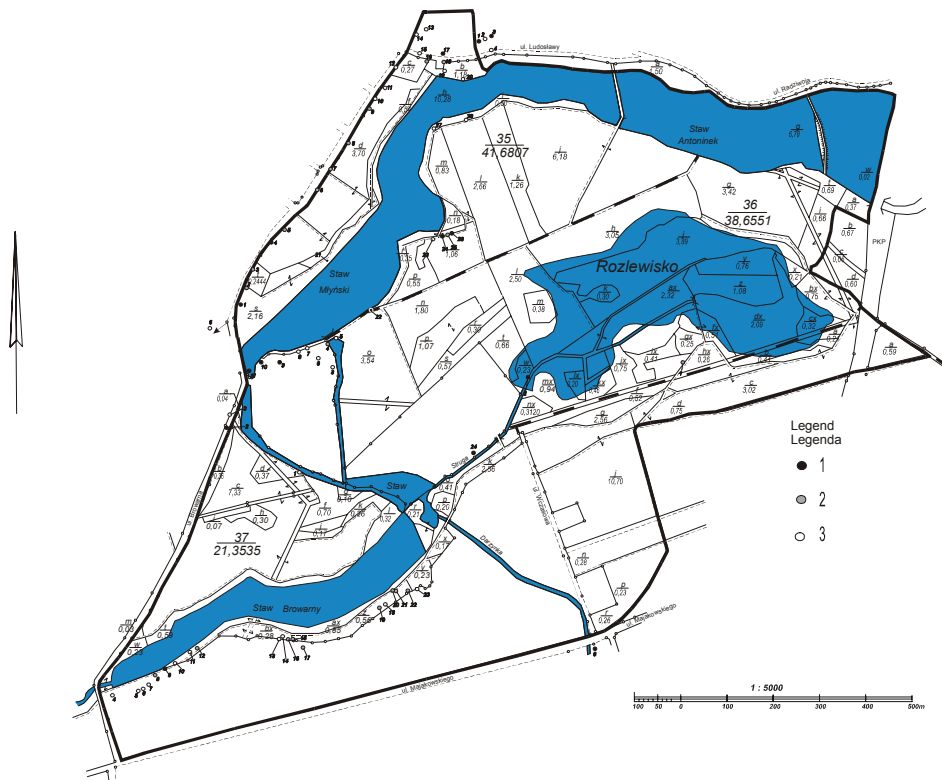


Fig. 1 B. Borders and waters "Olszak II" ecological site also distribution of the widest trees. 1 – trees proposed as nature monuments, 2 – monumental measure trees, 3 – trees with measures close to monumental

Rys. 1 B. Granice i wody użytku ekologicznego „Olszak II” oraz rozmieszczenie najgrubszych drzew. 1 – drzewa proponowane na pomniki przyrody, 2 – drzewa o wymiarach pomnikowych, 3 – drzewa o wymiarach zbliżonych do pomnikowych

Sixteen experimental plots of 0.25 ha each were established for studies on the structure of tree breast height diameters. The experimental surfaces were situated in ash-alder flood plain forests as well as in communities: dominated by *Betula pendula* or *Quercus robur* in the oak-hornbeam site, in a multi-species deciduous stand in the oak-hornbeam site or with an anthropogenic pine stand. Trees with the breast height diameter of 15 cm were selected for analyses.

The inventory of the thickest trees consisted in a strap review of stands of the ecological spot along a transect 50 m wide determined along the north-south direction in sub-compartments of the entire object. These trees were allocated to two groups: trees of monument dimensions [Instrukcja... 1996, species not included in the Instrukcja – after Ruciński 1998] and trees with dimensions close to those of monument dimensions with circumferences between 90 and 99 cm – *Prunus avium*, *Padus racemosa*, 140 and 159 cm – *Pyrus communis*, 160 and 179 cm – *Acer campestre*, 180 and 199 cm – *Carpinus betulus*, 200 and 219 cm – *Ulmus laevis*, *Acer platanoides*, 200 and 224 cm – *Alnus*

glutinosa, 220 and 249 cm – *Fraxinus excelsior*, *Acer pseudoplatanus*, *Platanus ×acerifolia*, 270 and 299 cm – *Robinia pseudoacacia*, *Aesculus hippocastanum*, 280 and 309 cm – *Pinus sylvestris*, *Salix alba*, *S. fragilis*, *Tilia cordata*, 340 and 379 cm – *Quercus robur*, *Populus ×canadensis*, *P. alba*, *P. nigra*. In addition six grand trees growing close to the boundary of the ecological site were also included in the prepared inventory. The health condition of trees was determined employing the classification of Kamiński and Czerniak [2000]. The approximate age of trees was established on the basis of the taxation carried out in 1993. Species names of plants were given after Mirek et al. [2002] and Seneta and Dolatowski [2004].

RESULTS

General characteristics of dendroflora

Dendroflora of the ecological site "Olszak I, II" comprises 108 taxons, which are listed in Table 1. This number includes 51 trees, 47 bushes, 8 plants which have both forms and one creeper and one dwarf shrub. The catalogued plants derive from 25 families, most often from *Rosaceae* and *Salicaceae*, less frequently from *Caprifoliaceae*, *Oleaceae*, *Aceraceae*, *Betulaceae*, *Grossulariaceae* or *Pinaceae*.

Table 1. The list of taxons of arborescent plants in "Olszak I, II" ecological site
Tabela 1. Wykaz taksonów roślin drzewiastych użytku ekologicznego „Olszak I, II”

No Lp.	Taxons name Nazwa taksonu	No Lp.	Taxons name Nazwa taksonu
1	2	1	2
1	<i>Acer campestre</i> L.	22	<i>Crataegus rhipidophylla</i> GAND.
2	<i>Acer negundo</i> L.	23	<i>Daphne mezereum</i> L.
3	<i>Acer platanoides</i> L.	24	<i>Euonymus europaeus</i> L.
4	<i>Acer pseudoplatanus</i> L.	25	<i>Fagus sylvatica</i> L.
5	<i>Acer pseudoplatanus</i> 'Atropurpureum'	26	<i>Fosythia suspensa</i> (THUNB.) VAHL
6	<i>Aesculus hippocastanum</i> L.	27	<i>Frangula alnus</i> MILL.
7	<i>Alnus glutinosa</i> (L.) GAERTN.	28	<i>Fraxinus excelsior</i> L.
8	<i>Alnus incana</i> (L.) MOENCH	29	<i>Fraxinus pennsylvanica</i> MARSH.
9	<i>Berberis vulgaris</i> L.	30	<i>Hedera helix</i> L.
10	<i>Betula ×aurata</i> BORKH.	31	<i>Juglans regia</i> L.
11	<i>Betula pendula</i> ROTH	32	<i>Larix decidua</i> MILL.
12	<i>Betula pubescens</i> EHRH.	33	<i>Larix ×eurolepis</i> HENRY
13	<i>Caragana arborescens</i> LAM.	34	<i>Ligustrum vulgare</i> L.
14	<i>Carpinus betulus</i> L.	35	<i>Lonicera tatarica</i> L.
15	<i>Cornus alba</i> L.	36	<i>Lonicera xylosteum</i> L.
16	<i>Cornus mas</i> L.	37	<i>Malus domestica</i> BORKH.
17	<i>Cornus sanguinea</i> L.	38	<i>Malus sylvestris</i> (L.) MILL.
18	<i>Cornus sericea</i> L.	39	<i>Morus alba</i> L.
19	<i>Corylus avellana</i> L.	40	<i>Parthenocissus inserata</i> (A. KERN.) FRITSCH
20	<i>Crataegus ×kyrtosyla</i> FINGERH.	41	<i>Philadelphus</i> sp.
21	<i>Crataegus monogyna</i> JACQ.		

1	2	1	2
42	<i>Picea abies</i> (L.) KARSTEN	75	<i>Rubus caesius</i> L.
43	<i>Pinus nigra</i> L.	76	<i>Rubus idaeus</i> L.
44	<i>Pinus sylvestris</i> L.	77	<i>Rubus nessensis</i> HALL
45	<i>Platanus</i> × <i>hispanica</i> MILL. EX MÜNHCH. 'Acerifolia'	78	<i>Rubus plicatus</i> WEIHE & NEES
46	<i>Populus alba</i> L.	79	<i>Rubus</i> × <i>pseudidaeus</i> (WEIHE) LEJ.
47	<i>Populus</i> × <i>canadensis</i> MOENCH	80	<i>Salix alba</i> L.
48	<i>Populus</i> × <i>canescens</i> (AITON) SM.	81	<i>Salix aurita</i> L.
49	<i>Populus nigra</i> L.	82	<i>Salix cinerea</i> L.
50	<i>Populus nigra</i> L. 'Italica'	83	<i>Salix dasyclados</i> WIMMER
51	<i>Populus tremula</i> L.	84	<i>Salix fragilis</i> L.
52	<i>Prunus avium</i> (L.) L.	85	<i>Salix pentandra</i> L. × <i>Salix fragilis</i> L.
53	<i>Prunus cerasifera</i> EHRH.	86	<i>Salix pentandra</i> L.
54	<i>Prunus domestica</i> var. <i>syriaca</i> (BORKH.) JANCH.	87	<i>Salix purpurea</i> L.
55	<i>Prunus mahaleb</i> L.	88	<i>Salix</i> × <i>rubens</i> SCHRANK.
56	<i>Prunus padus</i> L.	89	<i>Salix</i> × <i>sepulcralis</i> SIMONK. 'Chrysocoma'
57	<i>Prunus serotina</i> EHRH.	90	<i>Salix triandra</i> L.
58	<i>Prunus spinosa</i> L.	91	<i>Salix viminalis</i> L.
59	<i>Prunus virginiana</i> L.	92	<i>Sambucus nigra</i> L.
60	<i>Pyrus communis</i> L.	93	<i>Sambucus racemosa</i> L.
61	<i>Quercus petraea</i> (MATT.) LIEBL.	94	<i>Sorbus aucuparia</i> L. em. HEDL.
62	<i>Quercus robur</i> L.	95	<i>Sorbus intermedia</i> (EHRH.) PERS
63	<i>Quercus rubra</i> L.	96	<i>Spiraea chamaedryfolia</i> L. em. JACQ.
64	<i>Rhamnus catharticus</i> L.	97	<i>Spiraea salicifolia</i> L.
65	<i>Ribes aureum</i> PURSH	98	<i>Symphoricarpos albus</i> (L.) BLAKE
66	<i>Ribes nigrum</i> L.	99	<i>Syringa vulgaris</i> L.
67	<i>Ribes rubrum</i> L.	100	<i>Tilia cordata</i> MILL.
68	<i>Ribes spicatum</i> ROBSON	101	<i>Tilia platyphyllos</i> SCOP.
69	<i>Ribes uva-crispa</i> L.	102	<i>Ulmus glabra</i> HUDS.
70	<i>Robinia pseudoacacia</i> L.	103	<i>Ulmus</i> × <i>hollandica</i> MILLER
71	<i>Rosa canina</i> L.	104	<i>Ulmus laevis</i> PALL.
72	<i>Rosa dumalis</i> BECHST. em. BOULENGER	105	<i>Ulmus minor</i> MILL.
73	<i>Rosa rubiginosa</i> L.	106	<i>Vaccinium myrthillus</i> L.
74	<i>Rosa rugosa</i> THUNB.	107	<i>Viburnum lantana</i> L.
		108	<i>Viburnum opulus</i> L.

The examined species usually occur in few locations. The prevailing species are those that are very rare (75%). Rare (8%), frequent (7%), and very frequent (8%) species occur with similar regularity, while common species make up 2%.

Fertile deciduous forest site types are dominant in the examined ecological spot. Tree stand fragments with the species composition closest to the natural one can be found in the flood plain, alder swamp and oak-hornbeam forests, mainly in the Cybina River valley and adjacent areas in sub-compartments: 32 ax, 36 ax, dx, nx, 39 c, h, 40 j, l, m, o, 43 g. The arborescent plants which occur in the "Olszak I, II" site were allocated to 9 socio-ecological groups. The most numerous among them are species of fertile deciduous forests and shrub communities. A considerable proportion of native or permanently settled species of indefinable phytosociological affiliation, primarily ephemero-phites, is

somewhat disturbing. Woody plants associated with mixed coniferous forests are quite numerous, while plant species from swampy alder forests or riparian forests and brushes are less frequent. Single taxons are associated with thermophilic border communities, terraphytic communities which occur on wet and humid sites as well as mesophyllic communities of tall perennials (Fig. 2).

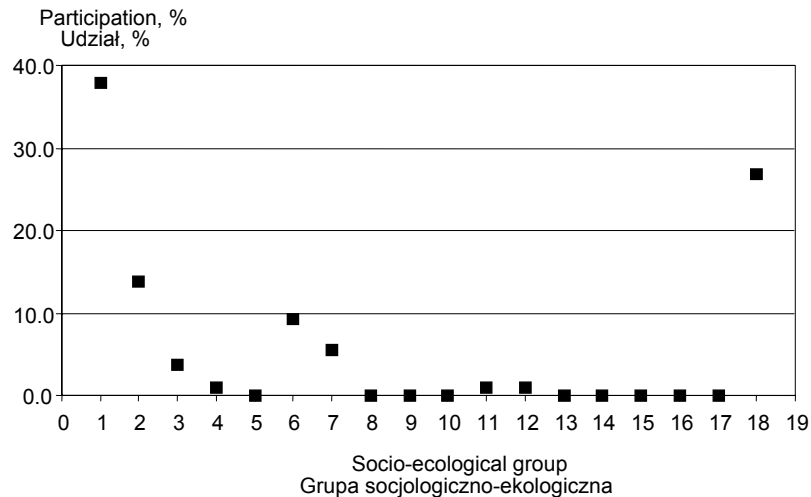


Fig. 2. The percentage participation of species in "Olszak I, II" ecological site in the sociological-ecological groups [according to Jackowiak 1993]

Rys. 2. Procentowy udział gatunków użytku ekologicznego „Olszak I, II” w grupach socjologiczno-ekologicznych [wg Jackowiaka 1993]

Stands with pioneering species (*Pinus sylvestris*, *Betula pendula*) are dominant in the examined ecological site, although there is also a considerable proportion of trees associated with fertile deciduous forests. This group includes, among others: *Quercus robur*, *Carpinus betulus*, *Acer platanoides*, *A. campestre*, *A. pseudoplatanus*, *Tilia cordata*, *Ulmus laevis*, *Alnus glutinosa*, *Fraxinus excelsior* or *Prunus padus*. The most frequent plants in the bush layer are: *Sambucus nigra*, *Cornus sanguinea*, *Crataegus monogyna*, *C. rhipidophylla*, *Corylus avellana*, *Rhamnus catharticus*, *Euonymus europaeus*. Sometimes protected species can also be found, for example, such as: *Frangula alnus*, *Viburnum opulus* and *Ribes nigrum*.

Introduced species make up 42.6% of the entire dendroflora species, whereas the proportion of domestic trees and bushes is not much higher and amounts to 57.4%. Among the latter plants, apophytes (34.3%), which persist steadily on strongly transformed sites, are more frequent than spontaneophytes (23.1%), which are connected with sites, which are not changed very much. From among non-native species, 32.4% are permanently settled kenophytes and 10.2% – ephemeroxytes. From the point of view of the natural structure of stands found in this ecological site, the following tree species occupying significant areas are unwelcome: *Populus ×canadensis*, *Quercus rubra*, *Robinia pseudoacacia* and *Prunus serotina*. Other introduced species growing in the examined site include: *Aesculus hippocastanum*, *Cornus alba* and *C. mas*, *Fraxinus*

pennsylvanica, *Juglans regia*, *Lonicera tatarica*, *Morus alba*, *Pinus nigra*, *Populus nigra* 'Italica', *Prunus cerasifera* and *P. mahaleb*. In addition, domestic species planted in this ecological site but which are outside their natural distribution range include: *Fagus sylvatica*, *Larix decidua*, *Picea abies*, *Sorbus intermedia* and *Tilia platyphyllos*.

Age, breast height diameter structure and height of trees

The mean age of stands is about 63 years. (VIth age class). The most numerous are young and medium-aged stands (II-IVth age class). The youngest stands are only a few years old – Ist age class, whereas the oldest ones are estimated at about 160 years of age – VIIIth age class [Opis... 1993].

The analysis of the breast height diameter structure comprised 1535 trees. The breast height diameter of the majority of trees ranged from 15.0 to 29.0 cm (992) and a significant number of trees (478) were characterised by breast height diameters from 29.1 to 45.0 cm. The lowest frequency of this parameter was recorded among the thickest trees as there were only 36 of them with the breast height diameter ranging from 51.1 to 91.0 cm (Fig. 3).

The height of most trees (59%) ranged from 21-25 m with the lowest trees measuring only 3 m and the highest – 28 m [Opis... 1993].

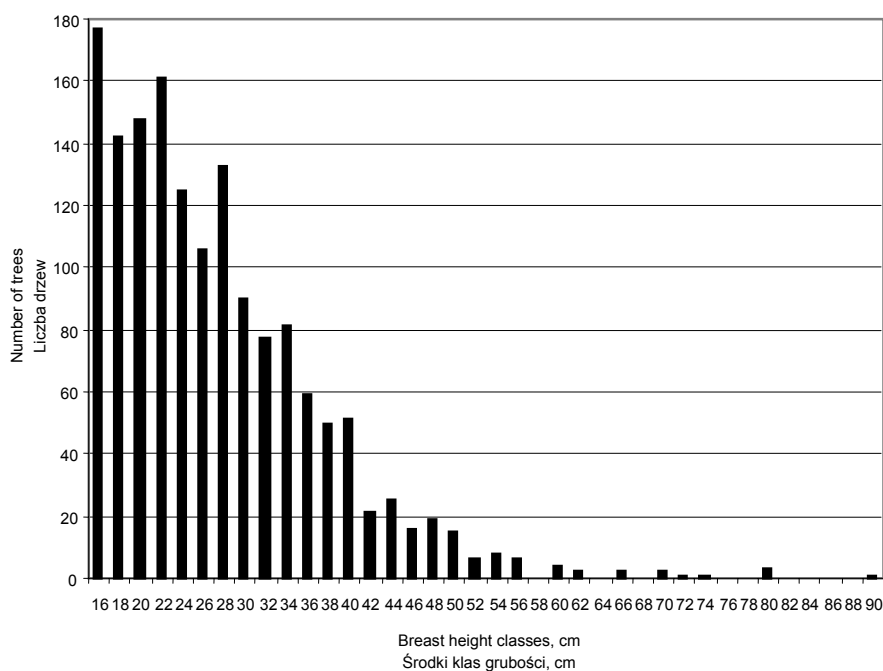


Fig. 3. The breast height structure of the trees in “Olszak I, II” ecological site, defined on the basis of 16 trial areas

Rys. 3. Struktura pierśnic drzew użytku ekologicznego „Olszak I, II” przedstawiona na podstawie 16 powierzchni próbnych

Protected, rare and endangered species

The following arborescent plant species are under legal protection: *Daphne mezereum*, *Frangula alnus*, *Ribes nigrum*, *Viburnum opulus*. All of them are found in the analysed area very rarely. *Hedera helix* was not placed on the list of species under legal protection because it was not found in the Mycielski Park, where it was grown as a cover plant.

From among arborescent plants found on the red list of threatened and endangered species in the region of Wielkopolska [Żukowski and Jackowiak 1995] were classified *Acer campestre*, *Crataegus rhipidophylla*, *Daphne mezereum* and *Populus nigra*, as rare plants (category R) and *Frangula alnus*, *Ribes nigrum* and *Viburnum opulus*, as not threatened. *Acer campestre* is a common species in the examined ecological site, while other species are found sporadically.

The following trees and bushes found on the list of special care species for the city of Poznań [Jackowiak 1993] are found on the examined area: *Alnus incana*, *Berberis vulgaris*, *Carpinus betulus*, *Cornus sanguinea*, *Crataegus rhipidophylla*, *Daphne mezereum*, *Euonymus europaeus*, *Frangula alnus*, *Lonicera xylosteum*, *Pinus sylvestris*, *Populus nigra*, *Prunus padus*, *Quercus petraea*, *Rhamnus catharticus*, *Ribes nigrum*, *R. spicatum*, *Rosa rubiginosa*, *Salix aurita*, *S. pentandra* and *Viburnum opulus*. *Rhamnus catharticus*, *Ribes spicatum*, *Prunus padus* are frequent, *Carpinus betulus*, *Cornus sanguinea*, *Euonymus europaeus* and *Pinus sylvestris* – very frequent. The remaining species occur very rarely.

Trees of monumental character and nature monuments

The author of the only publication about the dendroflora of the examined area is Szafran [1959]. In her work, she gave dimensions and locations of selected grand trees in the Kobylepole Park. Nine of them were growing in the area of the examined ecological site – *Aesculus hippocastanum*, *Gleditschia triacanthos*, *Juniperus virginiana*, *Pinus sylvestris*, *Platanus ×hispanica* 'Acerifolia', *Populus ×canadensis*, *Pyrus communis*, *Robinia pseudoacacia* and *Tilia cordata*. Only three of them were identified: *P. sylvestris* (circumference at 1.3 m – 250 cm, dead at present), *R. pseudoacacia* (418 cm, moderate condition) and *P. ×hispanica* 'Acerifolia' (352/273 cm, good condition). The last one is the only nature monument found in the examined area.

In the former Mycielski Park, grand trees grow most numerous along the Cybina River, in the neighbourhood of Browarny and Młyński ponds and along Browarna St. (Fig. 1A, 1B). The total of 194 grand trees were catalogued on the examined area and in its direct neighbourhood, of which 107 trees have monumental diameters and 87 – close to monumental ones. Ultimately, 76 trees with monumental diameters and very good or good health conditions were selected to be placed under monument tree protection (Table 2).

The comparison of the number of trees attaining monumental diameters in all the inventoried ecological sites situated within the boundaries of the city of Poznań shows that the "Olszak I, II" ecological site occupied the first position, both with regard to the number of grand trees and the number of taxons reaching monumental circumference [Table 3, Wrońska-Pilarek et al. 1999, 2000, 2001, 2002, 2003].

Table 2. The trees proposed as nature monuments of "Olszak I, II" ecological site

Tabela 2. Drzewa proponowane do objęcia ochroną w formie pomników przyrody w użytku ekologicznym „Olszak I, II”

No Lp.	Species name Nazwa gatunkowa	Number of trees Liczba drzew	Participation, % Udział, %
1	<i>Alnus glutinosa</i> (L.) GAERTN.	20	26.3
2	<i>Acer platanoides</i> L.	16	21.1
3	<i>Ulmus glabra</i> HUDS.	9	11.8
4	<i>Ulmus laevis</i> PALL.	8	10.5
5	<i>Fraxinus excelsior</i> L.	6	7.9
6	<i>Pyrus communis</i> L.	4	5.3
7	<i>Acer campestre</i> L.	2	2.6
8	<i>Acer pseudoplatanus</i> L.	2	2.6
9	<i>Aesculus hippocastanum</i> L.	2	2.6
10	<i>Carpinus betulus</i> L.	2	2.6
11	<i>Quercus robur</i> L.	2	2.6
12	<i>Robinia pseudoacacia</i> L.	1	1.3
13	<i>Salix fragilis</i> L.	1	1.3
14	<i>Tilia cordata</i> MILL.	1	1.3
Total – Razem		76	100

Table 3. Number of monumental circumference trees on the area of selected ecological sites in Poznań [according to Wrońska-Pilarek et al. 1999, 2000, 2001, 2002, 2003]

Tabela 3. Drzewa osiągające obwody pomnikowe w wybranych użytkach ekologicznych Poznania [wg Wrońskiej-Pilarek i in. 1999, 2000, 2001, 2002, 2003]

Taxons name Nazwa taksonu	Monumental circumference Obwód pomnikowy cm	„Olszak I, II”	„Dębina”	„Bogdank a”	„Strzeszy n”	„Darzybó r”
1	2	3	4	5	6	7
<i>Acer campestre</i> L.	160	2	–	–	–	
<i>Acer negundo</i> L.	250	2	1	–	–	
<i>Acer platanoides</i> L.	220	21	3	–	–	
<i>Acer pseudoplatanus</i> L.	250	2	–	–	–	
<i>Aesculus hippocastanum</i> L.	300	3	–	–	1	
<i>Alnus glutinosa</i> (L.) GAERTN.	225	23	1	10	5	1
<i>Betula pendula</i> ROTH	220	–	–	1	1	
<i>Carpinus betulus</i> L.	200	2	2	–	–	
<i>Crataegus monogyna</i> JACQ.	100					1

	1	2	3	4	5	6	7
<i>Fraxinus excelsior</i> L.		250	6	1	–	–	3
<i>Hedera helix</i> L.		20	–	1	–	–	
<i>Juglans nigra</i> L.		200	–	1	–	–	
<i>Malus domestica</i> BORKH.		100					1
<i>Pinus sylvestris</i> L.		310	–	1	–	–	
<i>Platanus</i> × <i>hispanica</i> MILL. EX MÜNHCH. 'Acerifolia'		250	1	–	–	–	
<i>Populus alba</i> L.		380	1	5	–	–	
<i>Populus</i> × <i>canadensis</i> MOENCH		380	12	–	–	2	
<i>Populus</i> × <i>canescens</i> (AITON) SM.		380	–	6	–	–	
<i>Populus nigra</i> L.		380	–	–	–	1	
<i>Prunus avium</i> (L.) L.		100	1	–	–	–	2
<i>Prunus padus</i> L.		100	1	–	1	–	
<i>Pyrus communis</i> L.		160	4	–	1	1	1
<i>Quercus robur</i> L.		380	2	20	–	–	1
<i>Robinia pseudoacacia</i> L.		300	2	–	–	–	
<i>Salix fragilis</i> L.		310	3	9	–	–	
<i>Tilia cordata</i> L.		310	1	–	–	1	
<i>Ulmus glabra</i> HUDS.		220	9	–	–	–	
<i>Ulmus laevis</i> PALL.		220	9	36	–	–	1
Total number of trees Liczba drzew ogółem		–	107	87	13	12	11
Total number of taxons Liczba taksonów ogółem		–	20	13	4	7	8

SUMMARY AND PROTECTION RECOMMENDATIONS

Fertile, deciduous forest site types are dominant in the examined ecological site. Fragments of stands with species composition closest to the natural are found mainly in forests growing along the Cybina River valley or adjacent areas, where we can find species associated with dynamic oak-hornbeam, flood-plain or alder swamp forests. The dendroflora of this ecological site exhibits strong anthropogenic influences, which are evident in: impoverished species composition of the tree and bush floor, predominance of apophytes over spontaneophytes, occurrence of numerous monocultures, most frequently with *Pinus sylvestris* and *Betula pendula* (often with non-native species, e.g. *Populus* × *canadensis*) and a significant proportion of trees and bushes of foreign origin. This high frequency of introduced woody plants is the result of, on the one hand, planned and intended activities of foresters who planted them there but, on the other, of accidental seeding of individual species by numerous anglers, strollers and cyclists who penetrate the area.

Nevertheless, the examined ecological site possesses exceptional dendrological value and provides shelter for many valuable arborescent species of plants. We can find here 4

species under legal protection, 7 species from the regional red list and 20 found on the list of endangered species for Poznań. It is also one of the most valuable objects in Poznań with regard to the number of trees with monumental size and 76 of its trees were selected to be placed under protection as nature monuments.

In order to ensure the appropriate protection for the valuable dendroflora found in the area of the "Olszak I, II" ecological site, the following steps are recommended:

- appropriate formation of the target structure and species composition of stands and plantations thanks to: taking into account, in detailed plans, of the direction, time scope and technique of performed tending operations; refraining from the introduction of foreign species, making a list of trees and bushes including: protected species – appropriate for the adopted forest type, tolerated – ecologically and geographically foreign and intended for elimination (especially from the group of invasive neophytes);
 - maintenance of water conditions existing in flood plains and alder swamps;
 - protection of the existing stands as the environment of many animals and plants.
- Identification of the most valuable stands (old stands) and their complete or partial exclusion from anthropo-pressure;
- leaving dead trees in forests;
 - protection of brush trees and bushes which form a natural forest boundary;
 - maintenance of protection of rare populations of protected and endangered species of arborescent plants found in the ecological site by the protection of communities in which they occur and periodical control of the population condition;
 - award monument protection to selected, most valuable trees and tend and protect the remaining valuable specimens by regular tending and sanitary operations. When making the list of monument trees, foreign and aggressive species of woody plants should be omitted;
 - introduction of a total ban of cutting of particularly valuable native species of trees and bushes. In the case of other species – specification of breast height diameters beyond which cutting would be forbidden [according to Pawlaczyk and Jermaczek 2000].

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DENDROFLORA UŻYTKU EKOLOGICZNEGO "OLSZAK I, II" W POZNANIU

Streszczenie. Dendroflora użytku ekologicznego „Olszak I i II” liczy 108 taksonów z 25 rodzin. W drzewostanach dominują drzewostany z *Pinus sylvestris* i *Betula pendula*,

znaczny udział mają drzewa i krzewy liściaste związane z lasami dębowo-grabowymi, łęgami i olsami. Fragmenty drzewostanów o składzie gatunkowym najbardziej zbliżonym do naturalnego zachowały się w lasach łęgowych, olsach i grądach, głównie w dolinie Cybiny i na terenach przyległych. Dendroflora użytku ulega silnym wpływom antropogenicznym. Pomimo to użytek należy uznać za jeden z najcenniejszych, pod względem dendroflory, obiektów w Poznaniu. Występują tu 4 gatunki objęte ochroną prawną, 7 gatunków z regionalnej czerwonej listy, 20 z listy roślin zagrożonych dla miasta Poznania, a także 76 drzew wytypowanych do ochrony w formie pomników przyrody.

Słowa kluczowe: dendroflora, okazałe drzewa, użytek ekologiczny, Poznań

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