NATURAL MONUMENTS AND MONUMENTAL TREES IN THE OBORNIKI AND RYCZYWÓŁ COMMUNES (WIELKOPOLSKA VOIVODESHIP)

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ABSTRACT. In 2010 in the Oborniki and Ryczywół communes a total of 110 trees-natural monuments, seven tree clusters and one avenue were inventoried, while no monuments of inanimate nature were reported in the area of the study. The survey covered jointly 167 trees of 26 species. The largest number of trees protected as natural monuments were sessile oaks *Quercus petraea* (28 trees) and English oaks *Quercus robur* (20). Most trees were of a good health condition. A total of 69 trees had healthy stems and 74 trees had healthy crowns. Among the inventoried trees 11 were dead.

KEY WORDS: natural monuments, Oborniki, Ryczywół, survey

INTRODUCTION

Natural monuments as the most numerous group of nature protection forms constitute an important element in the environmental protection system. They are valuable not only thanks to their monumental dimensions and shapes affecting the entire landscape, but they are also valuable material ensuring the continuity of nature heritage, including preservation of biodiversity (HARABIN 1996). Natural monuments need to be passed on to the future generations. The preservation function served by these monuments makes it possible to maintain genetic diversity, particularly in the case of old trees. The presence of aged, monumental trees together with the accompanying vegetation supplies a large body of information on the productivity of habitats and natural development trends. It is also a remnant of natural vegetation and the old age of trees may also show good adaptability of species to existing habitat conditions (OLACZEK 1978). Monumental trees are also monuments of culture, objects of anthropological, dendrochronological or bioindication studies.

THE STUDY AREA, MATERIAL AND METHODS

A survey of natural monuments was conducted in 2010 in the Oborniki and Ryczywół communes of the Oborniki county (Fig. 1). Natural monuments were inventoried based on information collected from the Regional Environmental Protection Directorate in Poznań and from commune offices.

Trees were inventoried by measuring their trunk circumferences at the height of 1.3 m, accurate to 1 cm. If a tree was located on a slope, its trunk circumference was measured from the side of the slope. Tree height was measured using a hypsometer by Suunto and recorded accurate to 0.5 m.

Health condition of the trunk and crown was assessed in the scale proposed by PACYNIAK & SMÓLSKI (1973):

- grade 1 (very good health condition) – completely healthy trees, with no dry damage or pest presence,
- grade 2 (good) – trees with partly dying twigs in apical parts of the crown, with the presence of plant or animal pests,
- grade 3 (medium) – trees, which have 50% dead crown and bole or stem, trees infested by pests to a considerable degree,

Fig. 1. Locations with natural monuments: 1 – boundaries of communes, 2 – roads, 3 – water bodies

- grade 4 (poor) – trees having 70% dead crown and bole or stem, considerable xylem losses,
- grade 5 (very bad) – trees having over 70% dead crown and bole or stem, with numerous holes, in which less than 25% stem circumference perform conductive functions, as well as dead trees.

The GPS position of natural monuments was determined using the car navigation system; in the case of avenues the position was given for the beginning of the tree planting, while for tree clusters it was the location of one of the trees.

Nomenclature for trees was adopted after “Dendrology” by SENETA & DOLATOWSKI (2008).

Tables 1 and 2 list natural monuments by their locations in communes, and within lists for individual communes they are ordered progressively based on the year they were established as natural monuments.

RESULTS

Within this study a total of 118 natural monuments were inventoried (Tables 1 and 2): 110 trees (101 in the Oborniki commune and 9 in the Ryczywół commune), seven tree clusters (5 in the Oborniki commune and 2 in the Ryczywół commune) and one avenue composed of 33 honey locust (*Gleditsia triacanthos* L.) trees in the Oborniki commune. Several natural monuments were not inventoried (due to the insufficient data on their location). These include: 1) a wych elm no. 255/855 from Kowanówko, established a natural monument on 17.02.1997, 2–4) a Norway maple no. 260/861, a European white elm no. 262/863 and a small-leaved lime no. 263/864 – all from Rożnowo, established natural monuments on 26.08.1969, 5) a Norway maple from Oborniki, growing in compartment 855a, established a natural monument on 28.02.2007.

In the case of the English oak no. 256/857 from Stobnica, established a natural monument on 26.08.1969 and a cluster of two European ashes no. 265/866 from Łukowo, established a natural monument on 26.08.1969 it was determined that those trees had been dead and as a result removed.

Among the 118 inventoried natural monuments there are 167 trees, with 25 of them included in seven groups (5.9% natural monuments).

Among all the inventoried trees 11 are dead. The health status of the trunk or bole was very bad in seven trees, in eight it was bad, in the case of 47 it was medium, in 69 it was good, while 25 trees were characterised by a very good health condition.

A very bad health condition of the crown was recorded in six trees, in 11 it was bad, in 44 – medium, in 74 – good, whereas a very good health condition of the crown was recorded in 21 trees. In the case of avenues the overall health condition of trees was assessed as medium. One of the avenue trees is dead and should be removed for safety reasons.

The inventoried trees-natural monuments belong to 26 species, of which 19 are native. The most numerously represented species are sessile oaks *Quercus petraea* (Mattuschka) Liebl. (28 trees) and English oaks *Quercus robur* L. (20 trees). Clusters are most frequently formed by small-leaved limes *Tilia cordata* Mill. (8 cluster natural monuments with 17 *Tilia* specimens). Honey locust *Gleditsia triacanthos* L., forming a single-species avenue of 33 trees, was the most numerously represented alien species.

Natural monuments are found both on state-owned land and private premises. State-owned land includes land administered by the State Forests with 73 trees (61.9%), land belonging to local government units, with a total of 10 trees (8.5%), land of the Agricultural Schools in Objezierze (14 natural monuments accounting for 11.9% of the total), land of the Agricultural Property Agency in Piła with four trees (3.4%). One tree is growing in the premises of the parish in Rożnowo. The other natural monuments 16 trees (13.6%) are found on private land.

Among all the natural monuments 74 (62.7%) were established by the provincial governor, while 33 (28%) were established by the commune council. No information was available on the legal basis for the regulations on 11 (9.3%) trees growing in the Ryczywół commune.

Almost 70% monuments bear appropriate plaques with information on the status of the object. Among single trees 69 bear a plaque of NATURAL MONUMENT, while among clusters three are properly marked, whereas the avenue is not marked.

Of all the inventoried natural monuments the thickest tree is an English oak no. 648/131 from Rożnowo, with a circumference of 802 cm. Apart from that in the Rożnowo park there are four trees-natural monuments, which also have impressive dimensions. It is a London plane tree with a circumference of 670 cm (no. 258/859), a Norway maple with 348 cm in circumference (no. 259/860), a European white elm – 436 cm (no. 261/862) and an English oak – 519 cm (no. 264/865).

Another impressive English oak (no. 574, the Ryczywół commune) has a circumference of 694 cm, while that growing in the military training grounds in Biedrusko (no. 1108, the Oborniki commune) has a circumference of 680 cm. We need to mention here an impressive horse chestnut tree (no. 2007/12, the Oborniki commune), which circumference is 421 cm.

In Stobnica there are as many as 40 trees established as natural monuments. At the didactic trail along the Kończak river there are monuments nos. 1109–1146, 227 and 228. Compartment 406h (the Podlesie forest district) is special in this respect, as having high landscape value and the largest number of trees-natural monuments.

Table 1. A list of tree – nature monuments in the Oborniki and Ryczywół communes

No.	Protected object/ name	Location; property owner	Dimensions					Health state	
			Year of establishment	girth at the year of establishment /m/	girth at the year of establishment	height (m)	of stem		
1	2	3	4	5	6	7	8	9	10
Oborniki commune									
1	648/131	<i>Quercus robur</i>	Rożnowo, former manor park, N 52°40'12", E 16°53'13"; County Office of Oborniki Wielkopolskie	1959	7.33	8.02	34.0	5	5
2	228	<i>Quercus robur</i>	Stobnica, Kiszukowo forest district, compartment 502d, premises of the Poznań University of Life Sciences, N 52°43'04", E 16°36'59"; Oborniki forest division	1967	5.10	5.20	fallen tree		
3	245/838	<i>Quercus robur</i>	Niemieczkowo, Niemieczkowo forest district, compartment 866b, N 52°40'17", E 16°43'16"; Oborniki forest division	1969	5.00	4.96	29.0	2	2
4	246/839	<i>Robinia pseudoacacia</i>	Ocieszyn, former manor park, N 52°35'58", E 16°48'50"; private plot	1969	2.50	3.68	20.0	3	1
5	257/858	<i>Quercus robur</i>	Maryłówka, Maryłówka forest district, compartment 555k, N 52°42'28", E 16°42'38"; Oborniki forest division	1969	4.30	4.96	25.5	4	3
6	258/859	<i>Platanus ×acerifolia</i>	Rożnowo, former manor park, N 52°40'15", E 16°53'11"; County Office of Oborniki Wielkopolskie	1969	5.80	6.70	35.0	3	2
7	259/860	<i>Acer platanoides</i>	Rożnowo, former manor park, N 52°40'12", E 16°53'06"; County Office of Oborniki Wielkopolskie	1969	3.10	3.48	26.0	3	3
8	261/862	<i>Ulmus laevis</i>	Rożnowo, former manor park, N 52°40'17", E 16°53'13"; County Office of Oborniki Wielkopolskie	1969	4.00	4.36	27.0	2	2
9	264/865	<i>Quercus robur</i>	Rożnowo, former manor park, N 52°40'11", E 16°53'11"; County Office of Oborniki Wielkopolskie	1969	4.70	5.19	33.0	5	5
10	266/866	<i>Fagus sylvatica</i>	Łukowo, former manor park, N 52°38'16", E 16°52'11"; Farming Cooperative in Łukowo	1969		2.20	34.0	4	3
11	369	<i>Quercus robur</i>	Podlesie, near an old school, N 52°44'25", E 16°40'54"; The Town and Commune Office of Oborniki	1981	3.60	4.15	29.0	2	2
12	370	<i>Tilia cordata</i>	Rożnowo, at the church, N 52°40'25", E 16°52'41"; The Roman Catholic Parish in Rożnowo	1981	2.90; 3.20	3.05; 3.25	16.0; 5.0	3	4
13	43/544	<i>Populus alba</i>	Niemieczkowo, former manor park, N 52°38'56", E 16°42'06"; Józefa Kukawska	1986	3.77	4.55	22.0	5	5
14	664 (Fig. 2)	<i>Aesculus hippocastanum</i>	Objezierze, park at the Agricultural Schools, N 52°36'05", E 16°45'54"; The Agricultural Schools in Objezierze	1991	3.50	3.52	21.0	2	4
15	665	<i>Platanus ×acerifolia</i>	Objezierze, park at the Agricultural Schools, N 52°36'04", E 16°45'54"; The Agricultural Schools in Objezierze	1991	3.20	3.20	23.0	2	2
16	666	<i>Populus alba</i>	Objezierze, park at the Agricultural Schools, N 52°36'02", E 16°45'54"; The Agricultural Schools in Objezierze	1991	4.20	4.41	27.0	3	5
17	667	<i>Tilia cordata</i>	Objezierze, park at the Agricultural Schools, N 52°35'58", E 16°45'53"; The Agricultural Schools in Objezierze	1991	3.00	3.05	5.0	-	-
18	669	<i>Tilia cordata</i>	Objezierze, park at the Agricultural Schools, N 52°36'00", E 16°45'55"; The Agricultural Schools in Objezierze	1991	3.80	3.84	27.0	2	4
19	670	<i>Populus alba</i>	Objezierze, park at the Agricultural Schools, N 52°35'58", E 16°45'53"; The Agricultural Schools in Objezierze	1991	5.30	5.45	31.0	3	4
20	671	<i>Fagus sylvatica</i>	Objezierze, park at the Agricultural Schools, N 52°35'60", E 16°45'52"; The Agricultural Schools in Objezierze	1991	3.75	4.15	35.0	3	2

1	2	3	4	5	6	7	8	9	10
21	672	<i>Fraxinus excelsior</i>	Objezierze, park at the Agricultural Schools, N 52°35'08", E 16°45'54"; The Agricultural Schools in Objezierze	1991	2.90	3.31	34.0	3	2
22	673 (Fig. 5)	<i>Quercus robur</i>	Objezierze, park at the Agricultural Schools, N 52°36'10", E 16°45'52"; The Agricultural Schools in Objezierze	1991	3.35	3.74	28.0	2	2
23	674	<i>Tilia cordata</i>	Objezierze, park at the Agricultural Schools, N 52°36'07", E 16°45'51"; The Agricultural Schools in Objezierze	1991	3.70	4.10	34.0	1	1
24	676	<i>Platanus × acerifolia</i>	Objezierze, park at the Agricultural Schools, N 52°35'59", E 16°45'50"; The Agricultural Schools in Objezierze	1991	3.90	4.10	30.0	2	3
25	677	<i>Populus alba</i>	Objezierze, park at the Agricultural Schools, N 52°36'01", E 16°45'50"; The Agricultural Schools in Objezierze	1991	5.60	5.90	25.0	5	5
26	689	<i>Pinus sylvestris</i> "Sosna klasztorna"	Bąblin, between the Warta and a road leading to a monastery, N 52°40'28", E 16°42'52"; private plot	1991	3.50	3.70	20.0	3	2
27	997/97	<i>Quercus robur</i>	Żerniki, Uchorowo forest district, compartment 193a, at the road from Żerniki to Roznowo, N 52°39'26", E 16°53'58"; Łopuchówko forest division	1997	3.84	4.06	26.0	4	2
28	998/97	<i>Quercus robur</i>	Łukowo, Uchorowo forest district, compartment 179h, N 52°37'41", E 16°53'01"; Łopuchówko forest division	1997	4.13	4.45	32.0	1	2
29	1	<i>Quercus petraea</i>	Dąbrówka Leśna, Święty Hubert Street, land lot no. 113/2, N 52°40'58", E 16°48'36"; The Town and Commune Office of Oborniki	1999	3.30	3.30	23.0	1	2
30	4	<i>Quercus robur</i> "Pszczółki Roberta"	Słonawy, forest parking at the Warta river, at the road from Słonawy to Bąblin, N 52°40'12", E 16°44'44"; Oborniki forest division	1999	4.25	4.50	27.0	2	3
31	1106/00	<i>Quercus robur</i>	Maniewo, Uchorowo forest district, compartment 91k, military training grounds, N 52°35'04", E 16°56'26"; Łopuchówko forest division	2000	4.30	4.60	26.0	3	1
32	1107/00	<i>Quercus robur</i>	Maniewo, Uchorowo forest district, compartment 59a, military training grounds, N 52°36'13", E 16°56'48"; Łopuchówko forest division	2000	5.80	6.06	27.0	4	3
33	1108/00	<i>Quercus robur</i>	Maniewo, Uchorowo forest district, compartment 59a, military training grounds, N 52°36'16", E 16°55'47"; Łopuchówko forest division	2000	6.50	6.80	28.0	2	2
34	1109/00	<i>Quercus petraea</i>	Stobnica, Podlesie forest district, compartment 406d, N 52°44'52", E 16°37'38"; Oborniki forest division	2000	3.60	4.05	29.0	5	4
35	1110/00	<i>Quercus petraea</i>	Stobnica, Podlesie forest district, compartment 406h, N 52°44'46", E 16°37'31"; Oborniki forest division	2000	3.30	3.33	27.0	3	3
36	1111/00	<i>Quercus petraea</i>	Stobnica, Podlesie forest district, compartment 406h, N 52°44'48", E 16°37'33"; Oborniki forest division	2000	3.14	3.22	22.0	2	3
37	1112/00	<i>Quercus petraea</i>	Stobnica, Podlesie forest district, compartment 406h, N 52°44'48", E 16°37'33"; Oborniki forest division	2000	3.90	4.24	31.0	2	2
38	1113/00	<i>Quercus petraea</i>	Stobnica, Podlesie forest district, compartment 406h, N 52°44'49", E 16°37'28"; Oborniki forest division	2000	3.70	3.73	27.0	2	2
39	1114/00	<i>Quercus petraea</i>	Stobnica, Podlesie forest district, compartment 406h, N 52°44'48", E 16°37'33"; Oborniki forest division	2000	3.50	3.55	28.0	2	3
40	1115/00	<i>Quercus petraea</i>	Stobnica, Podlesie forest district, compartment 406h, N 52°44'47", E 16°37'32"; Oborniki forest division	2000	3.40	3.66	30.0	1	2
41	1116/00	<i>Quercus petraea</i>	Stobnica, Podlesie forest district, compartment 406h, N 52°44'43", E 16°37'31"; Oborniki forest division	2000	3.30	fallen tree			
42	1117/00	<i>Quercus petraea</i>	Stobnica, Podlesie forest district, compartment 406h, N 52°44'40", E 16°37'31"; Oborniki forest division	2000	3.90	4.10	27.0	4	4
43	1118/00	<i>Quercus petraea</i>	Stobnica, Podlesie forest district, compartment 423i, N 52°44'16", E 16°37'17"; Oborniki forest division	2000	3.20	3.25	25.0	2	4
44	1119/00	<i>Quercus petraea</i>	Stobnica, Podlesie forest district, compartment 423i, N 52°44'16", E 16°37'17"; Oborniki forest division	2000	3.80	4.05	32.0	2	3
45	1120/00	<i>Quercus petraea</i>	Stobnica, Podlesie forest district, compartment 422f, N 52°44'34", E 16°37'36"; Oborniki forest division	2000	3.30	3.54	31.0	3	3
46	1121/00	<i>Quercus petraea</i>	Stobnica, Podlesie forest district, compartment 422f, N 52°44'34", E 16°37'36"; Oborniki forest division	2000	3.50	3.77	27.0	2	2
47	1122/00	<i>Quercus petraea</i>	Stobnica, Podlesie forest district, compartment 423k, N 52°44'24", E 16°37'29"; Oborniki forest division	2000	3.40	3.69	28.0	4	2
48	1123/00	<i>Quercus petraea</i>	Stobnica, Podlesie forest district, compartment 423k, N 52°44'24", E 16°37'30"; Oborniki forest division	2000	3.40	3.71	32.0	2	3
49	1124	<i>Quercus petraea</i>	Stobnica, Podlesie forest district, compartment 423k, N 52°44'24", E 16°37'30"; Oborniki forest division	2000	3.30	fallen tree			

1	2	3	4	5	6	7	8	9	10
50	1125/00	<i>Quercus petraea</i>	Stobnica, Podlesie forest district, compartment 423k, N 52°44'26", E 16°37'30"; Oborniki forest division	2000	3.40	3.60	31.0	3	3
51	1126/00	<i>Quercus petraea</i>	Stobnica, Podlesie forest district, compartment 423k, N 52°44'19", E 16°37'27"; Oborniki forest division	2000	3.80	4.12	32.0	2	2
52	1127/00	<i>Quercus petraea</i>	Stobnica, Kiszewko forest district, compartment 446k, N 52°43'45", E 16°37'20"; Oborniki forest division	2000	3.30	3.50	26.0	3	3
53	1128/00	<i>Alnus incana</i>	Stobnica, Kiszewko forest district, compartment 503a, N 52°42'59", E 16°36'43"; Oborniki forest division	2000	3.10	3.20	30.0	2	2
54	1129/00	<i>Alnus incana</i>	Stobnica, Kiszewko forest district, compartment 503a, N 52°42'59", E 16°36'43"; Oborniki forest division	2000	2.50	2.55	29.0	2	2
55	1130/00	<i>Alnus incana</i>	Stobnica, Kiszewko forest district, compartment 503a, N 52°42'59", E 16°36'43"; Oborniki forest division	2000	2.35	2.42	30.0	3	2
56	1131/00	<i>Alnus incana</i>	Stobnica, Kiszewko forest district, compartment 503a, N 52°42'59", E 16°36'43"; Oborniki forest division	2000	2.60	2.68	30.0	2	2
57	1132/00	<i>Alnus incana</i>	Stobnica, Kiszewko forest district, compartment 503a, N 52°42'59", E 16°36'42"; Oborniki forest division	2000	2.15	2.30	30.0	1	1
58	1133/00	<i>Alnus incana</i>	Stobnica, Kiszewko forest district, compartment 502d, N 52°43'18", E 16°37'10"; Oborniki forest division	2000	2.70	2.77	29.0	1	1
59	1134/00	<i>Alnus incana</i>	Stobnica, Kiszewko forest district, compartment 502d, N 52°43'04", E 16°36'58"; Oborniki forest division	2000	2.50	2.55	fallen tree		
60	1135/00	<i>Alnus incana</i>	Stobnica, Kiszewko forest district, compartment 471i, N 52°44'04", E 16°37'13"; Oborniki forest division	2000	2.25	2.30	28.0	1	1
61	1136/00	<i>Alnus incana</i>	Stobnica, Kiszewko forest district, compartment 471i, N 52°44'04", E 16°37'12"; Oborniki forest division	2000	2.35	2.42	28.0	1	2
62	1137/00	<i>Alnus incana</i>	Stobnica, Kiszewko forest district, compartment 471j, N 52°44'02", E 16°37'09"; Oborniki forest division	2000	2.15	2.30	27.0	1	1
63	1138/00	<i>Fagus sylvatica</i>	Stobnica, Podlesie forest district, compartment 406h, N 52°44'37", E 16°37'34"; Oborniki forest division	2000	3.00	3.00	fallen tree		
64	1139/00	<i>Quercus petraea</i>	Stobnica, Podlesie forest district, compartment 406h, N 52°44'39", E 16°37'32"; Oborniki forest division	2000	3.00	3.22	24.0	4	3
65	1140/00	<i>Quercus petraea</i>	Stobnica, Podlesie forest district, compartment 406h, N 52°44'43", E 16°37'34"; Oborniki forest division	2000	3.00	3.57	27.0	3	3
66	1141/00	<i>Quercus petraea</i>	Stobnica, Podlesie forest district, compartment 423b, N 52°44'26", E 16°37'23"; Oborniki forest division	2000	3.10	3.24	21.0	5	5
67	1142/00	<i>Pinus sylvestris</i>	Stobnica, Podlesie forest district, compartment 405c, N 52°45'01", E 16°37'38"; Oborniki forest division	2000	2.70	2.92	25.0	1	4
68	1143/00	<i>Quercus robur</i>	Stobnica, Kiszewko forest district, compartment 502k, N 52°42'55", E 16°37'00"; Oborniki forest division	2000	3.70	3.98	30.0	4	3
69	1144/00	<i>Quercus robur</i>	Stobnica, Kiszewko forest district, compartment 502k, N 52°42'55", E 16°37'00"; Oborniki forest division	2000	3.10	3.28	27.0	3	3
70	1145/00	<i>Quercus robur</i>	Stobnica, Kiszewko forest district, compartment 502k, N 52°42'54", E 16°36'58"; Oborniki forest division	2000	3.65	3.90	32.0	1	3
71	1146/00	<i>Quercus robur</i>	Stobnica, Kiszewko forest district, compartment 502k, N 52°42'54", E 16°36'58"; Oborniki forest division	2000	3.40	3.60	30.0	1	3
72	2007/1	<i>Pinus sylvestris</i>	Niemieckzowo, land lot 160, N 52°39'09", E 16°42'01"; private plot – Wojciech Bąk	2007	1.75	1.80	17.0	1	1
73	2007/3	<i>Pinus sylvestris</i>	Niemieckzowo, Niemieckzowo forest district, compartment 875b, N 52°39'37", E 16°44'23"; Oborniki forest division	2007	2.90	2.98	21.0	3	1
74	2007/4 (Fig. 3)	<i>Pinus sylvestris</i>	Niemieckzowo, Niemieckzowo forest district, compartment 879d, N 52°39'28", E 16°42'58"; Oborniki forest division	2007	3.70	3.72	20.0	2	1
75	2007/5	<i>Quercus petraea</i>	Niemieckzowo, Niemieckzowo forest district, compartment 890a, N 52°39'25", E 16°44'22"; Oborniki forest division	2007	4.10	4.43	31.0	3	2
76	2007/6	<i>Acer campestre</i>	Niemieckzowo, Niemieckzowo forest district, compartment 870d, N 52°40'33", E 16°41'56"; Oborniki forest division	2007	2.60	2.65	21.0	3	2
77	2007/7	<i>Cerasus avium</i>	Niemieckzowo, Niemieckzowo forest district, compartment 868a, N 52°40'22", E 16°42'48"; Oborniki forest division	2007	2.14	2.25	26.0	3	3
78	2007/8	<i>Quercus petraea</i>	Niemieckzowo, Niemieckzowo forest district, compartment 868a, N 52°40'23", E 16°42'46"; Oborniki forest division	2007	5.30	5.58	31.0	2	2
79	2007/9	<i>Quercus petraea</i>	Niemieckzowo, Niemieckzowo forest district, compartment 866h, N 52°40'15", E 16°43'16"; Oborniki forest division	2007	4.30	4.58	34.0	1	1
80	2007/10	<i>Quercus petraea</i>	Niemieckzowo, Niemieckzowo forest district, compartment 686b, N 52°40'28", E 16°43'20"; Oborniki forest division	2007	5.40	5.60	33.0	3	2
81	2007/11 (Fig. 4)	<i>Quercus petraea</i>	Niemieckzowo, Niemieckzowo forest district, compartment 866i, N 52°40'23", E 16°42'46"; Oborniki forest division	2007	5.00	5.05	29.0	2	1
82	2007/12	<i>Aesculus hippocastanum</i>	Nowołoskoniec, Nowołoskoniec forest district, compartment 812d, N 52°40'39", E 16°45'40"; Oborniki forest division	2007	4.15	4.21	20.0	3	4

1	2	3	4	5	6	7	8	9	10
83	2007/13	<i>Quercus petraea</i>	Nowołoskoniec forest district, compartment 812d, N 52°40'41", E 16°45'23"; Oborniki forest division	2007	3.90	4.01	26.0	5	4
84	2007/14	<i>Acer saccharinum</i>	Podlesie forest district, compartment 459i, N 52°43'56", E 16°40'49"; Oborniki forest division	2007	3.70	3.75	23.0	3	3
85	2007/15	<i>Ulmus minor</i>	Podlesie forest district, compartment 406h, N 52°44'49", E 16°37'43"; Oborniki forest division	2007	2.70	2.74	25.0	2	2
86	2007/16	<i>Carpinus betulus</i>	Podlesie forest district, compartment 406h, N 52°44'46", E 16°37'30"; Oborniki forest division	2007	2.16	2.38	25.0	2	2
87	2007/17	<i>Ulmus glabra</i>	Oborniki forest district, compartment 855a, N 52°39'23", E 16°48'46"; Oborniki forest division	2007	2.75	2.96	26.0	3	3
88	2007/18	<i>Ulmus glabra</i>	Oborniki forest district, compartment 855a, N 52°39'24", E 16°48'42"; Oborniki forest division	2007	2.40	2.40	27.0	5	5
89	2007/19	<i>Fraxinus excelsior</i>	Oborniki forest district, compartment 855a, N 52°39'23", E 16°48'42"; Oborniki forest division	2007	2.80	2.86	35.0	3	3
90	2007/20	<i>Fraxinus excelsior</i>	Oborniki forest district, compartment 855a, N 52°39'24", E 16°48'45"; Oborniki forest division	2007	2.50	2.50	33.0	2	3
91	2007/21	<i>Betula pendula</i>	Oborniki forest district, compartment 835k, N 52°40'20", E 16°47'38"; Oborniki forest division	2007	2.25	2.30	30.0	1	2
92	2007/22	<i>Pyrus pyraeaster</i>	Objezierze forest district, compartment 261a, N 52°36'07", E 16°48'04"; Oborniki forest division	2007	2.58	2.64	17.0	3	3
93	2007/23	<i>Pinus nigra</i>	Objezierze forest district, compartment 264g, N 52°35'28", E 16°47'37"; Oborniki forest division	2007	3.00	3.06	24.0	2	2
94	2007/24	<i>Juglans nigra</i>	Objezierze forest district, compartment 264j, N 52°35'24", E 16°47'48"; Oborniki forest division	2007	–	1.46	31.0	1	1
95	2008/1	<i>Salix alba</i> "Beta"	Niemieczkowo, former manor park, at a stream in the eastern part of the park, N 52°38'56", E 16°42'06"; private plot – Józefa Kukawska	2008	2.92	3.15	21.0	2	2
96	2008/2	<i>Picea abies</i> "Zygmunt"	Niemieczkowo, former manor park, at a stream in the eastern part of the park, N 52°38'58", E 16°42'07"; private plot – Józefa Kukawska	2008	2.30	2.40	30.0	1	1
97	2008/4	<i>Aesculus hippocastanum</i> "Jarota"	Niemieczkowo, former manor park, N 52°38'57", E 16°42'02"; private plot – Józefa Kukawska	2008	2.90	2.93	22.0	2	4
98	2008/5	<i>Quercus robur</i> "Lubicz"	Niemieczkowo, former manor park, N 52°38'57", E 16°42'01"; Józefa Kukawska	2008	2.40	2.52	27.0	2	3
99	2008/6	<i>Quercus robur</i> "Racek"	Niemieczkowo, land lot no. 22, near an old mill, N 52°39'23", E 16°41'60"; private plot – Robert Garczyński	2008	4.44	4.95	23.0	2	2
100	2008/7	<i>Quercus robur</i>	Niemieczkowo, land lot no. 22, near an old mill, N 52°39'22", E 16°41'60"; private plot – Robert Garczyński	2008	2.95	3.10	20.0	2	2
101	2008/8	<i>Quercus robur</i> "Młynarz"	Niemieczkowo, land lot no. 22, near an old mill, N 52°39'27", E 16°42'01"; private plot – Robert Garczyński	2008	3.26	3.32	25.0	2	2
Ryczywół commune									
102	137	<i>Pyrus communis</i>	Skrzetusz, land lot no. 376, N 52°49'39", E 16°47'26"; private plot	1959	3.02	3.20	20.0	2	2
103	138 (Fig. 9)	<i>Quercus robur</i>	Skrzetusz, at an old school, land lot no. 245/1, N 52°49'59", E 16°47'30"; Commune Office of Ryczywół	1967	3.70	4.78	24.0	1	2
104	139 (Fig. 7)	<i>Acer saccharinum</i>	Orłowo, park, land lot no. 29/10, N 52°46'16", E 16°47'17"; Agricultural Property Agency, branch in Piła	1967	4.83	5.20	32.0	2	1
105	135	<i>Tilia cordata</i>	Ludomy, park, near an old school, N 52°45'20", E 16°49'26"; Commune Office of Ryczywół	1969	3.58	4.07	35.0	2	2
106	141	<i>Pinus sylvestris</i>	Lipa, Piłka forest district, compartment 68c, N 52°42'57", E 16°49'46"; Oborniki forest division	1969	1.85	2.46	25.0	5	5
107	341	<i>Quercus robur</i>	Chlebowo, premises of Zakład Eksploatacji Torfu, land lot no. 96, N 52°45'02", E 16°45'59"; Zakład Eksploatacji Torfu	1969	3.87	4.00	27.0	1	2
108	573 (Fig. 6)	<i>Platanus × acerifolia</i>	Gorzewo, former manor park, N 52°47'22", E 16°49'47"; Agricultural Property Agency, branch in Piła	1992	5.12	5.70	30.0	2	2
109	574	<i>Quercus robur</i>	Igrzyna, land lot no. 11/19, N 52°51'17", E 16°48'05"; private plot	1992	6.68	6.94	30.0	3	3
110	654	<i>Quercus robur</i>	Karolewo, Ludomy forest district, at buildings of former forester's lodge in Gościejewko, N 52°49'11", E 16°54'55"; Oborniki forest division	1996	3.42	4.05	29.0	1	1

Table 2. A list of tree clusters and avenues – nature monuments in Oborniki and Ryczywół communes

No.	No. according to the provincial register	Protected object/ name	Location; property owner	Year of establishment	Dimensions			Health state	
					girth at the year of establishment	girth (m)	height (m)	of stem	of crown
Oborniki commune									
1	227	6 <i>Pinus sylvestris</i> "Stobnickie Babki"	Stobnica, Niemieczkowo forest district, compartment 502f, N 52°43'03", E 16°36'58"; Oborniki forest division	1967	1.6–3.00	1.80–3.10	24.0–26.0	3–2	3–2
2	430	Avenue, 33 <i>Gleditsia triacanthos</i>	Commune road Gołaszyn – Oborniki, N 52°38'18", E 16°49'34"	1983	0.45–1.30	0.55–1.70	6.0–15.0	5–2	5–2
3	668	5 <i>Tilia cordata</i>	Objezierze, park at the Agricultural Schools, N 52°36'02", E 16°45'54"; The Agricultural Schools in Objezierze	1991	2.2–3.65	2.74–4.03	21.0–32.0	3–2	2
4	675	4 <i>Tilia cordata</i>	Objezierze, park at the Agricultural Schools, N 52°36'08", E 16°45'50"; The Agricultural Schools in Objezierze	1991	1.6–3.9	2.44–3.90	14.0–25.0	3–2	2
5	2007/2	2 <i>Pyrus communis</i>	Uścikówek, Niemieczkowo forest district, compartment 862w, N 52°39'44", E 16°44'30"; Oborniki forest division	2007	3.10 and 3.20	3.15 and 3.30	15.5 and 17.0	3	5 and 4
6	2008/3 Fig. 8	3 <i>Picea abies</i> "Prosna"	Niemieczkowo, former manor park, N 52°38'57", E 16°42'05"; private plot – Józefa Kukawska	2008	1.66–2.16	1.75–2.30	29.0–32.0	1	1
Ryczywół commune									
7	140	3 <i>Tilia cordata</i>	Ninino, park, land lot 114/2, N 52°47'51", E 16°52'14"; Agricultural Property Agency, branch in Piła	1970	3.67–4.72	4.05–4.75	2.5–37.0	5–3	5–2
8	424 Fig. 10	<i>Quercus robur</i> and <i>Fraxinus excelsior</i>	Gorzewo, former manor park, N 52°47'27", E 16°49'51"; N 52°47'25", E 16°49'48"; Agricultural Property Agency, branch in Piła	1985	3.63 and 3.56	4.30 and 3.90	36.0 and 39.0	1	1

Another interesting location is Objezierze, with a magnificent palace and park complex. In the park there are 14 natural monuments nos. 664–677.

DISCUSSION

In the early 20th century and in the period between WWI and WWII numerous data appeared on impressive trees, e.g. CONWENTZ (1904), PFUHL (1904, 1908), STECKI & KULEZA (1926), KULEZA (1928), STECKI (1928), ŚRODOŃ (1934, 1935a, b, 1937), WODZICZKO et al. (1938). In several sources we may find information on monumental trees in the study area. For example, KULEZA (1928) mentioned a cluster of common elms of the cork variety *Ulmus campestris* f. *suberosa* Ehrh., growing in the Warta valley east of Oborniki (near Kowanówko) with circumferences up to 1.88 m, a wild service tree *Sorbus terminalis* Crantz. in the Maryłówka forest district with a circumference of 78 cm, a broad-leaved lime *Tilia platyphyllos* Scop. in the Papiernia forest district with a circumference of 4.55 m and two localities of flowering common ivy *Hedera helix* L. in forests between Łuków and Szymanków.

WODZICZKO et al. (1938) published a list of natural monuments in the Wielkopolska region. They mentioned the same specimens as those given by KULEZA

(1928) and reported on several new objects of nature value, i.e. several impressive common spruces in a forest on the Warta river in Łuków, an English oak in Gołaszyn, with a diameter of 1.5 m, an English oak from the Maryłówka forest district with a circumference of 3.4 m (this oak is probably the natural monument no. 257/858 and a circumference of 4.96 m). They mentioned locations with old small-leaved limes: Gołaszyn, Ninino, Połajewo, and lime trees growing at a road between Oborniki and Murowana Goślina.

Impressive trees growing in the Ryczywół commune were mentioned by IWANOWSKI et al. (1966): eight common junipers *Juniperus communis* L. growing at a road in Lipa, 20 common junipers from the Ludoma forest district and a common pear *Pyrus communis* L. growing in Skrzetusz. Among the above-mentioned trees only the pear tree was covered by legal protection and assigned register number 137.

In 2002 a competition for the thickest trees of the State Forests was announced. Over six thousand specimens from throughout Poland were registered. The competition selected the thickest trees of individual species. Several specimens from the forests in the Oborniki Forest Division were leading in the category of the thickest trees. In this respect both natural monuments and monumental trees were in-

Fig. 2. Horse chestnuts *Aesculus hippocastanum* in Objezierze (no. 664, the Oborniki commune, circumference 3.52 m); photo W. Antkowiak

Fig. 3. *Pinus sylvestris* (no. 2007/4, Niemieczkowo, the Oborniki commune, circumference 3.72 m); photo W. Antkowiak

Fig. 4. *Quercus petraea* (no. 2007/11, Niemieczkowo, the Oborniki commune, circumference 5.05 m); photo W. Antkowiak

Fig. 5. *Quercus robur* (no. 673, Objezierze, the Oborniki commune, circumference 3.74 m); photo W. Antkowiak

Fig. 6. *Platanus x acerifolia* (no. 573, Gorzewo, the Ryczywół commune, circumference 5.70 m); photo M. Krajewski

Fig. 7. *Acer saccharinum* (no. 139, Orłowo, the Ryczywół commune, circumference 5.20 m); photo M. Krajewski

Fig. 8. A tree cluster monument – three *Picea abies* trees from the park in Niemieczkowo (no. 2008/3, the Oborniki commune, circumferences 1.75, 1.95 and 2.30 m); photo W. Antkowiak

Fig. 9. *Quercus robur* (no. 138, Skrzetusz, the Ryczywół commune, circumference 4.78 m); photo M. Krajewski

Fig. 10. *Quercus robur* (no. 424, Gorzewo, the Ryczywół commune, circumference 4.30 m); photo W. Antkowiak

cluded (KUSIAK et al. 2008). A list not covered by legal protection is given below:

- a white poplar *Populus alba* L. – forest district Oborniki, compartment 276f, circumference 575 cm,
- a black alder *Alnus glutinosa* Gaertn. – forest district Oborniki, compartment 855b, circumference 445 cm,
- a crack willow *Salix fragilis* L. – forest district Kiszewko, compartment 600f, circumference 255 cm,
- a crack willow *Salix fragilis* L. – forest district Niemiechowo, compartment 866c, circumference 154 cm,
- a common pear *Pyrus communis* L. – forest district Objezierze, compartment 268a, circumference 245 cm,
- an apple tree *Malus domestica* Borkh. – forest district Objezierze, compartment 262b, circumference 179 cm,
- an apple tree *Malus domestica* Borkh. – forest district Maryłówka, compartment 531a, circumference 129 cm,
- a grey alder *Alnus incana* L. – forest district Objezierze, compartment 277c, circumference 150 cm,
- a grey alder *Alnus incana* L. – forest district Wypalanki, compartment 540 g, circumference 141 cm,
- a singleseed hawthorn *Crataegus monogyna* Jacq. – forest district Oborniki, compartment 835g, circumference 110 cm,
- a singleseed hawthorn *Crataegus monogyna* Jacq. – forest district Objezierze, compartment 300f, circumference 101 cm,
- a bird cherry tree *Padus avium* Mill. – forest district Objezierze, compartment 277c, circumference 107 cm.

In Poland almost 75% all trees covered by legal protection as natural monuments are oaks and lime trees (GRZYWACZ 2002), while in the surveyed area these species account for 47.5% all trees. As it was reported by ZARZYŃSKI (2003), the percentage share of *Quercus robur* among monumental trees is 35.3%, *Q. petraea* at 1.3% and *Tilia cordata* at 27.9%. In the Wielkopolskie province the mean circumferences of trees from the above-mentioned species are 4.01, 3.81 and 4.13 m, which classifies them as leading specimens in this respect.

When comparing statistical data (MAŁY ROCZNIK... 2016) with the results of this study it may be observed that the data recorded in the surveyed area differ slightly from the national means. In the study area a total of 118 natural monuments were recorded, of which 110 were single trees (93.2%), seven were tree clusters (5.9%) and one was an avenue. In 2010 a total of 36 293 natural monuments were registered in Poland, including 30 059 (82.8%) single trees, 3658 clusters (10.1%) and 699 (1.9%) avenues.

When analysing the dates of establishment of natural monuments for inventoried trees it was found that in the years 1950–1959 two (1.7%) natural monuments were established, in the years 1960–1969 it was 16 (13.6%) natural monuments, in the period 1980–1989 – 5 (4.2%), in the years 1990–1999 – 22 (18.6%), whereas 73 (61.9%) trees were assigned the status of natural monuments in the years 2000–2008 (in the period 1970–1979 no natural monuments were established in Poland). According to BRZEŹNIAK (1995) from 1960 to 1993 the number of natural monuments increased 4.6-fold. On the national scale the greatest number of natural monuments (7090) was established in the years 1980–1990, while in the period 1960–1970 it was only 1722 natural monuments. In turn, GRZYWACZ (2002) reported that in 2000 in comparison to the status of 1960 the number of single such trees and clusters increased 7-fold, while for that of avenues it was 9.2-fold.

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