

VASULAR PLANTS OF PLANNED NATURAL RESERVE ‘GORAJSKIE PARZYSKA’ (KRUCZ FORESTRY, THE REGIONAL DIRECTORATE OF STATE FOREST, PIŁA)

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Abstract. A list of vascular plants in the planned reserve “Gorajskie Parzyska” is presented in this paper. 226 taxa out of 152 genera and 57 families of vascular plants were inventoried. The most representative families are: *Fabaceae*, *Asteraceae*, *Poaceae*, *Rosaceae*, as well as *Salicaceae*, *Caryophyllaceae*, *Cyperaceae*, *Lamiaceae*, *Apiaceae*, *Ranunculaceae* and *Scrophulariaceae*. There were 19 species catalogued as species of special care as they are under total or partial legal protection and are listed on the Polish National Red List and on Regional Red List for Wielkopolska. The study area (9.26 ha) seems to be particularly valuable in comparison to the rest of Czarnkowska Moraine to other stands where endangered or protected species were found.

Key words: Gorajskie Parzyska, protected species, endangered species

INTRODUCTION

Constant development of urbanism, in particular single-family housing causes significant environmental modifications, such as reduction of a number of natural sites, habitat fragmentation, destruction of soil structure and modifications of hydrographical condition of the soil. While the use of agricultural wastelands for civil engineering or for investments does not cause any significant damage, the appearance of housing on valuable lands should raise a concern. Civil engineering constructions in the neighbourhood of lakes, forests and water-meadows stimulate burying such natural stands in order to rise the ground level. Human desire to commune with nature also brings a danger due to growing tourism and causes increased penetration of the areas where plants and animals occur. Valuable, unique stands of plants are simply trampled underfoot.

Human impact on ecosystems leads sometimes to the creating of bio-diverse habitats, equally valuable as the ones previously mentioned or, at least, to maintaining

the existing ones, such as all kinds of grasslands or moorlands, where regular mowing, removal of vegetable matter or grazing sustain their existence. The problem occurs when such practice is abandoned and modifications to the phytocenose starts. As shown on the above examples, attention should be paid to even the smallest fragments of habitats e.g. riparian forests, alder forests, wellheads, forest border communities (*Rubus fruticosus-Prunetum spinosae*), places where endangered species of plants are found. Such habitats should be preserved even if they are important only locally.

The most appropriate action for the study area is to cover it with an ecological protection or create a nature reserve there. In such a case, it would be possible to apply relevant protection and take actions to ensure survival of the area. According to Central Statistic Office (www.stat.gov.pl) for the year 2009, there were 1451 nature reserves established in Poland, with a total area of 163.4 thousand ha, and 98 nature reserves with a total area of 4099.3 ha were established in Wielkopolska. Comparing selectively by the type of the reserve, there are more forest reserves (712) than floral (174) ones. Although the floral objects occupy the second place in terms of their total existing number, in terms of area they are on a fifth place. This data shows the necessity of preserving the existing floral reserves, even if only fragments of valuable habitats are protected.

The Czarnkowska Moraine is very interesting in terms of floral biodiversity. Scientific research conducted by Straehler [1892], Żukowski [1993], Szmyt [2002], Jermaczek et al. [2008] and Szukala [2009] indicated numbers of remarkable species. Some of these are protected by law, some are listed as endangered and some are listed on diverse Red Lists. The foretold research indicates necessity of conservation of the area. It has been repeatedly suggested to establish a nature reserve on the area Żukowski [1993], Jermaczek et al. [2008].

STUDY AREA

The future reserve "Gorajskie Parzyska" is situated in the northern part of the Wielkopolskie Voivodship, in the czarnkowsko-trzcianecki district, Czarnków municipality, about 4 km to the south-west from Czarnków town and about 500 m to the south of the Pianówka village (52°53'05, 3"N, 16°30'10, 4"E). The research area belongs to the Goraj Forest Inspectorate, Krucz Forestry, the Regional Directorate of State Forest in Piła and belongs to mezzo-region of the Gorzów Dale [Kondracki 1978, 1998]. It covers an area of approximately 9.26 ha together with the following subunits included: whole 13 klm, 14 fi, and a fragment of 14acj, 16o, 17ab, 18a. The suggested nature reserve has the form of three arms: the Northwest Arm, the South Arm (with adhering subdivision 14f) the East Arm and it is formed by the moraine hills and its rich sculpture. The ground is locally humid which is caused by superficial, unfocused leakage of groundwater. Water excess is discharged by two drainage ditches.

The features of the climate of the study area correspond to those of Land of the Great Valleys. It is characterised by average annual temperature of 7.9°C, the number of frosty days is 30-50, and the number of days with ground-frost is 100-110. Precipitation is characterised by 560-640 mm per year, the lowest rainfall is observed in January, the largest in July. An ice sheet lingers approximately 50 (38-60) days. The vegetation period lasts 200-220 days. The winds blow mostly from the north-west and south-west,

carrying humid, maritime polar air masses or maritime tropical air masses [Bac and Rojek 1981, Wrzesiński and Ziętkowiak 2003, based on Gumiński 1948].

The following soil types were localized in the reserve: the majority of soils belong to brown earth type of soil (subunits 14a, 14j, 17a and 17b) while minority are acid brown (subunit 16o). There were also fawn brown soils (subunits 14f and 18a) found, fawn soils (subunit 14c), humic deluvial soils (subunits 13l and 14i) and diluvial brown soils (subunit 13k) [Operat... 2003]. Fawn brown soils are overgrown with trees and mainly composed of *Quercus robur*, *Fraxinus excelsior*, *Alnus glutinosa*, *Carpinus betulus*. Additionally the following species were found: *Aesculus hippocastanum*, *Picea abies*, *Fagus sylvatica*, *Acer pseudoplatanus*. Understory consists of *Crataegus laevigata*, *Sambucus nigra*, *Fraxinus excelsior*, *Acer platanoides*, and *Cornus sanguinea*. On deluvial soils sedge and reed communities were formed and composed of *Phragmites australis*, tall herb communities predominantly composed of *Cirsium oleraceum*, *Filipendula ulmaria*, *Geranium palustre*, *Geum rivale*, *Valeriana officinalis*, *Urtica dioica*, also small patches of alder currant were located.

METHODS

The research was conducted between 2005 and 2008. The land was divided into 5 m wide zones. The zones were created parallel to two watercourses, as they created the longest axle. Flora was described based on the geographical and historical distribution, on ecological and socio-ecological division and finally also on Raunkier's classification of life forms. Cataloguing species into different groups was based on the work of Jackowiak [1993]. Among the total number of vascular plant species found, there were species described as "valuable" which means protected by law [Rozporządzenie... 2004] or species listed on the National Red List [Zarzycki et al. 1992, Zarzycki and Mirek 2006] and on the Red List for Wielkopolska [Żukowski and Jackowiak 1995]. Localisation and distribution of the valuable species can be found on maps included in the manuscript [Szukała 2009]. For each of the above mentioned species the following features were described: the degree of coverage – defined by a combined, 6-point Braun-Blanquet scale; the appearance – from common to extremely rare; flowering and fruiting – from lack to rich flowering; state of health – from bad to very good. Data referring to trees being natural monuments is quoted from work of Szukała and Kolenda [2003]. The health conditions of the trees were described basing on the Kamiński and Czerniak scale [2002]. The names of species are listed per Mirek et al. [2002] and per Seneta and Dolatowski [2009].

RESULTS

In the study area there were 226 taxa of vascular plants found, out of 57 families and 152 genera, representing 54.6% of the total plants of Czarnkowska Moraine (Table 1). In a group of fern, there were 4 families recorded, represented by 7 species; in a conifers group, there was 1 species and in a group of monocotyledons and dicotyledons there were 52 families with 218 species found.

Table 1. List of taxa of vascular plants in future natural reserve “Gorajskie Parzyska”
 Tabela 1. Wykaz taksonów roślin naczyniowych projektowanego rezerwatu „Gorajskie Parzyska”

No. Lp.	Species name Nazwa gatunkowa	Raunkiaer's group Grupa Raunkiaera	Fre- quency Czę- stość	Category of hazard Kategoria zagro- żenia		Geographical- -historical group Grupa historyczno- -geogra- ficzna	Socio- -ecological group Grupa socio- -giczo- -ekolo- -giczna
				Poznań	Wlkp.		
1	2	3	4	5	6	7	8
1	<i>Acer campestre</i> L.	M	II		R	Ap	1
2	<i>Acer platanoides</i> L.	M	IV			Ap	1
3	<i>Acer pseudoplatanus</i> L.	M	III			Ap	1
4	<i>Acer pseudoplatanus</i> L. 'Purpurascens'	M	I			Kn	18
5	<i>Achillea millefolium</i> L.	H	IV			Ap	9
6	<i>Actaea spicata</i> L.	H	IV	Ex	V	Sp	1
7	<i>Adoxa moschatelina</i> L.	G	I	P1		Sp	7
8	<i>Aegopodium podagraria</i> L.	H	II			Ap	1
9	<i>Aesculus hippocastanum</i> L.	M	I			Kn	3
10	<i>Agrimonia eupatoria</i> L.	H	II			Ap	4
11	<i>Ajuga reptans</i> L.	H	I	P1		Sp	1
12	<i>Agrostis capillaris</i> L.	H	III			Ap	5
13	<i>Alliaria petiolata</i> (M. Bieb.) Cavara & Grande	H	III			Ap	7
14	<i>Alnus glutinosa</i> (L.) Gaertn.	M	II			Ap	6
15	<i>Alopecurus pratensis</i> L.	H	II			Ap	9
16	<i>Anemone nemorosa</i> L.	G	III	P1		Sp	1
17	<i>Anemone ranunculoides</i> L.	G	II	P1		Sp	1
18	<i>Anthriscus sylvestris</i> (L.) Hoffm	H	III			Ap	3
19	<i>Arabis glabra</i> (L.) Bernh.	H	I	V		Sp	4
20	<i>Arctium tomentosum</i> Mill.	H	II			Ap	12
21	<i>Artemisia campestris</i> L.	Ch	I			Ap	5
22	<i>Artemisia vulgaris</i>	Ch	IV			Sp	12
23	<i>Asarum europaeum</i> L.	H	III	V		Sp	1
24	<i>Astragalus cicer</i> L.	H	I			Ap	4
25	<i>Athyrium filix-femina</i> (L.) Roth	H	I	V		Sp	1
26	<i>Berteroa incana</i> (L.) Dc.	H,T	II			Ap	13
27	<i>Betula pendula</i> Roth	M	IV			Ap	2
28	<i>Brachypodium sylvaticum</i> (Huds.) P. Beauv.	H	II			Sp	1

Table 1 – cont. / Tabela 1 – cd.

1	2	3	4	5	6	7	8
29	<i>Briza media</i> L.	H	I	P2		Sp	9
30	<i>Bromus inermis</i> Leyss.	H	II			Ap	4
31	<i>Calamagrostis epigeios</i> (L.) Roth	G	IV			Ap	2
32	<i>Caltha palustris</i> L.	H	II	P3		Sp	8
33	<i>Calystegia sepium</i> (L.) R. Br.	G, H, li	III			Ap	12
34	<i>Campanula glomerata</i> L.	H	III	P1		Sp	4
35	<i>Campanula patula</i> L.	H	I	V		Sp	9
36	<i>Campanula persicifolia</i> L.	H	III	P		Sp	4
37	<i>Campanula trachelium</i> L.	H	III	E		Sp	1
38	<i>Cardamine amara</i> L.	H	I	P1		Sp	1
39	<i>Cardamine pratensis</i> L.	H	I	P2		Ap	9
40	<i>Carex acuta</i> L.	G, Hy	I	P2		Sp	6
41	<i>Carex acutiformis</i> Ehrh.	G, Hy	I	P2		Sp	6
42	<i>Carex appropinquata</i> Schumach.	H	I	V		Sp	6
43	<i>Carex digitata</i> L.	H	I	E		Sp	1
44	<i>Carex hirta</i> L.	G	II			Ap	10
45	<i>Carex remota</i> L.	H	III	E		Sp	1
46	<i>Carex sylvatica</i> Huds.	H	I	E		Sp	1
47	<i>Carex vulpina</i> L.	H, G	I			Ap	6
48	<i>Carpinus betulus</i> L.	M	II	P2		Sp	1
49	<i>Centaurea rhenana</i> Boreau	H	I			Ap	5
50	<i>Centaurea scabiosa</i> L.	H	I	P3		Ap	9
51	<i>Cerastium arvense</i> L.	C	I			Ap	5
52	<i>Cerasus avium</i> (L.) Moench	M	I			Ap	1
53	<i>Chaerophyllum temulentum</i> L.	T, H	III			Ap	3
54	<i>Chelidonium majus</i> L.	H	III			Ap	3
55	<i>Chrysosplenium alternifolium</i> L.	H	I	V		Sp	6
56	<i>Cichorium intybus</i> L.	H	III			Arch	13
57	<i>Circaea lutetiana</i> L.	G	I	Ex		Sp	1
58	<i>Cirsium arvense</i> (L.) Scop.	G	II			Ap	12
59	<i>Cirsium oleraceum</i> (L.) Scop.	H	II	P3		Ap	8
60	<i>Cirsium palustre</i> (L.) Scop.	H	I	P2		Sp	8
61	<i>Clinopodium vulgare</i> L.	H	I	E		Sp	4
62	<i>Conyzea canadensis</i> (L.) Cronquist	T, H	II			Kn	14
63	<i>Cornus sanguinea</i> L.	N	I	P1		Sp	1

Table 1 – cont. / Tabela 1 – cd.

1	2	3	4	5	6	7	8
64	<i>Coronilla varia</i> L.	H	I			Ap	4
65	<i>Corydalis cava</i> Schweigg & Korte	G	I	E		Sp	1
66	<i>Corylus avellana</i> L.	N	III			Ap	1
67	<i>Crataegus laevigata</i> (Poir.) Dc.	N, M	I	P1		Sp	1
68	<i>Crepis capillaris</i> (L.) Wallr.	T	I			Ef	18
69	<i>Crepis paludosa</i> (L.) Moench	H	I	P1		Sp	8
70	<i>Dactylis glomerata</i> L.	H	III			Ap	9
71	<i>Dactylorhiza maculata</i> (L.) Soó	G		E	V	Sp	6
72	<i>Dactylorhiza majalis</i> (Rchb.) P.F. Hunt & Summerh.	G		P1	V	Sp	8
73	<i>Daphne mezereum</i> L.	N	I	E	R	Sp	6
74	<i>Deschampsia caespitosa</i> (L.) P. Beauv.	H	II			Ap	8
75	<i>Dryopteris carthusiana</i> (VILL.) H.P. Fuchs	H	III			Ap	1
76	<i>Dryopteris dilatata</i> (Hoffm.) A. Gray	H	II			Ap	1
77	<i>Dryopteris filix-mas</i> (L.) Schott	H	I			Ap	1
78	<i>Echium vulgare</i> L.	H	II			Ap	13
79	<i>Epilobium hirsutum</i> L.	H	I			Ap	7
80	<i>Epilobium montanum</i> L.	H	I	P1		Sp	1
81	<i>Epilobium parviflorum</i> Schreb.	H	I			Ap	7
82	<i>Equisetum pratense</i> Ehrh.	G	II			Sp	1
83	<i>Equisetum sylvaticum</i> L.	G	III	Ex		Sp	1
84	<i>Euonymus europaeus</i> L.	N	II	P1		Sp	1
85	<i>Eupatorium cannabinum</i> L.	H	I	P2		Sp	7
86	<i>Euphorbia cyparissias</i> L.	H, G	IV			Ap	5
87	<i>Fagus sylvatica</i> L.	M	II			Kn	1
88	<i>Festuca gigantea</i> (L.) Vill.	H	II	P2		Sp	10
89	<i>Festuca pratensis</i> Huds.	H	II			Ap	5
90	<i>Ficaria verna</i> Huds.	H	II			Ap	5
91	<i>Filipendula ulmaria</i> (L.) Maxim.	H	I	P2		Sp	8
92	<i>Fragaria viridis</i> Duchesne	H	I	V		Sp	4
93	<i>Frangula alnus</i> Mill.	N	IV	P1	*	Sp	6
94	<i>Fraxinus excelsior</i> L.	M	I			Ap	1
95	<i>Fraxinus pennsylvanica</i> Marshall	M	I			Kn	1
96	<i>Galeobdolon luteum</i> Huds	C	II	V		Sp	1
97	<i>Galeopsis pubescens</i> Besser	T	I			Ap	1

Table 1 – cont. / Tabela 1 – cd.

1	2	3	4	5	6	7	8
98	<i>Galeopsis speciosa</i> Mill.	T	I	Ex		Sp	2
99	<i>Galium aparine</i> L.	T	IV			Ap	3
100	<i>Galium boreale</i> L.	H	I	P1		Sp	8
101	<i>Galium schultesii</i> Vest	H	I		R	Ap	6
102	<i>Galium uliginosum</i> L.	H	I	P1		Sp	8
103	<i>Galium verum</i> L.	H	III			Ap	5
104	<i>Geranium palustre</i> L.	H	I	P1		Sp	8
105	<i>Geranium robertianum</i> L.	T, H	III			Ap	3
106	<i>Geum rivale</i> L.	H	II	P2		Sp	8
107	<i>Geum urbanum</i> L.	H	III			Ap	3
108	<i>Glechoma hederacea</i> L.	G, H	IV			Ap	3
109	<i>Glyceria maxima</i> (Hartm.) Holmb	Hy	I	P1		Sp	7
110	<i>Heracleum sphondylium</i> L.	H	III			Ap	9
111	<i>Holcus lanatus</i> L.	H	I			Ap	9
112	<i>Humulus lupulus</i> L.	H, li	III			Ap	3
113	<i>Hypericum maculatum</i> Crantz	H	II	I		Ap	8
114	<i>Hypericum perforatum</i> L.	H	IV			Ap	4
115	<i>Impatiens parviflora</i> Dc.	T	IV			Kn	3
116	<i>Juncus articulatus</i> L. em. K. Richt.	H	I			Ap	8
117	<i>Juncus effusus</i> L.	H	I			Ap	8
118	<i>Lamium purpureum</i> L.	T, H	II			Arch	15
119	<i>Lathraea squamaria</i> L.	Gp	I	E		Sp	1
120	<i>Lathyrus pratensis</i> L.	H	II			Ap	9
121	<i>Leontodon hispidus</i> L.	H	I			Ap	9
122	<i>Leucantemum vulgare</i> Lam. S. Str.	H	I	I		Ap	9
123	<i>Linaria vulgaris</i> Mill.	G	II			Ap	13
124	<i>Listera ovata</i> (L.) R.Br.	G	I	V	V	Sp	1
125	<i>Lolium perenne</i> L.	H	III			Ap	10
126	<i>Lotus uliginosus</i> Schkuhr	H	I	P3		Sp	8
127	<i>Lychnis flos-cuculi</i> L.	H	II	P2		Sp	8
128	<i>Lysymachia nummularia</i> L.	C	II	P3		Sp	6
129	<i>Lysymachia vulgaris</i> L.	H	II	P3		Sp	8
130	<i>Lythrum salicaria</i> L.	H	I			Ap	8
131	<i>Maianthemum bifolium</i> (L.) F.W. Schmidt	C	III	P1		Sp	1
132	<i>Malus sylvestris</i> Mill.	M	I			Sp	1

Table 1 – cont. / Tabela 1 – cd.

1	2	3	4	5	6	7	8
133	<i>Medicago falcata</i> L.	H	I			Ap	4
134	<i>Medicago lupulina</i> L.	T, H	II			Ap	13
135	<i>Melandrium album</i> (Mill.) Garcke	T	III			Ap	13
136	<i>Melilotus alba</i> Medik.	T	I			Ap	13
137	<i>Mentha aquatica</i> L.	H, Hy	II	P2		Sp	7
138	<i>Mycelis muralis</i> (L.) Dumort.	H	III	P1		Sp	1
139	<i>Myosotis palustris</i> (L.) L. em. Rchb.	H	I			Sp	6
140	<i>Neottia nidus-avis</i> (L.) Rich.	Gs	I	Ex	E	Sp	1
141	<i>Oenothera biennis</i> L.	H	I			Ap	13
142	<i>Ophioglossum vulgatum</i> L.	G	I	V	V	Sp	8
143	<i>Oxalis acetosella</i> L.	G, H	II	V		Sp	1
144	<i>Oxalis stricta</i> L.	G	I			Kn	15
145	<i>Petrorhagia prolifera</i> (L.) P.W. Ball & Heywood	T	I			Ap	5
146	<i>Phalaris arundinacea</i> L.	G, H	II			Ap	7
147	<i>Phleum pratense</i> L.	H	I			Ap	9
148	<i>Phragmites australis</i> (CAV.) Trin. ex Steud.	G, Hy	III			Ap	7
149	<i>Phyteuma spicatum</i> L.	H	I	E		Sp	1
150	<i>Picea abies</i> (L.) KARSTEN	M	II			Kn	2
151	<i>Pimpinella saxifraga</i> L.	H	II			Ap	13
152	<i>Plantago lanceolata</i> L.	H	II			Ap	10
153	<i>Plantago major</i> L.	H	III			Ap	10
154	<i>Poa nemoralis</i> L.	H	III			Ap	1
155	<i>Poa palustris</i> L.	H	I			Ap	12
156	<i>Polygonatum multiflorum</i> (L.) All.	G	I	V		Sp	1
157	<i>Polygonum hydropiper</i> L.	T	I	P1		Ap	18
158	<i>Populus tremula</i> L.	M	II			Ap	2
159	<i>Potentilla reptans</i> L.	H	II			Ap	10
160	<i>Primula elatior</i> (L.) Hill	H	I	E		Sp	1
161	<i>Primula veris</i> L.	H	I	V	*	Sp	4
162	<i>Prunus serotina</i> Ehrh.	M	III			Kn	2
163	<i>Pulmonaria obscura</i> Dumort.	H	I	E		Sp	1
164	<i>Pyrus communis</i> L.	M	I			Sp	1
165	<i>Quercus robur</i> L.	M	V			Ap	1
166	<i>Quercus rubra</i> L.	M	I			Kn	2

Table 1 – cont. / Tabela 1 – cd.

1	2	3	4	5	6	7	8
167	<i>Ranunculus acris</i> L.	H	IV			Ap	9
168	<i>Ranunculus repens</i> L.	H	III			Ap	10
169	<i>Rhinanthus serotinus</i> (Schonh.) Oborny	H	III	E		Sp	1
170	<i>Ribes alpinum</i> L.	N	I	P1		Kn	1
171	<i>Ribes nigrum</i> L.	N	I	P1	*	Sp	6
172	<i>Ribes spicatum</i> E. Robson	N	I	P1		Sp	1
173	<i>Ribes uva-crispa</i> L.	N	II			Kn	1
174	<i>Robinia pseudoacacia</i> L.	M	IV			Kn	3
175	<i>Rosa canina</i> L.	N	II			Ap	1
176	<i>Rosa dumalis</i> Bechst.	N	IV			Sp	4
177	<i>Rubus idaeus</i> L.	N	III			Ap	1
178	<i>Rumex acetosa</i> L.	H	III			Ap	9
179	<i>Rumex aquaticus</i> L.	H	I	E	E	Sp	7
180	<i>Rumex conglomeratus</i> Murray	H	I			Ap	1
181	<i>Rumex obtusifolius</i> L.	H	I			Ap	12
182	<i>Salix caprea</i> L.	N, M	I			Ap	1
183	<i>Salix cinerea</i> L.	N	II			Ap	6
184	<i>Salix fragilis</i> L.	M	II			Ap	3
185	<i>Salix purpurea</i> L.	N	II			Ap	7
186	<i>Salix viminalis</i> L.	N	I			Ap	7
187	<i>Sambucus nigra</i> L.	N	V			Ap	3
188	<i>Sanicula europaea</i> L.	H	I	Ex		Sp	1
189	<i>Saponaria officinalis</i> L.	H	I			Ap	12
190	<i>Scirpus silvaticus</i> L.	G	I	P2		Sp	8
191	<i>Scrophularia nodosa</i> L.	H	II	P2		Sp	1
192	<i>Scrophularia umbrosa</i> Dumort.	H, Hy	I	P1		Sp	7
193	<i>Selinum carvifolia</i> (L.) L.	H	I	P2		Sp	8
194	<i>Silene vulgaris</i> (Moench) Garcke	H, G	II			Ap	13
195	<i>Solanum dulcamara</i> L.	Ch, li	II			Ap	12
196	<i>Solidago virgaurea</i> L.	H	I	P1		Sp	2
197	<i>Sorbus aucuparia</i> L. em. Hedl.	N, M	III			Ap	2
198	<i>Stachys sylvatica</i> L.	H	II	P1		Sp	1
199	<i>Stellaria graminea</i> L.	H	II			Ap	9
200	<i>Stellaria holostea</i> L.	C	III	V		Sp	1
201	<i>Stellaria nemorum</i> L.	H	I	V		Sp	1

Table 1 – cont. / Tabela 1 – cd.

1	2	3	4	5	6	7	8
202	<i>Taraxacum officinale</i> F.H. Wigg.	H	II			Ap	9
203	<i>Torilis japonica</i> (Houtt.) Dc.	T, H	I			Ap	3
204	<i>Trifolium alpestre</i> L.	H	I	Ex		Sp	1
205	<i>Trifolium arvense</i> L.	T	I			Ap	5
206	<i>Trifolium medium</i> L.	H	I			Ap	4
207	<i>Trifolium pratense</i> L.	H	III			Ap	9
208	<i>Trifolium repens</i> L.	CH	III			Ap	10
209	<i>Tussilago farfara</i> L.	G	II			Ap	13
210	<i>Urtica dioica</i> L.	H	IV			Ap	12
211	<i>Valeriana officinalis</i> L.	H	I	P1		Sp	8
212	<i>Valeriana dioica</i> L.S. Str.	H	I	P1	V	Sp	6
213	<i>Verbascum lychnitis</i> L.	H	I			Ap	4
214	<i>Veronica beccabunga</i> L.	C, Hy	II	V		Sp	7
215	<i>Veronica chamaedrys</i> L.	C	V			Ap	9
216	<i>Veronica longifolia</i> L.	H	II	P1		Sp	8
217	<i>Veronica spicata</i> L.	H, C	I	P1		Ap	5
218	<i>Viburnum opulus</i> L.	N	I	P1		Sp	1
219	<i>Vicia cracca</i> L.	H	III			Ap	9
220	<i>Vicia pisiformis</i> L.	H	II	P3		Sp	6
221	<i>Vicia sepium</i> L.	H	I	P1		Sp	1
222	<i>Vicia sylvatica</i> L.	H	III			Ap	5
223	<i>Vicia tetrasperma</i> L.	T	II			Arch	16
224	<i>Viola hirta</i> L.	H	IV			Sp	4
225	<i>Viola reichenbachiana</i> Jord. ex Boreau	H	III	P1		Sp	1
226	<i>Viola riviniana</i> Rchb.	H	III	V		Sp	2

Bold fonts denote legally protected and endangered species.
Pogrubienie – gatunki objęte ochroną prawną oraz zagrożone.

The most numerous families are: *Fabaceae*, *Asteraceae*, *Poaceae*, *Rosaceae*, *Salicaceae*, *Caryophyllaceae*, *Cyperaceae*, *Lamiaceae*, *Apiaceae*, *Ranunculaceae* and *Scrophulariaceae*. They are represented by 132 species, which is 58.4 % of flora covering the study area. In terms of the number of stands the largest group of species is a group of species considered as very rare (45.13%), less numerous species are those considered as rare (26.11%) and frequent (19.03%). The smallest group of species involved is a group of species considered as very frequent and common, constitutes 9.74% of the total flora observed.

The majority of plants recorded (209 species, representing 92.48%) are indigenous species. Among these, 113 species are autochthonous synanthropes and 96 species are

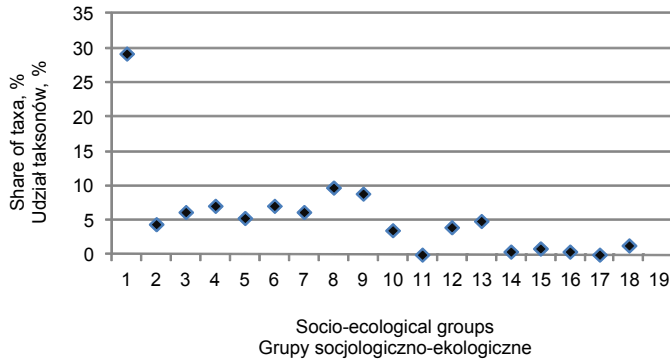


Fig 1. Share of socio-ecological groups in the flora of the future natural reserve "Gorajskie Parzyska"

Rys. 1. Udział grup socjologiczno-ekologicznych we florze projektowanego rezerwatu „Gorajskie Parzyska”

autochthonous semi-synanthropes. The allochthonous species are domesticated neophytes in number of 13 species (5.75%) and very few representatives of archaeophyte in number 3 species (1.33%). Only 1 species (0.44%) belongs to a group of plants called ephemerophytes, which appear sporadically and live shortly.

Among Raunkiaer's forms of life the most numerous are hemicryptophytes (128 species). Number of species in other groups is gradually decreasing. Phanerophytes are represented by 41 species, Cryptophytes by 29 species, therophytes by 17 species and chamaephytes by 11 species.

Inventoried species are classified into 16 out of 18 socio-ecological groups proposed by Jackowiak [1993]. Most numerous are 3 groups, containing from 20 up to 66 species, divided as following: species of fertile deciduous forests and shrub communities (group 1), species of wet meadows together with species of tall herb communities (group 8) and finally species of fresh meadows and moderately moist meadows (group 9). Similar values (14 or 16 species) describe each of groups 3, 4, 6 and 7. The poorest are: short-term, pioneering ruderal communities (14 species), garden weeds and wild root crops communities (15 species), communities of cereal crops weeds (16) and finally native species or permanently domesticated species of unspecified phytosociology, mostly ephemerophytes (18). The number of species in each group varies from 1 to 3 (Fig. 1).

Protected, rare and endangered plants

There are 19 species protected or endangered locally or nationally. 12 of the species are under legal protection; 6 under total protection and 6 under partial protection. There are 14 endangered species on the Red Book" of Wielkopolska [Żukowski and Jackowiak 1995] of which one species is also on the national list of endangered species. The largest group of species are vulnerable species (V) – 6 examples. There are 4 species which are extinct (E) and 4 which are rare (R). Continuously, 4 species are vulnerable and are totally protected (C). Among the extinct species one is fully protected and one partially protected (CZ) while among rare species one is under total protection (Table 2).

Table 2. Categories of risk for vascular plants occurring in future natural reserve “Gorajskie Parzyska”

Tabela 2. Kategorie zagrożenia roślin naczyniowych występujących na terenie projektowanego rezerwatu „Gorajskie Parzyska”

No Lp.	Species name Nazwa gatunkowa	Form of protection Forma ochrony	Category of hazard Kategoria zagrożenia	
			Wielkopolska	Polska
1	<i>Acer campestre</i> L.	*	R	*
2	<i>Actaea spicata</i> L.	*	V	*
3	<i>Asarum europaeum</i> L.	CZ	*	*
4	<i>Dactylorhiza maculata</i> (L.) Soó	C	V	V
5	<i>Dactylorhiza majalis</i> (Rchb.) P.F. Hunt & Summerh.	C	V	*
6	<i>Daphne mezereum</i> L.	C	R	*
7	<i>Frangula alnus</i> Mill.	CZ	*	*
8	<i>Galium schultesii</i> Vest	*	R	*
9	<i>Listera ovata</i> (L.) R.Br.	C	V	*
10	<i>Neottia nidus-avis</i> (L.) Rich.	C	E	*
11	<i>Ophioglossum vulgatum</i> L.	C	V	*
12	<i>Primula elatior</i> (L.) Hill	CZ	E	*
13	<i>Primula veris</i> L.	CZ	*	*
14	<i>Ribes nigrum</i> L.	CZ	*	*
15	<i>Rumex aquaticus</i> L.	*	E	*
16	<i>Valeriana dioica</i> L. S. Str.	*	V	*
17	<i>Viburnum opulus</i> L.	CZ	*	*
18	<i>Vicia pisiformis</i> L.	*	E	*
19	<i>Vicia sylvatica</i> L.	*	R	*

Protection: C – total protection, CZ – partial protection. Species: E – extinct, R – rare, V – endangered.

Ochrona: C – całkowita, CZ – częściowa. Gatunki: E – wymierające, R – rzadkie, V – narażone na wyginięcie.

SUMMARY AND SAFETY RECOMMENDATIONS

1. A large number of taxa (226) on less than 10 ha, proves significant natural values of the future „Gorajskie Parzyska” reserve and Czarnkowska Moraine. On the area of the Czarnkowska Moraine there were 414 species found, including 91 precious ones [Jermaczek et al. 2008].

2. Most numerous families, namely: *Fabaceae*, *Asteraceae*, *Poaceae*, *Rosaceae*, and *Salicaceae*, *Caryophyllaceae*, *Cyperaceae*, *Lamiaceae*, *Apiaceae*, *Ranunculaceae*

and *Scrophulariaceae*, reflect the participation of open space communities, in this case including wet meadows and tall herbs communities.

3. Plants of native origin are 92.48% (209 species). Alien taxa represent only 7.52% of 17 species. The species composition shows a considerable diversity of natural flora of the tested area. Among native species, the similar share of synanthropes, semi-synanthropes and native species indicates slight human impact on the environment.

4. Domination of hemicryptophytes (128 species), phanerophytes (41) and cryptophytes (29) characterises meadows, forests and regions located in the immediate vicinity of the forest.

5. On an area of about 9.26 ha, there were 19 species classified as valuable. 6 species under total protection and 6 species under partial protection give the total number of 12 species being under legal protection. The occurrence of two strictly protected species (*Dactylorhiza majalis* and *D. maculata*) was not confirmed during these studies, however, due to their specific appearance, were taken into account.

6. There were 6 species found which belongs to group of species highly susceptible to extinction (V), included to the Wielkopolska Red List and included to the National Red List. Rare (R) and dying (W) in Wielkopolska are four species.

The area of the proposed reserve "Gorajskie Parzyska" is the largest concentration of valuable species in Goraj forestry, both in terms of the number of species and size of their sites. In order to preserve the flora of this state the following actions should be taken as soon as possible:

- restoration of proper level of groundwater and omission of further dewatering in order to create preferential conditions for the development of higrophiles of meadow, including grasses, sedges, and most importantly orchids
- introduction of grazing or annual mowing with the removal of vegetable matter in order to maintain the proper species composition of groundcover and to prevent the progress of the succession of woody species
- possible removal, for natural protection, raids overgrown trees and shrubs from the meadows area and over-concentrated understories in the stand, in order to ensure good lighting conditions
- constant monitoring of rare species and the habitats where they occur
- paying particular attention to the stands of valuable species during logging process, and if possible excluding this site from such an action.

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ROŚLINY NACZYNIOWE PROJEKTOWANEGO REZERWATU „GORAJSKIE PARZYSKA” (NADLEŚNICTWO KRUCZ, RDLP PIŁA)

Streszczenie. Na terenie projektowanego rezerwatu „Gorajskie Parzyska” zinwentaryzowano 226 taksonów roślin naczyniowych ze 152 rodzajów i 57 rodzin. Najliczniej repre-

zestowane są rodziny *Fabaceae*, *Asteraceae*, *Poaceae*, *Rosaceae* oraz *Salicaceae*, *Caryophyllaceae*, *Cyperaceae*, *Lamiaceae*, *Apiaceae*, *Ranunculaceae* i *Scrophulariaceae*. Wyróżniono 19 gatunków „specjalnej troski”, zarówno będących pod ochroną całkowitą bądź częściową, jak i znajdujących się na krajowej lub regionalnej (dla Wielkopolski) „czerwonej liście” gatunków zagrożonych. Pod względem liczby gatunków na tak małej powierzchni (9,26 ha), w porównaniu z całym terenem Moreny Czarnkowskiej, oraz stanowisk gatunków rzadkich i chronionych, obszar ten wydaje się szczególnie cenny.

Słowa kluczowe: Gorajskie Parzyska, rośliny chronione, gatunki zagrożone

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