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Non-forest communities within the protected landscape area "Annówka" in the Lublin Region

Zbiorowiska nieleśne w granicach Obszaru Chronionego Krajobrazu „Annówka" na Lubelszczyźnie

SUMMARY

The phytosociological profile of the natural and anthropogenic plant communities that accompany the forests in the Annówka Protected Landscape Area in South-Eastern Poland was described. On the basis of 99 phytosociological records (Fig. 1, Tables 1–5) conducted according to the Braun-Blanquet method, 56 associations and 8 communities with an indeterminate taxonomic rank were distinguished. Of these worth noting are the following associations: *Nupharo-Nymphaeetum albae*, *Caricetum paniculatae*, *Leersio-Bidentetum* and *Polygonetum (Reynoutrietum) sachalinense*, and communities with *Potamogeton pusillus*, *Alisma plantago-aquatica* and *Astragalus glycyphyllos* seldom recorded in SE Poland.

STRESZCZENIE

Praca stanowi drugą część opracowania dotyczącego szaty roślinnej OCK „Annówka" w województwie lubelskim. W pierwszej części (16) przedstawiono charakterystykę geobotaniczną zbiorowisk leśnych. Podano również stanowiska chronionych i rzadkich gatunków roślin oraz okazałych drzew zasługujących na miano pomników przyrody. Niniejsza praca zawiera analizę florystyczno-ekologiczną zbiorowisk towarzyszących lasom.

Na podstawie 99 zdjęć fitosocjologicznych (ryc. 1, tab. 1–5) wykonanych na śródleśnych stawach Tyśmianka, w rowach, na łąkach, polach, drogach, groblach, zrębach leśnych, w młodnikach sosnowych i na obrzeżach lasów, wyróżniono 56 zespołów oraz 8 zbiorowisk o nie ustalonej bliżej randze systematycznej. W obrębie zespołów wydzielono podzespoły, warianty i facje.

Najliczniejszą grupę stanowią zespoły szuwarowe z klasy *Phragmitetea*. Pokrywają obrzeża stawów, bagna, rowy i lokalne obniżenia na śródleśnych łąkach. Powierzchniowo największy udział mają: *Typhetum angustifoliae, Phragmitetum communis* i *Caricetum acutiformis*.

Drugie miejsce pod względem liczebności zajmują zbiorowiska łąkowe z klasy *Molinio-Arrhenatheretea*. Z tej grupy największą powierzchnię, zwłaszcza na śródleśnych łąkach „Bilka", zajmują *Poo-Festucetum rubrae* i *Deschampsietum caespitosae*.

Stosunkowo liczną grupę stanowią zbiorowiska synantropijne z klas: *Bidentetea tripartiti, Epilobietea angustifolii, Artemisietea, Plantaginetea maioris, Chenopodietea* i *Secalietea*. Z nich największą powierzchnię zajmują zespoły segetalne: *Echinochloo-Seterietum* i *Arnoserido-Scleranthetum*.

Na uwagę zasługują zbiorowiska wodne i bagienne z klas: *Potamogetonetea* i *Phragmitetea* oraz torfowiskowe z klasy *Scheuchzerio-Caricetea fuscae* związane przestrzennie z wodami powierzchniowymi.

Zbadane zespoły i zbiorowiska roślin wykazują różnorodne stopnie sukcesyjnego i fitosocjologicznego powiązania. Większość z nich należy do często opisywanych zarówno w skali regionalnej, jak i krajowej.

Interesującymi i rzadziej występującymi na Lubelszczyźnie są zespoły wodne i szuwarowe: *Nupharo-Nymphaeetum albae* (z *Nymphaea alba*), *Cicuto-Caricetum pseudocyperi, Caricetum paniculatae, Caricetum vesicariae* oraz zbiorowiska z *Potamogeton pusillus* i *Alisma plantago-aquatica*; napiaskowe — *Herniario glabrae-Agrostietum vulgaris* i *Rumici-Sedetum acris*; otulinowe i okrajkowe — *Sambuco-Prunetum spinosae, Geranio-Trifolietum alpestris*, zbiorowisko z *Astragalus glycyphyllos*; synantropijne — *Leersio-Bidentetum* i *Polygonetum (Reynoutrietum) sachalinense*.

W wyniku przeprowadzonych badań florystycznych odnaleziono stanowiska chronionych i rzadszych na Lubelszczyźnie gatunków roślin, np. *Nymphaea alba, Dactylorhiza incarnata, Senecio paludosus, Rumex thyrsiflorus, Ranunculus sceleratus* i *Triglochin palustre*.

Key words: Protected Landscape Area "Annówka" in SE Poland, natural and anthropogenic communities, phytosociological profile.

INTRODUCTION

This paper is Part Two of an extensive study concerning the plant cover in the Protected Landscape Area "Annówka" in the Lublin Province. Part One (16) presents the geobotanical profile of forest communities. It also describes the stations of protected and rare plant species and exuberant trees that merit the name of nature monuments.

The present study contains a floristic and ecological analysis of aquatic, meadow and peatland vegetation, of rush-plants and vegetation growing on soils with a high sand admixture, in the protection and fringe zones, and of synanthropic plants reported within the PLA "Annówka".

The methods of investigation were not very different from those described in Part One of the study. On the basis of the analysis of 99 phytosociological records taken during the vegetation seasons of 1996–97 (Tables 1–5), 56 associations and 8 plant communities with indeterminate phytosociological rank were distinguished (5,17). The study is supplemented with the location map of phytosociological records.

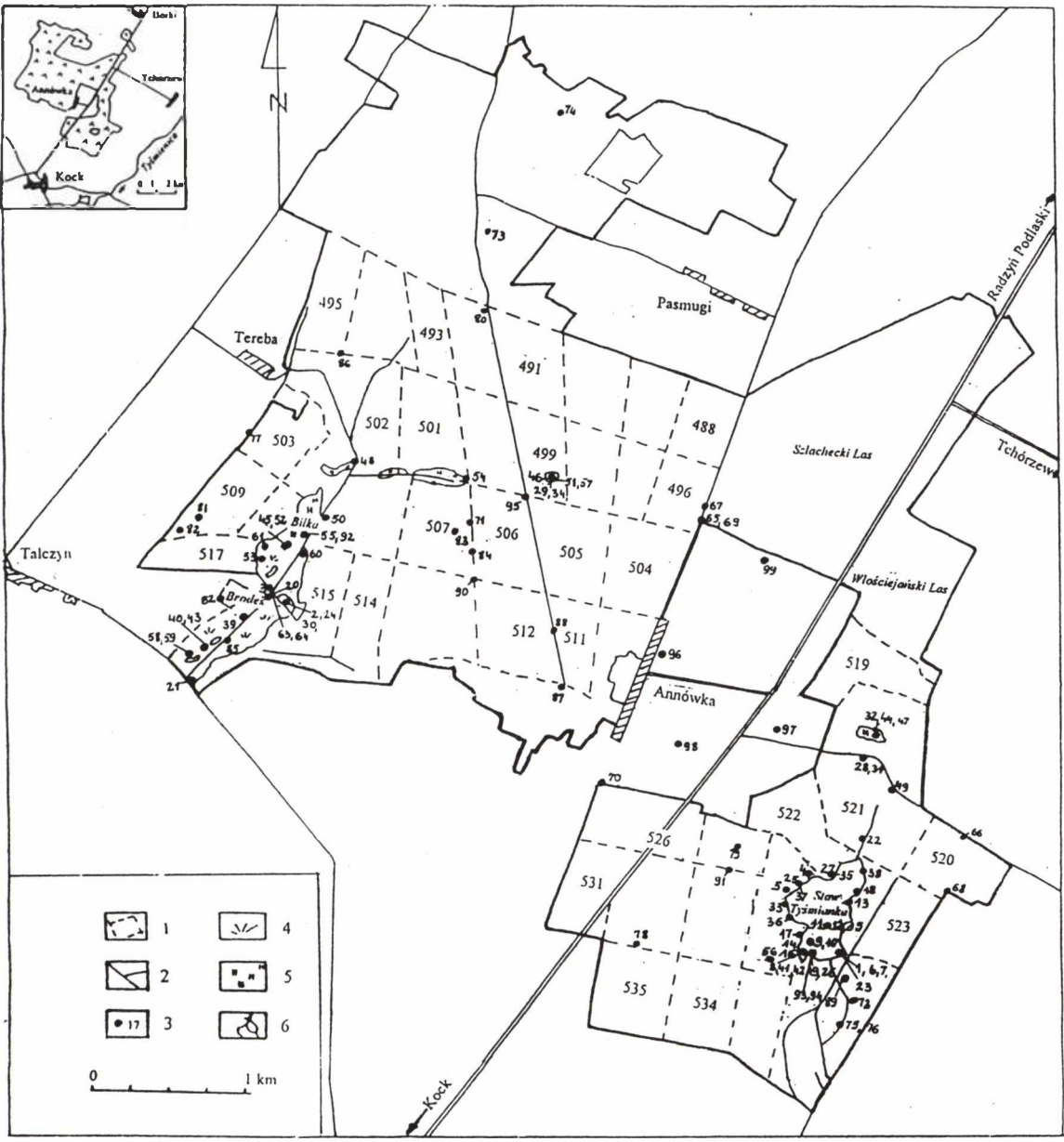

Fig. 1. Situational map of the investigation area with the location of phytosociological records

Explanations to Fig. 1: 1 — dividing lines between sections, 2 — forest roads, 3 — sites of taking phytosociological records, 4 — swamps, 5 — meadows, 6 — streams and drainage ditches

THE AREA OF INVESTIGATIONS

Non-forest communities cover ca. 370 ha, which make up almost 18 percent of the area of the PLA "Annówka". The largest part of the area under investigation (ca. 270 ha) is the farmland of the village of Annówka situated on its western edge, close to the forest of Tereba. The fields form some kind of enormous woodland clearing in the central part of the PLA. They are crossed by the busy highway of Lublin–Białystok.

The soils of the farmland are classified as leached brown and acid brown soils arisen as a result of transformation of primary podzolic soils through ploughing. They are characterized by a low content of humus and nutrients, acid pH, and by high drought sensitivity. With respect to their mechanical composition, they are mostly light loamy sands, less often dense, and also loose and poor-loamy sands (19).

Agriculturally, these are poor soils. Rye and potatoes are mostly grown on them, less often oats, buckwheat, serradella and vegetables. The crops are accompanied by weed communities of the classes *Chenopodietea* and *Secalietea.*

A high degree of breaking of individual farms determines the mosaic of crops and consequently, the diversity of habitats and synanthropic communities. Their role increases in the vicinity of the forests studied, where one can observe a typical cultural (anthropogenic) landscape with the ploughland dominating. In the 1960s in the fields near Talczyn and Tchórzew rare synanthropic species were reported, such as: *Polycnemum arvense, Arnoseris minima, Chenopodium polyspermum* and *Ch. foetidum* (3).

The anthropogenic elements in the surface features of the PLA "Annówka" are, apart from fields, also road embankments, the dams of the Tyśmianka ponds, drainage ditches and old peat workings. They are covered by the synanthropic communities of the classes: *Bidentetea tripartiti, Epilobietea angustifoliii, Artemisietea* and *Plantaginetea maioris,* and those growing on sand of the class *Sedo-Scleranthetea.*

Meadows cover ca. 70 ha. Their largest expanse, "Bilka," occurs in the western part of the Protected Landscape Area, in a stream valley near Talczyn. In the south it neighbours the forest range of "Brodek".

The lowest, swamped meadow areas are taken up by the expanses of lowland bog with the rushes of *Typhetum latifoliae* and with sedge tufts (*Caricetum gracilis, Caricetum rostratae, Carici-Agrostietum caninae*), while the higher meadows are covered by grass communities of the class *Molinio-Arrhenathereteea.*

Waters occupy ca. 25 ha. The permanent streams are two large ditches: in the eastern and western part of the PLA. One starts in the Tyśmianka ponds and it drains off water from the Borki Forest District to the Tyśmienica river. The other ditch, which drains off the Kock Forest District, flows into the Czarna river (the right-side tributary of the Tyśmienica).

The Tyśmianka ponds have a variable water table. They are supplied by underground, snowmelt and precipitation water. There are no surface tributaries here.

The waters of ditches, ponds and peat workings are covered by plant communities that flow on the surface or are submerged, of the classes *Lemnetea* and *Potamogetonetea.* They are accompanied by rush-plant communities of the class *Phragmitetea.*

THE SURVEY OF PLANT COMMUNITIES

Within the PLA "Annówka" the following communities of aquatic, rush, meadow, peaty, growing-on-fringes and synanthropic plants were reported:

1. *Lemno-Spirodeletum polyrrhizae* W. Koch 1954 em. Müll. Görs. 1960
   variant: typical
   variant: with *Lemna minor*
2. Community with *Potamogeton pusillus*
3. *Ranunculetum circinati* (Bennema et West. 1943) Segal 1965
4. *Hydrocharitetum morsus-ranae* Langendonck 1935
5. *Nupharo-Nymphaeetum albae* Tomasz. 1977
   variant: with *Nymphaea alba*
6. *Polygonetum natantis* Soó 1927
7. *Scirpetum lacustris* (Allorge 1922) Chouard 1924
8. *Typhetum angustifoliae* (Allorge 1922) Soó 1927
9. *Sparganietum erecti* Roll 1938
10. *Equisetetum limosi* Steffen 1931
11. *Phragmitetum communis* (Gams 1927) Schmale 1939
12. Community with *Alisma plantago-aquatica*
13. *Typhetum latifoliae* Soó 1927
14. *Oenantho-Rorippetum* Lohm. 1950
    variant: with *Oenanthe aquatica*
    variant: with *Rorippa amphibia*
15. *Glycerietum maximae* Hueck 1931
16. *Glycerietum plicatae* (Kulcz. 1928) Oberd. 1954
17. *Cicuto-Caricetum pseudocyperi* Boer et Siss. in Boer 1942
    variant: with *Carex pseudocyperus*
18. *Iretum pseudacori* Eggler 1933 (n. n.)
19. *Caricetum acutiformis* Sauer 1937
20. *Caricetum paniculatae* Wangerin 1916
21. *Caricetum rostratae* Rübel 1912
22. *Caricetum elatae* Koch 1926
23. *Caricetum appropinquatae* (Koch 1926) Soó 1938
24. *Caricetum gracilis* (Graebn. et Hueck 1931) R. Tx. 1937
25. *Caricetum vesicariae* Br.-Bl. et Denis 1926
26. *Phalaridetum arundinaceae* (Koch 1926 n. n.) Libb. 1931
27. *Filipendulo-Geranietum* Koch 1926
    variant: with *Filipendula ulmaria*
28. *Epilobietum hirsuti* Westhoff 1969
29. *Scirpetum silvatici* Knapp 1946
30. *Epilobio-Juncetum effusi* Oberd 1957
31. *Deschampsietum caespitosae* Grynia 1961
32. *Holcetum lanati* Issler 1936
33. *Poo-Festucetum rubrae* Fijałkowski 1959
34. Community with *Calamagrostis canescens*
35. *Carici-Agrostietum caninae* R. Tx. 1937
36. Community with *Juncus articulatus*
37. *Calluno-Nardetum strictae* Hrync. 1959
38. *Spergulo vernalis-Corynephoretum* (R. Tx. 1928) Libb. 1933
39. *Herniario glabrae-Agrostietum vulgaris* Fijałkowski 1978
40. *Rumici-Sedetum acris* Pass. 1977
41. *Geranio-Trifolietum alpestris* Müll. 1961
42. Community with *Trifolium medium*

43. Community with *Lembotropis nigricans*
44. Community with *Chamaecytisus ratisbonensis*
45. Community with *Astragalus glycyphyllos*
46. *Sambuco-Prunetum spinosae* Doing 1962
47. *Polygono-Bidentetum* (Koch 1926) Lohm. 1950
    variant: with *Polygonum hydropiper*
    variant: with *Bidens cernua*
48. *Leersio-Bidentetum* (Koch 1926) Poli et J. Tx. 1960
49. *Calluno-Sarothamnetum* Malc. 1929
50. *Epilobietum* (*Chamaenerionetum*) *angustifolii* Fijałkowski 1978
51. *Rubetum idaei* Pass. 1982
52. *Rubetum hirtae* Fijałkowski 1991
53. *Rubo-Calamagrostietum epigei* Fijałkowski 1978
54. *Impatientetum parviflorae* Fijałkowski 1991
55. *Eupatorietum cannabini* R. Tx. 1937
56. *Polygonetum sachalinense* Fijałkowski 1991
57. *Rubo-Solidaginetum serotinae* Fijałkowski 1978
58. *Lolio-Plantaginetum* (Lincola 1921) Beger 1930
59. *Prunello-Plantaginetum* Faliński 1963
60. *Caricetum hirtae* Fijałkowski 1991
61. *Rumici-Alopecuretum* R. Tx. (1937) 1950
62. *Juncetum macri* (Diem., Siss. et Westh. 1940) Schwick. 1944 em. R. Tx. 1950
63. *Echinochloo-Setarietum* Krusem. et Vlieg. (1939) 1940
    subassociation: *E.-S. stachyetosum palustris*
    subassociation: *E.-S. stellarietosum mediae*
64. *Arnoserido-Scleranthetum* (Chouard 1925) R. Tx. 1937

The numbering of communities in the present list corresponds to that used in the text below and in Tables 1–5.

THE FLORISTIC AND ECOLOGICAL PROFILE OF COMMUNITIES

Communities of the class *Lemnetea* (Table 1, rec. 1–5)

1. The class is represented only by one association: *Lemno-Spirodeletum polyrrhizae*. It is made up of dense concentrations of *Lemna minor* (with 50–80% coverage), sometimes with a fairly high co-participation of *Spirodela polyrrhiza* (up 30% coverage). Two distinct variants can be distinguished in it: typical and with *Lemna minor*. These plants are accompanied by scarce rush-plant species, for example *Cicuta virosa, Alisma plantago-aquatica, Rorippa amphibia, Solanum dulcamara*. Fijałkowski (5) treats the concentrations of *Lemna minor* as a distinct association *Lemnetum minoris*.

Lemno-Spirodeletum polyrrhizae forms small expanses on the rims of the Tyśmianka ponds, in ditches, old peat workings (in the forest range "Brodek") and in little valleys in the alder carr.

Table 1. Floristic composition of the communities of the classes: *Lemnetea* and *Potamogetonetea*

No. of community										
No. of record	1	2	3	4	5	6	7	8	9	10
Density of shrub layer b in %	.	.	.	.	.	.	.	+	.	.
Cover of herb layer c in %	80	90	80	90	80	60	90	70	80	80
1. *Lemno-Spirodeletum polyrrhizae*:										
Lemna minor	5	8	8	8	7	.	.	.	.	.
Spirodela polyrrhiza	3	1	+	.	.	.	.	.	.	.
Lemna trisulca	.	+	.	.	.	.	.	.	.	.
3. *Ranunculetum circinati*:										
Batrachium circinatum	.	.	.	.	.	1	8	.	+	.
Potamogetonion:										
2. *Potamogeton pusillus*	.	.	.	.	.	5	1	.	.	.
Myriophyllum spicatum	.	.	.	.	.	.	+	.	.	.
Ceratophyllum demersum	.	.	.	.	.	.	.	.	+	.
4. *Hydrocharitetum morsus-ranae*:										
Hydrocharis morsus-ranae	.	.	.	.	.	.	.	5	+	.
5. *Nupharo-Nymphaeetum albae*:										
Nymphaea alba	.	.	.	.	.	.	.	.	8	.
6. *Polygonetum natantis*:										
Polygonum amphibium f. *natans*	.	.	.	.	.	+	+	.	1	4
Phragmitetea:										
Cicuta virosa	r	+	+	.	.	.	.	.	.	.
Alisma plantago-aquatica	.	+	.	+	.	.	r	.	.	3
Rorippa amphibia	.	.	.	1	.	.	.	+	.	.
Carex pseudocyperus	.	+	.	.	.	.	.	.	.	.
Iris pseudacorus	.	.	.	.	+	.	.	.	.	.
Typha latifolia	.	.	.	.	+	.	.	.	.	.
Typha angustifolia	.	.	.	.	+	.	.	.	.	.
Glyceria fluitans	.	.	.	.	.	+	.	.	.	.
Oenanthe aquatica	.	.	.	.	.	.	.	+	.	.
Rumex hydrolapathum	.	.	.	.	.	.	.	+	.	.
Glyceria maxima	.	.	.	.	.	.	.	+	.	.
Accompanying sp.:										
Solanum dulcamara	r	+	+	1	.	.	.	.	.	.
Alopecurus geniculatus	.	.	.	.	.	r	+	.	.	1
Senecio paludosus	r	.	.	.	.	.	.	.	.	.
Lycopus europaeus	.	.	.	.	+	.	.	.	.	.
Salix cinerea b	.	.	.	.	.	.	.	+	.	.
Lythrum salicaria	.	.	.	.	.	.	.	.	.	+

Communities of the class *Potamogetonetea* (Table 1, rec. 6–10)

The class is represented by four associations and one community with an indeterminate phytosociological rank.

2. A community with *Potamogeton pusillus* (rec. 6) was reported only in the inshore, SE part of the little pond of Tyśmianka, with an area of several m^2. This is a phytocenose very poor in plant species. Its main component is *Potamogeton pusillus* (coverage of 50%). A small admixture is *Batrachium circinatum.*

3. *Ranunculetum circinati* (rec.7) is distinguished by the absolute domination of *Batrachium circinatum* over other plant species, for example *Potamogeton pusillus, Myriophyllum spicatum.*

A dense expanse of the association was recorded in the vicinity of a community with *Potamogeton pusillus,* in shallow water with a muddy floor.

4. *Hydrocharitetum morsus-ranae* (rec. 8) is mainly composed of concentrations of *Hydrocharis morsus-ranae.* A negligible addition is made up of *Oenanthe aquatica, Rorippa amphibia* and rush-plant species. The association was located

only in the inshore, SW part of the little pond of Tyśmianka, in the vicinity of *Nupharo-Nymphaeetum albae* and *Phragmitetum communis.*

5. *Nupharo-Nymphaeetum albae* (rec. 9) is made up above all of *Nymphaea alba,* which is at the same time the characteristic species of the association. Out of other plant species recorded in this association the most numerous was *Polygonum amphibium* f. *natans.*

Several years ago this community covered the greater part of the little pond of Tyśmianka. After the cleaning of the pond, the area of the association was reduced to a dozen-odd m^2. In sites gone shallow (SW side) expanses of *Alisma plantago-aquatica* and *Alopecurus geniculatus* appeared.

6. *Polygonetum natantis* (rec. 10) is distinguished with dominance of *Polygonum amphibium* f. *natans* over other plant species, for example *Alisma plantago-aquatica, Alopecurus geniculatus,* which take its place in the parts, gone shallow with organic deposits, of the little pond of Tyśmianka.

This association developed in the vicinity of *Nupharo-Nymphaeetum albae, Oenantho-Rorippetum* and of the community with *Alisma plantago-aquatica.* It covers several m^2 of shallow, eutrophic water.

Communities of the class *Phragmitetea* (Table 2, rec. 11–47)

The class is represented by 19 associations and one plant community with an indeterminate phytosociological rank.

7. *Scirpetum lacustris* (rec. 11) is distinguished by the absolute domination (coverage of 70%) of bulrush (*Schoenoplectus /Scirpus/ lacustris*) over other rush-plant species. It occurs in a narrow zone near the western bank of the little pond of Tyśmianka, in the vicinity of *Typhetum angustifoliae, Caricetum elatae, Caricetum acutiformis* and *Glycerietum maximae.* The water here is shallow and the floor is muddy.

A dense expanse of *Scirpetum lacustris* with an area of several m^2 was also recorded in the middle part of the large pond of Tyśmianka, at the depth of 1.5 m.

8. *Typhetum angustifoliae* (rec. 12–14) is chiefly composed of *Typha angustifolia* with as much as 70–90% coverage. A slight admixture is made up of other rush-plant species such as: *Rumex hydrolapathum, Glyceria maxima, Carex acutiformis* meadow plant species, for example *Lysimachia vulgaris, Lythrum salicaria.*

The association occurs in a narrow zone (1–3 m wide) on the eastern, southern and western banks of the large pond of Tyśmianka. It covers an even smaller area in the small Tyśmianka pond, from the SW side. With regard to the area covered, it ranks first among rush-plant communities.

9. *Sparganietum erecti* (rec. 15) was recorded only on the southern bank of the large pond of Tyśmianka, where it covers an area of ca. 10 m^2. The characteristic

Tab. 2. Floristic composition of the communities from the class *Phragmitetea*

No. of community	7		8			9	10		11		12		13			14			15		16	17		18				19			20			21			22		23		24		25	26
No. of record	12	7	12		13	14	15	16	17	18	19	12	20	21	13	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Density of shrub layer b in %	-	-	-	+	+	+	+	10	10	10	-	-	-	-	-	-	+	-	-	-	-	10	-	-	-	20	-	-	-	10	-	-	+	10	10	+	-	10	+	45	-	10	47
Cover of herb layer c in %	70	70	80	70	80	80	80	70	100	100	70	80	80	80	70	80	70	70	70	70	100	100	80	80	100	100	80	80	100	100	100	100	100	100	80	100	100	100	100	100	100	100
Cover of moss layer d in %	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-
7. *Scirpetum lacustris*:																																										
Scirpus lacustris	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
8. *Typhetum angustifoliae*:																																										
Typha angustifolia	+	9	7	7	.	.	.	.	.	.	+	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	+	.	.	.	.	.	.
9. *Sparganietum erecti*:																																										
Sparganium ramosum	.	+	.	.	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
10. *Equisetetum limosi*:																																										
Equisetum fluviatile	.	.	.	.	.	6	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.
11. *Phragmitetum communis*:																																										
Phragmites australis	.	.	.	.	.	.	9	7	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	x	.	.	.	.	.	.	.	.	.	.	.
13. *Typhetum latifoliae*:																																										
Typha latifolia	+	.	.	.	.	.	.	.	.	.	8	8	7	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	r	+	.	.	+	.	.	.	.	.	.
14. *Oenantho-Rorippetum*:																																										
Oenanthe aquatica	r	.	.	.	.	.	.	.	.	.	+	.	+	.	7	5	+	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rorippe amphibia	.	.	.	.	.	.	.	.	.	.	+	+	+	.	1	5	4	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
15. *Glycerietum maximae*:																																										
Glyceria maxima	.	.	+	1	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	9	9	.	.	.	.	.	+	.	.	x	.	.	+	.	.	+	.	.	.	.	.	.	.
***Phragmition*:**																																										
Butomus umbellatus	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
16. *Glycerietum plicatae*:																																										
Glyceria plicata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.
***Sparganio-Glycerion fluitantis*:**																																										
Glyceria fluitans	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Scrophularia umbrosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
17. *Cicuto-Caricetum pseudocyperi*:																																										
Carex pseudocyperus	.	.	.	.	.	.	+	.	.	.	.	.	r	.	.	.	r	.	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	r	.	.	r	.	.	.	.	.
Cicuta virosa	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	r	r	.	.	.	.	.	.	.	.	.
18. *Iridetum pseudacori*:																																										
Iris pseudacorus	.	.	.	+	.	+	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	x	.	8	8	5	6	.	2	2	2	.	.	.	1	.	.	.	.	1	.	.
19. *Caricetum acutiformis*:																																										
Carex acutiformis	.	.	.	1	.	.	+	1	.	+	.	.	+	.	.	.	.	.	+	+	.	.	.	.	.	1	.	9	7	6	4	.	.	+	+	.	.	.	.	.	.	.
20. *Caricetum paniculatae*:																																										
Carex paniculata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8	r	.	.	+	.	.	.	.	.	.
21. *Caricetum rostratae*:																																										
Carex rostrata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	6	.	.	3	.	.	.	.	.	.
22. *Caricetum elatae*:																																										
Carex elata ssp. *elata*	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	+	8	6	.	.	.	.	.	.	.
23. *Caricetum appropinquatae*:																																										
Carex appropinquata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	.	.	6	.	.	.	.	.	.
24. *Caricetum gracilis*:																																										
Carex gracilis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7	7	.	.	.	.
25. *Caricetum vesicariae*:																																										
Carex vesicaria	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	.	.
26. *Phalaridetum arundinaceae*:																																										
Phalaris arundinacea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	9
***Magnocaricion*:**																																										
Scutellaria galericulata	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	+	.	.	.	.	.	+	.	+	.	.	.	.
Galium palustre	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	+	+	.	.	.	.	+	+	.	.	+	+	+	.	.	.
Lysimachia thyrsiflora	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	x	.	.	1	r	.	.	.	.	r	.	.	.	.	.	+	.	.	.	.
Peucedanum palustre	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Poa palustris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.
***Phragmitetea*:**																																										
Rumex hydrolapathum	+	.	+	+	+	+	.	+	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	+	.	.	+	1	+	+	r	+	.	+	.	.	.	.	.
12. *Alisma plantago-aquatica*	.	.	.	.	.	+	.	.	6	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	+	.	.	.	.	.	.	.
Sium latifolium	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	r	.	.	.	.	.	.
***Lemnetea*:**																																										
Lemna minor	.	.	+	.	.	.	.	.	.	.	+	+	+	3	3	+	.	.	.	.	.	.	2	.	.	3	.	.	.	+	.	.	+	.	1	.	.	.	.	.	.	.
Spirodela polyrrhiza	.	.	+	.	.	.	.	.	.	.	.	.	.	3	.	+	.	.	.	.	.	.	1	.	.	2	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Lemna trisulca	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
***Alnetea glutinosae*:**																																										
Salix cinerea b	.	.	+	+	+	+	+	.	.	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	+	.	.	.	+	1	+	+	.	+	.	.	.	.
Salix cinerea c	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ribes nigrum b	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Solanum dulcamara	.	+	.	+	+	1	.	+	.	.	.	.	.	.	.	+	+	.	.	+	.	+	.	1	.	+	.	+	+	+	1	.	.	.	1	.	.	.	.	.	.	.	.
Lycopus europaeus	.	r	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	x	.	.	.	.	.	+	1	.	+	+	+	.	+	.	.	.	.	.	.
Calamagrostis canescens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	+	.	.	1	.	.	.
Thelypteris palustris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Salix pentandra b	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.
***Molinio-Arrhenatheretea*:**																																										
Lythrum salicaria	.	.	+	.	.	r	r	.	.	r	r	+	.	.	.	.	.	.	.	.	.	+	.	.	x	+	.	.	.	.	+	+	.	.	.	.	+	+	.	.	.	.
Lysimachia vulgaris	.	.	.	+	+	.	r	.	.	.	.	+	.	.	.	.	.	.	.	.	+	+	.	.	+	1	+	.	+	1	.	.	r	+	+	.	+	2	+	+	1	.	.
Deschampsia cespitosa	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	+	.	.	.	+	+	+	.	.	.
Juncus effusus	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	+	.	.	+	.	.	1	+	.
Caltha palustris	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	+	+	.	.	+	.
Myosotis palustris	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.
Cirsium palustre	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.
Filipendula ulmaria	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.
Epilobium hirsutum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Galium uliginosum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.
Lathyrus pratensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.
Alopecurus pratensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.
Equisetum palustre	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	1	+	.	.	.	.	.	.
Scirpus sylvaticus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.
Accompanying sp.:																																										
Alnus glutinosa b	.	.	.	+	.	1	+	.	.	.	.	.	x	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	+	.	.	.	.	.	.	1	x	.	.	1	.
Eupatorium cannabinum	.	.	.	.	+	.	.	.	.	.	x	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.
Polygonum hydropiper	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	x	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.
Mentha aquatica	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Epilobium palustre	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	+	.	.	1	.	.	.	.
Senecio paludosus	.	.	.	.	.	.	.	x	.	.	.	.	.	.	x	.	.	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Polygonum amphibium f. *natans*	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bidens cernua	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Myosoton aquaticum	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Urtica dioica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	+	.	.	.	.	.	.	.	.	.	.	.	.	x	.	.	.	.	.	.	.	.	.	.	.
Stellaria palustris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	+	.	.	.
Bidens tripartita	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.
Comarum palustre	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	+	.	1	.	.	.	.	.
Veronica scutellata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	+	.	.	.	.	.	.	.
Dactylorhiza incarnata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	r	r	.	.	.	.
Ranunculus repens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.
Calliergon cordifolium d	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.

Sporadic sp.

Geum rivale 45/+, *Cardamine pratensis* 45/+, *Holcus lanatus* 45/+, *Poa trivialis* 45/+, *Poa pratensis* 45/+, *Festuca rubra* 45/+, *Cirsium riulare* 45/+, *Polygonum bistorta* 45/+, *Lychnis flos-cuculi* 45/+, *Lotus corniculatus* 45/+, *Silaum silaus* 45/+, *Ranunculus acris* 45/+.

Accompanying sp.: *Polygonum amphibium* v. *terrestre* 17/+, *Ranunculus sceleratus* 19/+, *Stachys palustris* 22/r, *Rumex thyrsiflorus* 23/r, *Hydrocharis morsus-ranae* 25/1, *Rumex ucranicus* 26/r, *Polygonum minus* 26/+, *Athyrium filix-femina* 31/x, *Aegopodium podagraria* 31/x, *Rubus idaeus* 35/r, *Galium aparine* 39/+, *Drepanocladus aduncus* d 43/+, *Aulacomnium palustre* d 43/+, *Calliergonella cuspidata* d 43/+, *Anthoxanthum odoratum* 45/+.

and dominant species of the association is *Sparganium erectum* (coverage of 90%). A negligible admixture is made up of plants that come from the neighbouring association of *Typhetum angustifoliae.*

10. *Equisetetum limosi* (rec.16) is primarily distinguished by very densely growing *Equisetum fluviatile*, recognized as the characteristic species of the association. The community was reported on an inner-forest water patch (near the pond) in section 528, the Borki Forest District, in the vicinity of *Phragmitetum communis*, covering the area of ca. 30 m^2. During the investigations the water was never more than 50 cm deep.

11. *Phragmitetum communis* (rec. 17–18) commonly occurs on the eastern and western banks of the Tyśmianka ponds, where it forms expanses of several to several dozen m^2. The association is made up of dense concentrations of *Phragmites australis* (coverage of 70–90%), in which a negligible admixture is made up of other rush-plant species. The habitat of the association is eutrophic waters and the mineral substratum.

12. Community with *Alisma plantago-aquatica* (rec. 19) was found only in one station, in the western part of the little pond of Tyśmianka, in the vicinity of *Polygonetum natantis* and *Oenantho-Rorippetum.* It covers the area of several m^2, in shallow water with a muddy floor.

13. *Typhetum latifoliae* (rec. 20–22) is characterized by the absolute domination of *Typha latifolia* (coverage of 70–80%). It forms small expanses of several to dozen-odd m^2. It is found mainly in ditches and old peat workings in the Brodek forest range near Talczyn, less often on the fringe of the Tyśmianka ponds from the north side.

14. *Oenantho-Rorippetum* (rec. 23–26) develops in the form of two variants with the abundant occurrence of characteristic species: *Oenanthe aquatica* and *Rorippa amphibia* (coverage 40–70%). Tiny expanses of the association were recorded in the offshore zone of the little pond of Tyśmianka (from the SE and SW side) in old peat workings in section 516, the Kock Forest District.

Ecologically, the association is in the transition zone from aquatic communities of the classes *Lemnetea* and *Potamogetonetea* to rush plants of the class *Phragmitetea.*

15. *Glycerietum maximae* (rec. 27–28) occurs as dense expanses with the domination of *Glyceria maxima* (90% coverage). They were reported on the fringes of the Tyśmianka ponds, in the vicinity of *Typhetum angustifoliae, Caricetum elatae* and *Epilobietum hirsuti*, on a highly silted substratum.

16. *Glycerietum plicatae* (rec. 29) was found only in one station, in the flooded, inner-forest swamp in section 499, the Kock Forest District, covering the area of m^2. The dominant and characteristic species of the association is *Glyceria plicata.*

17. *Cicuto-Caricetum pseudocyperi* (rec. 30) in the studied area is a rare association. It was found in an old, worked-out peat ditch in section 516, the Kock Forest District, where it developed in the form of a variant with *Carex pseudocyperus*.

18. *Iretum pseudacori* (rec. 31–34) in the PLA "Annówka" develops in a typical facies with *Iris pseudacorus*. It forms small expanses (of several m^2) in ditches, for example in sections 518, 521, 528, the Borki Forest District and in the inner-forest water patches with slimy-clayey floors.

19. *Caricetum acutiformis* (rec. 35–38) occupies almost the whole of the western fringe of the ponds of Tyśmianka, where it forms expanses of several to several dozen m^2, in the vicinity of *Ribo nigri-Alnetum, Typhetum angustifoliae, Iretum pseudacori, Phragmitetum communis* and *Glycerietum maximae*.

The floristic and phytosociological structure of the association indicates its transition nature between rush-plants proper and the brushwood and riparian forests or alder carr.

20. *Caricetum paniculatae* (rec. 39) is a rare association in the Lublin region. In the PLA "Annówka" it was reported only in one station: in the "Brodek" forest range near Talczyn, close to the willow thicket and alder forest. Large tufts of *Carex paniculata* grow along a stream, on soils developed from lowmoor peat with an admixture of slime.

21. *Caricetum rostratae* (rec. 40) is chiefly made up of *Carex rostrata* (coverage of 60%), which is accompanied by fairly great numbers of *Veronica scutellata, Carex appropinquata, Rumex hydrolapathum,* less often by other rush-plant species.

The association develops on the acid, peaty, not very fertile substratum in the area of poor meadows in the "Brodek" forest range, E of Talczyn.

22. *Caricetum elatae* (rec. 41–42) develops as small expanses in the flooded, inner-forest swamps in section 528, the Borki Forest District (in the vicinity of the little pond of Tyśmianka). The tufts of *Carex elata* ssp. *elata* are accompanied by aquatic, rush-plant and brushwood species, for example *Lemna minor, Rumex hydrolapathum, Salix cinerea*. The association neighbours the following: *Ribo nigri-Alnetum, Salicetum pentandro-cinereae* and *Phragmitetum communis*.

23. *Caricetum appropinquatae* (rec. 43) was reported only in one station: in the "Brodek" forest range, E of Talczyn, in the valley of a stream, where it occurs in the neighbourhood of *Caricetum paniculatae* and *Caricetum rostratae*. The association covers the area of several m^2. *Carex appropinquata* (coverage of 60%) dominates in it.

24. *Caricetum gracilis* (rec. 44–45) is a multi-species community, where *Carex gracilis* (70% coverage) dominates. The admixture consists of numerous meadow

plants like: *Lysimachia vulgaris, Filipendula ulmaria, Lythrum salicaria, Cirsium palustre* and others.

The association covers an inner-forest meadow in section 518, the Borki Forest District, on which *Alnus glutinosa* was planted a year ago. It also occupies a several-square -metre depression on the "Bilka" meadows, NE of Talczyn.

25. *Caricetum vesicariae* (rec. 46) was recorded only in one station, in a flooded, inner-forest swamp in section 499, the Kock Forest District. It covers the area of several m^2 in the vicinity of *Iretum pseudacori* and of a community with *Calamagrostis canescens.* In the springtime waters reach up to 30 cm deep, in summer it sometimes dries up.

26. *Phalaridetum arundinaceae* (rec. 47) is characterized by the absolute domination of *Phalaris arundinacea* (90% coverage). It covers the area of ca.10 m^2 along the ditch on an inner-forest meadow, in section 518, the Borki Forest District. It neighbours *Caricetum gracilis.*

Communities of the class *Molinio-Arrhenatheretea* (Table 3, rec. 48–55)

The class is represented by seven associations.

27. *Filipendulo-Geranietum* (rec. 48) develops as a variant with one abundantly growing, characteristic species: *Filipendula ulmaria.* Out of other plants, the most numerous are: *Polygonum bistorta, Crepis paludosa, Carex gracilis* and *Deschampsia caespitosa.*

Only one expanse of the association covering an area of a dozen-odd m^2 was found in the inner-forest meadow in section 503, the Kock Forest District (E of Tereba), near a ditch.

28. *Epilobietum hirsuti* (rec. 49) is a community that rarely occurs in the studied area. It was found in a wet roadside ditch in section 521, the Borki Forest District, in the vicinity of an expanse with *Urtica dioica*, covering several m^2.

29. *Scirpetum silvatici* (rec. 50) was recorded only in the "Bilka" meadows near Talczyn, in the vicinity of *Filipendulo-Geranietum.* The characteristic species of the association, i. e. *Scirpus sylvaticus* reaches the coverage of 80% in the area of several m^2.

30. *Epilobio-Juncetum effusi* (rec. 51) is a community with dominant *Juncus effusus* (coverage of 70%), which is accompanied in greatest numbers by *Epilobium palustre* and *Lysimachia thyrsiflora.*

The association covers the fringes of an inner-forest swamp in section 499, the Kock Forest District, in the vicinity of *Salicetum pentandro-cinereae* of a community with *Calamagrostis canescens.*

31. *Deschampsietum caespitosae* (rec. 52–53) is made up of dense concentrations of *Deschampsia caespitosa* with the coverage of 60–70%. The admixture

with 10–20% coverage is composed of *Geum rivale, Festuca rubra, Poa pratensis, Linaria vulgaris* and *Carex hirta.*

The expanses investigated are connected with the degraded habitats in the "Bilka" meadows in the "Brodek" forest range near Talczyn.

32. *Holcetum lanati* (rec. 54) forms a dense expanse of *Holcus lanatus* with the coverage of 60%. It was reported in a small, inner-forest meadow in section 500, the Kock Forest District. In the admixture there are numerous specimens of *Deschampsia caespitosa, Carex hirta* and *Poa pratensis.* Smaller expanses were also recorded in the "Bilka" meadows, in the vicinity of *Poo-Festucetum rubrae.*

33. *Poo-Festucetum rubrae* (rec. 55) is chiefly made up of the grasses: *Poa pratensis* (coverage of 60%) and *Festuca rubra.* These species, located on local elevations among the meadows, are accompanied in greatest numbers by *Galium verum* (coverage of 30%), *Luzula campestris* and *Carex hirta.*

The association grows on mineral-peaty soils.

Communities of the class *Alnetea glutinosae* (Table 3, rec. 56–57)

34. The class is represented only by a community with *Calamagrostis canescens* (60% coverage). It was recorded on the fringes of inner-forest, intermittently flooded swamps in section 499, the Kock Forest District and section 528, the Borki Forest District. It is a kind of variant of the association *Salicetum pentandro-cinereae* (in the vicinity of which it occurs), or a variant of a rush-plant and meadow community, which is indicated by the accompanying species: *Iris pseudacorus, Juncus effusus, Lysimachia vulgaris* and others.

Similar expanses were described from various natural objects in the Lublin region (for example 11, 14). Fijałkowski (5) characterizes them as *Calamagrostio (canescenti)-Franguletum.*

Communities of the class *Scheuchzerio-Caricetea fuscae* (Table 3, rec. 58–59)

The class is represented by one association and one community with an indeterminate phytosociological classification.

35. *Carici-Agrostietum caninae* (rec. 58) is distinguished by the occurrence in facies of *Carex nigra* (60% of coverage). Out of herbaceous plants, there are numerous accompanying specimens of *Agrostis canina, Galium palustre, Cirsium palustre, Ranunculus repens*, and of bryophytes: *Marchantia polymorpha.*

The association develops on a flooded site in the "Brodek" forest range near Talczyn, in the vicinity of *Caricetum rostratae* and *Caricetum appropinquatae.* It grows on acid peaty soils (sedge and moss peat).

Tab. 3. Floristic composition of the communities from the classes: *Molinio-Arrhenatheretea, Alnetea glutinosae, Scheuchzerio-Caricetea fuscae* and *Nardo-Callunetea*

No. of community	27	28	29	30	31	32	33	34	35	36	37
No. of record	48	49	50	51	52	53	54	55	56	57	58	59	60	61
Density of shrub layer b in %	-	-	+	10	-	-	-	-	-	+	-	-	-	-
Cover of herb layer c in %	100	100	90	100	100	100	100	100	100	100	100	100	100	100
Cover of moss layer d in %	-	-	-	-	-	+	+	+	-	-	40	+	-	-
27. *Filipendulo-Geranietum:*														
Filipendula ulmaria	5	+	.	.	.	.	.	.	.	.	.	.	.	.
Geranium palustre	+	.	.	.	.	.	.	.	.	.	.	.	.	.
28. *Epilobietum hirsuti:*														
Epilobium hirsutum	.	9	.	.	.	.	.	.	.	.	.	.	.	.
Filipendulo-Petasition:														
Lythrum salicaria	+	.	+	+	+	.	.	.	.	+	.	.	.	.
Valeriana officinalis	+	.	.	.	.	.	.	.	.	.	.	.	.	.
29. *Scirpetum silvatici:*														
Scirpus sylvaticus	+	r	8	.	.	.	.	.	.	.	.	.	.	.
30. *Epilobio-Juncetum effusi:*														
Juncus effusus	.	.	+	7	.	.	.	.	.	1	.	.	.	.
31. *Deschampsietum caespitosae:*														
Deschampsia caespitosa	1	.	+	+	7	6	1	.	+	+	.	+	+	.
32. *Holcetum lanati:*														
Holcus lanatus	1	.	+	.	+	.	6	+	.	.	.	.	+	+
Calthion:														
Geum rivale	+	.	+	.	1	.	+	.	.	.	.	.	.	.
Crepis paludosa	1	.	.	.	.	.	.	.	.	.	.	.	.	.
Caltha palustris	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Molinietalia:														
Cirsium rivulare	+	.	.	.	.	.	+	.	.	.	.	.	.	.
Cirsium palustre	+	.	+	.	+	.	.	.	+	.	1	.	.	.
Lysimachia vulgaris	.	r	+	+	.	.	.	.	1	+	.	.	.	.
Galium uliginosum	.	.	.	+	.	.	.	.	.	.	+	r	.	.
Equisetum palustre	.	.	.	.	.	.	.	.	.	.	+	.	+	+
Sanguisorba officinalis	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Silaum silaus	.	.	.	.	.	.	r	.	.	.	.	.	.	.
33. *Poo-Festucetum rubrae:*														
Festuca rubra	+	.	.	.	1	2	+	1	.	.	.	.	x	.
Poa pratensis	+	.	.	.	.	1	1	6	.	.	.	.	+	.
Molinio-Arrhenatheretea:														
Lathyrus pratensis	+	.	.	.	+	.	.	.	.	.	.	.	.	.
Lotus corniculatus	+	.	.	.	.	.	+	.	.	.	.	.	.	.
Rumex acetosa	+	.	.	.	+	+	+	+	.	.	.	.	.	.
Symphytum officinale	.	+	+	.	.	.	.	.	.	.	.	.	.	.
Alopecurus pratensis	.	.	.	.	+	r	.	.	.	.	.	.	.	.
Ranunculus acris	.	.	.	.	r	r	.	.	.	.	.	.	.	.
Achillea millefolium	.	.	.	.	.	.	+	+	.	.	.	.	.	.
Plantago lanceolata	.	.	.	.	.	.	+	+	.	.	.	.	+	.
Galium mollugo	.	.	.	.	.	.	.	.	.	.	.	.	+	1
Polygonum bistorta	1	.	.	.	.	.	.	.	.	.	.	.	.	.
Poa trivialis	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Alnetea glutinosae:														
34. *Calamagrostis canescens*	.	.	.	+	.	.	.	.	6	6	.	.	.	.
Salix cinerea b	.	.	.	1	.	.	.	.	.	+	.	.	.	.
Padus avium c	.	+	.	.	.	.	.	.	.	.	.	.	.	.
Solanum dulcamara	.	+	.	.	.	.	.	.	.	.	.	.	.	.
Lycopus europaeus	.	r	.	.	.	.	.	.	.	.	.	.	.	.
35. *Carici-Agrostietum caninae:*														
Agrostis canina v. *stolonifera*	.	.	.	.	.	.	.	.	.	.	1	1	.	.
Caricion fuscae, Caricetalia fuscae:														
Epilobium palustre	.	.	.	1	.	.	r	.	.	+	.	+	.	.
Stellaria palustris	.	.	.	.	.	.	.	.	.	+	+	r	.	.
Carex nigra	.	.	.	.	.	.	.	.	.	.	6	+	.	.
Ranunculus flammula	.	.	.	.	.	.	.	.	.	.	r	r	.	.
Viola palustris	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Caricion davallianae:														
36. *Juncus articulatus*	.	.	.	.	.	.	.	.	.	.	+	6	.	.
Carex flava	.	.	.	.	.	.	.	.	.	.	+	r	.	.
Scheuchzerio-Caricetea fuscae:														
Triglochin palustre	.	.	.	.	.	.	.	.	.	.	r	r	.	.
37. *Calluno-Nardetum:*														
Viola canina	.	.	.	.	.	.	.	+	.	.	.	.	+	.
Nardus stricta	.	.	.	.	.	.	.	.	.	.	.	x	7	6
Danthonia decumbens	.	.	.	.	.	.	.	.	.	.	.	.	r	.
Nardetalia, Nardo-Callunetea:														
Potentilla erecta	+	.	.	.	.	.	r	.	.	.	.	.	+	.
Luzula campestris	.	.	.	.	.	.	.	1	.	.	.	.	1	+
Luzula multiflora	.	.	.	.	.	.	.	.	.	.	.	.	r	r
Hieracium pilosella	.	.	.	.	.	.	.	.	.	.	.	.	r	.
Carex pilulifera	.	.	.	.	.	.	.	.	.	.	.	.	x	.
Calluna vulgaris	.	.	.	.	.	.	.	.	.	.	.	.	x	.
Phragmitetea:														
Carex gracilis	1	+	.	.	.	.	.	.	.	.	.	.	.	.
Carex acutiformis	+	+	.	.	.	.	.	.	.	.	.	.	.	.
Peucedanum palustre	r	.	.	.	.	.	.	.	+	.	.	.	.	.
Iris pseudacorus	.	.	.	r	.	.	.	2	+	.	.	.	.	.
Lysimachia thyrsiflora	.	.	.	2	.	.	.	.	+	.	.	.	.	.
Carex vesicaria	.	.	.	+	.	.	.	.	r	.	.	.	.	.
Galium palustre	.	.	.	+	.	.	.	.	x	1	.	.	.	.
Scutellaria galericulata	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Carex elata	.	.	.	.	.	.	.	1	.	.	.	.	.	.
Carex rostrata	.	.	.	.	.	.	.	.	.	+	.	.	.	.
Accompanying sp.:														
Alnus glutinosa b	.	r	+	.	.	.	.	.	.	.	.	.	.	.
Alnus glutinosa c	.	+	.	.	.	.	.	.	.	.	.	.	.	.
Frangula alnus b	.	.	.	+	.	.	.	.	.	+	.	.	.	.
Frangula alnus c	.	.	.	.	.	+	.	.	+	.	.	.	.	.
Galium aparine	+	.	1	.	.	.	.	.	.	.	.	.	.	.
Urtica dioica	+	1	.	.	.	.	1	.	.	.	.	.	.	.
Hypericum perforatum	+	.	.	.	.	.	.	+	.	.	.	.	.	.
Ranunculus repens	+	.	+	.	.	.	+	.	.	.	1	+	.	.
Stellaria graminea	.	.	.	+	.	.	+	.	.	.	.	.	.	.
Potentilla anserina	.	.	.	.	.	1	+	.	.	.	+	r	.	.
Carex hirta	.	.	.	.	.	1	1	1	.	.	.	.	1	1
Linaria vulgaris	.	.	.	.	.	1	.	+	.	.	.	.	r	1
Festuca ovina	.	.	.	.	.	r	.	+	.	.	.	.	+	.
Calliergonella cuspidata d	.	.	.	.	.	+	+	+	.	.	.	.	.	.
Agrostis capillaris	.	.	.	.	.	.	+	+	.	.	.	.	+	.
Galium verum	.	.	.	.	.	.	+	3	.	.	.	.	.	1
Anthoxanthum odoratum	.	.	.	.	.	.	.	+	.	.	.	.	+	+
Thymus serpyllum	.	.	.	.	.	.	.	1	.	.	.	.	.	1
Ajuga genevensis	.	.	.	.	.	.	.	x	.	.	.	.	.	1
Rumex acetosella	.	.	.	.	.	.	.	r	.	.	.	.	.	r
Cardaminopsis arenosa	.	.	.	.	.	.	.	r	.	.	.	.	.	x
Sagina nodosa	.	.	.	.	.	.	.	.	.	.	+	1	.	.
Marchantia polymorpha d	.	.	.	.	.	.	.	.	.	.	4	x	.	.
Sporadic sp.:														

Accompanying sp.: *Epipactis helleborine* 48/r, *Mentha aquatica* 48/+, *Cornus sanguinea* c 49/+, *Humulus lupulus* 49/+, *Trifolium repens* 53/r, *Rumex obtusifolius* 54/r, *Cirsium arvense* 54/+, *Veronica chamaedrys* 54/+, *Conyza canadensis* 55/r, *Dryopteris spinulosa* 56/r, *Rubus idaeus* 56/x, *Dactylorhiza incarnata* 58/r, *Dianthus deltoides* 60/r, *Lolium perenne* 61/+, *Knautia arvensis* 61/r.

Tab. 4. Floristic composition of the communities from the classes: *Sedo-Scleranthetea*, *Trifolio-Geranietea sanguinei* and *Rhamno-Prunetea*

No. of community	38	39	40	41	42	43	44	45	46
No. of record	62	63	64	65	66	67	68	69	70
Density of shrub layer b in %	+	-	-	+	-	-	+	+	90
Cover of herb layer c in %	90	80	80	90	90	100	90	100	10
Cover of moss layer d in %	+	+	'	+	'	'	'	'	'
38. *Sperguto vernalis - Corynephoretum:*									
Spergula morisonii	+	.	.	.	.	.	.	.	.
Corynephorion canescentis:									
Corynephorus canescens	6	.	.	.	.	.	.	.	.
39. *Herniario glabrae - Agrostietum vulgaris:*									
Herniaria glabra	+	3	+	.	.	.	.	.	.
Armerion elongatae:									
Dianthus deltoides	.	+	1	.	.	.	.	.	.
40. *Rumici - Sedetum acris:*									
Sedum acre	.	+	4	.	.	.	.	.	.
Festuco-Sedetalia:									
Thymus serpyllum	+	2	.	.	.	.	.	.	.
Sedum maximum	+	.	.	.	.	.	.	r	.
Sedo-Scleranthetea:									
Rumex acetosella	1	+	+	.	.	.	.	.	.
Trifolium arvense	+	1	+	.	.	.	.	.	.
Rhacomitrium canescens d	+	+	+	.	.	.	.	.	.
Polytrichum piliferum d	+	+	.	.	.	.	.	.	.
Festuca ovina	+	+	.	.	.	.	.	.	.
Jasione montana	2	.	.	.	.	.	.	.	.
Hieracium pilosella	+	.	.	.	.	.	.	.	.
Ceratodon purpureus d	+	.	.	.	.	.	.	.	.
Arenaria serpyllifolia	.	.	1	.	.	.	.	.	.
Potentilla argentea	.	.	r	.	.	.	.	.	.
Veronica dillenii	.	.	r	.	.	.	.	.	.
41. *Geranio-Trifolietum alpestris:*									
Trifolium alpestre	.	.	.	6	.	+	.	+	.
Lathyrus niger	.	.	.	r	.	.	.	.	.
Trifolion medii:									
Galium mollugo	.	.	.	r	x	.	.	x	.
42. *Trifolium medium*	.	.	.	.	6	.	.	.	.
Trifolio-Geranietea sanguinei:									
45. *Astragalus glycyphyllos*	.	.	.	+	.	+	.	6	.
Vicia sylvatica	.	.	.	.	r	.	.	x	.
Clinopodium vulgare	.	.	.	.	.	.	1	.	.
Galium verum	.	.	.	.	.	.	+	.	.
46. *Sambuco-Prunetum spinosae:*									
Prunus spinosa d	.	.	.	.	.	.	.	.	9
Molinio-Arrhenatheretea:									
Achillea millefolium	.	.	+	.	+	.	+	.	.
Poa pratensis	.	.	+	+	1	+	+	+	+
Festuca rubra	.	.	.	1	+	1	+	1	+
Lotus corniculatus	.	.	.	r	.	r	.	r	.
Ranunculus acris	.	.	.	r	.	r	.	r	.
Serratula tinctoria	.	.	.	r	.	.	.	r	.
Taraxacum officinale	.	.	.	.	r	.	.	.	r
Pastinaca sativa	.	.	.	.	r	.	.	.	r
Bromus mollis	.	.	1	.	.	.	.	.	.
Rumex acetosa	.	.	.	.	.	.	.	.	+
Accompanying sp.:									
Carpinus betulus b	.	.	.	+	x	.	.	+	.
Salix caprea b	.	.	.	+	x	.	.	+	.
Agrostis capillaris	.	1	+	+	.	+	+	+	.
Lolium perenne	.	+	+	.	.	.	.	.	+
43. *Lembotropis nigricans*	.	.	.	2	.	9	.	+	.
Knautia arvensis	.	.	.	r	.	r	.	r	.
Veronica chamaedrys	.	.	.	r	.	r	+	+	.
Anthriscus sylvestris	.	.	.	r	.	.	.	r	.
Agropyron repens	.	.	.	.	1	.	.	.	+
Artemisia vulgaris	.	.	.	.	r	.	.	.	r
44. *Chamaecytisus ratisbonensis*	.	.	.	.	.	.	7	x	.

Sporadic sp.:

Accompanying sp.: *Pinus sylvestris* b 62/+, *Potentilla arenaria* 63/1, *Poa annua* 63/+, *Polygonum aviculare* 63/+, *Dicranella heteromalla* d 63/+, *Linaria vulgaris* 64/1, *Scleropodium purum* d 65/+, *Brachythecium rutabulum* 65/+, *Tilia cordata* c 66/x, *Quercus robur* c 66/x, *Fragaria vesca* 66/+, *Plantago major* 66/r, *Torilis japonica* 66/r, *Aegopodium podagraria* 66/r, *Trifolium repens* 66/r, *Corylus avellana* b 68/+, *Fraxinus excelsior* b 68/+, *Galium schultesii* 68/1, *Convallaria majalis* 68/1, *Hieracium murorum* 68/r, *Veronica officinalis* 68/+, *Geum urbanum* 70/+, *Urtica dioica* 70/+, *Galium aparine* 70/+, *Chelidonium majus* 70/+, *Stellaria media* 70/+, *Fallopia dumetorum* 70/r, *Capsella bursa-pastoris* 70/r, *Anthemis arvensis* 70/r, *Arabis glabra* 70/r.

36. The community with *Juncus articulatus* (rec. 59) was recorded only on one site: near peat pits in the "Brodek" forest range, covering an area of 5 m^2. It is distinguished by the domination of *Juncus articulatus* (60% of coverage). Fijałkowski (5) describes similar expanses in the rank of the association *Triglochio-Juncetum articulati.*

Communities of the class *Nardo-Callunetea* (Table 3, rec. 60–61)

37. The class is represented only by one association — *Calluno-Nardetum*, in which the characteristic and dominant species is *Nardus stricta* (60–70% of coverage). A significant feature is a high participation in it of species growing in poor, sandy habitats, for example *Luzula campestris, Thymus serpyllum, Linaria vulgaris, Carex hirta.*

Small expanses of the association were found in the western fringe of the "Bilka" meadows, in the vicinity of young pine forests (sections 508 and 516, the Kock Forest District). It is also found along the road crossing those meadows, where in elevations there are found *Galium mollugo, G. verum* and *Ajuga genevensis* in the admixture.

Communities of the class *Sedo-Scleranthetea* (Table 4, rec. 62–64)

The class is represented by three associations growing on sand:

38. *Spergulo vernalis-Corynephoretum* (rec. 62) is characterized by the domination of *Corynephorus canescens* (60% coverage). In the admixture there are numerous specimens of species from dry, acid habitats: *Jasione montana* (20% coverage) and *Rumex acetosella.* A small percentage of bryophytes is also marked, for example *Polytrichum piliferum, Rhacomitrium canescens, Ceratodon purpureus.* The association develops on the fringes of pine monocultures in the vicinity of Talczyn and Tereba (the Kock Forest District).

39. *Herniario glabrae — Agrostietum vulgaris* (rec. 63) in the PLA "Annówka" is a very rare species. Recorded only on the dam in section 515/517, the Kock Forest District, covering an area of 5 m^2. It is made up of numerous plant specimens growing on dry, acid ground with a high sand admixture: *Herniaria glabra* (coverage of 30%), *Thymus serpyllum, Potentilla arenaria, Trifolium arvense* and others.

According to Fijałkowski (5), this association is always tried with podzolic and yellow-brown soils composed of low-loamy and loamy sands.

40. *Rumici — Sedetum acris* (rec. 64) covers ca. 10 m^2 near an expanse of *Herniario glabrae — Agrostietum vulgaris.* The association is composed of concentrations of *Sedum acre* (coverage of 40%) with an admixture of *Arenaria*

serpyllifolia, Dianthus deltoides, Bromus mollis and other species growing on sand.

Communities of the class *Trifolio-Geranietea sanguinei* (Table 4, rec. 65–69)

The class is represented by one association and four fringe-plants communities with an indeterminate syntaxonomic rank.

41. *Geranio-Trifolietum alpestris* (rec. 65) is characterized by the domination of *Trifolium alpestre* (60% cover). In the admixture there are single shrubs of *Carpinus betulus* and *Salix caprea* and numerous *Lembotropis nigricans* and *Festuca rubra.*

In the PLA "Annówka" this is a rare fringe-plants community, reported on the southern fringe of the Szlachecki Las forest, near a forest road from Annówka — Pasmugi. It covers the area of 4–5 m^2, in the vicinity of communities with *Lembotropis nigricans* and *Astragalus glycyphyllos.*

42. Community with *Trifolium medium* (rec. 66) develops in thinned sites, mainly near the roads crossing the shining oak forest and at the intersection of section limits, for example in section 520, the Borki Forest District, 511/512, the Kock Forest District, in the farmers' forest of the village of Pasmugi. *Trifolium medium* reaches 80% coverage on the area of 5–15 m^2. Similar expanses were described from the forests in the vicinity of Lublin (15).

43. Community with *Lembotropis nigricans* is made up of a dense expanse of the yellow-flowered broom (*Lembotropis nigricans*) with the coverage of 90%. It is found an area of 4–5 m^2, on the roadside edge in section 496, the Kock Forest District, in the vicinity of *Geranio-Trifolietum alpestris* and *Querco roboris--Pinetum.*

Fijałkowski (5) classifies expanses with *Lembotropis nigricans* as having the ranks of associations *Cytiso-Quercetum* and *Cytiso-Pinetum.* As a thermophilous fringe-plants community it has been described from the fringes of forests near Lublin (15).

44. Community with *Chamaecytisus ratisbonensis* (rec. 68) was recorded only on the SE fringe of section 520, the Borki Forest District, covering the area of 5–7 m^2. Together with *Chamaecytisus ratisbonensis*, which reaches the cover of 70% there are: *Clinopodium vulgare, Galium schultesii, Convallaria majalis, Genista tinctoria* and others. Fijałkowski (5) assigns the expanses with *Chamaecytisus ratisbonensis* to the association *Cytiso-Quercetum.*

45. Community with *Astragalus glycyphyllos* (rec. 69) was recorded only in one station, on a roadside edge in section 496, the Kock Forest District, from the SE-side. It covers the area of 6 m^2 in the vicinity of *Geranio-Trifolietum*

alpestris and the community with *Lembotropis nigricans*. These are fringe-plants communities of the dry-ground forest and the shining oak forest.

Communities of the class *Rhamno-Prunetea* (Table 5, rec. 70)

46. This class is represented by one protection-zone association: *Sambuco--Prunetum spinosae*. It developed on the north-western fringe of section 526, the Borki Forest District (near the village of Annówka), covering the area of several dozen m^2. In the studied expanse *Prunus spinosa* (90% coverage) dominates. It is accompanied by sparse specimens of synanthropic plant: *Urtica dioica, Ballota nigra, Chelidonium majus* and others.

Communities of the class *Bidentetea tripartiti* (Table 5, rec. 71–76)

Two associations represent this class:

47. *Polygono-Bidentetum* (rec. 71–75) develops in two variants. One of them is characterized by the domination of *Polygonum hydropiper* (coverage of 50–80%), the other — by that of *Bidens cernua* (coverage of 90%). Other plants are found in negligible quantities.

The expanses of the association occur most often near wet, inner-forest roads (for example in sections 532, 507) and on the intersection of section dividing lines (for example 500/499/506/505). They also cover the rims of ditches, occupying the area of several to several dozen m^2.

48. *Leersio-Bidentetum* (rec. 76) was reported only in one station, in section 532, the Borki Forest District, covering the area of 2–3 m^2. The main component of the association is *Leersia oryzoides* (coverage of 90%) growing along the stream banks, S of the little pond of Tyśmianka. In the vicinity of it *Polygono--Bidentetum* occurs with dominant *Bidens cernua*.

Communities of the class *Epilobietea angustifolii* (Table 5, rec. 77–82)

Five plant associations were distinguished within the class.

49. *Calluno-Sarothamnetum* (rec. 77) is distinguished by the domination of *Sarothamnus scoparius* (coverage of 70%) over the other plant species found in it, for example *Calamagrostis epigeios, Festuca rubra, Agrostis capillaris, Poa pratensis*.

The community was recorded on the fringe of a pine forest, in section 503, the Kock Forest District (near Tereba), covering the area of a dozen-odd m^2. Similar expanses were also described from other forest complexes (for example 12, 15).

50. *Epilobietum* (*Chamaenerionetum*) *angustifolii* (rec. 78) is a synanthropic community covering the sandy roadside edge within the fresh pine forest, in section 530 the Borki Forest District. *Chamaenerion angustifolium*, recognized as the association's characteristic species, forms a dense expanse (coverage of 90%) on the area of 8 m^2.

51. *Rubetum idaei* (rec. 79–80) develops most often on dry-ground forest cuttings, in inner-forest roadside edges and in forest fringes (for example in section 525, the Borki Forest District, 492 the Kock Forest District).

The association is formed of the expanses of red raspberry (*Rubus idaeus*) accompanied chiefly by synanthropic plants species and those of the coniferous forest, for example *Pteridium aquilinum, Calamagrostis epigeios, Galeopsis ladanum, Carex hirta.*

52. *Rubetum hirtae* (rec. 81) is characterized by the large coverage (60%) of *Rubus hirtus.* It covers three to five-year old cuttings afforested with the pine with an admixture of the common oak (*Quercus robur*) in section 509, the Kock Forest District.

53. *Rubo-Calamagrostietum epigei* (rec. 82) is a community growing on a cut-over, covering a considerable area in sections 517, 509 and 503, the Kock Forest District. It is made up of concentrations of *Calamagrostis epigeios* (coverage as high as 80%), often with an admixture of *Rubus plicatus* and *R. hirtus*, less often of other synanthropic species.

Communities of the class *Artemisietea* (Table 5, rec. 83–88)

The class is represented by four associations.

54. *Impatientetum parviflorae* (rec. 83–84) is a synanthropic community that covers not often walked, wet paths and section dividing lines in the western part of the Kock Forest District (for example in section 506, 507). *Impatiens parviflora*, recognized by Fijałkowski (5) as the association's characteristic species, reaches 90–100% coverage. It is most often accompanied by *Polygonum hydropiper*, les often by *Stellaria media, Ranunculus repens, Poa annua, Mentha aquatica.*

55. *Eupatorietum cannabini* (rec. 85) forms a dense expanse of *Eupatorium cannabinum* (coverage of 80%) with an admixture of *Urtica dioica* (coverage of 10–20%).

Community occupies the area of 5–6 m^2 in the "Brodek" forest range, E of Talczyn (near a ditch), in the vicinity of *Salicetum pentandro-cinereae.*

56. *Polygonetum* (*Reynoutrietum*) *sachalinense* (rec. 86) was reported in three stations in the Kock Forest District. Two dense expanses of *Reynoutria sachalinensis* (of 5–10 m^2) occur near a forest road in section 502 (near Tereba),

Tab.5. Floristic composition of the communities from the classes: *Bidentetea tripartiti, Epilobietea angustifolii, Artemisietea, Plantaginetea maioris, Chenopodietea* and *Secalietea*

No. of community	71	72	73	47	74	75	76	48	77	49	78	50	79	51	80	52	81	53	82	54	83	84	85	55	86	56	87	88	57	89	58	90	91	59	92	60	93	61	94	95	62	96	63	97	98	64	99
No. of record	-	-	-	:	-	-	-	-	-	-	10	-	+	-	10	20	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Density of shrub layer b in %	100	100	100	100	100	100	100	90	90	60	-	-	100	100	90	90	100	100	100	100	100	100	100	100	100	90	90	80	90	80	90	80	90	100	90	90	80	80	100	100	100	100	100	100	100	40
Cover of herb layer c in %	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cover of moss layer d in %																																														
47. Polygono-Bidentetum:																																														
Polygonum hydropiper	8	8	8	5	1	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	1	1	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
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48. Leersio-Bidentetum:																																														
Leersia oryzoides	.	.	.	.	.	+	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bidention tripartiti, Bidentetea tripartiti:																																														
Bidens cernua	.	.	.	.	.	9	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bidens tripartita	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.
Ranunculus sceleratus	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	+	.	.	.	.	.	.	.	.	.	.
49. Calluno-Sarothamnetum:																																														
Sarothamnus scoparius	.	.	.	.	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
50. Chamaenerionetum angustifolii:																																														
Chamaenerion angustifolium	.	.	.	.	.	.	.	.	9	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
51. Rubetum idaei:																																														
Rubus idaeus	+	.	.	.	.	.	.	.	+	.	+	.	4	.	5	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
52. Rubetum hirtae:																																														
Rubus hirtus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	6	1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
53. Rubo-Calamagrostietum epigei:																																														
Calamagrostis epigeios	.	.	.	.	.	.	.	.	2	.	.	+	.	.	.	.	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Athyrio-Rubion idaei, Epilobietea angustifolii:																																														
Fragaria vesca	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gnaphalium sylvaticum	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sambucus racemosa b	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	r	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rubus plicatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
54. Impatientetum parviflorae:																																														
Impatiens parviflora	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9	9	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
55. Eupatorietum cannabini:																																														
Myosoton aquaticum	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
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56. Polygonetum sacchalinense:																																														
Reynoutria sachalinensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
57. Rubo-Solidaginetum serotinae:																																														
Solidago gigantea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Allianion, Onopordetalia, Artemisietea:																																														
Rumex obtusifolius	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Urtica dioica	.	.	.	.	x	r	.	.	.	.	.	.	.	.	.	.	.	.	+	+	1	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
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Alliaria officinalis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Chelidonium majus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
58. Lolio-Plantaginetum:																																														
Chamomila suaveolens	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Plantago major v. *typica*	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	2	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.
Capsella bursa-pastoris	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.
Lolium perenne	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
59. Prunello-Plantaginetum:																																														
Poa annua v. *aquatica*	1	+	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	r	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Plantago major v.*brachystachya*	1	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Prunella vulgaris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
60. Caricetum hirtae:																																														
Carex hirta	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Polygonion avicularis:																																														
Poa annua	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	3	2	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bryum argenteum d	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
61. Rumici-Alopecuretum:																																														
Rorippa sylvestris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.
Alopecurus geniculatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	7	.	.	.	.	.	.	.	.	.	.	.	.
62. Juncetum macri:																																														
Juncus tenuis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.
Agropyro-Rumicion crispi:																																														
Agrostis stolonifera	.	+	r	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla anserina	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
63. Echinochloo-Setarietum:																																										2	2	.	.	
Echinochloa crus-galli	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Panico-Setarion:																																														
Setaria glauca	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	2	.		
Setaria viridis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.			
Digitaria ischaemum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.			
Chenopodietea:																																										+	3	.	+	
Chenopodium album	.	.	r	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.		
Polygonum aviculare ssp.*heterophyllum*	.	.	r	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.		
Oxalis stricta	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.		
Polygonum lapathifolium	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.		
Galinsoga parviflora	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.		
Sonchus oleraceus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
64. Arnoseridо-Scleranthetum:																																														
Arnoseris minima	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	2		
Arnoseridion minimae, Aperetalia:																																														
Apera spica-venti:	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1		
Vicia hirsuta	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.		
Scleranthus annuus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1		
Arabidopsis thaliana	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r		
Molinio-Arrhenatheretea:																																													
Taraxacum officinale	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	r	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
Scirpus sylvaticus:	.	.	.	.	r	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.		
Poa pratensis	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
Anthriscus sylvestris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	r	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
Trifolium repens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	1	+	+	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.		
Myosotis palustris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
Deschampsia caespitosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	.	.	.		
Lythrum salicaria	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.		
Accompanying sp:																																														
Corylus avellana b	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
Quercus robur b	.	.	.	.	.	.	.	.	.	.	+	+	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
Pinus sylvestris b	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
Pinus sylvesrtis c	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
Picea abies b	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
Picea abies c	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
Betula pendula b	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
Betula pendula c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
Populus tremula b	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
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Frangula alnus b	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
Frangula alnus c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
Salix cinerea c	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	r	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
Ranunculus repens	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
Lapsana communis	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.		
Mentha aquatica	+	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	r	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.		
Stellaria media	1	+	1	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	+	.	.	+	.	.	.	+	2	.	.	.	.	.	.	.	.	.	.	.	+	1	1	.	.	
Juncus bufonius	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
Achillea millefolium	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+		
Conyza canadensis	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	r	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+		
Agrostis capillaris	.	.	+	+	.	.	+	+	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+		
Sinapis arvensis	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	2	+		
Galium aparine	.	.	.	.	x	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
Peucedanum palustre	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.		
Fallopia convolvulus	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	.	.		
Galeopsis ladanum	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	+	.		
Rumex acetosella	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+		
Trientalis europaea	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
Veronica officinalis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
Carex pilulifera	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
Galeopsis pubescens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.		
Secale cereale	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8	.		
Alisma plantago-aquatica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	+	.	.	.	.	.	.	.	.		
Oenanthe aquatica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	r	.	.	.	.	.	.	.	.		
Epilobium palustre	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	r	.	.	.	.	.	.	.	.		
Solanum tuberosum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8	7	.	.		
Agropyron repens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+		
Equisetum arvense	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	1		
Galeopsis tetrahit	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.		
Polygonum persicaria	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.		
Viola arvensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	r		
Spergula arvensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	+		
Erodium cicutarium	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	r		
Centaurea cyanus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	+		

Sporadic sp.:

Molinio-Arrhenatheretea: Leontodon autumnalis 73/+, *Festuca rubra* 77/1, *Lysimachia vulgaris* 78/+, *Holcus lanatus* 79/+, *Juncus effusus* 81/r, *Poa trivialis* 85/+, *Molinia coerulea* 86/r, *Filipendula ulmaria* 91/r, *Galium mollugo* 92/+, *Stachys palustris* 96/2.

Accompanying sp.: *Oxalis acetosella* 71/1, *Athyrium filix-femina* 71/r, *Stellaria graminea* 74/r, *Glyceria fluitans* 75/+, *Chamaecytisus ratisbonensis* 77/+ *Veronica chamaedrys* 77/+, *Pimpinella saxifraga* 77/r, *Ceratodon purpureus* d 77/+, *Acer platanoides* c 79/r, *Ulmus laevis* c 79/r, *Larix europaea* c 79/1 *Hypericum perforatum* 79/r, *Pteridium aquilinum* 80/4, *Robinia pseudacacia* b 80/1, *Sorbus aucuparia* c 80/+, *Carex ericetorum* 81/1, *Hieracium pilosell* 81/+, *Carex leporina* 81/+, *Pyrus communis* c 81/r, *Tilia cordata* 82/+, *Plagiomnium affine* d 83/+, *Atrichum undulatum* d 83/+, *Alnusglutinosa* c 85/+, *Phalari arundinacea* 87/r, *Potentilla argentea* 89/r, *Lycopus europaeus* 91/1, *Mycelis muralis* 91/+, *Solanum dulcamara* 91/r, *Potentilla erecta* 91/r, *Viol reichenbachiana* 91/r, *Nardus stricta* 92/x, *Sagittaria sagittifolia* 93/+, *Typha angustifolia* 94/r, *Polygonum amphibium* 94/x, *Mentha arvensis* 96/1, *Cirsiu urvense* 97/+, *anthemis arvensis* 97/+, *Filago minima* 99/+, *Myosotis stricta* 99/+.

while one expanse (of 20 m^2) — over a ditch in section 511/512, in the vicinity of the farmers' forests. All the expanses cover fertile, permanently wet loamy soils.

57. *Rubo-Solidaginetum serotinae* (rec. 88) develops on roadside edges (for example between sections 511/512) and on cuttings (section 500, the Kock Forest District). The dominant species is *Solidago gigantea* (coverage of 80%), accompanied mostly by *Rubus idaeus. R. hirtus, R. plicatus* and *Impatiens parviflora.*

Communities of the class *Plantaginetea maioris* (Table 5, rec. 89–95)

The class is represented by five associations.

58. *Lolio-Plantaginetum* (rec. 89–90) is characterized by concentrations of *Plantago major* (coverage of 20–40%) with an admixture of chiefly *Poa annua* (coverage of 20–30%), *Polygonum hydropiper, Trifolium repens* and *Stellaria media.*

The association occupies wet roadside edges of inner-forest roads and intersections of section dividing lines, mainly in the Kock Forest District.

59. *Prunello-Plantaginetum* (rec. 91) was recorded on a wet, not walked up section dividing line 525/529 in the Borki Forest District. It neighbours *Lolio--Plantaginetum* and *Polygono-Bidentetum.* It is characterized by a considerable percentage of *Prunella vulgaris* (coverage of 30%), accompanied by *Mentha aquatica, Polygonum hydropiper, Deschampsia caespitosa*, and less often by other species.

60. *Caricetum hirtae* (rec. 92) is a rare association in the area investigated. It is composed of small expanses of *Carex hirta* (with coverage as high as 60%) with an admixture of grasses, especially *Poa pratensis,* less often *Deschampsia caespitosa.* They were recorded near the road crossing the "Bilka" meadows near Talczyn, in the vicinity of *Poo-Festucetum rubrae.*

61. *Rumici-Alopecuretum* (rec. 93–94) is characterized by the domination of *Alopecurus geniculatus.* It reaches 50–70% coverage and it is accompanied by aquatic, rush-plant and meadow species because the expanses studied are connected with the zone of water-land transition. They occupy shallowed sites in the SW part of the little pond of Tyśmianka (section 528 the Borki Forest District).

62. *Juncetum macri* (rec. 95) was recorded in the Kock Forest District, on the intersection of dividing lines of sections 500/499/506/505. *Juncus teniuis* forms a dense expanse (coverage of 50%) in the vicinity of *Polygono-Bidentetum.*

Communities of the class *Chenopodietea* (Table 5, rec. 96–97)

63. The class is represented only by the association *Echinochloo-Setarietum.* It develops mainly in potato and vegetable crops. The dominant species are: *Echinochloa crus-galli, Chenopodium album* and *Stachys palustris.* In smaller percentages there are: *Stellaria media, Mentha arvensis, Fallopia convolvulus* and others. Fijałkowski (4) assigns similar expanses to the subassociations: *Echinochloo-Setarietum stachyetosum palustris* (rec. 96) and *E.-S. stellarietosum mediae* (rec. 97).

Communities of the class *Secalietea* (Table 5, rec. 98–99)

65. The class is represented by association *Arnoserido-Scleranthetum* reported in Annówka in rye crops. In the fields neighbouring the PLA "Annówka" it also occurs in oats, buckwheat and lupin crops.

The characteristic and dominant species in the community is *Arnoseris minima* (coverage of 20–30%). It is accompanied by comparatively numerous specimens of: *Setaria glauca, Apera spica-venti, Spergula arvensis, Sinapis arvensis* and *Equisetum arvense.* The association develops on dryer habitats, poorer and more acid than *Echinochloo-Setarietum.*

RESULTS

The Protected Landscape Area "Annówka" is characterized by a high diversity of plant cover. Natural-type communities dominate, while in terms of the area covered, forest associations predominate (16). However, in quantitative terms, there are decidedly more non-forest communities. Worth noting are aquatic, marsh and peatbog communities that are spatially connected to surface waters.

As a result of investigations carried out on inner-forest ponds, streams, meadows, fields, roads, dams and forest cuttings, in pine thickets and on forest fringes, 56 associations and eight plant communities with an indeterminate phytosociological rank were distinguished. These phytocenoses were listed in Tables 1–5 and their short floristic and ecological descriptions were given. Within associations, subassociations, variants and facies were distinguished.

The communities investigated were grouped in 16 classes, 19 orders and 27 alliances. The most numerous group are rush-plant communities of the class *Phragmitetea.* They cover the fringes of the Tyśmianka ponds, ditches and local depressions in inner-forest meadows. The majority of the communities described occur on very small and scanty expanses. In terms of area the largest percentage goes to: *Typhetum angustifoliae, Phragmitetum communis* and *Caricetum acutiformis.*

The second most numerous communities are the meadow ones of the class *Molinio-Arrhenatheretea.* In this group the largest area is occupied by *Poo--Festucetum rubrae* and *Deschampsietum caespitosae.*

A comparatively large group are synanthropic communities of the classes: *Bidentetea tripartiti, Epilobietea angustifolii, Artemisietea, Plantaginetea maioris, Chenopodietea* and *Secalietea.* Of these, the segetal associations: *Echinochloo--Setarietum* and *Arnoserido-Scleranthetum* occupy the largest area.

The studied plant associations and communities exhibit varied degrees of successional and phytosociological connection. In terms of their composition and diversity they do not significantly differ from those given so far. Most of them belong to the frequently described ones both on a regional and national scale (for example 1–2, 4–15, 18, 20, 22–23). Some associations like: *Glycerietum plicatae, Epilobietum hirsuti, Calluno-Sarothamnetum, Epilobietum* (*Chamaenerionetum*) *angustifolii, Rubetum hirtae, Caricetum hirtae, Impatientetum parviflorae* and communities with *Trifolium medium, Lembotropis nigricans, Chamaecytisus ratisbonensis* belong to those occurring nationwide very often; they are, however, comparatively rarely described (for example 1, 5, 12, 15).

The associations that occur comparatively rarely in the Lublin region include: *Ranunculetum circinati, Nupharo-Nymphaeetum albae, Cicuto-Caricetum pseudocyperi, Caricetum paniculatae, Caricetum vesicariae, Herniario glabrae-Agrostietum vulgaris, Rumici-Sedetum acris, Geranio-Trifolietum alpestris, Sambuco--Prunetum spinosae, Leersio-Bidentetum, Polygonetum* (*Reynoutrietum*) *sachalinense, Rumici-Alopecuretum* and communities with: *Potamogeton pusillus, Alisma plantago-aquatica, Juncus articulatus* and *Astragalus glycyphyllos.*

The most interesting of those named in the PLA "Annówka" are associations: *Nupharo-Nymphaeetum albae* (with *Nymphaea alba*), *Caricetum paniculatae*, *Leersio-Bidentetum* and *Polygonetum* (*Reynoutrietum*) *sachalinense,* as well as communities with *Potamogeton pusillus, Alisma plantago-aquatica, Astragalus glycyphyllos.*

In the course of floristic studies, stations of several species were found, which belong to the protected plants and are considered rare in the Lublin region. They are: *Nymphaea alba, Senecio paludosus* and *Rumex thyrsiflorus* — in the little pond of Tyśmianka; *Dactylorhiza incarnata, Ranunculus sceleratus* and *Triglochin palustre* — in the "Brodek" forest range near Talczyn, and *Lysimachia thyrsiflora* — on an inner-forest swamp in section 499, the Kock Forest District.

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