

MARSH VEGETATION (*PHRAGMITO-MAGNOCARICETEA*) IN VICINITY OF THE TRAKOVICE VILLAGE

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Súhrn: Močiarna vegetácia (*Phragmito-Magnocaricetea*) v blízkom okolí Trakovíc. Na jednotlivých lokalitách bolo nájdených 6 spoločenstiev triedy *Phragmito-Magnocaricetea*: *Phragmitetum vulgaris*, *Typhetum latifoliae*, *Sparganietum erecti*, spoločenstvo s *Iris pseudacorus*, *Caricetum acutiformis* a *Caricetum gracilis*. Najhojnejším spoločenstvom na študovanom území je *Phragmitetum vulgaris* a *Caricetum acutiformis*. Medzi vzácne spoločenstvá patrí spoločenstvo s *Iris pseudacorus* a *Caricetum gracilis*.

Key words: Slovakia, plant communities

Introduction

Malovcová (2005, 2006) and Malovcová-Staníková (2007) studied flora, aquatic and marsh vegetation in Trnavská pahorkatina Heights. Recently research focus to area situated in floodplain of the Dudvák River (Malovcová-Staníková ined.).

The goal of the work is to present new knowledge about spreading of the communities of the *Phragmito-Magnocaricetea* in vicinity of the Trakovice Village.

The associations of *Phragmitetum vulgaris* and *Caricetum acutiformis* are the most abundant communities in the studied area. Stands with *Iris pseudacorus* and the *Caricetum gracilis* belong to the rarest communities in the studied area.

Communities form physiognomically homogeneous stands. They are species poor communities. Their looks are formed by dominant species.

Studied area

Trakovice Village is situated in Trnavská pahorkatina Heights, on shores the Dudvák River (lowland river). The mean temperature of the coldest month (January) is - 1,5 °C, the mean temperature of the warmest month (July) is 20,0 °C, and the mean yearly temperature is 9,4 °C. The yearly average precipitation attains 585 mm (Feráková et al. 1968). Phytogeographically this area is characterized by the Eupannonian flora (Futák 1966, 1984).

Material and methods

In the years 2005 and 2006 the phytocoenological relevés were made. The methods of Zürich-Montpellier School (Braun-Blanquet 1964) were used during the field research of plant communities and the data processing. The seven-degree Braun-Blanquet's scale was used to estimate the abundance and dominance of the plant species.

The data were put into the database of phytocoenological relevés in the program TURBOVEG (Hennekens 1996a). The phytocoenological table was edited in the program MEGATAB (Hennekens 1996b).

The names of the plants are in accordance with the Checklist of non-vascular and vascular plants of Slovakia (Marhold, Hindák 1998). The names of the plant communities from the class *Phragmito-Magnocaricetea* are presented according to Ořáhelová et al. (2001). The categories of threat and rareness for the vascular plants are stated by the review of Feráková et al. (2001).

Results and discussion

Syntaxonomical survey of plant communities

Class : *Phragmito-Magnocaricetea* Klika in Klika et Novák 1941

Order: *Phragmitetalia* Koch 1926

Alliance: *Phragmition communis* Koch 1926

1. as.: *Phragmitetum vulgaris* von Soó 1927

2. as.: *Typhetum latifoliae* Lang 1973

3. as.: *Sparganietum erecti* Roll 1938

4. stands with *Iris pseudacorus*

Alliance: *Magnocaricion elatae* Koch 1926

Suballiance: *Caricion rostratae* (Balátová-Tuláčková 1963) Oberd. et al. 1967

5. as.: *Caricetum acutiformis* Egger 1933

Suballiance: *Caricion gracilis* (Neuhäusl 1959) Oberd. et al. 1967

6. as.: *Caricetum gracilis* Almquist 1929

1. *Phragmitetum vulgaris*

Stands of the community occur in a littoral zone of canals and in depressions in fields. This community has wide ecological amplitude, its water regime is dynamic. The stands are flooded mainly during spring. The vegetation tolerates both autumn and winter drainages. The *Phragmitetum vulgaris* represent often the first silting stadium of the standing waters, it participates in terrestrialisation process.

The community is built on dominancy of the species *Phragmites australis* and on the diagnostic species of the class *Phragmito-Magnocaricetea* (Tab. 1). The average cover of the stands is 99 %. The average number of species in the relevé is 6.

The stands of community belong to the most abundant communities in the studied area.

Malovcová-Staníková (2006) studied *Phragmitetum vulgaris* in vicinity of the Hlohovec Town. This community was described from the next Nitrianska pahorkatina Heights (Ripka 1999).

2. *Typhetum latifoliae*

Stands of the community occur in the littoral zone of canals of the studied area. Their water regime is fluctuating during the vegetation period. If terrestrial phase is longer, the community is damaged. The community forms monocoenoses in hydrophase. It is hemerophile. It participates in terrestrialisation process, too.

Tab. 1. *Phragmitetum vulgaris* in the vicinity of Trakovice Village

Relevé number	1	2	3	4	5	6	7	8	9	S
Relevé area (m ²)	2	2	2	2	2	2	2	2	2	
	0	0	5	5	5	5	5	0	0	
<i>Phragmito-Magnocaricetea, Phragmitetalia</i>										
<i>Equisetum fluviatile</i>	+	+	.	.	.	.	.	.	.	II
<i>Carex acutiformis</i>	.	.	.	.	.	.	1	.	.	I
<i>Rumex hydrolapathum</i>	.	1	.	.	.	.	.	.	.	I
<i>Lysimachia vulgaris</i>	.	.	.	.	.	.	.	.	+	I
<i>Phragmition communis, Phragmitetum vulgaris</i>										
<i>Phragmites australis</i>	5	5	5	5	5	5	5	5	4	V
The constant taxa										
<i>Calystegia sepium</i>	2	2	1	1	1	1	3	2	+	V
<i>Urtica dioica</i>	2	2	1	.	+	.	.	3	3	IV
<i>Equisetum arvense</i>	.	.	+	+	+	.	.	+	.	III
Other taxa										
<i>Galium aparine</i>	.	.	.	.	3	.	.	1	3	II
<i>Symphytum officinale</i>	+	.	.	.	.	+	.	.	1	II
<i>Rubus caesius</i>	.	.	+	+	.	.	.	.	.	II
<i>Cirsium arvense</i>	+	+	.	.	.	.	.	.	.	II

Appendix 1:

Tab. 1. Species found only in one relevé:

Alopecurus pratensis - + (9); *Cardaria draba* - + (9); *Galium verum* - + (2); *Lactuca serriola* - + (8); *Poa trivialis* - + (8); *Potentilla reptans* - + (1); *Artemisia vulgaris* - r (8); *Dipsacus fullonum* - r (8); *Carex hirta* - r (1).

Localities of the relevés and other information about the phytocoenological relevés:

(relevé number, village/town, locality, cover herb layer, date)

1. Trakovice, south of the village, 50 m north of way to Bučany's floodplain forest, in right shore of the canal; E₁ 100 %; August 12, 2005
2. Trakovice, south of the village, 150 m north of way to Bučany's floodplain forest, in right shore of the canal; E₁ 100 %; August 12, 2005
3. Trakovice, north of the village, Rakytovký kanál Canal, cca 500 m north of delta to the Dudvák River, in right shore of the canal; E₁ 100 %; June 8, 2006
4. Trakovice, north of the village, Rakytovký kanál Canal, cca 10 m north of the relevé number 3, in right shore of the canal; E₁ 100 %; June 8, 2006
5. Trakovice, cca 100 m north of the village, cca 30 m east of the Dudvák River, near spring; E₁ 100 %; June 8, 2006
6. Trakovice, north of the village, Rakytovký kanál Canal, cca 500 m north of the relevé number 4, in right shore of the canal; E₁ 100 %; June 8, 2006
7. Trakovice, north of the village, Rakytovký kanál Canal, cca 50 m south of hunting vista, in left shore of the canal; E₁ 100 %; June 8, 2006
8. Trakovice, southeast of the village, 30 m south of way to Trakovice's floodplain forest, in right shore of the canal; E₁ 100 %; June 9, 2006
9. Trakovice, 20 m north of bridge of the road Trakovice – Hlohovec, in left shore of the canal; E₁ 95 %; June 8, 2006

It is created by dominance of the species *Typha latifolia* and by the diagnostic species of the class *Phragmito-Magnocaricetea*.

This association is the vulnerable community in the studied area.

Malovcová-Stanišková (2006) studied *Typhetum latifoliae* in vicinity of the Hlohovec Town. The community was described at Nitrianska pahorkatina Heights (Ripka 1999).

The floristic composition of the community is documented by the following relevés:

Relevé No. 1: Trakovice, cca 1500 m southeast of the village, in lauder of the canal; the sampled area of 20 m²; the cover of E_c 100%; September 3, 2005: *Typha latifolia* 4, *Calystegia sepium* 3, *Carex acutiformis* 2, *Symphytum officinale* 2, *Galium verum* 1, *Glyceria maxima* 1, *Lycopus europaeus* 1, *Lysimachia vulgaris* 1, *Rubus caesius* 1, *Solanum dulcamara* 1, *Chenopodium* sp. +, *Cirsium arvense* +, *Epilobium ciliatum* +, *Lamium purpureum* +, *Pastinaca sativa* +, *Phragmites australis* +, *Rosa canina* +.

Relevé No. 2: Trakovice, cca 10 m south of bridge of road Hlohovec - Trnava, in lauder of the canal; the sampled area of 20 m²; the cover of E_c 90%; June 9, 2006: *Typha latifolia* 4, *Lemna minor* 2, *Calamagrostis epigejos* 1, *Glyceria maxima* 1, *Lycopus europaeus* 1, *Phragmites australis* 1, *Sparganium erectum* 1, *Veronica beccabunga* 1, *Alisma plantago-aquatica* +, *Lythrum salicaria* +, *Symphytum officinale* +.

Relevé No. 3: Trakovice, cca 100 m south of way to Trakovice's floodplain forest, in lauder of the canal; the sampled area of 20 m²; the cover of E_c 90%; June 13, 2006: *Typha latifolia* 5, *Lysimachia nummularia* 1, *Persicaria amphibia* 1, *Phalaroides arundinacea* 1, *Calystegia sepium* +, *Equisetum arvense* +, *Glyceria maxima* +, *Lycopus europaeus* +, *Symphytum officinale* +.

3. *Sparganietum erecti*

Stands of community occur in the littoral zone of the canals of the studied area. Their water regime is dynamic. They tolerate fall in water, however, ones are resistant to drainage of the soil dimly. They quickly respond to changes of ecological conditions. It manifests itself in occupying of a new space or subsidencing. Phytocoenoses considerably contribute to silting water sites.

The community is created by dominance of the species *Sparganium erectum* and by the diagnostic species of the class *Phragmito-Magnocaricetea*.

Recorded vulnerable taxon is *Butomus umbellatus* (VU). This association is the vulnerable community in the studied area, because it forms small patches and strips, often as pioneer community.

Malovcová-Stanišková (2006) studied the community in vicinity of the Hlohovec Town. Ripka (1999) studied this community at Nitrianska pahorkatina Heights.

The floristic composition of the community is documented by the following relevés:

Relevé No. 1: Trakovice, southeast-east of the village, cca 200 m north of way to Bučany's floodplain forest, in lauder of the canal; the sampled area of 20 m²; the cover of E_c 85%; June 13, 2006: *Sparganium erectum* 5, *Iris pseudacorus* 2, *Lysimachia nummularia* 2, *Butomus umbellatus* 1, *Carex acutiformis* 1, *Veronica beccabunga* 1, *Alisma plantago-aquatica* +, *Lycopus europaeus* +.

Relevé No. 2: Trakovice, southeast-east of the village, cca 30 m north of way to Bučany's floodplain forest, in lauder of the canal; the sampled area of 20 m²; the cover

of E_c 85%; June 13, 2006: *Sparganium erectum* 5, *Iris pseudacorus* 2, *Carex acutiformis* 1, *Lythrum salicaria* 1, *Schoenoplectus lacustris* 1, *Alisma plantago-aquatica* +, *Lycopus europaeus* +, *Symphytum officinale* +, *Typha angustifolia* +.

4. Stands with *Iris pseudacorus*

Stands of community occur in the littoral zone of the canals of the studied area. Their water regime is relatively dynamic. Water level (water line) falls in the launders of the canals in summer. The community is hemerophile, too.

The community is created by dominance of the species *Iris pseudacorus* and by the diagnostic species of the class *Phragmito-Magnocaricetea*.

This association is the vulnerable community in the studied area, because it forms small patches and strips.

Ripka (1999) studied this community at Nitrianska pahorkatina Heights.

The floristic composition of the community is documented by the following relevés:

Relevé No. 1: Trakovice, southeast-east of the village, cca 80 m north of way to Trakovice's floodplain forest, in launder of the canal; the sampled area of 20 m²; the cover of E_c 90%; June 9, 2006: *Iris pseudacorus* 5, *Sparganium erectum* 2, *Caltha palustris* 1, *Carex acutiformis* +.

Relevé No. 2: Trakovice, southeast-east of the village, cca 200 m south of way to Trakovice's floodplain forest, in launder of the canal; the sampled area of 20 m²; the cover of E_c 80%; June 13, 2006: *Iris pseudacorus* 4, *Sparganium erectum* 2, *Glyceria maxima* 1, *Veronica beccabunga* 1, *Lycopus europaeus* +.

5. *Caricetum acutiformis*

The community occurs in the littoral zone of canals of the studied area. Their water regime is fluctuating during the vegetation period. The stands are flooded in spring, however water level falls in a short time. The community and its dominant taxon *Carex acutiformis* tolerate long-term limose and terrestrial ecophases.

The community is built on dominance of the species *Carex acutiformis* and on the diagnostic species of the class *Phragmito-Magnocaricetea* (Tab. 2). The average cover of the stands is 98%. The average number of species in the relevé is 13.

Recorded vulnerable taxon is *Scutellaria hastifolia* (VU). The stands of community belong to the most abundant communities in the studied area.

6. *Caricetum gracilis*

Stands of the community occur in the littoral zone of canals of the studied area. Their water regime is dynamic, floods are low and short-term. Groundwater decreases under soil surface in the summer. On the contrary long-lasting and high floods create fall in vitality of *Carex acuta*.

This community is created by dominance of the species *Carex acuta* and by the diagnostic species of the class *Phragmito-Magnocaricetea*.

This association is the rare community in the studied area.

Malovcová-Staníková (2006) studied this community in vicinity of the Hlohovec.

Tab. 2. *Caricetum acutiformis* in the vicinity of Trakovice Village

Relevé number	1 2 3 4 5 6 7 8 9 1 1 1 1 1 1 1 1 1 2	S
	0 1 2 3 4 5 6 7 8 9 0	
Relevé area (m ²)	2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	
	0 0 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
<i>Phragmito-Magnocaricetea, Phragmitetalia</i>		
<i>Lycopus europaeus</i>	+ + + . + + + . . .	II
<i>Typha latifolia</i>	. r r r . . + . . r +	II
<i>Iris pseudacorus</i>	3 3 . . . + +	I
<i>Lythrum salicaria</i>	+ . 1 +	I
<i>Lysimachia vulgaris</i>	. . + + . . +	I
<i>Rumex hydrolapathum</i>	. . . . . 1	I
<i>Equisetum fluviatile</i>	. . . . . + . . . . . . . . . . . . .	I
<i>Glyceria maxima</i>	. . . . . . . . . . . . . + . . . . .	I
<i>Mentha aquatica</i>	. . +	I
<i>Phalaroides arundinacea</i>	. . . . . . . . + . . . . . . . . . .	I
<i>Phragmites australis</i>	. . . . . . . + . . . . . . . . . . .	I
<i>Stachys palustris</i>	. . . . . . . . . . . . . . . . + . . .	I
<i>Magnocaricion elatae, Caricion rostratae, Caricetum acutiformis</i>		
<i>Carex acutiformis</i>	5 5 5 5 5 5 5 5 5 4 5 5 5 5 5 5 5 5 5	V
<i>Carex acuta</i>	. . . . . . . . . . . . . . . . 1 + +	I
<i>Caricion gracilis</i>		
<i>Cirsium arvense</i>	. . . . . + 1 . + r . . + 1 . + 1 + +	III
<i>Carex hirta</i>	. . . . . . + + 1 . . . 1 . + 1 + 1 .	II
<i>Alopecurus pratensis</i>	. . . . . . . . 1 . 1 + .	I
<i>Rumex crispus</i>	. . . . . . . . + . . . . . . . . . .	I
The constant taxa		
<i>Calystegia sepium</i>	. . . 1 2 2 3 . . 2 1 + + . . 2 . . 1 1	III
<i>Galium mollugo</i>	. . . . . . . 1 1 1 . 2 2 2 2 3 1 1 +	III
<i>Arrhenatherum elatius</i>	. . . . . . . 2 . 1 1 + 2 + 2 1 + 1 +	III
<i>Symphytum officinale</i>	. . . . + r + . . 1 . + 1 . 2 1 . + + 1	III
<i>Galium aparine</i>	. . . . . . 3 + + 2 1 . . . 1 1 1 +	III
<i>Lathyrus pratensis</i>	. . . . . . + r . + . + . + + + + . +	III
Other taxa		
<i>Equisetum arvense</i>	. . . . . . . 4 3 . . + 2 1 1 . + . +	II
<i>Pastinaca sativa</i>	. . 1 . + . . . + + + . . . + + + . .	II
<i>Convolvulus arvensis</i>	. . . . . . . 1 + + . . + 1 + 1 . . .	II
<i>Euphorbia esula</i>	. . . . . . . + . + . + + + . 1 + .	II
<i>Galium verum</i>	. . + + 2 + 1 2	II
<i>Dactylis glomerata</i>	. . . . . . . . . + . . 2 1 + + 1 .	II
<i>Achillea millefolium</i> agg.	. . . . . . . + . + . r . + +	II
<i>Rubus caesius</i>	. . . . + . . . . . . . . . 2 + 3	I
<i>Urtica dioica</i>	. . . . . 2 . 2 + . . 1 .	I
<i>Potentilla reptans</i>	. . . . 1 2 . . . + . . . + .	I

<i>Cirsium canum</i>	. . . . . r 1 + +	I
<i>Linaria vulgaris</i>	. . . . . + . . . . . + r . . . + . . .	I
<i>Artemisia vulgaris</i>	. . . . . . . . . . r r . r . . . r . . .	I
<i>Lactuca serriola</i>	. . . . . . . . . . + . + . . 1	I
<i>Silene vulgaris</i>	. . . . . . . . . . . . . + 1 +	I
<i>Chenopodium glaucum</i>	. . . . . + . . . . . . . . + + . . . . .	I
<i>Fallopia convolvulus</i>	. . . . . . . . . . . . . . . + + + . . . . .	I
<i>Persicaria amphibia</i>	. . . . . . . . . . . . . . + . . . + +	I
<i>Rosa canina</i>	. . 1 +	I
<i>Poa pratensis</i>	. . . . . . . . . . . . . . + + . . . . . . .	I
<i>Silene latifolia</i> subsp. <i>alba</i>	. . . . . . . . . . . . . . . + . + . . . . .	I
<i>Dipsacus fullonum</i>	. . . . . . . . . . . . . . . + r	I

Appendix 2:

Tab. 2. Species found only in one relevé:

Clematis vitalba - 2 (11); *Ranunculus repens* - 2 (10); *Scutellaria hastifolia* - 2 (19); *Aristolochia clematitis* - 1 (12); *Geum urbanum* - 1 (6); *Prunus spinosa* juv. - 1 (8); *Avena sativa* - + (8); *Bromus sterilis* - + (18); *Calamagrostis epigejos* - + (17); *Carex spicata* - + (16); *Chenopodium species* - + (11); *Elytrigia repens* - + (8); *Equisetum pratense* - + (5); *Eupatorium cannabinum* - + (3); *Lamium maculatum* - + (7); *L. purpureum* - + (5); *Lathyrus tuberosus* - + (3); *Lysimachia nummularia* - + (1); *Mentha x piperita* - + (6); *Mycelis muralis* - + (5); *Persicaria minor* - + (8); *Poa trivialis* - + (19); *Tanacetum vulgare* - + (10); *Veronica chamaedrys* - + (10); *Cerinthe minor* - r (16); *Vicia species* - r (15).

Localities of the relevés and other information about the phytocoenological relevés:

(relevé number, village/town, locality, cover herb layer, date)

1. Trakovice, southeast-east of the village, near the way to Trakovice's floodplain forest, in launder of the canal; E₁ 85 %; June 13, 2006
2. Trakovice, southeast-east of the village, cca 200 m north of way to Trakovice's floodplain forest, in launder of the canal; E₁ 90 %; June 8, 2006
3. Trakovice, the canal near playground, in right shore of the canal; E₁ 100 %; August 12, 2005
4. Trakovice, cca 500 m south of the village, in left shore of the canal; E₁ 100 %; August 12, 2005
5. Trakovice, southeast of the village, cca 300 m north of way to Bučany's floodplain forest, in right shore of the canal; E₁ 100 %; September 3, 2005
6. Trakovice, cca 400 m south of the village, in right shore of the canal; E₁ 100 %; August 12, 2005
7. Trakovice, cca 100 m south of the village, in right shore of the canal; E₁ 100 %; August 12, 2005
8. Trakovice, southeast of the village, cca 225 m south of the road Trakovice – Hlohovec, in left shore of the canal; E₁ 100 %; June 13, 2006
9. Trakovice, north of the village, Rakytovký kanál Canal, cca 200 m south of the road Žlkovce – Leopoldov, in right shore of the canal; E₁ 95 %; June 8, 2006
10. Trakovice, northeast of the village, cca 180 m north of the road Trakovice – Hlohovec, in right shore of the canal; E₁ 95 %; June 8, 2006
11. Trakovice, northeast of the village, cca 400 m behind stepfold of canal to Leopoldov, 50 m east of the hunting vista, in right shore of the canal; E₁ 100 %; June 8, 2006
12. Trakovice, northeast-east of the village, cca 200 m north of the road Trakovice – Hlohovec, in left shore of the canal; E₁ 100 %; June 8, 2006

13. Trakovice, southeast-east of the village, cca 300 m north of way to Trakovice's floodplain forest, in right shore of the canal; E₁ 100 %; June 8, 2006
14. Trakovice, southeast-east of the village, cca 300 m south of the road Trakovice – Hlohovec, in right shore of the canal; E₁ 100 %; June 8, 2006
15. Trakovice, southeast-east of the village, near the way to Trakovice's floodplain forest, cca 50 m west of the relevé n. 17, in left shore of the canal; E₁ 95 %; June 13, 2006
16. Trakovice, southeast-east of the village, cca 200 m south of way to Trakovice's floodplain forest, in left shore of the canal; E₁ 95 %; June 13, 2006
17. Trakovice, southeast-east of the village, cca 270 m south of way to Trakovice's floodplain forest, in left shore of the canal; E₁ 100 %; June 13, 2006
18. Trakovice, southeast of the village, cca 100 m north of way to Trakovice's floodplain forest, in left shore of the canal; E₁ 100 %; June 9, 2006
19. Trakovice, southeast of the village, cca 200 m north of way to Trakovice's floodplain forest, in left shore of the canal; E₁ 100 %; June 9, 2006
20. Trakovice, southeast of the village, cca 200 m south of the road Trakovice – Hlohovec, in left shore of the canal; E₁ 100 %; June 9, 2006

The floristic composition of the community is documented by the following relevé:

Relevé No. 1: Trakovice, southeast of the village, cca 170 m north of way to Trakovice's floodplain forest, in left shore of the canal; the sampled area of 20 m²; the cover of E_c 95 %; June 9, 2006: *Carex acuta* 5, *Urtica dioica* 3, *Calamagrostis epigejos* 2, *Symphytum officinale* 2, *Calystegia sepium* 1, *Iris pseudacorus* 1, *Lemna minor* 1, *Cirsium arvense* +, *Equisetum arvense* +, *Galium aparine* +, *Glyceria maxima* +, *Humulus lupulus* +, *Lycopus europaeus* +, *Poa trivialis* +, *Rubus caesius* +, *Typha latifolia* +.

Conclusion

The following communities of *Phragmitetum vulgaris*, *Typhetum latifoliae*, *Sparganietum erecti*, stands with *Iris pseudacorus*, *Caricetum acutiformis* and *Caricetum gracilis* were found in the vicinity of the Trakovice Village. There are 6 vegetation units, which documented by 37 recent relevés. They occur in the littoral zone of the canals and in the terrain depressions.

The associations of *Phragmitetum vulgaris* and the *Caricetum acutiformis* are the most abundant communities in the studied area.

Stands with *Iris pseudacorus* and the *Caricetum gracilis* are the rarest communities. I treat these stands as vulnerable communities in the studied area.

The communities are created by dominant species and by the diagnostic species of the class *Phragmito-Magnocaricetea*.

The recorded vulnerable species are *Butomus umbellatus* (VU) and *Scutellaria hastifolia* (VU).

At present the stands of the communities are endangered especially by consequent succession. These factors have a pact on floristical composition and structure of stands.

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