

Endangered and threatened rush plants in Żuławy Wiślane (northern Poland)

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Abstract: The paper presents results of the research concerning endangered and threatened rush species such as: *Alisma gramineum*, *A. lanceolatum*, *Carex disticha*, *Hippuris vulgaris*, *Rumex aquaticus* and *Stellaria crassifolia*. The aim of this study was to recognise distribution and to evaluate resources and contemporary state of this plant group in Żuławy Wiślane. The distribution is based on the published historical and present data from the last 130 years and on the results of field works in 2001-2005 years. The evaluation of nature resources, based on the distribution of valuable species, shows that Druzno lake is a distinguishable part of Żuławy Wiślane. For many years that area has been the place of concentration of several rare and endangered species populations.

Key words: rare and threatened species, rush plants, distribution, Żuławy Wiślane, northern Poland

The contemporary flora of Żuławy Wiślane (northern Poland) has developed under the influence of natural processes connected with the accumulating activity of Wisła river and the anthropogenic changes. For centuries human impact on this region modified water conditions and expressed, among others, in constructing a dense network of ditches and flood embankments as well as regulating river beds. The relevant changes in habitats led to the flora transformation. The aim of the research is to recognize distribution and to evaluate the resources and contemporary state of the endangered and threatened rush species within the studied area.

The objects of the compilation were rush species belonging to various threat categories in Gdańskie Pomerania region (Markowski & Buliński 2004). The material consists of historical and contemporary published data as well as own data collected in 2001-2005. These sources of information were used to analyse species occurrence within Żuławy Wiślane from the end of 19th century till present. Species localities are given in subsquares (5 x 5 km) within ATPOL squares (10 x 10 km) (Zajac 1978). Those subsquares are signed as: a – upper-left part of ATPOL square; b – upper-right; c – lower-left; d – lower-right (compare Markowski & Buliński 2004).

Alisma gramineum Lej. – DA91d: between Bystra and Wiślina, Motława river (Abromeit *et al.* 1898-1940); DA93b: Rybina, the right bank of Wisła Królewiecka river (Środa 1991b); DB04c: SE of

Rakowiska, the pond; DB21b: W of Kończewice, the pond; Mątowy Wielkie, the pond; DB22a: Mątowy Wielkie, the pond (Środa *et al.* 2002); DB22c: Mątowy Wielkie, the pond (Środa 1991a; Środa *et al.* 2002).

Alisma lanceolatum With. – DA81d: Gdańsk Sobieszewo, the bank of Wisła river (Preuss 1911 after Kępczyński & Rutkowski 1991); DB04c: SE of Rakowiska, the pond (Środa *et al.* 2002); DB05a: Kępa Rybacka, Nogat river (Środa *et al.* 2002); DB14a: near Rakowo, the pond (Środa 1991a); DB21b: W of Kończewice, the pond (Środa *et al.* 2002); DB22a: Mątowy Wielkie, the pond (Środa *et al.* 2002); DB23a: W of Kamienica, the ditch (Środa *et al.* 2002).

Carex disticha Hudson – DA92b: about 1 km S of Przegalina, the left bank of Wisła Przekop river (Smykowska 2001); DA93d: about 1,2 km W of PGR Nowotna (Afranowicz 2004); DB15bd, DB16ac, DB25b: the ‘Druzno Lake’ nature reserve (Schulz 1941; Markowski *et al.* 2002); DB16c: Komorowo Żuławskie (Środa *et al.* 2002); DB25b: Dzierzgonka, Dzierzgoń river (Środa *et al.* 2002); DB32a: Mątawa Forest, the glade (Jelinowski 1969);

Hippuris vulgaris L. – DA81d: about 1,2 km SE of Sobieszewo; about 0,6 km SE of Sobieszewo; about 0,3 km SE of Sobieszewko; DA91d: about 1,5 km SE of Miłocin; DA92a: about 1,6 km SE of Sobieszewska Pasta; Trzciniowo, about 1 km SE of Sobieszewska Pastwa (Afranowicz 2004); DB03b: near Cyganki; DB05d: near Elbląg (Abromeit *et al.* 1898-1940);

DB14c: about 1,5 km N of Kaczynos; DB15d: about 1,8 km S of Żurawiec (Afranowicz 2004); DB22a: Mątowy Wielkie, the pond (Środa *et al.* 2002);

Rumex aquaticus L. – DB15bd, DB16ac, DB25b: the ‘Drużno Lake’ nature reserve (Mowszowicz 1954; Kluszczyńska & Szmeja 1979; Markowski *et al.* 2002);

Stellaria crassifolia Ehrh. – DB15bd, DB16ac, DB25b: the ‘Drużno Lake’ nature reserve (Schulz 1941; Markowski *et al.* 2002).

The group of endangered and threatened rush species in Żuławy Wiślane is represented by the following species: *Alisma gramineum*, *A. lanceolatum*, *Carex disticha*, *Hippuris vulgaris*, *Rumex aquaticus* and *Stellaria crassifolia*. On regional red lists of plants of Gdańskie Pomorania – GP (Markowski & Buliński 2004) and Western Pomorania – WP (Żukowski & Jackowiak 1995) they are ranked to various threat categories: *Alisma gramineum* GP – CR, WP – V; *Alisma lanceola-*

tum GP – VU, WP – I; *Carex disticha* GP – NT, WP – V; *Hippuris vulgaris* GP – VU; *Rumex aquaticus* GP – NT, WP – V; *Stellaria crassifolia* GP – CR, WP – E.

On a scale of Poland *Alisma gramineum*, *A. lanceolatum*, *Hippuris vulgaris* are vulnerable species and *Stellaria crassifolia* a endangered one (Zarzycki & Szelağ 2006).

The evaluation of nature resources, based on distribution of valuable species, shows that Drużno lake is a distinguishable part of Żuławy Wiślane. For many years that area has been the place of concentration of several rare and endangered species populations. Only here *Rumex aquaticus* i *Stellaria crassifolia* were noted, although the second one hasn't been confirmed recently (Markowski *et al.* 2002).

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