

# Threat evaluation of *Carex chordorrhiza* L.f. in northern Poland

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**Abstract:** On the basis of published and unpublished data as well as the own study results the threat status of *Carex chordorrhiza* in the area of its declining core geographical range in northern Poland has been evaluated. In the most western part of the studied area String sedge is believed to be regionally extinct (RE). In the central part the species has been classified as an endangered species (EN), while in northeastern part of Poland it has been ranked into the group of near threatened taxa (NT).

**Key words:** *Carex chordorrhiza*, boreal plant, law protection, threat categories, species range, northern Poland

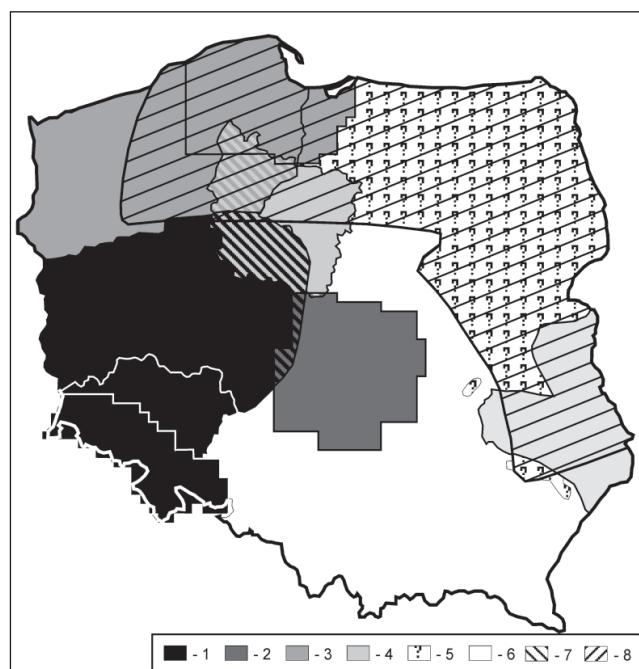
In the area of declining core geographical range, as a result of less suitable climatic, phytocenotic and habitat conditions as well as greater competitiveness of other plants, a species becomes less and less frequent or even endangered component of a flora.

A good example of such process is the behaviour of String sedge *Carex chordorrhiza* in northern part of Poland. This is a boreal plant species which in Poland reaches its southwestern border of core geographical range. In most regions of the country, from which it is known, String sedge is presently one of the special treatment species and it is classified into different threat categories. Since 2004 it is also under strict law protection (RMŚ 2004).

The main aim of this paper was to evaluate the threat degree of *Carex chordorrhiza* in northern Poland.

The region of northern Poland was established on the basis of a geobotanical division made by Matuszkiewicz (1993). The borderline of the area runs along to south borders of two sections: the Pomeranian and Northern Mazursko-Białoruski. The study area has been divided into three distribution parts, taking into account the border of core distribution of the species, marked by Hultén & Fries (1986) as well as the western border of the Northern Mazursko-Białoruski Section. Threat categories were estimated according to IUCN (IUCN 2001, 2003; Standards... 2003; Pullin 2004) on the ground of published and unpublished data about populations noted in the area, supplemented by the results of our own field research carried out in 2000-2003.

The dependence between part of range and threat status is well visible in a regional scale (Fig. 1). In most regions of Poland, where String sedge was found only in isolated localities – in the Wielkopolska, Lower



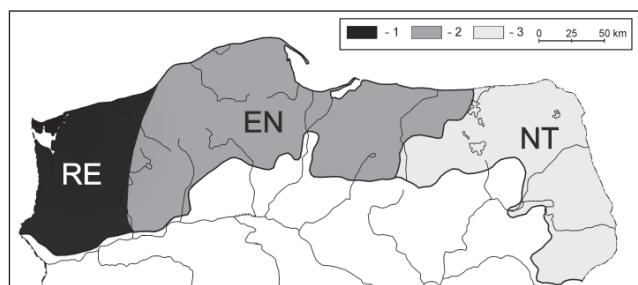
**Fig. 1.** Threat categories of *Carex chordorrhiza* in particular regions of Poland against a background of its geographical range  
Explanations: 1 – extinct; 2 – critically endangered; 3 – endangered; 4 – vulnerable; 5 – unknown threat category; 6 – the area, where the species doesn't occur; 7 – area shared by neighbouring regions; 8 – core geographical range, according to Hultén & Fries (1986)

Silesia and Sudeten Mountains – it has a status of an extinct (Ex) or regionally extinct (RE) taxon (see Żukowski & Jackowiak 1995; Fabiszewski & Kwiatkowski 2002; Kącki et al. 2003). Only in central Poland the species is classified into the group of critically endangered (CR) (Jakubowska-Gabara & Kucharski 1999). In two regions, across which the border of core geographical range runs (Hultén & Fries 1986) – the Kujawsko-Pomorski (Rutkowski 1997) and the southeastern part of Poland (Kucharczyk & Wójciak 1995) – *Carex chordorrhiza* has a status of a vulnerable species (VU). In the third such region – Pomerania – its situation is different. The species on both red lists of the Western Pomerania (Żukowski & Jackowiak 1995) and Gdańskie Pomerania (Markowski & Buliński 2004) is ranked among the group of endangered taxa (E and EN). Still there is a lack of information about the status of the species in the area of the highest concentration of its localities in northeastern Poland.

On the basis of published and unpublished data as well as the own study results (Bloch-Orłowska 2005, 2007) the stage of threat of *Carex chordorrhiza* in three distinguished areas of distribution in northern Poland has been evaluated (Fig. 2).

In the most western area String sedge had been noted at 10 localities (Bloch-Orłowska 2007). Nowadays the species is believed to be regionally extinct (RE), as there is no information about any contemporary locality of the species in that part of the country. At the same time, the species still exists in other regions of Poland, so according to IUCN recommendations it shouldn't be ranked to the group of extinct taxa (EX) or extinct in the wild (EW) (see IUCN 2001).

In the central part of the studied area *Carex chordorrhiza* has been classified as an endangered species (EN). There are only a few, isolated and small



**Fig. 2.** Threat categories proposed for *Carex chordorrhiza* in parts of northern Poland  
Explanations: 1 – regionally extinct (RE); 2 – endangered (EN); 3 – near threatened (NT)

populations in that part – just 7 contemporary localities out of 45 previously known (see Bloch-Orłowska 2007) and the extent of occurrence is less than 5 000 km<sup>2</sup>. Both features suggest that the species is considered to be facing a high risk of extinction in the wild in the future, if the appropriate protecting actions is not started. In the northeastern part of Poland String sedge has been ranked into the group of near threatened taxa (NT). There are about 32 contemporary localities, diverse in size, out of 117 localities of the species known from that region (see Bloch-Orłowska 2007) and the extent of occurrence is estimated at 20 000 km<sup>2</sup>. At the present time there is no sufficient reasons to classify the species into the group of threatened taxa on the scale of the region, although there is a possibility of such a situation in the near future.

The continuing reduction of *Carex chordorrhiza* localities in the area of its declining core geographical range in northern Poland indicates an urgent need for taking contemporary localities of the species under law protection.

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