



SURVEYING THE GLACIAL RELICT *CAREX MARITIMA* GUNN. ON THE SCILIAR (BOLZANO PROVINCE, ITALY)

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Aim

The aim of this work is to report on the conservation status of glacial relicts with special regard to *Carex maritima* Gunn. on the Sciliar mountain in the western Dolomites.

Introduction

In the Bolzano Province (South Tyrol), the Sciliar plateau situated on ca. 2450 m altitude is a hot spot of glacial relicts. It is included in the Natura 2000 reserve Sciliar-Catinaccio, and also part of the Dolomites UNESCO World Heritage. The Sciliar plateau hosts the main population of *Carex maritima* in South Tyrol (Fig. 1).

C. maritima (Fig. 2), is a character species of the FFH habitat type 7240* Alpine pioneer formations of *Caricion bicoloris-atrofuscae*. The EU wide conservation state in the Alpine biogeographic region is unfavourable-bad¹.

The curved sedge is found on alpine or subalpine levels and northern shores of Eurasia, northern America and also on mountains of South America² inhabiting neutral to slightly acid, sandy, stony, argilous at times peaty grounds influenced by cold water^{1,3}. In Italy it is confined to the Alps. In the Red Lists of South Tyrol, and Austria its status is CR. Conservation of glacial relicts is challenging in the light of climate change. Alpine farming and tourism pose additional threats.

Methods

In field campaigns between 2016 and 2019, historic and known growth places were visited and the study area scrutinized for new ones. On four sites phytosociological relevés of plant communities including *C. maritima* were made. In a second step, the conservation status of a typical habitat 7240* with *C. maritima* was assessed by estimating the habitat structure, the abundance of typical species and impacts according to the Guideline of Habitat Mapping in South Tyrol (several authors, in prep.).



Fig. 3 (left): *7240 habitat site as waterer.

Habitatstruktur	B
Typische Arten	A
Beeinträchtigungen	C
Erhaltungszustand*	B - mittel

Fig. 4: (right) Conservation state assessed.

Tab. 1: Species composition and abundance according to the Guideline of Habitat Mapping in South Tyrol (in prep.).

*7240 species	Companions	Caricion fuscae	Species	Abundancy
*			<i>Carex maritima</i>	r (rare)
*			<i>Carex microglochin</i>	v (present)
*			<i>Juncus arcticus</i>	v
*			<i>Juncus triglumis</i>	cd (co-dominant)
	*		<i>Bartsia alpina</i>	v
	*		<i>Saxifraga aizoides</i>	s
	*		<i>Salix herbacea</i>	v
		*	<i>Carex nigra</i>	d (dominant)
		*	<i>Juncus filiformis</i>	s (scattered)
		*	<i>Luzula sudetica</i>	v
		*	<i>Eriophorum angustifolium</i>	s
		*	<i>Eriophorum scheuchzeri</i>	cd
			<i>Epilobium cf. anagallidifolium</i>	v
			<i>Carex davalliana</i>	s
			<i>Euphrasia ssp.</i>	v
			<i>Persicaria vivipara</i>	c
			<i>Poa alpina</i>	c
			<i>Deschampsia cespitosa</i>	sd (sub-dominant)

References:

- European Environment Agency. Factsheet for Alpine pioneer formations of the *Caricion bicoloris-atrofuscae*. Retrieved August 19, 2020 from <https://eunis.eea.europa.eu/habitats/10152>
- Portal to the Flora of Italy. *Carex maritima* Gunnerus. Retrieved August 19, 2020, from <http://dryades.units.it/>
- Lasen C., Wilhelm T., 2004. Natura 2000 Habitat in Alto Adige. Provincia Autonoma di Bolzano-Alto Adige.
- Zehm A., Weber G., 2013. Umsetzung eines landesweiten floristischen Artenhilfsprogramms – Konzepte und Erfahrungen. – ANLiegen Natur 35: 40–54, Laufen.

Results & Discussion

Historic spots of *C. maritima* (CR) were confirmed and three new ones detected. The curved sedge was sometimes associated with other glacial relicts including *C. capitata* (CR) and *Juncus arcticus* (VU). Sandy, at times stony, sedimentary soils (Fig. 3) are typical origins for 7240* Alpine pioneer formations of *Caricion bicoloris-atrofuscae*¹. On one site, where *C. maritima* was associated with *C. microglochin* (VU), *Juncus arcticus* (VU) and *Juncus triglumis* (VU), the conservation state of *7240 was assessed as unfavourable-inadequate. It was favourable, though, in terms of species composition (Tab. 1 and Fig. 4). However, alpine farming has an impact on all potential habitat sites. Animals regularly use wet areas on the Sciliar as waterer leading to considerable trampling damage and eutrophication (Fig. 3). Nevertheless, on suitable substrates the curved sedge can reach abundancies between 500 and 1000 individuals (Fig 5).

South Tyrol has an important national and international responsibility for the conservation of *C. maritima* in the central parts of the Alps. This applies also to other CR glacial relicts i.e. *C. capitata*. To facilitate the conservation of priority species, special management strategies have been successfully implemented, e.g. in Bavaria⁴. We suggest to follow suite in South Tyrol.

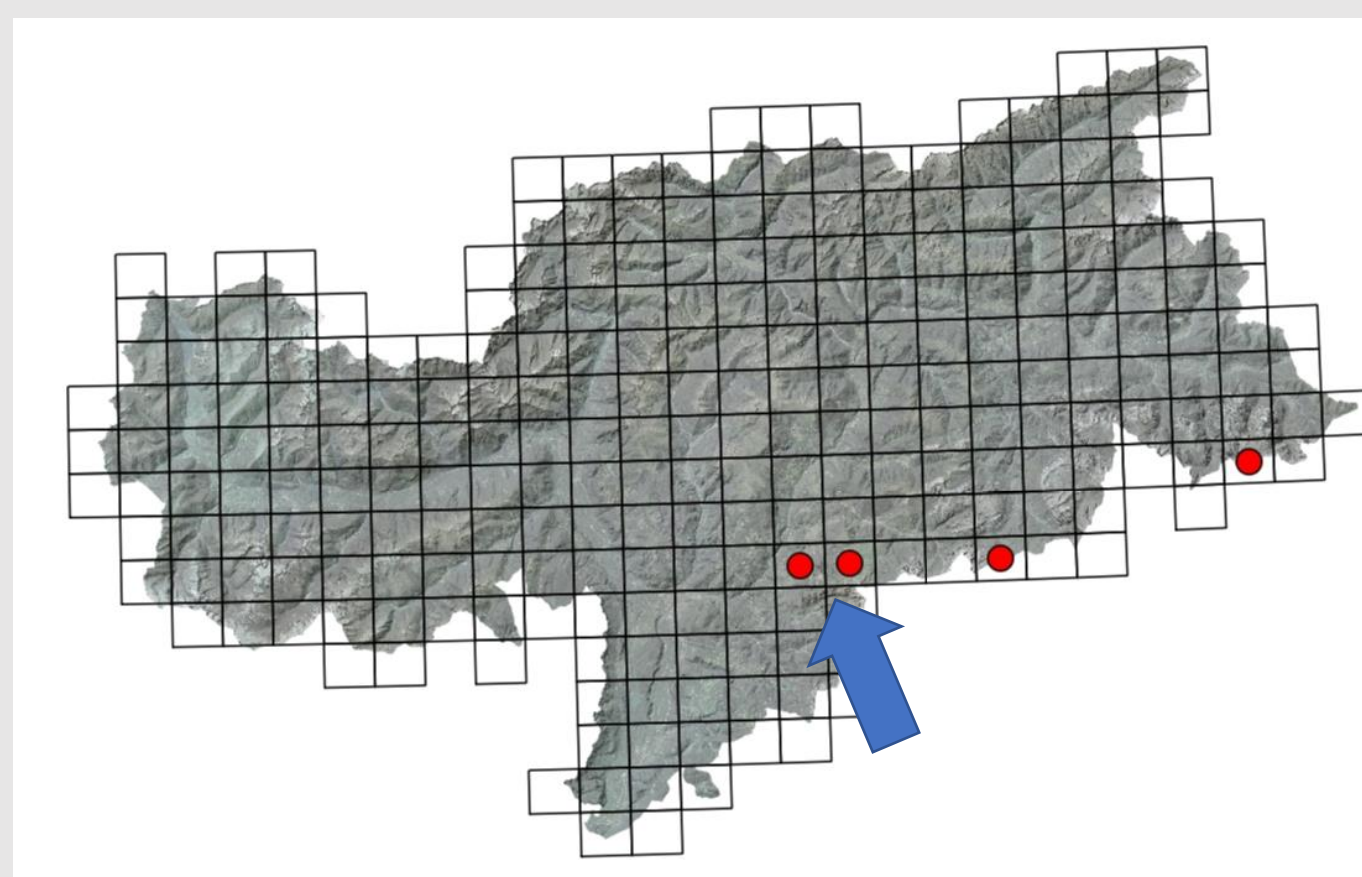


Fig. 1 (left): Current distribution of *Carex maritima* in the province Bolzano. The blue arrow marks the two gridpoints of the Sciliar-Catinaccio reserve. Retrieved from www.florafauna.it on 17.08.2020

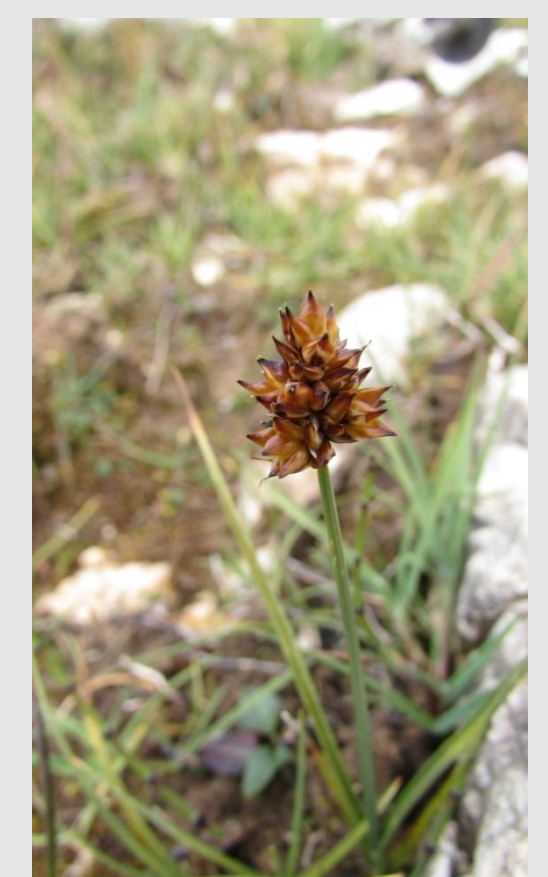


Fig. 2 (right): Habitus of *Carex maritima*, the curved sedge. Foto: FZemmer 16.08.2018

Conclusion

C. maritima, as a species of pioneer habitats, seems rather resilient to trampling damage. To date, the population of *C. maritima* on the Sciliar mountain can be considered as stable but its habitats suffer from degradation due to the impacts of alpine farming. To turn the site in a favourable state, an adjustment in the management is advised. The general recommendation is to include all CR glacial relict species in a species protection programme with special management of their growth places.



Fig. 5 Potential *7240 areas with mass occurrence of *Carex maritima*, *Carex bicolor* and *Juncus arcticus*



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