

BOOK OF ABSTRACTS



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on Community Ecology**

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In&Out: comparing plant diversity of coastal dunes inside and outside the protected areas of Northern and Southern Tuscany

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Coastal sand dunes host highly specialized plant communities and provide essential ecosystem services (Drius et al. 2019). However, they are currently among the most threatened ecosystems in Europe (Janssen et al. 2016), and the effectiveness of the existing protected areas for their conservation is being questioned (Sperandii et al. 2020). In this study, the plant diversity of Tuscan coastal dunes was analyzed with the aim of comparing its patterns inside and outside protected areas.

A total of 506 plots of 4 m² were surveyed in 2019-2021 along the Tuscany coasts. Plant species occurrence and abundance were recorded, and the species were classified into focal, ruderal, and alien groups. Patterns of α - and β -diversity were studied separately for each group of species and for each geographical zone, to account for the varying levels of anthropic pressure in the North and the South of the region. Diversity was partitioned across spatial scales through additive partitioning, and the total β -diversity was decomposed into replacement and richness difference. The differences between protected and non-protected areas were assessed by comparing values of species richness and Local Contributions to Beta Diversity (LCBD).

The results indicated few differences between protected and non-protected areas. In the North, where anthropic disturbance is higher, protected areas had significantly higher values of focal species richness but lower LCBD, while no differences were observed in the South nor for the other groups of species. Diversity partitioning revealed that the geographical peculiarities of the region were better represented by protected areas than by non-protected ones. Replacement was the dominant component of the β -diversity of focal species, indicating that conservation efforts should not be limited to species-rich sites, but should include sites of high ecological uniqueness, which are however only partially protected in the present.

Therefore, the results suggest that the current network of protected areas should be reviewed, potentially by extending it to the most ecologically unique sites and by revising management practices to minimize disturbance levels, in order to ensure the long-term conservation of coastal dune ecosystems.

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