

The role of dune system morphology on habitats development

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Well preserved dune systems act as the most effective barrier against the influence of the sea, such as salty and intense winds, storms, tidal waves and sand burial, protecting natural inland habitats as well as nearby urban and agricultural areas. Climate change can influence the balance between sediment supply, coastal erosion degree, modifying the morphology of coastal systems and eventually impair their protective function. The aim of the study is to investigate the relationship between the morphological characteristics of dune systems and the conservation status of coastal grasslands, which are among the most threatened coastal habitats. Data on vegetation were collected along twelve transects, composed of 4-m² plots, from the limit of the wooded area (fixed dunes) to the shoreline. In each plot, all vascular plant species were recorded and the projected cover of all species and moss layer cover were visually estimated. In correspondence of each transect we measured some geomorphological features (e.g. width of the active and inactive dune area, height of the active foredune). The conservation status of each plot was evaluated according to species composition and structure. Through logistic regression, we determined if the presence of the most conserved aspects depended on geomorphological features. We found that a good conservation status of grasslands was linked to higher or wider active dune areas, which better fulfill their protection function of the inland habitats, mitigating the natural disturbance. In order to conserve coastal grasslands, a sustainable beach management should be developed, avoiding direct dune destruction and other actions preventing dune development. To prevent the potential consequences of climate change, management plans should take into account also the preservation or restoration of the foredune plant communities, which are fundamental for the development and self-maintenance of the foredunes.

