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**Population connectivity and genetic
diversity in Mediterranean seagrasses in
the framework of management and
conservation of the coastline**

Doctor of Philosophy

Life and Biomolecular Sciences

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Abstract

This thesis explores how assessments of genetic diversity and connectivity of seagrasses can be used for the conservation and management of the coastline. As ecosystem engineers, any changes in their population dynamics, including genetic-level ones, can impact both the seagrass and the associated community it supports. The relationship between biodiversity (assessed as genetic diversity of the structuring species) and ecosystem function has been deeply explored in *Zostera marina* – a seagrass with circumglobal distribution. It has not, however, been explored in most other seagrass species including *Posidonia oceanica*, a seagrass of great longevity and limited distribution. In this thesis I address, for the first time, the usefulness of genetic diversity assessments of two exemplary seagrass species (*Posidonia oceanica* and *Zostera noltei*) for conservation in a more comprehensive way by also relating observations of contemporary gene flow to population genetic patterns. I start by investigating the reciprocal relationship between genetic diversity and anthropogenic disturbance and move on to two more application-based studies: one in which genetic connectivity is considered in the design of marine protected areas; and one exploring the importance of genetic diversity and identity for successful restoration. I also investigate the influence of genetic parameters on sexual reproduction and conclude by presenting genetic landscapes that could be used for transplantation and protection purposes.