

THE USE OF ECOSYSTEM ENGINEERS TO UNDERPIN ECOSYSTEM MANAGEMENT: THE *LANICE CONCHILEGA* CASE

Rabaut Marijn, Magda Vincx and Steven Degraer

Marine Biology Section, Biology Department, Ghent University (UGent), Krijgslaan 281, S8, B-9000 Gent, Belgium

E-mail: marijn.rabout@ugent.be

Marine Protected Areas (MPAs) have been proposed as a valuable tool to apply the ecosystem approach while the amount of information needed to manage systems in a sustainable way is often perceived as insufficient. Our study provides information on how scientific data can be used and on how to deal with the complexity of the system. The strategy focuses on small-scale, short-term studies on a limited set of organisms. Organisms investigated are chosen because of their supposed horizontal and vertical links with other (groups of) organisms and because of their (direct or indirect) economic value. This strategy was applied for the Belgian part of the North Sea using the bio-engineering polychaete *Lanice conchilega*. The ecological importance of this species relates to its modulation mechanisms (such as the elevation, the consolidation of the sediment, the spatial extent and the patchiness). Increased habitat complexity provides favourable conditions for other infaunal species. These species attract on their turn other predatory infauna. The analyses of the associated species indicate that biodiversity and productivity increase in areas where *L. conchilega* occurs (species richness increases with factor three, while the macrobenthic density is seven times higher). Analyses for the Belgian part of the North Sea show that *L. conchilega* shapes the community composition by expanding the realized niche of species that otherwise occur in low densities. Besides the horizontal and vertical interaction within the benthic ecosystem, interactions with other ecosystem components may occur. Therefore, the interaction with juvenile flatfish (often species of high commercial value) and the resilience of the particular *L. conchilega* system to beam trawl flatfish fisheries is being investigated in a set of laboratory experiments. Results show that *L. conchilega* is relatively resistant to intermediate fishing pressure. However, species that are strongly associated with the *L. conchilega* aggregations are greatly impacted after fisheries disturbance. Intertidal field experiments showed that the most dominant associated species *Eumida sanguinea* was impacted very severely and that also the amphipod *Urothoe poseidonis* showed post-impact effect. The information gathered in the case of *L. conchilega* is an example of ready-to-use information for the marine management of the soft-bottom area of concern.