

A multiscale seascape approach to assess animal communities in Baltic Sea seagrass meadows

Stjärnkvist Nellie¹, Hernvall Patrick¹, Staveley Thomas¹, Wikström Sofia² and Gullström Martin¹

¹ Department of Ecology, Environment and Plant Sciences, Stockholm University, 106 91 Stockholm, Sweden

E-mail: nellie0202@hotmail.com

² Baltic Eye, Baltic Sea Centre, Stockholm University, 106 91 Stockholm, Sweden

Seagrass meadows are important habitats for commercially important fish species, as they constitute nursery-, hiding- and foraging grounds. Though, a worldwide decrease of seagrass coverage by c. 29% has occurred during the last century, and along the Swedish west coast has a reduction of 60% during the past 30 years been documented. On the Swedish east coast (western Baltic Sea), however, little is known about seagrass distribution and quality; therefore, it is imperative to understand the role of seagrass meadows in relation to faunal and floral communities at different scales, in this region. This study aims to investigate epifaunal communities in Baltic Sea eelgrass (*Zostera marina*) meadows using a multiscale seascape approach. Twenty sites (each composed of a focal seagrass meadow) were sampled for epifauna and seagrass habitat metrics. A further ten sites were mapped (at a 600 m diameter scale) to quantify benthic habitat spatial patterning, and to assess the potential effects of larger spatial scale variables. Fish data were also collected to gain an indication of the fish assemblage that utilise these seagrass meadows. Seagrass structural complexity (i.e. seagrass shoot height and density) played a minor part in explaining the variation in epifaunal communities, whereas the presence of other flora and amount of filamentous algae explained a major part of the variation and were both positively related to epifaunal abundance. Furthermore, seascape variables, such as total vegetation coverage, explained some of the variation of epifaunal abundance, though negatively, as did the presence of fish. As many epifauna groups recruit through larvae carried with water currents, an increased vegetation coverage assessed at the seascape level can be expected to have a negative effect on epifauna abundance, whereas an increased structural complexity of the meadow increases the enticement of the habitat, thus potentially increasing the abundance and diversity of epifaunal groups. This study fills an important knowledge gap of the function of eelgrass meadows and their associated flora and fauna communities in the western Baltic Sea and gives insight into the importance of different scale variables that affect these underwater ecosystems.

Keywords: Baltic Sea; eelgrass; epifauna; seascape