

How can herbivores modify ecosystem service delivery in seagrass beds?

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Seagrasses provide important habitat that delivers ecosystem services such as the provision of food to a wide diversity of herbivores globally. In the Great Barrier Reef (GBR) we find the full size spectrum of herbivores; from small mesograzers such as amphipods, to macrograzers such as fish and large megagrazers such as turtles and dugongs. These herbivores can structurally alter seagrass beds in either positive or negative ways depending on their size, feeding preferences and methods and grazing intensity. These structural changes can subsequently interact with the delivery of other ecosystem services, or the benefits to humans, provided by the seagrass meadow. Multiple ecosystem services have the potential to interact with each other in non-linear relationships. Interactions between herbivory and the provision of other ecosystem services may be additive, synergistic or antagonistic. For example where seagrass growth is stimulated by mesograzers controlling epiphytic algal loads, or light cropping by fish or turtles there may be an additive or synergistic association with carbon sequestration, sediment stabilisation and habitat provision while heavy grazing by dugong may interact with these services in an antagonistic relationship, but have an additive or synergistic relationship with ecotourism. An understanding of these interactions will be important to ecosystem managers seeking to maximise delivery of ecosystem services and will help them to understand what trade-offs need to be considered when managing for the conservation of megaherbivores. The GBR not only has one of the highest diversities of herbivores, but also highly diverse seagrass species which cover more than 35 000 km². This makes the GBR an ideal place to study seagrass herbivore interactions and their impact on ecosystem service provision across a range of seagrass species and community types. This presentation will outline the current knowledge about herbivore impacts on seagrass ecosystem service provision and provide a conceptual framework to illustrate how herbivory may interact with other ecosystem services. It will also identify how research from temperate seagrass beds may apply to a tropical setting and suggest how the current research gap can be addressed.