



Invited feature

The Great Barrier Reef World Heritage Area seagrasses: Managing this iconic Australian ecosystem resource for the future



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ABSTRACT

The Great Barrier Reef World Heritage Area (GBRWHA) includes one of the world's largest areas of seagrass (35,000 km²) encompassing approximately 20% of the world's species. Mapping and monitoring programs sponsored by the Australian and Queensland Governments and Queensland Port Authorities have tracked a worrying decrease in abundance and area since 2007. This decline has almost certainly been the result of a series of severe tropical storms and associated floods exacerbating existing human induced stressors. A complex variety of marine and terrestrial management actions and plans have been implemented to protect seagrass and other habitats in the GBRWHA. For seagrasses, these actions are inadequate. They provide an impression of effective protection of seagrasses; reduce the sense of urgency needed to trigger action; and waste the valuable and limited supply of "conservation capital". There is a management focus on ports, driven by public concerns about high profile development projects, which exaggerates the importance of these relatively concentrated impacts in comparison to the total range of threats and stressors. For effective management of seagrass at the scale of the GBRWHA, more emphasis needs to be placed on the connectivity between seagrass meadow health, watersheds, and all terrestrial urban and agricultural development associated with human populations. The cumulative impacts to seagrass from coastal and marine processes in the GBRWHA are not evenly distributed, with a mosaic of high and low vulnerability areas. This provides an opportunity to make choices for future coastal development plans that minimise stress on seagrass meadows.

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1. Introduction

The Great Barrier Reef World Heritage Area (GBRWHA), while best known for its iconic coral reefs, is also home to one of the world's largest seagrass ecosystems. The GBRWHA was listed in 1981 and stretches along 2300 km of the north-eastern coast of Australia including 347,800 km² of seabed (Fig. 1). The 2800 coral reefs that form the most obvious structure of the GBRWHA cover only 6% of the region, while the shallow inter-reef and lagoon areas are far more extensive, approximately 58% of the region. The remainder is comprised of continental shelf slope and deep ocean (Wachenfeld et al., 1998). The Australian Government declared a marine park in 1975 which overlays most of the World Heritage Area. This marine park (The Great Barrier Reef Marine Park) was comprehensively rezoned in 2004 and is managed by the Great

Barrier Reef Marine Park Authority. It is complimented inshore by Queensland Government state marine parks and management plans. Both Governments have enacted legislation to provide the legal basis for management which follows a multi-use zoning strategy.

Coral reef systems of the GBRWHA have been researched extensively (e.g. Done, 1992; Connell et al., 1997; Hughes et al., 2003; Wilkinson, 2004; Bellwood et al., 2004; De'ath et al., 2012), but until recently little attention has been paid to the less accessible and less charismatic lagoon, soft bottom, inter-reef, reef platform and near shore habitats that include seagrass meadows. This is despite the fact that major penaeid shrimp and scallop trawl fisheries operate in these waters (Williams, 1997; Grech and Coles, 2011). These near shore, soft bottom and inter-reef habitats are nursery grounds for important recreational and commercial fish species (Watson et al., 1993; Coles et al., 1993), and key iconic and economically valuable tourist species of whales, dolphins, turtles and dugong, are found there (Stoeckl et al., 2010).

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