

Issues for seagrass conservation management in Queensland

W. J. LEE LONG,¹ R. G. COLES¹ and L. J. MCKENZIE¹

Coastal, reef-associated and deepwater (>15 m) seagrass habitats form a large and ecologically important community on the Queensland continental shelf. Broad-scale resource inventories of coastal seagrasses were completed in the 1980s and were used in marine park and fisheries zoning to protect some seagrasses. At least eleven of the fifteen known species in the region reach their latitudinal limits of distribution in Queensland and at least two *Halophila* species may be endemic to Queensland or northeastern Australia. The importance of seagrasses to Dugongs *Dugong dugon*, Green Turtles *Chelonia mydas* and commercially valuable prawn fisheries, will continue to strongly influence directions in seagrass research and conservation management in Queensland. Widespread loss of seagrasses following natural cyclone and flood events in some locations has had serious consequences to regional populations of Dugong. However, the impacts to Queensland fisheries are little studied. Agricultural land use practices may exacerbate the effects of natural catastrophic events, but the long-term impacts of nutrients, pesticides and sediment loads on Queensland seagrasses are also unknown. Most areas studied are nutrient limited and human impacts on seagrasses in Queensland are low to moderate, and could include increases in habitat since modern settlement. Most impacts are in southern, populated localities where shelter and water conditions ideal for productive seagrass habitat are often targets for port development, and are at the downstream end of heavily modified catchments. For Queensland to avoid losses experienced by other states, incremental increases in impacts associated with population and development pressure must be managed. Seagrass areas receive priority consideration in oil spill management within the Great Barrier Reef and coastal ports. Present fisheries legislation for marine plant protection, marine parks and area closures to trawl fishing help protect inshore seagrass prawn nursery and Dugong feeding habitat, but seagrasses in deep water do not yet receive any special zoning protection. Efficacy of the various Local, State and Commonwealth Acts and planning programmes for seagrass conservation is limited by the expanse and remoteness of Queensland's northern coast, but is improving through broad-based education programmes. Institutional support is sought to enable community groups to augment limited research and monitoring programmes with local "habitat watch" programmes. Research is helping to describe the responses of seagrass to natural and human impacts and to determine acceptable levels of changes in seagrass meadows and water quality conditions that may cause those changes. The management of loss and regeneration of seagrass is benefiting from new information collected on life histories and mechanisms of natural recovery in Queensland species. Maintenance of Queensland's seagrasses systems will depend on improved community awareness, regional and long-term planning and active changes in coastal land use to contain overall downstream impacts and stresses.

INTRODUCTION

PRIOR to the 1980s, seagrasses and their values were poorly understood in Australia, and received little conservation attention. Information on the extent of seagrasses in Queensland was limited to a few locations near population centres. Young and Kirkman (1975) mapped seagrasses in Moreton Bay and Kirkman (1978) provided the first documented seagrass loss for Moreton Bay and for Queensland. Seagrasses in northern Queensland were only documented in collections for taxonomic classifications (den Hartog 1970; Greenway 1979) and studies of succession in intertidal seagrasses at Townsville (Birch and Birch 1984). A reconnaissance of the Torres Strait (Bridges *et al.* 1982) indicated that seagrasses were an important habitat in that region. Broad-scale seagrass surveys along the Queensland coastline (by the Queensland Department of Primary Industries) were not initiated until 1984 following recognition of the importance of seagrasses as nursery habitat for juvenile prawns of commercially valuable prawn fisheries (Coles and Lee Long 1985). The importance of seagrasses to survival of Dugong *Dugong dugon* (Heinsohn *et al.* 1977) and Green Turtles *Chelonia mydas* (Lanyon *et al.* 1989) led

to further seagrass surveys. Conservation management priorities for these threatened fauna strongly influence the direction of seagrass research and conservation management in Queensland.

Placing values on Queensland seagrasses

Seagrasses world-wide represent important components of coastal primary production (Hillman *et al.* 1989) and support complex marine food webs (e.g., Howard *et al.* 1989). In Queensland, estuarine and shallow coastal seagrass meadows are nursery habitat for commercially important prawn populations (Coles *et al.* 1993; Watson *et al.* 1993) and appear to be more important than deepwater seagrasses as nursery habitat for commercially and recreationally important species of prawns and fish (Derbyshire *et al.* 1995). Meadows dominated by *Halophila* and *Halodule* species are preferred Dugong feeding areas (e.g., Preen 1995). Dugong feeding habitats include seagrasses in shallow and deep (>15 m) water, and centres of high Dugong numbers were indicators of vast areas of seagrass in shallow to deep water in the Lookout Point to Barrow Point region (Lee Long *et al.* 1989) and in

¹Queensland Department of Primary Industries, Northern Fisheries Centre, P.O. Box 5396, Cairns, Queensland, Australia 4870.
PACIFIC CONSERVATION BIOLOGY Vol. 5: 321-28. Surrey Beatty & Sons, Sydney, 2000.