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Distribution of Seagrasses, and Their Fish and Penaeid Prawn Communities, in Cairns Harbour, a Tropical Estuary, Northern Queensland, Australia

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Abstract

From aerial photography (July 1987) and diving surveys (February 1988), 876 ha of seagrasses (eight species) were mapped in Cairns Harbour, tropical north-eastern Queensland. *Zostera capricorni* was the most common seagrass species and had the greatest biomass at 79 g m^{-2} dry weight of stems and leaves and 180 g m^{-2} dry weight of roots and rhizomes. The maximum shoot density found was 4798 shoots m^{-2} of *Halodule pinifolia*, the second most common species. Seagrasses were found only between 0·5 and 5·0 m below mean sea level. *Zostera capricorni* was found at the shallowest depths, *Halodule pinifolia* at the deepest depths. Twenty species of penaeid prawns, nine of which are marketed commercially, were sampled from the seagrass beds. Abundances of prawns of commercial species were significantly greater on seagrass-covered substrata than on nonvegetated substrata. Overall, 5614 mostly small or juvenile fish, representing 134 taxa, were sampled from seagrasses in Cairns Harbour. The most numerous fish species were a goby, *Yongeichthys criniger*, and a pony fish, *Leiognathus splendens*. Only 15 species were highly valued as recreational fish, and only 11 species were highly valued as commercial fish. Of the fish species, five (4%) were highly valued species of both groups. The density of fish on the seagrass beds was estimated to be 8809 fish ha^{-1}.

Introduction

Extensive seagrass meadows are found in nearshore tropical waters throughout the world (den Hartog 1970). Although the potential for loss of seagrass habitat in coastal waters has been recognized (Larkum 1976; Poiner and Roberts 1986), ecological research in northern Australian waters remains surprisingly sparse. The difficulties of working in remote coastal areas of low human population densities, high water turbidities and large tidal ranges have prevented detailed projects from being undertaken in northern Australia. den Hartog's (1970) revision of seagrass taxonomy provided a foundation for recent seagrass research in the northern Queensland region. Fourteen species of seagrass have now been identified in north-eastern Queensland, and a general knowledge of their distribution patterns has been documented (Coles *et al.* 1989).

Long-term studies at Townsville (Birch and Birch 1984) and a survey of species in the Torres Strait (Bridges *et al.* 1982) have provided information on the role of disturbance and emersion in the control of seagrass species' depth ranges and the distribution of seagrass species in the tropics. A reasonable history of studies of crustacean and fish communities of temperate-region seagrass habitats (see reviews by Bell and Pollard 1989; Howard *et al.* 1989; Klumpp *et al.* 1989) is not, however, paralleled in the northern tropics of Australia, so that there still exists only a rudimentary knowledge of the faunal communities of Australian tropical seagrasses.

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