OVERVIEW

The development of Magnetic Quay is the first large scale commercial development to be undertaken on Magnetic Island that involves extensive modification of the marine environment. A major aspect of the development is the excavation of a 187 berth marina and access channel, and the construction of a large breakwater. These will impinge on a considerable area of the fringing reef adjacent to Bright Point, at the northern end of Nelly Bay.

This reef is included in the Great Barrier Reef Marine Park (Central Section). The progress of the development is therefore dependent upon the consent of the Great Barrier Reef Marine Park Authority, whose brief it is to ensure that such developments do not cause major impacts on the biota of the marine park. Accordingly, the GBRMPA has made construction provisional on the funding, by the developers, of detailed environmental monitoring of the fringing reef environments to assess whether the development of Magnetic Quay is likely to have any long-term adverse effects on those reefs. This document is the report of the baseline study of the fringing reefs along the south-east coast of Magnetic Island, including those in Nelly Bay where Magnetic Quay is to be built.

The fringing reefs of Arthur, Florence, Geoffrey, Nelly and Picnic Bays on Magnetic Island represent a diverse group of reef environments, supporting a rich assemblage of hard corals and other sessile taxa. The two strongest patterns in the distribution and composition of these assemblages were: A) Hard corals were more abundant and diverse on reef slopes than on reef flats at all bays; and B) reefs in Nelly Bay supported a different assemblage of corals than those at other Bays. Algae were more abundant on reef flats than on reef slopes and were slightly more abundant at the north end of Nelly Bay than elsewhere. We found no evidence of unique biotic features on the reefs at the north end of Nelly Bay that require special protection.

The organisms on these fringing reefs obviously thrive in the relatively turbid, high sediment conditions that are a feature of the coast of Magnetic Island. Sedimentation on the reefs during January and February 1989 was greater than that measured in most coral reef environments elsewhere in the world. The effects on the benthic biota of increasing rates of sedimentation beyond natural levels, however, is not well understood for any fringing reef environment. Suggested critical upper limits of tolerance of corals to sedimentation vary by an order of magnitude. The unequivocal statement of critical rates of sedimentation beyond which management action would be warranted is, therefore, difficult. We have recommended a set of values that should be seen only as first approximations, and should be subject to review in the light of the results of future fieldwork at Magnetic Island. We have also suggested a logical protocol for the sensible assessment of whether an impact has occurred at any time during the construction and operation of Magnetic Quay.