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## EXECUTIVE SUMMARY

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When an unsealed road was pushed through coastal rainforest in the Cape Tribulation region in late 1984, there were fears that increased run-off from the road might damage the inshore fringing reefs in the region, which was within the Great Barrier Reef Marine Park. A large multidisciplinary research project was established by GBRMPA to examine the effects of the road. This study forms a part of that larger project.

The aims of this study were to investigate the effects of increased sedimentation on the early life history stages of the corals, i.e. coral recruitment onto settlement plates and the recruitment and mortality of small corals. The region was divided into three zones which were predicted to be affected by the construction of the road to varying degrees. Two reefs were studied in each of the three zones, and the coral population parameters were compared among the zones.

At some sites, density of coral spat on settlement plates during the summer period was the highest ever reported in any study of coral recruitment. Very few corals recruited during winter. There was a tendency for more spat settlement on plates in the central and northern zones, compared with the southern zone. There was also a tendency for a corresponding higher rate of mortality of spat on the plates towards the north. Qualitatively different spat settlement patterns (at family level) were observed at different reefs which suggests that there is not a single larval pool available at all the study reefs. The recruitment study indicated that the availability of coral larvae did not correlate with the predicted pattern of increased sedimentation in the region of the new road.

Juvenile corals (i.e. 1cm to 20cm diameter) recruited at similar rates on natural substrata at all reefs. Migration of colonies and fragments of colonies contributed more to successful recruitment than larval settlement, especially for the dominant genera (Acropora and Montipora). In general, there was no difference in mortality rates of juveniles among any of the study reefs except for one reef in the southern zone which was most affected by a cyclone in early 1986. Again, these patterns did not correlate with the predicted increased sediment from road run-off.

In general, recruitment of coral larvae is limited by the availability of hard substrata for settlement. At Cape Tribulation, the low larval recruitment apparently reflects inadequate substrata and recruitment of coral fragments is a significant factor in the determination of coral community structure under these circumstances.

The hydrodynamics of the region, the heterogeneous nature of reef types, and variation in the degree of exposure mean that there is large local variation in the effects of physical and oceanographic parameters such as waves, currents, eddies etc. The Cape Tribulation reefs have grown throughout their history in an environment of heavy terrigenous influx. (Johnson and Carter 1987). It is unclear to what extent present influx is affecting the reefs as compared with resuspension of muddy bottom sediment.

Two physical events, a cyclone and a coral bleaching episode in successive years, had a significant impact on the coral community during the study period. Any deleterious effects attributable to the road could not be detected, firstly, because of the effects of the two major physical events during the period, and secondly, because the study lacked an effective 'before road' control. Caution should also be exercised in the interpretation of the results of the study because of its relatively short term nature.