

SUMMARY

The aims of this study were to investigate the medium-term effects of sediment run-off caused by the construction of a coastal road through rainforested catchments in late 1984 on the coral communities of the Cape Tribulation fringing reefs. In the absence of any pre-construction baseline we relied on surveys of two similar control locations, north and south of the potential impact location adjacent to the new road catchment, to determine the significance of any changes that occurred. The southern control was adjacent to the long-established portion of the road south of Cape Tribulation and the northern control adjacent to a small undisturbed catchment. A preliminary three-year study had suggested that the road construction had no effect of the fringing reefs of this region (Ayling and Ayling 1991). It was also hoped that this longer-term study would shed some light on the nature of on-going changes in the benthic communities of fringing reefs in the Great Barrier Reef region.

During the preliminary study we had decided to confine the surveys to the explanate *Montipora/clumping Acropora* assemblage that was dominant between 2–4 metres below Australian Height Datum (AHD). In shallower water *Sargassum* algae dominated, while in deeper water a suite of more massive corals such as *Galaxea* and *Hydnophora* was present, but this deeper depth strata was not represented at many of the sites and was not included in the regular surveys.

Four sites were established in each of the three locations, and five permanent 20 metre intersect line transects set up to survey coral communities at each site in 1985. These transects were resurveyed between October and December each year from 1985 to 1988 (Ayling and Ayling 1991), and from 1994 to 1997 (this report).

During the previous survey coral cover at all three locations decreased from an initial high of around 50% cover, due to a small cyclonic episode in April 1986, and a widespread coral-bleaching episode in February 1987. Both these disturbances caused consistent reductions across all three locations. No disturbances occurred in 1988 and coral cover increased by 33% back to the initial levels in all locations.

Surveys were also made using five random 20 metre line intersect transects at five sites where silt run-off from the road was observed to enter the reef community. These sites were all on narrow rocky reefs that supported a less-abundant coral community that was not dominated by *Montipora/Acropora* corals. Changes at these sites were generally similar to those recorded in the permanent transect sites.

Although there was at least one major disturbance in the six years between the 1988 survey and the first new survey in 1994 (cyclone Joy in 1990), coral cover either remained stable or increased over this period. There were other disturbances during the three years of this new study, including a major flood episode in March 1996, but coral cover either remained stable (location 1 and 3) or increased (location 2). Coral cover at the direct run-off sites also either remained stable or increased during this period. Coral cover in the potential impact location 2 has increased by 45% since 1985, a larger increase than in either control. This suggests that there has been no longer-term degradation of fringing reefs in this location that may have resulted from silt run-off from the new road.

This study suggests that these fringing reefs are healthy, supporting a rich growth of a wide variety of coral species, and able to cope with acute disturbances such as cyclones, floods and coral-bleaching episodes with only short-term disruption.

Although there have been no consistent increases in *Sargassum* cover during the 12 years covered by these projects, there was a suggestion that turf algae had increased in the permanent transects over the past three years.

We suggest that permanent monitoring sites be established and maintained on a variety of fringing reefs to look at long-term changes in coral communities that may be due to man-induced changes to the coastal environment in an attempt to test the widely held perception that many fringing reefs are either degraded or suffering chronic siltation stress.