

SUMMARY

Closure of areas to destructive or extractive uses has gained increasing favour recently as a strategy to achieve the conservation goals for marine environments. In most cases, however, there has been neither the prior data nor the subsequent monitoring of area closures, and comparable non-closed areas, to allow empirical evaluations of the area-closure management strategy. In 1975, the Great Barrier Reef Marine Park Act provided for the declaration of the Great Barrier Reef Marine Park and its management for conservation and multiple use. During the following 12 years, strategies of zoning areas of the Great Barrier Reef for different levels of use were implemented over the entire Marine Park. For none of the management sections of the Marine Park were systematic, purposeful surveys of reefs with different zoning status done at or prior to the implementation of the first term of zoning. The second zoning plan for the Cairns Section of the Marine Park came into effect in 1992. In this project we sought to gather comprehensive survey data on the status of reefs prior to the implementation of this as amended zoning plan in order to facilitate future assessments of its effectiveness.

We surveyed 50 reefs over the entire Cairns Section, including reefs with a history of closure to extractive uses such as fishing, reefs that had always been open to most uses, and reefs that were to have their zoning status changed under the as amended zoning plan. In so doing, we were also in a position to compare the status, in 1990–91, of reefs with different zoning histories, albeit in the absence of structured baseline data from before the then effective zoning period (1983–91). We surveyed six locations around the perimeter of each reef by well-established and tested underwater visual survey methods.

The results we present here do not indicate a clear, unequivocal set of patterns in abundances of several organisms related to zoning history or notional tourist use. For many taxa, no effects of either past zoning or tourist use were evident. For other taxa, the zoning-related patterns frequently depended on either where across the continental shelf we looked, on the habitat considered, or on the notional history of consistent tourist use. Patterns in abundances related to frequency of tourist use also varied with habitat, zoning status, or shelf position.

We found no clear evidence of large numbers of crown-of-thorns starfish (COTS, *Acanthaster planci*) on any reef, indicating that there was no evidence of a re-emerging outbreak of COTS in 1991. The emergence of boom populations of *A. planci* since 1994 suggests either that those individuals present in the boom populations were not present in 1991, or that they were small and sufficiently cryptic that non-destructive visual surveys would not have detected them.

Apart from any logical considerations, our data suggest that there is only limited potential to infer effects of management strategies from simple one-off 'before and after' estimates of abundance or community structure. Considerable inter-annual variation in counts also suggest that simple paired surveys will be likely to produce large differences unrelated to effects of management strategy. Unequivocal inferences about the effectiveness of zoning strategies as management tools will require repeated measurements over extended periods at both managed and used reefs. Such a strategy specifically targeted at management strategy evaluation does not currently exist on the Great Barrier Reef. In the absence of such an explicit assessment and refinement approach, or formal and regular monitoring strategies targeted specifically at management strategy evaluation, interpretations of 'status' surveys of the type we have completed will be impaired by inadequate information and there will continue to be little empirical evidence from which to justify or refine existing management strategies.