

As Hilborn (p.11 1985) has pointed out, "The traditional nemesis of commercial fisheries, overcapitalisation and inefficiency, are valued aspects of a recreational fishery".

GBRMPA has generally not distinguished between recreational and commercial fishing, and in line with the zoning procedures specified in the Great Barrier Reef Marine Park Act has closed reefs to particular types or levels of fishing by all users.

Restrictions on fishing expressed through zoning plans are designed to ensure conservation of the Reef and equitable opportunities for all users. Different zone types are designed to provide differing degrees of environmental protection, which GBRMPA sees as its prime responsibility. In a recent survey of users of the Capricornia Section of the Great Barrier Reef Marine Park where restrictions have been in force since 1981, the majority of all user groups indicated that they believed the zoning plan had helped protect the reef.

On the question of opportunities provided for recreational line fishing in the zoning plan, the vast majority of respondents of all user groups indicated that they felt the level of fishing opportunities provided was about right. Most groups were divided about whether there should be fewer opportunities provided for commercial fishing (Environment Science and Services, 1986).

The zoning approach to ensuring conservation of fishing opportunities is based in part on the philosophy that closed areas will enable a part of the resource to be undisturbed by fishing, providing a reference area, and potentially an enhanced supply of eggs and/or larvae, and/or juveniles and/or adults for the parent, and other reefs. The extent to which this strategy is successful for reef fish in Capricornia is under investigation, and there is a major research effort being directed at assessing the effect of closing and reopening one of the "Replenishment Area" reefs.

Preliminary indications from the data already available suggest that reefs where fishing has not occurred or effort has been lower may have somewhat more and/or somewhat larger fish, than reefs heavily fished. However, for reefs examined in the Great Barrier Reef the effects are not as striking as may have been expected from results in the Philippines (Russ, 1984), or from early surveys in Capricornia (Craik, 1981b).

It has been suggested that a negative effect of zoning is to increase effort on "open" reefs.

Assessment of the likely effect of management measures is complicated by our relatively poor knowledge of the population dynamics of reef fish.

Remarkably little is known about the precise life history details of Great Barrier Reef fishes of recreational and commercial importance. Among other things, it is known that many reef fishes change sex (e.g., Goeden, 1978), that they do not appear to be very mobile (although a small percentage of tagged

coral trout have been recaptured 30-40km away from their tagging reef; Craik and Mercer, unpublished data), that there are what appear to be natural variations in cross-shelf and north-south distribution of coral trout (Ayling and Ayling 1985, 1986), that annual coral trout recruitment may be large (up to 30% of the population), that early growth is rapid and that mortality in early years appears to be fairly high (Ayling, pers. comm.).

We do not know

- whether eggs and larvae spawned at one reef generally remain at the parent reef or end up at another reef, and whether this varies between reefs
- whether reef fish are stationary over long periods of time
- the longevity of many species
- whether the size at which reef fish change sex is reduced as the average size of fish in the population is reduced, or whether it remains steady
- whether GBR reef fish make spawning aggregations as do the same species in other coral reef areas
- whether there is a critical spawning population size
- rates of natural mortality.

In other words, there is still a lot of basic information on life history matters to be collected.