

The potential problem with the Great Barrier Reef reef fishery is three-fold:

- on the best figures available the combined fishing effort of recreational fishermen is estimated to be increasing at a rate of about 7% a year. If the catch continues to increase at present rates, it will be about 12,000 tonnes by 1990.
- the total reef fish catch is continuing to increase, but there are signs of at least localized pressure, becoming evident.
- a small number of recreational fishermen are catching "commercial" quantities of fish without being subject to the restrictions applying to licensed commercial operators. Such operations cannot be described as truly "recreational". These operators and licensed commercial fishermen may legally fish in areas designated for "limited fishing" provided they do not contravene gear restrictions e.g.. in the Marine National Park 'A' Zone. Accordingly they may take large quantities of fish, however because most such areas are heavily used by more orthodox recreational fishermen they are unlikely to be fished by licensed commercial or large scale recreational fishermen.

Already there may be some signs for concern about reef fish stocks:

- a decline in the mean size of reef fish caught from 2.6kg in 1961 to 1.4kg in 1985 off Townsville (Craik, unpublished data)
- the mean number of reef fish caught at reefs off Cairns is lower than that immediately north or south (Craik, unpublished data)
- the mean number of reef fish caught increases with increasing distance from shore off Cairns (Craik, 1979)
- the relatively smaller average size of coral trout at fished reefs in Capricornia compared with "closed" reefs (Ayling and Ayling, 1986)
- the relatively greater abundance of coral trout at reefs off Townsville reported to be subject to "low" fishing pressure compared with reefs subject to "high" fishing pressure (Ayling and Ayling, 1985)
- numbers of coral trout appear to increase with increasing distance from shore off Townsville (Ayling and Ayling, 1985).

Although the Great Barrier Reef Region is an extremely large area, and the problems are not yet acute, they will increase with continuing unrestrained increases in fishing effort. The small sizes of reef fish for sale in markets in Port Moresby, Tahiti and the Philippines indicate that heavy fishing can have a significant effect (personal observation). The commonness of sex reversal in reef fishes is an additional complication. If average fish sizes are being reduced by fishing, the fish population might fail to compensate by reducing the size at which the sex changes occur. It should however be pointed out

that a decrease in average fish size is not necessarily evidence of over fishing; average fish size decreases as soon as a virgin stock is fished.

Conflict between recreational and commercial fishermen is beginning to surface and this is reinforced by the absence of any restrictions on some amateur fishermen who in many respects fish commercially, as outlined above. These "pro-ams" are able to recover some of their costs or obtain a profit from what is portrayed as a recreational activity. Recent change to s35 of the Queensland Fishing Industry Organisation and Marketing Act are intended to restrict such sales.

It is also being recognised that management of recreational as well as commercial fishing may be desirable and in many cases, necessary (Starling, 1986) although the response of recreational fishermen to suggestions for management appears to depend on their fishing motivation.

A survey of island campers in the Capricornia Section of the Great Barrier Reef Marine Park indicated that there are two groups of campers; those who visit the islands to experience the natural attractions of the area and those who visit primarily to go reef fishing. The former group caught fish to eat and sometimes took a few kilograms of fish home with them; the second group used the island as a base from which to go fishing and had large freezers for storing fillets (Walker, 1986). Some campers expressed concern that fishing had deteriorated around the islands; others indicated it was as good as it always has been (Walker, 1986).

Surveys of recreational fishermen indicate that the motivation of living outdoors and experiencing natural environmental qualities, taking it easy, relaxation etc., are of considerable importance (Craik, unpublished data; Moeller & Engilken, 1972; Meyer, 1977) although catching fish was of moderate importance. In trout farms, however, where anglers paid \$US.1.50 per day (1983) to fish for up to 5 trout, catching at least 1 trout was as important as enjoyment of nature and relaxation (Hicks et al; 1983).

A number of attitudinal surveys on recreational fishing in Canada has indicated that number or size of fish caught is generally a less important consideration than lack of crowding (Bugan, 1974; Radford and Wiebe, 1975; Cox 1976; cited in Copes and Ketsch, 1986).

A recent investigation of the diversity of responses from recreational fishermen in their reasons for fishing and fishing experience preferences, showed that their responses varied systematically with the importance they placed on catching fish. Those who regarded the catching of fish as being of relatively low importance (low-consumptive) rated most other aspects of the fishing experience (e.g., relaxation, interacting with nature, escaping the daily routine) more important than high-consumptive fishermen. It seems obvious that actions that would limit catches would be likely to have a greater impact on high- consumptive oriented fishermen (Fedler and Ditton, 1986).

Hilborn (1985) reports that a contentious issue in the British Columbia salmon sports fishery was that of bag limits, the proposed levels for which would have affected only 5% of anglers. Sport fishing groups actively opposed these regulations and the reasons for this opposition appear to include the fact that the most active fishermen spend more time fishing and

have a higher stake in the fishery, and that the type of person who takes an active role in a fishing group is likely to be a frequent fisherman who associates with other frequent fishermen. "Thus the few fishermen who would be affected by small annual bag limits are the same people one expects to lead fishermen's lobby groups" (p.12).

Low levels of representation in lobby groups is also likely to be true in Australia; it is estimated that only 4% of recreational fishermen belong to organised fishing clubs (Aust. Rec. Fishing Confederation, 1984d cited in Gartside, n.d.).

An analysis of Madison River float anglers preferences for management strategies showed that different groups of anglers preferred different types of management strategies (Schoolmaster and Frazier, 1985), with experience being the single most important variable in this study. In terms of educational and interpretive programs, such information is particularly useful for determining which groups should be targeted with what information.

This diversity of responses to different management strategies was also found to be true for marine anglers in New York (Dawson and Wilkins, 1983). Charter and private boat anglers were questioned as to which form of potential regulation for marine recreational angling they preferred.

Responses were as follows:

Regulation	Charter Boats Favour or neutral	Private Boats Favour or neutral
Min size limit	70	90
Limited gear (2 lines)	56	69
Prohibition on amateur fish sales	55	62
Daily bag limit	50	61

Over 70% of both angler groups reported they would continue to fish as frequently as they had in the past if any of the regulations were imposed and the daily bag limit, the least favoured option, would have greatest potential impact on participation.