1. INTRODUCTION

Managing marine fish involves particular difficulties which are not found in the management of terrestrial animals. In a general way, fishing can be equated with terrestrial "hunting" whereas cattle production for instance can be equated with "farming" and its potentially superior efficiency. The regions and boundaries established for management of marine areas are obviously artificial, and may be recognised, frequently only with difficulty, by fishermen but not at all by the fish. The continuous nature of water and the consequent immigration and emigration of organisms in and out of areas, coupled with the uncertainty of the size of area required to be self-sustaining makes fish management in marine parks a difficult task, based frequently on educated guesses, particularly in the absence of much information on the organisms involved.

2. EXISTING FISHERIES

Several kinds of fisheries can be identified:

- commercial
- recreational
  - . line
  - . spear

- subsistence
- miscellaneous
    - . coral collection
    - . aquarium fish collection
    - . mariculture

Existing commercial fisheries in the Great Barrier Reef Region include:

School Prawn	Trevally
Sand crab	Scallop
Mud crab	Barramundi
Spanish Mackerel	Marlin
Coral trout	Kingfish
Red emperor	Mullet
Snapper	Wrasse
	Whiting

and see attached map (Figure 1) (Rooney et al., 1978).

Although the marlin fishery is not a commercial fishery in the normal way, it generates and involves large amounts of money.

As is the case for the vast majority of Australian fisheries, mainly inshore resources are exploited and according to the Australian Fishing Council Working Group on the 200 mile zone (AFCWG), there is limited scope for further development other than by Australians,

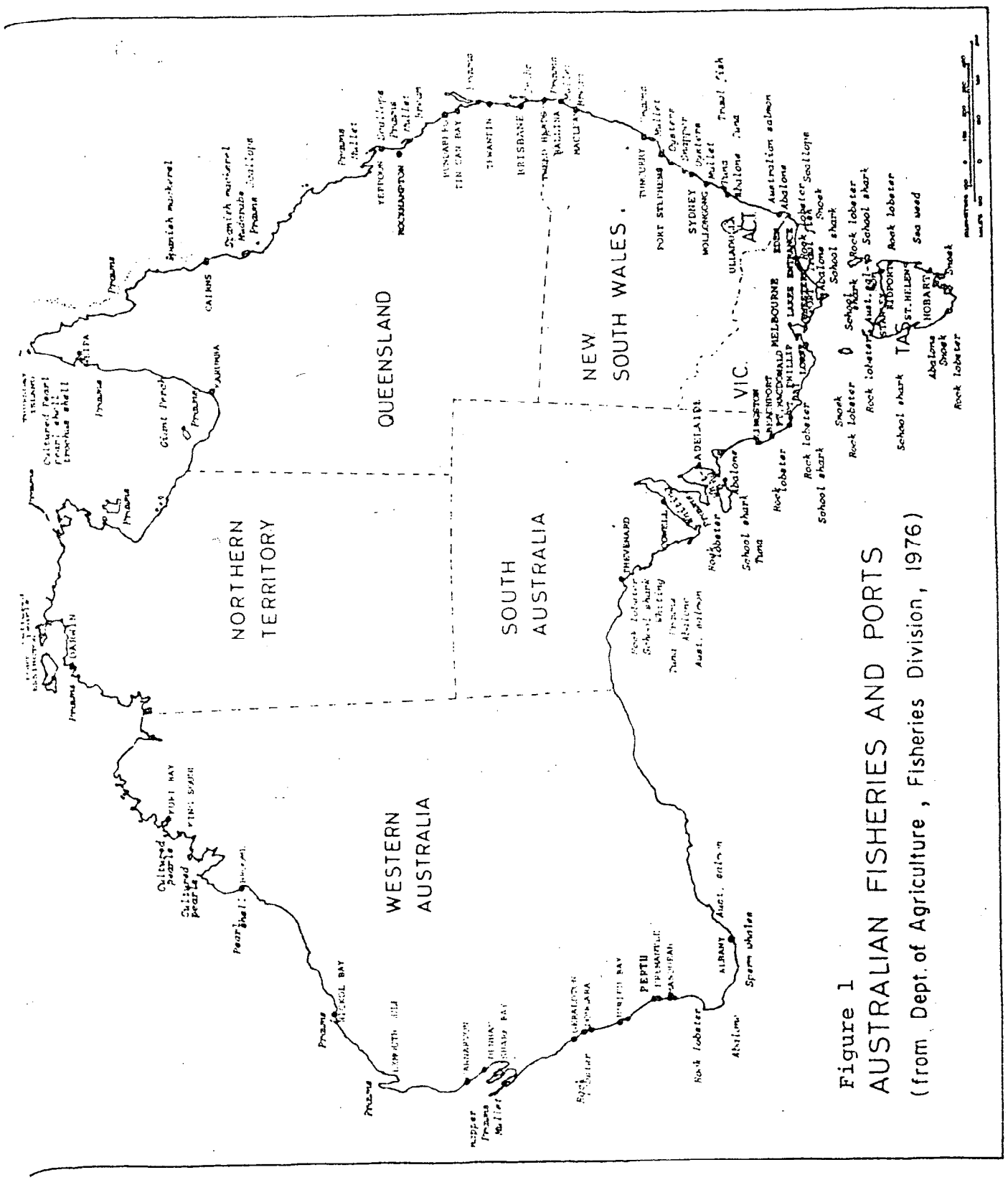

Figure 1
AUSTRALIAN FISHERIES AND PORTS
(from Dept. of Agriculture, Fisheries Division, 1976)

particularly in scallop and prawn fisheries where some degree of management already exists. In demersal fisheries near large population centres, some form of control may need to be introduced. In contrast, pelagic fisheries, e.g. Spanish mackerel, tend to be relatively under-exploited (AFCWG, 1977).

Foreign fishing activity in the Great Barrier Reef area mainly involves Taiwanese boats fishing for clams (AFCWG, 1977). By February 1977, 22 Taiwanese fish boats had been apprehended with an estimated 406,000 clams (Aust. Fish.,1977). Recently, increased trawling activity by Taiwanese pair trawlers has been reported and some Japanese longlining is believed to occur (AFCWG, 1977).

As far as future development of resources is concerned, some potential for demersal trawl resources off the east coast of Queensland is believed to exist, but the types of fish and the kinds of bottom may limit it. Potential resources for skipjack tuna, northern bluefin tuna, yellowfin tuna, sharks, squid, billfish, lightfish and lanternfish are unknown, but may be at least moderate for some fisheries in some areas of the Great Barrier Reef Region (AFCWG, 1977).

The amateur fishery in the Great Barrier Reef area is involved in catching many of the same species caught by the commercial fisheries, although areas, quantities and methods obviously vary. Amateur fishing, through logistic considerations is obviously more concentrated near large population centres, but presumably there is potential for expansion to the outer reefs and the northern end of the reef.

Subsistence fishing for dugong, turtles and reef fish is undertaken by indigenous people around Lockhart (Chase, 1978), the Torres Strait Islands and Palm Islands (Goeden, 1975).

Although mariculture is not intensively undertaken in Australia, it offers possibilities on a small scale for localised areas. In the Great Barrier Reef area, oyster farming on Palm Island (Bryson, 1977) and pearl culture in the northern region of the Reef (Haysom and McPherson, 1978) are undertaken. However problems which maricultural activities can generate include:

- the production of organic effluents from hatcheries;

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- sedimentation from raft culture;
- introduction of toxic chemicals;
- physical alteration of the environment;
- the introduction of exotics and parasites (Ray, 1976);
- the fencing off of areas, interfering with free passage, recreational fishing and boating (Rooney et al., 1978).

3. AIMS OF THE FISHERIES

The aim of the commercial fisherman is obviously to maximise his catch, particularly in the short term but also over as long a period as he intends to fish. However, in the absence of any regulation (licence limitation, catch quotas, etc.) the amount of fishing increases beyond the points of maximum sustained economic yield and maximum sustained biological yield and tends to stabilise, at a lower catch, around a point where costs and value are about equal (Crutchfield, 1959).

Likewise, commercial enterprises such as coral, shell and aquarium fish collection are obviously designed to maximise profit, and, although individuals may regulate their own collecting to ensure future income, the absence of any limitation on the number of people involved in such activities may, in an expanding fishery

result in "overfishing".

Maricultural activities are designed to farm fast growing, easily raised, economically profitable organisms, and while such enterprises are unlikely to result in overfishing, unless badly managed, mariculture presents its own set of problems, discussed earlier.

The aim of the recreational line fisherman is less clear, but studies conducted elsewhere suggest that such factors as water quality, natural beauty and privacy are more important to a fisherman than the size and number of fish caught (Moeller and Engelken, 1972). However, logistic factors tend to concentrate amateur fishermen in more accessible areas than commercial fishermen, and there will probably be less inclination for the amateur fisherman, particularly in the absence of any regulation, to spread his effort.

Spear-fishing also tends to be concentrated in more accessible areas and in the presence of frequent spear fishing may result in "shyness" of larger species (Goeden, 1972 cited in Goeden, 1975) and rapid depletion of resources, because the target can be more readily pursued by a spear fisherman than a line fisherman (Ray,1976).

Personal and family food requirements are the objective of subsistence fishing, but realistic mechanisms are required to limit the fishery to traditional levels (in effort and equipment)(Robinson, 1976).

4. CONFLICT BETWEEN USERS

Frequently conflict is generated between and within commercial and amateur fishermen and tourist groups, the latter category of people having the ability to cause inadvertent habitat destruction by walking, anchoring and removal of "souvenirs" (Goeden, 1975; Ruello and Henry, 1977). This conflict has been heightened by increased mobility of both amateur fishermen and tourists.

The differing aims and interests of each group mean that commercial fishermen may feel their livelihood threatened by amateur fishermen and both commercial and amateur fishermen may see the other group as responsible for the death of large numbers of young fish by retention of undersized fish, netting practices, etc. Amateur fishermen may feel that trawl and seine nets destroy bottom areas and organisms (Ruello and Henry, 1977). According to Ruello and Henry, much of the conflict between commercial and amateur fishermen is due to ignorance and envy and very little of it is based on fact.

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