

# Reef fish fisheries in the Great Barrier Reef World Heritage Area

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## Description of the fishery

Principal reef fish species occurring in the Great Barrier Reef World Heritage Area are fish from the demersal tropical coral reef group and reef pelagics.

Tropical coral reef fish species targeted by fishers include many species of the families of *Lethrinidae*, *Lutjanidae* and *Serranidae*, amongst others. Coral trout (*Plectropomus sp.*), red throat sweetlip emperor (*Lethrinus miniatus*) and red emperor (*Lutjanus sebae*) form a significant proportion of catches.

Reef pelagics comprise a further range of species taken. Most commonly targeted as food fish are spanish mackerel (*Scomberomorus commerson*), other mackerels, shark of the family *Carcharhinidae*, and tunas (*Scombridae*). Billfish are sought after by sports fishers for tag and release fishing.

The above fish species occur elsewhere in Queensland but are most commonly landed from the waters of the Great Barrier Reef.

## Participants and their catches

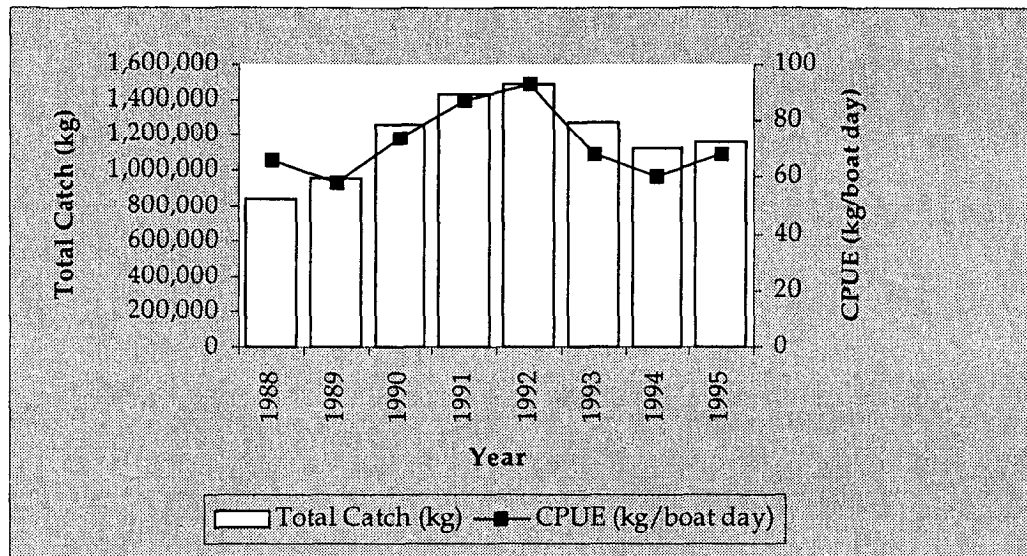
Many people use reef fish stocks of the Great Barrier Reef; commercial, recreational and indigenous fishers, clients of charter and guided fishing tours, divers, underwater photographers and others simply viewing those stocks.

Commercial fishers participate extensively in the harvesting of tropical coral reef and reef pelagic fish stocks of the Great Barrier Reef. There are 251 licensed operators in the principal Great Barrier Reef Line Fishery with a further 1563 licence holders with more limited commercial access to those stocks.

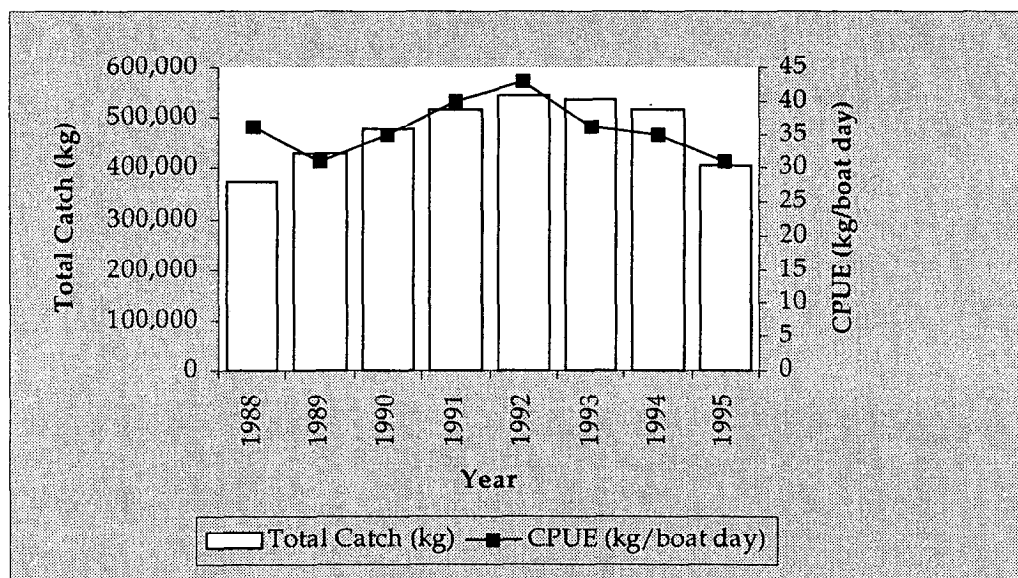
Time series data about catches are limited to log book records kept by commercial fishers. Summary records of commercial landings of the principal fish species in the Great Barrier Reef Region are contained in Figs. 1, 2 and 3. A more comprehensive analysis of these data can be found in an independent review of the commercial log book data undertaken by the Cooperative Research Centre for Ecologically Sustainable Development of the Great Barrier Reef (Mapstone et al. 1996).

They observed that effort in the tropical commercial demersal reef line fishery appeared fairly stable over the period 1989-94. The notable exception was effort that resulted in landings of red emperor, which has consistently declined. This may be the result of a shift in targeting by the fishery, especially since red emperor are caught mostly at night in deeper waters rather than in daylight hours on the shallower reefs where most reef line effort is currently directed. There are few conspicuous signals in the logbook data of incipient problems with the reef line fishery, although the slight downward trends in catch rates of red throat emperor and of miscellaneous

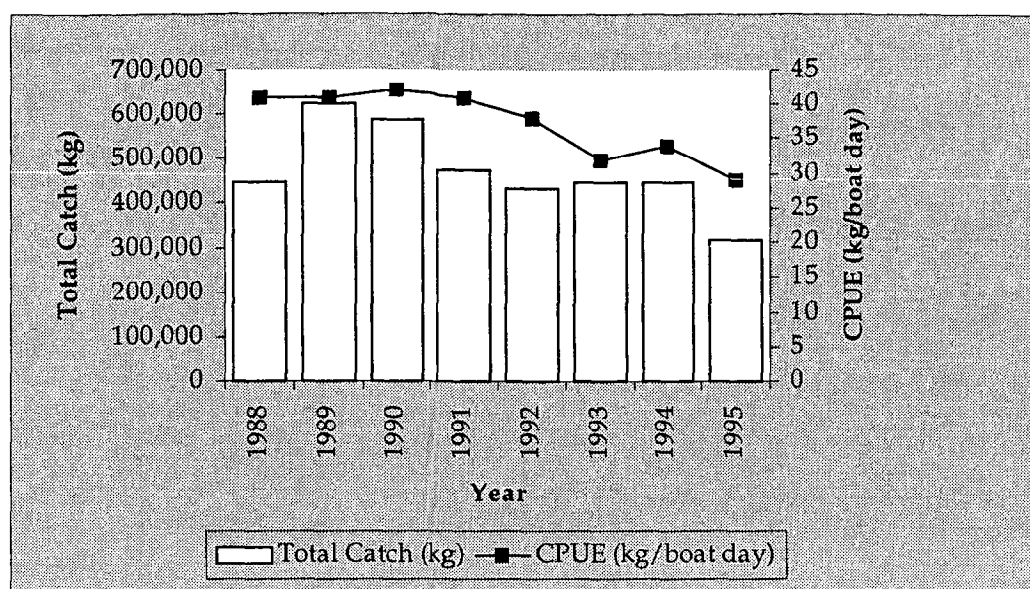
reef species should be monitored carefully in future years. The recent drop in total catch of coral trout in the face of increased effort is also noteworthy, and should be monitored carefully.



**Figure 1.** Total catch and catch per unit effort (CPUE) in the commercial coral trout (*Plectropomus* spp.) fishery in the Great Barrier Reef World Heritage Area from 1988 to 1995. Source: QFISH logbook system, QFMA.



**Figure 2.** Total catch and catch per unit effort (CPUE) in the commercial red throat emperor (*Lethrinus miniatus*) fishery in the Great Barrier Reef World Heritage Area from 1988 to 1995. Source: QFISH logbook system, QFMA.



**Figure 3.** Total catch and catch per unit effort (CPUE) in the commercial spanish mackerel (*Scomberomorus commerson*) fishery in the Great Barrier Reef World Heritage Area from 1988 to 1995. Source: QFISH logbook system, QFMA.

Recreational fishing for stocks on the Great Barrier Reef is also a popular pastime. Limited information is available on the levels of recreational fishing on reef fish stocks. Comparisons drawn from two studies 10 years apart yield the following information on the levels of participation by recreational anglers.

**Table 1.** Use of pleasure craft for fishing in the Great Barrier Reef Region (source: Hundloe 1985; Blamey and Hundloe 1993)

Economic region	Number used for fishing in reef region 1980	Number used for fishing in reef region 1990	Percentage increase over ten years	Estimated number used in open waters 1990
Rockhampton	4440	6911	56%	442
Mackay	2597	4898	89%	264
Townsville	4320	6370	47%	535
Cairns	3530	6122	73%	826
<b>Total</b>	14 887	24 301	65%	2067

Blamey and Hundloe (1993) estimated the total annual catch from the 24 300 boats (in 1990 above) at between 2.6 and 3.2 million fish, with a total weight of between 3500 and 4300 tonnes. (Note: this estimated catch includes tropical coral reef fish, reef pelagics and other species).

Blamey and Hundloe (1993) made comparisons with catch characteristics of an earlier study in 1980-81. The authors note that the validity of these comparisons is questionable, given that the 1980-81 survey figures were based on fishers' recall (in mail surveys) of previous trips, whereas the 1990-91 boat-ramp survey documented catches of the trip from which fishers had just returned. Tentative calculations estimate that the total weight of fish caught in 1990-91 was

40% lower than the 1980-81 figure, even though the number of people fishing has increased by about 50% in many regions.

Higgs (1993 and this volume) has assessed historical records provided by recreational fishing clubs in areas adjacent to the Great Barrier Reef.

### **Current management arrangements**

Current management arrangements for reef fish stocks can be divided into four main categories: those that apply to all fishers, and those that apply only to the commercial fishery, only to the recreational fishery and only to the charter fishing vessel industry.

Minimum and maximum legal size limits for 36 reef fish species apply to all fishers. Most of those species fall within the tropical coral reef fish species group.

Commercial harvesting of tropical coral reef fish is controlled by existing regulatory requirements, which limit access to licence holders whose primary fishing-boat licences are endorsed for that purpose. Access for operations within the tropical coral reef fishery is divided into several main categories endorsed on the licence as set out below.

- L1      Line fishery (other than Great Barrier Reef region)  
Permits the holder to fish using a rod and line or handline with a maximum of six hooks and no more than three lines a person from a boat in waters outside the Great Barrier Reef Region on the east coast of Queensland.
- L2      Line fishery (reef)  
Permits the holder to fish using a rod and line or handline with a maximum of six hooks and no more than three lines a person from a boat and use more than one tender vessel to operate in the Great Barrier Reef Region, but (in effect) only if such tender vessels were licensed before June 1993.
- L3      Line fishery (reef)  
Permits the holder to fish using a rod and line or handline with a maximum of six hooks and no more than three lines a person from a boat and permits the use of a maximum of one tender (if currently licensed) in conjunction with the primary commercial fishing boat in the line fishery in the Great Barrier Reef Region.
- L6/L7    Line fishery (south Queensland)  
Permits the holder to fish using a rod and line or handline with a maximum of six hooks and no more than three lines a person from a boat within all tidal waters east of the territorial sea baseline and south of latitude 25° S.
- L8      Line fishery (multiple hook - east coast)  
Permits fishers to operate within tidal waters deeper than 200 metres that are east of longitude 142° 31' 49" E. However, these operators are not permitted to take coral trout, red emperor (and snapper).

For each of the fishery symbols, requirements on apparatus available for use and conditions of use of tender vessels also apply.

The Fisheries Regulation 1995 sets maximum size limits on boats used in line fisheries:

- primary fishing boats - 20 metres; and
- tender fishing boats - 7 metres.

(Larger boats licensed before the new regulation are exempt from this 20-metre limit.)

The size of vessels is further limited by the Queensland Fisheries Management Authority (QFMA) policy on boat replacement in commercial fisheries. Persons in charge of licensed fishing operations for tropical coral reef fish species must also be licensed as commercial fishers. Other persons are required to hold Assistant Fishers licences. The Fisheries Regulation 1995 allows for a crew licence to be issued in certain circumstances.

Recreational fishers are limited to a total of 30 fish in their possession. This applies to 26 popular reef fish species. Within this overall total of 30 fish, certain species have sub-limits (for example, 10 coral trout). Recreational fishers are not permitted to sell their catch.

Recreational fishers may fillet their catch at sea, but must retain all the skin on each fillet until the fish is brought ashore. This is to help identify the species of fish.

Recreational fishers can use a rod and line or handline with up to six hooks attached. Each person may use up to three sets of such apparatus. Recreational fishers may also use spears or spearguns, but not while using or wearing underwater breathing apparatus (for example, SCUBA).

Charter boats, when engaged in fishing charters in excess of 48 hours duration (extended commercial fishing tours), may possess double the normal recreational bag limit (that is, 60 fish in possession). Charter boat clients on extended tours may remove most of the skin other than a 3 cm<sup>2</sup> area for identification purposes.

Under the new Fisheries Regulation 1995, all charter fishing boat operators (commercial fishing tours) require a commercial fishing-tour permit if they take a fee-for-service.

### **Purpose of management arrangements**

Current management arrangements were introduced primarily to cap fishing effort in tropical coral reef fish and reef pelagic fisheries. Minimum legal sizes were introduced based on the principle of allowing each individual of a species to spawn on average at least once before being legally available for capture.

Maximum legal sizes have been applied to some tropical coral reef fish species, such as estuary cod and potato cod. These size limits were introduced in response to public opinion about poor eating quality of those large specimens and the perceived desirability of protecting large fish for viewing purposes.

Bag limits now in use for reef fishes have essential roles in fisheries management, including:

- conserving heavily exploited species;
- encouraging anglers to be more conservative in their fishing practices;
- spreading the catch more equitably amongst anglers; and
- reducing the potential for illegal marketing of excess catches by some fishers.

Limited licensing of the commercial sector is used to contain levels of fishing effort, in this case to those that applied when the limited licensing regime was introduced in 1993.

## **Current issues**

Current issues in management of reef fish stocks include:

- concerns about catch and fishing effort trends for popular reef fish species;
  - localised depletion of coral reef fish;
  - the value of using spawning area and seasonal closures;
  - the appropriateness of existing minimum and maximum size limits and bag limits;
  - the adequacy of current data collection;
  - disputes about resource allocation;
  - the adequacy of surveillance and compliance resources;
  - the impacts of habitat modification and pollution on stocks;
  - the emergence of the live fish trade;
- amongst others.

## **Present actions**

Major conservation initiatives were taken in 1993 with the introduction of a package of measures which applied restraints on all users of reef fish stocks. Generally those measures set out to place a limit on further growth in fishing effort across all sectors. Whilst it is difficult to measure the performance of those measures towards the stated goal after only two years, reviews of both commercial and recreational catch data show some consistency in catch/effort relationships over time. This however is neither evidence for nor guarantee of current effort levels being within the limits of sustainable use of reef fish stocks. Nor do they confirm that those stocks are overfished.

In the absence of conclusive information about reef fish stocks, management arrangements are kept under close scrutiny. Over the 1996-1997 period, management arrangements for tropical coral reef fish stocks are being publicly reviewed with the purpose of forming a statutory fisheries management plan for those stocks consistent with ecologically sustainable use principles provided under the new *Fisheries Act 1994*. Current issues identified above are to be addressed in that process. Reef pelagic fish stocks are scheduled for similar review on completion of the plan for the demersal fishes.

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