

## The aquarium fishery in the Cook Islands: 'is there a need for management?'

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### Summary of the fishery

The commercial exploitation of aquarium fish in the Cook Islands was established during November 1988. One foreign-owned company was granted permission to operate on Rarotonga by the Cook Islands Government. Although the operation is relatively small it is an important export earner for the country: earning NZ\$80,000 at its initial stage to present earnings of NZ\$240,000 per year. The operation currently employs 6 full-time and 3 part-time collectors who earn between NZ\$50 and NZ\$700 per week depending on their catch and experience.

Other islands in the Cooks, particularly those with frequent air links to Rarotonga, have the potential for the commercial exploitation of aquarium fish. However, the lack of interest, knowledge and capital has prevented any collecting on these islands. It is anticipated that in the future resources in the outer islands will be utilised.

Due to the variety of fish species collected for the aquarium trade, the biology will not be discussed in this paper. The interested reader is directed to a recent publication by the Forum Fisheries Agency, entitled, *Nearshore Marine Resources of the South Pacific* (Wright & Hill, 1993) for information on the biology and other aspects of the fishery. In the Cook Islands a total of 35 different marine ornamental fish are collected by divers using SCUBA, with either small-meshed barrier or hand-held scoop nets, at depths of eight to 70 metres, however only eight species are in regular demand. Fish captured from deep water are pierced in the air bladder or staged (depending on species) to prevent the need for lengthy decompression procedures.

Cook Islands Aquarium Fish Ltd does not accept ornamental fish caught from the lagoon. Fish are kept in special tanks with circulated fresh salt water on board medium-sized (5–8m) vessels prior to transfer into a warehouse holding facility. To avoid waste build-up during air shipment they are not fed for two to three days prior to shipping.

### Problems with the industry

There has been much objection to the establishment and operations of Cook Islands Aquarium Fish Ltd,

from recreational dive operators and the general public, with the principal accusations being:

1. The fish collectors are indiscriminately destroying the coral reef habitat, and
2. The operations of aquarium fish collecting have caused significant depletion of both ornamental and reef food-fish stocks.

Responses by Cook Islands Aquarium Fish Ltd to questions about its operations are attached in Annex1.

Cook Islands Aquarium Fish Ltd accepted that some of their collectors have caused minor damage to the reef unnecessarily during capture of one species of fish. Collectors with frequent destructive fishing practices have been dismissed. Currently the operators maintain that they do their best to monitor their staff and no longer allow inexperienced collectors to collect species which require any coral notching (careful removal of branches from the middle of a coral head) (Passfield & Evans, 1991).

The overall CPUE (all species pooled) has remained consistent after 1990 as illustrated in Figure 1. This suggests that resources are sustainable with the current levels of exploitation.

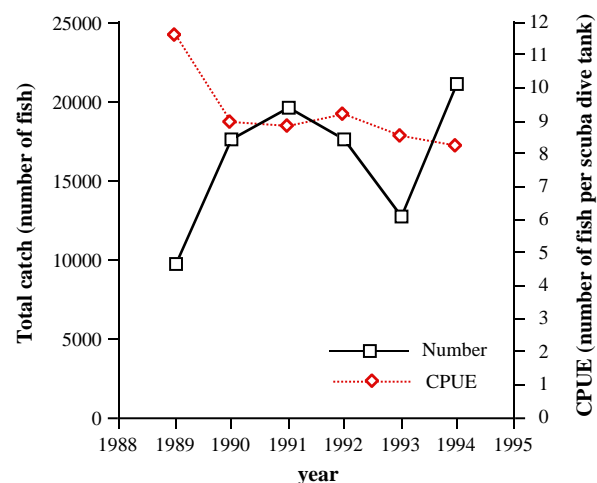


Figure 1. The history of overall catch (numbers of fish) and effort (dive tanks per year), extracted from annual records supplied by Cook Islands Aquarium Fish Ltd

## Management of the fishery

At present the fishery is not governed by any regulations which are designed to limit the total catch or effort, since no distinct decline in catch rates has been detected. Management is limited to a ban on fishing in the lagoon by the expatriate fish collectors. However, there are no regulations covering local Cook Islanders fishing inside the lagoon (FFA Report No. 93/25).

## Future trends

With only one exporter operating at the present time on Rarotonga, and assuming fishing practices do not change, no management (e.g., catch quotas, harvest seasons, etc.) appears to be necessary. However, to avoid further conflicts between the different user groups (i.e. fishermen, aquarium fish collectors, recreational divers, conservationists, etc.) there is an urgent need to address the social goals in fisheries management. It is prudent that management guidelines be established prior to the expansion of industry.

The future management strategies are likely to incorporate the following components:

- ☞ That only one operator be granted permission to commercially exploit marine ornamental fish on each island which has sufficient stocks and infrastructure to establish a viable fishery.
- ☞ That licences be issued to aquarium fish exporters. Conditions for the issue of licences should include:
  - *The exporters have a good international reputation, and catch and effort statistics are made available;*
  - *A code of fishing practices be established and that the operator be responsible for ensuring that collectors follow this code. The code should include ecological considerations and also qualifications for collectors (approve minimum standards for collection methods);*
  - *That permanent marine reserves located around the islands be designated, where fishing in general is prohibited. These reserves may be selected for their aesthetic appeal where recreational divers can observe fish in an undisturbed habitat.*

These recommendations for management of the aquarium fishery should minimise the conflicting issues between different user groups, avoid over-

fishing, and maintain economic benefits to the country.

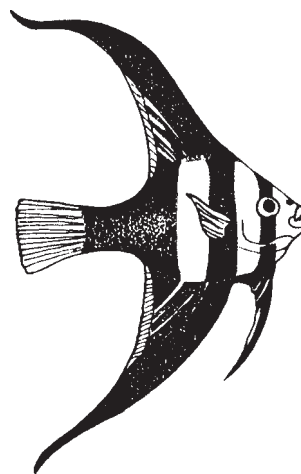
## Conclusion

Establishing management guidelines for aquarium fish is high on the agenda if exploitation is expanded to outer islands within the group. It is anticipated that these regulations will be designed to achieve the following goals: encourage development, ensure that only clean, recognised operators are given permission to operate, avoid conflicts between different user groups (fish collectors, spear fishermen, conservationists, recreational divers, etc.).

In summary, the Cook Islands experience with a recently developed fishery for aquarium fish has been a success, in terms of creating employment, fisheries development and self-imposed management. No detrimental biological effects on the resources have been detected.

## References

- PASSFIELD, K. & J. EVANS (1991). Aquarium Fish Profile, Ministry of Marine Resources Profile No. 7. Rarotonga, Cook Islands.
- RICHARDS, A. (1993). Cook Islands Fisheries Resources Profiles. Research Coordination Unit. FFA Report No. 93/25. 121 p.



## Annex 1: Responses by Cook Islands Aquarium Fish Ltd to questions concerning its operations.

### *Coral head 'notching' and the real causes of reef damage*

- Only one species of fish, *Neocirrhites armatus* (Red Hawks), requires coral notching in order to successfully collect it. This species lives in

only one type of coral (*Pocillopora*), out of over 40 different types of coral on Rarotonga's reefs. Thus, the 'notching' of this one type of coral is a small percentage of the entire coral reef.

- The reef around Rarotonga covers over 32 kilometres and coral is notched in only a three to four kilometre section of the 32 kilometres. The 'notching' is done on only one of over 40 types of coral in this three to four kilometre area.
- The majority of 'notched' coral heads do not die. They remain alive, filling the notched areas with new growth of branches.
- The branches from the notched coral head grow when planted and produce additional coral heads.
- Scientific studies show that the end result of the 'notching' of coral heads and planting of coral branches increase the total number of coral heads on the reef, as *Pocillopora* has a life span of 15 years. The technique of notching helps to maintain the population.
- The causes of extensive damage to Rarotonga's coral reefs have been and will continue to be cyclones and water pollution, not damage to individual coral heads, whether it be the result of boat anchors, sport divers, shell collectors or fish collectors.
- Coral reefs recover from damage caused by cyclones in about 8 to 10 years. New coral grows from broken pieces left by the cyclone, and larval coral produced by the remaining live coral through the reproduction process.
- Coral reefs do not recover from water pollution, they remain dead unless the water pollution is stopped. The amount of time needed for a polluted reef environment to re-grow, once the pollution is stopped, is much longer than the recovery time after a cyclone.

#### *Type of fish collected and effects on 'food fish'*

- The aquarium fish are not the types caught for food.
- The number and type of aquarium fish collected do not affect the 'food chain' of the edible fish on the reef: algae eaters such as parrots and surgeons do not prey on other reef fish.

- The majority of the fish are caught entirely by locally-trained collectors.
- The aquarium fish which are caught are not a food source for large fish caught trolling and do not affect the population of those fish. Tuna and barracuda do not feed on ornamental reef fish, as trolling methods prove.
- Small ornamental reef fish recruit and grow within a few months, as collection numbers prove.

#### *Aquarium fish resources and Cook Islands Aquarium Fish Ltd*

- The aquarium fish are sold overseas and bring foreign money into the country.
- The aquarium fish replenish quickly (6-14 months) and provide an unending source of money when managed correctly.
- At present Cook Islands Aquarium Fish Ltd buys fish from six full-time and three part-time self-employed fish collectors, trained by the company.
- The company employs one part-time warehouse worker.
- Cook Islands Aquarium Fish Ltd., since it was started in November 1988, has trained or attempted to train 42 Cook Islanders for positions in warehouse management, maintenance and fish collecting. Up to the present time the company has been unable to find persons interested in attempting the five-year training period required to manage the warehouse and export phase of the business.
- In response to accusations that Cook Islands Aquarium Fish Ltd is unlawfully operating without local partnership or investment: As provided for in the Cook Islands Development Investment Act and Investment Code, Cook Islands Aquarium Fish Ltd is a foreign-owned company. Nowhere does the Act or the Code state that a foreign company investing in agriculture or fisheries **must** have local partnership.

