

FORUM FISHERIES AGENCY / SOUTH PACIFIC COMMISSION WORKSHOP ON  
MANAGEMENT OF SOUTH PACIFIC INSHORE FISHERIES

Noumea, New Caledonia, June 26 to 7 July 1995

The Aitutaki experience in the development of management strategies for the Trochus fishery.  
(Cook Islands)  
By I. Bertram.

Summary

The commercial exploitation of *Trochus niloticus* from Aitutaki began in 1981 with limited controls. This resulted in approximately 200 tonnes (dry shell weight) taken from an area of 460 hectares of known trochus habitat, over a period of fifteen months. In the past years, the Ministry of Marine Resources and the Aitutaki Island Council have used a combination of regulations to counteract the problem of overfishing in order to ensure the long term viability of the trochus fishery. The fishery is now managed through the use of the following regulations: short harvesting seasons; minimum and maximum (8 - 11 cm) size limits; limiting the catch to 60 % (originally, approximately 30%) of the harvestable stock, i.e. 8 - 11 cm basal diameter size range; and the use of Individual Transferable Quotas (ITQ's). (Zoutendyk and Passfield 1989). Government intervention through fisheries management strategies resulted in the trochus resource being utilised on a relatively sustainable basis with the economic benefits of the resource made available to the resident population of Aitutaki.

A total of 280 *T. niloticus* were first introduced to Aitutaki in 1957. During the early 1980's attempts were made to introduce trochus to other islands from Aitutaki. The sole purpose of this was to establish a future commercial fishery. During the 24 year period between the introduction of trochus to Aitutaki and the establishment of a commercial fishery, harvesting of the species was prohibited, to allow the stock to reach commercial levels. However, special permission was granted for the transfer of trochus to other islands. Trochus is currently only commercially exploited on Aitutaki, when the standing stock reaches approximately 550 - 650 shells per hectare. Trochus (dry shell weight) yields from Aitutaki range from 200 tonnes to 18 tonnes with an average (excluding the first harvest) of 32 tonnes.

Trochus populations on Rarotonga, Manihiki, Penrhyn and Palmerston Island are now well established however have not reached commercially exploitable levels and in the case of Rarotonga trochus are currently harvested for local consumption. The focus of this paper therefore will be based on the development of management strategies for the Aitutaki Trochus fishery.

Management of the Aitutaki Trochus Fishery

Currently the Marine Resources Act 1989 and the Aitutaki Fisheries Protection By-Laws 1990 are the only two statutes which apply to the trochus fishery. From the establishment of the trochus fishery on Aitutaki a management plan was developed by drawing on examples from trochus fisheries elsewhere and experience from past harvests on Aitutaki (FFA Report No.93/25). The aim for the development of an effective management plan was to maintain a catch as large as possible which would be profitable to the community and not biologically jeopardise the renewability of the resource. Table 1. Illustrates the development of management strategies for the Aitutaki trochus fishery in chronological order.

The management strategies put into practice for the Aitutaki trochus fishery are briefly summarised below.

Harvest season

The harvesting seasons following the 1981 harvest were very limited in duration ranging from one day to 3 months. Initial harvest seasons were declared arbitrarily. However due to actual yields grossly exceeding that of the set quota, harvest duration was then determined by the estimated time to attain the allocated quota. This system alone proved ineffective in controlling the allocated catch quotas. In 1987 the harvest duration's were allocated as separate 24 hour periods. The harvest

seasons, were then closed when yields were pretty much close to the allocated total catch quota. The introduction of 24hr pulse fishing periods appears to have successfully minimised quota overruns.

#### Catch limits

It has been difficult to determine how the first two catch quotas were achieved, however after the second harvest season quotas were calculated as approximately 30% of the assessed biomass of 8 - 11cm shells. During the 1990/91 and 1992 harvest, the total allowable catch quotas were set at 60% of the assessed standing stock of legal size shells.

Trochus harvest inspectors are required to monitor all landing sites as the harvest progressed. This has proved logistically impossible (Sims. 1988).

#### Trochus reserve

A breeding reserve was introduced in 1983 which covers a 3km stretch of the windward reef of Aitutaki. The location of the reserve was designed to promote retention of plankton larvae in the lagoon (Sims. 1988). Pre- and post-harvest surveys in the reserve suggested that poaching has occurred in the reserve (Sims. 1988).

#### Size limits

Legal size limits were introduced after the establishment of the fishery and have changed over the years from the experience gained in each harvest. A minimum size limit of 8cm was imposed during the first harvest (Clark. D. pers.comm.). Experience from other trochus fisheries has indicated that trochus reach reproductive maturity at around 6-7cm basal diameter. A minimum size limit of 8cm allows most young trochus the opportunity to spawn before becoming vulnerable to fishing pressure.

During the first harvest season trochus buyers were reluctant to purchase large wormy shells, the outcome of this was the introduction of a maximum size limit of 12.5cm (basal diameter) during the 1983 harvest season. In 1984 the maximum size limit was reduced to 11cm (Bour. 1988). This appears to have successfully improved the value of the total catch. The maximum size limit was designed to limit the taking of low value (wormy) shells and preserve the more fecund animals within the population.

#### Licensing

Licensing of divers was first introduced in 1983 and is currently a requirement under law.

#### Trochus kept alive

There is a requirement that all harvested trochus must be kept alive until approved by a harvest inspector. This allows for the illegally harvested shells to be returned to the water.

#### Individual Transferable Quotas

During the 1990/91 harvest an Individual Transferable Quota (ITQ) system was introduced to control the problems with quota overruns. To determine the ITQ, the allocated total catch quota is divided evenly between all resident individuals of Aitutaki during the allocated harvest season, regardless of the desire to participate, age or actual ability to harvest trochus (Zoutendyk. 1990).

The ITQ as a management tool appears to be most favoured by the community, as all individuals receive an equal share of the economic benefits. The introduction of ITQ's was a success in reducing quota overruns, it also minimised the risk of stock piling prior to harvest seasons. ITQ's also have the added potential to increase the value of the total catch (Fishers are more inclined to fill their quota with high valued shells). ITQ's will most certainly be used in future harvest.

Table 1: A chronological history on the development of management strategies for the Aitutaki trochus fishery. (Tonnes expressed as dry shell weight)

Management strategies practiced during each harvest	The actual occurrence during each harvest season	Comments
---	--	----------

**1981/82 harvest season**

A short harvest season of 3 months was declared.	The actual harvest season, 15 months.	The harvest season was decided arbitrarily.
Harvest-able quota was set as 30 tonnes.	Approximately 200 tonnes of trochus shell was collected.	Records do not show how this quota was determined, probably by speculation ?.
Size limits.	?	A minimum size limit of 8cm (basal diameter) was imposed.

**1983 harvest season**

Three months was declared as the harvest season.	The actual duration of the harvest, three months.	The harvest season was determined by estimating the time to attain the set quota.
Harvest-able quota set as 20 tonnes.	A total of 35.7 tonnes harvested.	This quota was probably determined by speculation ?.
Legal size limits.	Illegal size trochus harvested were confiscated by harvest inspectors prior to processing.	The minimum size of 8 cm was maintained a maximum size limit of 12.5 cm basal diameter was introduced to remove poor grade (wormy) shells from the total catch.
Established a trochus reserve.	Poaching occurred in the reserve.	Three kilometres of stretch of windward reef was designated as a trochus reserve. The size of the reef was decided arbitrarily. Harvesting in the reserve occurred due to poor enforcement efforts.
Licences issued.	42 licences issued.	Licences cost, NZ \$1.00.
Trochus must be kept alive prior to inspection.	Illegal size shells were confiscated prior to processing.	Confiscated shells were returned to the lagoon.

**1984 harvest season**

Three months declared as the harvest season.	The actual harvest season, 12 days.	The harvest season was reduced due to the total catch grossly exceeding the set quota.
--	-------------------------------------	--

Harvest-able quota set as 20 tonnes.	A total of 45.7 tonnes harvested.	The quota was calculated as 30% of the harvest-able stock (8 - 11 cm size range).
Legal size limits.	Inspectors removed undersized and oversize shells prior to processing.	The minimum size limit was maintained however the upper size limit was reduced to 11cm (Bour. 1988), probably due to parasitic infestation on large shells. This has successfully improved the total catch value.
Maintained trochus reserve.	Poaching occurred in the reserve.	Harvesting in the reserve occurred due to poor enforcement.
Licences issued.	300 licences issued.	Licences cost, NZ \$1.00.
Trochus must be kept alive prior to inspection.	Illegal size shells were confiscated prior to processing.	Confiscated shells were returned to the lagoon.

#### 1985 harvest season

Three days was declared as the harvest season.	The actual harvest season, three days.	The harvest season was determined by estimating the time to attain the set quota.
Harvest-able quota was set at 20 tonnes.	A total of 27 tonnes was harvested.	Quota was set at 30% of the harvest-able stock..
Legal size limits	Illegal size trochus harvested were confiscated by harvest inspectors.	The legal size for trochus was maintained as animals with a basal diameter of 8 - 11 cm size range.
Maintained trochus reserve.	Harvesting occurred in the reserve.	Harvesting in the reserve occurred due to poor enforcement. This was suggested by surveys conducted in the reserve before and after the harvest season.
Licences issued.	250 licences issued.	Licences cost, NZ \$1.00.
Trochus must be kept alive prior to inspection.	Illegal size shells were confiscated prior to processing.	Confiscated shells were returned to the lagoon.

#### 1987 harvest season

Two days declared as the harvest season.	The actual harvest season, two days.	The season was divided into two separate 24 hour periods till the quota was reached. This was introduced to prevent harvest overruns.
--	--------------------------------------	---

Harvest-able quota set at 40 tonnes.	A total of 45.1 tonnes harvested. Stock piling took place prior to the opening of the fishing season (Terekia. O. <i>pers.comm.</i> ).	Quota set at 30% of the harvest-able stock . Stock piling prior to any harvest allow the fishers to achieve a large catch during the harvest duration.
Legal size limits.	Illegal size trochus harvested were confiscated by harvest inspectors prior to processing.	The legal size for trochus was maintained as animals with a basal diameter of 8 - 11 cm.
Maintained trochus reserve.	There were rumours that poaching just before the harvesting occurred in the reserve (Terekia. O. <i>pers.comm.</i> ).	More effort was placed on enforcement.
Licences issued.	190 licences issued (day 1) 233 licences issued (day 2)	License issued for the first 24 hour harvest period was valid for the second 24 hour period. The cost of licenses remained at NZ \$1.00.
Trochus must be kept alive prior to inspection.	Approximately 350kg of processed shell was confiscated since they were processed without the knowledge of harvest inspectors.	The confiscated shells were later returned to the fishers, as ordered by the Island Council, without any form of prosecution (Terekia. O. <i>pers.comm.</i> ).

#### 1988 harvest season

One day declared as the harvest season.	The actual harvest season, one day.	
Harvest-able quota was set at 20 tonnes.	A total of 18 tonnes harvested.	Quota set at less then 30% of the harvest-able stock (8 - 11 cm) (Zoutendyk and Passfield 1989).
Legal size limits.	Illegal size trochus harvested were confiscated by harvest inspectors.	The legal size for trochus was maintained as animals with a basal diameter of 8 - 11 cm size range. Confiscated animals were distributed throughout the lagoon.
Maintained trochus reserve.	Poaching just before the harvesting occurred in the reserve.	More effort was place on the enforcement of the reserve during the harvest.

**1990/91 harvest season**

Five days declared as the harvest season.	The actual harvest season, five days.	
Harvest-able quota set at 25 tonnes.	A total of 26.2 tonnes harvested.	The quota was set at 60% of the harvest-able stock, (8 - 11 cm) size range. The introduction of ITQ's seems to have solved the problem of excess quota overruns.
Legal size limits.	Inspectors removed undersized and oversize shells from the catch prior to processing.	The minimum size limit was maintained at 8-11cm basal diameter.
Maintained trochus reserve.	Harvesting occurred in reserve.	More efforts was exerted in enforcing the reserve. The total ITQ allocated to fishers who were caught poaching the reserve were confiscated by the inspectors, however they were later returned as ordered by the Island Council, without any form of prosecution.
Licences issued.	2,250 licenses issued.	The cost of licenses remained at NZ \$1.00.
Trochus must be kept alive prior to inspection.	Illegal size shells were confiscated prior to processing.	
Introduced Individual Transferable Quotas (ITQ).	15 kg allocated to all individuals, regardless of age, actual ability or desire to participate in the harvest.	It was difficult for fishers to reach there allocated quota, therefore a large proportion of wormy shells were collected.

**1992 harvest season**

Pulse fishing of 24hr periods.	The actual harvest season, 17 days.	A series of 24hr pulse fishing periods were declared until the catch approached the allocated quota.
The quota was set at 25 tonnes.	The actual harvested, 27 tonnes.	Because of the nature of the harvest few fishers participated, it therefore became difficult to achieve the allocated quota.

Legal size limits.	Inspectors removed undersized and oversize shells prior to processing.	The minimum size limit was maintained at 8cm, however during the progress of the harvest the maximum size limit was increased from 11cm to 12cm to allow for the allocated quota to be attained.
Maintained trochus reserve.	Harvesting occurred in reserve.	Poor reserve enforcement resulted in poaching. This was probably due to the efforts and results of the enforcement officers being overlooked during past harvest seasons.
Trochus must be kept alive prior to inspection.	Illegal size shells were confiscated prior to processing.	Confiscated shells were returned to the lagoon.

During 1992 there was a great need for finance to complete an Aitutaki community project. It was decided that the revenue received from the trochus harvest for that year be directed towards the completion of the community project. A series of 24hr pulse fishing periods was declared till the allocated quota of 25 tonnes was achieved. However as the harvest progressed it became difficult to obtain the allocated quota with legal size shell. The upper size limit was then increase to 12cm basal diameter.

Stock assessment results after the 1992 harvest have indicated that the standing stock of trochus to date, have not reached commercially exploitable levels (Figure 1).

Possible reasons and causes for the slow recovery in the population are as follows:-

- the assessment of the trochus population or interpretation of the assessment result could have been incorrectly performed,
- the use of 60% as a guideline in which quotas are currently set may be an unreasonable figure, as a means of determining the allowable catch,
- from a more cynical point of view, pressure from short-sighted bureaucrats who required a quick source of cash in order to complete a community project, could have played a role in the determining of a high quota.

Figure 1. The history of density estimates (individuals / hectare) for the Aitutaki trochus resources. The closed circles represents post harvest density estimates. The shaded bar indicates the approximate density guideline in which trochus harvest are declared.

It is illustrated in Figure 1. that harvest occurred annually between 1983 to 1985 and should have occurred in 1986. This would have allowed for five successive annual harvest. Harvest-able quotas for the period were determined as approximately 30% of the standing fishable biomass.

## Conclusion

During the development of the trochus fishery, established management tools were improved and others introduced. This has evolved into a management plan for the fishery which has proven to be a very effective mechanism in achieving most of its goals. In the near future there is a need to further investigate a more applicable figure (between 30 to 60%) in which harvest quotas are calculated. There is also a need to ensure that the reserve is strictly enforced, and poaches prosecuted in order to reduce future poaching.

Further trends in the future are to produce a simple handbook on how to assess the trochus population and interpret field data on Aitutaki and possibly the development of a computer program in which catch quotas and individual transferable quotas are determined. This would most certainly reduce the risk of errors in stock assessment and analysis. Hopefully this will ensure that it becomes difficult for bureaucrats to tinker with the system.

It is anticipated that these goals will be achieved prior to the exploitation of trochus resources from other islands within the Cook Islands.

## **References**

Bour, W. 1988. Synoptic study of trochus in the Pacific. S.P.C. Workshop on Inshore Fisheries Resources. Working Paper No. 3. S.P.C. Noumea, New Caledonia. 43 pp.

FFA Report No. 93/25, 1993., Cook Islands Fisheries Resources Profiles.

Sims, N.A. 1988. Trochus research in the Cook Islands and its implications for management. S.P.C. Workshop on Inshore Fisheries Resources. Background Paper No. 37. S.P.C. Noumea, New Caledonia. 13 pp.

Zoutendyk, D and Passfield, K. 1989. Recent Trochus density history and present status on Aitutaki and its implications for management. Ministry of Marine Resources, Cook Islands.

Zoutendyk, D. 1990. Report on Aitutaki Trochus (*T. niloticus*) research trips of 29 January - 6 February and 12 - 15 March, 1990. Ministry of Marine Resources, Cook Islands.

---

FORUM FISHERIES AGENCY / SOUTH PACIFIC COMMISSION WORKSHOP ON  
MANAGEMENT OF SOUTH PACIFIC INSHORE FISHERIES

Noumea, New Caledonia, June 26 to 7 July 1995

The Aquarium Fishery in the Cook Islands.

"Is there a need for management ?".

(By Ian Bertram)

Abstract

New industry however has caused much opposition

There is a problem but not with the renewability of the resources conflicts lies between the deferent user groups (divers, spearfishermen aquarium fish collectors. Conflicts lies between the different user and non user groups (divers, fishers, collectors, conservationist/)

At present no conservation guidelines have been imposed nor has there been a ceiling set on annual exports of aquarium fish from the Cook Islands, primarily because no distinct decline in catches and catch rates have been detected.

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 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 (recreational divers, fish collectors, conservationist etc).

Rationale of the Fishery

The commercial exploitation of aquarium fish from the Cook Islands was established during November 1988. One foreign-owned company was granted permission to operate on Rarotonga by the Cook Islands Government. The operation is relatively small however an important export earner for the country. Cook Island aquarium fish exports range between NZ\$ 80,000 to 240,000 or around 10,000 to 20,000 fish per year.

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 hoped that in the future this unexploited resources will be utilised.

Due to the variety of fish species collected for the aquarium trade the biology will not be discussed in this paper, a comprehensive review of the biology and aspects about the fishery are available, in the recent publication by the Forum Fisheries Agency, entitled, 'Nearshore Marine Resources of the South Pacific' (Wright and Hill, 1993), which the interested reader is directed to.

In the Cook Islands a total of 35 marine ornamental fish are collected by divers using SCUBA, with either small-meshed barrier or hand-held scoop nets, at depths of 7-70 ? m. Fish captured form deep water are either pierced or staged to prevent the need for lengthy decompression procedures. Fish are kept in special tanks with circulated fresh salt water on board medium size (5-8 m) vessels. To avoid waste build-up during air shipment the fish are not feed, two - three days prior to packing.

Problems with the Industry

There has been much objection to the establishment and operations of the Cook Islands Aquarium Fish Ltd, from recreational dive operators and the general public with the principal accusations that;

1. the fish collectors are discriminately 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 the Cook Islands Aquarium Fish Ltd. to questions about its operations are attached in Annex 1.

Cook Island Aquarium Fish Ltd accepted that some of their collectors have caused minor damage to the reef unnecessarily during fish capture. However, they maintain that they do their best to monitor their staff and no longer allow new divers to collect species which require any coral notching<sup>1</sup>(Passfield and Evans 1991).

---

Figure 1. The overall history of catch and effort (extracted from annual records supplied by the Cook Islands Aquarium Fish Ltd).

From the history of records kept by the industry CPUE figures for each year was determined. Annex 2

#### Management of the Fishery

At present the fishery is not governed by any regulations which are designed to limit the total catch or effort. Management is limited to a ban on fishing in the lagoon by the expatriate fish collector. 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 (eg, catch quotas, harvest seasons etc) appear to be necessary. However to avoid further conflicts between the different user groups (ie; fishermen, aquarium fish collectors, recreational divers, conservationist etc) there is an urgent need to address the social goals in fisheries management. It is prudent that a management guideline is established prior to the expansion of industry.

The future trends in the aquarium industry are to develop a management plan which incorporates the following recommendations.

- That only one operator be granted permission to commercially exploit marine ornamental fish on each island which have sufficient stocks and infrastructure to establish a viable fishery.
- That licenses be issued to exporters and collectors. Licenses should be based on the grounds that the exporters have a good international reputation and that fish collectors are aware and avoid destructive fishing methods. Licenses should also mention that exporters make available catch records. also state that must train and employ local personnel

---

<sup>1</sup>The careful removal of branches from the middle of a coral head.

- That permanent marine reserves distributed around the islands, be designated where fishing in general is prohibited. These reserves should be selected for their aesthetic appeal where recreational divers can observe fish in an undisturbed habitat.

These recommendations for management addresses economic benefits, local employment, should address the conflicting issues between the different user groups.

Conclusion

## **References**

FFA Report No. 93/25, 1993., Cook Islands Fisheries Resources Profiles.

Passfield, K and Evans, J. 1991. Aquarium Fish Profile, Ministry of Marine Resources Profile number 7. Rarotonga, Cook Islands.

## Annex 1.

Responses by the Cook Islands Aquarium Fish Ltd. to questions concerning it's operations.

### 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 does not affect the "food chain" of the edible fish on the reef.
- The majority of the fish are caught entirely by locally trained collectors.
- The aquarium fish which are caught are not a food sources for large fish caught trolling and do not affect the population of those fish.

### Coral head "notching" and the real causes of reef damage

- There are over 40 different types of coral on Rarotonga's reefs. The "notching" of coral heads is done on only one type of coral, a very small percentage of the total coral on the reef.
- The reef around Rarotonga covers over 32 kilometres and coral is notched in only a 3-4 kilometre section of the 32 kilometres. The "notching is done on only one of over 40 types of coral in this 3-4 kilometre area.
- The majority of "notched" coral heads do not die, they live and regrow more branches in the heads.
- The branches from the notched coral head grow when planted and produce additional coral heads.
- Scientific studies show, the end result of the "notching" of coral heads and planting of coral branches increase the total number of coral heads on the reef.
- The causes of extensive damage to Rarotonga's coral reefs have been and will be cyclones and water pollution's, not by 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 - 10 years. New coral grows from broken pieces left by the cyclone, and larval coral produced by the remaining live coral through 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.

### The aquarium fish resources and Cook Islands Aquarium Fish Ltd.

- The aquarium fish are sold over-seas and bring foreign money into the country.
- The aquarium fish replenish quickly (6 - 14 months) and provide an unending sources of money when managed correctly.
- At present Cook Islands Aquarium Fish buys fish from two full time and one part time self-employed fish collectors, trained by the company.
- The company employees one part time warehouse worker.
- Cook Islands Aquarium Fish Ltd. since it was started in November 1988 has trained or attempted to train 39 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 5 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. No where does the Act of the Code state a foreign company must have local partnership.

Annex 2.

Catch numbers and effort (SCUBA tanks per year) history of the five most important species collected, perenthercies indicate the percentage of the total catch.

	1989	1990	1991	1992	1993	1994
Effort (Dive tanks / year)	840	1,960	2,210	1,910	1,480	2,560
Total Catch (numbers of fish)	9,739	17,619	19,606	17,568	12,675	21,100
Flame angel <i>Centropyge loriculus</i>	3,785 (38.86)	6,325 (35.90)	6,652 (33.93)	5,362 (30.52)	5,598 (44.17)	7,347 (34.82)
Red hawk <i>Neocirrhites armatus</i>	2,434 (24.99)	5,045 (28.63)	7,800 (39.78)	7,569 (43.09)	4,074 (32.14)	6,022 (28.54)
Lemon peel <i>Centropyge flavissimus</i>	789 (8.10)	1,525 (8.66)	1,592 (8.12)	1,346 (7.66)	538 (4.24)	1,436 (6.81)
<i>Anthias ventralis</i>	259 (2.66)	633 (3.59)	655 (3.34)	1,285 (7.32)	1,353 (10.67)	3,924 (18.60)
<i>Cirrhilabrus scottorum</i>	1,022 (10.49)	1,448 (8.22)	1,243 (6.34)	1,100 (6.26)	671 (4.88)	1,322 (6.27)
CPUE (numbers/dive tank)	11.59	8.99	8.87	9.20	8.56	8.24

FORUM FISHERIES AGENCY / SOUTH PACIFIC COMMISSION WORKSHOP ON  
MANAGEMENT OF SOUTH PACIFIC INSHORE FISHERIES

Noumea, New Caledonia, June 26 to 7 July 1995

Cook Islands  
Country Statement

Responsible Bodies:

Ministry of Marine Resources acts as an advisory role, advises island councils on controls needed and suggest the appropriate method of controlling harvesting.

The island council accepts recommendations and with the help of crown law drafts a By-Law which is not a national law. They also select the enforcers of the By-Laws, usually the resident police, fisheries officers, members of the island council themselves.

Which organisations in the country has some influence on the control of fishing, what sort of hierarchy is there and how do they communicate with each other? what sort of manpower and budget is available.

Laws and Regulations:

The types of laws in the Cooks include, fishing licences trochus, size limits, trochus size limits, licences, short harvest season. Island council with marine resources police trochus By-Laws.

general, ban poisoning, dynamite peer pressure closed season for parau, island council. reserves, Ootu No one enforces the reserves

Since 1985 spear-fishing has been banned in Pukapuka lagoon by the traditional governing body, the Island Council, to protect small, easily speared groupers and coral cod (*Epinehelus* and *Cephalopholis*) which are highly valued as food. Conservation practices are regularly review by the Island Council.

The Aitutaki fisheries protection By-Laws (1990) ban the use of SCUBA while spear-fishing, gathering any species of fish and setting or gathering any set net or collecting fish from any such net. There are also comprehensive laws regarding net-fishing, namely: hauling of nets, restrictions on nets in channels, set nets and drag nets. There is also a By-Law banning the use of any explosive or poisonous substance to capture fish.

What legal law is there over the disposition of marine resources and fishing and who exercises it, or is responsible for enforcing it .

Policies:

What is the overall view of the administration on coastal marine resources management (for example some countries devolve responsibility for management onto local communities and traditional groups wherever possible) Are there written guidelines (eg for the issue of licences, or the approval of investments), or are each case treated on an ad-hoc basis?

Problems:

What are the biggest headaches for the boss? What do fisheries officers spend most of their time on?, What fisheries issues are raised most often by the public or by the fishing community?

less fish

Dispite bans on the use of SCUBA while spear-fishing, enforcement is difficult and this practice does occur. Fisheries awareness programs, especially in schools, may be effective in crabbing the use of SCUBA while spear-fishing Longer term problems.

What problems do fisheries heads and officers perceives that are not necessarily concerns of the public or politicians (eg lack of reserves, slow response to proposed changes in legislation, lack of funding flexibility for enforcement, local businessmen with too much influences)

Future Plans:

Are changes envisaged in the organisation of fisheries management, Are there any obvious trends which you plan to address over the next few years, what are the priority fisheries management subjects to be addressed?