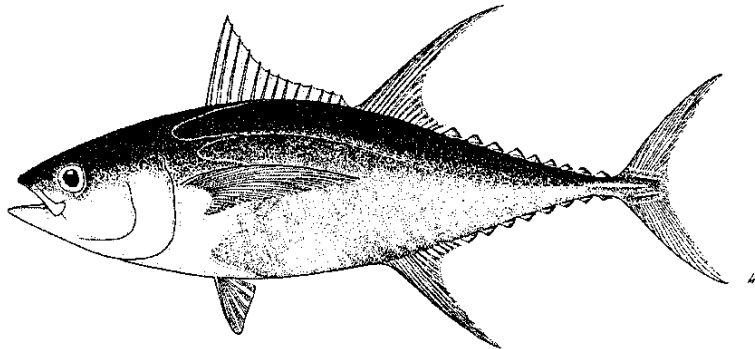


Tonga Tuna Fisheries Status Report



P.M. Likiliki, S.V. Matoto & U. Fa'anunu

Ministry of Fisheries, Tonga.

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Background :

History of the Fishery:

In the early 80's, one vessel (FV Lofa) dominated the commercial tuna fishery in the whole Kingdom of Tonga. This single longline vessel caught an average of 200mt annually. By 2001, 25 fishing vessels were registered and licensed to fish in Tonga's undeclared EEZ. In 2003 and 2004 the total number of longline fishing vessels registered and fish in Tongan water were 33 and 22 respectively. The Tuna fishing in Tonga increased and achieved a record catch of 1,647mt in 2002.

Tonga has approximately 700,000 km² of undeclared EEZ which extends from Latitude 13 to 25 degrees offers moderate potential for exploitation. Historically, the annual catches of tuna species are dominated by the deep swimming albacore species which makes up 70%, less than 20% are yellow fin and 10% are big eye. Skipjack and yellow fin are surface tuna species, they are known to occur more seasonally and are believed not to be fully exploited in Tonga's fisheries waters.

Non-target species which are associated with the long line fishery such as billfish, mahimahi, opah, wahoo and sharks were sold locally.

Tonga's domestic longline fleets are based in Nuku'alofa. Prior to 2002 the fishing was based around the Tongatapu waters (the most southern part of the Tonga group). This fishery is now fished in all waters beyond the 12nm zone of our fisheries waters.

Fishing effort has steadily increased by 2000 but decline in 2003- 2004. Historically fishing vessels undertook relatively small number of sets before returning. The past two years, vessels have traveled far distance between sets.

Fish is exported mainly to the United States (including American Samoa cannery), Japan and New Zealand.

Pole and Line have been done previously by local fishers but at a small scale. Historically no tuna purse seine activity has been recorded in Tonga.

Treaties and Agreements:

Tonga as a member of the FFA is a signatory to regional agreement and treaties that concerns with the fishing of High Migratory Species such as:

- 1987 Multilateral Treaty on Fisheries with Government of the United States and the Government of Certain Pacific Island.
- 1989 Convention for the Prohibition of Fishing with Long Drift nets
- 1981 Regional Treaty on Cooperation in Fisheries Surveillance and Law Enforcement
- 2000 Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean.

Tonga has ratified and is party to international agreements and treaties such as:

- 1982 United Nations Convention on the Law of the Sea
- 1995 UN Fish Stocks Agreement.

The 2003-2004 tuna fishery:

In 2003 the domestic catch of tuna species and its by product were 1,308 mt. It is a significant decline from the recorded annual catch in 2001 (1,988mt). While 2004 was a further decline to 373mt

Table 1: The table below gives the summary of the annual catches of 2003 and 2004 and total hooks used based on SPC logbooks (mt) from fishing vessels:

Years	ALB	BET	YFT	Total	Marlin	Swordfish	Others	Total	Total Hooks
2003	660	80	227	967	40	14	287	341	6,901,756
2004	106	34	121	261	14	23	75	112	3,303,025

Table 2: The table below shows the number of vessels licensed from 2003-2004:

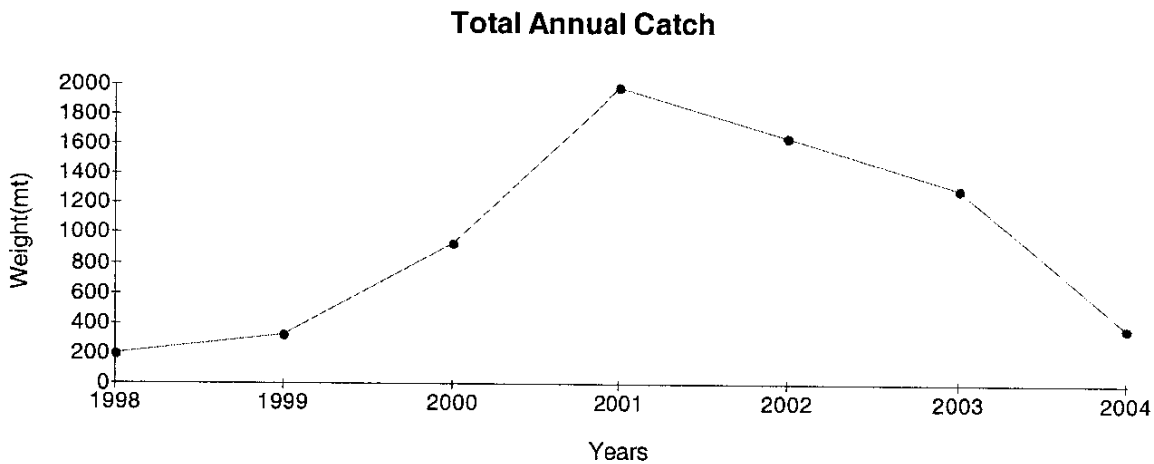
Years	Local Vessel	Joint Venture	Government	Total
2003	17	14	2	33
2004	12	8	2	22

There (Table 1) appears to be a clear decline in category “Others” includes; mahimahi, wahoo, moonfish, swordfish and shark. Marlin includes; stripe, Black and Blue Marlins. The three target tuna species shows a significant decline in 2004 as compared to 2003. Yellowfin caught in 2003 were relatively higher than that caught in 2004. Similarly, bigeye catches declined for the same period. Albacore has always made up a large amount of the total catches of tuna annually but it too shows significant decline.

The decrease in fishing vessels (Table 2) in 2004 indicate similar trend shown in the annual total catches of the reported years. It appears that the decline in catch in 2003 ensured the relocation of locally based foreign fishing vessels to other countries under joint venture agreement with local nationals. One government owned fishing vessel did not participated in any long line fishing in 2004. Due to fishing uncertainties in 2004 coupled with high operational costs, continued El Nino, most vessels only fished once a month.

The graph below illustrate the total catch since 1997. The years 2001, 2002 seen as the best year for the longline fishery in Tonga.

Year	Weight(mt)
1997	214
1998	193
1999	327
2000	931
2001	1988
2002	1647
2003	1308
2004	373



Status of the Stock:

SPC have developed stock assessment models for the three main tuna species fished in Tonga. They are Albacore, yellowfin and bigeye. The assessments uses the MULTIFAN-CL together with tagging data, length frequency, catch and effort data. The models include spatial structure that devides the stock into fishery regions. The method incorporates fishing in other EEZ. The model provides regional perspective of the current stock.

A Regional Look:

Tonga is grouped in a region known as “Region 5” (a large area in the southwestern Pacific Area). They include New Caledonia, Vanuatu, Fiji, Wallis and Futuna, Samoa, America Samoa, Niue, Cook Islands and Tahiti. The majority of the tuna species caught in Region 5 use longline fishing method.

The SCTB in 2003, concluded that the yellowfin species are not overfished in the WCPO. It explained that whilst that stock are not overfish it may be closer to full exploitation. Moreover, it advised that any further increase in fish mortality would not be wise for the long-term sustainability of that stock. Thus for the entire WCPO, Tonga longline accounts for less than 2% of the total yellowfin catch. It would mean that Tonga long line as part of Region 5 does not contribute significantly to the exploitation of the entire WCPO yellowfin.

Bigeye tuna assessment in 2003 of Region 5 similarly indicates that Tonga only fished a small proportion of the catch from this region. However, the assessment indicated that there is a future risk to the bigeye stock in Region 5 and the stock has been known to have decreased by 20% in the past decades. Scientifically it is a relatively low impact but it signals that there has been a low recruitment in the past.

There are no existing threats to the albacore stocks in Region 5.

Fleet Structure:

It is believed that the most economical vessel length for Tonga range from 20m-30m. The vessels above 30m would also be uneconomical as the crew costs would be too high, have high maintenance costs and high fuel costs as compared to high fishing uncertainties. For larger vessels (30m) crewing costs are a significant factor and smaller vessels (20m) lack the necessary range due to limitations on fuel and ice capacity. Interestingly, the foreign vessels which joined the longline fleet are generally larger than those considered optimal by the local companies and as such when fishing are not profitable they would be the first to leave the Tonga longline fishing. The locally based foreign fishing vessels are dominated by Chinese and Korean vessels.

Fishing Effort:

It is understood by the Ministry of Fisheries that the long line fishery has increased in the distance traveled during individual fishing trips. Smaller vessels (less than 20m) have also increased their durations during fishing trips as uncertainties in fishing continue. Larger vessels decreased their fishing days which is due the high costs of operations compared to the result of the fishing activities.

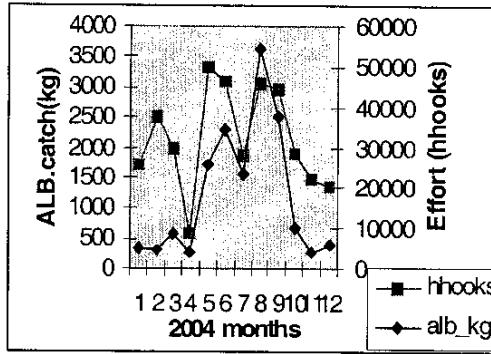
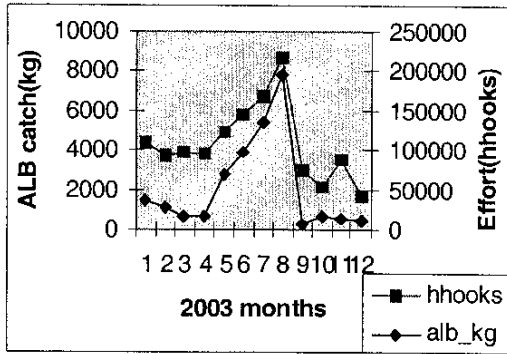
The number of hooks for 2003 and 2004 differ greatly (*Table 1*). But an average of 25 hooks per floats has been the configuration for the past two to three years. The fishing effort remains high for seasons of May to August months.

Catch Rates:

The three main targeted species are explain below. The graphs below illustrates the differences in catch rates for the said reported years. It also shows the decline in effort in 2004.

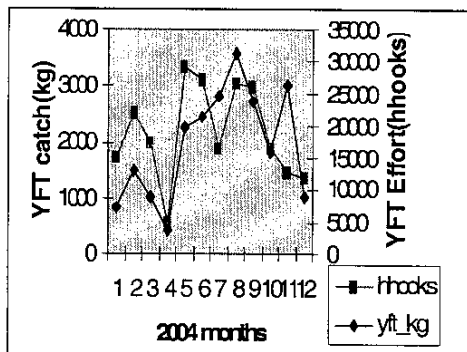
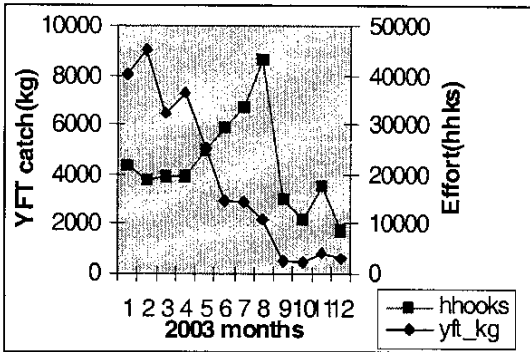
Albacore:

Catch rates have always been good for the months of May-August however thereafter December-January were significantly lower. Historically, better catches have been seen in May- September and December-January. Similarly 2004, the same months produced higher catches of albacores but with decreased fishing effort as compared to 2003. The graph below illustrates the drop in effort for 2004 as compared to 2003 which results in the drop in catches in 2004.



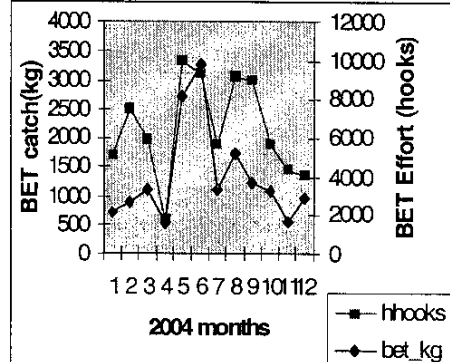
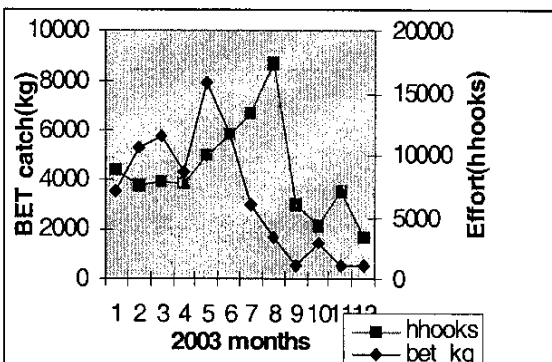
Yellowfin:

Historically yellowfin catches were always high in January-May period and subsequently decreases towards September-November. Higher total catch rates were achieved in early part of 2003 as compared with 2004. However, high catches towards the third and second quarters of 2004 were achieved.



Bigeye:

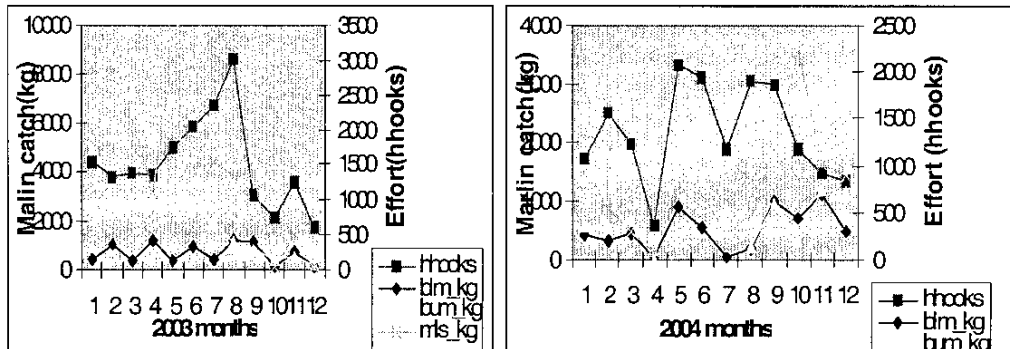
In the late 90s catch rates for Bigeye were relatively high although the fishing effort was low. In 2004, the catch of bigeye were relatively low as compared to its fishing efforts. The second quarter remained high in both years.



The By product of tuna longline in Tonga

Billfish species:

The total catch of the Marlin species decline as compared to fishing effort in 2004 as shown by the graphs below. The species of Marlin are Blue, Black and other marlins.



Sharks:

The Ministry of Fisheries is continuing its effort to make sure that sharks are not targeted by tuna longline vessels. Certain locally based foreign fishing vessels have been penalized for catching more than would be required percentage (10-30%) of by-catch.

Environmental Impact:

Historically albacore are more abundant in the southern part of Tonga’s EEZ and yellowfin and Bigeye are more abundant in the central and northern waters.

In 2003 the decline of catches was due to the effects of the El Nino phenomena. By December 2004 although the catch had slightly improved it was further realize that the El Nino condition was not profitable to all locally based foreign vessels under joint venture agreement. This is attributed by the fact that the location of Tonga’s EEZ are in the subequatorial and therefore the abundance of the tuna species will be affected and influenced by the environmental conditions.

Sea Surface Temperature:

The high catches of yellowfin in the months of January-May coincide with the highest surface temperatures. High catches occur in the warmer waters. In contrast, the catches of albacore are higher in low surface temperature.

Oceanographic conditions cause variations to the catches in every year. In the summer months of 2003, water temperatures were relatively high in the northern area of the EEZ. The conditions were similar throughout 2004. As a result low catches were recorded of albacore and higher catches of yellowfin.

Economic Issues:

Total FOB revenue estimated were TOP\$813,498.00 from the total tuna catch of 2004. The maximum catch for 2004 were in June and the species with most contribution to the export earnings from tuna was Albacore. The export of tuna depends only on the

capability of Exporters to meet their operating costs and thus allow them the opportunity to transport tuna to International Market.

The tuna industry employs around 500 people.

There were 730.13mt of fresh tuna exported in 2002 and valued at \$4,818,858.00. In 2001, 1,202.40 metric tonnes were valued at \$7,935,840. The tuna operators continue to benefit from duty free fuel. A subsidy provided by government to assist fishing such as tuna longline

A decline in the exports of both valuable species of yellowfin and bigeye to Japan. Less than half of the volumes of tuna exported in 2002 were exported in 2004. With the export value of the Bigeye has increased, while a decrease in the value per kilogram for the Yellowfin.

At the end of 2004, there was an increase for the value of Albacore and a decline for the value of Yellowfin, but Bigeye fluctuates over the years and further decrease from 2003 to 2004.

The decline in the export of tuna during (2003-2004) was due to harsh El Nino conditions in the Tonga seas, operating costs and fishing vessels crew availability.

For 2004, Albacore were valued at T\$ \$450,733.50, Yellowfin with T\$126,633.50. The total earnings from the Tuna export in 2004 were a FOB value of T\$729,767.50. The economic risks are not helped by the continued El Nino crisis which has affected the Tonga tuna fishery for the past couple of years.

Management Issues:

The approved management plan for tuna has not been reviewed since its first adoption in 2001. These pose significant problems for the years 2003-2004. The SPC status report of the history assessments recommends that the assessment for the tuna species is to be considered in the regional context. There is some concern raised about the overall yellowfin and bigeye in the region.

Until 2004, the tuna fishery was the highest revenue earner fishery for Tonga. There is a cap of 50 fishing vessel approved by the local Tuna management Committee. However, that number remains unachieved. There needs to be better monthly analysis of the data collected by the Ministry. By the beginning of 2005 all foreign based companies and vessels have left the Kingdom due to the decline and uncertainty felt in the past two years.

The tuna fishery has experience difficulties and over the past five years the vessel number have increased from 7 to over 30 and a move from smaller vessels to larger vessels. Estimates of catches are still not properly recorded, this due largely to lack of funds and human resources within the Ministry of Fisheries.

There have been no efforts in the past to provide a stock assessment for all billfish and other non-target species that has been a major component of the tuna longline in Tonga.

While there seems to be no concern for these species locally the stock would remain uncertain. While the last two years have recorded a drop in albacore catches, it is believed that some areas remained very productive.

Onshore and Future Developments:

Transshipment at sea is forbidden under the current management plan for tuna unless it is conducted under "permitted transshipment operation" from the Secretary for Fisheries. There are five tuna packing facilities which all operate under HACCP certified conditions. Some companies are required to use these certified facilities. Two companies are exporting loins, fresh cut packed sashimi packets.

The tuna resources still offer opportunity for growth of the domestic industry. Any major growth would be from a combination of factors such as the fishing component which is able to fish beyond the Tonga's waters and a processing that is able to add value to the product. These will raise significant economic contributions. While the industry remains uncertain due to economic difficulties, it must remain flexible and implement good management measures so as to minimize unnecessary costs. More importantly are the subsidies that government has enabled to provide for this fishery and as such has given these companies opportunity to continue fishing in the face of uncertainties.

Tonga Government is making every change possible in its reform process to form conducive policies which encourages foreign investments and local fishers to assure profitability in this fishery. Foreign participation is restricted to tuna provided that all its catches are processed and exported from Tonga. Although Technical Assistance has been sought to assist commercial banks, banks are hesitant to approve loan amounts which are relevant to the running of fishing industry.

The Ministry is currently assessing various training programmes in collaboration with the Tonga Maritime Polytechnic Institute in facilitating crew needs typically for fishing activities.

Monitoring and Compliance:

The catch data are currently collected from SPC logbooks and from SPC port sampling. The Ministry of Fisheries is making every effort possible to analyse these catch data in a bi-monthly basis. The port sampling data are collected by the Stock Assessment Section and those data are entered by the Information Section. The logbook data are collected by the Licensing Section as a condition to the duty free fuel concession scheme. At present all these data are analysed by SPC and in future the Fisheries Management Section will take a leading role in such activity.

Logbooks returned were much improved as compared to the early 90's. Some tuna companies have been penalized under the new Fishery Management Act 2002 for non-compliance. The comprehensive Act stipulates heavy fines if companies are not fishing under their license conditions and requirements. The operations of the Argos VMS system has been labelled a success for the Ministry of Fisheries as it can at anytime directly track the movement of fishing vessel in and outside Tongan water.

Selected References:

- Anon.(2003). Tonga National Tuna Fishery Report. SCTB.
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