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**ANNUAL REPORT TO THE COMMISSION  
PART 1: INFORMATION ON FISHERIES, RESEARCH, AND STATISTICS**

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**WCPFC-SC6-AR/CCM-24**

**TONGA**

# TONGA

## Annual Report Part 1

### Information on Fisheries, Research and Statistics



**Tu'ikolongahau Halafihi**  
**Fisheries Division**  
**Ministry of Agriculture & Foods, Forests and Fisheries**

Scientific data was provided to the Commission in accordance with the decision relating to the provision of scientific data to the Commission by 30 April 2009	<b>YES</b>
If no, please indicate the reason(s) and intended actions:	

## 1.0 ABSTRACT

The operation of tuna longline fleet in Tonga continued in 2009 in similar manner as in previous years, but it was affected by various factors particularly economic problems faced by fishing companies. Tonga continued to operate its tuna fishery with full domestic longline fleet since 2005 only and mainly operate within Tonga's EEZ.

Tuna fishery total catch in quantity and value for 2009 further declined from 2008 was the lowest in the history of this fishery in Tonga after it peaked in 2007 for the last five years. Again, this is due to various reasons including, big reduction in fishing effort (no. of hooks); by 69 % as compared to 2007 and consistent with the decline in number of active fishing vessels. This reduction in effort was due to some fishing vessels switched to *beche de mer* fishery started in Tonga in 2008 instead and other reasons such as environmental and oceanographic conditions. However, the total annual fishery catch rate (CPUE) continued increasing up to 2008 since 2005 and dropped down in 2009 but seems irrelevant to the decline in catch. The total CPUE is mostly affected by the CPUE for yellowfin and the CPUE trends for albacore and bigeye are opposite to each other. Albacore became the highest percentage composition of tuna in the total catch for 2009 with high percentage of yellowfin and bigeye. Catch composition of tuna indicated that most of longline vessels and the structure of the fleet are targeting bigeye and yellowfin tuna for fresh fish market with high proportion of albacore tuna. Dolphinfish and moon fish dominated the bycatch composition. From observer reports, Tonga tuna fishery has no impacts on species of special conservation interest (e.g. turtle, marine mammals and birds).

Offshore Fisheries Program (OFP) of SPC continued to provide assistance in providing Tonga Fisheries with relevant information about tuna stock in Tongan water relative to the whole stock in the Western and Central Pacific Ocean. The total tuna catch by Tonga fleet in 2009 still remain insignificant to have any major impact on the whole stock in the region and WCPO. Despite the ample room for improvement and development of tuna fleet in Tonga, high operation cost had restricted the operation of fishing vessels mainly to areas near the main fishing port, Nuku'alofa.

Tonga research program for tuna namely; data collection and observer deployment were continued in 2009 with great improvement. The port sampling coverage was 86 % and the observer coverage was 12 %. At the same time, measures and resolutions of the Commission are being implemented and monitored by Tonga Fisheries.

## 2.0 BACKGROUND

Tuna Fishery started in early 1970's with second hand longliner and skipjack vessels from Japan. In early 1980's the Government put into test the commercial viability of tuna longlining using a new longliner, M.F.V.Lofa, donated by Japan. In 1991, the Government established a semi-Government company, Sea Star, to operate M.F.V.Lofa commercially. The USAid/Tonga Fisheries project in early 1990's tested the viability of medium size vessels for longlining targeting fresh fish for sashimi. This was let to increase in number of domestic fleet targeting fresh tuna in late 1990's to peak in early 2000's.

Tonga has approximately 700,000 km<sup>2</sup> of undeclared EEZ that extends from Latitude 13 to 25 degrees offers moderate potential for exploitation. Total catches from the Tonga EEZ have displayed

a similar trend to effort, dominated by albacore. The total tuna catch from the EEZ dropped down from 763.6 mt in 2008 to only 394.41 in 2009 and was the lowest in the history of tuna fishery in Tonga. The 2009 catch was dominated by albacore (31.5 %), with lesser amounts of yellowfin (27.7 %) and bigeye (9.5 %). Since 2003, longline vessels have shifted targeting from albacore to yellowfin and bigeye to export as fresh fish.

A significant game-fishing sector exists in Tonga. However, interactions with the commercial longline fleet are likely to be relatively minor as the longline fleet has significantly declined since 2003.

### 3.0 FLAG STATE REPORTING

#### 3.1 Status of the Fishery

##### 3.1.1 Total annual catch, by primary species

The annual catch and effort estimate, by primary species for the Tongan longliners in the WCPF Convention Area for the years 2005 to 2009 are summarized in Table 1 and also given in Figure 1. Both Table I and Figure 1 reveal that the annual catch for the tuna primary species continued to increase from 2005 until 2007 and sharply declined in 2008 and more in 2009. The catch in 2008 dropped down by 31.2 % and 66.8 % by weight in 2009 as compared to the catch in 2007. This decline is mainly a result of reduction in efforts (number of hook) by 35.8 % in 2008 and 68.8 % in 2009 as compared to the fishing effort in 2007. From the history of this fishery in Tonga waters; longline effort rapidly increased from the mid 1990s to peak at more than 10 million hooks set during 2002 before a rapid decline in hooks (and vessels). The huge reduction in fishing effort is due to various factors including economic issues and the diversion of fishing effort from tuna to beche-de-mer fishery that was opened in 2008.

The main target species for the longline fishery are bigeye, yellowfin and albacore and catches for those species were all proportionally declined since 2008 due to reasons mentioned above. Albacore tuna re-dominated the annual catch for 2009 after dominated once by yellowfin in 2008. However, the annual CPUE estimate, by primary species for the Tongan Longliners for the year 2005 to 2009 is given in Figure 2 shows that the total CPUE continued to increase from 2005 up to 2008 and slightly declined in 2009. This is different from what is observed in the catch trends and it confirmed that the decline in catches is principally due to the reduction of fishing effort but not directly relevant to the status of the stock. The trend for the annual CPUE is directly proportional to the trend for the annual CPUE for yellowfin.

Table 1. Annual Catch and Effort Estimate, by primary species, for the Tongan longliners were active in the WCPFC Convention Area for the years 2004 to 2009.

Year	Effort Average no. of hooks	Primary species catch (mt)						
		Albacore	Bigeye	Yellowfin	Skip jack	Swordfish	Marlins	TOTAL
2004	1633500	187.8	37.7	163.3	3.4	30.3	16.5	<b>439</b>
2005	2827800	178.2	77.3	114.5	1.7	22.3	35.9	<b>429.9</b>
2006	3388600	380	101	183	0.5	34	41	<b>739.5</b>
2007	3285600	390	129	341	0.8	31	49	<b>940.8</b>
2008	2109300	220.2	81	290.8	0.3	29	28.6	<b>649.9</b>
2009	1023900	124.3	37.6	109.4	0	22	19	<b>312.3</b>

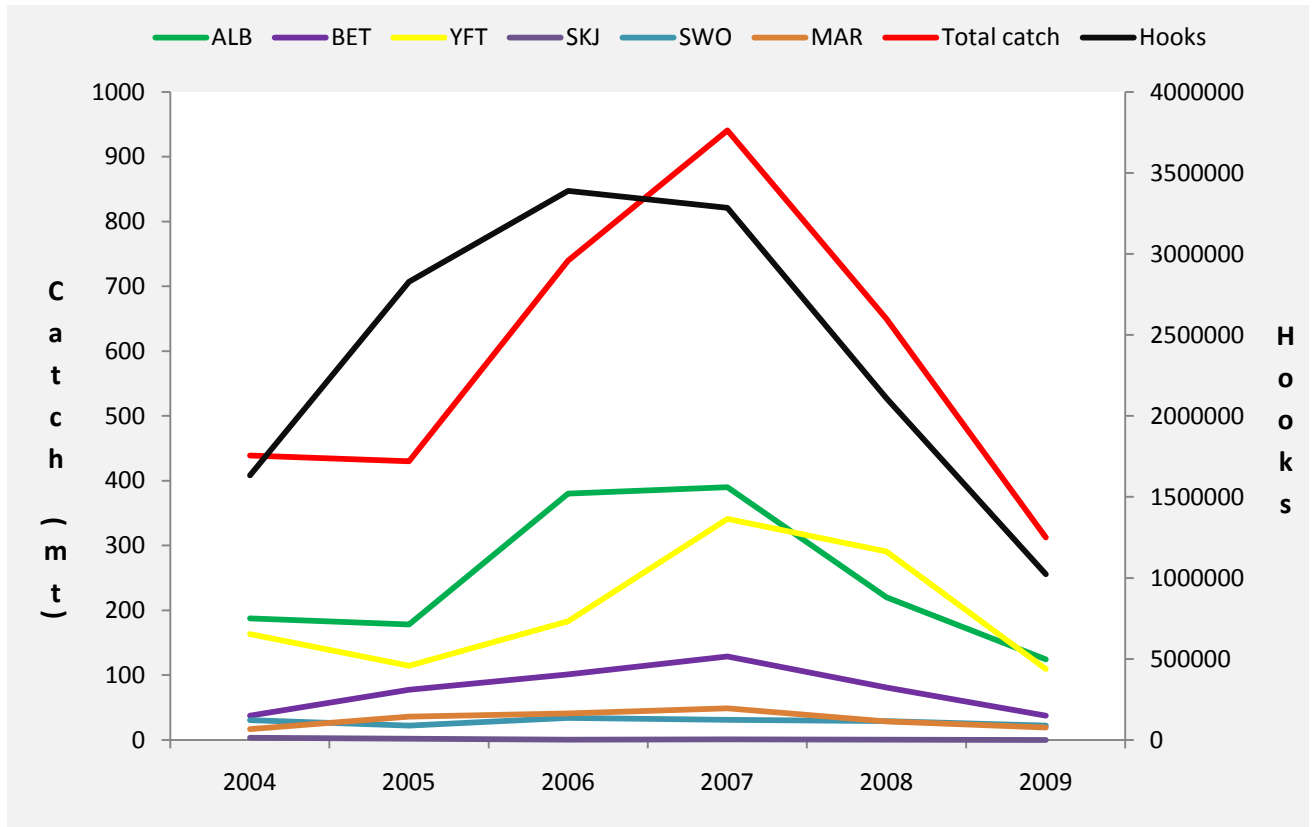


Figure 1. Historical annual Catch (mt) and Effort (no. of hooks), by primary species, for the Tongan longliners were active in the WCPFC Convention Area for the years 2005 to 2009

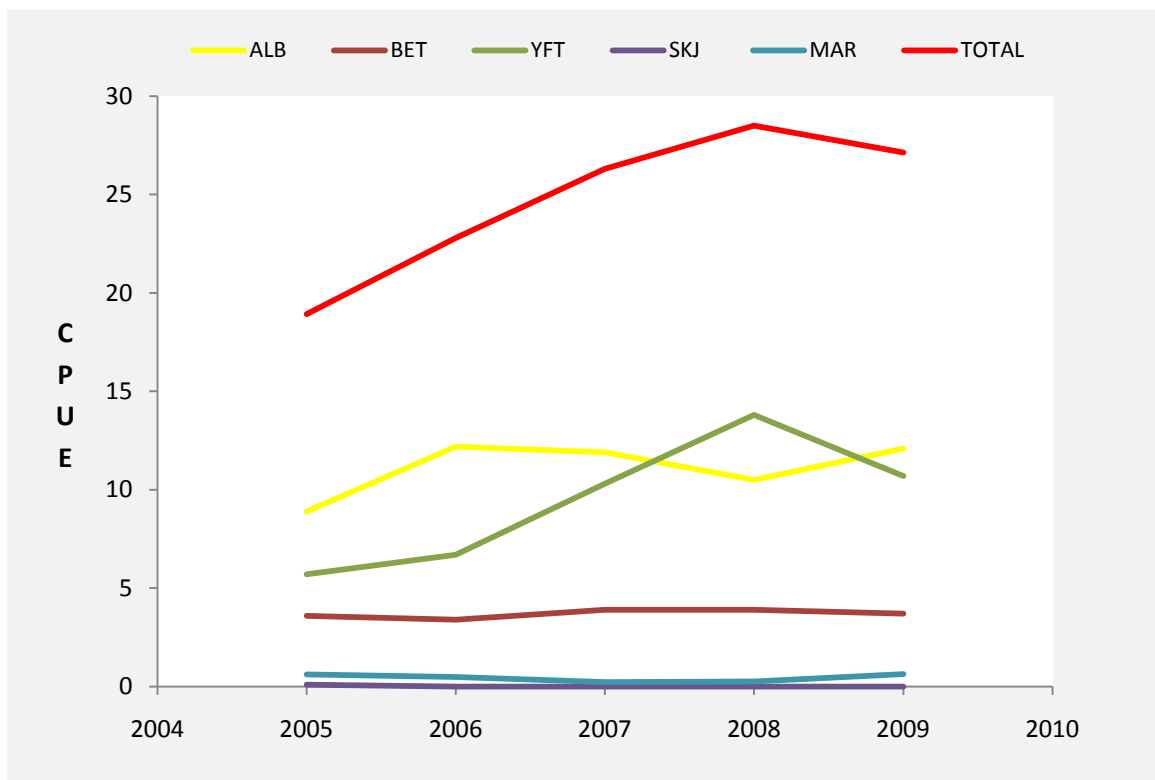


Figure 2. Historical annual CPUE, by primary species, for the Tongan longliners were active in the WCPFC Convention Area for the years 2004 to 2009

### 3.1.2 Annual catch estimates of non-target, associated and dependent species

The annual estimated catches of non-target, associated and dependent species, by the Tongan Longliners, in the WCPFC Convention Area, for the years 2005 to 2009 are given in Table 2. Dolphin fish is the most common bycatch species followed by sharks and moonfish. The major bycatch species in the longline fishery are significant components of annual exports. The large reductions in longline effort have resulted in reductions in landings of the major bycatch species.

By-catches are obtained from logsheets and are also obtained from observer records. Observer records are important for estimating catches of the less valuable species that are less likely to be retained or recorded; it is difficult to obtain reliable estimates from species rarely caught in longline fisheries

Observers have reported high retention rates of target tunas, with most discards being due to fish being shark damaged. Wahoo, dolphinfish, moonfish and billfishes also had high retention rates as these are also valuable components for the fishery. In contrast, lancetfish, escolar, oilfish and certain shark species are rarely retained, although almost all sharks (greater than 90 %) are finned before being discarded. A single turtle (unidentified) was captured by the domestic longline fishery in the Tonga EEZ, and was released alive. No other interactions with species of

special conservation interest (e.g. turtles, marine mammals, birds) were reported by observers since the program started in 1995.

**Table 2. Annual estimated catches of no-target, associated and dependent species, including sharks, by the Tongan Longliners, in the WCPFC Covention Area, for years 2005 to 2009.**

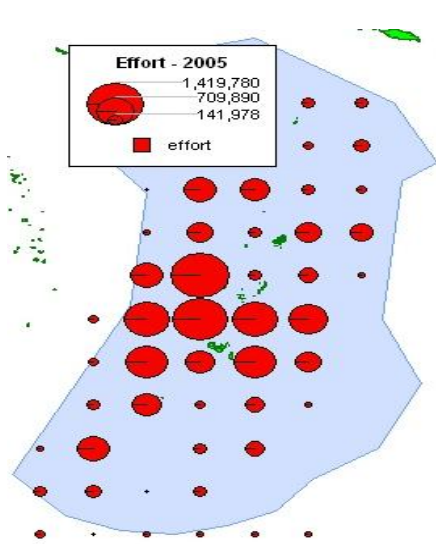
Non Target Species	2005	2006	2007	2008	2009
Wahoo	38.3	32.5	45.11	29.1	10
Short-Billed Spearfish	4.02	5.21	5.23	2.17	2
Sharks (Unidentified)	98.1	33.3	38.4	21.9	10
Sailfish (Indo Pacific)	2.80	1.13	3.54	1.76	2
Pacific Blue Tuna	0	0	0.15	0	0
Dolphin fish	57.7	71.9	85.0	42.9	45
Oilfish	2.0	0	0	0	0
Opah/Moonfish	25.1	10.9	18.0	16.4	13
Rainbow	0	0	0.01	0	0
Others	3.2	37.3	5.1	0.69	0.1
<b>TOTAL</b>	<b>231</b>	<b>192.2</b>	<b>201</b>	<b>115</b>	<b>82.1</b>

### 3.2 Fishing Patterns

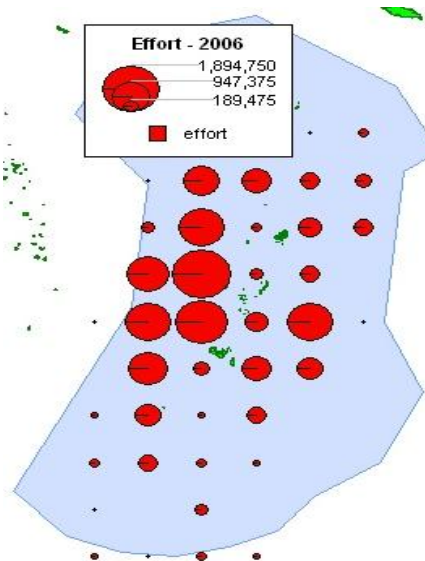
The annual distribution of target species catch and effort by the Tongan longliners active in the WCPFC Convention Area, for years 2005 to 2009 are given in Figure 3a-e and Figure 4a-e. Most longline effort by the Tonga fleet is reported within the Tonga EEZ. However, there have been minor levels of effort reported in high seas areas immediately to the south of the Tonga EEZ. Total catches by Tonga vessels outside of the Tonga EEZ are minor as most vessels are not capable of operating long distances from Nuku'alofa.

As most vessels operate from the port of Nuku'alofa, most effort is focused in the central area of the EEZ. Since 2000, the highest levels of effort have been reported during the second and third quarters of the year. The area of operation of the fleet has been similar since 2005, with the exception of a reducing range of fishing operations and reducing distances between sets. These may be in response to changes in targeting by the remaining fleet.

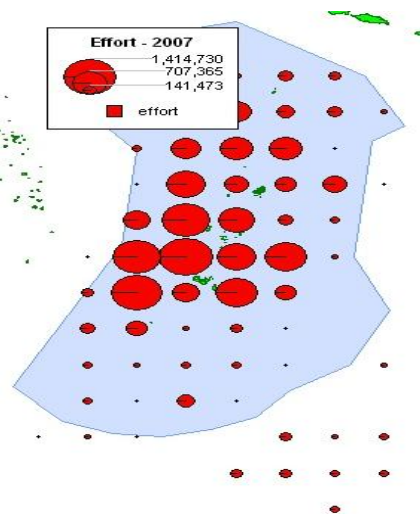
The highest albacore catch rates from the Tonga EEZ are generally reported during the middle of the year, with a smaller peak at the end of the year. Albacore catch rates are relatively high in the northern and southern EEZ during the second and last quarters of the year. Highest catch rates of yellowfin and bigeye are reported from the western EEZ, especially during the first and second quarters of recent years.



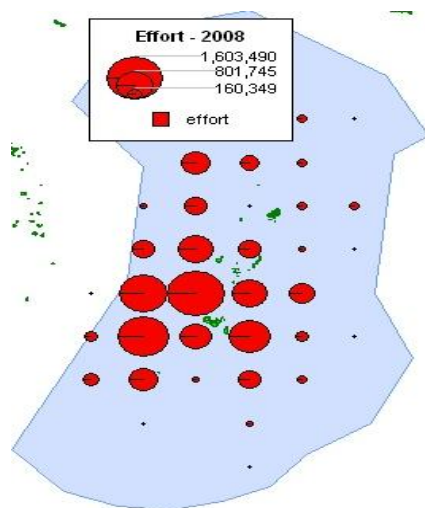
(a) 2005



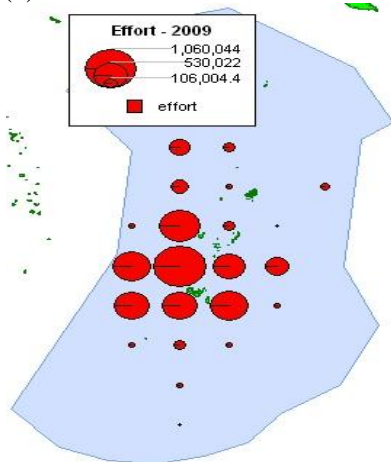
(b) 2006



(c) 2007



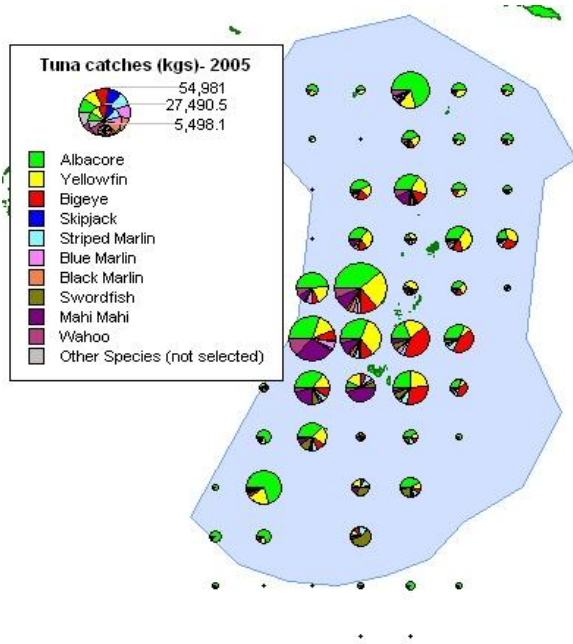
(d) 2008



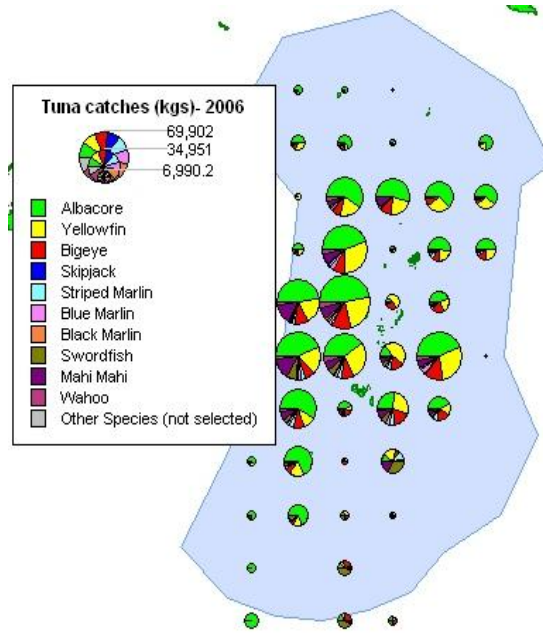
(e) 2009



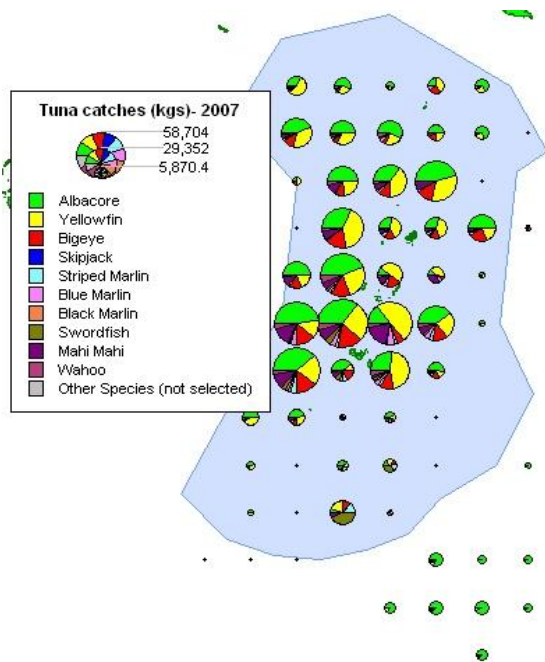
**Figure 3a-e. Annual Distribution of target species effort by the Tongan Longliners active in the WCPFC Convention Area, for the year 2004 to 2008.**



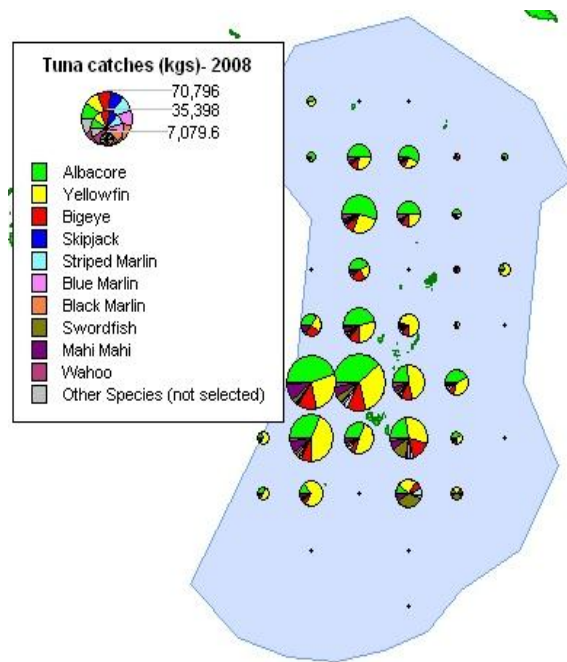
(a) 2005



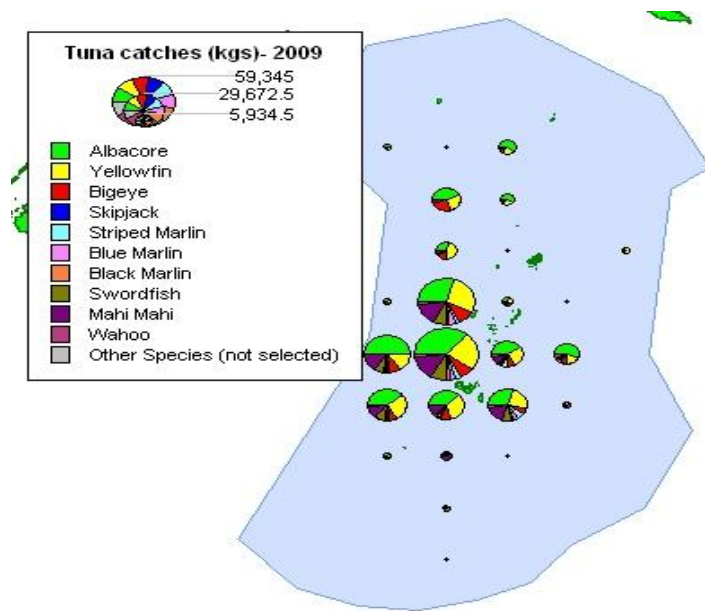
(b) 2006



(c) 2007



(d) 2008



(e) 2009

**Figure 4a-c. Annual Distribution of target species catches by the Tongan Longliners active in the WCPFC Convention Area, for the year 2004 to 2008.**

### 3.3 Fleet Structure

Following the development of the domestic longlining and the opening of the fishery for the chartering vessels, Locally Based Foreign Fishing Vessel (LBFFV) in late 1990s the tuna fleet increased to peak in 2002 and 2003 but has subsequently declined due to poor catch rate and high operation cost. At the end of 2004, all of the Locally Based Foreign Fishing Vessels (LBFFV) relocated to other countries and some are sitting in port. Domestic longliner vessels are mostly 20m-30m. The Table 3 shows the number of licensed fishing vessels registered to fish in Tonga waters and currently only Domestic fishing are fishing in Tongan waters. The number of licensed vessels used in this report was obtained from TUFMAN database and slightly different from the number used in previous reports. This is because the TUFMAN database only gives active vessels.

In 2009, a maximum of seven (7) local longline fishing vessels were licensed to fish within Tonga's fisheries waters, noting a moratorium is still in place since 2004, for licensing locally based foreign fishing vessels to fish within Tonga's fisheries waters. Out of the 7 licensed vessels, 6 vessels were fishing but only two vessels were actively fishing throughout the year and vessels did not make any trip in 2009.

**Table 3. The number of Tongan longliners licensed to fish in Tongan waters from 2005 to 2009.**

<u>Year</u>	<u>Gear</u>	<u>No. of Domestic Longline vessels</u>
2005	Longline	11
2006	Longline	14
2007	Longline	13
2008	Longline	9
2009	Longline	7

#### **4.0 SOCIO-ECONOMIC FACTOR**

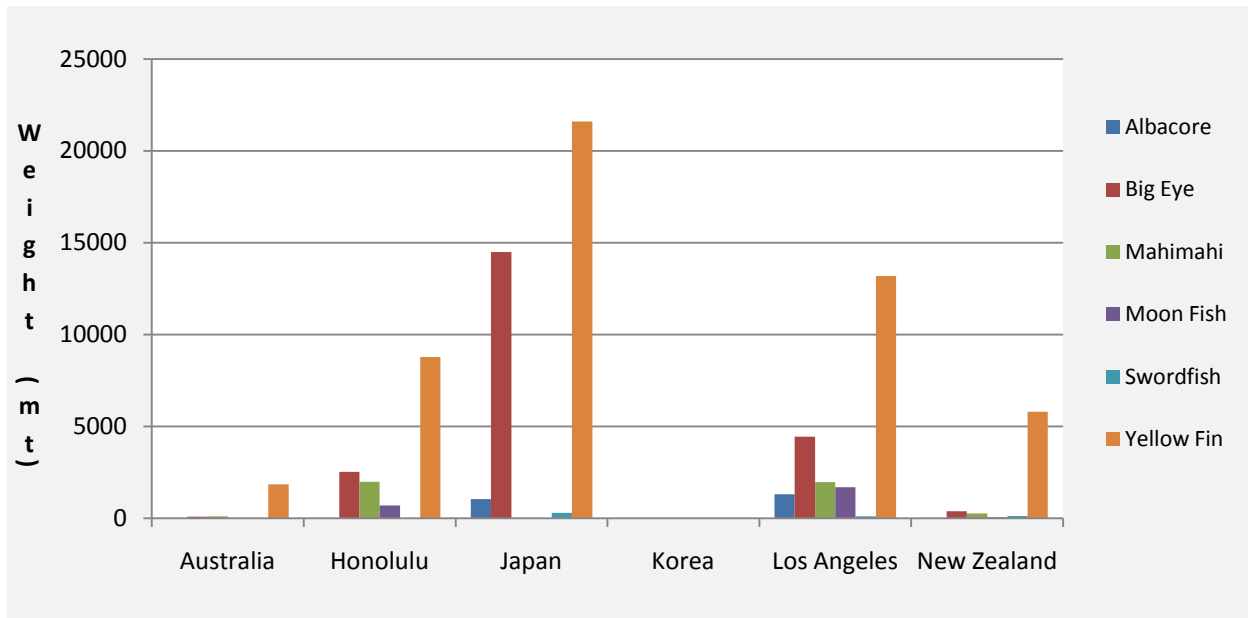
Exportation of Tuna from Tonga continued in 2009 but there was a big drop in both quantity and revenue collected from this fishery due mainly to reasons explained earlier in this report. As previous years, majority of the catches for 2009 were exported and the rest was sold locally. The total FOB revenue estimated was TOP\$ 290,124.00 for the total tuna catch of 2009 as compared to TOP\$867,756.50 in 2008 and that is a big drop by 66 %. The maximum monthly catch for 2009 was in January and the species with the highest contribution to the export earnings from tuna was yellowfin (Figure 5) as it was in 2008. The other main components of the export were albacore, bigeye, and swordfish. Bi-catch was dominated by moonfish and mahimahi. In general, the export revenue for 2009 dropped by 96 % as compared to the revenue collected from the exportation of tuna in 2001.

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. Again, the decline in the exportation of tuna during the last three years was due to harsh El Nino conditions in the Tonga seas and big impacts of worldwide economic problems on fishing operations such a fuel, crew costs, freight, marketing, repairs and maintenance. Employment in this fishery is also decline in parallel with the decline in both catch and income. The industry employs around 300 people. The tuna operators continue to benefit from duty free fuel, a subsidy provided by government to assist fishing such as tuna longline.

#### **5.0 DISPOSAL OF CATCH**

##### **5.1 Marketing**

Figure 5 below presents the main markets with respect to weight for the tuna export for Tonga in 2009. The biggest portion of the total export volume of 45 % was exported to Japan followed by 27 % to Los Angeles, and 17 % to Hawaii. Other important markets are New Zealand and Australia. Fish were mostly exported “fresh” to markets except, in previous years most albacore and skipjack were frozen before exporting to Pagopago, American Samoa, but in 2009 there was no export to Pagopago. Most portions of albacore catch were sold locally.



**Figure 5. Export Destinations for Tonga Tuna, 2009**

## 6.0 ONSHORE DEVELOPMENT AND FUTURE PROSPECTS OF FISHERY

There are three 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.

Tonga has adopted the ecosystem approach to fisheries management (EAFM) framework that provides for the overall sustainable management of tuna fisheries. Under this framework is the preparation of various policy documents, namely: EAFM report, Operational plan, revised TMP, and a legal framework. The Operational and revised TMP plans will specify the objectives that

are to be achieved through implementation of priority/ relevant strategic management actions for Tonga longline (LL) and sport (SP) fisheries. This EAFM process reflects a significant move from the management of single target species into a more holistic management framework.

## 7.0 RESEARCH ACTIVITIES AND STATUS OF TUNA FISHERY DATA COLLECTION

### 7.1 Observer

The Tonga National Observer Programme is under the Monitoring & Surveillance Section of the Fisheries Division. The staffs at this program are responsible, for the activities of the Observer Programme in close collaboration with relevant SPC-OFP staffs for deployment on vessels fishing within Tonga waters, and with FFA, when an observer is requested to be deployed under the Multilateral Treaty arrangement. Two observer trainee from Tonga participated in the sub-regional observer training held at Santo, Vanuatu in 2009. Both trainees participated in the 5 weeks training and pass the course, both have been deployed as observers on local fishing vessel fishing in Tonga waters, also several trips in the UST vessels.

In 2009, the number of observers was available for deployment remained at 5 as it was in 2008.

Overall, the observer coverage for the year 2009 increased to 12 % from 9 % in 2008.

Table 4 below shows the number of trips carrying an observer in 2009. Attempt is made to further increase the number of observer deployment in 2010.

Under the Multilateral treaty, observers from Tonga's national observer programme can be deployed on the US fishing vessels, upon request from the administrator, (FFA). Approximately 10 observer deployments have been made in the year 2009.

**Table 4. Number of observer trips made in 2009**

<u>Trip Number</u>	<u>Vessel Name</u>	<u>From</u>	<u>To</u>	<u>Sea Days</u>
1	Laumanu	04-Mar-09	12-Mar-09	9
2	Marine Princess	18-Mar-09	26-Mar-09	9
3	Kerry Elle	02-Apr-09	14-Apr-09	13
4	Pacific Blue #18	19-May-09	26-May-09	8
5	Pacific Blue #18	11-Jun-09	20-Jun-09	10
6	Laumanu	18-Sep-09	26-Sep-09	9
7	Laumanu	30-Sep-09	07-Sep-09	8
8	Kerry Elle	07-Oct-09	13-Oct-09	7
9	Kerry Elle	15-Oct-09	22-Oct-09	8
10	Laumanu	02-Nov-09	13-Nov-09	12
11	Kerry Elle	03-Nov-09	08-Nov-09	6
12	Kerry Elle	13-Nov-09	21-Nov-09	9

The major constraint faced by the programme was lack of longline fishing vessels for observer to deploy. A maximum of seven (7) local longline fishing vessels were licensed to fish within

Tonga's fisheries waters, only 2 were active. Most of the vessels switched to harvest bech-de-mer and the rest were sitting on port due to high costs of operations. Availability and enthusiasm of observers are sometimes affected by poor conditions (cleanliness and size of vessels) of fishing vessels.

## **7.2 Port sampling**

The tuna fishery port sampling program for Tonga is under the Offshore Section of the Fisheries division and is funded by the Secretariat for the Pacific Community (SPC) since the program was started in 80s. Sampling typically occurs at one port at Nuku'alofa and it occurs throughout the year. The port sampling activities include; recording of lengths and weights for every species during unloading of tuna fishing vessels, collecting of logsheets from captains of each fishing vessel and also collecting of unloading forms from fishing companies. All data and information from logsheet, port sampling and unloading are entered to TUFMAN database. The port sampling report, logsheet data and unloading information are regularly provided to SPC through monthly report.

There was a great improvement in port sampling coverage for the last 4 years as it was increased from 56 % in 2006 to 70 % in 2007; again 76 % in 2008 and up to 87 % in 2009. Coverage rates for logsheet data and unloading data continued to be 100 % in 2009. The Tonga Fisheries Division is obliged to maintain this high percentage coverage of port sampling to ensure it fulfill its obligation to the commission.

Offshore Fisheries Program (OFP) of SPC continued to provide assistance in providing Tonga Fisheries with relevant information about tuna stock in Tongan water relative to the whole stock in the Western and Central Pacific Ocean. The total tuna catch by Tonga fleet in 2009 still remain insignificant to have any major impact on the whole stock in the region and WCPO. Despite the ample room for improvement and development of tuna fleet in Tonga, high fuel cost had restricted the operation of fishing vessels mainly to areas near the main fishing port, Nuku'alofa.