**SCIENTIFIC COMMITTEE**
**EIGHTH REGULAR SESSION**

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

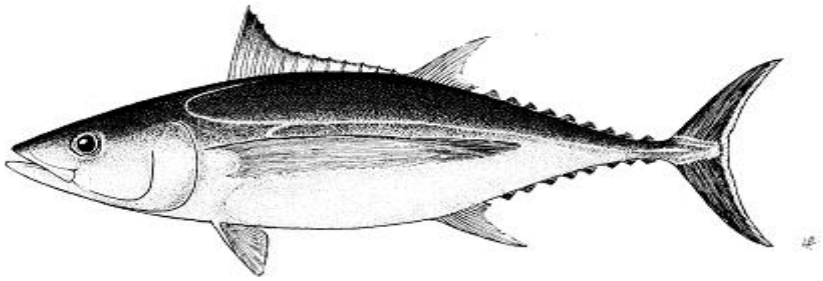
**WCPFC-SC8-AR/CCM-24 Rev 1**

**TONGA**

# TONGA

# Annual Report Part 1

## Information on Fisheries, Research and Statistics



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|---|---|
| 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 2012 | **YES** |
| If no, please indicate the reason(s) and intended actions: | |

## 1.0 ABSTRACT

Toward the end of 2011, Tonga reopened its waters to foreign fishing vessels after 6 years moratorium. This movement is one of the strategies Tonga plans to implement to develop its fisheries. However, the fishery continued to be affected by various factors particularly economic problems faced by local fishing companies. In 2011, only 3 local fishing vessels and 1 foreign fishing vessel had valid licenses to fish in the Tonga EEZ as compared to 5 local vessels in 2010. The Tonga tuna longline fleet mainly operates within the Tonga's EEZ and sometimes extends to the high seas in the southern part of Tonga.

The tuna fishery total catch in quantity and value for 2011 increased considerably as compared to the year 2010. The increased in the tuna production is due to the reopening of the Tongan waters to foreign fishing vessels. For the last five years, the total catch rates (CPUE) for the fishery continued increasing until 2008 and then declined in 2009 to the lowest in 2011. It is evident that the trend for the total CPUE was attributed to the decline in the CPUEs for albacore, yellowfin and bigeye for the last 4 years. In 2011, yellowfin tuna dominated the catch composition with 50 % followed by albacore with approximately 10 %. Catch composition indicated that most longline vessels and the structure of the fleet targeted bigeye and yellowfin tuna for fresh fish market with high proportion of albacore tuna. Dolphinfish and yahoo dominated the bycatch composition. From the observer reports, Tonga tuna fishery has no impacts on species of special conservation interest (e.g. turtle, marine mammals and birds).

Tonga Fisheries Division continued to work closely with the Offshore Fisheries Program (OFP) of SPC on issues regarding the status of tuna resources in the Tonga EEZ relative to the whole stock in the Western and Central Pacific Ocean (WCPO). The total tuna harvested by Tongan fleet in 2011 was still insignificant to pose any major impact on the whole stock in the region and the 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 such as data collection and observer deployment continued in 2011 with satisfactory outcomes. The port sampling coverage maintained at 90 % as compared to 91 % in 2010. However observer coverage dropped from12 % in 2010 to 4 % in 2011. At the same time, measures and resolutions of the Commission are being implemented and monitored by Tonga Fisheries.

## 2.0 BACKGROUND

Tongan commercial fisheries for high migratory species 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 longlinig 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 km2 of undeclared EEZ that extends from Latitude13 to 25 degrees offers moderate potential for exploitation. Total catches from the Tonga EEZ have displayed

a similar trend to effort. The total tuna catch from the EEZ increased from 215.3 mt in 2010 to 343.8 mt (63 %) in 2011. The considerable increased in catch in 2011 was due to the reopening of foreign fishing vessels to fish in the Tongan waters. The 2011 catches were dominated by yellowfin (50 %), followed by 9.9 % albacore with lesser amount for bigeye (5.3 %). 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 2007 to 2011 are summarized in Table 1 and also given in Figure 1. For the last 5 years since 2007, the total catches for the primary species continued declining with respect to fishing efforts. However, in 2011 catches started increasing due to more efforts had been placed in the fishery.

In more details, the total catches by weight for the primary species dropped down by 31.2 % in 2008, 66.8 % in 2009, 82.5 % in 2010 as compared to the total catch landed in 2007. These considerable declines are results of rapid reduction in fishing efforts (number of hook) by 35.8 % in 2008, 68.8 % in 2009 and 83.8 % in 2010 as compared to the fishing effort in 2007. In reference to the history of this fishery in Tongan 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 booth hooks and vessels in recent years. The huge reduction in fishing effort is attributed to the decline in catch rates and other various factors including economic issues.

The main target species for the Tonga longline fishery are bigeye, yellowfin and albacore and catches for those species were all declined since 2007 due to the reasons mentioned above. The catch for 2011 is dominated by yellowfin. The annual CPUE estimate by primary species for the Tongan Longliners for the year 2007 to 2011 is given in Figure 2. Figure 2 shows that the total CPUE continued to increase up until 2008 and then declined in 2009 and continued in 2010 to a low value in 2011. The decline in the total CPUE seems to be controlled by the CPUEs for yellowfin, bigeye and albacore.

Table 1. Annual Catch and Effort Estimate, by primary species, for the Tongan longliners were active in the WCPFC Convention Area for the years 2007 to 2011.

| Year | Effort Average no. of hooks | Primary species catch (mt) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Albacore | Bigeye | Yellowfin | Skip jack | Swordfish | Marlins | **TOTAL** |
| 2007 | 3285600 | 390 | 129 | 341 | 0.8 | 31 | 49 | **940.8** |
| 2008 | 2109300 | 220.2 | 81 | 290.8 | 0.3 | 29 | 28.6 | **649.9** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2009 | 1023900 | 124.3 | 37.6 | 109.4 | 0 | 22 | 19 | **312.3** |
| 2010 | 531090 | 56.6 | 23.5 | 47.2 | 0.1 | 25.5 | 12 | **164.9** |
| 2011 | 701100 | 34.2 | 18.3 | 170.6 | 1.3 | 22.2 | 30.7 | **227.3** |

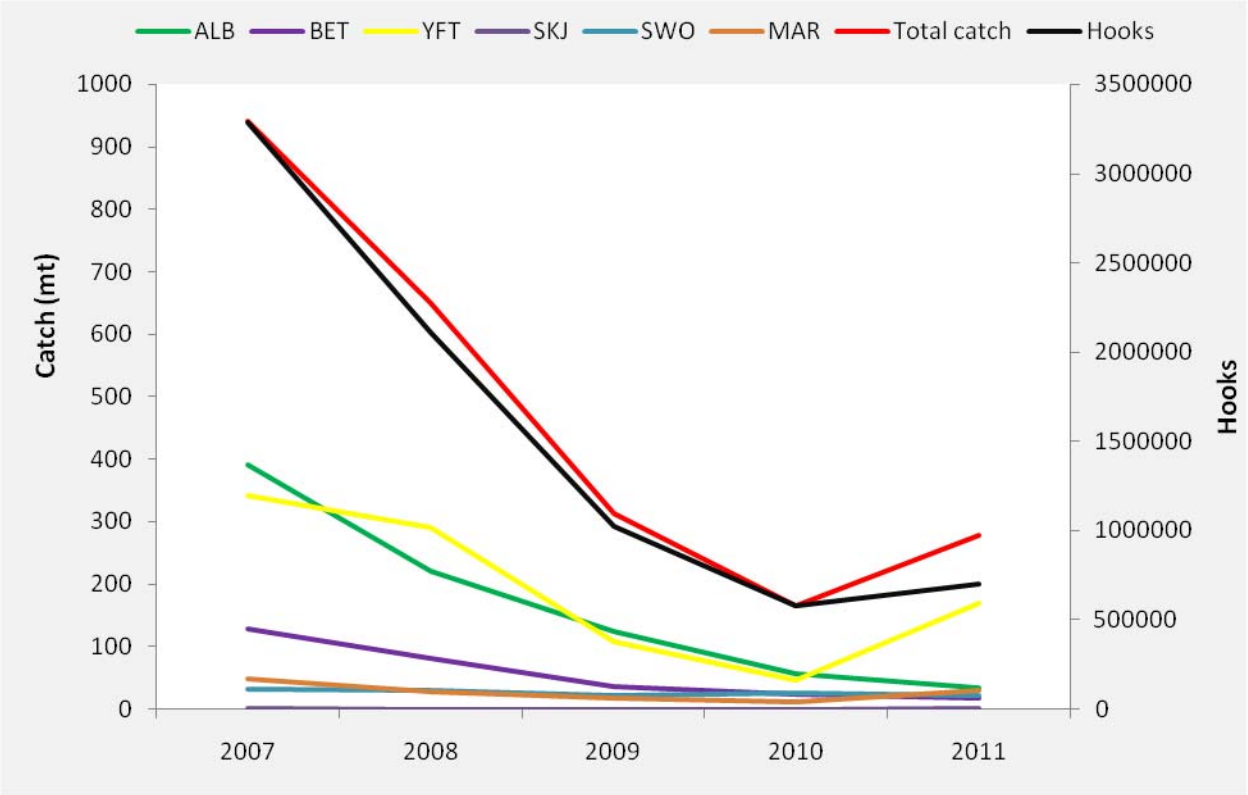



Figure 1. Historical annual Catch (mt) and Effort (no. of hooks), by primary species, for the Tongan longliners were active in the WCPFC Convention Area for the years 2007 to 2011

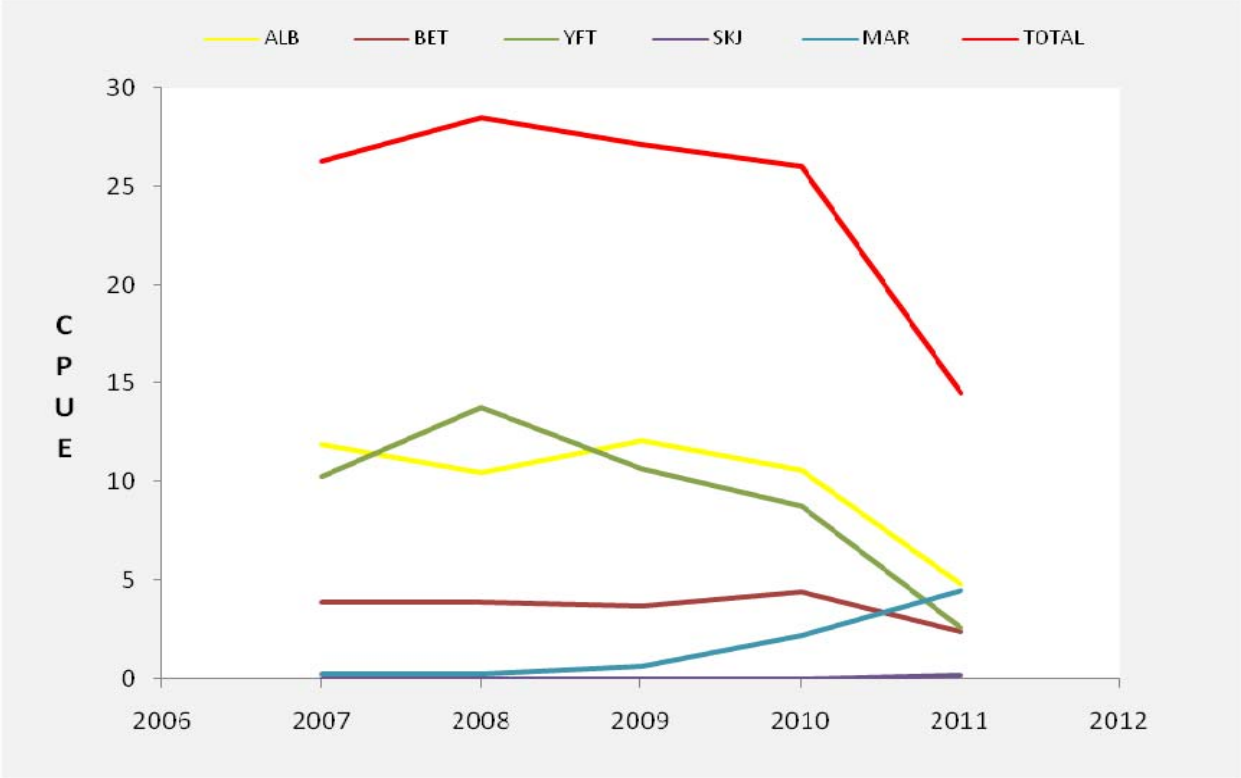



Figure 2. Historical annual CPUE, by primary species, for the Tongan longliners were active in the WCPFC Convention Area for the years 2007 to 2011

### 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 2007 to 2011 are given in Table 2. Dolphin fish is the most common bycatch species followed by shark and yahoo. 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. 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.

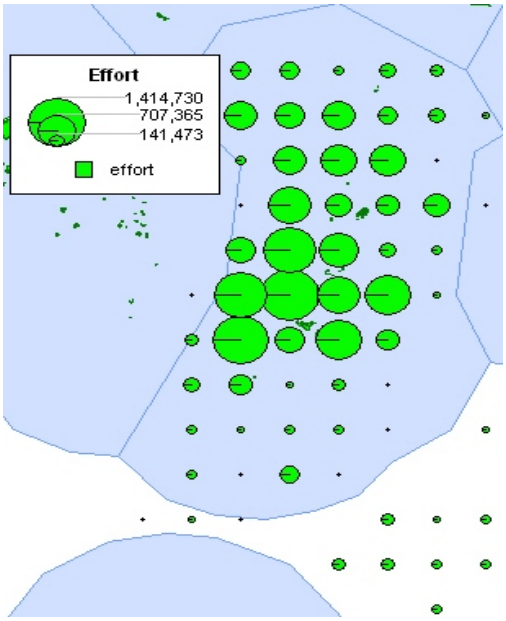
**Table 2. Annual estimated catches (mt) of no-target, associated and dependent species, including sharks, by the Tongan Longliners, in the WCPFC Covention Area, for years 2007 to 2011.**

| Non Target Species | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|
| Wahoo | 45.11 | 29.1 | 10 | 7.0 | 8.8 |
| Short-Billed Spearfish | 5.23 | 2.17 | 2 | 1.3 | 3.1 |
| Sharks (Unidentified) | 38.4 | 21.9 | 10 | 2.1 | 14.2 |
| Sailfish (Indo Pacific) | 3.54 | 1.76 | 2 | 0.8 | 2.5 |
| Pacific Blue Tuna | 0.15 | 0 | 0 | 0.0 | 0 |
| Dolphin fish | 85.0 | 42.9 | 45 | 27.1 | 30.9 |
| Oilfish | 0 | 0 | 0 | 0.0 | 0 |
| Opah/Moonfish | 18.0 | 16.4 | 13 | 11.8 | 3.4 |
| Rainbow | 0.01 | 0 | 0 | 0.0 | 0 |
| Others | 5.1 | 0.69 | 0.1 | 0.0 | 4.3 |
| **TOTAL** | **201** | **115** | **82.1** | **50.1** | **67.2** |

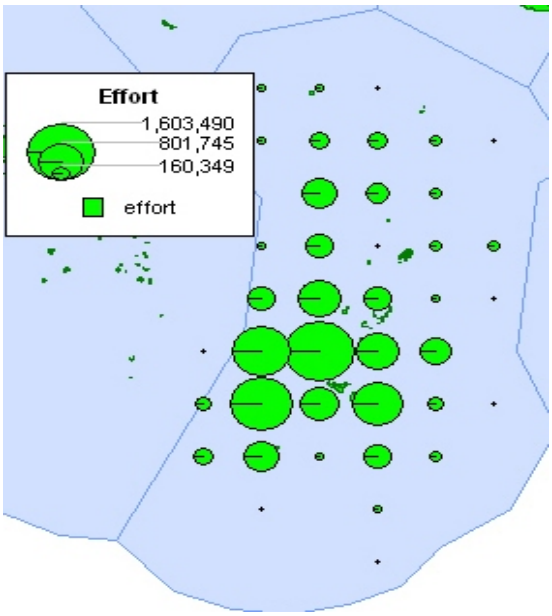
### 3.2 Fishing Patterns

The annual distribution of effort and catch for the target species by the Tongan longliners active in the WCPFC Convention Area, for years 2007 to 2011 are given in Figure 3a-e and Figure 4a-e respectively. Most longline efforts by the Tonga fleet are 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 were not capable of operating long distances from Nuku'alofa. In recent years most efforts were focused in the central area of the EEZ due to high costs of operations including high prices of fuel. 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 2007, with the exception of a reducing range of fishing operations and reducing distances between sets. Due to less vessels operated in 2011, no fishing effort was reported from the northern and the southern EEZ of Tonga.

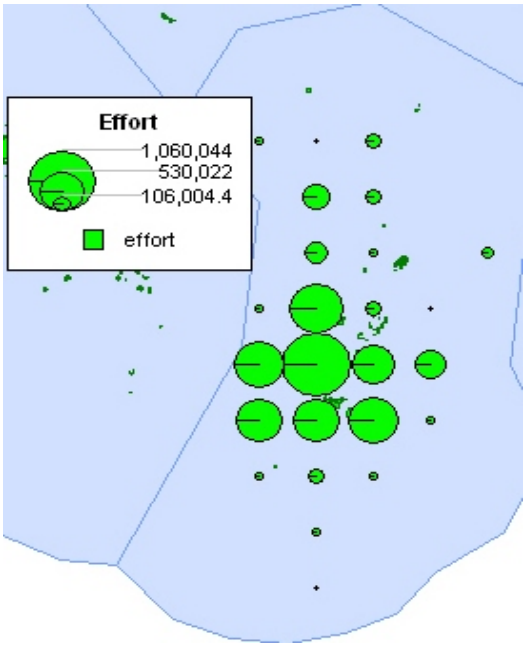
The highest albacore catch rates from the Tonga EEZ are generally reported during the middle of the year, with a smaller peak at the end of the year. Albacore catch rates are relatively high in the central and the south of the EEZ during the second and the last quarter of the year. Highest catch rates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



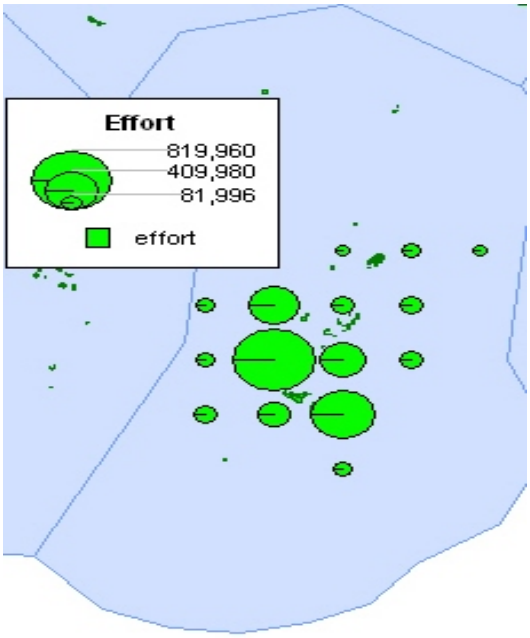

(a) 2007



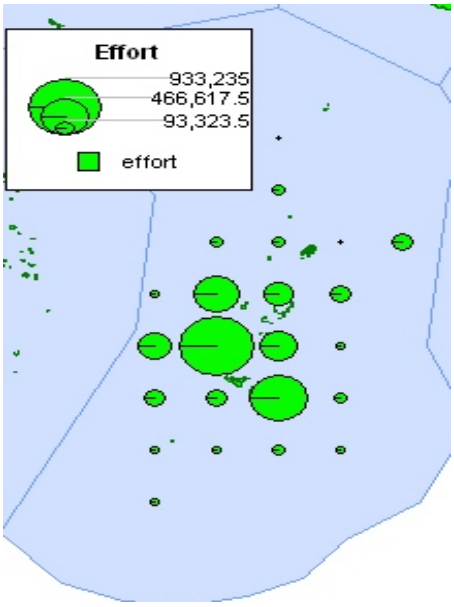

(b) 2008




(c) 2009

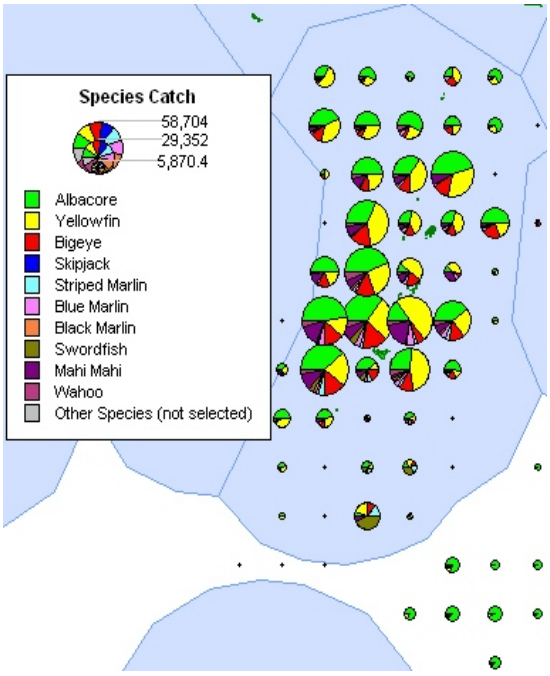



(d) 2010

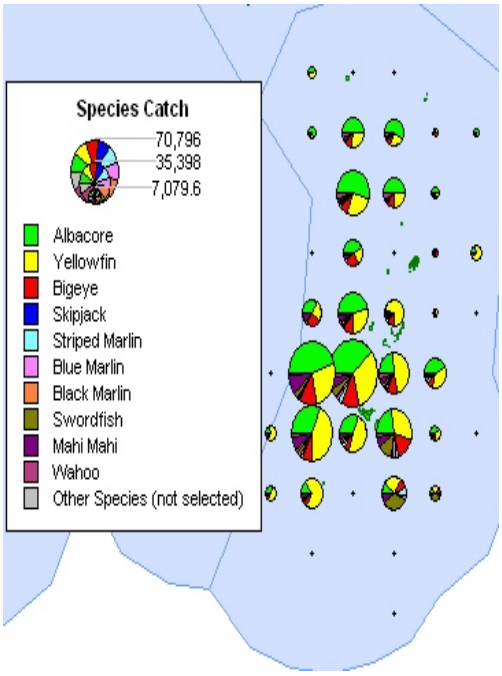



(e) 2011

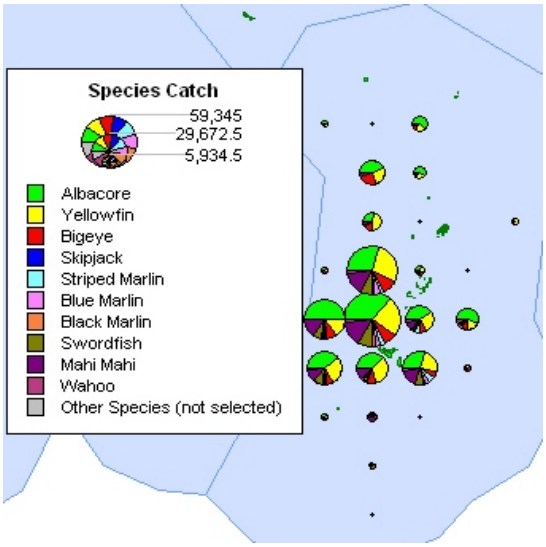
**Figure 3a-e. Annual Distribution of target species effort by the Tongan Longliners active in the WCPFC Convention Area, for the year 2007 to 2011.**



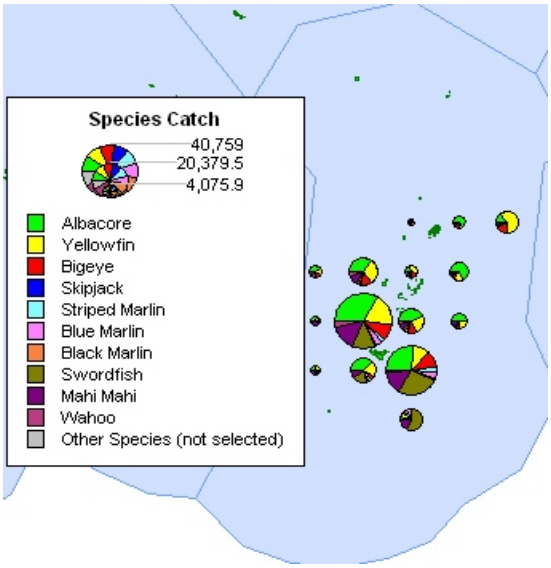

(a) 2007



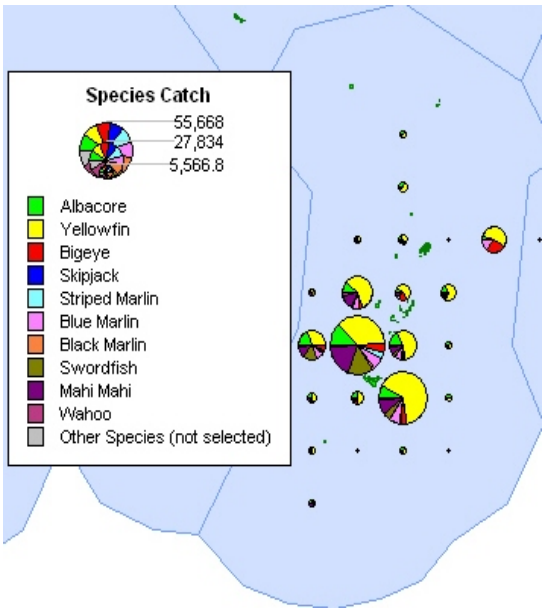

(b) 2008




(c ) 2009




(d) 2010




(e) 2011

**Figure 4a-e. Annual Distribution of target species catches by the Tongan Longliners active in the WCPFC Convention Area, for the year 2007 to 2011.**

### 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 operational costs. At the end of 2004, all of the Locally Based Foreign Fishing Vessels (LBFV) relocated to other countries. However, in 2011, Tonga has ended the moratorium placed since 2004, for licensing locally based foreign fishing vessels to fish within Tonga's EEZ by allowing again LBFV as part of its programme to develop its production. This program was started in December 2011 with one foreign vessel. Table 3 shows the number of licensed fishing vessels registered to fish in Tonga waters for the last 5 years.

**Table 3. The number of Tongan longliners licensed to fish in Tongan waters from 2007 to 2011.**

| Year | Gear | Domestic vessels | LBFV | Total |
|---|---|---|---|---|
| 2007 | Longline | 13 | - | 13 |
| 2008 | Longline | 9 | - | 9 |
| 2009 | Longline | 7 | - | 7 |
| 2010 | Longline | 5 | - | 5 |
| 2011 | Longline | 3 | 1 | 4 |

## 4.0 SOCIO-ECONOMIC FACTOR

Exportation of Tuna from Tonga continued in 2011 and both quantity and revenue increased in response to the large increase in catches and fishing efforts toward the end of the year. As in previous years, majority of the catches for 2011 were exported and the rest were sold at local markets. The total estimated FOB revenue collected from export in 2011 was TOP$ 677,085 as compared to TOP$133,626.50 collected in 2010 which is a considerable jump by about 80 %.

The monthly exports in terms of quantity and revenue for 2011 were highest in December with 50.8 % followed by 7.9 % in May. The highest portion of the export was again from yellowfin of 73 % as in 2010 with high percentage of albacore as given in Figure 5. Some bi-catch species were also exported and it was dominated by yahoo and marlin.

The exportation of tuna depends only on the capability of exporters to meet their operating costs including opportunities to transport export to overseas markets. Employment in this fishery also drops as a result of financial constraints faced by the tuna fishing companies. Hence, it is approximately less than 100 people are still employed in the industry. The tuna operators continue to benefit from duty free fuel, a subsidy provided by government to assist fishing.

## 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 2011. The biggest portion; 45.9 % of the total export volume was exported to Japan followed by 35.1 % to Taiwan, 10.7 % to Loa Angeles and around 8 % to Honolulu. Other important markets are New Zealand and Korea but no export to these countries in 2011. Fish were mostly exported "fresh" to markets except, in previous years most albacore and skipjack were frozen before exporting to Pagopago, American Samoa, but there was no export to Pagopago since 2009. Hence, most portions of albacore catch were sold locally.

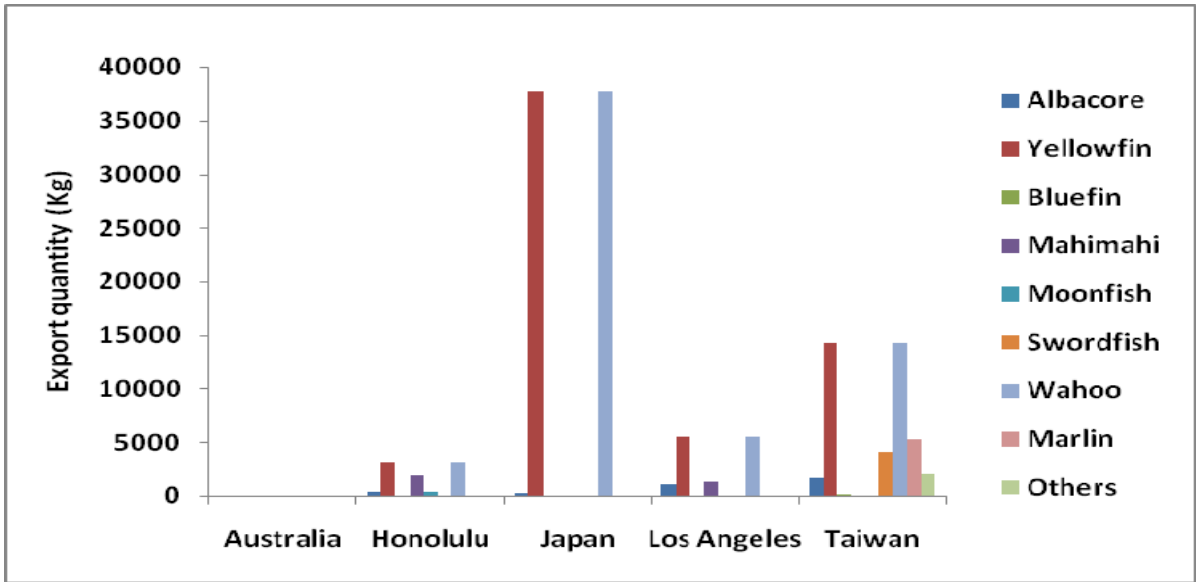



**Figure 5. Tuna Export and Destinations for Tonga, 2011**

## 6.0 ONSHORE DEVELOPMENT AND FUTURE PROSPECTS OF FISHERY

Tonga Government is making every change possible in its reform process to form conducive policies which will encourage foreign investments and local fishers to assure profitability in this fishery. Part of the development is, Tonga with the help of the FFA Secretariat have started a bareboat framework to allow fishing companies and entities to charter foreign flag vessels to fish in its waters. This arrangement has been made in the last 2 years and it was kick-started in December 2011 with one Taiwanese vessels. Toward the end of June 2012, 8 more foreign vessels entered the fishery under this program. For future development, it is expected that close to 20 foreign vessels are expected to have valid licenses to fish in the Tongan waters. The positive effect of this development is revealed in the total catch and export value of December 2011 as compared to other months of the year. Overall, the export value for tuna in 2011 increased by 80 % as compared to the export in 2010.

In 2011, Tonga continued to participate in the regional Tuna Data Workshop and the Stock Assessment Workshop which are conducted on an annual basis for SPC member countries. Data Workshop was aimed to improve member countries' scientific tuna monitoring and data management capacity, and satisfy their data reporting obligations to the Western and Central Pacific Fisheries Commission (WCPFC). The Stock Assessment Workshop was recognised as an important program in capacity building for fisheries officers and managers in the region. In this workshop, for the first time, participants were introduced to the Tuna Management Simulator (TUMAS) a new software tool developed by the OFP that allows fishery managers and advisors to evaluate the performance of different management options. TUMAS allows commission members to explore and compare the results of different management options and assists them to make management decisions and negotiate at regional fisheries meetings.

Tonga observer program is developing to ensure compliance with the WCPFC measures and also to provide jobs for its people. In 2011, two sub-regional basic observer trainings were conducted by the Secretariat of the Pacific Community (SPC) and the Pacific Islands Forum Fisheries Agency (FFA), in which Tonga participated in. The first training was a 6 week training held in Suva, Fiji from 28th March to 6th May 2011 and 5 private sector individuals from Tonga was send to this training. Another basic observer training was held in Santo, Vanuatu from 2nd November – 12th December 2011 and 3 private sector individuals from Tonga took part in this training. All the 8 trainees to these two trainings passed and were certified and authorized as observers under the Tonga national observer programme and the sub-regional observer programme. By 2011, the number of Tonga available certified observer was 13 compared to 5 in 2010.

The TUFMAN database for tuna was developed from MS Access to SQL. Since the uetlisation of the database in Tonga for the management, monitoring and analysis of tuna data, it was problematic. This is because the Tonga Fisheries Division's server could not accommodate the upgrading of the SQL. Hence, a request was sent to SPC for financial and technical support to address this problem. Fortunately, this problem was fixed in 2011 by SPC expert plus purchasing of a new server through fund from the Devfish project.

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

### 7.1 Observer

The Tonga National Observer Programme is aimed to collect information on fish catch, onboard fish handling techniques, fishing technology, by-catch and discards for stock assessment and management purposes. Fishing vessels' compliance with fisheries legislation is also an integral part of this program. The staffs at this program are responsible, for the activities of the Observer Programme in close collaboration with relevant SPC-OFP staffs for deployment of observers on vessels fishing within Tonga waters, and with FFA, when an observer is requested to be deployed under the Multilateral Treaty arrangement. Over the past few years, the Oceanic Fisheries Programme (OFP) of the Secretariat of the Pacific Community (SPC) PROCFish Project, provided funds and services to assist the Tonga national observer programme deploy

observers on domestic longline fishing vessels. In 2011, financial assistance was received from the Japanese Trust Fund (JTF) with USD$3686 identified for observer fees.

Although the major focus of the observer programme is the longline fishery, trained observers also cover other fisheries such as beche-de-mer fishery and deepwater snapper fishery. In 2011, the Tonga Fisheries focused more on beche-de-mer fishery and the deployment on longline fishing vessel was minimal and only during the beche-de-mer closed season. As such, observer coverage for 2011 dropped down from 12 % in 2010 to only 4 %.

Under the sub-regional observer program administered by the Forum Fisheries Agency (FFA), Tonga continued to provide observers to be deployed on US single purse seine fishing vessels under the US Treaty. In 2011, three of our domestic observers were deployed under this regional program. Tonga's national observer programme was audited by the WCPFC in March 2011 and has now gained interim authorization to the WCPFC Regional Observer Programme

**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 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 the local TUFMAN database. Port sampling reports, logsheet data and unloading information are regularly provided to SPC through monthly submission and report.

In 2011, high percentage of port sampling coverage was maintained at 90 % in comparison to 91 % in 2010. Coverage rates for logsheet data and unloading data continued to be 100 % in 2011. The Tonga Fisheries Division is obliged to maintain this high percentage coverage of port sampling to ensure the fulfillment of its obligation to the Commission.

Offshore Fisheries Program (OFP) of SPC continues to provide assistance to Tonga Fisheries with relevant information about tuna stock in Tongan waters relative to the whole stock in the Western and Central Pacific Ocean. The total tuna catch by Tongan fleet in 2011 still remains insignificant to have impacts on the whole stock in the WCPO. Despite the ample room for improvement and development of tuna fleet in Tonga, high operational costs such as fuel have restricted the operation of local fishing vessels mainly to areas near the main fishing port, Nuku'alofa.