SCIENTIFIC COMMITTEE
FOURTH REGULAR SESSION

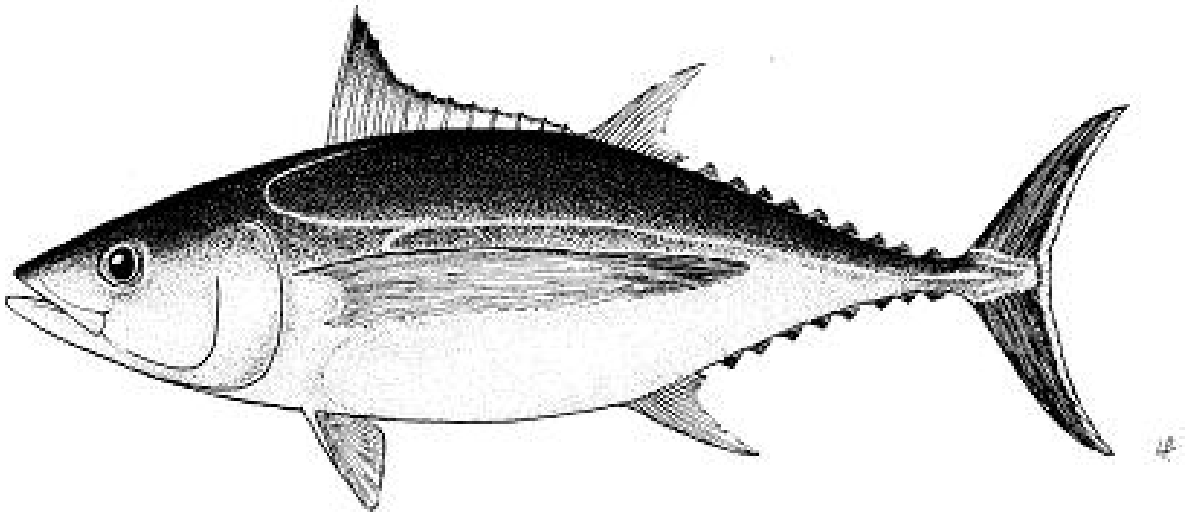
11-22 August 2008
Port Moresby, Papua New Guinea

ANNUAL REPORT – PART 1
INFORMATION ON FISHERIES, RESEARCH, AND STATISTICS

WCPFC-SC4-AR PART 1/WP-29

TONGA

Tonga Tuna Fishery Annual Report to SC4
Papua New Guinea
22nd August 2008



Prepared by

Tu'ikolongahau Halafihi
'Ulunga Fa'anunu

1. Introduction:

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 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 km^2 of undeclared EEZ that extends from Latitude13 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 36%, less than 25% are yellow fin and 14% are big eye. Dolphinfish, Wahoo and Moonfish dominate the by-catch species.

2. Status of the Fishery

2.1 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 (LBFV) relocated to other countries. The table 1 shows the number of licensed fishing vessels registered to fish in Tonga waters.

Table 1. The number of longliners licensed to fish in Tongan waters, 2000 - 2007.

Year	Gear	Domestic	LBFV	Total
2000	Longline	14	2	16
2001	Longline	17	2	19
2002	Longline	18	11	29
2003	Longline	13	16	29
2004	Longline	14	14	28
2005	Longline	15	0	15
2006	Longline	12	0	12
2007	Longline	12	0	13

2.2 Total Annual Catch

The Figure 1 gives the annual catch (metric tons) of the main tuna species and by-catch by both domestic and LBFFV. It shows a steady decline of the annual catch after 2001 to the lowest in 2004. This steady decline is accounted by the decline in Catch Per Unit Effort (CPUE) in Figure 3. Due to

low CPUE and high operation cost, only some of the licensed vessels were fishing. The others were tied at wharf or go fishing once a month or two. The total catch increased in 2005 and continued up to 2007 at a slower rate as compared to the rate it decreased from 2001.

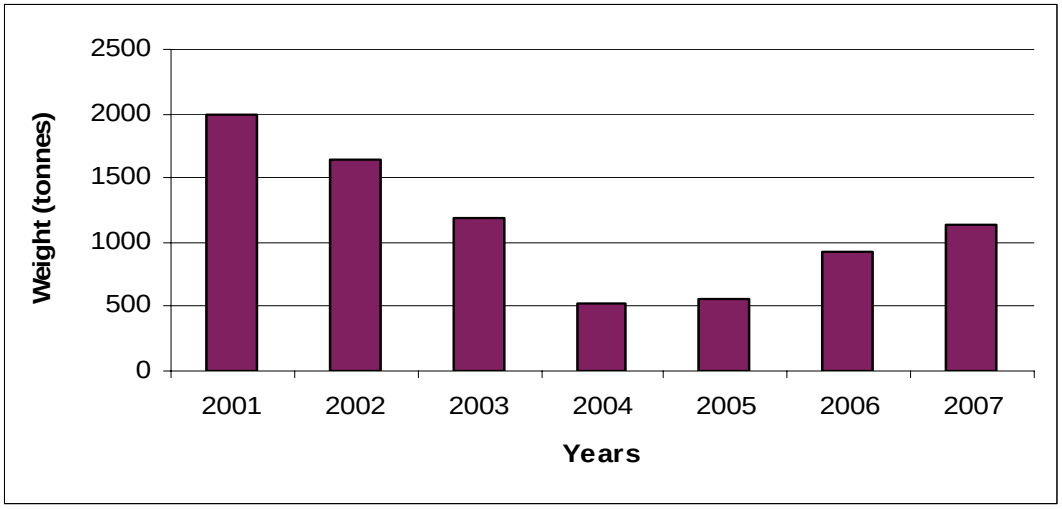


Figure 1: The Annual Catch of Tuna and Bycatch, 2001 – 2007

2.3 Catch by Species

Figure 3 shows the annual catch by species. Albacore dominate the annual catch. It accounted for 32 – 40% of the total catch followed by yellowfin at 20 – 31% and bigeye at 8 – 20%. The by-catch composition is very significant at 26 – 32%. The dolphin (Mahimahi) and moonfish accounted for more than 50% of the by-catch.

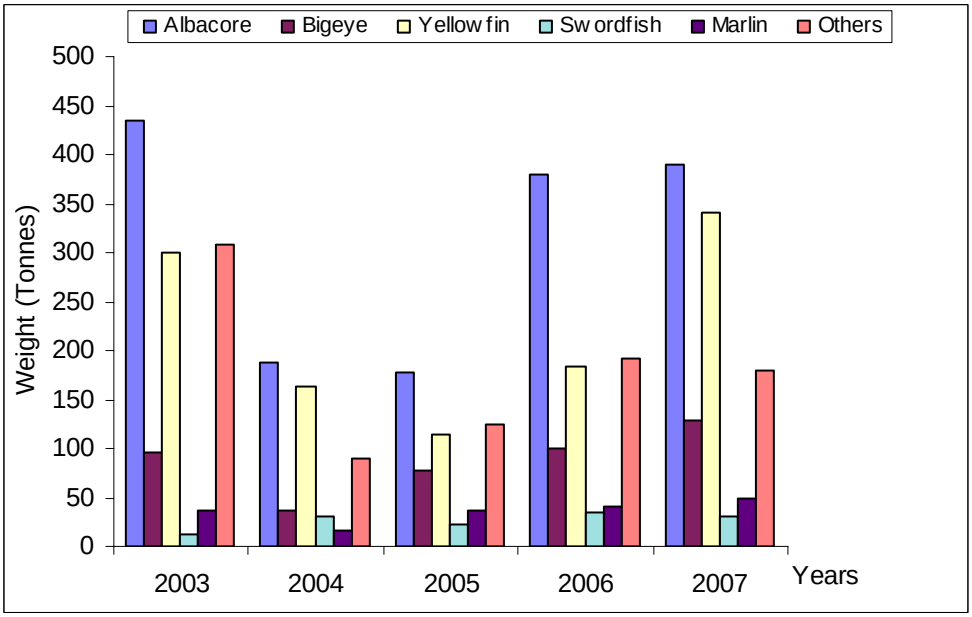


Figure 2: Annual Catch by Major Species

2.4 Catch per Unit Effort (CPUE)

Figure 3 below gives the quarterly Catch per Unit Effort (CPUE) for tuna and by-catch. The fluctuations in the tuna CPUE in Tonga EEZ is mainly driven by oceanographic effects. The CPUE for albacore is highest in the 3rd quarter and lowest in the 1st quarter. The bigeye CPUE is highest in the 2nd quarter and lowest in the first quarter. On the other hand the yellowfin is highest in the 2nd quarter.

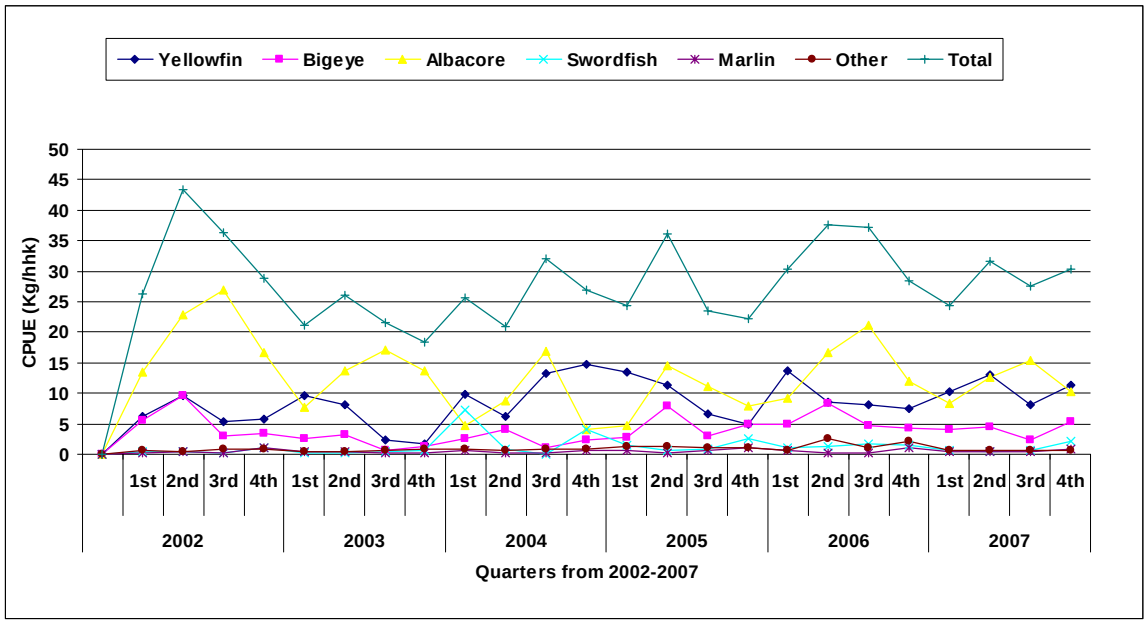


Figure 3: Quarterly CPUE for 2002 - 2007

2.5 Catch Distribution

Figure 4 and Figure 5 give the catch distribution by species and distribution of effort respectively over the Tongan EEZ for 2007. The sizes of the circles represent the volume of catch per unit grid area that is subject to relative abundance and effort.

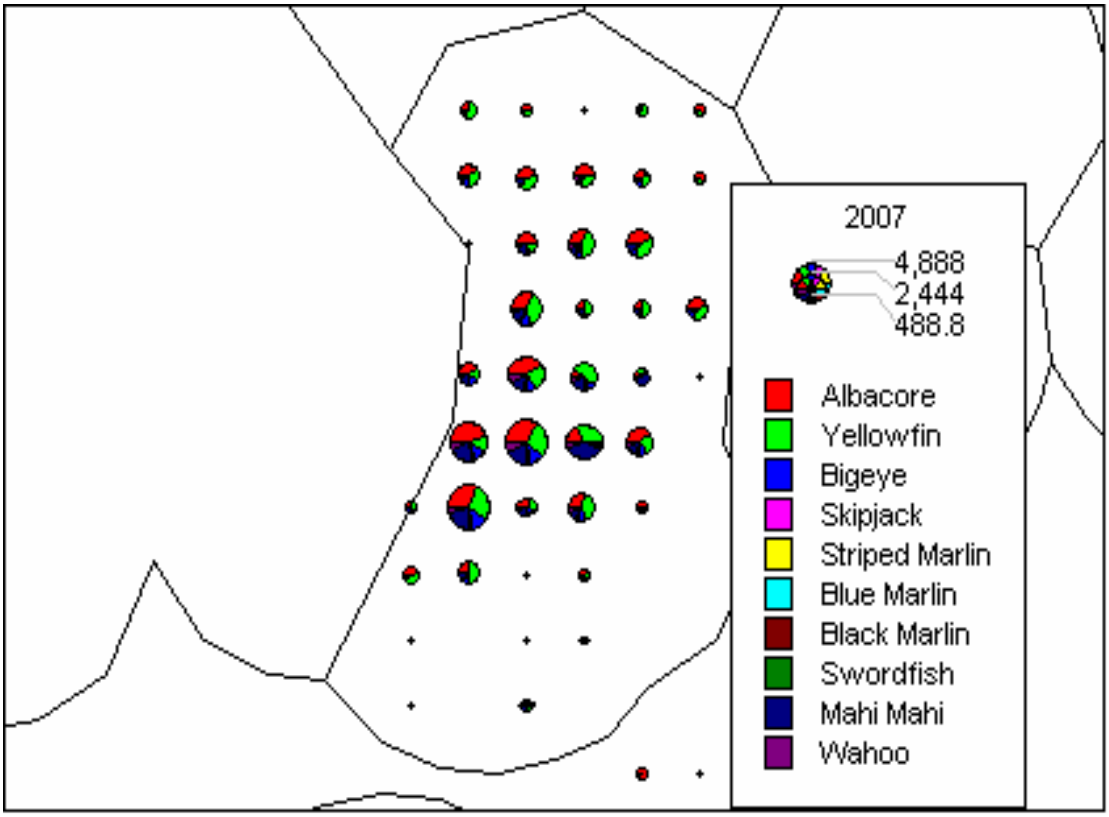


Figure 4: Catch Distribution over the Tongan EEZ for 2007.

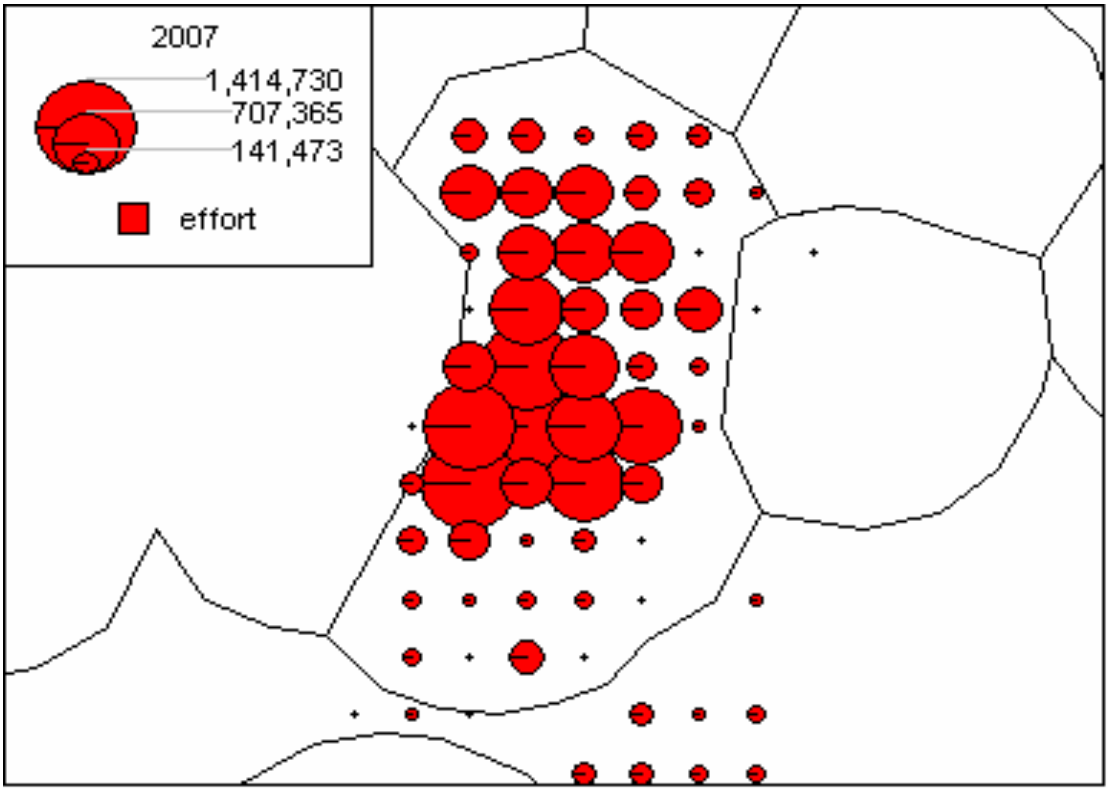


Figure 5: Effort distribution over the Tonga EEZ for 2007.

2.6 Bycatch

All the by-catches from tuna longlining were retained and sell locally or export. The by-catches were mainly dolphin fish, moonfish, marlin and sailfish.

2.7 Marketing

The percentages of export from the annual catch vary from 32.5% in 2007 to 61% in 2001. Figure 6 shows the percentages of the catch by species were exported from 2002 to 2007. It indicates the low percentage of albacore compare to yellowfin and bigeye and surprisingly lower than the 'other species' category.

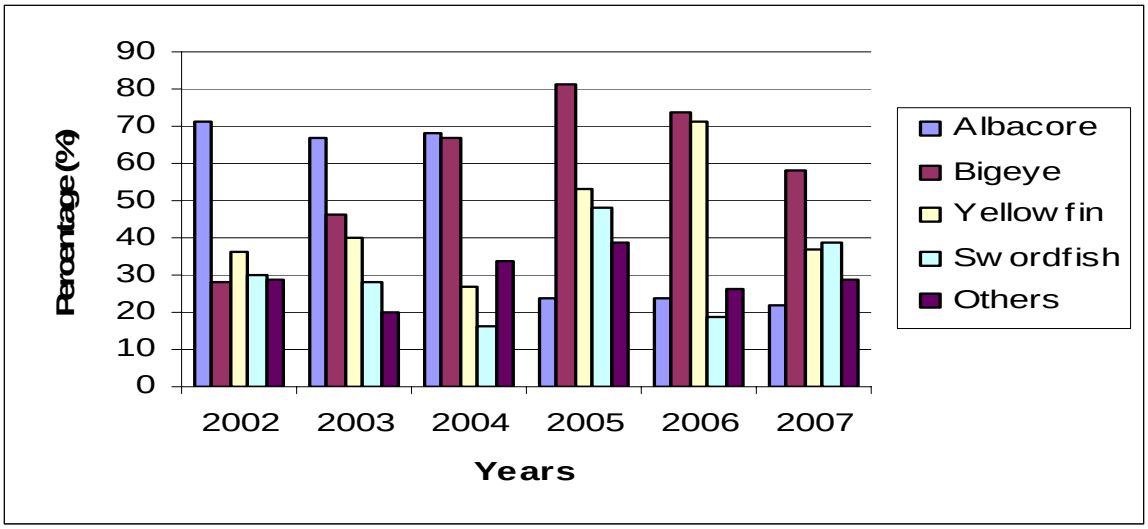


Figure 6: Percentage of the catch by species were exported

The Figure 7 shows the export destinations for all tuna and by-catch. The major export destinations for fresh fish are Los Angeles at 22.7%, Hawaii at 21.8%, New Zealand and Japan at 20.3 and 19.3 respectively. Most frozen albacore and skipjack were exported to Pagopago, American Samoa.

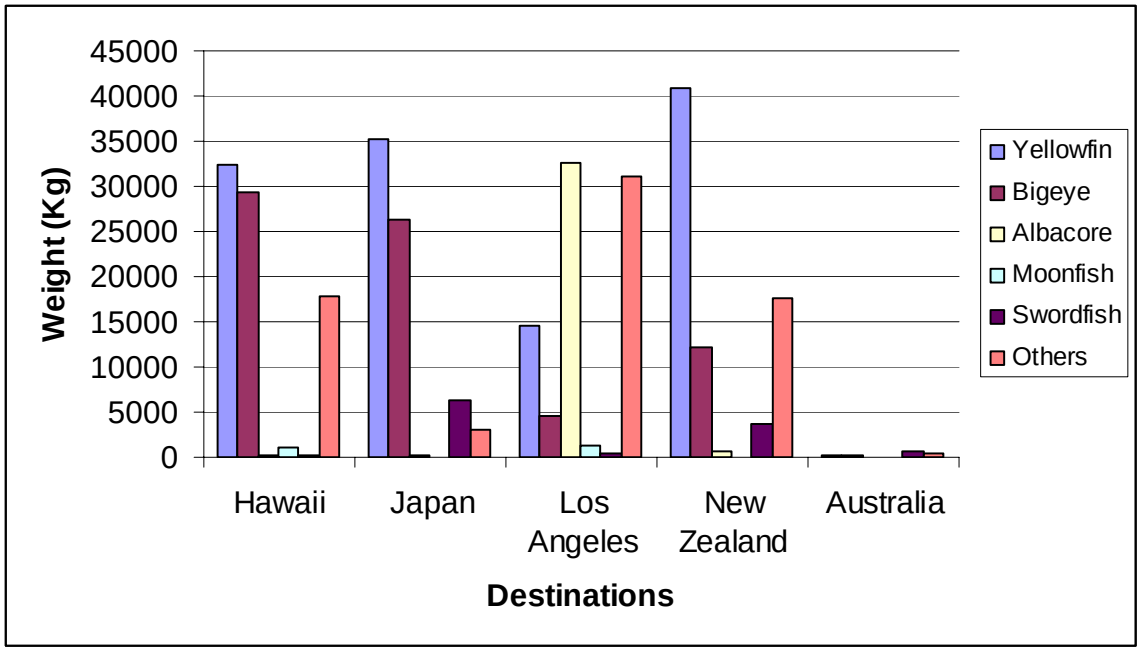


Figure 7: Export Species by Destination for 2007

2.8 Export Value

The total value is calculated based on the current domestic market value. These are T$7.00/kg for three main tuna species and swordfish and T$5.00/kg for all species under the 'other tuna' category. The Table 2 gives the total volume of export by species. The quantity exported and value as shown in Figure 8 was highest in 2003.

Table 2: The Annual Export (kg) by Species

Species	2002	2003	2004	2005	2006	2007
Albacore	459,133	647,524	127,093	42,616	90,281	87,675
Bigeye	93,423	44,037	25,376	62,351	74,574	73,994
Yellowfin	138,247	120,862	43,543	60,968	130,149	125,302
Moonfish	15,445	4,278	434	22,909	19,416	2,389
Swordfish	7,022	3,413	4,961	10,646	6,522	11,765
Others	62,816	65,443	36,416	39,214	49,324	70,094
Total	776,086	985,555	257,823	238,704	370,266	371,219

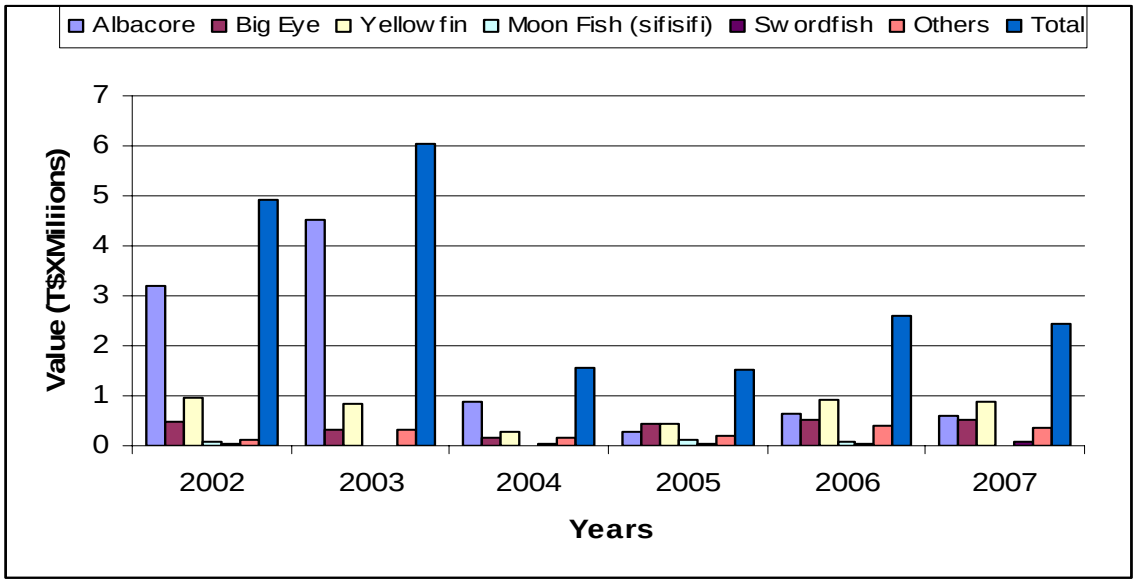


Figure 8: Total Annual Export Value by Species

3. Research and Statistics

3.1 Observer

The Tonga National Observer Programme is under the Monitoring & Surveillance Section of the Fisheries Division. The Section consists of two permanent staff and these two staffs are responsible for the activities of the Observer Programme in close collaboration with relevant SPC-OFP staffs for deployment on vessels fishing within Tonga's waters, and with FFA, when an observer is requested to be deployed under the US Treaty arrangement.

The major constraint facing the programme is the availability of certified observers to carry out observer related duties when requested. The observers are employed on a contract basis per trip, and most of them when landing a permanent job, tends to take that offer and is not available as an observer anymore.

Another constraint faced was the lack of enthusiasm from observers to be deployed on certain vessels, due to the status of these vessels ie. cleanliness etc, leading to observers at most times, becoming "unavailable" for deployment when it is known these fleet will be the ones carrying the observer.

At the start of 2007, only one observer (Siosifa 'Amanaki) was available for deployment and this was the case, for most of 2007. Table 3 below shows the number of trips carrying an observer in 2007

Table 3: Number of deployment made in 2007

	Observer Name	Trip ID	Vessel Name	From	To	Sea Days
1	Siosifa 'Amanaki	SIA 07-01	Laumanu	30-01-07	05-02-07	7
2	Siosifa 'Amanaki	SIA 07-02	Wainui II	24-05-07	07-06-07	15
3	Siosifa 'Amanaki	SIA 07-03	Wainui II	28-06-07	11-07-07	14
4	Taani He	TAH 07-01	Wainui II	15-09-07	28-09-07	14
5	Siosifa Fifita	SIF 07-01	Pacific Blue 28	10-11-07	23-11-07	14
6	Siosifa Fifita	SIF 07-02	Marine Princess	17-12-07	29-12-07	13
					TOTAL	77 sea days

Overall, the number of observer deployment for 2007 (6 trips) decreases dramatically compared to the 19 deployments made in 2006. This is attributed to the constraints identified above. It is anticipated, more deployments will be made in 2008.

3.2 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). For the year, 2007 there were six people involved in port sampling in addition to their other duties at the fish market. The port sampling activities including; recording of lengths and weights for every species during offloading at wharf; collecting of logsheets from fishing vessels; entering of data into Tufman database; sending of hard copy data to SPC; preparation of monthly report and sending to SPC. There was a great improvement in port sampling coverage for 2007 as it was increased from 56 % coverage in 2006 to 70 %. Attempt is made to further increase the port sampling coverage by 2008. The Table 4 below summaries the number of fish sampled during port sampling for the year 2007.

Table 4: Total No. of fish sampled per month for 2007

Months	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
No. of Sampled fish	1511	1770	2106	3041	3336	3661	3524	5319	4542	3120	2709	1817

In 2007, the only problem faced by this program was the shortage of staff for data collection and data entry due to three staffs took long vacation leave plus extra months for their overdue overtimes accumulated from previous years.

4. Stock Assessment program with SPC.

The fluctuations of tuna abundance in the Tonga EEZ were mainly driven by oceanographic and climatic phenomena including El Nino and La Nina. This is similar to other EEZs in the sub-region where Tonga Fishery operates. It is very clear from the

assessment that the largest impacts on main tuna species, especially yellowfin and bigeye are in the equatorial regions, especially in the west. On the other hand, the impact of the sub-regional where the Tonga Fishery operates on the overall tuna stock is very low (see Figure 8, 9 & 10). Similarly, the impact of the Tonga Longline Fishery the in the sub-regional where the Tonga Fishery operates is very low (see Figure 11, 12 & 13).

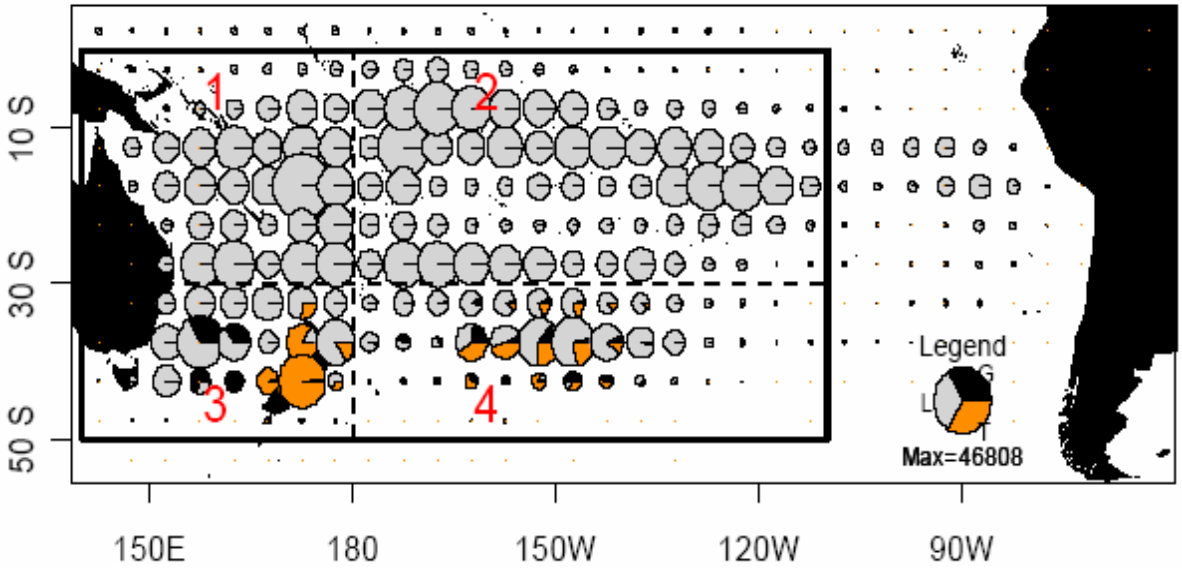


Figure 9: Albacore Catch Distribution by Sub-region (Brett Malony report to EAFM Workshop in Tonga, July 2007)

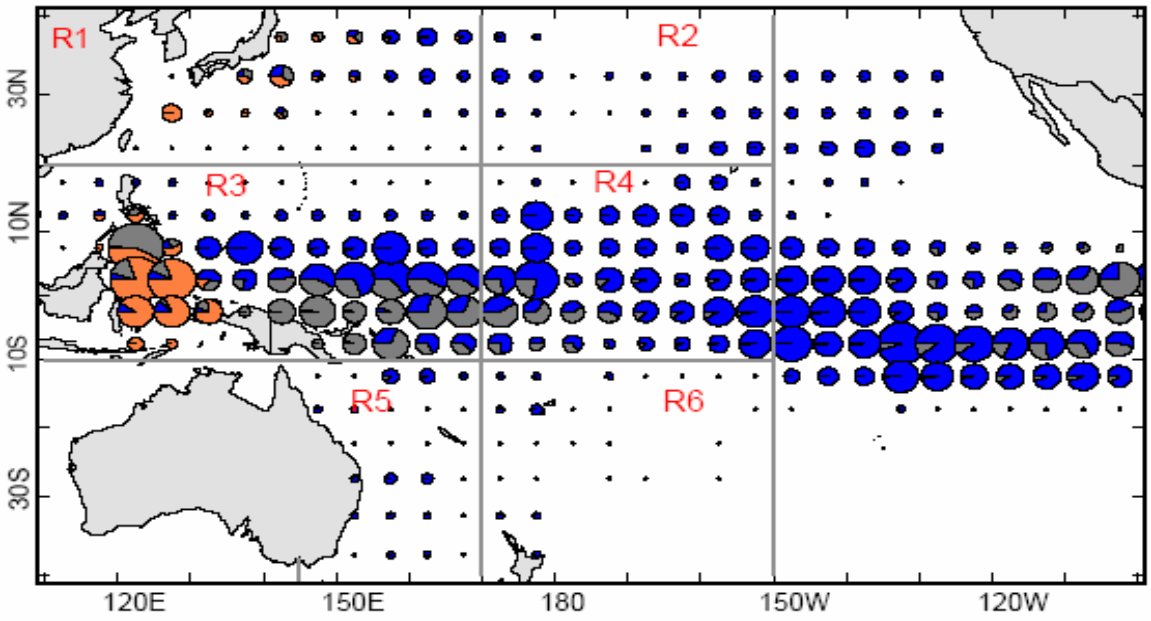


Figure 10: Bigeye Catch Distribution by Sub-region (Brett Malony report to EAFM Workshop in Tonga, July 2007)

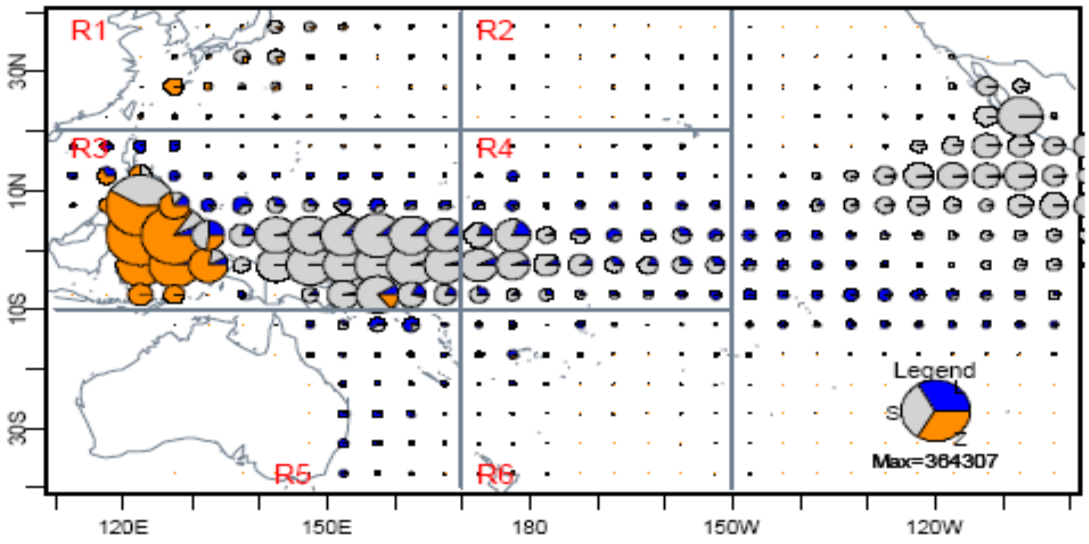


Figure 11: Yellowfin Catch Distribution by Sub-region (SPC Stock Assessment Repor,2006)

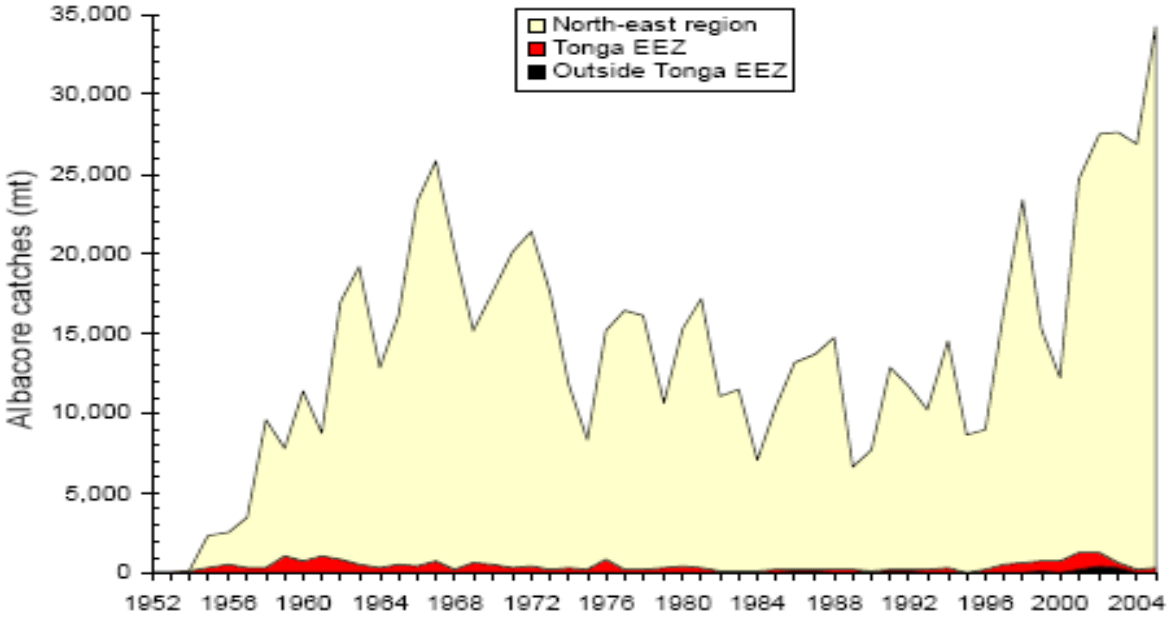


Figure 12: Annual catches of albacore tuna by longline fisheries within the Tonga EEZ, by Tonga-flagged longline vessels beyond the Tonga EEZ, and the entire north-east sub-region of the MFCL stock assessment model, 1952–2005

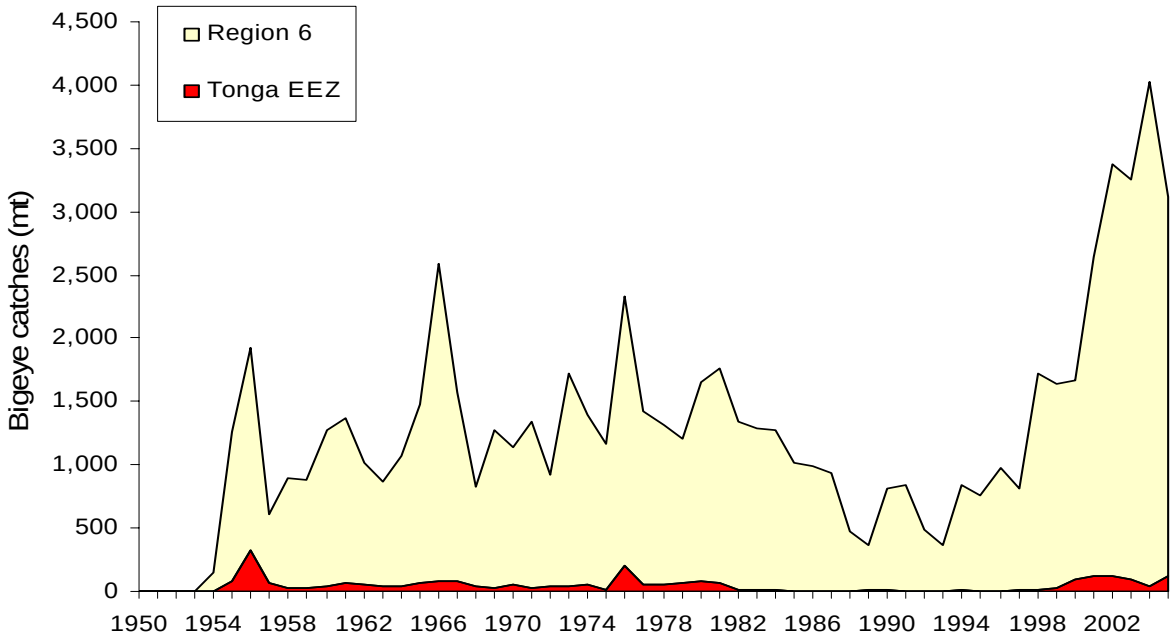


Figure 13: Bigeye catch by Tonga longline relatively regionally (Brett Malony report to EAFM Workshop in Tonga, July 2007)

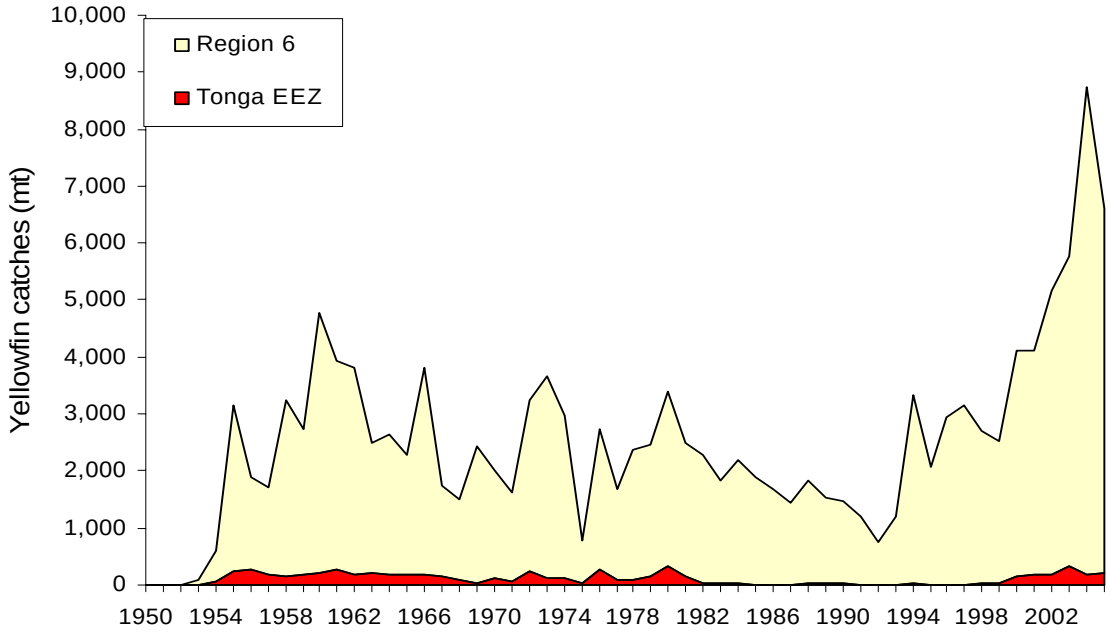


Figure 14: Yellowfin catch by Tonga longline fishery relatively regionally (Brett malony report to EAFM Workshop in Tonga, July 2007)

Tonga catch of albacore regionally is very small. It is about 0.5 % of the annual WCP-CA catches. The current catches of bigeye by Tonga's longline are insignificant which is about less than 250 mt annually. This is about less than 0.2% of the WCP-CA catches. Yellowfin catches from Tonga regionally small (< 500 mt) which is about 0.15% of the WCP-CA catches. Therefore, the status of bigeye and yellowfin should not be seen as a limit to increasing longline effort targeting albacore in Tonga EEZ.

5. Management

The Tuna Management Plan set a maximum of 50 vessels based on estimation using data complied by SPC and annual catch rate at that time, prior 2002. However, the National Tuna Management Committee set a new cap of 30 vessels in 2004 due to insufficient shore facilities and infrastructure coupling with lacking of cargo space, especially for fresh fish. For the same reason a moratorium on issuing of Locally Based Foreign Fishing Vessels came into effect in May 2004.

For monitoring purposes, the cabinet has approved to use VMS to track fishing vessel activities. Therefore, all tuna fishing vessels, both domestic and Foreign locally based, must have a VMS as part of the conditions of it license. In addition a national observer program was implemented to monitor fishing effort and catches.

Last but not least, Tonga Fisheries has imposed a catch limit for shark which is not more than 10% of the total catch.

Summary

The operation of tuna longline fleet in Tonga continued in 2007 in similar manner as in 2006, but with more number of fishing vessels than those reported to Scientific Committee 2nd Meeting in 2006. Tonga continued to operate its tuna fishery with full domestic longline fleet only and mainly operate within Tonga's EEZ.

Tuna fishery catch rate (CPUE), total catch in quantity and value for 2007 continued to improve from the status of the fishery in 2004 and 2005 but still much lower than the highest level of catch reached in 2001, a total catch of almost 2000 mt. Albacore tuna remain the highest percentage of tuna composition in the total catch during 2007 with increasing percentages of bigeye and yellowfin tuna. 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.

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 2007 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.

Tonga Fisheries continue improving the tuna data collection established few years ago with assistance of SPC and FFA, and recently by the Commission. This includes the increasing of port sampling and observer coverage on domestic vessels using regional observer program with the same standard data collection and compulsory domestic VMS program. At the same time, measures and resolutions of the Commission are being implemented and monitored by Tonga Fisheries.