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

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**WCPFC-SC4-AR PART 1/WP-32**

**VANUATU**



The Vanuatu Fisheries Department

## ***National Tuna Fishery Report***

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VANUATU

13/08/08

### **Summary**

Vanuatu is a member of the regional fisheries management organizations (RFMOs) such IATTC, ICCAT, IOTC and the WCPFC. The membership of Vanuatu in these RFMOs has enabled Vanuatu's fishing fleet to fish these RFMOs' waters for tuna and other highly migratory fish species. Vanuatu fleet is comprised of 27 purse seiners, 64 longliners, fishing vessels. Catch and Effort coverages for the Vanuatu fleet have been high but the size data coverage is uncertain due to lack of observers on board the vessels and also due to lack of unloading data sought from the landing ports. In the Vanuatu EEZ the only foreign fleet with high catch and effort data coverage is the Fiji fleet. In the period 2001 – 2007 the annual catch estimates of the Vanuatu fleet have generally increased as did the fishing effort (sets) and number of fish per 100 hooks, as for the purse seiners, there were more sets on unassociated than associated schools. In The purse seine fleet's total catches have increased from 11,196 mt to 140,989 mt, comprising 85% skipjack, 14% yellowfin and 2 % bigeye. Unraised and provisional 2007 data show that catches of all major tuna species have increased with around over 160,000 mt of skipjack, 20,000 mt yellowfin and 3,000 mt of bigeye harvested. Some of these purse seine vessels fished under the FSM Arrangement 'home party' criteria as Papua New Guinea, and therefore may have been included in the PNG-fleet catch statistics. The major tuna species in the longline fleet catch was dominated by albacore (60%), then yellowfin (16%) and lastly bigeye (10%). Unraised and provisional estimates for the longline fleet in 2006 were 9,339 mt, 1,558 mt and 936 mt for albacore, bigeye and yellowfin respectively but if raised could be higher. Data for the Vanuatu EEZ were based on unraised logsheet data. Fishing in the Vanuatu EEZ was by foreign fleets from China, Fiji, Taiwan and Korea. The Taiwanese fleet has decreased but the Chinese and Fiji fleet have increased rapidly, based on the number of license issued in 2007.

## Introduction

This report was prepared by *Tony Taleo (NTDC)* of the Vanuatu Fisheries Department. The report covers the fishing operations of the Vanuatu flag fishing vessel fleet operating in the WCPFC area during the period 2003 to 2007, as well as the a report on the fishing operations of foreign fishing vessels operating within the Vanuatu Exclusive Economic Zone (EEZ). The report mainly focuses on the *fleet structures, annual catch estimates, and catch/effort distributions*. The report also raises areas where new and further effort is required on the part of Vanuatu to enhance its role in contributing to the overall conservation and management of highly migratory stocks in the WCPFC area.

## Annual Fisheries Information

### 1.1 Flag-state reporting

The Vanuatu fishing fleet is comprised of purse seiners, longliners and pole & line vessels which fish between the Pacific, Indian and Atlantic Oceans. Fishing inside the exclusive economic zones (EEZ) of coastal states was possible by way of bilateral fishing access agreements particularly for long liners and sub-regional arrangements (FSM Arrangement) for purse seiners.

Table 1. Number of VANUATU purse-seine, longline and pole & line vessels active in the WCPFC Convention Area, 2001-2007

	2001	2002	2003	2004	2005	2006	2007
Long line	-	-	-	55	(21) 55	61	64
Purse Seine	-	-	-	24	(10) 24	27	27
Pole & Line	-	-	-	3	3	3	-
	-	33	75	82	(34) 82	91	91

### Data coverage

Data regarding the fishing operations of the Vanuatu fleet have been provided by the various members in whose jurisdictions the vessels may have operated, and also by Vanuatu Flag Management Authority. The catch and effort data coverage for the Vanuatu fleet are high, but the size data coverages are uncertain as most of these vessels are landing their catch elsewhere and this would mostly be corroborated by the observers and port samplers in whose jurisdictions catch may have been landed or transshipped in table 2. The inferences for high, medium, and low scores for the catch/effort, and size data coverage, are provided in annex 1. A high score for catch or effort implies that more than 80% of the data had been covered and question marks indicate that there was no data coverage.

Table 2: Estimated annual coverage of catch, effort and size data for VANUATU fishing fleets in the WCPFC Convention Area, 2003–2005.

Gear	Fleet	Year	Catch/Effort data coverage	Size data coverage
LONGLINE	VANUATU	2003-2004	HIGH	??
		2005-2006	HIGH	??
		2007-2008	HIGH	
PURSE SEINE	VANUATU-Bilateral	2003-2004	HIGH	??
		2005-2006	HIGH	??
		2007-2008	HIGH	
PURSE SEINE	VANUATU-flagged (FSM Arrangement)	2003-2004	HIGH	??
		2005-2006	HIGH	??
		2007-2008	HIGH	??

### Annual Catch and Effort Estimates for the period 2003 - 2007

The annual catch and effort estimates have been estimated for the Vanuatu fleet operating under bilateral arrangements, the FSM Arrangement, and the longline vessels operating in the wider WCPFC Area. The general observation was that annual catch and effort estimates have increased continuously for the purse seine and the longline fleets.

The purse seine fleet that operated under bilateral arrangements recorded an increase in effort in the number of days vessels spent fishing and searching from 779 days in 2003 to more than 1,619 days in 2006 (Table 3a). The effort in the total number of sets had increased but more so for the associated sets. The total annual estimated catches increased from 21,382mt in 2003 to more than 67,010 mt in 2007, which is about a 6 fold increase. During this period, all tuna species in the catch of the main tuna species increased. Skipjack catches only increased slightly while yellowfin (7,030 mt) and bigeye (391mt) catches have more than doubled in 2007, from the 2006 level. Noticeably, the “other” fish category caught by this fleet was 14mt in 2005 and decreased in 2006 to more than 9 mt. For this fishery, skipjack is the dominant species (85%) followed by yellowfin (14%), and then bigeye (1%).

During the 2003-2007 period, the purse seine fleet operating under the FSM Arrangement attained the highest total annual effort in terms of fishing and searching days, at 3,120 recorded in 2003 (Table 3b). In terms of sets, this fleet fished on more unassociated sets than associated sets. In fact unassociated sets increased from 481 in 2001 to 2,157 in 2005. Unassociated sets fell slightly in 2005 to 1,048 down 870, from 1,918 in 2004. The annual estimated purse seine catch increased from 35,875mt in 2001 but dropped slightly in 2005 to 123,061mt then increases in 2006 to 147,138mt. For this fishery, skipjack is the dominant species (85%) followed by yellowfin (13%), and then bigeye (2%).

During this period 2003-2007, the longline fleet recorded its highest total annual catch estimate as 8,901 mt in 2006 with a total effort of 224,579 hooks (Table 3c). This effort was the highest effort recorded for this period, and since 2002 declined to 91,223 hooks in 2005. The longline fishery recorded the highest catches for albacore in 2006 being 7,648 mt and since then declined to 6,404 mt in 2007. The highest catch for bigeye was in 2006 but this dropped from 2,145 mt to 1,574 mt in 2007. Yellowfin catches showed a similar trend for the same years as bigeye catches. Albacore was the dominant species in the catch followed by yellowfin, bigeye, blue marlin and other marlin species.

### **Catch distribution**

The purse seine fleets were mainly operating within the 10 degrees N and 10 degrees S and between 130 degrees E and 150 degrees W. The effort in the purse seine fishery is measured as days fishing and searching. Figures 1a, 1b show the effort distributions of purse seine vessels that operated under the FSM Arrangement and under bilateral agreements.

Purse seiners operating under the FSM arrangement effort were concentrated along the equatorial region and over the 2003-2007 periods, showed a slight movement towards the 140 degree E and towards the 10 degree S. Purse seiners operating under bilateral agreements were also distributed along the equatorial region, but more so in an easterly direction concentrating up to the 160 degree W.

The longline effort is given as 100s of hooks. The efforts are distributed between 40 degrees North and 40 degrees south. This implies that both the southern and northern albacore stocks were targeted. However, there was more effort in south i.e between 10 degrees S and 40 degrees S with a strong concentration in the Vanuatu EEZ and little effort in the EEZs of other coastal states particularly in 2006.

Tables 3 (a). Annual catch estimates for the VANUATU (Bilateral) purse-seine fleet, by species in the WCPFC Convention Area, 2003-2007.

YEAR	VESSELS ACTIVE	DAYS FISHERD	SKIPJACK	YELLOWFIN	BIGEYE	OTHER	TOTAL
			CATCH	CATCH	CATCH	CATCH	CATCH
2003	4	779	19,197	1,855	330	...	21,382
2004	7	1,688	48,243	3,750	311	5	52,309
2005	8	2,089	63,700	10,234	797	14	74,745
2006	7	1,619	54,750	5,769	434	9	60,962
2007	10	...	59,589	7,030	391	...	67,010

Tables 3 (b). Annual catch estimates for the VANUATU-flagged (FSM Arrangement) purse-seine fleet, by species in the WCPFC Convention Area, 2003-2007. (Source : Raised logsheet data). Note that these vessels are listed as having an FSM Arrangement "Home Party" as Papua New Guinea, and may be included in the PNG-fleet catch statistics elsewhere.

YEAR	VESSELS ACTIVE	DAYS FISHERD	SKIPJACK	YELLOWFIN	BIGEYE	OTHER	TOTAL
			CATCH	CATCH	CATCH	CATCH	CATCH
2003	15	3,120	69,988	18,828	20	0	88,836
2004	18	4,590	131,318	13,279	26	28	144,651
2005	19	4,750	131,475	21,565	309	62	153,412
2006	19	4,697	144,971	25,064	467	95	170,597
2007	19	4,454	134,310	22,223	162	39	156,734

Tables 3 (c). Annual catch estimates for the VANUATU longline fleet, by species in the WCPFC Convention Area, 2003-2007. Data for 2007 are provisional.

YEAR	VESSELS ACTIVE	ALBACORE	BIGEYE	YELLOWFIN	OTHER	TOTAL
		CATCH	CATCH	CATCH	CATCH	CATCH
2003	33	4,903	841	1,315	1,056	8,115
2004	55	9,566	1,862	1,322	...	12,750
2005	55	9,339	1,558	936	...	11,833
2006	75	11,648	2,145	664	1,062	15,519
2007	55	6,404	1,574	594	329	8,901

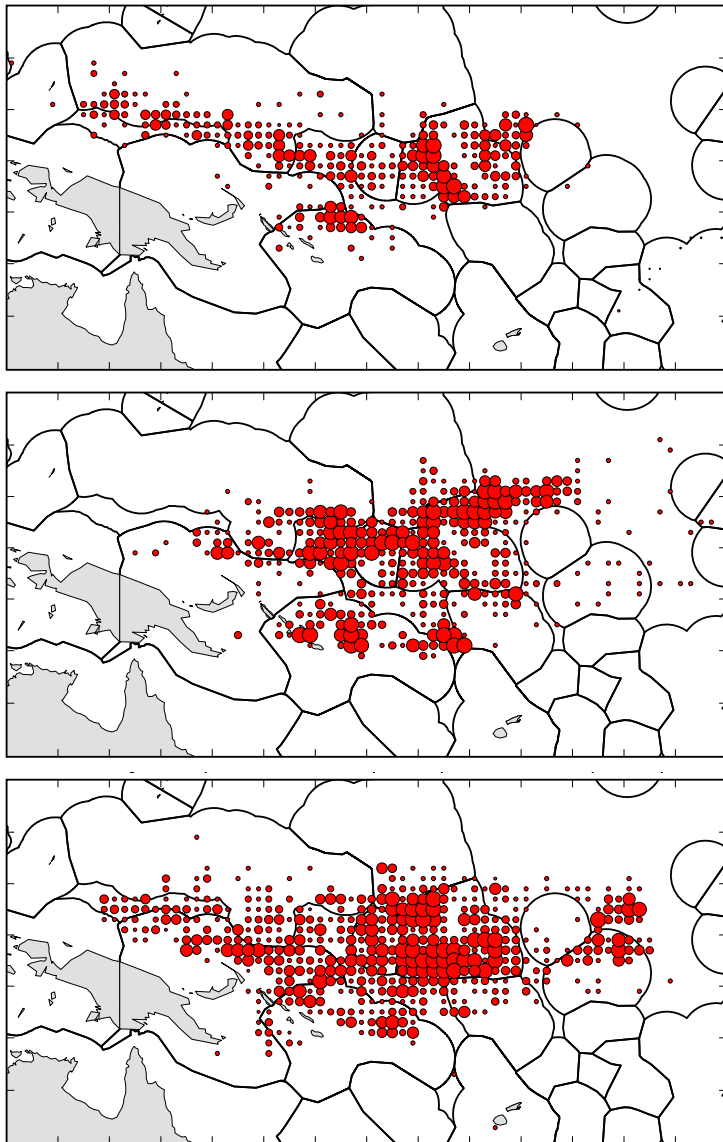
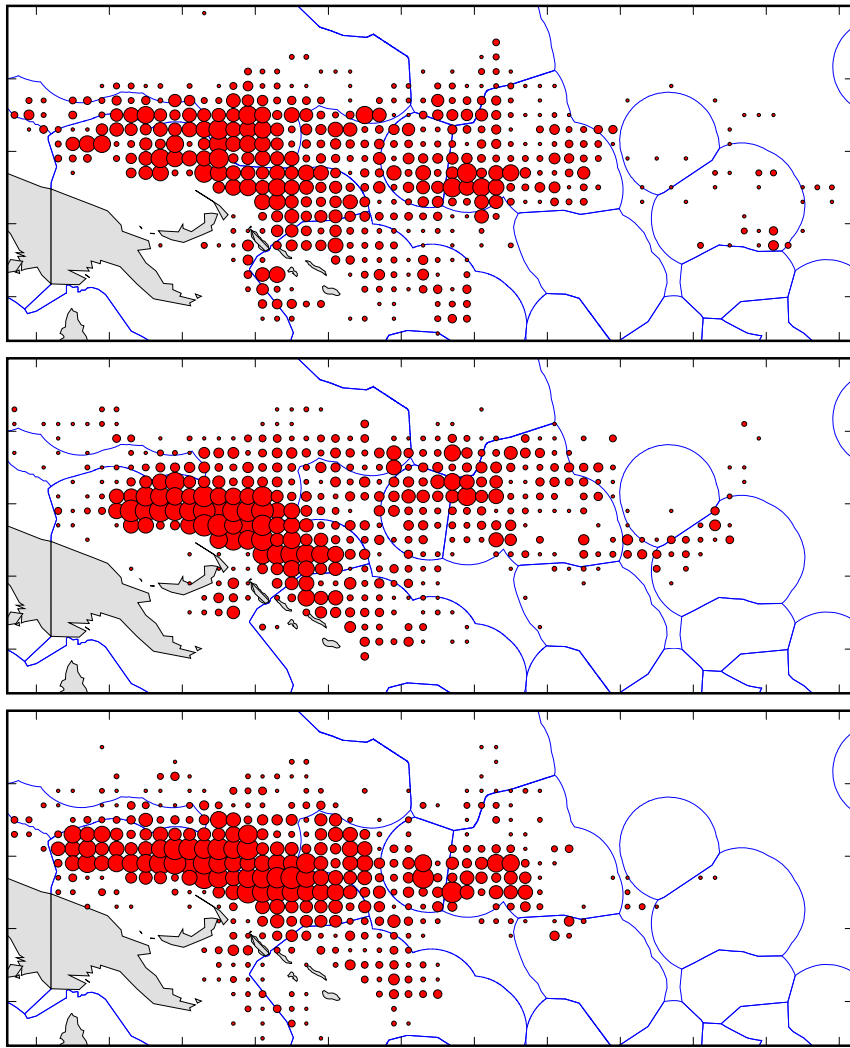
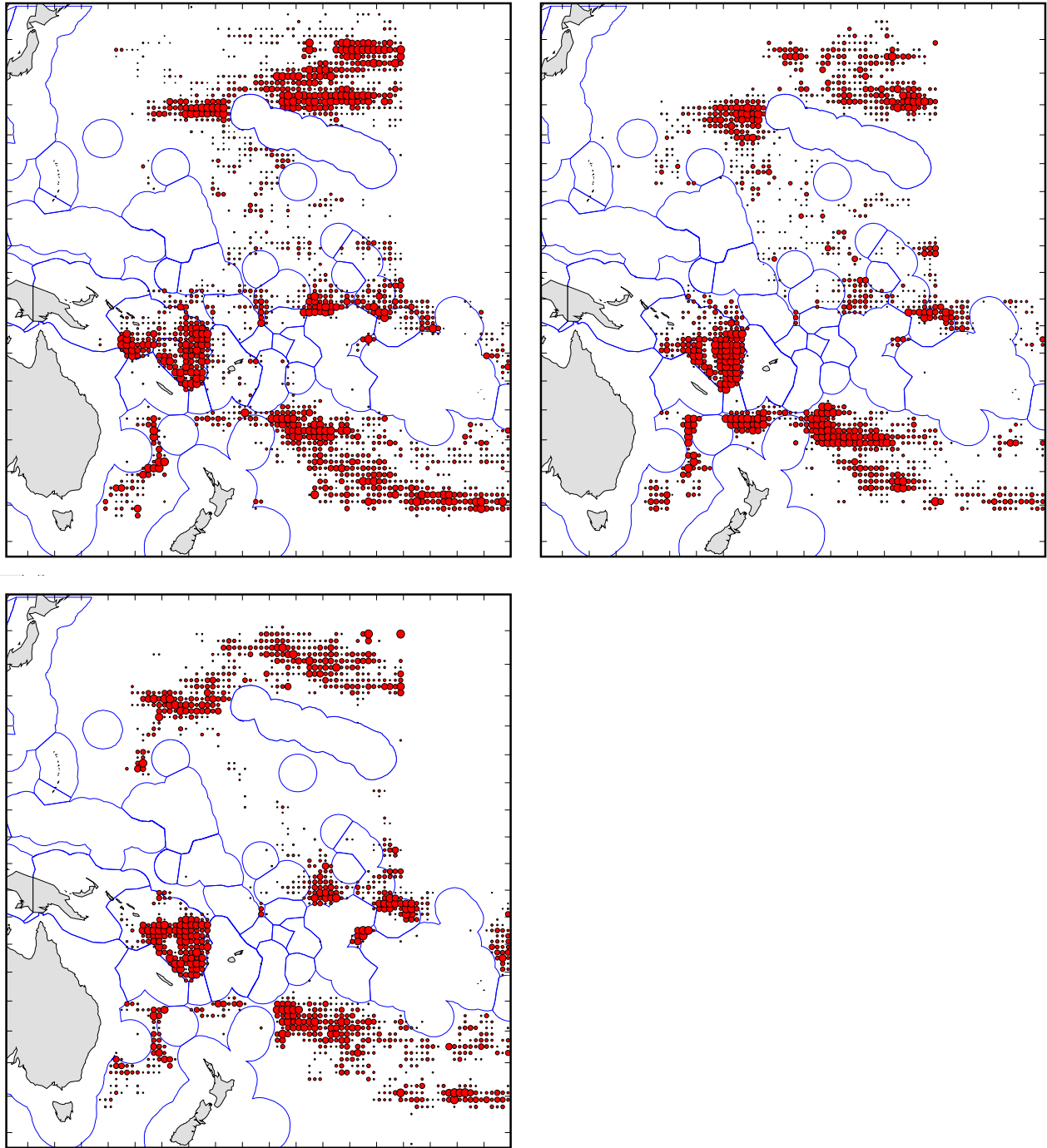


Figure 1 (a) Annual distribution of effort (days fishing and searching) for the VANUATU (Bilateral) purse seine fleet throughout the WCPFC Convention Area for 2005 (top), 2006 (middle) and 2007 (bottom)



*Figure 1 (b) Annual distribution of effort (days fishing and searching) for the VANUATU-flagged (FSM Arrangement) purse seine fleet throughout the WCPFC Convention Area for 2005 (top), 2006 (middle) and 2007 (bottom)*



*Figure 1 (c) Annual distribution of effort (100s of hooks) for the VANUATU longline fleet throughout the WCPFC Convention Area for 2004 (top-left), 2005 (top-right) and 2006 (bottom) (2007 data are not fully processed)*

**Estimated Annual total catches of non-target, associated and dependent species by VANUATU purse seine fleets, 2003-2007.**

It is not known what the estimated annual total catches of non-target, associated and dependant species by the Vanuatu purse seine fleets for the period 2003-2007, as Vanuatu doesn't have observer coverage on its vessels still. It is not known whether or not this information is being collected by observers in the jurisdictions that the vessels were operating in.

**2.2 Coastal-state reporting**

Vanuatu has had a long history of longline fishing in the vicinity of the EEZ since the early 1950s and was dominated by fleets from the distant water fishing nations namely, the Chinese Taipei and Korea, up to the mid-1990s Commercial tuna fishing within the Vanuatu EEZ consists of longline fishing with minimal domestic activity in local waters. Since then there has been a rapid expansion of the domestic fleet. Foreign fleets from Fiji, China, Chinese Taipei, and Korea still fish in Vanuatu waters for tuna & tuna like species under bilateral access agreements. Most of these vessels operate out of American Samoa and Fiji and primarily target albacore tuna for the canneries in American Samoa and Fiji. In 2007, Vanuatu licenced 1119 longline fishing vessels to fish for tuna & tuna-like fish species (Table 5). Fishing fleet from Fiji and China have increased whilst Korean vessels and Chinese Taipei vessels have decreased.

*Table 4. Number of foreign fleet vessels licensed to fish in the VANUATU EEZ by year, flag and gear type*

	Year									
	2003		2004		2005		2006		2007	
FLAG	No. Vessels	Gear Type	No. Vessels	Gear Type	No. Vessels	Gear Type	Gear Type	No. Vessels	Gear Type	No. Vessels
Belize	3	LL	3	LL	3	LL	LL	0		0
Cambodia	0	-	0	LL	1	LL	LL	0		0
China	35	LL	57	LL	57	LL	LL	51		61
Equatorial Guinea	0	-	0				-	0		0
Fiji	31	LL	17	LL	28	LL	LL	19		17
Korea	29	LL	10	LL	11	LL	LL	1		
Cook Island							LL	1	LL	2
Senegal							LL	2		0
New Zealand	0	-	0	-	0	-	LL	0		0
Penama	0	-	0				LL	0		0
Taiwan	29	LL	23	LL	16	LL	LL	33		24
US	0		0				LL	0		0
Vanuatu	12	LL	8	LL	11	LL	LL	14		15
<b>TOTAL</b>	<b>139</b>		<b>118</b>		<b>127</b>			<b>122</b>		<b>119</b>

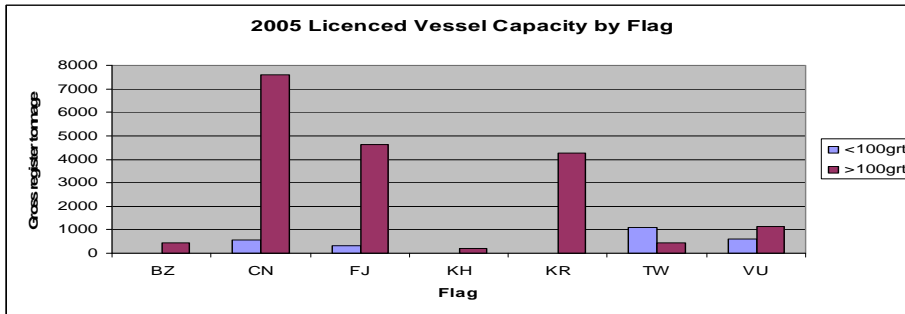
Note: LL – Longline

The Chinese fleet was the dominant fleet operating in the Vanuatu EEZ, both in terms of vessel numbers and capacity, followed by Chinese Taipei, then Fiji. Most of the vessels that have been licenced to fish in Vanuatu waters were greater than 100 GRT.



**Figure 3: 2005 Licenced Vessel Capacity By Flag**

Figure 2: >>>>



*Estimated data coverage*

Coverage of logsheets from foreign fleets fishing in the Vanuatu EEZ extend back as far as the 1970s and have been low and variable among years. The only recent high coverage catch and effort rates are those from the Vanuatu and Fiji fleet. There have also been significant missing data thus it hasn't been possible to estimating coverage rates for some years. Because of the uncertainty of the estimated catch and effort data, and size data coverages amongst the fleets that operate in Vanuatu, the catch and effort levels for Vanuatu have been difficult to estimate. It is understood however that, most of these fleets have been unloading their catch in the ports of Levuka, Pagopago, and Suva. Vanuatu will be looking into very strict measures in terms of estimated catch and effort data, as from 2008 since most of our license vessels will be required to offload all catches in the newly build processing plant in Vila bay.

Most of the current presented data were obtained from the OFP/SPC database, and were originally collected and supplied by Vanuatu and Fiji. It should be noted that data provided for Vanuatu in this report and also from the past reports to the commission are from unraised logsheet data.

*Table 5. Estimated coverage of catch, effort and size data for bilateral-arrangement, foreign fleets fishing in VANUATU's EEZ.*

Gear	Fleet	Year	Catch/Effort data coverage	Size data coverage
LONGLINE	China	2003-2004	??	??
		2005-2006	??	??
LONGLINE	Chinese Taipei	2003-2004	??	??
		2005-2006	??	??
	FIJI	2003-2004	HIGH	??
		2005-2006	LOW	??

*Annual catches in the Vanuatu eez*

In the period 2001 to 2006, the total annual catch for all the fleets that were undertaking fishing operations in Vanuatu had increased from 1,933mt to 8,842mt – over a four fold increase. This increase was largely attributed to the Fiji fleet which recorded over 60% of the total catch for the 2001-2007 periods, and with the Taiwanese fleet contributing only 11%. In fact catches for the Taiwanese fleet have declined in comparison to other fleets. On the other hand, catches for the Chinese fleet have steadily increased during this period.

The annual estimated tuna catch composition by weight for 2007, was again dominated by albacore (73%), significant yellowfin (19%), and minor bigeye (3%). These catch proportions were similar to the historical tuna catch compositions.

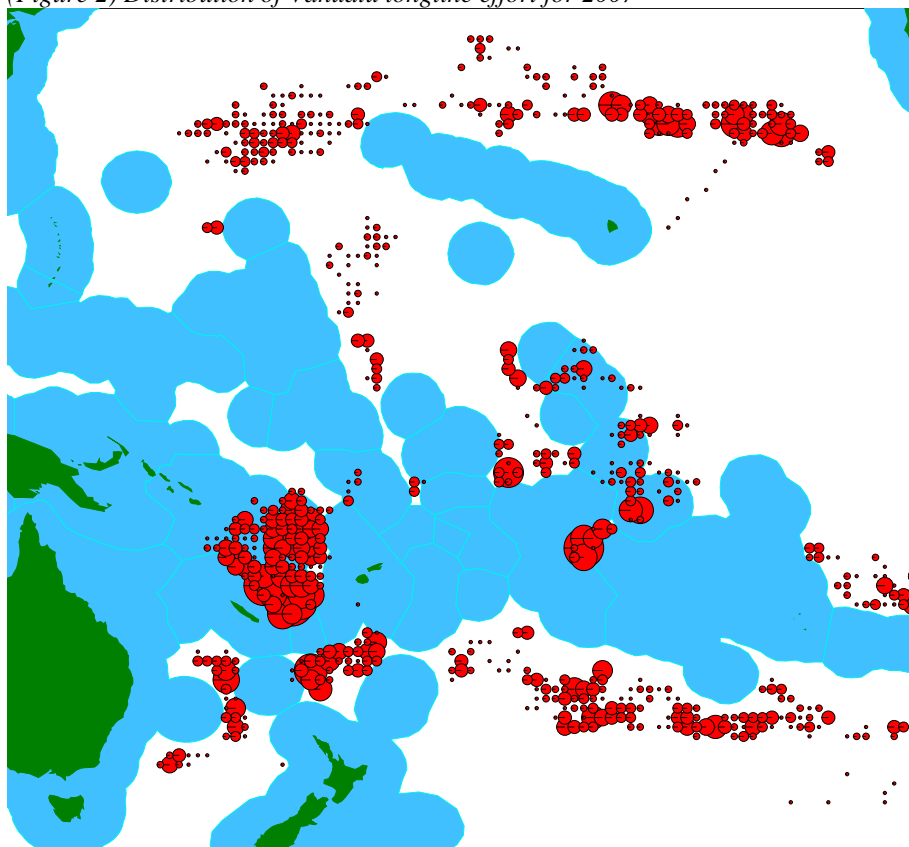
It has been estimated that the total catch of albacore in 2006 exceeded 6,000 mt based on unraised data but it is likely that the best estimate may have approached 10,000 mt if the data were raised.

The recent tuna fisheries in Vanuatu has generally seen a rapid expansion of fishing effort. It is estimated that this recent effort exceeded 25 million hooks per year based on unraised data but it is likely that the actual estimate may exceed 40 million hooks per year if the data were raised. It is noted that high catches were usually obtained with high effort.

Tables 6. Annual catches by longline fleets in the VANUATU EEZ, by flag and species, 2003-2007 (Source : Regional tuna fisheries database – raised logsheet data; 2007 data are preliminary)

Fleet	Year	Tuna Catch (metric tonnes)			
		ALB	BET	YFT	TOTAL
China	2003	616	99	154	869
	2004	897	112	235	1,244
	2005	1,543	179	412	2,134
	2006	2,740	108	308	3,155
	2007	379	14	104	497
Chinese Taipei	2003	915	208	587	1,710
	2004	863	24	323	1,209
	2005	1,164	274	509	1,947
	2006	2,183	1,637	994	4,813
	2007	373	21	135	529
Fiji	2003	1,280	156	653	2,088
	2004	2,698	150	633	3,482
	2005	2,590	71	567	3,229
	2006	3,482	140	654	4,276
	2007	1,210	57	229	1,496
Vanuatu	2003	917	197	615	1,729
	2004	478	60	115	653
	2005	1,149	58	243	1,450
	2006	1,305	64	159	1,528
	2007	366	29	132	527
TOTAL EEZ	2003	3,727	659	2,010	6,396
	2004	4,937	346	1,305	6,588
	2005	6,446	582	1,731	8,759
	2006	9,709	1,949	2,114	13,772
	2007	2,328	121	601	3,050

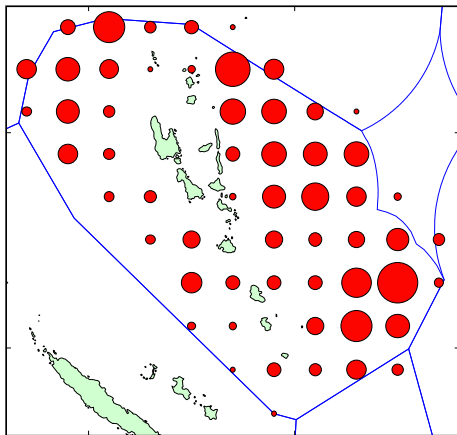
(Figure 2) Distribution of Vanuatu longline effort for 2007



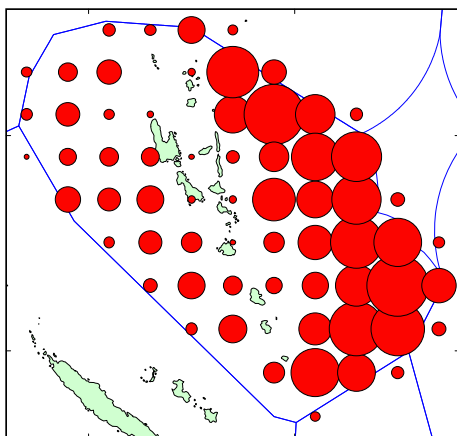
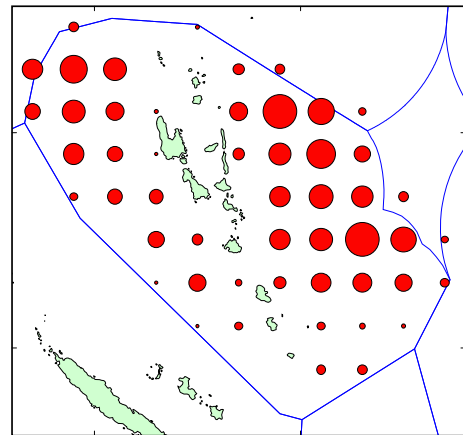
*Annual distribution of fishing effort*

The fishing effort for the tuna fishery in Vanuatu occurred more in the eastern area of the EEZ which borders Fiji, Solomon Islands and the high seas enclave. This is probably due to economic reasons such as the closer proximity to canneries in American Samoa and Fiji.

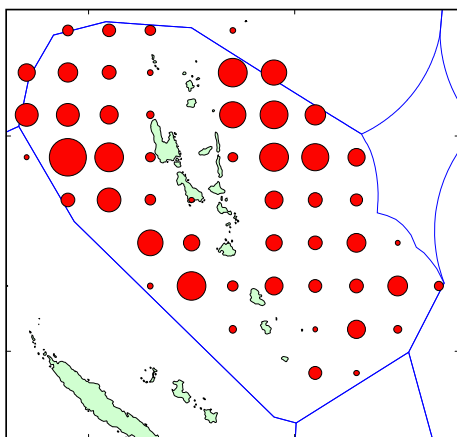
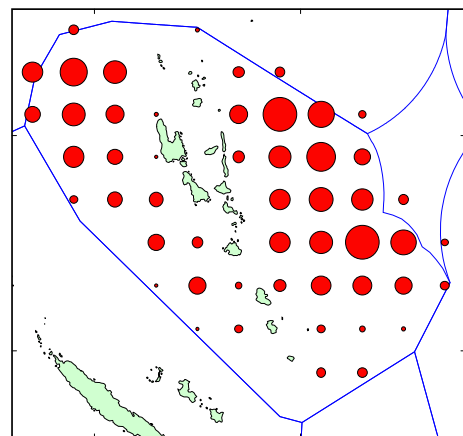
The graphical representation of the distribution of fishing of the various fleets namely, Chinese, Chinese Taipei, and Fiji, active in the Vanuatu EEZ during 2006 and 2007 is shown in FIGURE???. From this effort distribution map, it can be seen that the Taiwanese fleet annual effort have decreased while the Fiji and Chinese fleet fishing effort have increased.



*Chinese Fleet*



*Fiji*



*Chinese Taipei*

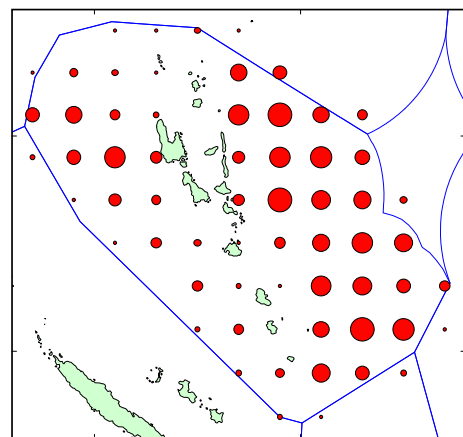


Figure 3. Annual distribution of effort by the main foreign longline fleets active in the VANUATU EEZ for 2004 (left) and 2005 (right)

### Distribution of Catch by Species

The distribution of catch by species was similar to the distribution of effort for the same period, i.e. distributed more to the eastern part of the Vanuatu EEZ bordering the western and eastern EEZ boundaries of the Fiji and Solomon Islands including the high seas enclave between these EEZs (Table 7). Catches were high in this area with albacore being the dominant species. Increased catches of bigeye tuna were observed in the western part of the Vanuatu EEZ compared to those on the eastern part. It is likely that the vicinity of the New Hebrides trench in the western EEZ may have some influence on the catchability of bigeye.

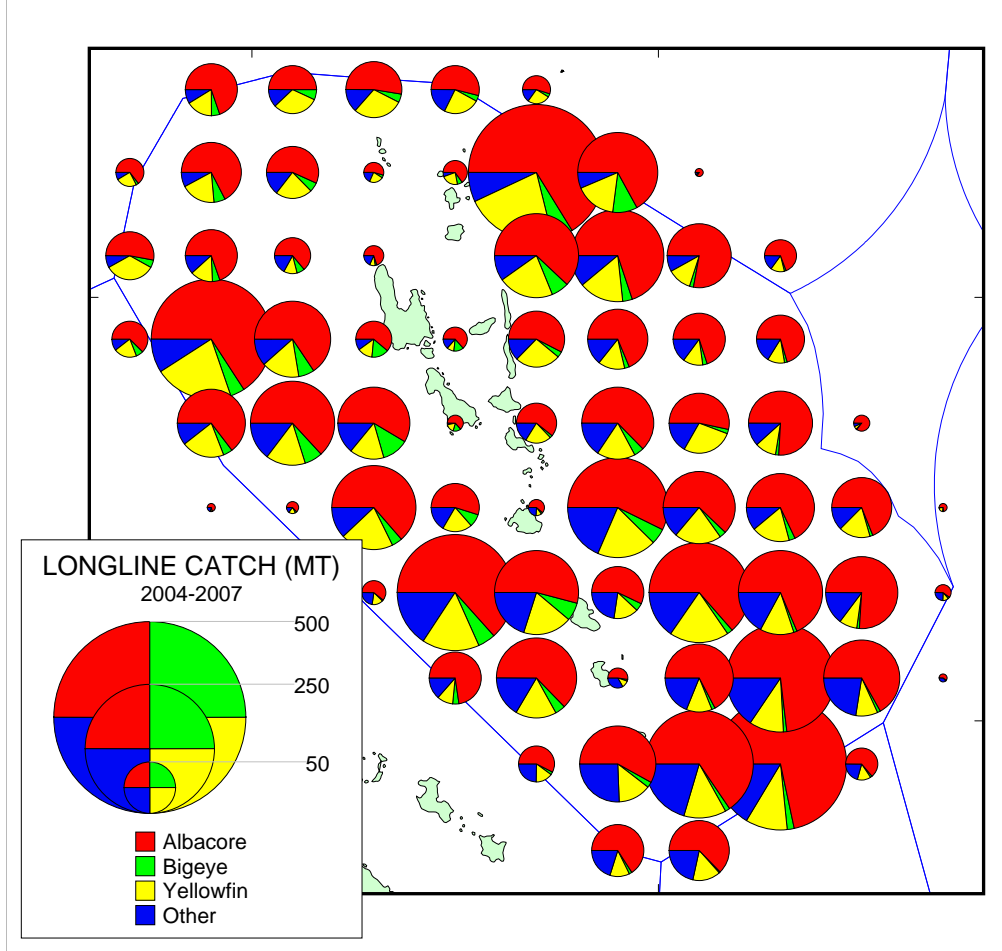


Figure 4. Distribution of catch by species by all longline fleets combined in the VANUATU EEZ, 2004–2007

Historically, the Taiwanese fleet fished within the EEZ during the spring (October – December) and summer (January – March), with most of the effort occurring in spring. Albacore catch rates were moderate during spring and summer and lowest during fall. Yellowfin catch rates were highest at the advent of winter (July), but declined thereafter and remained low until fall.

### Fishing Effort - Catch Per Unit Effort (cpue)

The cpue is measured as nominal cpue, which is numbers of fish per hundred hooks (no. / 100 hooks). Recent cpue had been dominated by albacore and yellowfin. The Taiwanese fleet was the only fleet that showed a longer nominal cpue trend going back to 1991

During late 1990s cpue for albacore as observed by the Taiwanese fleet, was around 2 fish / 100 hooks. However since 1999 the cpue had fallen to 1 fish / 100 hooks in 2003, but has recovered since late 2004 for all fleets with 1.6 - 1.8 fish/100 hooks being obtained in 2005.

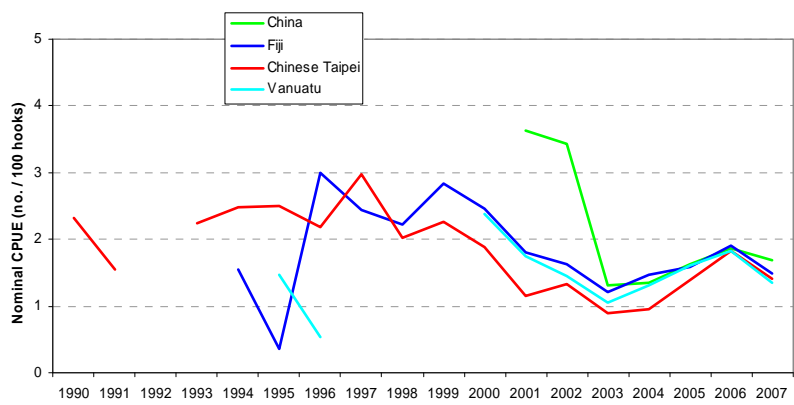


Figure 5 (a). Trends in nominal catch rates of ALBACORE TUNA taken by longline fleets operating in the VANUATU EEZ, 1990-2007

The highest recorded nominal cpue for yellowfin was just over 0.4 fish per 100 hooks in 2002. Recent nominal cpues have been variable and since 2003 showed a convergence trend among the fleets with cpues ranging from 0.2 – 0.25 fish per 100 hooks being achieved in 2005. This level of effort was similar to the 2000 level, but was still lower than the late 1990s.

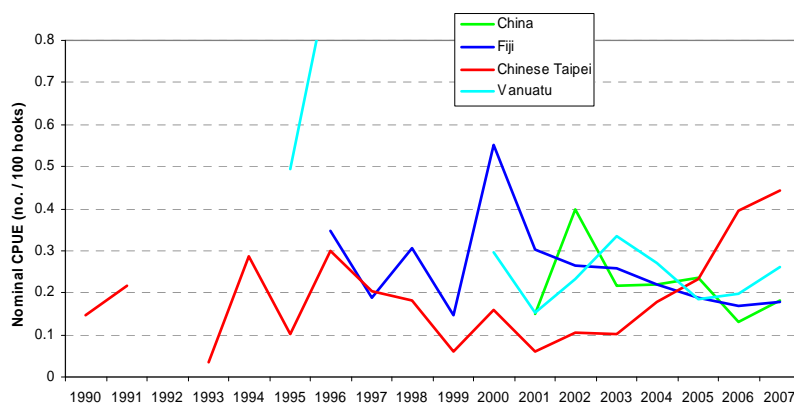


Figure 5 (b). Trends in nominal catch rates of YELLOWFIN TUNA taken by longline fleets operating in the VANUATU EEZ, 1990-2007

With the exception of the Taiwanese fleet, nominal cpue rates for bigeye in 2001 were highly variable between 0.01 to 0.13 fish per 100 hooks. Since then all fleets recorded between 0.03 to 0.05 fish per 100 hooks in 2005 with the Taiwanese displaying an increase in cpue from 2001. The cpues achieved in 2005 are similar to that achieved in 2000 was still lower than the 1992 level.

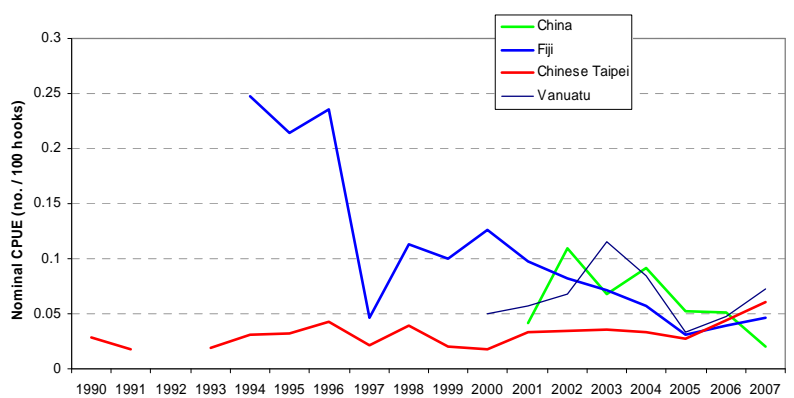


Figure 5 (c). Trends in nominal catch rates of BIGEYE TUNA taken by longline fleets operating in the VANUATU EEZ, 1990-2007

### 3. Research and Statistics

#### 3.1 Port sampling and observer program 2001-2007

Vanuatu currently does not have a port sampling and observer program. During this period there were no unloadings nor port activities in Vanuatu during this period, and very limited observer coverage in the Vanuatu fishery during this period for the Fiji fleet in the Vanuatu EEZ. Vanuatu recognizes that this is a critical data ‘gap’. Therefore there is a need for such a program to be established as soon as practical to ensure that significant coverage can be made for composition of catches, size data, discarding rates, protected species and verification of logsheet data.

## ANNEX 1

Table 2 Categories of coverage for catch, effort and size data.

<b>Category</b>	<b>Catch/Effort data coverage</b>	<b>Size data coverage</b>
HIGH	> 80%	> 15%
MEDIUM	50-80%	5-15%
LOW	0-50%	0-5%
–	No data	No data

### LEGEND :

“**Catch/Effort data coverage**” is determined by the comparing the annual catch from operational (logsheet) data to the **total** annual catch, as determined by unloadings or other types of data/information.

“**Size data coverage**” is determined by comparing the number of trips covered by port sampling and observers (collecting size data) with the estimated number of **actual** trips undertaken by this fleet during that year.