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NATIONAL TUNA FISHERY REPORT
VANUATU

WCPFC-SC2-2006

VANUATU

Introduction

This report was prepared by William Naviti and Tony Taleo 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 2001 t0 2005, 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, 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.

1 Annual Fisheries Information

1.1 Flag-state reporting

The Vanuatu fishing fleet is comprised of purse seiners, long liners and pole & line fishing vessels. In 2005, Vanuatu authorized 86 fishing vessels to fish for tuna and tuna-like species in international waters. Of these, only 11 longliners were actually licenced to fish in Vanuatu waters. In the wider WCPFC area, 82 vessels operated, comprising 55 Longliners, 24 purse seiners and 3 pole & line vessels. However, only 18 longliners, actually shifted between the Pacific and Atlantic Oceans in 2005. Fishing inside the exclusive economic zones (EEZ) of coastal states were 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, 2001-2005

	2001	2002	2003	2004	2005
Long line	-	-	-	55	(21) 55
Purse Seine	-	-	-	24	(10) 24
Pole & Line	-	-	-	4	3
	-	33	75	83	(34) 82

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 by Vanuatu. 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 by Vanuatu.

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 2005	HIGH HIGH	?? ??
PURSE SEINE	VANUATU-Bilateral	2003-2004 2005	HIGH HIGH	?? ??
PURSE SEINE	VANUATU-flagged (FSM Arrangement)	2003-2004 2005	HIGH HIGH	?? ??

Annual Catch and Effort Estimates for the period 2001 - 2005

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 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 242 days in 2001 to 1,560 days in 2004 (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 11,196mt in 2001 to 73,000mt in 2005, 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 (3,872mt) and bigeye (381mt) catches have more than doubled in 2005, from the 2004 level. Noticeably, the "other" fish category caught by this fleet was 5mt in 2004 and increased in 2005 to 14mt. For this fishery, skipjack is the dominant species (85%) followed by yellowfin (14%), and then bigeye (1%).

During the 2001-2005 period, the purse seine fleet operating under the FSM Arrangement attained the highest total annual effort in terms of fishing and searching days, at 4,336 recorded in 2004 (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 to 140,989mt in 2004 but dropped slightly in 2005 to 123,061mt. For this fishery, skipjack is the dominant species (85%) followed by yellowfin (13%), and then bigeye (2%).

During this period 2001-2005, the longline fleet recorded its highest total annual catch estimate as 8,600mt in 2002 with a total effort of 224,579 hooks based on raised logsheet estimates and those for 2004 and 2005 aren't available but is believed to be more (Table 3c). The longline fishery recorded the highest catches for albacore in 2002 as being 6,756 mt (raised logsheet data) and

recent unraised and provisional data indicate that catches for albacore and bigeye have increased beyond the 2003 levels to 9,339 mt and 1,558 mt respectively while the yellowfin catch has fallen slightly. In 2003, albacore was the dominant species in the catch (60%) followed by yellowfin (16%), bigeye (11%), other species (10%) and lastly billfish (3%).

Catch distribution

The purse seine fleet were mainly operating within the 10 degrees North (N) and 10 degrees South (S) and between 130 degrees East (E) and 150 degrees West (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 2001-2005 period, 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 that both the southern and 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 only minor effort in the EEZs of other coastal states particularly in 2005.

Table 3 (a). Annual catch and effort estimates for the VANUATU (Bilateral) purse-seine fleet, by species in the WCPFC Convention Area, 2001-2005. (Source : Raised logsheet data; Data for 2005 are unraised and provisional, but coverage is "HIGH")

	Effort			Catch (metric tonnes)				
Year	Days Fishing & Searching	UnAss. Sets	Assoc. sets	SKJ	YFT	BET	OTH	TOTAL
2001	242	108	44	8,669	2,422	105	0	11,196
2002	418	99	145	17,720	2,169	211	0	20,100
2003	650	154	185	19,103	2,108	170	0	21,381
2004	1,560	240	718	48,051	3,872	381	5	52,309
2005	1,850	758	521	62,086	10,140	992	14	73,232

Tables 3 (b). Annual catch and effort estimates for the VANUATU-flagged (FSM Arrangement) purse-seine fleet, by species in the WCPFC Convention Area, 2001-2005. (Source : Raised logsheet data; Data for 2005 are unraised and provisional, but coverage is "HIGH"). 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.

	Effort			Catch (metric tonnes)				
Year	Days Fishing & Searching	UnAss. Sets	Assoc. sets	SKJ	YFT	BET	OTH	TOTAL
2001	1,025	481	114	30,710	4,939	226		35,875
2002	1,313	529	323	43,470	4,199	271		47,940
2003	2,955	1,335	593	69,120	16,464	455		86,039
2004	4,336	1,262	1,918	128,741	11,213	1,035		140,989
2005	4,106	2,157	1,048	105,237	15,694	2,130		123,061

Tables 3 (c). Annual catch and effort estimates for the VANUATU longline fleet, by species in the WCPFC Convention Area, 2001-2005 (Source : Raised logsheet data; Data for 2004 and 2005 are unraised and provisional but coverage is high)

	Effort	Catch (metric tonnes)								
Year	(100s of hooks)	ALB	BET	YFT	BLM	BUM	MLS	SWO	OTH	TOTAL
2001	23,023	655	17	49	1	4	3	5	4	739
2002	224,579	6,756	396	778	18	74	39	85	459	8,604
2003	221,548	4,903	841	1,315	25	117	56	70	788	8,115
2004	-	9,566	1,862	1,322	-	-	-	-	-	-
2005	-	9,339	1,558	936	-	-	-	-	-	-

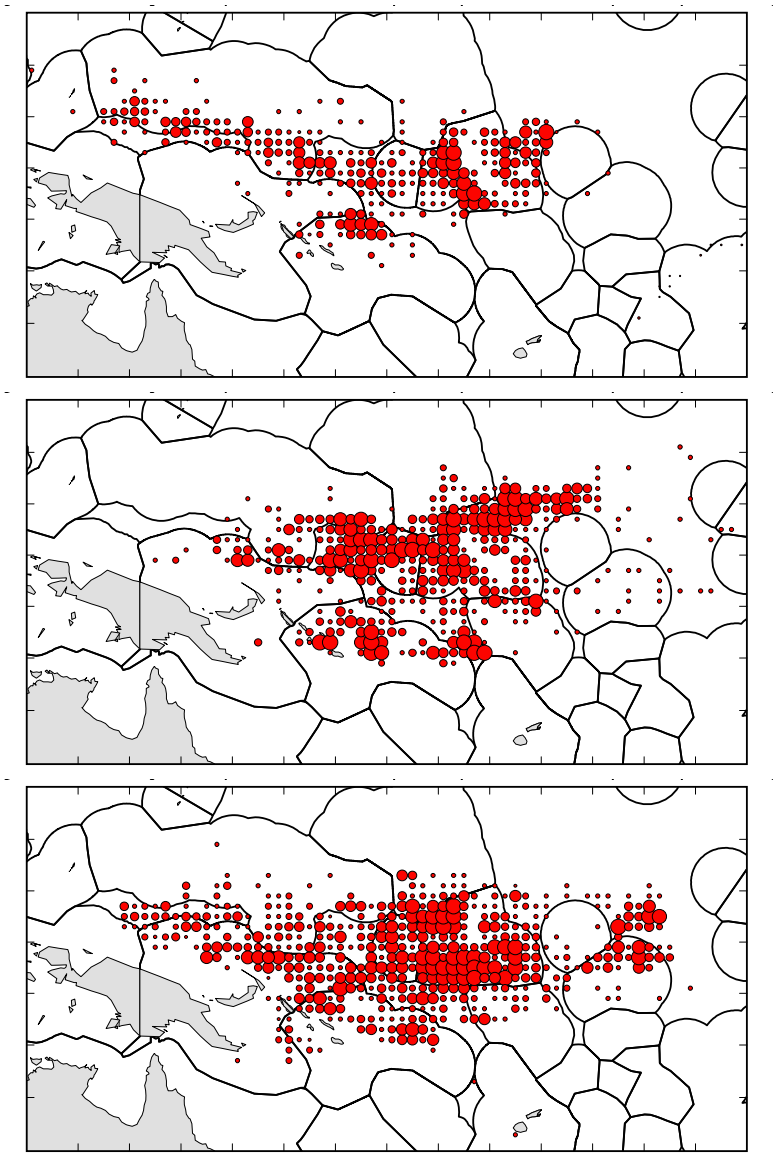

Figure 1 (a) Annual distribution of effort (days fishing and searching) for the VANUATU (Bilateral) purse seine fleet throughout the WCPFC Convention Area for 2003 (top), 2004 (middle) and 2005 (bottom)

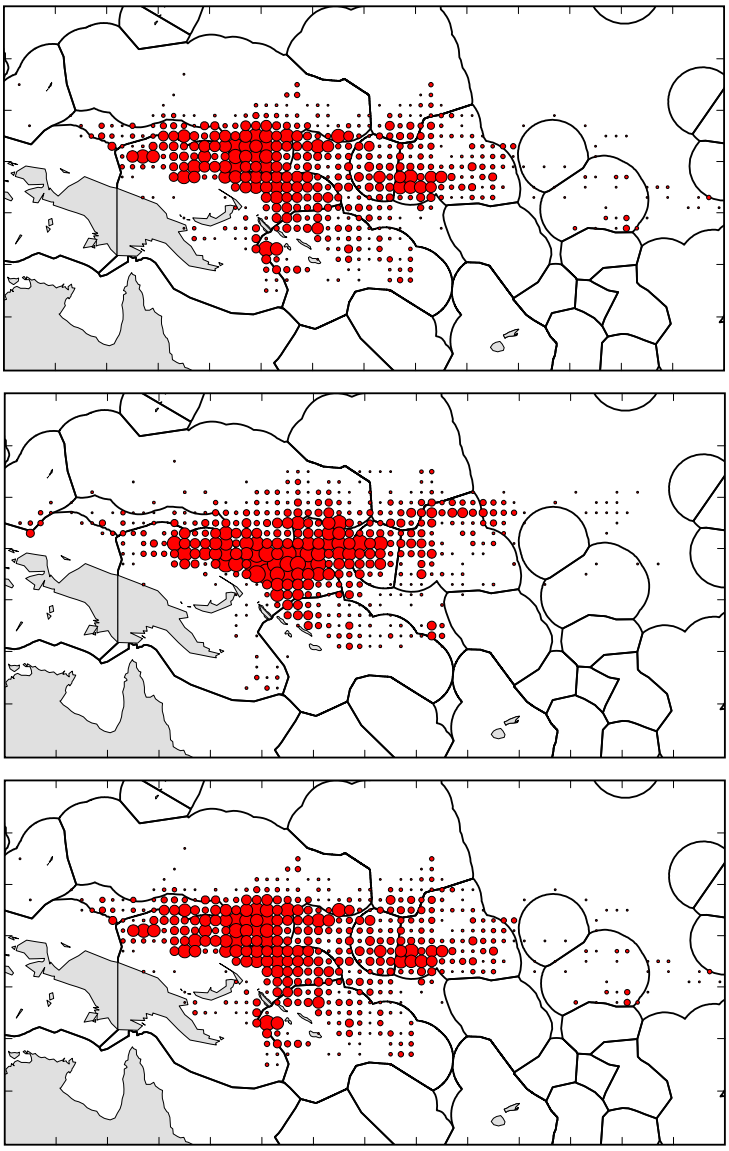

Figure 1 (b) Annual distribution of effort (days fishing and searching) for the VANUATU-flagged (FSM Arrangement) purse seine fleet throughout the WCPFC Convention Area for 2003 (top), 2004 (middle) and 2005 (bottom)

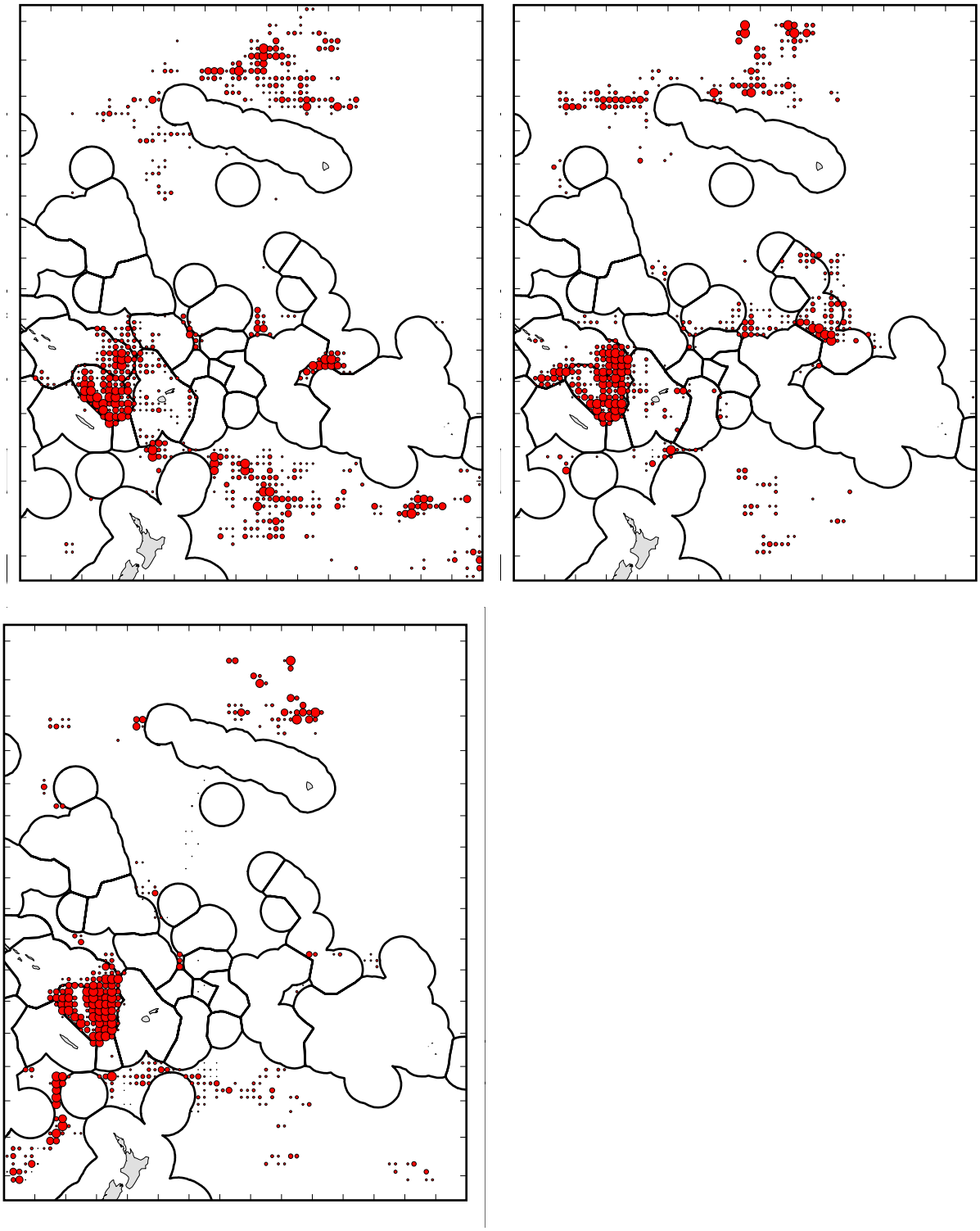

Figure 1 (c) Annual distribution of effort (100s of hooks) for the VANUATU longline fleet throughout the WCPFC Convention Area for 2003 (top-left), 2004 (top-right) and 2005 (bottom)

Estimated Annual total catches of non-target, associated and dependent species by VANUATU purse seine fleets, 2003-2005.

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 2003-2005, as Vanuatu doesn't have an 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 2005, Vanuatu licenced 127 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 5. Number of foreign fleet vessels licensed to fish in the VANUATU EEZ by year, flag and gear type

	Year									
	2001		*2002*		*2003*		*2004*		*2005*	
FLAG	*No. Vessels*	*Gear Type*	*No. Vessels*	*Gear Type*	*No. Vessels*	*Gear Type*	*No. Vessels*	*Gear Type*	*No. Vessels*	*Gear Type*
Belize	*3*	*LL*	*3*	*LL*	*3*	*LL*	*3*	*LL*	*3*	*LL*
Cambodia	*0*	*-*	*7*	*LL*	*0*	*-*	*0*	*LL*	*1*	*LL*
China	*8*	*LL*	*18*	*LL*	*35*	*LL*	*57*	*LL*	*57*	*LL*
Equatorial Guinea	*1*	*LL*	*0*	*-*	*0*	*-*	*0*			
Fiji	*3*	*LL*	*13*	*LL*	*31*	*LL*	*17*	*LL*	*28*	*LL*
Korea	*0*	*-*	*5*	*LL*	*29*	*LL*	*10*	*LL*	*11*	*LL*
New Zealand	*0*	*-*	*2*	*LL*	*0*	*-*	*0*	*-*	*0*	*-*
Penama	*2*	*LL*	*2*	*LL*	*0*	*-*	*0*			
Chinese Taipei	*30*	*LL*	*34*	*LL*	*29*	*LL*	*23*	*LL*	*16*	*LL*
US	*0*	*-*	*2*	*LL*	*0*		*0*			
Vanuatu	*1*	*LL*	*19*	*LL*	*12*	*LL*	*8*	*LL*	*11*	*LL*
TOTAL	*48*		*105*		*139*		*118*		*127*	

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 Fiji, then Chinese Taipei. Most of the vessels that have been licenced to fish in Vanuatu waters were greater than 100 GRT.

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 (Table 6). It is understood however that, most of these fleets have been unloading their catch in the ports of Levuka, Pagopago, and Suva.

The most of the 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 are from unraised logsheet data.

Table 6. 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	??	??
LONGLINE	Chinese Taipei	2003-2004	??	??
		2005	??	??
	FIJI	2003-2004	HIGH	??
		2005	HIGH	??

Annual catches in the Vanuatu EEZ

In the period 2001 to 2005, 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 (Table 7). This increase was largely attributed to the Fiji fleet which recorded over 60% of the total catch for the 2001-2005 period, 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 2005, was 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 2005 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.

Table 7. Annual catches by longline fleets in the VANUATU EEZ, by flag and species, 2001-2005 (Source : Unraised logsheet data collected and provided to SPC by Vanuatu and Fiji)

		Catch (metric tonnes)				
Fleet	**YEAR**	**ALB**	**BET**	**YFT**	**OTH**	**TOTAL**
China	2001	1	0	0	0	2
	2002	100	6	26	11	143
	2003	248	17	46	47	358
	2004	436	33	93	53	614
	2005	712	38	198	99	1,047
Chinese Taipei	2001	909	14	82	28	1,034
	2002	931	26	170	63	1,190
	2003	418	13	55	43	530
	2004	320	7	62	51	440
	2005	426	24	99	91	641
FIJI	2001	392	38	141	78	649
	2002	942	105	311	190	1,548
	2003	1,286	148	625	243	2,302
	2004	2,110	112	491	317	3,030

	2005	3,955	148	916	608	5,627
Vanuatu	2001	208	7	33	2	249
	2002	326	25	89	66	507
	2003	465	71	208	123	867
	2004	341	27	104	93	565
	2005	1,034	38	237	219	1,527
TOTAL EEZ	2001	1,510	58	257	108	1,933
	2002	2,299	162	597	330	3,387
	2003	2,417	248	935	456	4,056
	2004	3,207	179	750	514	4,650
	2005	6,127	248	1,450	1,016	8,842

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 2004 and 2005 is shown in figure 2. 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.

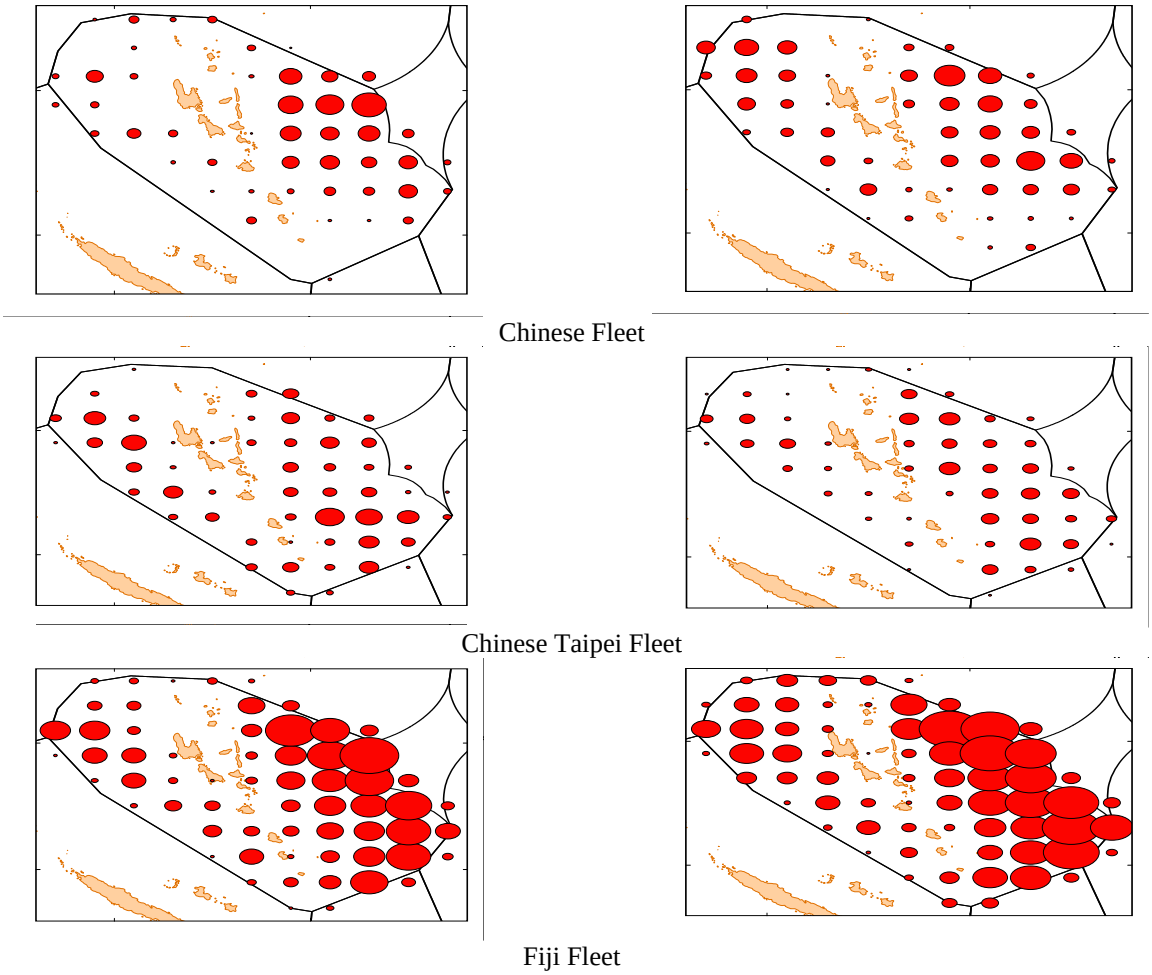

Figure 2. Annual distribution of effort by the main foreign longline fleets active in the VANUATU EEZ for 2004 (left) and 2005 (right).

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 (Figure 3). 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.

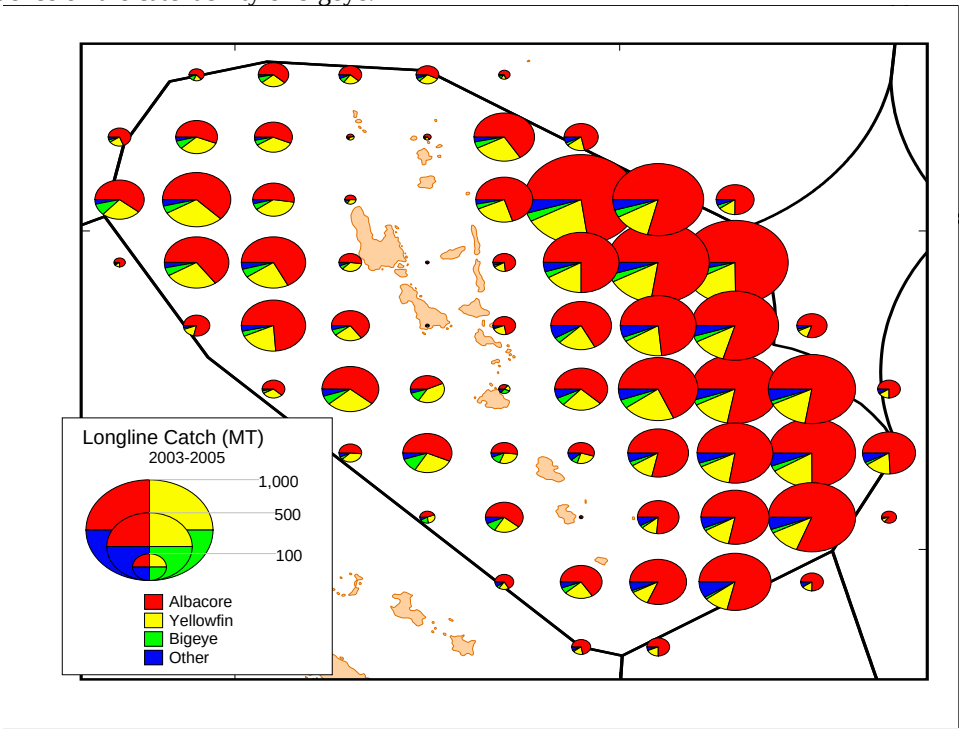

Figure 3. Distribution of catch by species by all longline fleets combined in the VANUATU EEZ, 2003–2005

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 Eeffort (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 (figure 4a). 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.

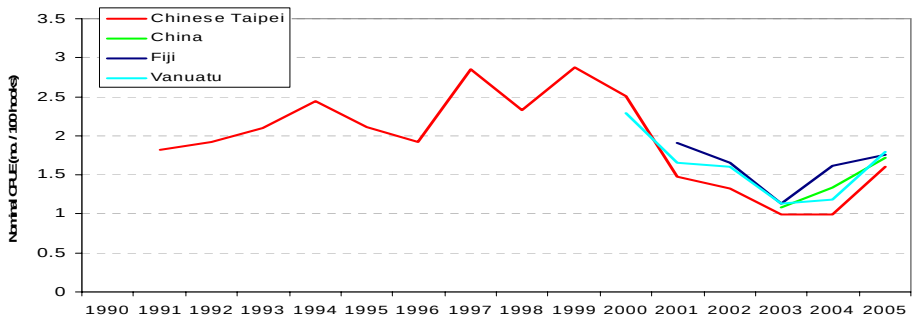

Figure 4 (a): Trends in nominal catch rates of ALBACORE TUNA taken by longline fleets operating in the VANUATU EEZ, 1990-2005

The highest recorded nominal cpue for yellowfin was just over 0.4 fish per 100 hooks in 2002 (figure 4 (b)). 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.

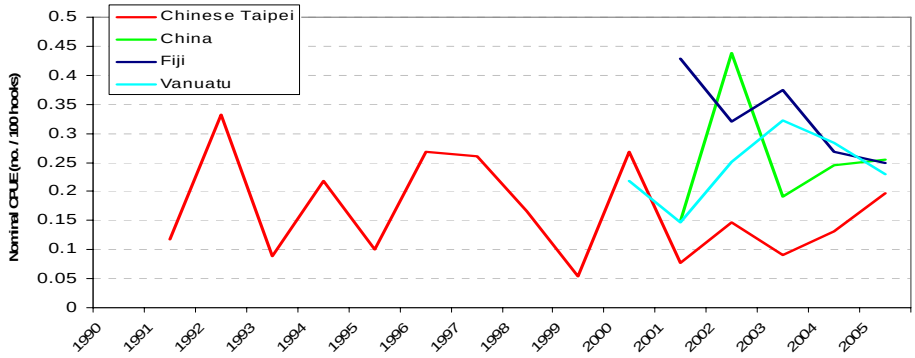

Figure 4 (b). Trends in nominal catch rates of YELLOWFIN TUNA taken by longline fleets operating in the VANUATU EEZ, 1990-2005

With the exception of the Taiwanese fleet, nominal cpue rates for bigeye in 2001were highly variable between 0.01 to 0.13 fish per 100 hooks (figure 4 (c)). Since then all fleets recorded between 0.03 to 0.05 fish per 100 hooks in 2005 with the Taiwanese showing 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.

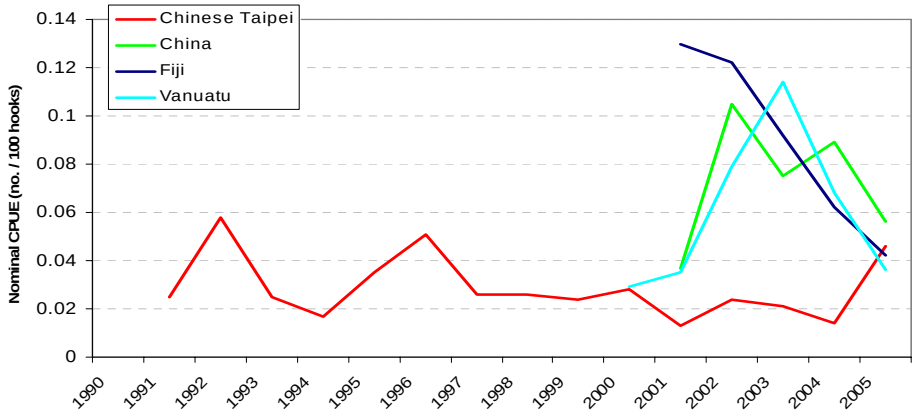

Figure 4 (c). Trends in nominal catch rates of BIGEYE TUNA taken by longline fleets operating in the VANUATU EEZ, 1990-2005

3. Research and Statistics

3.1 Port sampling and observer program 2001-2005

Vanuatu currently does not have a port sampling and obsever 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 to establish an observer program 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, both in.

ANNEX 1

Categories of coverage for catch, effort and size data.

Category	Catch/Effort data coverage	Size data coverage
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.