SCIENTIFIC COMMITTEE
FIFTH REGULAR SESSION

10-21 August 2009
Port Vila, Vanuatu

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

WCPFC-SC5-AR/CCM-18

PAPUA NEW GUINEA

WESTERN CENTRAL PACIFIC FISHERIES COMMISSION
SCIENCE COMMITTEE
PART 1 REPORT-2009
PAPUA NEW GUINEA

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SUMMARY

The Papua New Guinea tuna fishery is made up of the purse-seine and the longline sectors. The longline is a domestic fishery with all vessels fishing only in PNG waters. The purse-seine sector is a mix of both domestic and foreign access vessels. The domestic sector comprises the PNG flag vessels, and PNG chartered vessels which support processing facilities onshore in PNG. The PNG Chartered Vessels fish both in PNG waters and waters outside of PNG especially those licensed under the Federated state of Micronesia arrangement (FSMA). Catch by the longline dropped from 2858mt in 2007 to 1,209 in 2008. This was a result of reduction of effort which declined from 60,000 hundred hooks to 20,000 hundred hooks. Catch by domestic purse-seine vessels in PNG waters was 24,723mt, an increase from 21,494 in 2007 and almost Zero (0.3mt) catch in areas outside PNG waters indicating that the fleet fished almost entirely in PNG waters. Catch in PNG waters by PNG Chartered vessels in 2008 was 112,286 mt a decline from the 2007 catch of 124,572mt. Catch by these vessels outside PNG waters also dropped in 2008 to 65,901mt from 80,030mt in 2007. The catch by foreign vessels in PNG waters in 2008 was 249,866mt, also a decrease from the 2007 catch of 320,132 mt. All declines in catch are due to decline in effort. Total catch in PNG waters for 2008 was 388,084 mt. The catch is a decrease from the 2007 catch of 466,208 mt. Most of the sets in the PNG waters in the last five years were associated sets, especially sets on logs and debris. The PNG observer program has about 150 observers currently and will be reaching 200 observers by end of this year. Observer coverage level by PNG observers has been very high for all fleets fishing in PNG. Coverage level on Domestic purse-seine vessels is about 90%, PNG chartered purse-seine about 60% and the foreign vessels just under 30%. Port sampling is been carried out in four major ports and the results of the 2008 sampling is as in the paper WCPFC-SC5-2009/EB-IP-16.

Background

Tuna in the areas under Papua New Guinea (PNG) Jurisdiction is caught by two main fishing methods, namely Purse-seine and Longline. Total annual catches have average around 430,000mt per year in the recent three years. This represents about 25% of WCPO catch and about 10% of the global catch. Most of the catch (99%) is attributed to the purse-seine fishery. Purse-seining started in PNG waters in the early 1980s and has intensified since than reaching the highest catch of 462,983mt in 2007. The longline fishery started even earlier than the purse-seine fishery, originally only as access by foreign fleets. But in the mid 1990s a policy on domestication enabled the fishery to be a national activity only, hence doing away with access by foreign fleets.

The tuna fishery in PNG represents a balance of both domestic industry development and foreign distant water fishing nations (DWFN) access agreements. Domestic industry

development is pursued by using a model whereby fishing licence is granted on the condition that the vessels catch fish for processing facilities in-country. Vessels under this scheme are either re-flagged to PNG or are given incentives by way of less licence fees and allowing them to fish within archipelagic waters or sponsoring them to fish under the Federated States of Micronesia Arrangement (FSMA). So far only the Philippine and Vanuatu flagged vessels are under this scheme apart from the PNG flagged vessels. The mode of operation by the Philippine and Vanuatu flagged vessels differ in that the Philippine flagged vessels fish exclusively in PNG waters, including the archipelagic waters whilst the Vanuatu flag vessels fish widely including the waters of the other Parties to the Nauru Agreement (PNA).

The fishery is guided by the National Tuna Fishery Management Plan which establishes an overall management structure, and an application frame-work for all tuna fisheries, including licence limits and total allowable catches (TACs), gear restrictions and the use, deployment and limits to number of Fish Aggregating Devices (FADs).

The purse-seine fishery operates within the guidelines of important regional and sub-regional arrangements such as the Parties to the Nauru Agreement (PNA), whose requirements are incorporated in the National Tuna Management Plan**.**

Flag State Reporting
Activity by PNG flag vessels
Longline
All PNG flag longline vessels fish exclusively in National Fisheries waters. There is no activity by these vessels in waters beyond areas under national jurisdiction. For activity by these vessels, see under coastal state reporting**.**

Purse-seine
PNG Flag
Nine (9) purse-seine vessels fly Papua New Guinea flag. These vessels fish principally in PNG waters and offload their catch to onshore processing plants in the country. The smaller medium size vessels fish off Fads mainly in the archipelagic waters and use mothership operations, whereby catch is transferred to motherships that take the catch to the processing plants in-country. The catcher vessels in these operations have observers on board every time they are out at sea. In the recent past, only three vessels on average, fished outside PNG fisheries zones, especially in the high sea pockets adjacent to the PNG EEZ (table1).

Catch
Catch by the PNG flag vessels outside the PNG fisheries zone has mainly been in the high sea pocket, east and adjacent to the PNG EEZ (fig1). Catch at the most was about 1500mt in 2004 (table1), but has since declined, to almost zero (0) catch in 2008. The composition of catch on average is 85% (skipjack), 14% (yellowfin) and 1% (bigeye).

Table 1. Catch by PNG flag purse-seine vessels in areas outside PNG waters

	Effort		Set types		Catch(Metric tonnes)				
Year	No. of active vessels	Days fishing & Searching	Un-asso sets	Assoc sets	SKJ	YFT	BET	OTH	TOTAL
2004	4	56	0	56	1,288.3	228.6	21.8	9.8	1548.4
2005	5	62	14	48	902.3	240.1	84.8	0.9	1228.1
2006	2	4	1	3	175.0	3.4	0	0	178.3
2007	4	18	4	14	349.7	163.0	0	0.4	513.1
2008	1	1	0	1	0.3	0	0	0	0.3

Effort.

In 2008, most of the fishing effort (fishing days) by these vessels was in the two high seas pockets adjacent to the PNG EEZ (fig2). On average, these vessels spend about a month (28 days) outside PNG fisheries waters. Most (86%) of their sets, average 24 sets per year were associated sets, especially sets on natural floating objects (Table1& fig 1).

Table2. Effort by number of set types in areas outside PNG waters by PNG flag vessels

	Year											
	2004		**2005**		**2006**		**2007**		**2008**		**Grand Total**	
Set Type	**# sets**	**%**	**# sets**	**%**	**# sets**	**%**	**# sets**	**%**	**# sets**	**%**	**# sets**	**%**
Anchored raft, FAD or Payao	10	18	8	13	2	50	0	0	0	0	20	14
Drifting log, debris or dead animal	40	71	27	44	1	25	5	28	0	0	73	52
Drifting raft, FAD or Payao	1	2	1	2	0	0	0	0	1	100	3	2
Feeding on baitfish	5	9	11	18	0	0	9	50	0	0	25	18
Total Associated set	**56**	**100**	**47**	**77**	**3**	**75**	**14**	**78**	**1**	**100**	**121**	**86**
Unassociated	**0**	**0**	**14**	**23**	**1**	**25**	**4**	**22**	**0**	**0**	**19**	**14**
Grand Total	**56**	**100**	**61**	**100**	**4**	**100**	**18**	**100**	**1**	**100**	**140**	**100**

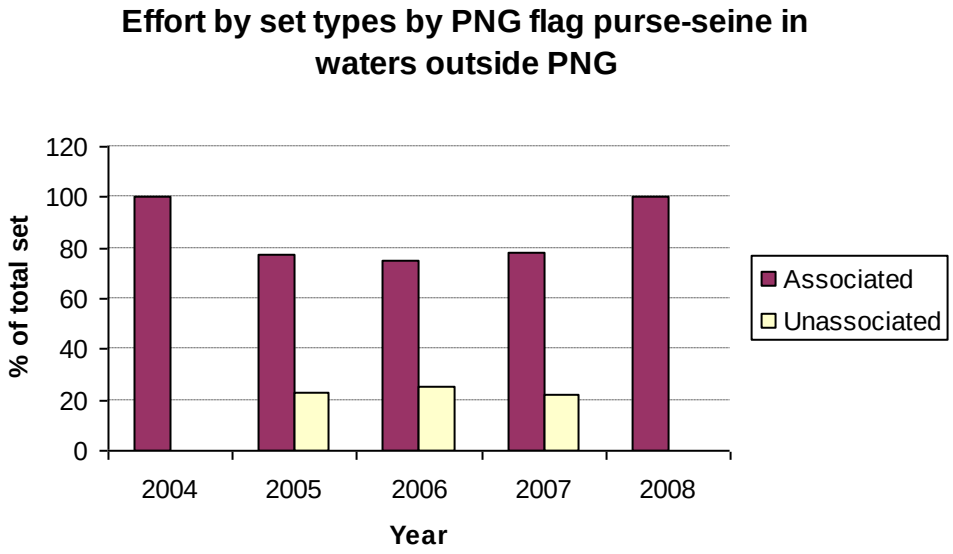


Fig1. Percentage by set types outside PNG waters by PNG flag purse-seine vessels. Shows effort is mainly on associated sets.

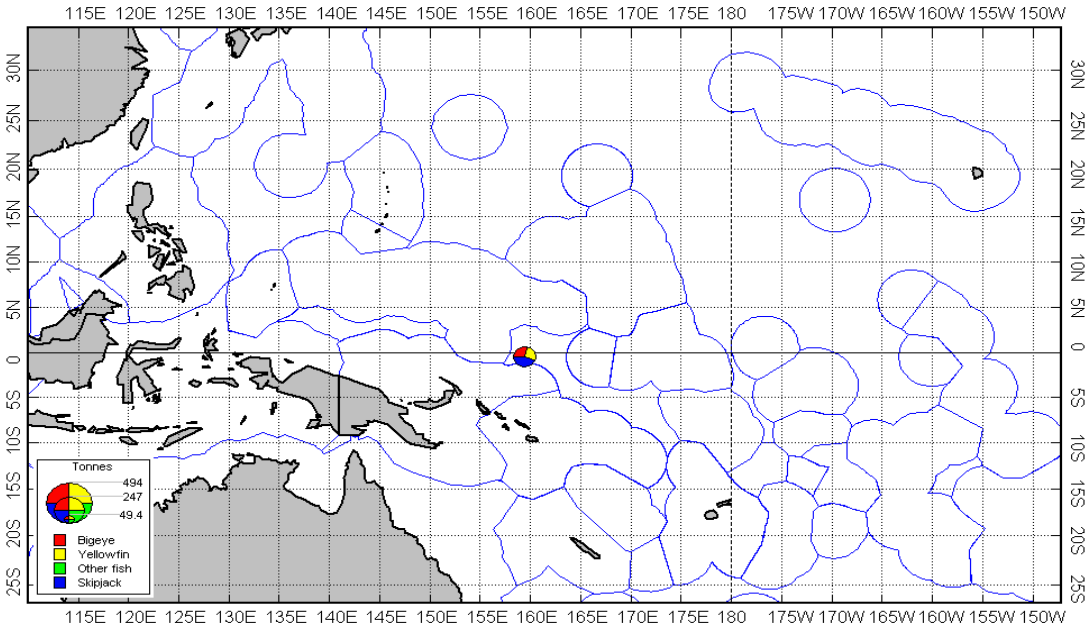


Figure 2: Catch by PNG flag purse seine vessels outside PNG waters-2008

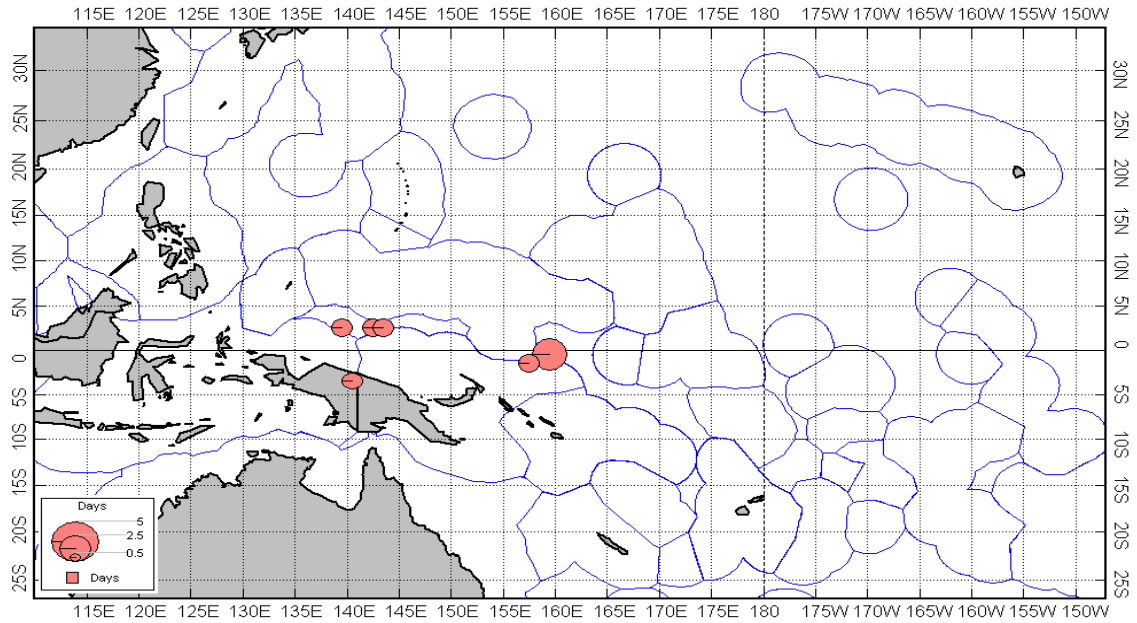


Figure 3: Effort distribution of PNG Flag vessels fishing outside PNG EEZ- 2008

PNG Chartered Vessels

Catch

Thirty-three vessels currently operate as chartered vessels or locally based foreign (LBF) vessels in PNG, under an arrangement to realise domestic industry development. These vessels operate as support vessels, catching fish for the processing plants in PNG and they are supported by some form of incentive by the Government of PNG. About half the number of vessels, mainly Philippine flag, fish principally in PNG waters while the other half, mainly Vanuatu flagged fish widely through out the PNA waters under the FSM licensing arrangement. Catch by these vessels was highest in 2005, reaching over 105,000mt. Their annual average catch outside of PNG waters is about 83,000mt per year (table3). Skipjack constitutes most (84%) of the catch and the remaining is yellowfin (16%). Bigeye catch by these vessels is less than 1% in areas outside PNG waters.

Table3. Catch by PNG Chartered purse-seine vessels in areas outside PNG waters

	Effort		Set types		Catch(Metric tonnes)				
Year	No. of active vessels	Days fishing & Searching	Un-asso sets	Asso sets	SKJ	YFT	BET	OTH	TOTAL
2004	22	1754	455	1299	76,398	8,360	48	21	84,827
2005	26	1814	936	878	92,426	12,680	343	181	105,630
2006	22	1376	604	772	65,895	13,158	330	16	79,399
2007	28	1268	628	640	69,530	10,358	125	17	80,030
2008	19	1110	723	387	47,747	17,958	172	24	65,901

Effort

On average, PNG chartered vessels spend about 1,464 days annually fishing in waters other than PNG's. This is about 34% of their total fishing days yearly. Most (54%) of their sets in these waters were on associated sets, and sets on drifting logs or debris constituted most (55%) of the associated sets (table4). Man-made fish aggregating devices (FADs) both anchored and drifting was the next highest accounting for 35% of the total associated sets (table4). There is however a decline on the number of associated sets in general but an increase in the number of sets on un-associated schools (fig 4). The reduction on associated sets is by as much as seventy percent (70%), mainly on Anchored FADs and sets on schools feeding on baitfish. However, sets on drifting FADs show an increase (table4). Most effort (fishing days) is in areas eastward from PNG in waters of the other PNA countries (fig6).

Table4. Effort by number of set types in areas outside PNG waters by PNG chartered vessels

	YEAR											
	2004		**2005**		**2006**		**2007**		**2008**		**Total**	
SET TYPES	**# sets**	**%**	**# sets**	**%**	**# sets**	**%**	**# sets**	**%**	**# sets**	**%**	**# sets**	**%**
Anchored raft, FAD or Payao	212	12	66	4	5	1	62	5	21	2	366	5
Drifting log, debris or dead animal	867	49	517	28	407	29	313	25	68	6	2172	30
Drifting raft, FAD or Payao	175	10	218	12	260	19	206	16	231	21	1090	15
Feeding on baitfish	45	3	77	4	99	7	52	4	65	6	338	4
Live whale	0	0	0	0	1	0	6	0	0	0	7	0
Live whale shark	0	0	0	0	0	0	1	0	2	0	3	0
Total associated set	**1,299**	**74**	**878**	**48**	**772**	**56**	**640**	**50**	**387**	**35**	**3,976**	**54**
Unassociated set	**455**	**26**	**936**	**52**	**604**	**44**	**628**	**50**	**723**	**65**	**3346**	**46**
Grand total	**1754**	**100**	**1814**	**100**	**1376**	**100**	**1268**	**100**	**1110**	**100**	**7322**	**100**

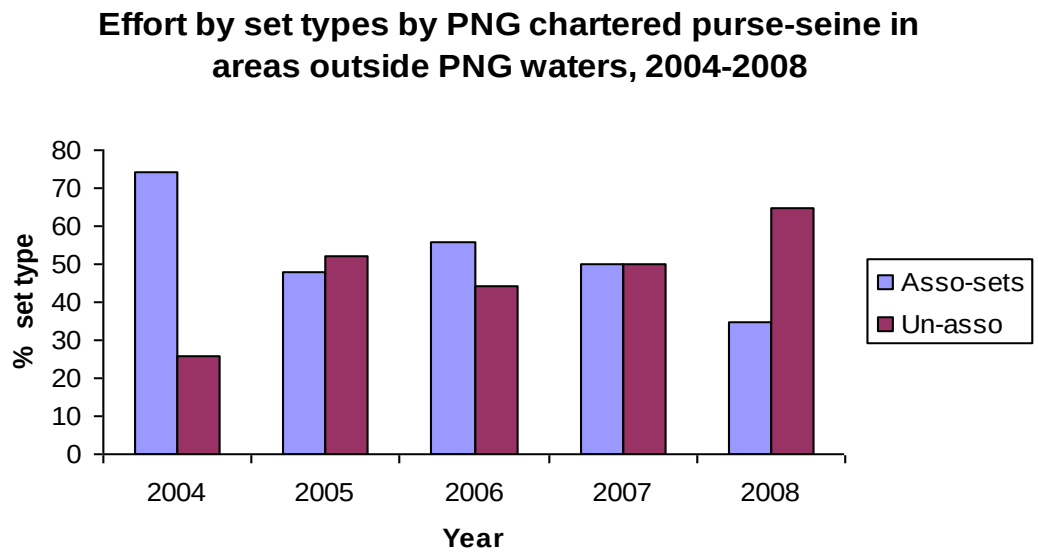


Fig 4. Percentage of set by set type used by PNG chartered purse-seine vessels in areas outside PNG waters, 2004-2008. Shows a decline in associated sets and an increase in un-associated set.

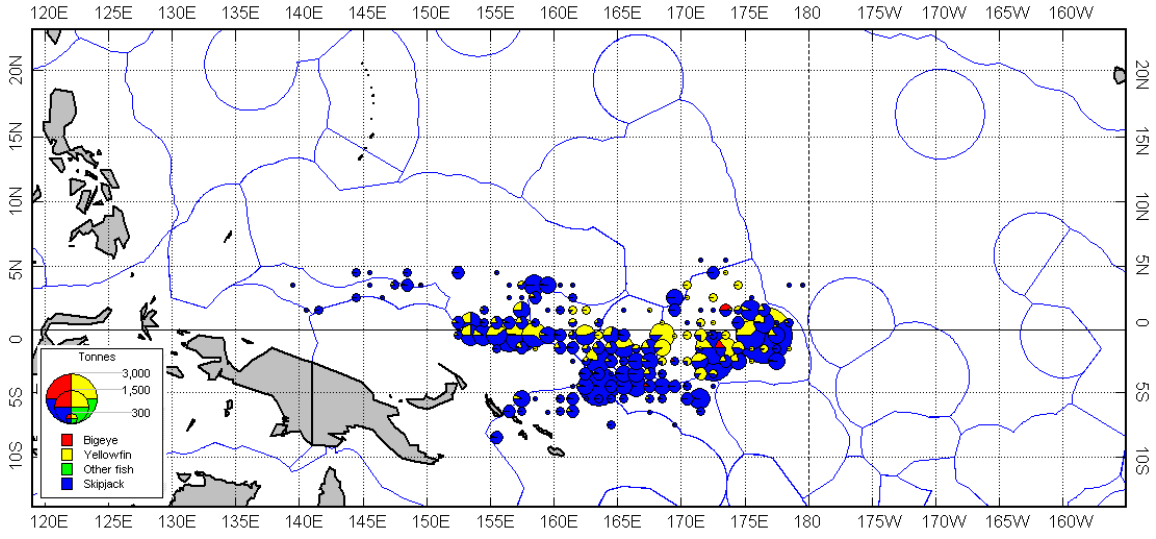


Figure 5. Purse Seine catch (metric tonnes) of PNG chartered vessels fishing in areas outside PNG waters-2008.

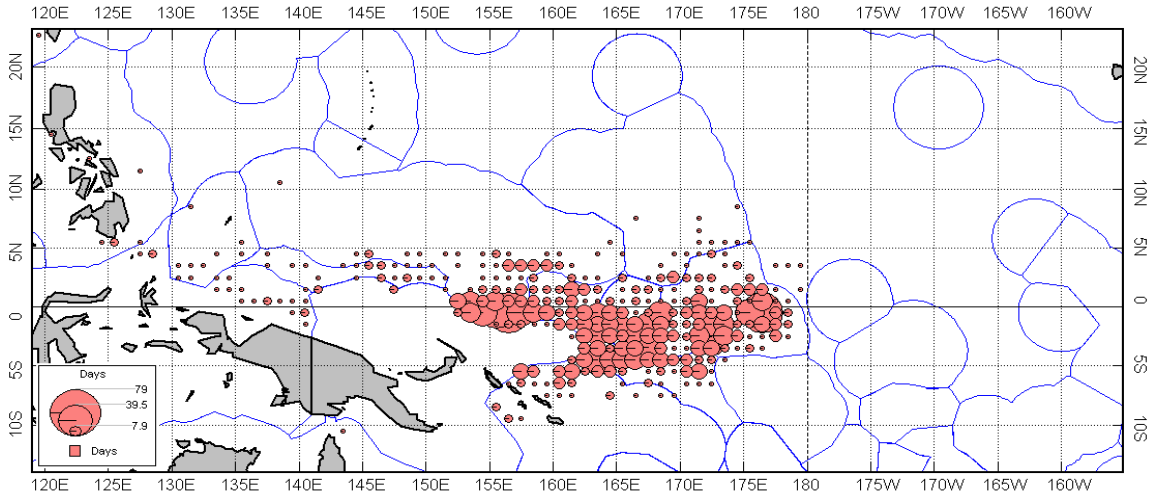


Figure 6: Effort (number of fishing days) distribution of PNG chartered vessels fishing in areas outside PNG waters -2008. Shows effort mainly in the waters of PNA.

Coastal State Reporting

Activity by PNG flag vessels

Longline

The longline fishery in PNG includes a distinct shark fishery which is managed under a separate management arrangement from the tuna longline. The Shark fishery is managed under the shark Fishery Management plan. Effort in this fishery is limited to 9 vessels, setting 1,200 hooks per day and a TAC of 2,000 mt dressed weight per year. All vessels in this fishery fish only in the PNG Fisheries Waters.

The tuna longline sector is managed under the Tuna Fishery Management Plan, which limits effort (100 vessels and 1200 hooks per set per day) and catch limit (10,000mt per year based on the combined catch of yellowfin and bigeye tuna) for the tuna longline fishery sector. Number of Vessels actively fishing in this sector has declined in the past several years due mainly to high operational cost (table5).

Catch.

Estimates of the tuna longline catch for 2008 from available logsheet data indicate a total catch of 1209mt (all species) the lowest in the recent 5 years. The catch comprises 846 mt yellowfin, 128 mt bigeye and 191mt albacore and 44 mt of other fish. There was a general decline in the catch of the tuna species (Albacore -85%, yellowfin -36%) except for bigeye which increased by 27% compared to 2007.

Catch in 2008 was dominated by yellowfin (70% of the total catch and 73% of the tuna catch) followed by Albacore (15% of total catch and 16% of tuna catch) with lesser catches of bigeye. These declines in catch are a result of reductions in fishing effort which has dropped from 60,000hhooks in 2007 to 20,000hhooks in 2008 (table6).

Table5. Number of Papua New Guinea longline and Handline vessels active in areas under PNG Fisheries waters, 2005-2008.

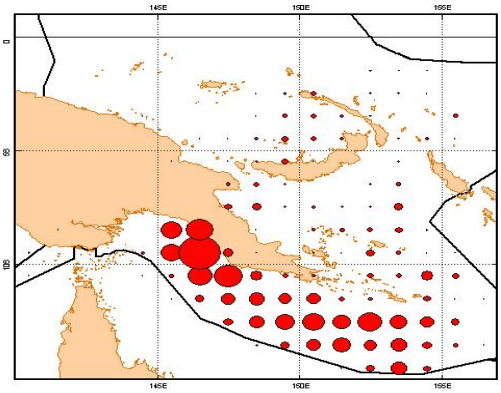
Year	Long line (tuna)	Handline (tuna)	Longline (Shark)	Total
2005	27	10	9	46
2006	27	10	9	46
2007	22	10	9	41
2008	12	5	9	29

Table 6. Annual catch and effort estimates for PNG tuna longline fleet, by species in waters under national jurisdiction, 2004-2008(source spc).

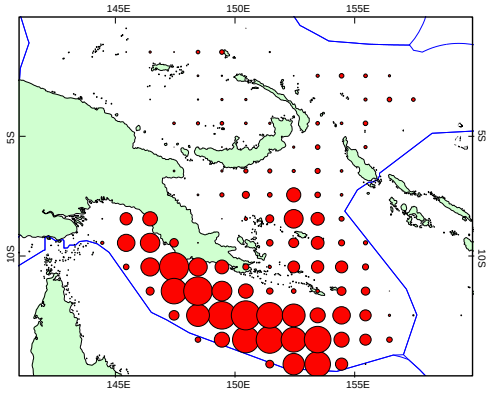
	EFFORT	CATCH (Metric tonnes)								
YEAR	HHOOKS	ALB	BET	YFT	BLM	BUM	MLS	SWO	OTH	TOTAL
2004	76233	1558	320	1871	13	65	11	13	58	3909
2005	76348	2087	213	1067	38	58	9	18	59	3550
2006	76428	1777	215	2162	23	37	14	10	154	4392
2007	59481	1319	101	1324	21	41	13	11	29	2858
2008	20296	191	128	846	5	12	1	6	20	1209

Effort

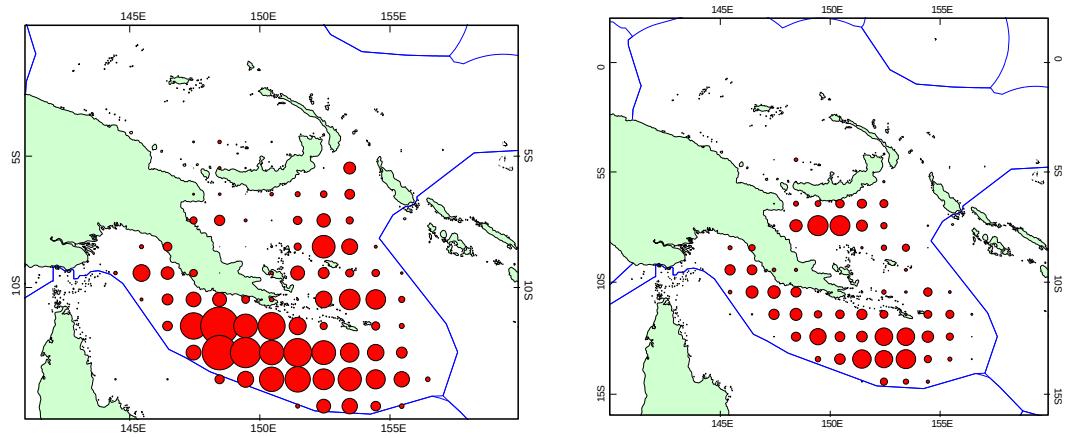
Effort in terms of number of hooks was stable at around 76,000 hundred hooks in years 2004-2006 and this resulted in a stable catch of around 4000mt total catch per year. The effort dropped to 60,000 hundred hooks in 2007 and so did the catch which dropped to 3,000mt. The effort further dropped to 20,000 hundred hooks in 2008, which resulted in the catch of only 1200mt total catch all species.



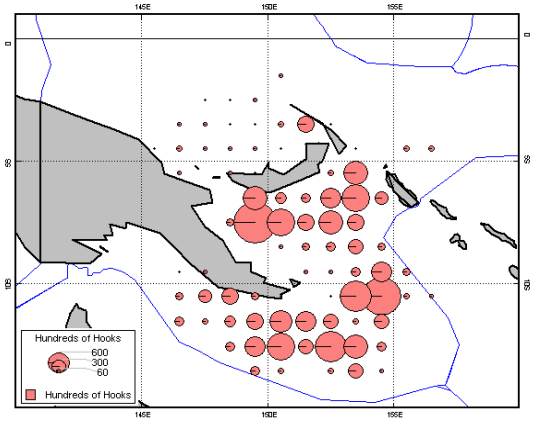
2004



2005

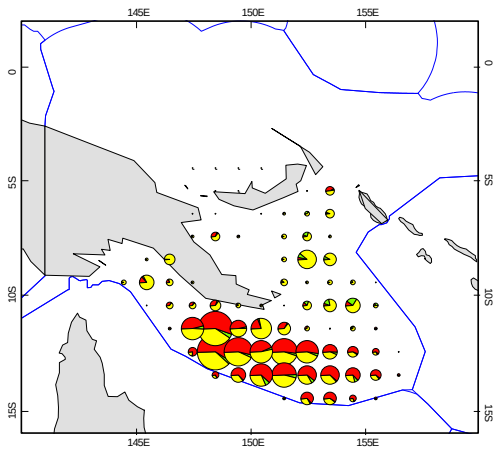


2006 2007

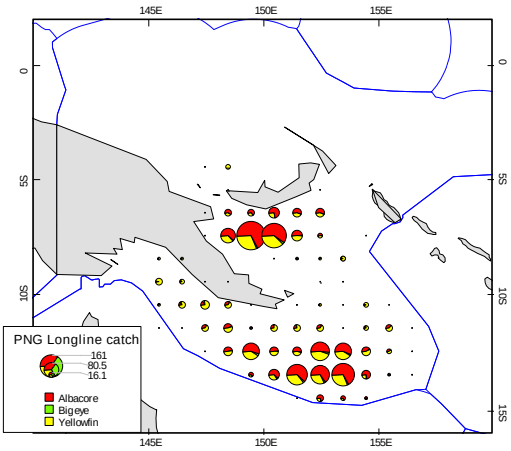


2008

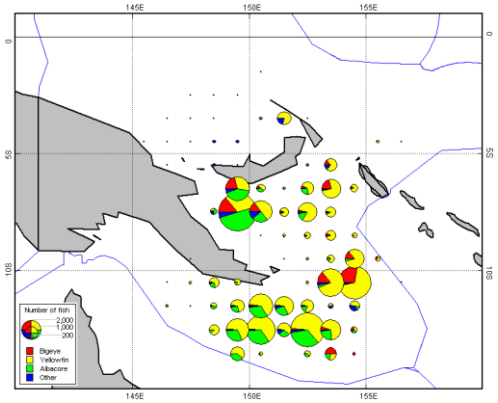
Figure 7. Annual distribution of effort (100s of hooks) for the Papua New Guinea longline in the area under national jurisdiction for 2004 (top-left), 2005 (top-right), 2006 (middle-left), 2007 (middle-right) and 2008 (bottom).



2006



2007



2008

Figure 8. Annual distribution of catch by PNG flag longline vessels in areas under national jurisdiction- Top left (2006), Top-right (2007) and bottom left is 2008.

Catch rates

Trends in catch rates by species (Yellowfin, Bigeye and Albacore) for the longline fleet operating in PNG waters, 1993-2008 show for bigeye that, the catch rate declined sharply in the early 1990s from 1.5 fish per 100 hooks to almost zero fish per 100 hooks in 1995(fig 9). The catch rate has not recovered since than and has remained at <0.2 fish per 100 hooks over last 13 years. Catch rates of yellowfin was variable having initially increased to about 2fish per100 hooks in the late 1990s than declined and stabilised at about 1fish per 100 hooks over the period, 1999-2007, but there was a sharp increase in 2008. Albacore catch rates had an initial increase in years 1996-1998, than decline to about 0.1 fish per 100 hooks and increased as off 2003 and peaked at 2.5 fish per 100 hooks in years 2005-2007. One reason why the catch rate of albacore dropped in 2008 is that they are not being targeted as the processing plants in American Samoa have closed to which they used to sell the albacore catch. This situation may have influenced the fishermen to target yellowfin again as indicated by the high catch rate in 2008.

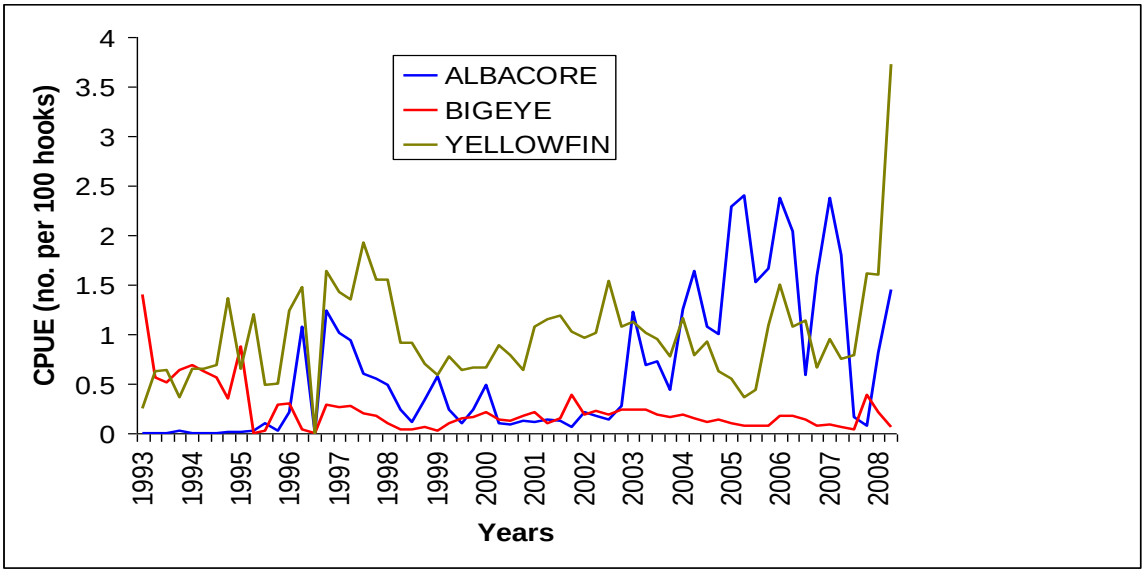


Fig 9. Quarterly trends in nominal catch rates of Albacore, Bigeye and yellowfin tuna taken by PNG longline fleet, 1993-2007

Purse-seine

Nine (9) purse-seine vessels fly Papua New Guinea flag. These vessels fish primarily in PNG waters and offload their catch to onshore processing plants in the country. The smaller medium size vessels fish on Fads and use mother-ship operations. They have observer board every-time they are out at sea.

Catch

Catch by the PNG flag vessels averaged around 20,000mt per year in the recent five (5) years. The highest catch was in 2008. Average catch composition in the last five years is dominated by skipjack (60%), then yellowfin (38%) than Bigeye(0.4%) and bycatch (0.4%).

Table 7. Annual Catch and Effort estimates for PNG Flag purse-seine vessels in areas under national jurisdiction, 2004-2008 (source: NFA database)

	Effort		Set types		Catch(Metric tonnes)				
Year	No. of Active vessels	Days fishing & Searching	UnAss sets	Assoc sets	SKJ	YFT	BET	OTH	TOTAL
2004	6	450	13	437	10,175.4	2,568.1	63.1	14.8	12,821.3
2005	6	751	115	636	12,834.1	8,535.6	138.0	112.6	21,620.2
2006	6	638	87	551	13,158.7	6,102.1	52.8	44.7	19,358.3
2007	6	568	96	472	12,803.6	8,387.3	121.5	181.6	21,494.0
2008	6	705	167	538	12,026.6	12,552.6	68.0	76.0	24,723.0

Effort.

Effort in terms of vessel numbers has being stable at six(6) vessels, fishing and searching for about 600 days per year on average. They fish mainly on associated sets (table 7) which, accounts for 84% of their total set (table 8). Sets on natural log, debris or dead animal and sets on schools feeding on baitfish makes up most (80%) of the associated sets. Sets on man-made Fads both anchored and drifting accounts for only 20% of the associated sets or 17% of the total set. Effort on unassociated sets by PNG flag vessels is increasing reaching just over 20% in 2008(fig 10).

Table 8. Effort by number and percentage of set types by PNG Flag vessels in PNG waters, 2004-2008

	YEARS											
	2004		2005		2006		2007		2008		Total	
Set Type	# sets	%	# sets	%	# sets	%	# sets	%	# sets	%	# sets	% Total
Anchored raft, FAD or Payao	67	15	52	7	84	13	49	9	91	13	348	11
Drifting log, debris or dead animal	267	59	420	56	332	52	179	32	181	26	1418	44
Drifting raft, FAD or Payao	14	3	17	2	38	6	47	8	60	9	195	6
Feeding on baitfish	89	20	139	19	97	15	195	34	206	29	757	23
Live whale	0	0	5	1	0	0	2	0	0	0	7	0
Live whale shark	0	0	1	0	0	0	0	0	0	0	1	0
Total Associated	437	97	634	84	551	86	472	83	538	76	2726	84
Unassociated	13	3	115	15	87	14	96	17	167	24	511	16
Grand Total	450	100	751	100	638	100	568	100	705	100	3239	100

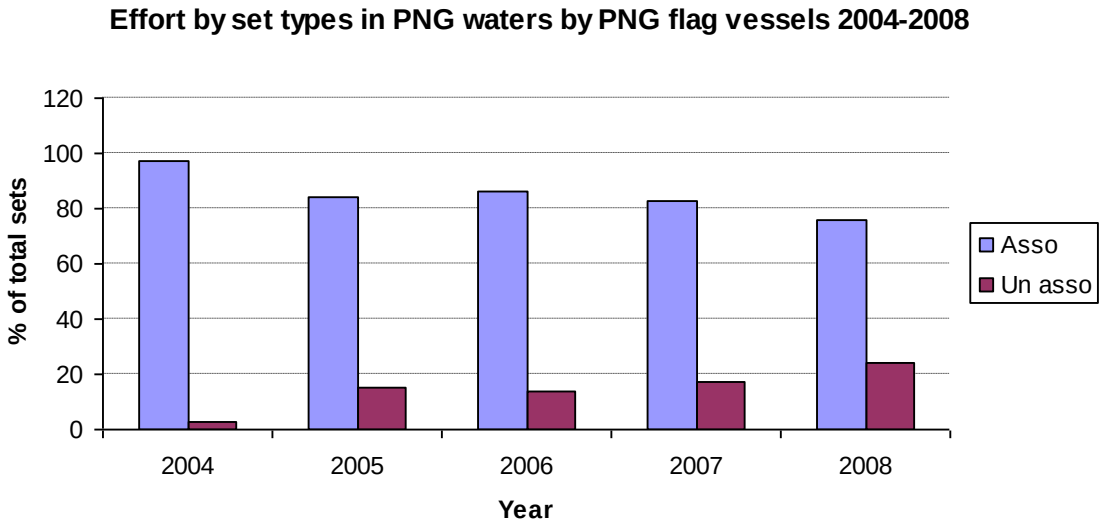
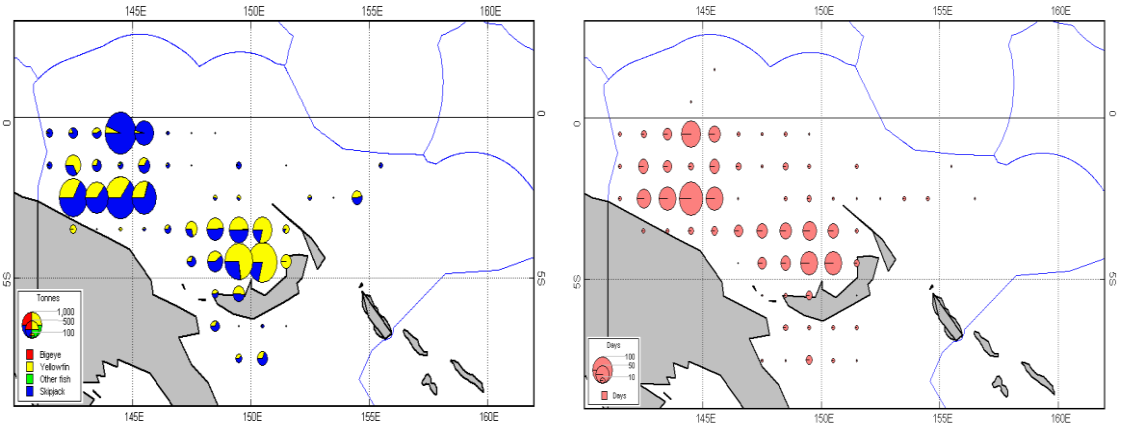


Fig 10. Percentage by set types in PNG waters by PNG chartered purse-seine vessels 2004-2008



Total catch 2008 *Effort (sets per day) 2008*

Fig 11. Annual total catch and effort distribution by PNG flag Purse-seine vessels in PNG waters in 2008, Catch (left) and Effort (right)

Activity by Vessels under charter.

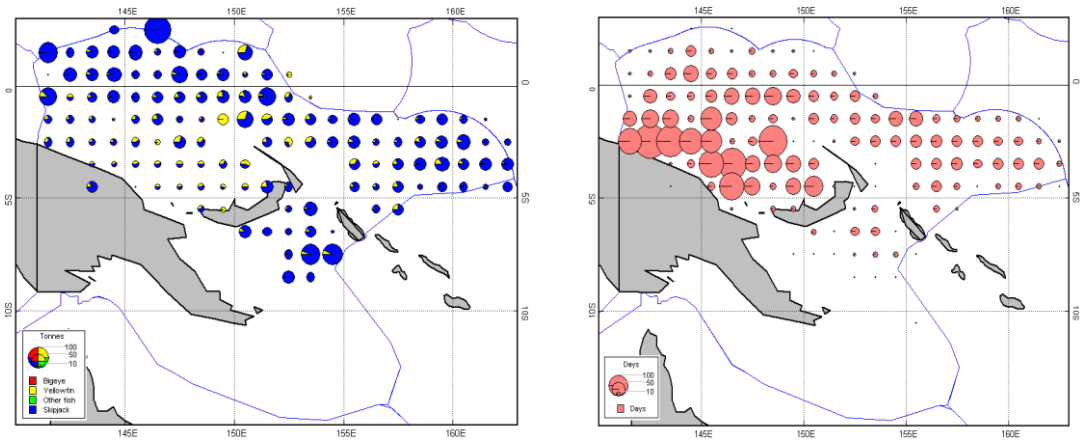
Vessels under charter by PNG companies operate in association with onshore processing facilities. These vessels are sometimes referred to as Locally-based foreign (LBF). They are an integral part of the industry in PNG and are meant to catch fish for the processing facilities in PNG. Two categories operate under this arrangement. Those that fish exclusively in PNG waters (Philippine flag) and those that spent part of their time fishing widely through out the region, especially in waters of the PNA(Vanuatu flag).

Catch.

The average catch in the last five years by these vessels has been around 120,000mt per year (table 9). The highest catch was in 2006. The catch in 2008 is 112,000mt which dropped from the 2007 catch of 125,000mt. Catch composition in the years 2004-2008 was dominated by skipjack. It accounted for 78% while the remaining 22% was yellowfin tuna.

Table 9. Catch by PNG Chartered vessels in waters under PNG national Jurisdiction

		Effort	Set types		Catch(Metric tonnes)				
Year	No. of active Vessels	Days fishing & Searching	Un-asso sets	Assoc sets	SKJ	YFT	BET	OTH	TOTAL
2004	28	2483	304	2,179	84,721	15,446	23	3	100,193
2005	31	2675	340	2,250	59,834	28,807	650	231	89,522
2006	33	3126	522	2,523	101,166	24,628	148	554	126,348
2007	34	2858	663	2,195	98,359	26,020	130	63	124,572
2008	33	2923	469	2,454	85,673	26,259	173	181	112,286



Catch (total)2008 Effort (set per Day)2008

Fig 12 Total catch and Effort distribution by PNG chartered vessels in 2008. Catch (left) and Effort (right).
Legend: (Blue- Skipjack, Yellow-Yellowfin tuna, Red – estimated Bigeye tuna)

Effort

About 32 vessels have been active in the last five years, fishing and searching on average for about 2813 days per year(table9). Most of their sets were on associated schools (83%), especially sets on anchored Fads (table 10&fig 13).

Table 10. Effort by number and percentage of set types by PNG chartered vessels in PNG waters, 2004-2008

	YEAR											
	2004		2005		2006		2007		2008		Total	
SET TYPES	# sets	%	# sets	%	# sets	%	# sets	%	# sets	%	# sets	%
Anchored raft, FAD or Payao	1425	57	1267	49	1199	39	1180	41	1584	54	6655	48
Drifting log, debris or dead animal	667	27	851	33	1013	33	709	25	477	16	3717	27
Drifting raft, FAD or Payao	75	3	112	4	234	8	214	7	331	11	966	7
Feeding on baitfish	11	0	17	1	72	2	77	3	59	2	236	2
Live whale	0	0	0	0	1	0	7	0	0	0	8	0
Live whale shark	0	0	0	0	1	0	1	0	0	0	2	0
Total associated set	**2,178**	**88**	**2,247**	**87**	**2,520**	**83**	**2,188**	**77**	**2,451**	**84**	**11,584**	**83**
Unassociated	**304**	**12**	**340**	**13**	**522**	**17**	**663**	**23**	**469**	**16**	**2298**	**17**
Grand Total	**2482**	**100**	**2587**	**100**	**3042**	**100**	**2851**	**100**	**2920**	**100**	**13882**	**100**

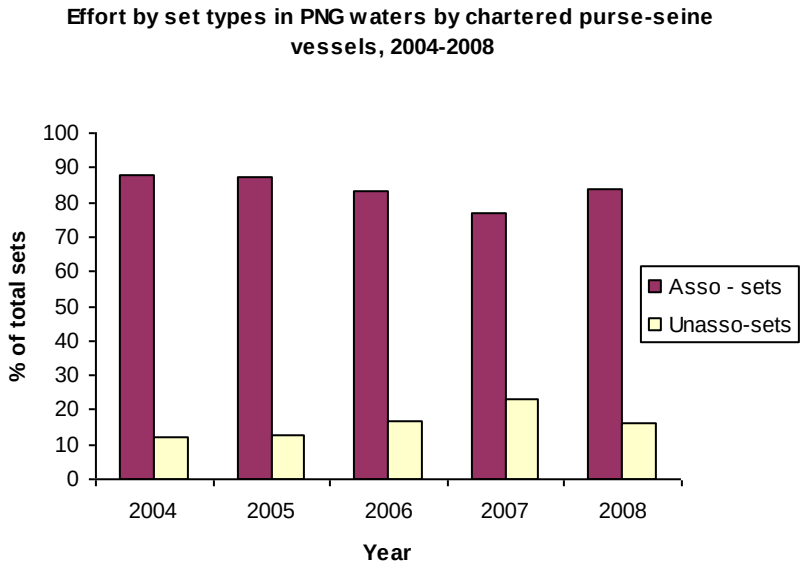


Fig 13. Percentage by set types in PNG waters by PNG chartered purse-seine vessels 2004-2008. Shows more associated sets than un-associated sets.

Activity by foreign vessels in PNG waters

Purse-seine

Catch

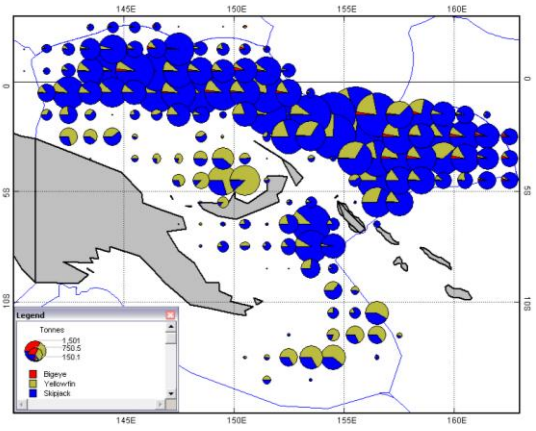
Average annual catch for years 2004-2008 by foreign flag vessels is around 250,000mt (table 11). Highest catch was in 2007 reaching more than 300,000mt. This high catch corresponds to high effort in that particular year. Like wise low catches corresponds to low effort. Species composition show that skipjack made up 83%, yellowfin 16% and bigeye just under 1% the years 2004-2008. Most catches is by Chinese Taipei (32.4%), Korea (27.1%), Japan (14%) and the Philippines (11.1%) respectively (attachment A). The remaining 15% was caught by the other foreign fleets including China, US, Vanuatu and those of the other pacific countries licensed under the FSM Arrangement. Total catch by the foreign fleet dropped from 320,132mt in 2007 to 249,866mt in 2008. Catch by all fleets dropped in 2008 from 2007, accept for the US fleet and the Philippine fleet which had increased catch (Attachment A). The decline in catch ranged from 30% (Japan) to as high a 62% (Vanuatu). Philippines had an increase of 17% whilst the US had the biggest catch increase by approximately 400%. Both increases were a result of increased number of vessels entering the fishery. Most catch has been in the northern part of PNG (figure 14).

Table 11. Annual catch and effort by Foreign purse-seine vessels in PNG Waters, 2004-2008

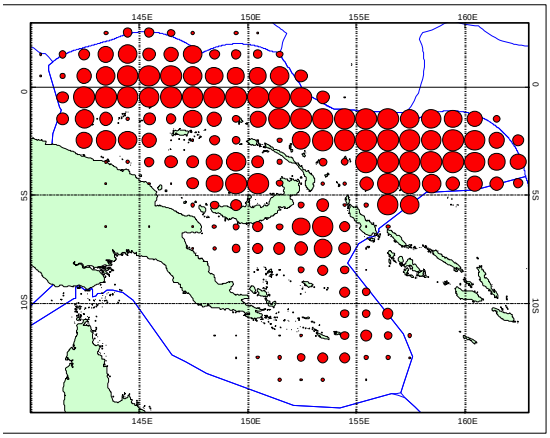
		Effort	Set types		Catch(Metric tonnes)				
Year	Active no. of vessels	Days fishing & Searching	Asso sets	Un-Asso sets	SKJ	YFT	BET	OTH	TOTAL
2004	96	6,745	4001	659	189,193	22194	825	54	212,265
2005	87	6,755	2981	711	137,401	36340	965	79	174,785
2006	130	9,140	4302	1060	239,030	35908	1,158	78	276,173
2007	131	10,963	4941	1659	265,788	51264	2,376	705	320,132
2008	128	8,961	4698	1512	195,891	51110	2,728	137	249,866

Effort.

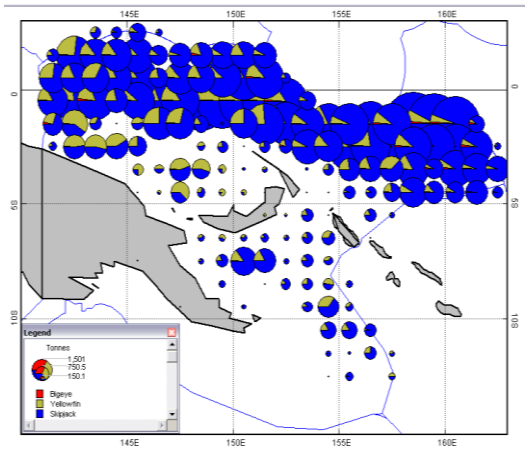
One hundred thirty vessels were actively fishing in PNG waters in the last three years. On average in the last five (5) years the vessels used about 8,500 fishing days per year. Days in which sets were made, accounted for 62% of the fishing days (table 11). About 80% of the sets were associated sets while only 20% was on un-associated sets (table11&12). There is indication that sets on un-associated schools has increased in more recent years (fig 15). Biggest users of associated sets in the last five years were Chinese Taipei (30%), Philippines (23%) and Korea making up 22% (fig 16). Sets on logs or debris makes up most the sets and is consistent across all fleets (fig 17). Effort distribution shows that the northern part of PNG and towards the east is where most fishing took place in the last few years (figure 14).



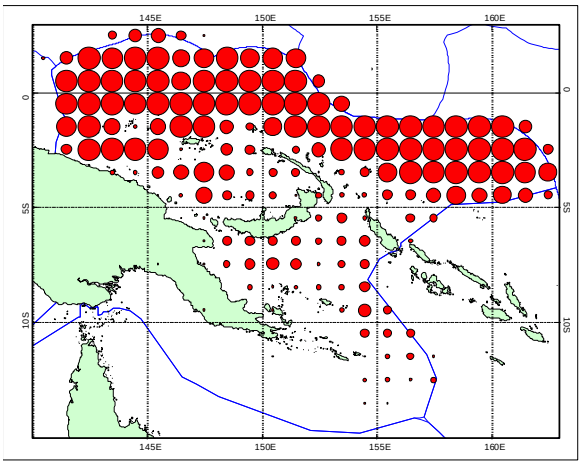
2008



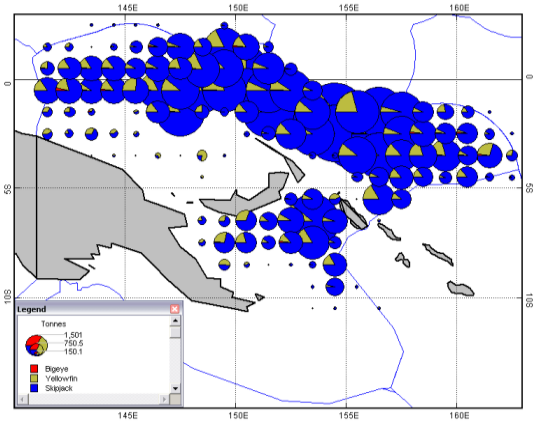
2008



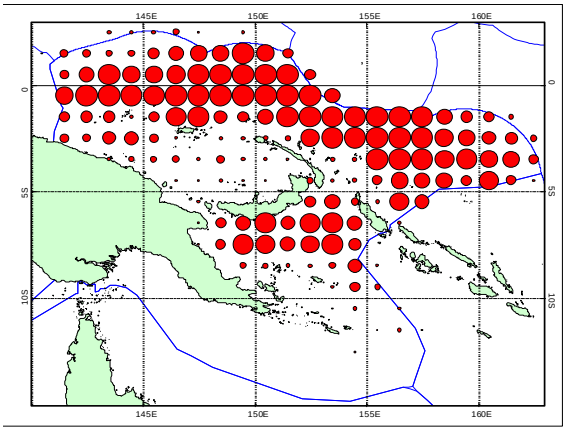
2007



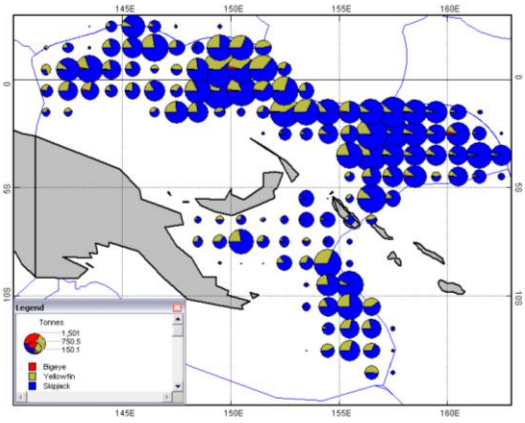
2007



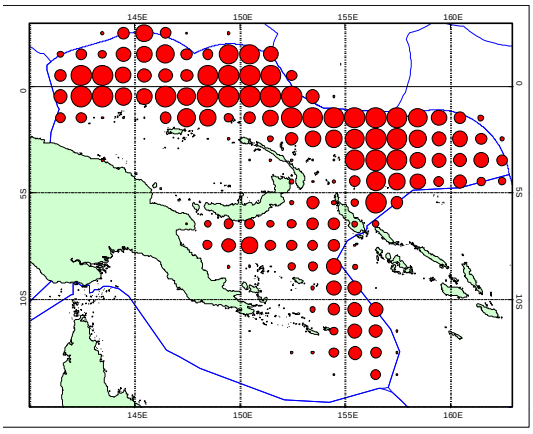
2006



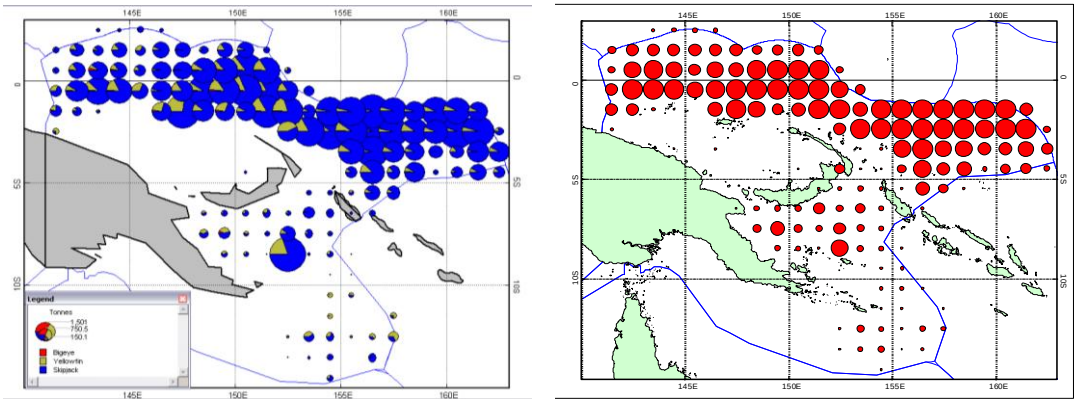
2006



2005



2005



2004 2004

Fig14. Annual catch and distribution by foreign purse-seine fleet in PNG waters, 2004-2008. Catch 2008 (top-left) and effort 2008 (top-right) and catch 2004 (bottom-left) and effort 2004 (bottom-right).

Table 12. Effort by number and percentage of set types by foreign vessels in PNG waters 2004-2008

	YEARS											
	2004		2005		2006		2007		2008		Total	
Set Type	# sets	%	# sets	%	# sets	%	# sets	%	# sets	%	# sets	% Total
Anchored raft, FAD or Payao	240	5	239	7	306	6	218	3	337	5	1340	5
Drifting log, debris or dead animal	2703	58	1905	52	2771	52	2701	42	1517	24	11597	44
Drifting raft, FAD or Payao	452	10	202	6	569	11	764	12	1973	32	3960	15
Feeding on baitfish	575	12	635	17	646	12	1019	16	850	14	3725	14
Live whale	1	0	0	0	5	0	11	0	19	0	36	0
Live whale shark	0	0	0	0	5	0	5	0	2	0	12	0
Total Associated	**4001**	**86**	**2981**	**81**	**4302**	**80**	**4718**	**74**	**4698**	**76**	**20700**	**79**
Unassociated	**659**	**14**	**711**	**19**	**1060**	**20**	**1659**	**26**	**1512**	**24**	**5601**	**21**
Grand Total	**4660**	**100**	**3692**	**100**	**5362**	**100**	**6377**	**100**	**6210**	**100**	**26301**	**100**

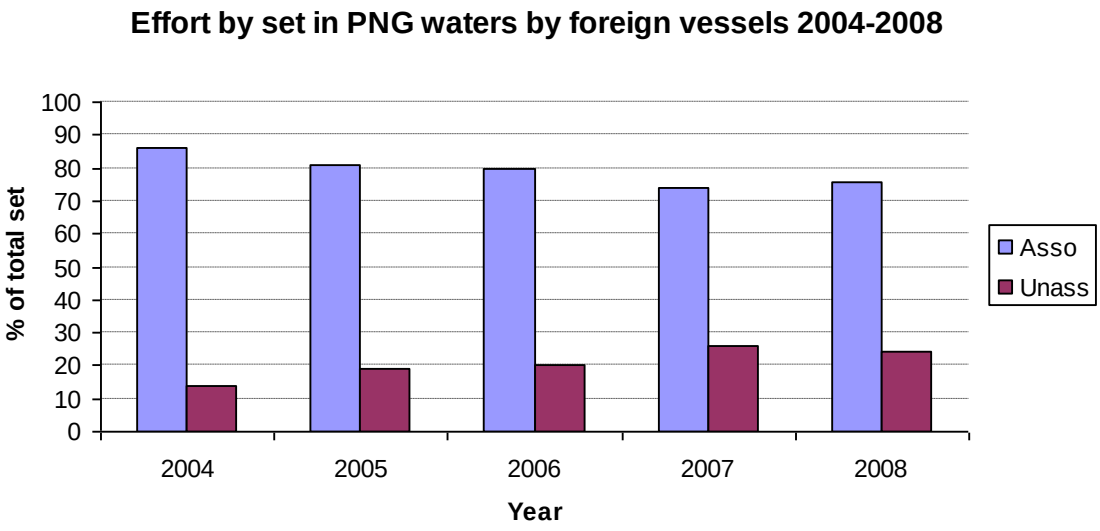


Fig 15. Percentage by set type in PNG waters by foreign vessels 2004-2008

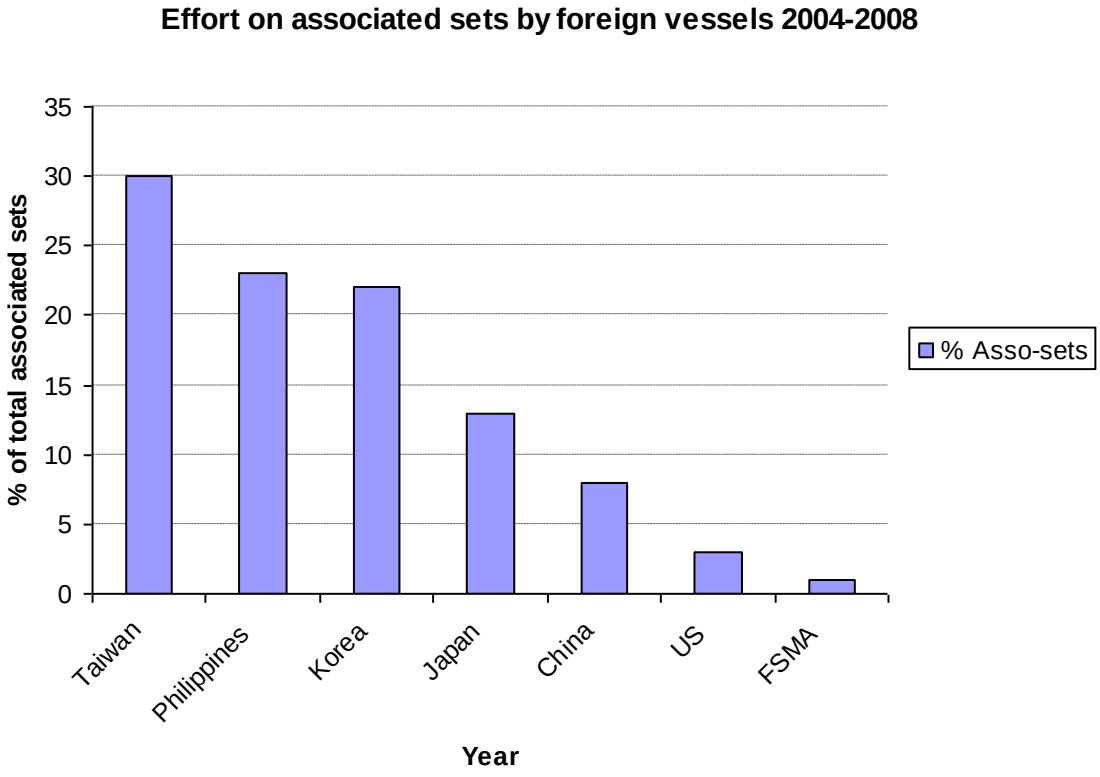


Fig 16. Percentage of associated sets by fleet in PNG waters. Shows Chinese Taipei, Philippines and Korea as the leading users of associated sets in PNG waters.

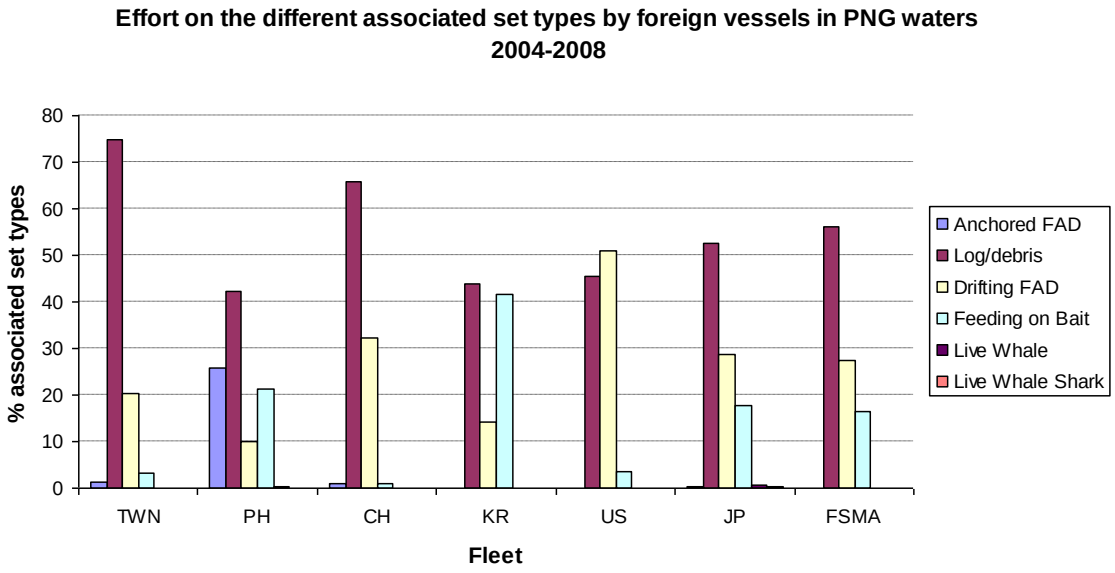


Fig 17. Effort on associated set types by fleet. Shows more effort/sets on log/debris associated schools by all fleet.

Socio-economic factors

Papua New Guinea's objective in the tuna fishery is to build a industry and not to be reliant on access fees. Reliance on revenue from Access fees is a temporary arrangement until such time the similar revenue can be earned from those linked to onshore facilities, then access arrangements will be done away with. The government's directive to build an industry stems from the fact that PNG needs to provide employment for its citizens and also the fact that the citizens of PNG got to be participants in the industry some how.

Disposal of catch

4.1 Exports

Table 13 lists tuna fishery exports by main category and value for the period 2004-2008. The total value of tuna fishery related exports has increased steady in the last five years peaking at USD 144 million in 2008. The export figures do not include the value of tuna transhipped by PNG-based vessels.

Chilled tuna is mostly exported to Japan and Australia, frozen tuna to Philippines, Japan, Thailand and Chinese Taipei, canned tuna mainly to the European markets (Germany, Great Britain), with small quantities to Pacific Island countries, tuna loins to Europe and US and fish meal to Australia, Philippines and Japan. Shark products are mostly exported to Chinese Taipei.

An estimated 4,000-5,000mt of canned tuna is consumed locally.

Table 13. Tuna fishery product exports by volume and value
(Source: NFA records; values in USD; frozen shark and frozen tuna weights are dressed; the 2008 figures may be incomplete; dried shark fins are not included)

	Chilled tuna		**Frozen tuna**		**Canned tuna**		**Loins tuna**		**Fish meal**		**Shark meat (frozen)**		**Shark fins (frozen)**		**TOTAL (USD Million)**
Year	Mt	value	Mt	Value	Mt	Value	Mt	Value	Mt	Value	Mt	Value	Mt	Value	
2004	2,320	10.4	26,720	17.9	16,746	38.9	1, 749	1	3,174	1.5	1,331	0.5	137	0.7	70.9
2005	989	4.0	38.282	32.9	15,511	41.0	14,675	8.3	3,944	1.5	1,464	0.5	148	0.8	89.0
2006	1,667	7.5	33,159	33.1	16.380	42.3	11,896	10.3	6,142	3.0	1,896	0.7	144	0.8	97.7
2007	1,395	6.1	40,364	54.8	14,654	40.9	11,525	12.4	5,484	2.8	1,886	0.8	129	0.8	118.6
2008	1,302	6.2	44,145	74.5	12,177	48.3	10,031	10.3	4,752	2.6	1,833	0.9	125	0.8	143.6

Onshore developments

Three tuna processing plants are currently in operation and four are under progress. Each of the three operating facilities is supported by a cold storage. The IFC facility is an existing facility that processes mackerel, but is now being fitted with additional production lines to process tuna.

Table 14. Processing facilities, both operating and proposed.

Name	Facility type	Capacity-input (mt/day)	Status	Date of start operation
SSTC	Tuna loins	100	Operating	2004
RD	Tuna canning	150	Operating	1997
Frabelle	Canning/loins	100	Operating	2006
IFC	Canning/loins		Under progress	-
Thai Unon/Century canning/Frabelle	Canning/loins	350	Under progress	-
RD/Fairwell	Canning/loins	200	Under progress	-
Chinese investment	loins	200	Under progress	-

)

Future Prospects of the fishery

Longline

Longline fishery has declined over the years and is not likely to expand in the near future unless there some major change in the current policy controlling this particular fishery. The main reason for the decline is the high operational cost.

Handline

Although very minimal at this stage, this fishery has some potential of expansion in the not to distant future. The processing plants are supporting this sector through the

production and supply of ice. The fish caught by this sector is than sold to the processing establishments.

Purse-seine
Effort in terms of fishing days is capped as per the commission measure 2008-01. However in PNG there would be a re-alignment or shift in the vessels fishing as those vessels not associated with any onshore facility are given less priority over vessels associated with onshore development. This may mean new vessels into PNG waters provided they are associated with onshore development. If this happens than, some vessels currently licensed but not associated with onshore facilities will no-longer be licensed to fish within the waters of PNG.

Status of tuna fishery data collection systems

Fleets have been very cooperative in submitting catch and effort data as per catch logsheet. As a result there has been very high coverage of the catch and effort data (table 14).

For coverage explanations see attachment c.

Table 14 a. Estimated annual coverage of catch, effort and size data for Papua New Guinea fishing fleets in the WCPFC Convention Area, 2003–2005.

Gear	Fleet	Year	Catch/Effort data coverage	% coverage	Size data coverage	% coverage
LONGLINE	PAPUA NEW GUINEA	2003-2004	HIGH	>80%	HIGH	>15%
		2005	HIGH	>80%	HIGH	>15%
		2006	HIGH	>80	MEDIUM	5-15%
		2007	HIGH	>80	MEDIUM	5-15%
PURSE SEINE	PAPUA NEW GUINEA	2003-2004	HIGH	>80%	MEDIUM	5-15%
		2005	HIGH	>80%	MEDIUM	5-15%
		2006	HIGH	>80	MEDIUM	5-15%
		2007	HIGH	>80	MEDIUM	5-15%

Table 14b. **Estimated annual coverage of catch, effort and size data for Papua New Guinea Chartered purse-seine fleets in the WCPFC Convention Area, 2004–2008.**

PURSE SEINE	PAPUA NEW GUINEA Chartered	2003-2004	HIGH	>80%	MEDIUM	5-15%
		2005	HIGH	>80%	MEDIUM	5-15%
		2006	HIGH	>80	MEDIUM	5-15%
		2007	HIGH	>80	MEDIUM	5-15%

Table 14 c. Estimated coverage of catch, effort and size data for bilateral-arrangement, foreign fleets fishing in Papua New Guinea's EEZ.

Gear	Fleet	Year	Catch/Effort data coverage	% coverage	Size data coverage	% coverage
PURSE SEINE	CHINA	2004	HIGH	>80%	MEDIUM	5-15%
		2005	HIGH	>80%	MEDIUM	5-15%
		2006	HIGH	>80%	MEDIUM	5-15%
		2007	HIGH	>80%	MEDIUM	5-15%
		2008	HIGH	>80%		
	KOREA	2004	HIGH	>80%	MEDIUM	5-15%
		2005	HIGH	>80%	MEDIUM	5-15%
		2006	HIGH	>80%	MEDIUM	5-15%
		2007	HIGH	>80%	MEDIUM	5-15%
		2008	HIGH	>80%		
	CHINESE TAIPEI	2004	HIGH	>80%	MEDIUM	5-15%
		2005	HIGH	>80%	MEDIUM	5-15%
		2006	HIGH	>80%	MEDIUM	5-15%
		2007	HIGH	>80%	MEDIUM	5-15%
		2008	HIGH	>80%		
	VANUATU	2004	HIGH	>80%	MEDIUM	5-15%
		2005	HIGH	>80%	MEDIUM	5-15%
		2006	HIGH	>80%	MEDIUM	5-15%
		2007	HIGH	>80%	MEDIUM	5-15%
		2008	HIGH	>80%		
	JAPAN	2005	HIGH	>80%	-	-
		2006	HIGH	>80%	-	-
		2007	HIGH	>80%	-	-
		2008	HIGH	>80%	-	-

Observer programme

The current number of observers in PNG is about 150. A couple more observer trainings this year should boost the number to around 200 observers. Observer coverage on all fleets fishing in the PNG fisheries waters is high as shown in table 15. On average, observer coverage level for PNG flag vessels is about 88%, PNG Charter vessels about 63% and foreign vessels just under 30%. Observers also cover trips on tuna longline vessels and Fad deployment trips.

Table 15. Observer coverage by PNG observers on fleets fishing in waters under PNG national jurisdiction.

	PNG FLAG VESSELS			PNG CHARTERED VESSELS			FOREIGN FLAG VESSELS		
Year	Est. vessel days at sea	Observer Days	Percentage Coverage (%)	Est. vessel days at sea	Observer Days	Percentage Coverage (%)	Est. vessel days at sea	Observer Days	Percentage Coverage (%)
2004	1080	1061	98.3	3725	1989	53.4	8769	2709	30.9
2005	1802	1329	73.8	4013	2802	69.8	8781	2079	23.7
2006	1531	1354	88.4	4689	2924	62.4	11882	3677	30.9
2007	1363	1125	82.5	4287	2520	58.8	14252	2769	19.4
2008	1712	1615	94.3	4484	3253	72.5	12487	3952	31.6
AVG	**1498**	**1297**	**87.5**	**4240**	**2698**	**63.4**	**11234**	**3037**	**27.3**

Port sampling programme

Port sampling was contacted in major unloading and transhipment port around the country in 2008. The results are as presented in the paper WCPFC-SC5-2009/EB-IP-16.

Attachment A:

Table 16: Annual catches by foreign purse seine fleets in the Papua New Guinea EEZ, by flag and species, 2003-2007 (Source : Logsheets collected by NFA)

		CATCH (metric tonnes)				
Fleet	**Year**	**SKJ**	**YFT**	**BET**	**OTH**	**TOTAL**
China	2004	4,751	285	0	1	5,037
	2005	6,627	1,169	0	1	7,796
	2006	10,242	1,649	0	0	11,891
	2007	19,372	2,497	0	46	21,915
	2008	11,845	2,581	35	12	15,065
FSM Arrangement	2004	11,250	1,481	72	0	12,803
	2005	8,042	1,847	304	0	10,193
	2006	11,070	930	396	4	12,400
	2007	4,863	1,070	68	0	6,001
	2008	2,785	230	0	1	3,129
Japan	2004	0	0	0	0	0
	2005	120	10	0	0	130
	2006	16,537	3,954	314	9	20,813
	2007	70,373	13,361	1,443	96	85,273
	2008	46,823	9,185	1,899	0	59,606
Korea	2004	72,207	9,507	18	1	81,732
	2005	47,595	13,475	15	1	61,086
	2006	73,371	10,587	47	4	84,009
	2007	48,892	10,565	25	1	59,483
	2008	32,826	14,091	100.3	0	48,365
Philippines	2004	22,584	4,811	675	38	28,108
	2005	12,675	6,098	369	54	19,197
	2006	20,862	6,607	257	32	27,758
	2007	17,786	9,723	571	550	28,630
	2008	18,326	12,776	241	116	33,374
Chinese Taipei	2004	74,019	5,472	59	15	79,565
	2005	57,331	12,666	215	21	70,233
	2006	81,903	9,669	124	24	91,720
	2007	85,556	11,488	219	11	97,273
	2008	51,631	7,263	171	6	61,155
USA	2004	3,447	638	1	0	4,086
	2005	1,196	460	62	0	1,718
	2006	6,865	701	20	0	7,586
	2007	5,647	973	50	0	6,670
	2008	27,293	3,864	272	2	32,403
Vanuatu	2004	935	0	0	0	935
	2005	3,815	615	0	2	4,432
	2006	18,180	1,811	0	5	19,996
	2007	13,299	1,587	0	1	14,887
	2008	4,362	1,120	10	0	5,679
TOTAL EEZ	**2004**	**189,193**	**22,194**	**825**	**54**	**212,265**
	2005	**137,401**	**36,340**	**965**	**79**	**174,785**
	2006	**239,030**	**35,908**	**1,158**	**78**	**276,173**
	2007	**265,788**	**51,264**	**2,376**	**705**	**320,132**
	2008	**195,891**	**51,110**	**2,728**	**137**	**249,866**

ATTACHMENT B

Table 17. Number of sets on set types by fleet 2004-2008.

FLEET	YEAR	AFAD	NLOG	DFAD	BAIT	Live Whale	Live Whale shark	Total Asso	Un-asso	GRAND TOTAL
Taiwan	2004	1	996	147	27			**1171**	**364**	**1535**
	2005	10	1062	77	22			**1171**	**455**	**1626**
	2006	27	1091	176	36		1	**1331**	**573**	**1904**
	2007	38	1033	255	78		1	**1405**	**867**	**2272**
	2008	13	512	619	37	1		**1182**	**760**	**1942**
Philippines	2004	269	566	76	63			**974**	**56**	**1030**
	2005	212	360	37	123			**732**	**19**	**751**
	2006	273	568	105	141	1		**1088**	**66**	**1154**
	2007	177	298	105	305	3	1	**889**	**65**	**954**
	2008	321	247	168	403	14	1	**1154**	**121**	**1275**
China	2004		125	33	3	1		**162**	**29**	**191**
	2005	17	181	18	4			**220**	**51**	**271**
	2006		163	24				**187**	**72**	**259**
	2007	1	279	119	9			**408**	**196**	**604**
	2008		363	349		1		**713**	**230**	**943**
Korea	2004		823	144	454			**1421**	**193**	**1614**
	2005		285	45	470			**800**	**171**	**971**
	2006	6	580	122	406	2		**1116**	**234**	**1350**
	2007		275	103	385			**763**	**184**	**947**
	2008		95	248	231			**574**	**145**	**719**
US MLT	2004		68	19	3			**90**	**7**	**97**
	2005		5		2			**7**	**1**	**8**
	2006		45	116	6			**167**	**7**	**174**
	2007		21	20				**264**	**15**	**279**
	2008									
JAPAN	2004									
	2005									
	2006		319	15	54	2	4	**394**	**102**	**496**
	2007	2	795	162	242	8	3	**1212**	**332**	**1544**
	2008	3	300	589	179	3	1	**1075**	**256**	**1331**
FSM	2004		125	33	25			**183**	**10**	**193**
	2005		12	25	14			**51**	**14**	**65**
	2006		5	11	3			**19**	**6**	**25**
	2007									
	2008									

Attachment C.

Coverage of catch, effort and size data can now be categorized into three categories. They can either be high, medium or low. Where there is no data, it would be stated as "no data". For the catch/effort data coverage "high" represents coverage of greater than 80%, "medium" between 50-80% while "low"0-50%. For the size data coverage "high" is represented greater than15%, "medium" 5-15% and "low" 0-15% (see Table 18).

The percentage representation of the latter data coverage is so because the actual size data collection is not extensive (i.e. a sample representation is required only) and in many cases can only be partially carried out.

Table 18. 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 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.