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

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PAPUA NEW GUINEA

ANNUAL REPORT TO THE WESTERN AND CENTRAL PACIFIC FISHERIES COMMISSION

PART 1: INFORMATION ON FISHERIES, RESEARCH AND STATISTICS 2009

PAPUA NEW GUINEA

LUDWIG KUMORU
NATIONAL FISHERIES AUTHORITY

August 2010
Nukualofa, Tonga.

Scientific data was provided to the Commission in accordance with the decision relating to the provision of scientific data to the commission by the 30th April 2010	**YES**

SUMMARY

The Papua New Guinea (PNG) tuna fishery is made up of both the Purse-seine and longline sectors with a small, but important handline sector. The longline and Handline sector is a citizen only activity and all vessels fish exclusively in the waters under PNG national jurisdiction. 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. While the PNG flagged vessels fish primarily in PNG waters, but occasionally in the adjacent high seas, the chartered vessels fish both in PNG waters and waters outside of PNG. Foreign vessels under access arrangements fish in PNG waters whenever there is fish to catch.

Total catch in 2009 within PNG waters was 455,346 mt, a 9% drop from the 2008 catch of 500,433mt. This catch is estimated to be about 11% of global catch and 19% of WCPO catch in 2009. The decline in total catch is attributed to the decline in the total fishing effort. The catch contribution was, seventy percent (71%) by foreign vessels that fish under Access arrangements, 21% from PNG chartered vessels and 8% from the PNG flag vessels. Small amount <0.5% (2,217mt) is from the longline sector. Catch by PNG flagged vessels outside PNG waters was 544mt and was from the high sea pockets north and adjacent to the PNG EEZ. The Catch by PNG chartered vessels outside of PNG waters was 70,855mt and was mainly from the high seas and the waters of the other PNA countries.

A total of 227 vessels were active in the PNG waters in 2009. Thirty-two (32) were longline and handline vessels and 195 were purse-seine vessels. Nine (9) of the 195 vessels were PNG flagged, 31 were PNG chartered and 155 were foreign vessels fishing under Access arrangements. The total purse-seine effort in 2009 was 13,348 days fished and searched, a 2% drop from 13,675 days in 2008. Longline effort also dropped from 42,805 hundreds of hooks (hhk) in 2008 to 36,574hhks in 2009. Sets by purse-seine vessels in PNG were mainly associated sets which accounted for 81% of the total sets. About sixty percent (60%) of the associated sets was by Foreign vessels and the other 40% by PNG flagged and PNG chartered vessels.

Data collection in PNG is very good with above 80% Catch & effort data coverage for all fleets. For size and species composition data, PNG runs a port sampling program as well as an observer program that covers the vessels based out of PNG and foreign vessels fishing the PNG fisheries Zone. The PNG observer program runs 200 man/women program with the aim to beef up the strength to 400 observers by the next 3-4 years. Observer coverage on vessels fishing in PNG waters on average range from 30% on foreign vessels to 83% on PNG flag vessels. PNG chartered vessel has a 58% observer coverage on average.

PNG is striving towards building a fishing industry, therefore fishing licenses are linked to onshore investment. At full capacity PNG is looking to processing all fish caught in PNG waters, back in PNG. The rights to fish in PNG, will also be linked to onshore investment in the near future.

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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 475,000mt per year in the recent three years. This represents about 19% of WCPO catch and about 11% 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 since intensified, reaching the highest catch of 500,433mt in 2008. 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**.**

ANNUAL FISHERIES INFORMATION

1. ESSENTIAL INFORMATION

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 unload 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 pockets, north and east of PNG and adjacent to the PNG EEZ (fig1). Catch in 2009 was mainly in the high seas pocket North of PNG. The highest catch in the recent 5 years is 539mt (2009). The average catch over the recent five years is 77% (skipjack), 20% (yellowfin) and 3% (bigeye).

Table 1.Catch by PNG flag purse-seine vessels in areas outside PNG waters 2005-2009 (source-NFA data).

	Effort		Set types		Catch(Metric tonnes)				
Year	No. of active vessels	Days fishing & Searching	Un-asso sets	Assoc sets	SKJ	YFT	BET	OTH	TOTAL
2005	11	214	200	14	2062.	5553.	123.0	4	2741
2006	2	4	1	3	175	4	0	0	179
2007	4	18	4	14	350	163.0	0	01	532
2008	2	2	0	2	5	0	0	0	5
2009	3	15	6	9	487	56.	0	0	544.

Effort.

In 2009, most of the fishing effort (fishing days) by these vessels was in the high seas pockets north of PNG, (fig2). On average, these vessels spend about 2 weeks (15 days) outside PNG fisheries waters. Most (60%) of their sets, 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				
Set Type	2005	2006	2007	2008	2009
Anchored Fads	145	2	0	1	2
Drifting Fads	6	0	0	1	1
Drifting logs or debris	37	1	5	0	1
Feeding on Baitfish	12	0	9	0	5
Unassociated	14	1	4	0	6
Total no. sets	**214**	**4**	**18**	**2**	**15**

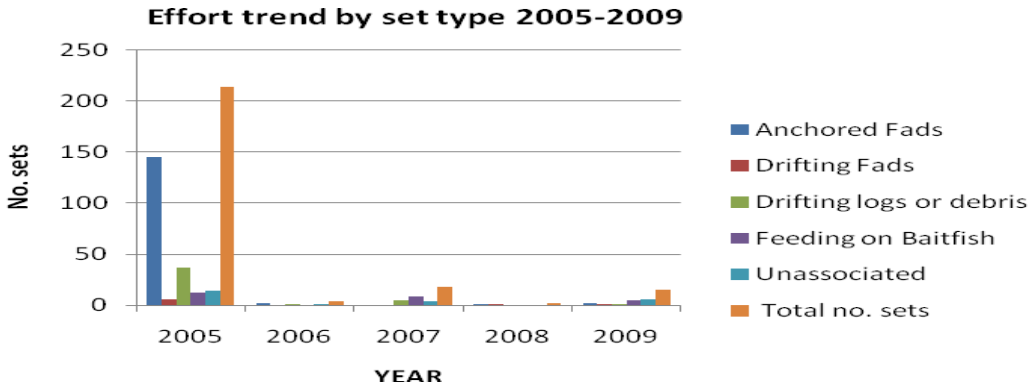


Fig1. Effort trend by set type by PNG flag vessels in waters outside PNG national jurisdiction. Shows a declining effort by PNG vessels in areas outside PNG waters.

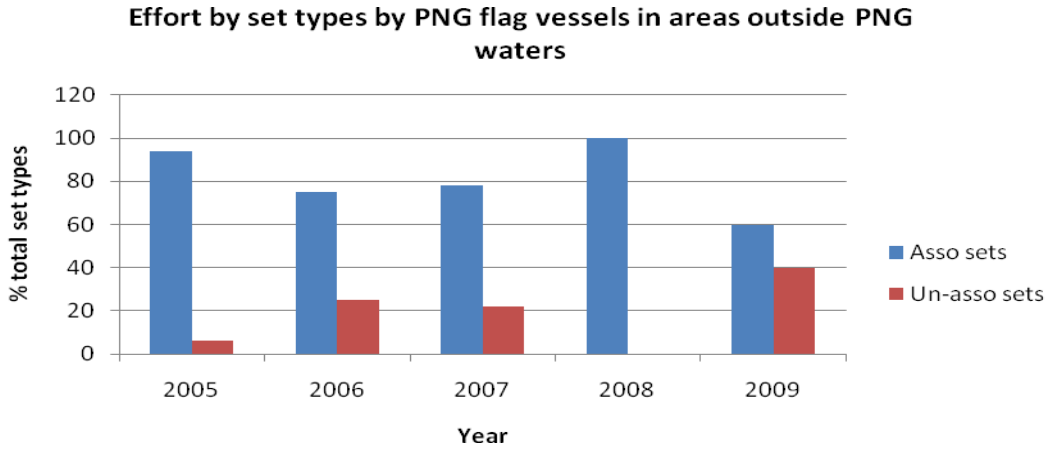


Fig2. Percentage by set types outside PNG waters by PNG flag purse-seine vessels. Shows a decline in associated sets and an increase in un-associated sets.

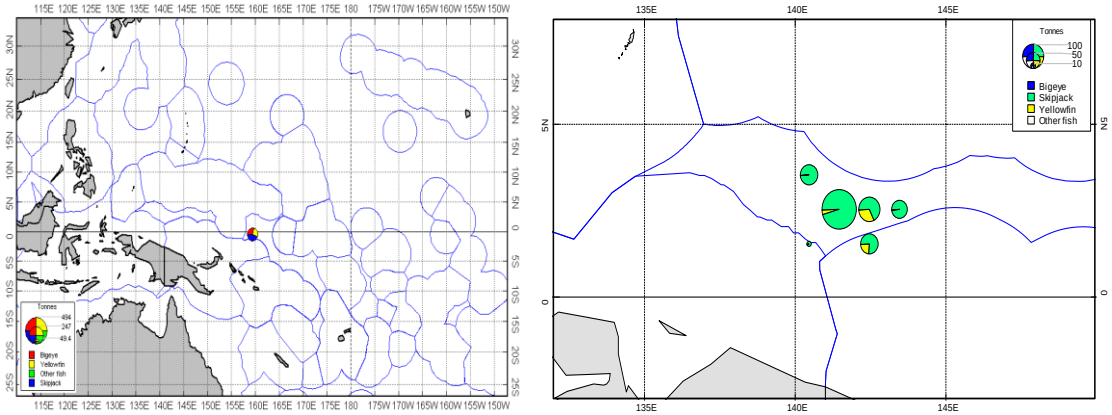


Figure 3: Catch distribution by PNG flag purse seine vessels outside PNG waters left (2008), Right-(2009)

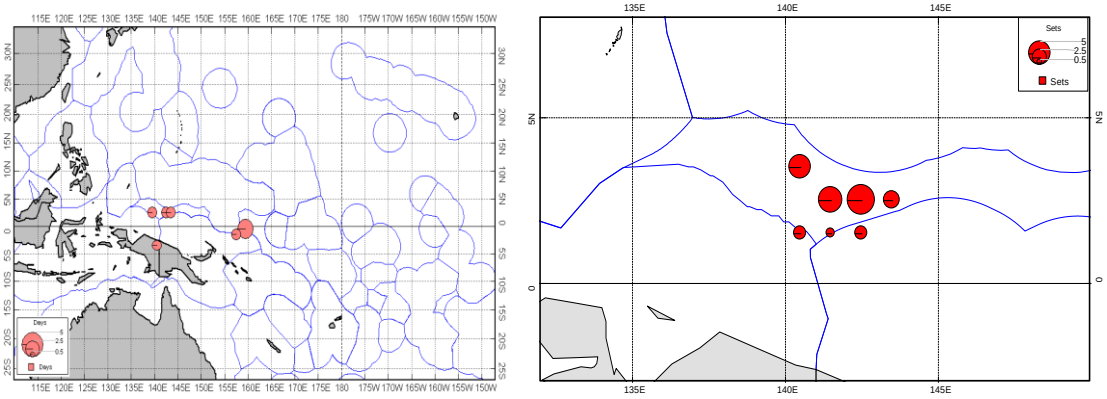


Figure 4 : Effort distribution of PNG Flag vessels fishing outside PNG EEZ-Left (2008), Right(2009). Shows effort mainly in the high sea pockets.

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 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 (fig6). Catch by these vessels was highest in 2005, reaching over 105,000mt (69,715 in 2009). Their annual average catch outside of PNG waters is about 80,000mt per year (table3). Skipjack constitutes most (85%) of the catch and the remaining is yellowfin (15%).

Table3. Catch by PNG Chartered purse-seine vessels in areas outside PNG waters 2005-2009 (source: NFA).

	Effort		Set types		Catch(Metric tonnes)				
Year	No. Of active vessels	Days fishing & Searching	Un-asso sets	Asso sets	SKJ	YFT	BET	OTH	TOTAL
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
2009	14	1140	606	534	61,729	7,887	67	32	69,715

Effort

On average, PNG chartered vessels spend about 1,342 days annually fishing in waters other than PNG's in the last five years. This is about 32% of their total fishing days yearly. Most (52%) of their sets in these waters is on un-associated sets. Associated sets makes up 48% of their sets and sets on drifting logs or debris constitutes most (45%) of the associated sets (Table4 &fig5). Drifting Fads is the next common set type accounting from 37% of the total associated sets. Associated sets have decreased in the recent years such that the most common sets are now the un-associated sets. Most effort (fishing days) is in areas eastward from PNG in waters of the other PNA countries (fig7).

Table4. Effort by number of set types in areas outside PNG waters by PNG chartered vessels 2005-2009 (source NFA).

	YEAR				
Set Type	2005	2006	2007	2008	2009
Anchored Fad	98	3	62	21	0
Drifting Fad	177	260	206	230	323
Drifting log or debris	490	406	308	68	171
Feeding on baitfish	66	137	43	65	36
Live whale	0	1	6	0	4
Live whale Shark	0	0	1	2	0
Unassociated	971	617	473	730	606
Unspecified	0	2	2	1	0
TOTAL	**1802**	**1426**	**1101**	**1117**	**1140**

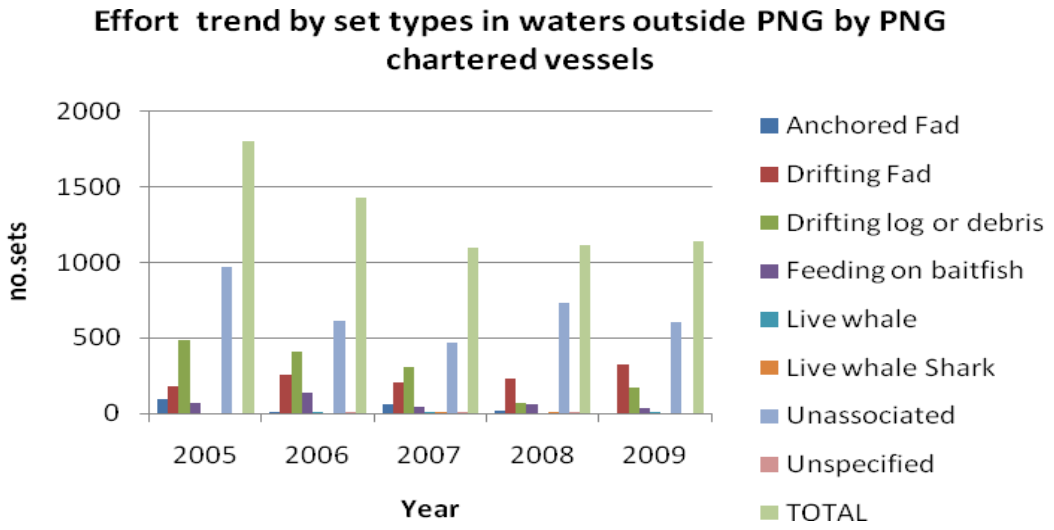
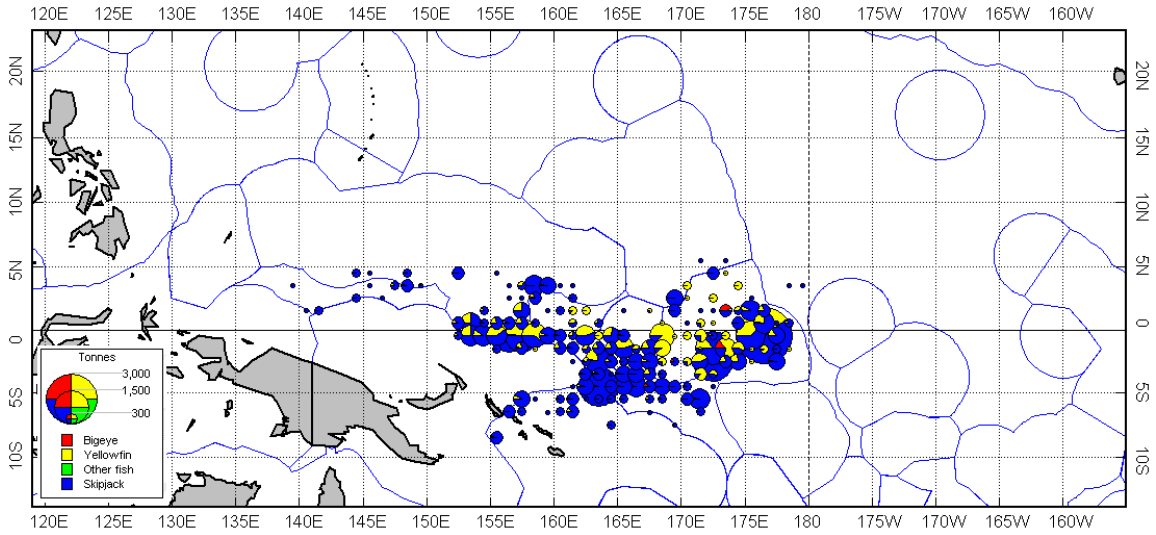


Fig 5. Effort trend by PNG chartered Vessels in waters outside PNG. Shows decline in total effort (no. sets).



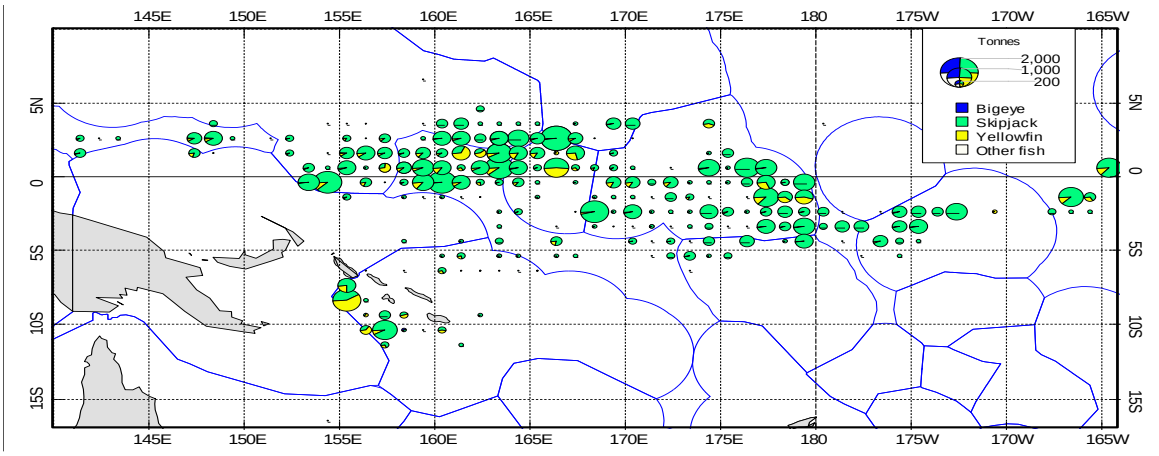


Figure6. Catch (metric tonnes) distribution by PNG chartered vessels fishing in areas outside PNG waters-top (2008), Bottom (2009).

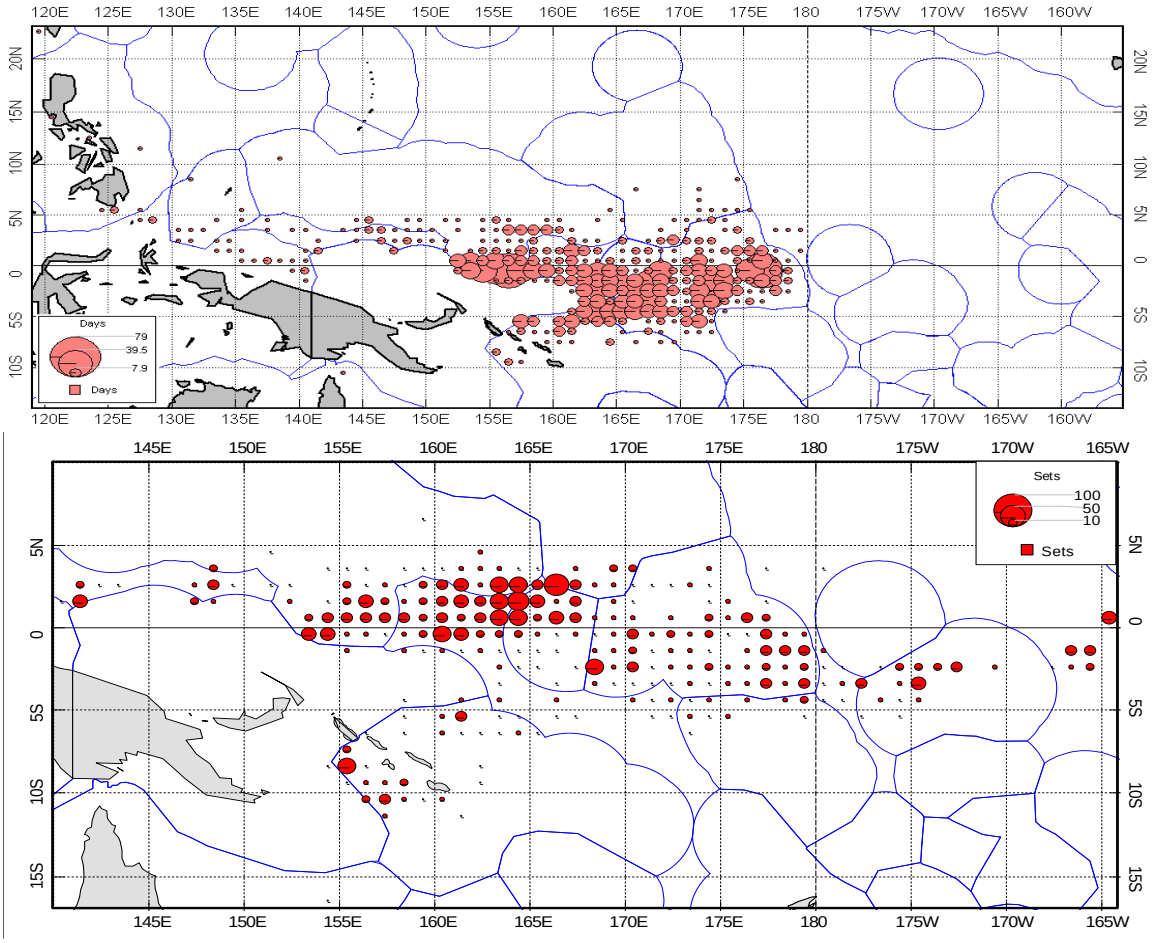


Figure7: Effort distribution of PNG chartered vessels fishing in areas outside PNG waters Effort in fishing days, top (2008), Effort in no. sets bottom (2009). Shows effort mainly in the waters of PNA.

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 to100 vessels setting 1200 hooks per set per day and catch to10,000mt per year based on the combined catch of yellowfin and bigeye tuna. 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 2009 from available logsheet data indicate a total catch of 2,217mt (all species) the lowest in the recent 5 years. The catch comprises 1466 mt yellowfin, 62 mt bigeye and 432mt albacore and 257 mt of other fish. There is a general decline in total catch from years 2006 to 2009. Catch of yellowfin tuna dropped from 2254 mt in 2008 to 1466mt in 2009 and that of bigeye tuna from 197mt to 62mt. All other species had an increase in catch, including Albacore which increased from 284mt to 432mt.

Catch in 2009 was dominated by yellowfin (66% of the total catch and 75% of the tuna catch) then Albacore (20% of total catch and 22% of tuna catch). These declines in catch are a result of reductions in fishing effort which has dropped from 42,000hhooks in 2008 to 36,000hhooks in 2009 (table6).

Table5. Number of Papua New Guinea longline and Handline vessels active in areas under PNG Fisheries waters, 2005-2009 (source: NFA database).

Year	Long line (tuna)	Handline (tuna)	Longline (Shark)	Total
2005	38	10	9	57
2006	31	10	9	50
2007	27	10	9	46
2008	19	5	9	33
2009	20	5	7	32

Table 6. Annual catch and effort estimates for the PNG tuna longline fleet, by species in waters under national jurisdiction, 2005-2009(source NFA data base).

	EFFORT	CATCH (Metric ones)									
YEAR	HHOOKS	ALB	BET	YFT	BLM	BUM	MLS	SWO	Shk	OTH	TOTAL
2005	74318	2184	234	1067	37	63	9	20	35	47	3,696
2006	64344	1728	215	1993	22	39	14	10	42	110	4,173
2007	59681	1567	109	1511	24	55	13	12	43	37	3,371
2008	42805	284	197	2254	13	39	4	17	96	37	2,941
2009	36574	432	62	1466	14	43	6	24	99	71	2,217

Effort

The average number of hooks used in years 2005-2009 is 55,500 hundred hooks. The effort has been on the decline in the recent past such that in 2009, only 36,500 hundred hooks were used compared to more than 74,000 hundred hooks. The decline in effort resulted in, less catch as well, which dropped from about 4,000mt in years 2005-2007 to 2,000mt in 2009.

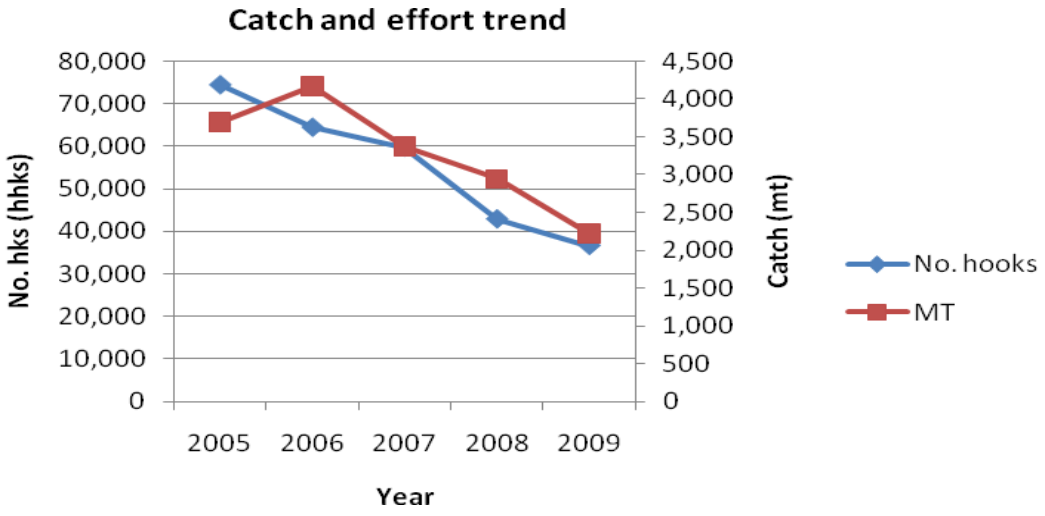


Fig8. Catch and effort trend for the PNG domestic tuna longline. Shows a declining trend in both effort and catch 2005-2009.

Effort distribution.

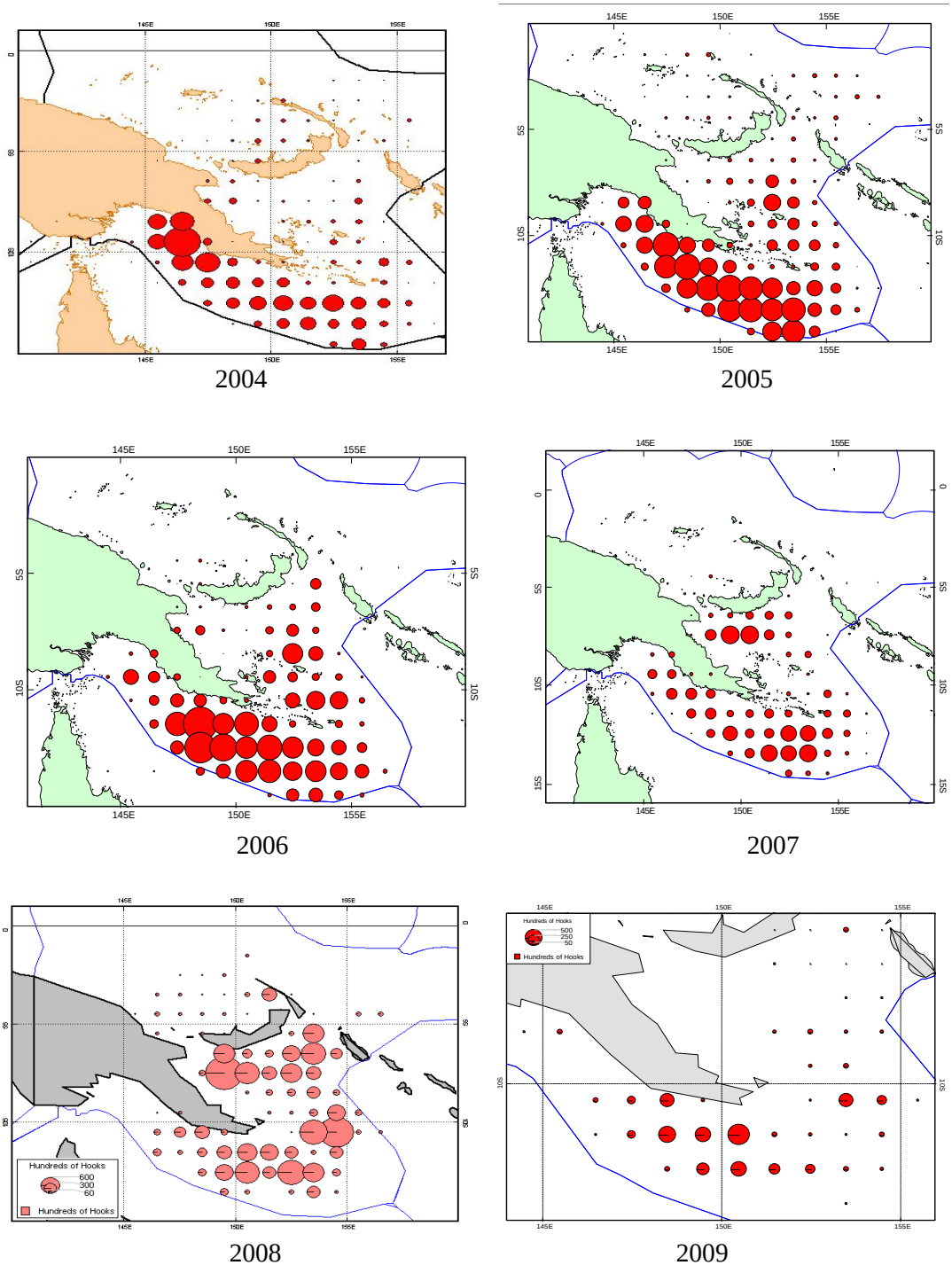


Figure 9. Annual distribution of effort (100s of hooks) for the Papua New Guinea tuna longline fishery in the area under PNG national jurisdiction for 2004 (top-left), 2005 (top-right), 2006 (middle-left),2007 (middle-right),2008 (bottom-left),2009 (bottom-right).

Catch distribution

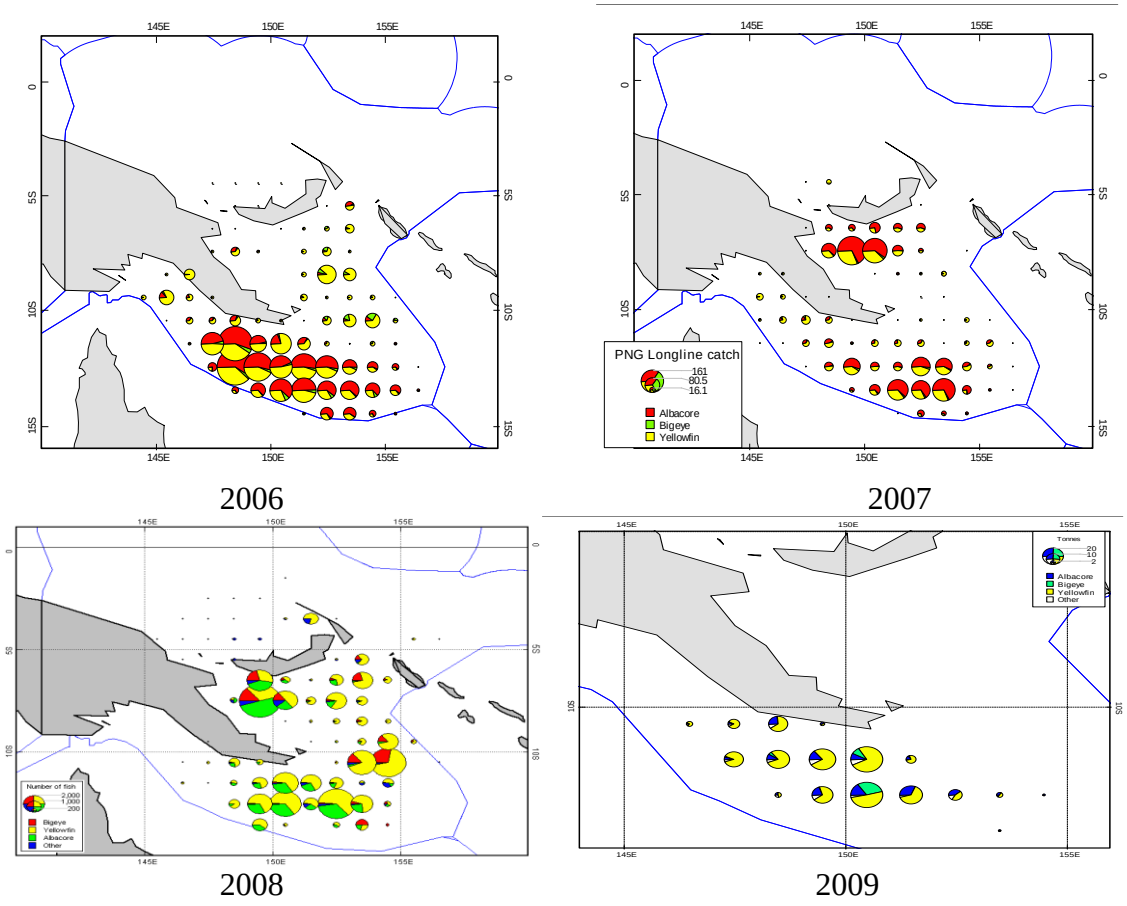


Figure10. Annual distribution of catch by PNG flag longline vessels in areas under national jurisdiction- Top left (2006), Top-right (2007), bottom left 2008 and bottom right is 2009.

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.

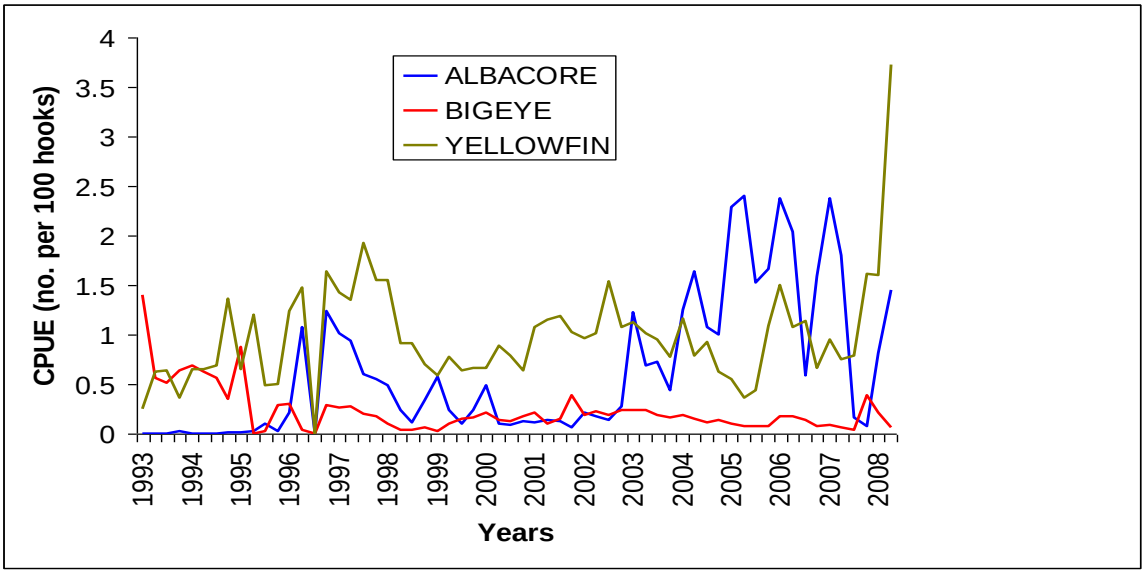


Fig 11. Quarterly trends in nominal catch rates of Albacore, Bigeye and yellowfin tuna taken by PNG longline fleet, 1993-2008

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, 2005-2009 (source: NFA database)

	Effort		Set types		Catch(Metric tonnes)				
Year	No. Of Active vessels	Days fishing & Searching	Un-Ass sets	Assoc sets	SKJ	YFT	BET	OTH	TOTAL
2005	11	1163	116	1044	15,799	10,069	400	108	26,376
2006	6	638	87	551	12,550	5,833	53	45	18,481
2007	7	613	96	517	11,973	8,065	106	172	20,316
2008	8	1023	171	852	17,725	13,226	71	80	31,102
2009	9	1217	258	959	20,756	13,025	212	257	34,250

Effort.

Effort in terms of active vessels is about 8 vessels per year, fishing and searching for an average of about 930 days per year. 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 accounts for most of the sets (32% of total and 38% of the associated sets). Effort on unassociated sets by PNG flag vessels is increasing making up over 21% of the sets in 2009(fig 13). The effort (no.sets) is on a rise as of 2006 so is the catch.

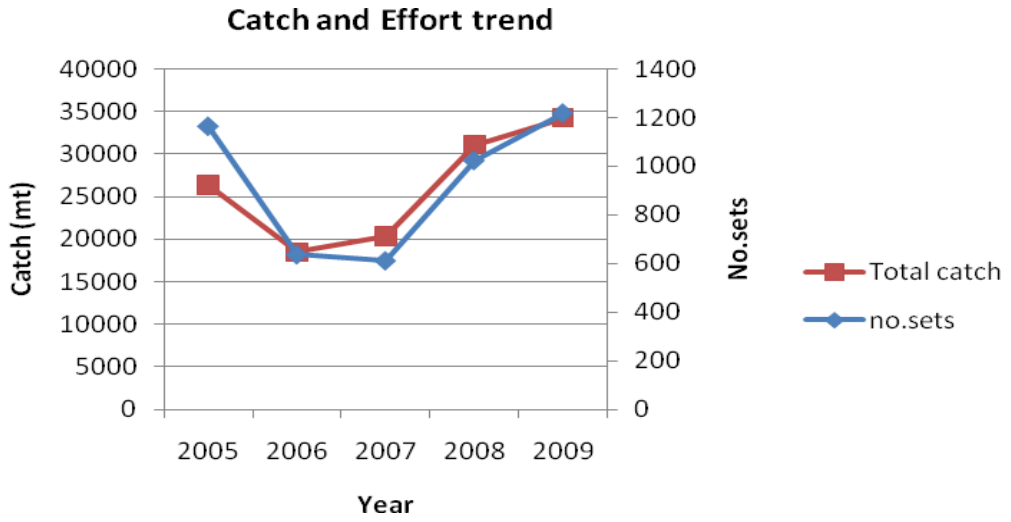


Figure12. Catch and effort trend for PNG flag purse-seine vessels in PNG waters. Shows an increasing trend in both effort and catch.

Table 8. Effort by number of set types by PNG Flag vessels in PNG waters, 2005-2009 (source: NFA data base)

	YEAR				
Set Type	2005	2006	2007	2008	2009
Anchored Fads	374	84	72	360	282
Drifting Fads	27	38	60	80	110
Drifting logs or debris	497	332	188	187	296
Feeding on Baitfish	140	97	195	225	269
Live whale	5	0	2	0	2
Live whale shark	1	0	0	0	0
Unassociated	116	87	96	171	258
Unspecified	3	0	0	0	0
Grand Total	**1163**	**638**	**613**	**1023**	**1217**

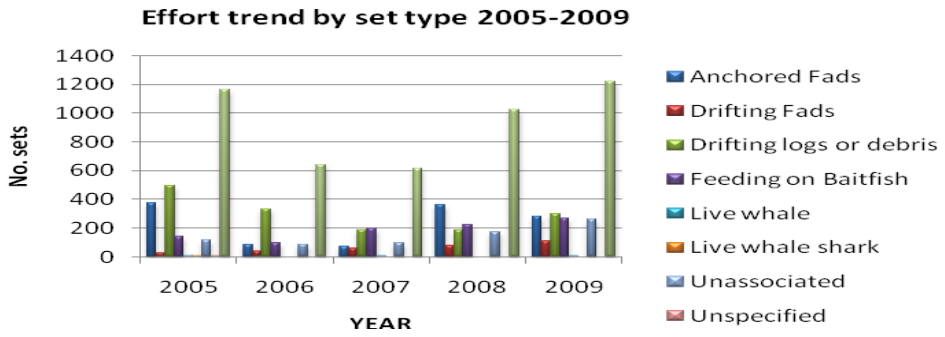
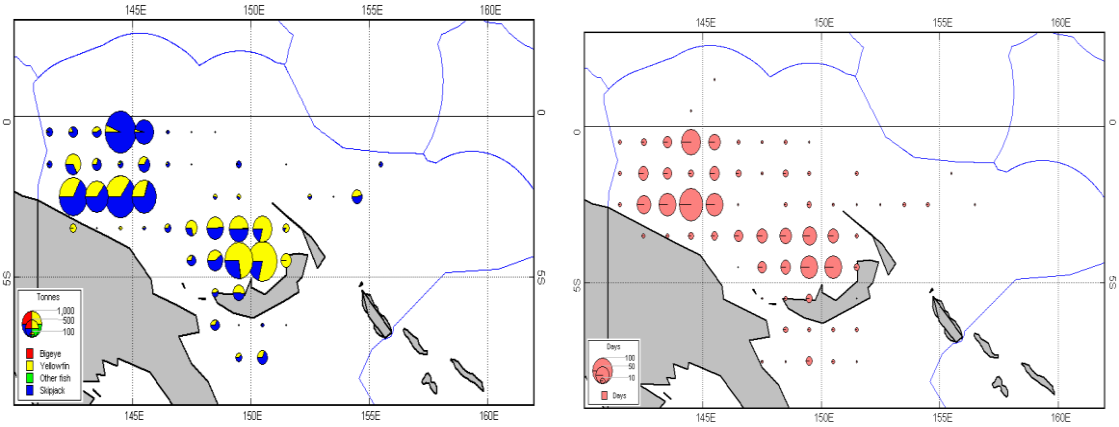
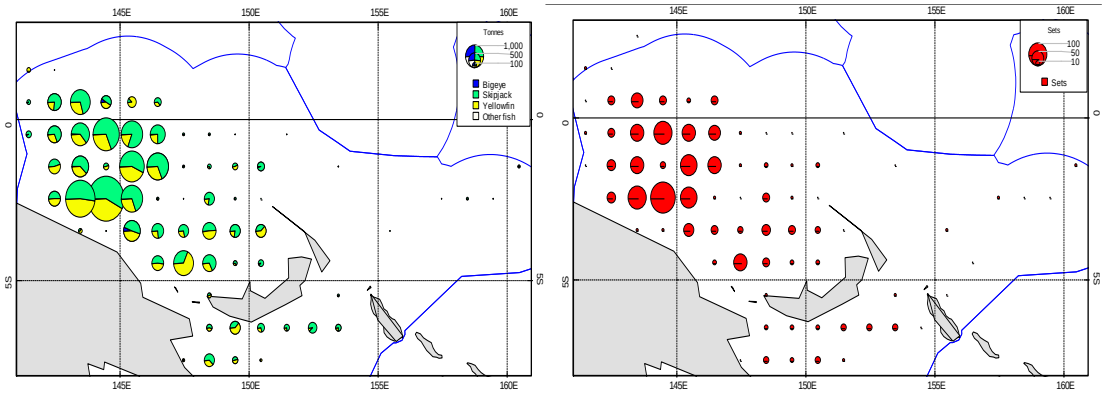


Fig 13. Effort by set types in PNG waters by PNG flag purse-seine vessels 2005-2009.Shows the increase in number of sets made each year.



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



Total catch 2009 *Effort (sets per day) 2009*

Fig 14. Annual total catch and effort distribution by PNG flag Purse-seine vessels in PNG waters. Top (2008),Bottom (2009), 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).

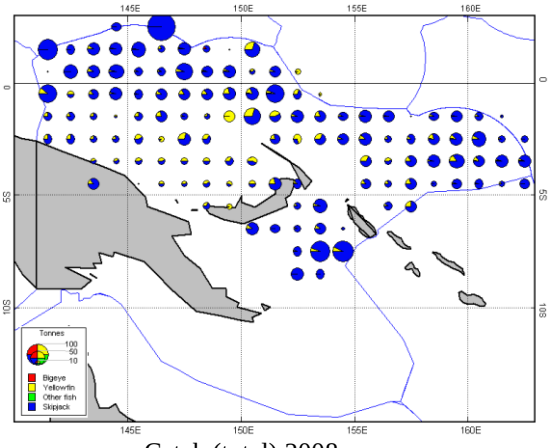
Catch.

The average catch in the last five years by these vessels has been around 100,000mt per year (table 9). The highest catch was in 2006. Since then there has been a decline with the biggest decline from 2008 to 2009, a drop from 112,286mt to 95,023mt (15% drop). Catch composition in the years 2005-2009 was dominated by skipjack. It accounted for 76% while the remaining 24% was yellowfin tuna with less than 1% bigeye. The sharp decline in catch 2008-2009 is attributed to decline in effort, partly due to the 2 months ban on Fad fishing.

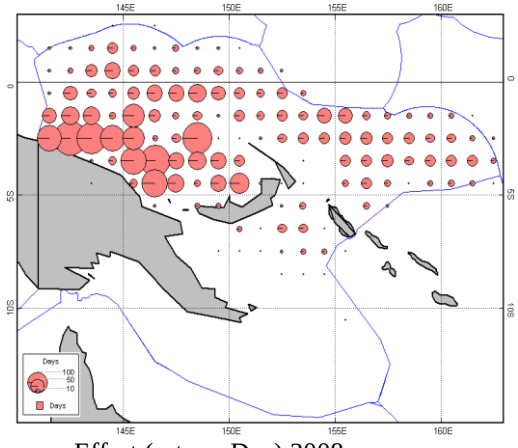
Table 9. Catch by PNG Chartered vessels in waters under PNG national Jurisdiction 2005-2009

		Effort	Set types		Catch(Metric tonnes)				
Year	No. Of active Vessels	Days fishing & Searching	Un-asso sets	Assoc sets	SKJ	YFT	BET	OTH	TOTAL
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
2009	31	2758	366	2,392	69,418	25,259	200	145	95,023

Catch and effort distribution.



Catch (total) 2008



Effort (set per Day) 2008

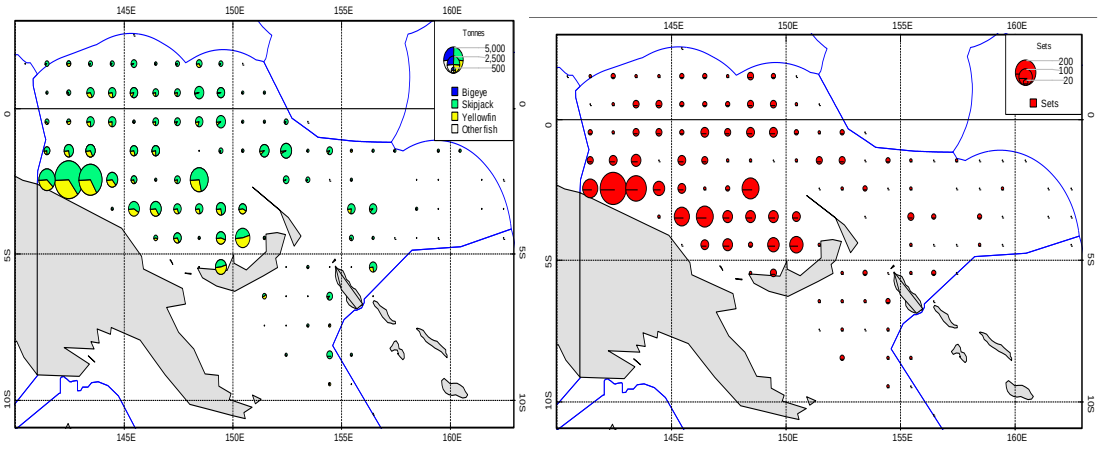


Fig 15 Total catch and Effort distribution by PNG chartered vessels in PNG waters, 2008 and 2009. Top (2008), bottom (2009) Catch (left) and Effort (right).

Effort

Thirty-one vessels were active in 2009, searching and fishing for 2758 days. The effort (no.days) was the second lowest in the recent five years. On average, 32 vessels are active anually with an average annual effort of 2,868 days. (table9). Most of their sets are on associated schools (83%), especially sets on anchored Fads (table 10&fig 13). Sets on anchored Fads accounts for 48% of the total number of sets and 58% of the total number of associated sets.

Table 10. Effort by number of set types by PNG chartered vessels in PNG waters, 2005-2009

	YEAR				
Set Type	**2005**	**2006**	**2007**	**2008**	**2009**
Anchored Fads	1267	1199	1180	1584	1583
Drifting Fads	112	234	214	331	218
Drifting logs or debris	851	1013	709	477	558
Feeding on Baitfish	17	72	77	59	27
Live whale	0	1	7	0	6
live whale shark	0	1	1	0	0
Unassociated	340	522	663	469	366
Unspecified	3	3	7	3	0
TOTAL	2590	3045	2858	2923	2758

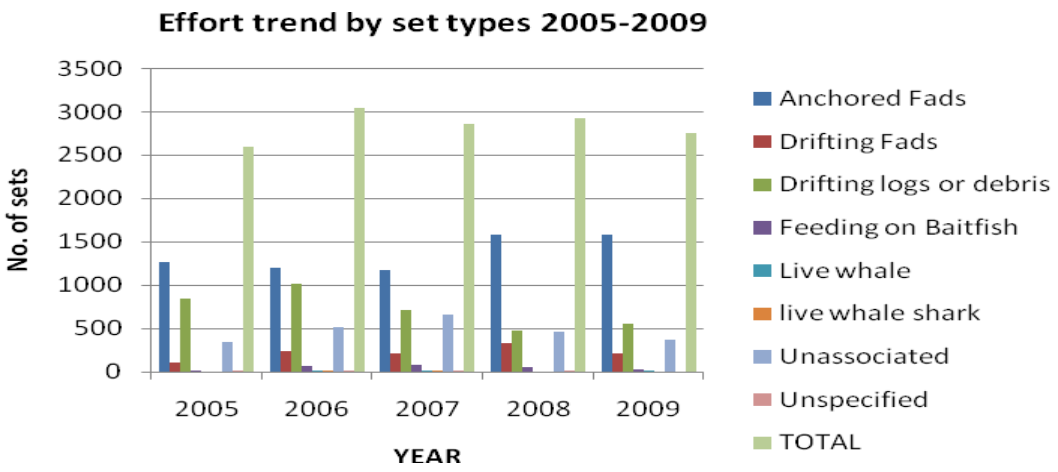


Fig 16. Effort by set types in PNG waters by PNG chartered purse-seine vessels 2005-2009. Shows a slight reduction in un-associated sets and in the total sets.

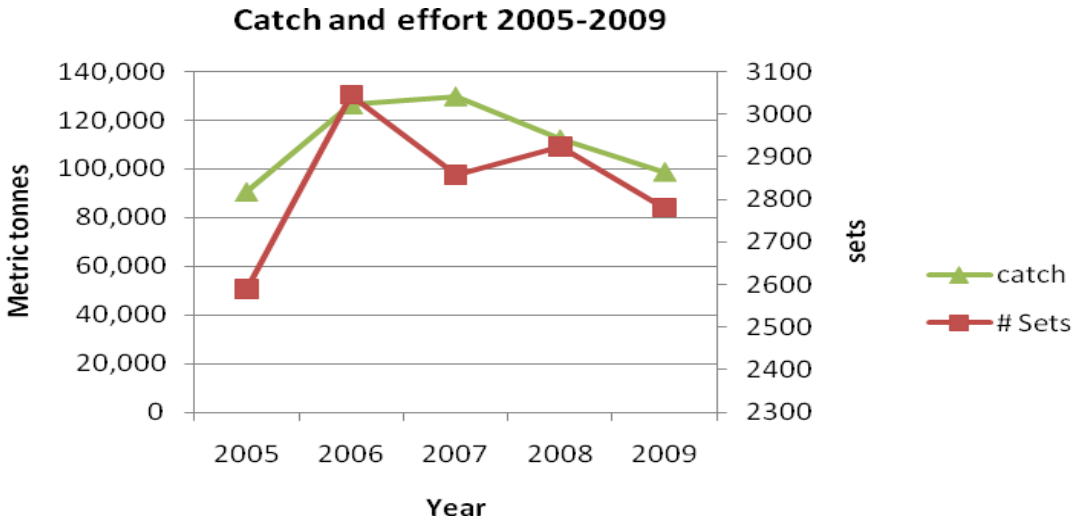


Fig 17. Catch and effort trend by PNG chartered purse-seine vessels in PNG waters. Shows a decline in the total number of sets and the subsequent decline in catches since 2007.

Activity by foreign vessels in PNG waters

Purse-seine

Catch

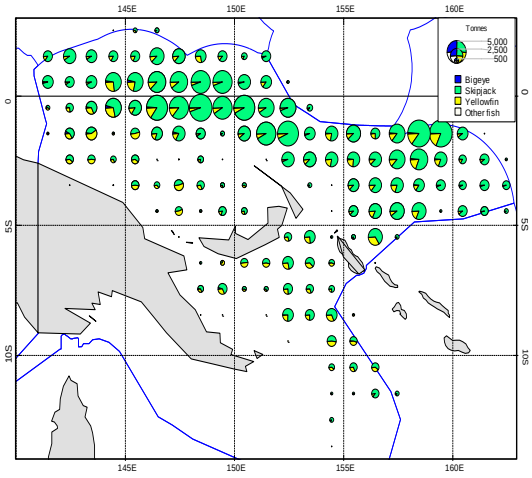
The 2009 catch by foreign vessels in PNG waters was, 323,856mt, an 8% drop from the 2008 catch of 354,104mt (also highest catch in last 5 years, table 11). Annual average catch in the last five years is 290,000mt. Catch by most of the fleets declined in 2009 except for The US, the Philippine and the fleet fishing under the FSMA arrangement (attachment A). The decline in catch is related to reductions in effort (table 11 & fig20). Catch composition in 2009 was Skipjack, 79% Yellowfin, 19% and bigeye 1%. The annual average catch composition by fleet is Taiwan 27%, Japan 21.%, Korea 20%, Philippines 12.%, US 8%, China 7.% and the remaining is Vanuatu and the vessels under the FSM A arrangement.

Table 11. Annual catch and effort by Foreign purse-seine vessels in PNG Waters, 2005-2009 (source: NFA database)

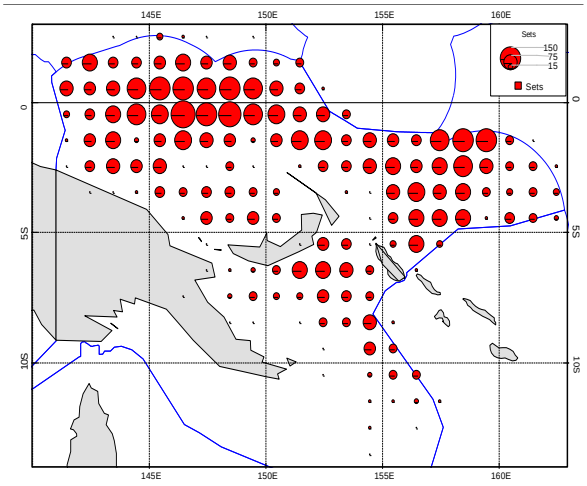
		Effort	Set types		Catch(Metric tonnes)				
Year	Active no. Of vessels	Days fishing & Searching	Asso sets	Un-Asso sets	SKJ	YFT	BET	OTH	TOTAL
2005	87	6,755	2981	711	137,401	36340	965	79	174,785
2006	130	9,140	4302	1060	239,030	35908	1,158	78	276,173
2007	131	10,963	4941	1659	265,788	51264	2,376	705	320,132
2008	128	9,729	5101	1642	277,227	72,164	4,589	120	354,104
2009	155	9,373	4,674	1261	271,294	49,037	3,201	322	323,856

Effort.

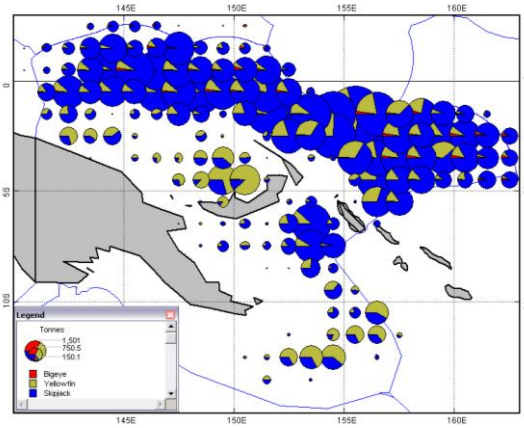
About one hundred thirty six (136) vessels were actively fishing in PNG waters in the last four years. The number increased to 155 vessels in 2009. The average number of fishing days by these vessels in the recent five (5) years is 9,192 days per year. Days in which sets were made, accounted for 63% of the fishing days (table 11). About 79% of the sets were associated sets while only 21% was on un-associated sets (table11&12). There is indication that sets on un-associated schools has increased in more recent years but is decreasing again (fig 19). General trend is that there is decline in both associated and un-associate sets in 2009, hence a reduction in the total number of sets. Biggest users of associated sets in the last five years were Philippines 25%, Taiwan 23%, Korea 19%, Japan 15% and China 10%. The US, FSMA and Vanuatu fleets account for only 8% of the total associated sets in the last five years (fig 21). Sets on logs or debris makes up most the sets and is consistent across all fleets (fig 19). Effort distribution shows that the northern part of PNG and towards the east is where most fishing took place in the last couple of years (figure 18).



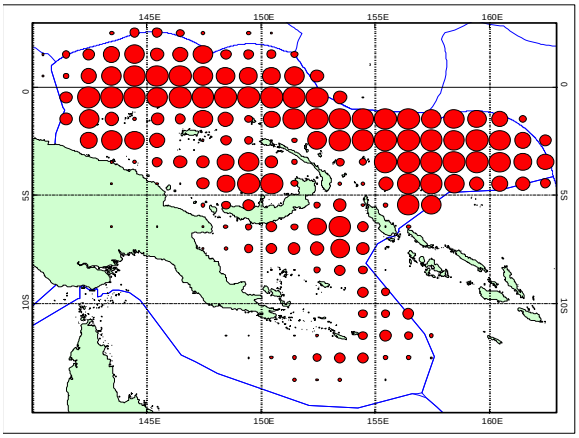
2009



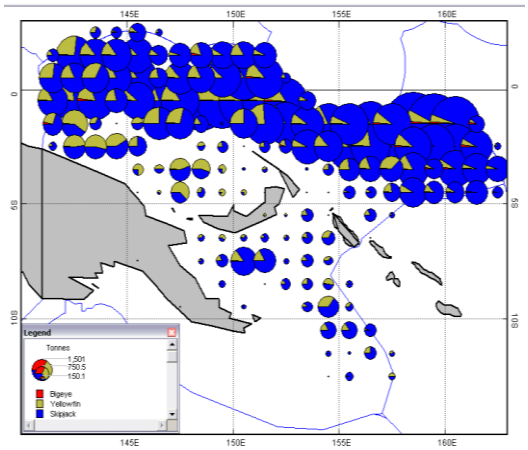
2009



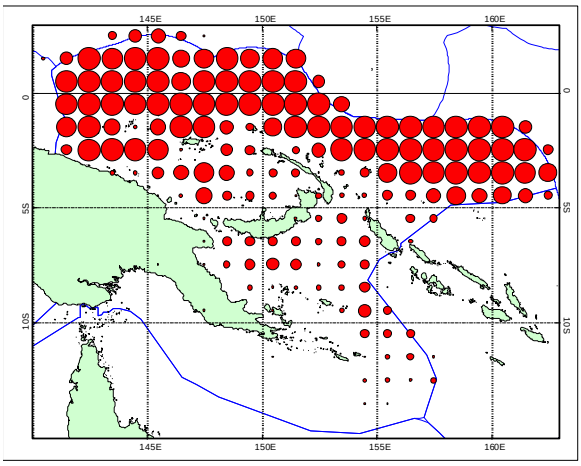
2008



2008



2007



2007

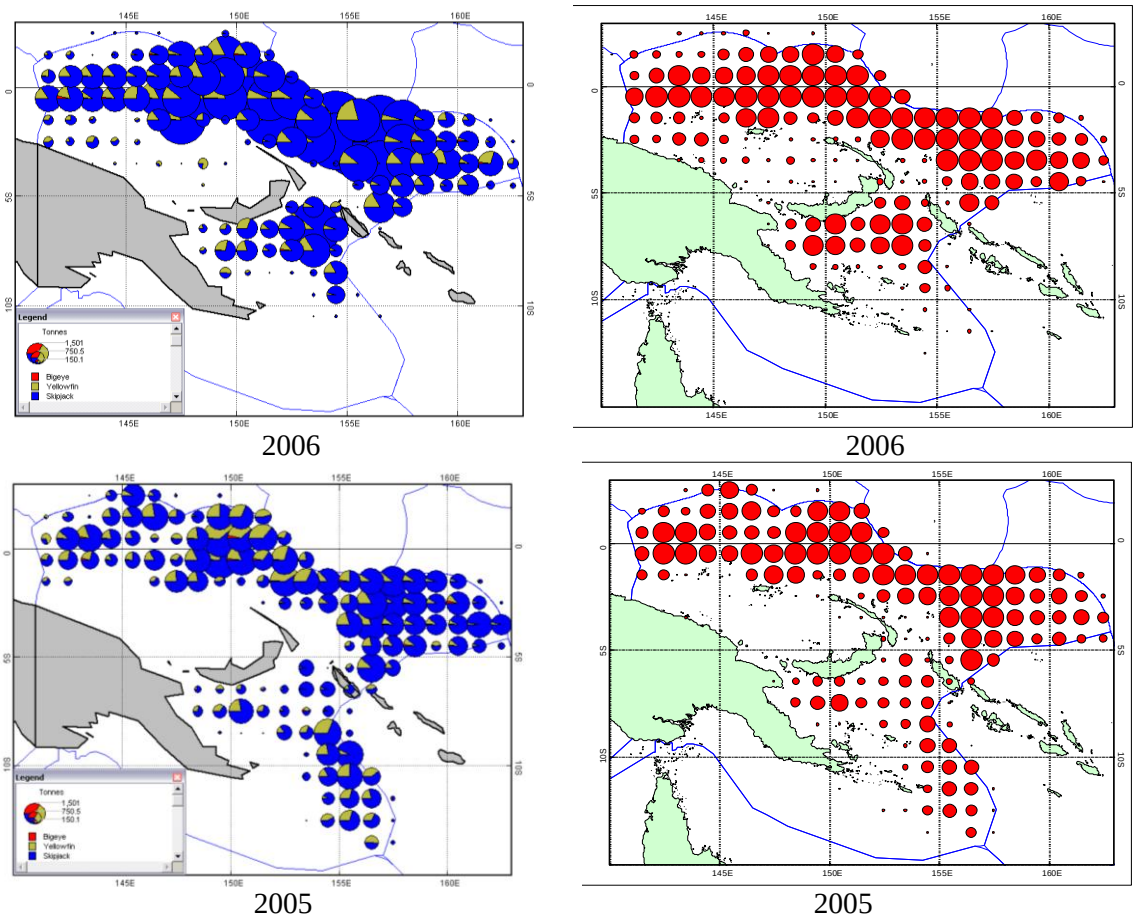


Fig18. Annual catch and effort distribution by foreign purse-seine fleet in PNG waters, 2005-2009. Catch 2009 (top-left) and effort 2009 (top-right) and catch 2005 (bottom-left) and effort 2005 (bottom-right).

Table 12. Effort by number of set types by foreign vessels in PNG waters 2005-2009 (source: NFA database)

Set Types	2005	2006	2007	2008	2009
Anchored Fad	239	309	215	862	28
Drifting Fad	202	594	776	2227	1436
Drifting log or debris	1905	2787	2719	1585	2059
Feeding on bait fish	635	646	1026	919	877
Live whale	0	6	11	19	7
Live whale shark	0	5	7	2	1
Unassociated	711	1076	1673	1668	1177
Unspecified	13	10	72	29	20
TOTAL NO. of Sets	**3705**	**5433**	**6499**	**7311**	**5,605**

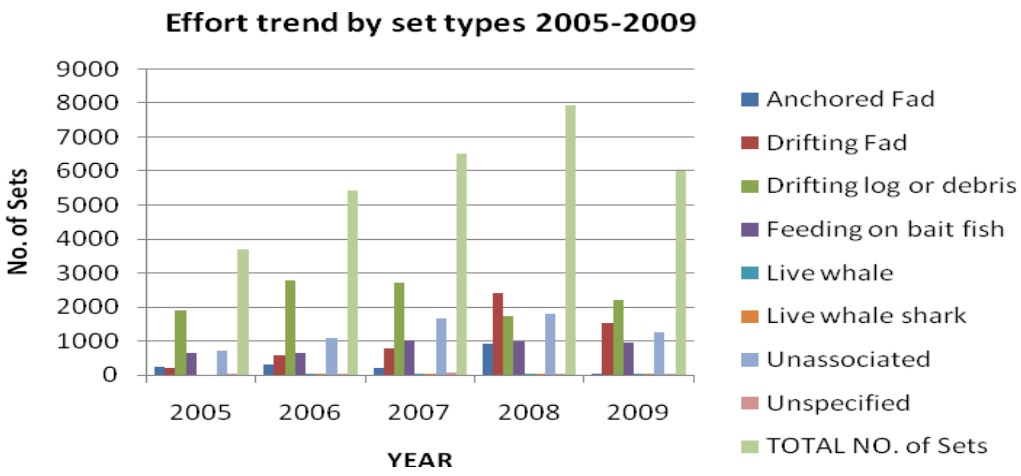


Fig 19. Effort by set type in PNG waters by foreign vessels 2005-2009. Shows a decrease in the total number of sets by foreign vessels in 2009.

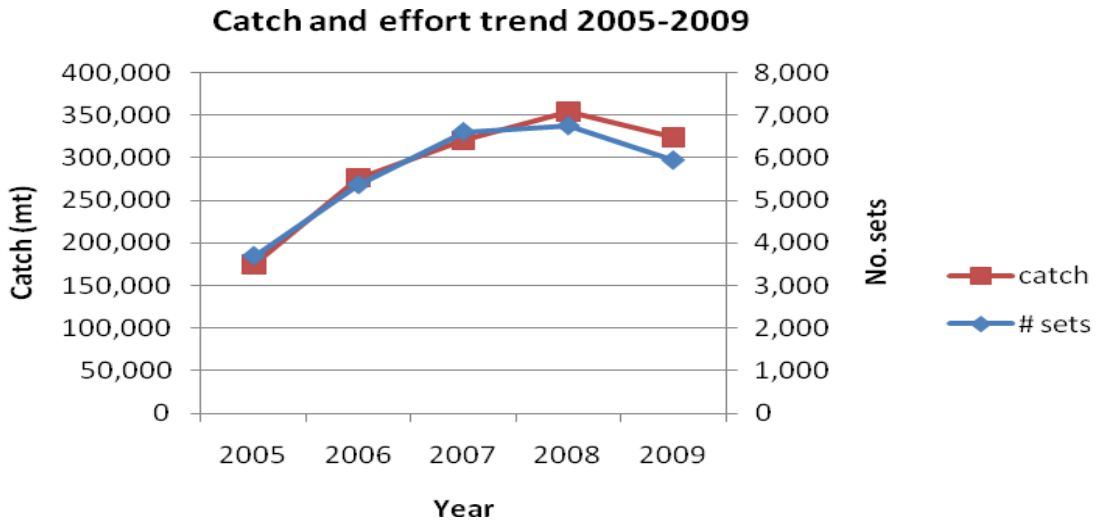


Fig 20. Catch and effort trend in PNG waters by foreign vessels. Shows a decline in the total number of sets and the subsequent decrease in catch in 2009.

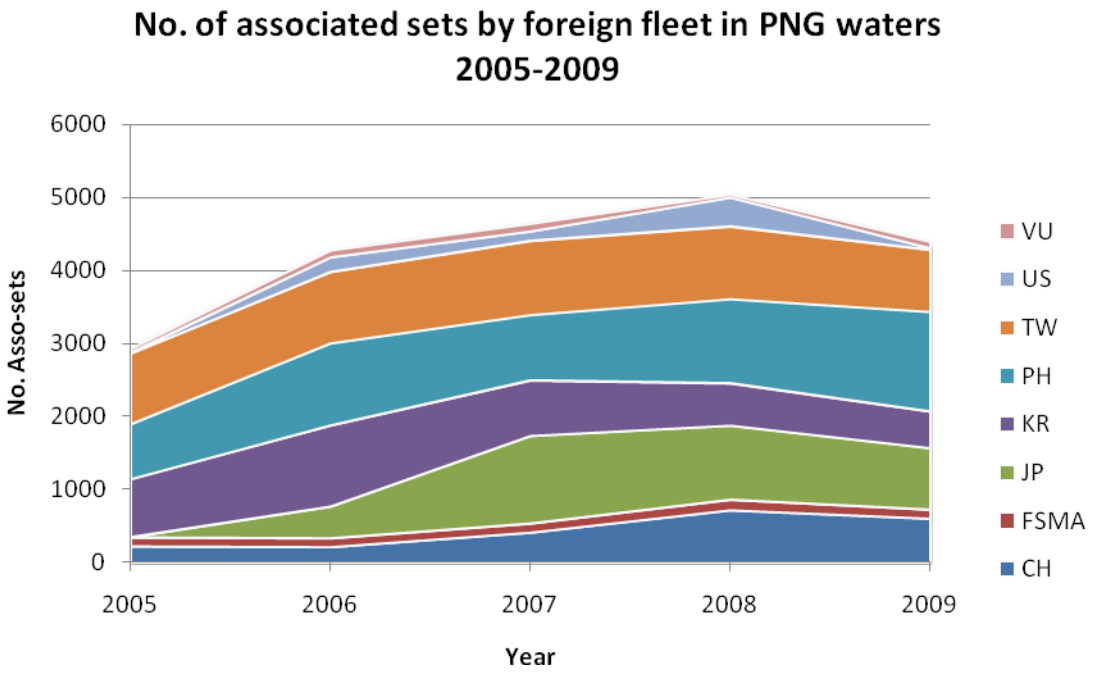


Fig 21. Percentage of associated sets by foreign fleet in PNG waters. Shows, Philippines, Taiwan, Japan and china as the leading users of associated sets in PNG waters.

Total home EEZ catch, for all species, all gears and all fleets combined 2005-2009

The estimated total catch by all vessels fishing in the PNG EEZ for the past five years (2005-2009 inclusive) is shown in table 12, Annual catch average around 430,000mt and is comprised for the most part of purse-seine catches (99% of total catch). The drop in catch in 2009 is a result of reduced fishing effort in 2009 due to a combination of both management decision (3 months fad closer) and possible environmental influence. The high catch in the recent five years is attributed to increased effort (no. of fishing vessels) especially within Archipelagic waters as well better reporting due to the Vessel Monitoring System (VMS). Species composition from purse-seine catch show that skipjack makes up the bulk of the catch (79%) and the remainder (21%) is yellowfin and bigeye less than 1% (table13). Longline catch is dominated by Yellowfin tuna (53%) than Albacore (35%) and Bigeye (5%). The bycatch component comprising sharks and marlins accounts for the remaining 7% (table 6).

Table 13. Total catch by all vessels fishing in PNG waters 2005-2009 (source: NFA logsheet data, 2010).

Year	2005	2006	2007	2008	2009	Historical High
Purse-seine	290,680	421,151	465,021	497,492	453,129	469,544 (2008)
Longline	3,696	4,173	3,371	2,941	2,217	19,584 (1978)
Pole &line	0	0	0	0	0	74,649 (1974)
TOTAL	294,376	425,342	468,392	500,433	455,346	500,433 (2008)

Total effort and catch by year and species

Table 14. Catch and effort by all Purse-seine vessels in PNG waters 2005-2009

		Total Effort	Set types		Catch (metric tonnes)				
Year	No. of Active vessels	Days fishing & searching	Asso sets	Un-asso sets	SKJ	YFT	BET	OTH	TOTAL
2005	129	10,593	6,275	1,167	213,034	75,216	2,015	418	290,683
2006	169	12,904	7,376	1,669	352,746	66,369	1,359	677	421,151
2007	172	14,434	7,653	2,418	376,120	85,349	2,612	940	465,021
2008	169	13,675	8,407	2,282	380,625	111,649	4,833	381	497,492
2009	195	13,348	8,025	1,885	361,468	87,321	3,613	724	453,129

Total effort

Effort in terms of number of vessels has increase in the last 5 years. The increase is due to increase in the domestic fleet with vessels linked to onshore processing and also the increase in the vessels under the US treaty. The Fishing and searching days associated with these vessels has also increased from 10,500 days in 2005 to over 13,000 days in 2008. In 2009 the number of days dropped. The decline can be attributed to some extent to the WCPFC CMM-2008 – 01 where a 2 month ban on associated sets was implemented in 2009.

2. USEFUL INFORMATION

Socio-economic factors

Papua New Guinea's objective in the tuna fishery is to build an 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 have to be participants in the industry.

Disposal of catch

4.1 Exports

Table 13 lists tuna fishery exports by main category and value for the period 2004-2009. The total value of tuna fishery related exports has increased steadily in the last five years peaking at USD 149 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 15. Tuna fishery product exports by volume and value (Source: NFA records; values in USD; frozen shark and frozen tuna weights are dressed; the 2009 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	47,444	78.5	12,545	50.0	10,031	10.3	4,752	2.6	1,833	0.9	125	0.8	149.3
2009	0.6	2.7	138,223	49.1	15,742	49.8	11,249	13.6	5,552	3.1	1,966	1.3	83	0.6	120.2

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 16. 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	100	Under progress	-
Thai Union/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 supply of ice and buying of the fish.

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 those 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 16). For size data, PNG runs an port sampling programme through which size data by species is collected in addition those collected by observers at sea. However the port sampling covers mostly vessels fishing in PNG waters and unloading or transhipping through PNG ports. For vessels not unloading or transhipping through PNG ports, size data is collected through the observer programme. As of 2010, size data is collected from all purse-seine vessels active in the fishery.

For coverage explanations see attachment c.

Table 17 a. Estimated annual coverage of catch, effort and size data for Papua New Guinea fishing fleets in the WCPFC Convention Area, 2005–2009

Gear	Fleet	Year	Catch/Effort data coverage	% coverage	Size data coverage	% coverage
LONGLINE	PAPUA NEW GUINEA	2005	HIGH	>80	HIGH	>15
		2006	HIGH	>80	MEDIUM	5-15
		2007	HIGH	>80	MEDIUM	5-15
		2008	HIGH	>80	MEDIUM	5-15
		2009	HIGH	>80	MEDIUM	5-15
PURSE-SEINE	PAPUA NEW GUINEA	2005	HIGH	>80	MEDIUM	5-15
		2006	HIGH	>80	MEDIUM	5-15
		2007	HIGH	>80	MEDIUM	5-15
		2008	HIGH	>80	HIGH	>15
		2009	HIGH	>80	HIGH	>15

Table 17b. **Estimated annual coverage of catch, effort and size data for Papua New Guinea Chartered purse-seine fleets in the WCPFC Convention Area, 2003–2009.**

Gear	Fleet	Year	Catch/Effort data coverage	% coverage	Size data coverage	% coverage
PURSE - SEINE	PAPUA NEW GUINEA Chartered	2005	HIGH	>80	MEDIUM	5-15
		2006	HIGH	>80	MEDIUM	5-15
		2007	HIGH	>80	MEDIUM	5-15
		2008	HIGH	>80	HIGH	>15
		2009	HIGH	>80	HIGH	>15

Table 17c. Estimated coverage of catch, effort and size data for bilateral-arrangement, foreign fleets fishing in Papua New Guinea's EEZ.

	Fleet	Year	Catch/Effort data coverage	% coverage	Size data coverage	% coverage
PURSE-SEINE	CHINA	2005	HIGH	>80	MEDIUM	5-15
		2006	HIGH	>80	MEDIUM	5-15
		2007	HIGH	>80	MEDIUM	5-15
		2008	HIGH	>80	MEDIUM	5-15
		2009	HIGH	>80	HIGH	>80
	KOREA	2005	HIGH	>80	MEDIUM	5-15
		2006	HIGH	>80	MEDIUM	5-15
		2007	HIGH	>80	MEDIUM	5-15
		2008	HIGH	>80	MEDIUM	5-15
		2009	HIGH	>80	HIGH	>15
		2009	HIGH	>80	HIGH	>15
	CHINESE TAIPEI	2005	HIGH	>80	MEDIUM	5-15
		2006	HIGH	>80	MEDIUM	5-15
		2007	HIGH	>80	MEDIUM	5-15
		2008	HIGH	>80	MEDIUM	5-15
		2009	HIGH	>80	HIGH	>15
	VANUATU	2005	HIGH	>80	MEDIUM	5-15
		2006	HIGH	>80	MEDIUM	5-15
		2007	HIGH	>80	MEDIUM	5-15
		2008	HIGH	>80	MEDIUM	5-15
		2009	HIGH	>80	HIGH	>15
	JAPAN	2005	HIGH	>80	-	-
		2006	HIGH	>80	-	-
		2007	HIGH	>80	-	-
		2008	HIGH	>80	-	-
		2009	HIGH	>80	HIGH	>15

RESEARCH AND INFORMATION

Observer programme

The current number of observers in PNG is about 200. The program aims to train up to 400 observers by the next 3-4 years. The observer training is now a component of the trainings run by the National Fisheries College. The trainings are run four times a year for two months each session. 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 83% (72% in 2009), PNG Charter vessels about 58% (37% in 2009) and foreign vessels just under 30% (36% in 2009). Observers also cover trips on tuna longline vessels and Fad deployment trips (no included in table). There was a general decline in the observer coverage for PNG flagged and PNG chartered vessels, despite increase in observer days in the case of PNG flagged vessels. The decline in observer coverage is attributed to increased vessels days at sea and a decline in observer days for PNG chartered vessels. There was however an increase in observer coverage for foreign vessels fishing in PNG waters in 2009 (36%). On average observer coverage for foreign vessels in the last six years is about 30% (36% in 2009).

Table 18. Observer coverage by PNG observers on fleets fishing in waters under PNG national jurisdiction (source: NFA data base)

	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	3,725	1989	53.4	8,769	2709	30.9
2005	1802	1329	73.8	4,013	2802	69.8	8,781	2079	23.7
2006	1531	1354	88.4	4,689	2924	62.4	11,882	3677	30.9
2007	1363	1125	82.5	4,287	2520	58.8	14,252	2769	19.4
2008	1712	1615	94.3	4,484	3253	72.5	12,487	3952	31.6
2009	2,157	1816	84.2	4,717	2356	50.0	11,052	4017	36.4
AVG	1,608	1,383	86.0	4,319	2,641	61.2	11,204	3,201	28.6

Port sampling programme

PNG runs an intensive port sampling program in the main unloading and transhipment ports around the country. An estimated 20-25% by weight of the unloading and transhipments is sampled. Results of the 2009 activity are as presented in paper *ST-WP 07*.

Attachment A:

Table 19: Annual catches by foreign purse seine fleets in the Papua New Guinea EEZ, by flag and species, 2005-2009 (Source : Logsheets collected by NFA)

		CATCH (metric tonnes)				
Fleet	**Year**	**SKJ**	**YFT**	**BET**	**OTH**	**TOTAL**
CHINA	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	28,515	6,285	64	16	34,879
	2009	21,896	2,493	72	4	24,465
FSM Arrangement	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	19,718	5,083	58	0	24,852
	2009	26,489	1,507	44	0	28,042
Japan	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	52,991	12,484	2,126	8	67,609
	2009	52,747	11,413	1,092	0	65,252
Korea	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
	2009	34,977	6,167	82	1	41,227
Philippines	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	33,581	14,523	354	0	48,458
	2009	36,098	16,146	1,501	216	53,961
Chinese Taipei	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	70,265	11,986	219	79	82,547
	2009	46,002	5,437	142	101	51,682
USA	2005	1,196	460	62	0	1,718
	2006	6,883	702	20	0	7,604
	2007	9,659	1,219	46	0	10,924
	2008	34,216	6,378	243	2	40,837
	2009	47,876	5,494	266	0	53,636
Vanuatu	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	5,192	1,340	10	15	6,557
	2009	5,209	380	2	0	5,591
TOTAL EEZ	**2005**	**137,401**	**36,340**	**965**	**79**	**174,785**
	2006	**239,048**	**35,909**	**1,158**	**78**	**276,191**
	2007	**265,788**	**51,264**	**2,376**	**705**	**320,132**
	2008	**277,227**	**72,164**	**4,589**	**120**	**354,104**
	2009	**271,294**	**49,037**	**3,201**	**322**	**323,856**

ATTACHMENT B

Table 20. Number of sets on set types by fleet 2005-2009.

FLEET	YEAR	AFAD	NLOG	DFAD	BAIT	Live Whale	Live Whale shark	Total Asso	Un-asso	GRAND TOTAL
TAIWAN	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**
	2009	10	411	391	38	0	0	**850**	**270**	**1120**
PHILIPPINES	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**
	2009	478	352	127	408	1	0	**1366**	**302**	**1668**
CHINA	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**
	2009	0	248	344	6	0	0	**598**	**94**	**692**
KOREA	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**
	2009	1	105	172	227	0	0	**505**	**125**	**630**
US MLT	2005		5		2			**7**	**1**	**8**
	2006		45	116	6			**167**	**7**	**174**
	2007		21	20				**264**	**15**	**279**
	2008									
	2009	1	14	3	2	0	0	**20**	**0**	**20**
JAPAN	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**
	2009	14	475	192	152	6	1	**840**	**351**	**1191**
FSM	2005		12	25	14			**51**	**14**	**65**
	2006		5	11	3			**19**	**6**	**25**
	2007									
	2008									
	2009	0	63	45	16	0	0	**124**	**10**	**134**

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 21. 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.