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PART 1: INFORMATION ON FISHERIES, RESEARCH, AND STATISTICS

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SAMOA

INDEPENDENT STATE OF SAMOA

ANNUAL REPORT TO THE COMMISSION

PART 1: INFORMATION ON FISHERIES, RESEARCH AND STATISTICS.

FISHERIES DIVISION
Ministry of Agriculture and Fisheries
Government of Samoa.
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Abstract.

Samoa's tuna fishery comprised of the troll fishery and the tuna longline fishery. Both fisheries operate within Samoa's Exclusive Economic Zone (EEZ) of approximately 120,000 km^2 involving vessels raging from 9 meters to over 20 meters in length.

The troll fishing fleet comprised of some 25 alia fishing vessels (catamaran style) of 9 to 11 meters in length landing just over 154 tonnes of fish in 2008, and an average of around 132 tonnes over the past three years.

The tuna longline fishery in Samoa is much more industrialized and the bulk of the catch is exported. The fishery targets South Pacific Albacore tuna (albacore) and all the catch landed is caught in Samoa's EEZ. An estimated 2977.1 tonnes of fish was landed from the tuna longline fleet in 2008, a drop of around 20 percent from the 2007 catch. Albacore comprised up over 78 percent of the total tuna longline catch in 2008. Catches of yellowfin tuna accounted for around 10.6 percent of the catch in 2008 followed by bigeye tuna at around 3.6 percent. Other pelagic species including broadbill swordfish, marlin, wahoo, dolphin fish and others comprised up the rest of the catch. The fishery involves some 44 vessels of which over half are the alia vessels and some bigger vessels of 12.5 to over 20.5 meters in length. The tuna longline fishing fleet is abased in Samoa and the participation is highly domestic

1.1 Annual Fisheries Information

Samoa's tuna fishery comprised of the troll fishery and the tuna longline fishery. Both fisheries operate within Samoa's Exclusive Economic Zone (EEZ) of approximately 120,000 km^2 involving vessels raging from nine meters to over 20 meters in length. Participation in the Samoa tuna fishery is almost exclusively domestic with the fishing fleet all based locally.

Troll fishing in Samoa occurs all through out the year targeting mainly schools of skipjack tuna in the open sea and around fish aggregating devices (FAD). Other tuna and pelagic species are also caught including yellowfin tuna and dolphin fish. The troll fishing fleet comprised of some 25 alia fishing vessels (catamaran style) of nine to eleven meters in length landing just over 154 tonnes of fish in 2008, and an average of around 132 tonnes over the past three years. The catch is mainly sold at the main fish markets in both Upolu and Savaii, where the catch estimates are obtained from. In some cases, the catch is completely sold out at the port of landing which is usually in the rural areas. This fishery is mainly for the domestic market.

The tuna longline fishery in Samoa is much more industrialized and the bulk of the catch is exported. The fishery targets South Pacific Albacore tuna (albacore) and all the catch landed is caught in Samoa's EEZ. Matured yellowfin and bigeye tuna of over 30 kilograms are also important component of the tuna longline catch as to the high market prices it attracts from fresh chilled markets in New Zealand and main land United States of America. The fishery involves some 44 vessels of which over half are the alia vessels

and some bigger vessels of 12.5 to over 20.5 meters in length. The tuna longline fishing fleet is abased in Samoa and the participation is highly domestic. The tuna longline fishing fleet operates all year around however, fishing effort intensify during the albacore season which is usually occurs from May until October and in some years, November.

1.1.1 Annual catch by species, gear in the WCPFC Convention Area.

An estimated 140.51 tonnes of skipjack tuna was caught from the troll fleet operating in Samoa's EEZ in 2008, comprising over 90 percent of the total troll catch. This is an increase of over 39 percent from the skipjack amount landed in 2007. Most of the skipjack catch was taken from free swimming schools as there's only one anchored FAD in Samoa's EEZ that supports troll fishing activities. Skipjack catches is observed to be steadily increasing from 2006 to 2008. Yellowfin tuna is the second most caught fish from the troll fishery comprising up just over 4 percent of the total catch in 2008. Unlike skipjack tuna, a decreasing trend is observed for annual catches of yellowfin tuna since 2006. A drop of over 47 percent is observed for yellowfin catches in 2008 from the 2007 catch, which is around 53 percent lower than the amount caught in 2006. Other species that were often caught including Dolphin fish and Kavalau comprising up 2.6 and 2.2 percent of the total troll catch in 2008. Other pelagic species that were caught in minor amounts from the troll fishery were rainbow runner and barracuda, which were estimated at 0.04 and 0.09 tonnes respectively.

Table 1: Troll caches from 2006 to 2007

	2006	**2007**	**2008**
Skipjack tuna (*Katsuwonus pelamis*)	94.22	100.64	140.51
Yellowfin tuna (*Thunnus albacares)*	25.87	12.03	6.35
Dolphin fish (*Coryphaena hippurs*)	4.11	0.99	4.11
Barracuda	0.41	0.09	0.09
Wahoo (*Acanthocybium solandri*)	0.31	0.07	
Kavalau	0.49	1.57	3.39
Bigeye tuna (*Thunnus obesus)*	0.14	0.02	
Rainbow runner (*Elagatis bipinnulata*)	0.14	0.32	0.04
Total	**125.69**	**115.70**	**154.49**

The tuna longline fishing fleet has a much longer range than the troll fleet and ventured out further exploiting the full range of Samoa's EEZ. The fleet operates through out the year and landed all its catch in Samoa. Albacore is the targeted species and occurs through out the year however, strong seasonal variation in albacore catches occurs from May to October/November. An estimated 2977.1 tonnes of fish was landed from the tuna longline fleet in 2008, a drop of around 20 percent from the 2007 catch. Albacore comprised up over 78 percent of the total tuna longline catch in 2008. Catches of yellowfin tuna accounted for around 10.6 percent of the catch in 2008 followed by bigeye tuna at around 3.6 percent. Other pelagic species including broadbill swordfish, marlin, wahoo, dolphin fish and others comprised up the rest of the catch.

Table 2: Estimated weight (whole weight) in tonnes of tuna landed from Samoa's tuna longline fleet.

	2004	2005	2006	2007	2008
Albacore *Thunnus alalunga*	**1,232.5**	**1,262.7**	**2,112.7**	**3113.3**	**2342.5**
Yellowfin *Thunnus albacares*	**444.2**	**198.8**	**263.8**	**305.0**	**316.8**
Bigeye *Thunnus obesus*	**103.5**	**64.2**	**128.0**	**100.9**	**105.7**
Other species	**154.6**	**138.5**	**209.6**	**236.2**	**212.1**
Est. total catch	**1934.8**	**1664.2**	**2714.1**	**3755.4**	**2977.1**

1.1.2 Number of vessels by gear type, size (fleet structure)

Fishing vessels comprising up the Samoa's commercial fishing fleet are all locally based and all their catches are landed in Samoa ports. Commercial fishing vessels are licensed according to length under the 2005-2009 Samoa Tuna Management and Development Plan. This has seen fishing vessels categorised under five classes - Class A (≤11m) Class B (>11m -≤12.5m) Class C (>12.5 -≤15m) Class D (>15m-≤20.5m) and Class E (>15m).

Table 3: Number of longline vessels fishing for albacore tuna in Samoa's EEZ as per Samoas TMDP categorization.

	Class A	Class B	Class C	Class D&E[1]	Total
2004	2	1	5	9	**17**
2005	17	3	3	9	**32**
2006	37	2	2	13	**54**
2007	43	2	2	13	**60**
2008	28	1	2	13	**44**

Table 4: Number of longline vessels fishing for albacore tuna in Samoa's EEZ based on RT categorisation.

Size class (GRT)	2004	2005	2006	2007	2008
0–10	3	20	37	43	28
10–50	9	7	11	11	11
50–200	5	5	6	6	5
200–500					
500+					

[1] The two Classes combined given that there were less than 4 vessels in Class E and all poses the same fishing capacity as with vessels in Class D.

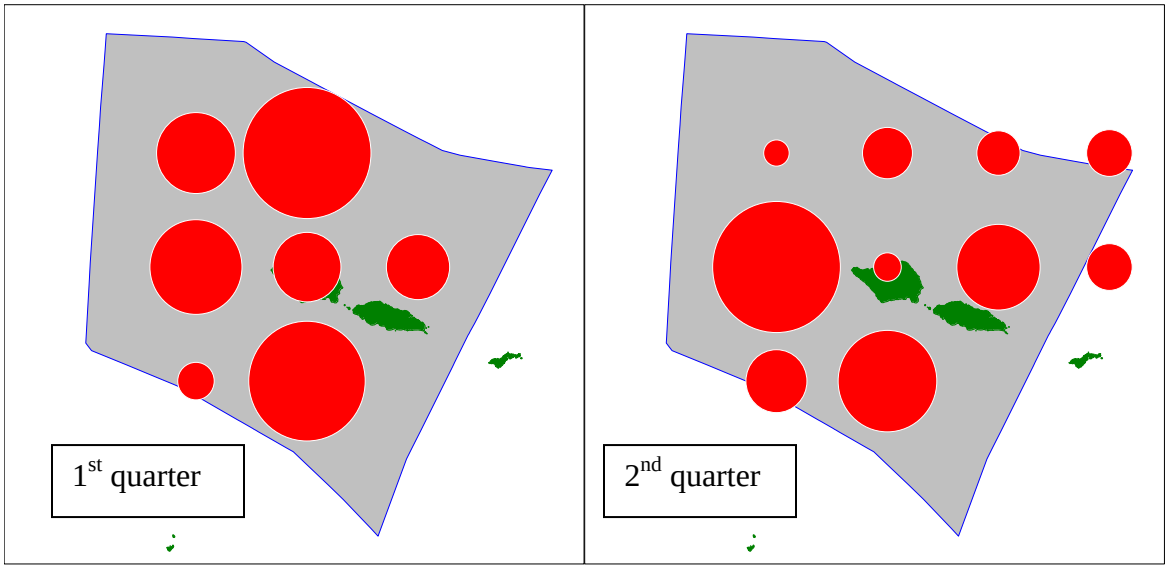
While the number of bigger vessels remains relatively the same from 2004 to 2008, the number of vessels in the alia category shows a reduction of 35 percent in 2008 from the amount of vessels in 2007, after a gradual increase from 2004.

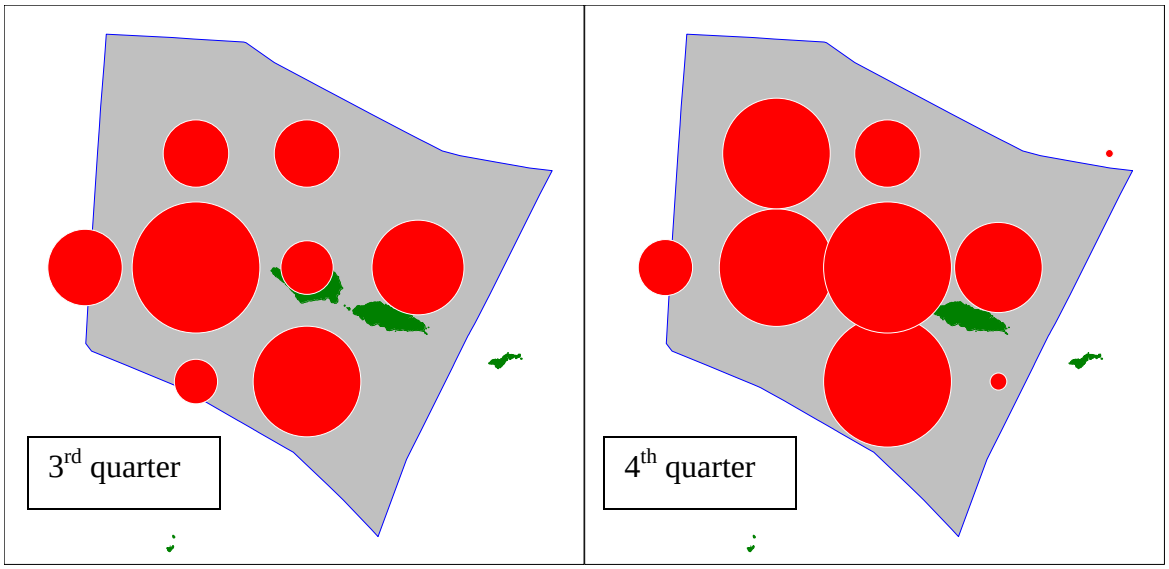
Table 5: Number of Troll and Longline vessels in the Alia category (Class A) from 2006 to 2008

Class A (Alia) (≤11m)	2006	2007	2008
Troll vessels	15	24	25
Tuna longline vessels	37	43	28

1.1.3 Fishing patterns (catch by time/area)

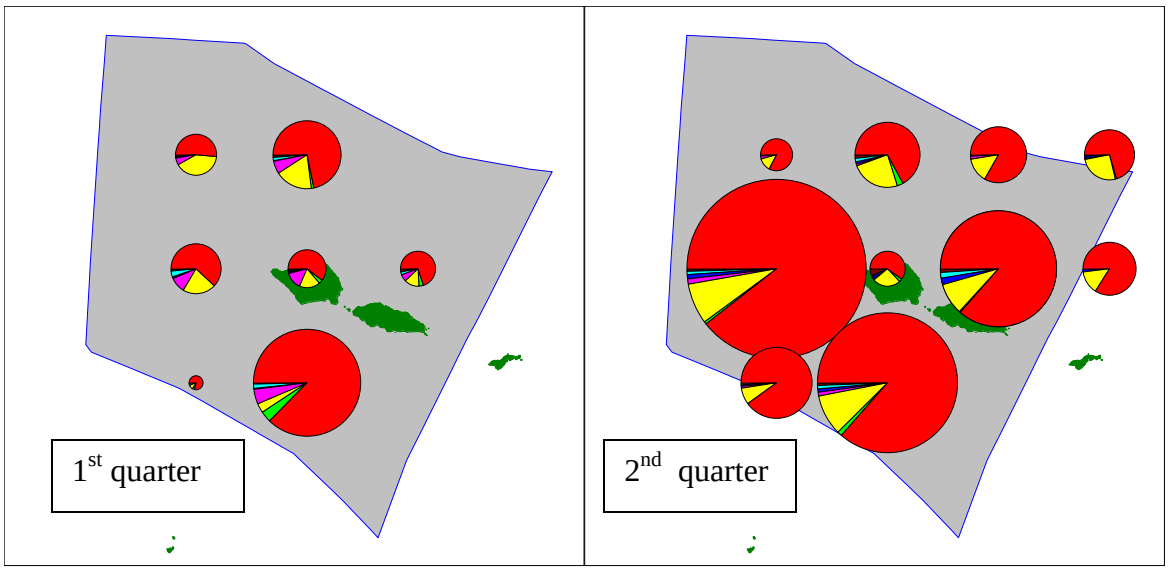
Figure 1: Distribution of Samoan longline effort (hooks) by quarter during 2008. The number of hooks deployed s proportional to the area of the circle.

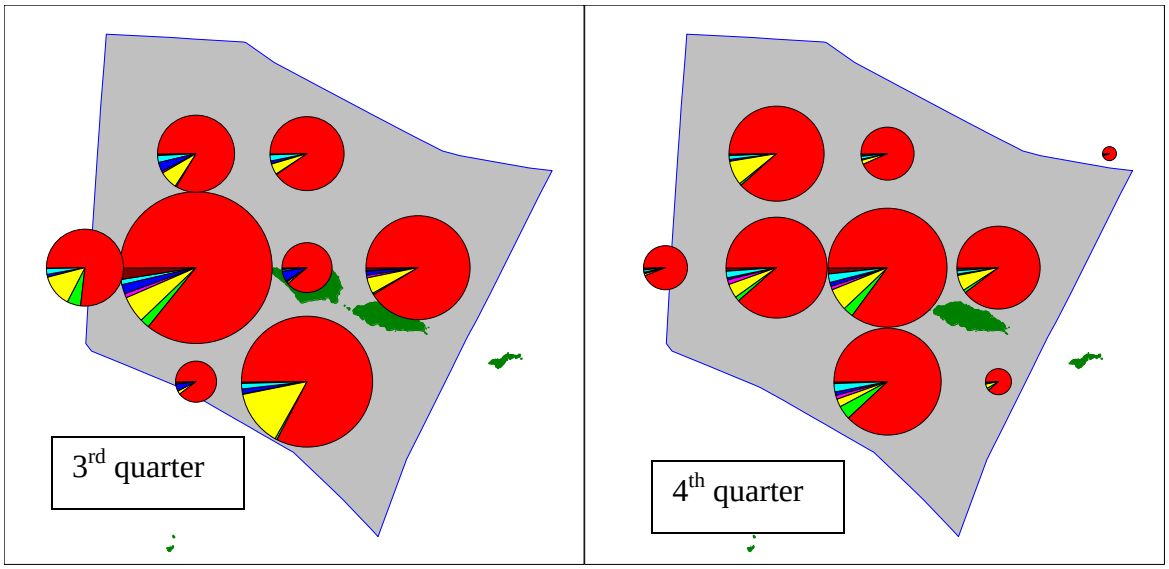


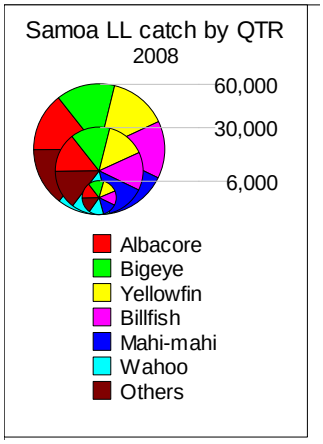


The distribution of Samoa's longline effort is confine within Samoa's EEZ which approximately falls within a 5^{o} lat. by 5^{o} long grid. The temporal distribution of the longline effort in 2008 indicates the fishery operating all year around. The effort levels show more concentration in the 4th quarter while the 2nd quarter has the least effort. The 1st and 3rd quarter have relatively the same effort.

Figure 2 : Distribution of Samoan longline catch (kgs) by species and quarter during 2008

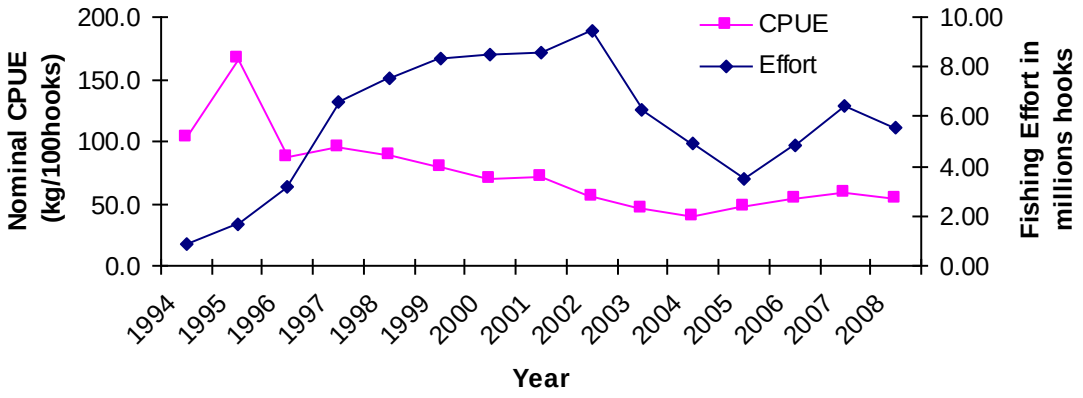






The tuna longline catches particularly that of albacore are prominent in the 2nd and 3rd quarter and slightly reduced in the 4th quarter. The first quarter shows very low catch levels compared to other quarters. The catch composition is heavily dominated by albacore all through out the four quarters. Other species including yellowfin and bigeye tuna have been caught consistently through out the year, with no distinct changes in catches observed for each quarter.

Figure 3: A plot of nominal CPUE and effort trends from 1994 to 2008 for Samoa's domestic tuna longline fleet.



A general decline in CPUE in the fishery is observed over time despite rapid increases and high levels of effort maintained by the fleet up until 2002. CPUE shows improvements in 2005 to 2007 before it slightly drops again in 2008.

1.1.4 Estimated catches on non target species.

Table 6 shows non-target species caught from Samoa's Tuna longline fishery. Like yellowfin and bigeye tuna, some of the non target species including dolphinfish (*Coryphaena hippurus*), wahoo (*Acanthocybium solandri*), swordfish (*Xiphias gladius*), moonfish (*Lampris guttatus*) and striped marlin (*Tetrapturus audax*) caught from the fishery made up an important component of the fresh chilled fish exports.

Table 6: Non target species caught from Samoa's tuna longline fishing fleet targeting albacore. The fleet operates inside Samoa's EEZ, lies within the WCPFC statistical area south of the equator.

Non Target Species	2004	2005	2006	2007	2008
BIGEYE THRESHER SHARK (*Alopias superciliosus*)				0.05	
BLACK MARLIN (*Makira indica*)	2.25	6.81	3.25	13.19	15.25
BLACKTIP REEF SHARK (*Carcharhinus melanopterus*)	0.02				
BLUE MARLIN (*Makaira nigricans*)	8.98	14.68	19.65	20.67	15.84
BLUE SHARK				1.03	
BROADBILL SWORDFISH (*Xiphias gladius*)	3.73	1.30	3.00	4.68	6.37
DOGTOOTH TUNA (*Gymnosarda unicolor*)			0.37		
DOLPHINFISH (*Coryphaena hippurs*)	28.99	26.50	64.97	51.20	39.19
ESCOLAR (*Lepidocybium flavobrunneum*)	0.07	0.13	0.09	0.23	
GALAPAGOS SHARK (*Carcharhinus galapagensis*)				0.11	
GREAT BARRACUDA (*Sphyraena barracuda*)	9.76	3.78	5.75	10.79	8.18
LONGNOSE LANCET FISH (*Alepisaurus ferox*)	0.10		0.11	0.04	0.02
MARLIN[2]	1.62	17.77	2.58	7.54	15.71
MOONFISH (*Lampris guttatus*)	0.32	2.71	1.92	2.29	10.67
OCEANIC WHITETIP				0.36	
OILFISH (*Ruvettus pretiosus*)	0.50		0.04	1.93	1.04
POMFRET[3]	6.52	2.78	3.21	2.80	3.1
RAINBOW RUNNER (*Elagatis bipinnulata*)	0.05	0.02		0.06	
SAILFISH (*Istiophorus platypterus*)	2.06	2.79	2.32	3.13	7.21
SHARK[4]	1.88	2.38	3.45	4.77	1.69
SHORTBILL SPEARFISH (*Tetrapturus angustirostris*)	3.38	1.53	4.21	6.58	1.21
SILKY SHARK *(Carcharhinus falciformis*)				0.07	
SKIPJACK TUNA (*Katsuwonus pelamis*)	57.51	37.20	14.87	31.50	20.19
SOUTHERN BLUEFIN TUNA (Thunnus maccoyii)			0.23	0.03	
STRIPED MARLIN (*Tetrapturus audax*)	24.32	5.25	4.41	7.48	21.11
SUNFISH (*Ranzania laevis*)	0.51	0.11	0.10		0.38
TUNA[5]		0.46	0.51	0.71	0.91
WAHOO (*Acanthocybium solandri*)	60.60	48.43	35.30	54.99	62.14
Total	**252.67**	**161.66**	**138.57**	**209.62**	**236.22**

Logsheets collected from the longline fishing fleet together with port sampling data and very minimum observer data for 2008 all shows no reports of sea turtles catches.

1.1.5 Useful Information

The Ecosystem Approach to Fisheries Management (EAFM) process is currently underway in Samoa. The review of Samoa's fisheries legislation is also in progress. Work in the development of Samoa's Tuna Management and development Plan 2020-

[2] This could be a combination of Blue, Black or Striped Marlin as it was difficult to identified during port sampling due to 1) it was already processed on board (sliced into pieces), 2) came out frozen and discolored.

[3] This includes *Brama brama, Eumegistus illustris, Taractichthys steindachneri* and all other pomfrets coded BRZ

[4] Sharks unloaded from longline vessels without fins and tails.

[5] Tuna unloaded from longline vessels covered with sheets to be exported fresh chilled

2014 is also underway. FFA plays a critical role in these activities with assistance also being sought from the Secretariat for the Pacific Community (SPC) on fisheries science related matters.

A drop in both frozen and fresh chill tuna exports was observed in 2008. This is a direct result from the 20 percent drop in the tuna longline catches in 2008 from the 2007 catch as all the tuna exports are almost exclusively from the tuna longline fishery.

Table 6: Volume in (MT) of Samoa's frozen and fresh chilled fish exports from 2002 to 2006

Year	Frozen	Fresh chilled	Total Exports
2003	1580	474	2054
2004	1339	534	1837
2005	1101	230	1331
2006	1436	139	1575
2007	2737	437	3174
2008	2083	125	2208

1.2 Research and Statistics

Port sampling activities and logsheet data continues to provide the main data for the estimation of annual catch and effort levels for the domestic longline fleet. The lengths data for all species landed however are sent to SPC for research purposes. Market landings survey provides catch estimates for troll catches. It is conducted a similar way with the port sampling activity however only a portion of the whole catch from a troll vessel is sampled. Samoa Fisheries is currently looking at strategies to strengthen tuna fisheries data collected from troll vessels.

The logsheets are collected from the captains of each fishing vessel, and then it is registered and entered into the offshore database for processing. The same is done for port sampling data. Boat census data is also collected and entered in the offshore database. This is to verify the number of boats going out fishing and the number of fishing days for each vessel category against logsheets information of fishing days. This data is critical in the estimation of Samoa's catch and effort data from its tuna longline fishing fleet.

Samoa observer programme manage to have a very minimum coverage of the longline activities. A new strategy is being proposed under the developed TMDP to address various issues that affect the placement of observers on board our domestic fishing vessels.