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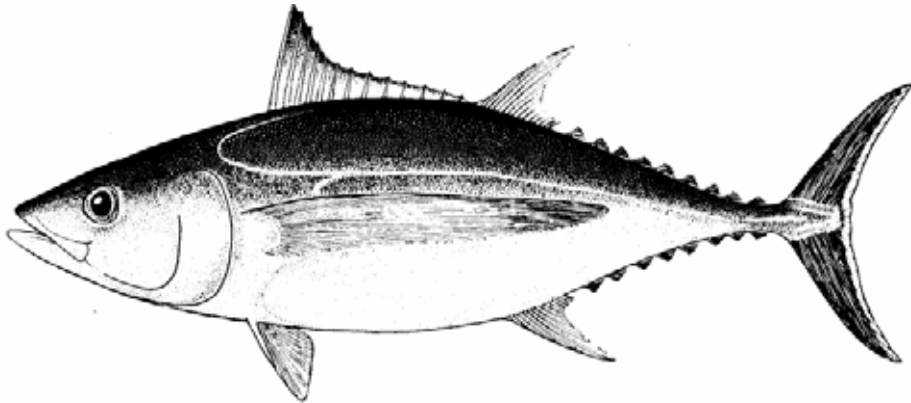
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INDEPENDENT STATE OF SAMOA

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Samoa Tuna Longline Fishery Report



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1. INTRODUCTION

The domestic tuna longline industry in Samoa has been developed rapidly since the mid 1990s very much due to the successful modification of the gear design. Albacore tuna (*Tunnus alalunga*) is the target species while large (>20 kg) yellowfin and bigeye tunas also make up a major component of catches from the domestic tuna longline fleet. Various pelagic species (by-catch) are also caught in Samoa's EEZ however; they are of lesser importance to the export markets relative to, Albacore and large Bigeye and Yellowfin.

In 2001, an estimated 6180 metric tonnes of fish was harvested from the domestic tuna longline fishing. Around 80% of the catch was exported generating estimated revenue of SAT \$45,788,000. Annual catches were then declined considerably from 2002 to 2005.

A gradual improvement in catch rates was observed since May 2005 as compared to the past three years. June was the peak month in 2005 with a nominal catch rate of around 90 kg/100 hooks for all species caught. Albacore which is the targeted species, accounted for around 76% of the total tuna longline catch in 2005.

An estimated catch of around 1664 metric tonnes of fish was caught in 2005 by the domestic tuna longline fleet. Tuna accounted for over 90% of the total catch. An estimated 1486.3 metric tonnes of the catch was exported as either fresh chilled or frozen fish. The rest of the catch was sold to local markets particularly hotels and restaurants.

Despite having the smallest EEZ in the region coupled with the recent decline in tuna longline catches, the domestic tuna longline fishery has continued to be one of the major export earners to Samoa's economy with its fish exports in 2005 generating an estimated amount of over 13 million tala.

2. FLEET STRUCTURE

Commercial fishing vessels in Samoa are license according to length under the current (05 - 09) tuna management and development plan. This has seen local fishing vessels categorised under five classes, Class A ($\leq 11\text{m}$) Class B ($>11\text{m} - \leq 12.5\text{m}$) Class C ($>12.5 - \leq 15\text{m}$) Class D ($>15\text{m} - \leq 20.5\text{m}$) and Class E ($>15\text{m}$).

Table 1. Estimated active domestic longline vessels from 2000-2006 in each class category.

Year	Class A ($>11\text{m}$)	Class B ($>11-12.5\text{m}$)	Class C ($>12.5-15\text{m}$)	Class D and E ($>15\text{m}$)
2000	119	20	9	6
2001	116	14	8	11
2002	31	15	8	14
2003	6	4	5	9
2004	2	1	5	9
2005	17	3	3	9
2006*	22	2	2	10

* Estimates from January to June 2006

All fishing vessels under Class B to Class E are exclusively longliners. Vessels in Class A, mainly refers to as the alia (catamaran style vessels) which were the first vessels to engage in domestic longline fishing in Samoan waters. Overtime, bigger commercial longliners were introduced into the fishery as to the successful and good returns generated from the alia operations. As indicated in Table 1, the alia vessels dominated the domestic longline fishery up until 2002 where an abrupt drop in the number of alia was observed. A significant drop in the numbers of Class B vessels was also observed in 2003. Unlike Class B, there was a considerable

amount of alias re-entering the longline fishery in 2005 and continue to do so in 2006. The number of longline vessels in Class C gradually decreases since 2000 from 10 to 2 in 2006. The number of fishing vessels in bigger Classes of D and E does not show a distinct trend as with all the other Classes.

3. DOMESTIC LONGLINE CATCHES

3.1 Annual Catch Estimates for 2000 - 2005

Table 2: Annual catch estimates (metric tons) for the main species by the domestic fleet, 2002–2005 (based on port sampling and other sources).

Species	2002	2003	2004	2005	Grand total
ALBACORE	4,222.90	2,253.00	1,232.50	1,262.66	16,015.36
YELLOWFIN TUNA	369.00	292.60	444.20	198.83	2,827.33
BIGEYE TUNA	137.00	110.00	103.50	64.21	694.11
SKIPJACK TUNA	114.40	69.40	38.70	14.78	323.88
STRIPED MARLIN		0.80	5.20	4.39	13.99
SHORTBILL SPEARFISH	1.60		3.40	1.53	16.43
BLACK MARLIN	10.50	9.50	2.20	6.81	36.91
BLUE MARLIN	25.30		9.00	14.91	72.71
BROADBILL SWORDFISH	13.40	1.40	3.90	1.30	30.40
SAILFISH	13.90	0.20	2.10	2.79	25.09
DOLPHINFISH	92.00	52.70	29.10	26.42	289.72
ESCOLAR				0.11	0.11
GREAT BARRACUDA	10.50	13.40		3.58	34.88
WAHOO	78.50	41.10	48.70	35.20	254.40
MOONFISH				2.70	2.70
POMFRET				2.85	2.85
RAINBOW RUNNER			0.10	0.02	0.32
BARACUDA				0.07	0.07
BIGEYE BARACUDA	0.30	0.10	9.70		12.50
SHARK			1.80	2.48	4.28
BLUE SHARK					0.30
GREY REEF SARK					0.30
SILKY SHARK	0.50				0.50
BIGEYE TERESER SHARK	0.20				0.20
SUNFISH		1.70	0.10	0.10	7.40
DOGTOOTH TUNA	1.40				1.40
MARLIN				17.77	17.77
SOUTHERN BLUEFIN TUNA	0.20			0.23	0.43
ESCOLAR			0.10		0.10
TUNA			0.50	0.51	1.01
Total	5,091.60	2,845.90	1,934.80	1,664.24	20,687.44

Source: Data from 2002-2005 were obtained from the Samoa Fisheries database summarising port sampling data.

Annual estimates of longline catches have been decline since 2003 as shown in Table 2. There is however a slight improvement in albacore catches in 2005 as compared to albacore catches in 2004.

Reports from SPC suggest that abundance (CPUE) show strong correlations to some oceanographic conditions. Langley (2004) reports that catch rates of albacore in other domestic fisheries (e.g. Fiji and Tonga) have been related to oceanographic conditions and lower catch rates have been attributed to higher sea surface temperature and lower frontal activity (currents and eddy features). Furthermore, the report states that in 2002 and 2003 sea surface temperatures in the Samoa EEZ were significantly higher during the main fishing season. Similarly altimetry

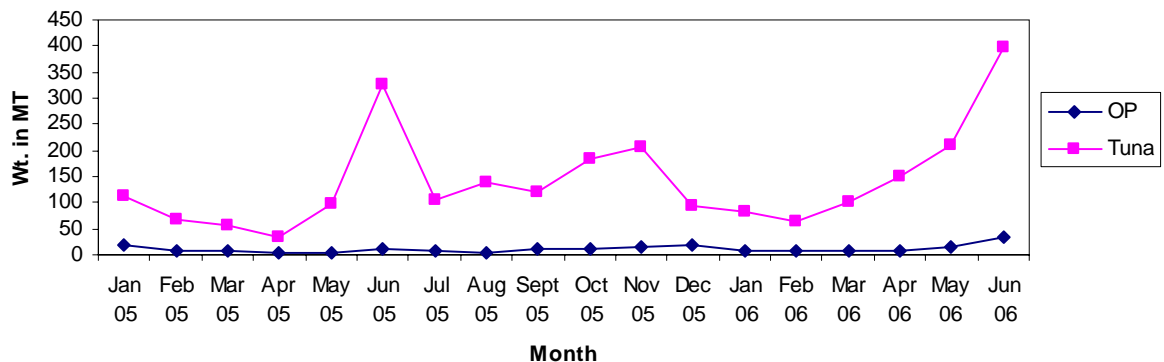
data (sea surface height anomalies) indicate a lower level of frontal activity during the same period. These factors may explain the low catch rates during the same period. The time series of oceanographic data and catch effort data is too short to determine the frequency of these low catch events.

Table 3: Catch estimates and percentage composition of each species landed from the domestic longline fleet in 2005

Species	Wt. in MT	% comp. of catch
ALBACORE	1,262.66	75.87
YELLOWFIN TUNA	198.83	11.95
BIGEYE TUNA	64.21	3.86
SKIPJACK TUNA	14.78	0.89
STRIPED MARLIN	4.39	0.26
SHORTBILL SPEARFISH	1.53	0.09
BLACK MARLIN	6.81	0.41
BLUE MARLIN	14.91	0.90
BROADBILL SWORDFISH	1.30	0.08
SAILFISH	2.79	0.17
DOLPHINFISH	26.42	1.59
ESCOLAR	0.11	0.01
GREAT BARRACUDA	3.58	0.21
WAHOO	35.20	2.12
MOONFISH	2.70	0.16
POMFRET	2.85	0.17
RAINBOW RUNNER	0.02	0.00
BARACUDA	0.07	0.00
SHARK	2.48	0.15
SUNFISH	0.10	0.01
MARLIN	17.77	1.07
SOUTHERN BLUEFIN TUNA	0.23	0.01
TUNA (unknown)	0.51	0.03
Total	1,664.24	100.00

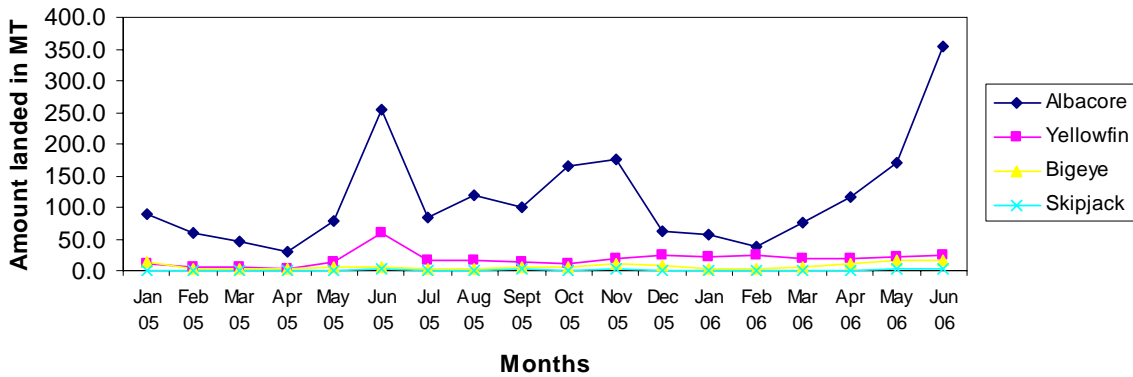
Catches from the domestic longline fleet is purely dominated by tuna particularly Albacore which accounts for over 75% of the 1664.24 metric tonnes of fish caught in 2005. A considerable proportion of the total catch was taken up by Yellowfin with a percentage composition close to 12% and Bigeye at around 3.8%. A variety of other pelagic fishes including Wahoo, Dolphin fish and Broad Bills are also caught but contribute very less to the total catch in 2005.

Figure 1: Trend in catch estimates of tuna (albacore, yellowfin, bigeye and skipjack) and other pelagic species listed in Table 2 from January 2005 to June 2006.



Apart from tuna species, other pelagic species contributed insignificantly to longline catches as shown in Graph 1.

Figure 2: Trend in catch estimates of the four tuna species (Albacore, Yellowfin, Bigeye and Skipjack) from January 2005 to June 2006.

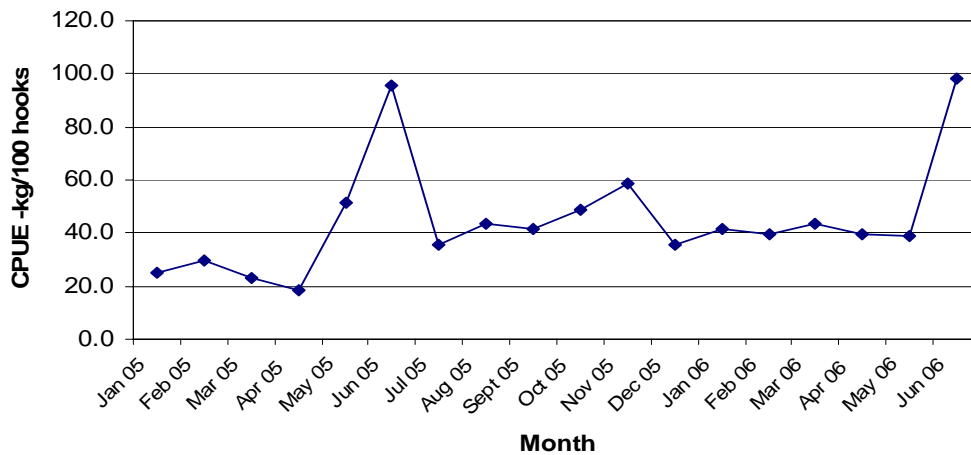


Out of the four tuna species, Albacore which is the targeted species for the domestic longline fishery dominated the catch followed by Yellowfin. Bigeye and Skipjack are also caught, but in lesser amounts as compared to Yellowfin.

Fluctuation in Albacore catches is evident as shown in Graph 2 however, there were remarkable catches observed in June 2005 and June 2006 where over 250 and 350 metric tonnes of Albacore were caught respectively.

3.2 Catch Rates from January 2005 to June 2006

Figure 3: Combined nominal CPUE for Albacore, Yellowfin, Bigeye and Skipjack



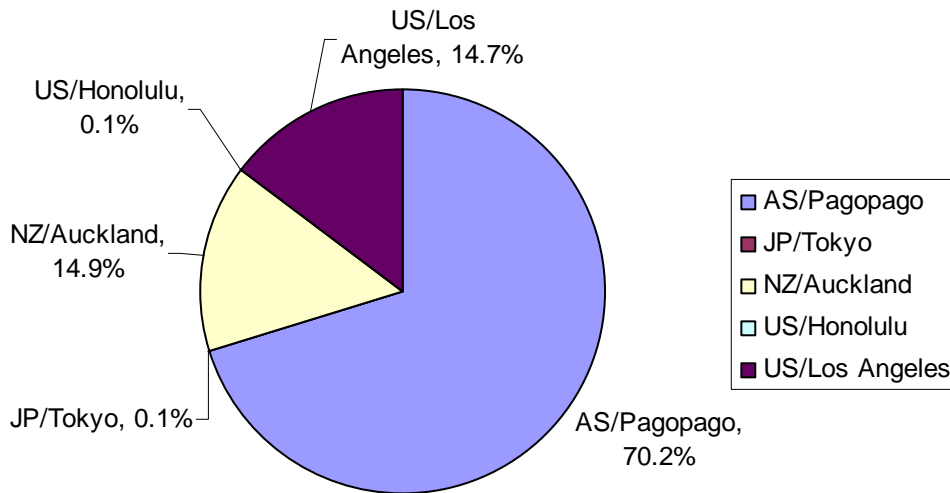
Low catch rates ranging from around 19-30kg /100 hooks were experienced from Jan to April in 2005. It improves in May and then shoots up over the 80 mark in June before it falls back down again in July. One interesting point to note is that when the catch rates falls back down after June it didn't fall below the levels experienced from January to April in 2005. It fluctuates from July 2005 to May 2006 above levels experienced from Jan – April until it peaks again in June 2006 with a catch rate exceeding 90kg /100 hooks. There was also a peak in November with its catch

rate close to 60kg/100 hooks, but not as significant as compared to both months of June in 2005 and 2006.

4. EXPORTS

4.1 Market destination of the catch.

Figure 4 : Market disposal of fish exports from the domestic longline fishery in 2005



Around 89% of the total domestic longline catch is exported. The bulk of fish exports go to the markets in A. Samoa with a relatively fair portion exported to the fresh chill markets in the United States, New Zealand and Japan.

4.2 Species Composition of fish exports

Figure 5: Species Composition of fish exports from the domestic longline fishery in 2005

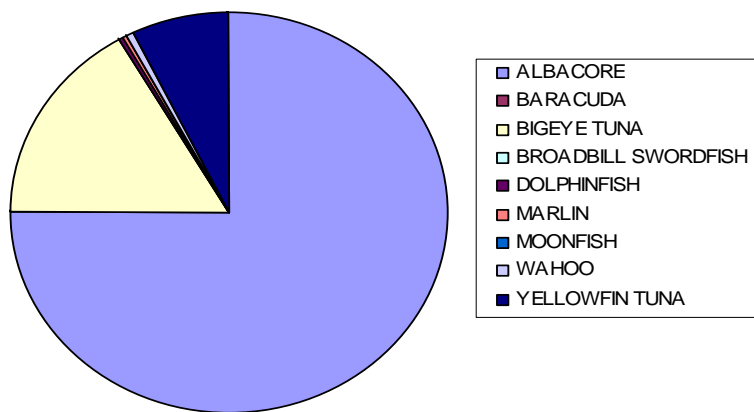


Figure 5 show that Albacore constituted the bulk of fish exports in 2005. Most of the Albacore is presumed to be exported as frozen fish to the canneries in A. Samoa. Bigeye and Yellowfin tuna

constituted a considerable proportion of the total fish exports with other valuable by-catch species accounted for relatively much lesser portion of the total fish exports.

5. ONSHORE DEVELOPMENTS

5.1 JICA – sponsored projects for fisheries wharf and fisheries market

This project is schedule to complete in December 2006. The extension will allow more room for fishing boats to moor safely as to the congestion in the wharf during periods of low catches. The fisheries market is undergoing major renovation work and aims at improving the standards as well as the environment in which the catch from the domestic fishing fleet is stored, handled and sold to the general public.

5.2 Other infrastructural developments

Plans are underway for the installation of an ice making machine for the alia longline fleet based in Apia as to the insufficient supply of ice experienced during periods of good catches. Another ice making machine is proposed to install at Salelologa in the island of Savaii for fishermen actively involved in fishing in that area.

6. MONITORING ACTIVITIES

The Fisheries Division with the assistance from the AusAid sponsored Samoa Fisheries Project in the mid 1990's developed an offshore fishery database system that uses length measurements to estimate weight of each offshore species caught from the domestic longline fishery. Over the years it was developed with assistance from SPC to include reports on CPUE for each offshore species caught as well as the amount of fish exported.

The following surveys provide data that feeds into the offshore fishery database.

- Port Sampling
- Daily boat counts
- fishing vessel log sheets
- Provisional fish export forms
- Fish export certificates.

Port sampling has continue to provide the most reliable data to estimate total catch of the domestic longline fleet This is a SPC sponsored project and it was started in Samoa in the late 1990's. Port sampling surveys at least 50% of weekly unloads for all vessel Classes.

With the exception of few alias, all other longline vessels unload at the Fisheries Wharf. Daily boat counts in the Fisheries wharf was designed to provide data for the purpose of raising catch estimates from port sampling and fishing vessels log sheets.

Fish export data from provisional export forms are verified against fish export certificates before it is entered in the offshore fishery database.

7. FUTURE PROSPECT OF THE FISHERY

Despite low catches in 2005 as compared to 2004, the overall tuna CPUE of the fishery is very encouraging. The CPUE tends to fluctuate through out 2005 and the first six months of 2006 however, the general pattern observed suggests a gradual increases in CPUE with the exception of June 2005 and June 2006 where the CPUE for Albacore tuna increases dramatically. Given these observed trends and the oceanographic account associated with the dramatic recent decline

in tuna catch rates, the nature of the tuna longline fishery in Samoa is now much more understandable and measures will be considered in reviewing the national tuna management and development plan to ensure the long term viability of the fishery.

8. REFERENCES

- 1. Langley, A., 2004. *The influence of oceanographic conditions on recent trends in catch rates from the Samoa Longline Fishery*. SPC Report. Noumea.**
- 2. Imo R, Mulipola A, Time S and Faasili U. Jr. 2005. *Samoa Tuna Fisheries Report*. WCPFC - SC1 (FR WP - 22) Samoa Fisheries Division. Apia.**