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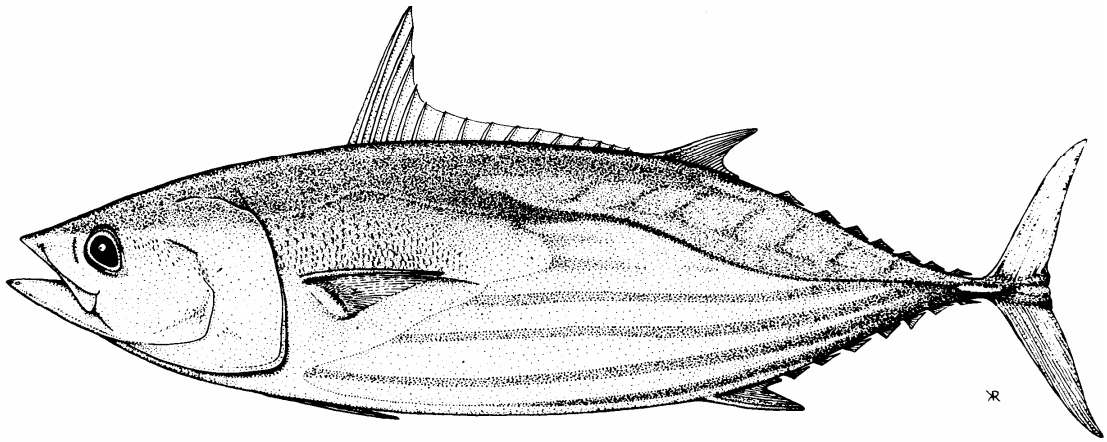
Fiji tuna and billfish fisheries



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1. INTRODUCTION

The Fiji fishing zone has provided good catches of albacore and other pelagic species. This area has attracted foreign fishing activity since the early 1950s. Fijian participation in the commercial tuna fishing then picked up in the mid 1970s, then mainly focusing on pole-and-lining. Since the inception of the Taiwanese and Korean longline activity in the 1980s, longlining has become the predominant fishing method, while pole and line fishing is conducted in a very small scale with few artisanal trolling fishers targeting FAD's for the local market.

The Fisheries Department's Management Services Division of the Ministry of Fisheries and Forests in its development phase continues to execute and implement the management of its offshore resources under the Tuna Development and Management Plan.

As a precautionary approach in managing the tuna fishery, the Fiji Government has pegged a TAC (Total Allowable Catch) at 15,000mt for albacore, bigeye, and yellowfin tuna. Continuing work on setting Fiji's National Total Allowable Catch based on previous history of catches, available information on the productivity of the EEZ, the present mix of gears, and existing regional assessments of the stocks is currently underway. A CAP limit of 110 vessels was also placed on the number of longline licenses to fish in Fiji waters.

This paper was prepared for presentation to the WCPFC – SC 1 in Noumea, New Caledonia on August 2005. It describes the methods used by Fiji fleets (both licensed and unlicensed-Fiji based vessels) to catch tuna and billfish in the Fijian fishing zone, fishing fleet structure, catch records for five years (2000-2004), marketing of catches, onshore monitoring and future developments.

2. TUNA AND BILLFISH FISHERIES

2.1 Fleet Structure

Table 1 shows the breakdown of domestic vessels licensed to fish in Fiji waters over the last five years.

Table 1. The number of domestic vessels licensed to fish in Fijian waters.

YEARS	DOMESTIC LONGLINE VESSELS	DOMESTIC POLE AND LINE VESSELS
2000	61	1
2001	95	2
2002	103	2
2003	101	1
2004	84	14

For the past five years the number of domestic licensed longline vessels has increased significantly from 61 in 2000 to 103 in 2002. However, the number of longline vessels licensed then decreased in 2004 to 84 due to a stricter license vetting process and better monitoring on the conduct of fishing

vessels fishing in Fiji waters. During the 2004 fishing period, the 84 longline vessels made a total of 1,997 fishing trips.

The pole and line vessels in 2004 comprised of 13 Japan vessels having trip-based licenses and a single Fiji vessel.

2.1.1 Domestic longline

For the last five years, longlining has been the preferred method of tuna fishing in Fiji. Catch logsheets are completed by vessels and provided to the Fiji Fisheries Department as a condition of fishing license.

Unfortunately, logsheets do not provide full coverage of activities at this stage and it has been necessary to adjust the logsheet catch totals to account for missing data. For years prior to 2000, the logsheet coverage is not known and it has therefore not been possible to raise the logsheet data. Estimates of the target species and non-target species for 2004 were determined by raising the available logsheet data to account for **months** where vessels were known to be active, but did not provide logsheets. (The Fisheries Department maintains a table showing months where licensed vessels were active/inactive and where logsheets have been submitted). The 2004 logsheets coverage for the Fiji domestic fleet was 98%.

The non-target species was assumed to have been under-reported in logsheets and with more observer data now being collected, future estimates of the non-target species would be determined using the proportion of observers' non-target species composition to the target species percentage composition (as done for the 2002 non-target species estimates).

Unlike most distant-water longline fisheries, the Fiji domestic fishery lands and markets a number of non-tuna species, although shark and other species are not commercially viable (e.g. lancet fish) are typically discarded. It should be noted that the estimation of total catch at this stage does not take into account the non-target species (e.g. shark) discarded at sea.

Table 2 shows the breakdown of the total catch for each of the past five years, noting that discarded non-target species have not been accounted for.

Table 2: Estimates of the catch by species for the domestic longline fleet.

SPECIES	CATCH LANDED (MT)				
	2000	**2001**	**2002**[1]	**2003**	**2004**
Tuna (ALB, BET, YFT)	9217	10715	10906	10252	16708
Non-Target	2202	1504	5567	1953	2909
TOTAL	11441	12219	16472	12205	19617

* Non-target species raised to observer percentage species composition (2002).

The total catch by the domestic longline fleet (catches inside and outside the EEZ) during 2004 was 19,617mt (16,708mt for the tuna species). The catch of tuna by the domestic longline fleet increased by 6,456mt from the 10,252mt caught in 2003 (see figure 1). This increase was attributed to the increase in the record catches of all the 3 tuna species.

Since 2000 (as shown in figure 1) the total tuna catch has increased steadily up until 2002. The 2003 total tuna catch however showed a decreasing trend to levels lower than that achieved in 2001 and 2002. The tuna catch then increased extensively in 2004.

Trends in nominal CPUE are sometimes used as an indicator of abundance, but must be considered in association with other direct (e.g. targeting strategy, patterns of effort, size composition of the catch, recruitment, etc.) and indirect (e.g. environmental) factors affecting the fishery.

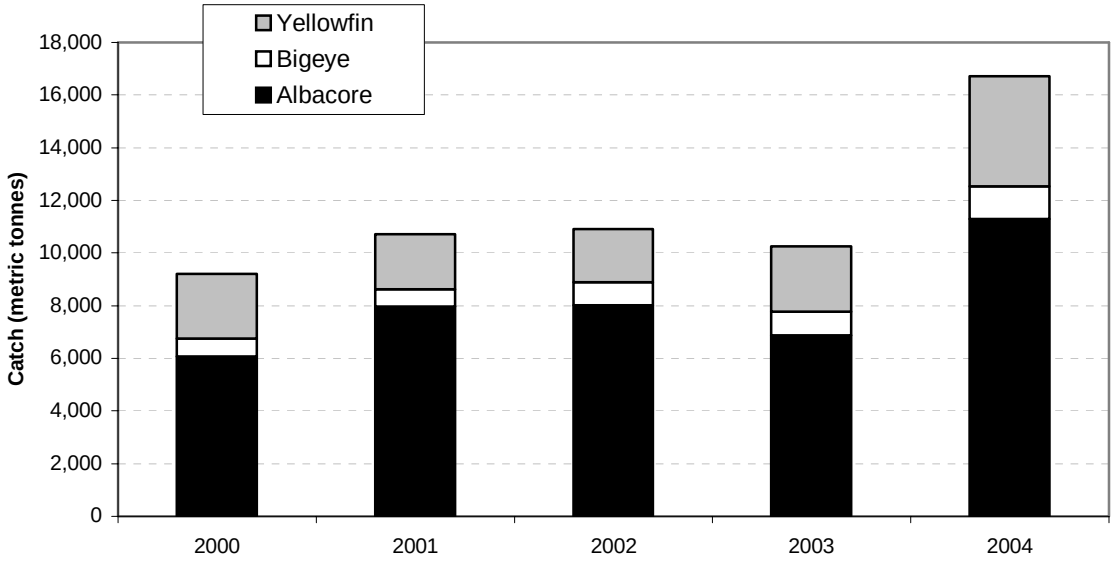

Figure 1. Annual Catch (metric tonnes) trends for albacore, bigeye, and yellowfin tuna.

Figure 2 shows the trends in tuna CPUE for the Fiji longline fleet. The CPUE for albacore increased sharply in 1996 from being consistently below 1.0 per 100 hooks to around 1.5 per 100 hooks. In 2003, it returned to the 1.0 per 100 hooks before increasing again to 1.3 in 2004. The peak in the yellowfin CPUE for 2000 may be due to there being more yellowfin available compared to previous years, otherwise yellowfin CPUE appears relatively stable over the time series. Bigeye CPUE appears to have remained consistent at and around the 0.2 level over the time series.

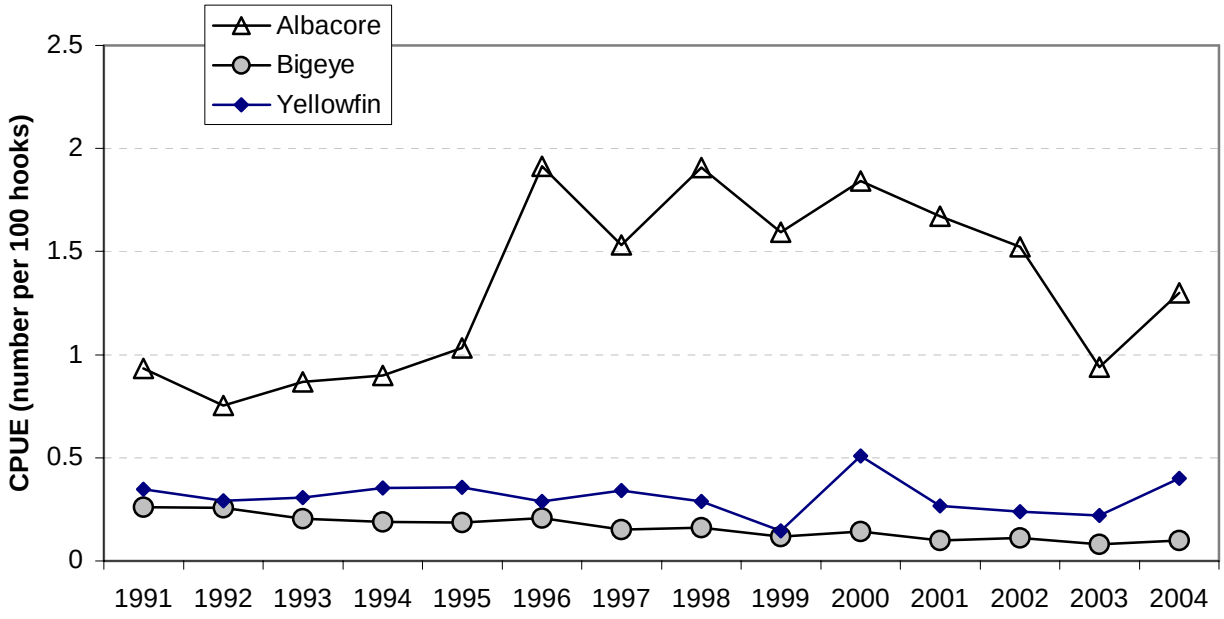

Figure 2. Annual trends in albacore, bigeye and yellowfin nominal CPUE (number per 100 hooks) for the Fijian longline fleet

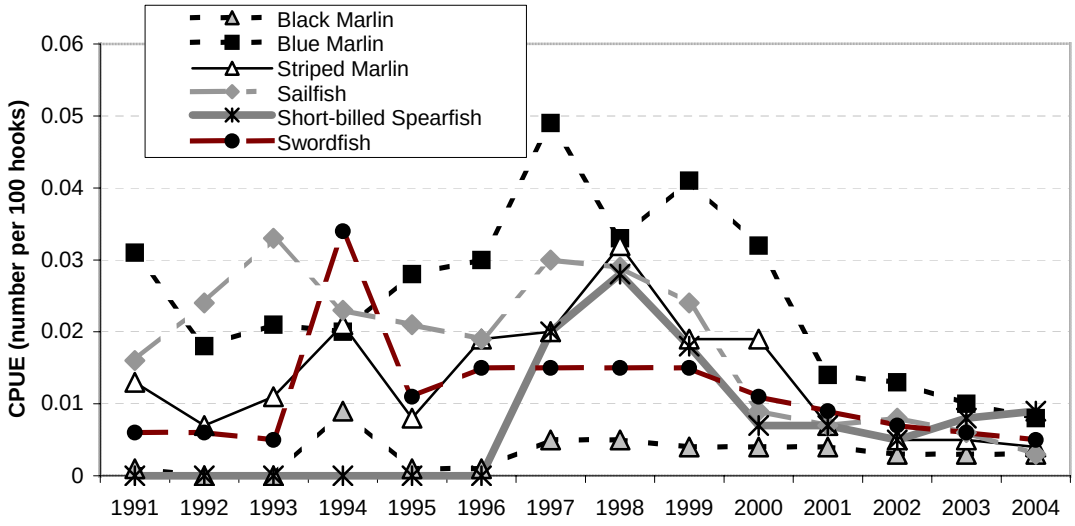

Figure 3. Annual trends of billfish CPUE (number per 100 hooks) for the Fijian longline fleet.

Note that there may be some degree of under-reporting of non-target species. In future, hope to use the catch rates (CPUE) from observer data.

From 1991 to 1993, trends for the billfish – black marlin, blue marlin, striped marlin, and swordfish, were similar i.e. all increased and decreased in nominal CPUE around the same times. From the years 1994 to 1999, the trends shown by the swordfish, striped marlin, and black marlin were opposite to that of the blue marlin. In 1994, the number of fish caught per 100 hooks increased notably for swordfish, striped marlin, and black marlin at the same time being stable for the blue marlin. The billfish nominal CPUE decreased rapidly between the years 1999 to 2001 to a range between 0.014 and 0.002 fish per 100 hooks. This decreased further in 2004 with the exception of short-billed spearfish, which increased from 0.005 fish per 100 hooks to 0.009 fish per 100 hooks.

The species composition of the tuna catch is primarily made up of albacore (typically more than 75%), followed by yellowfin, then bigeye. The second and third quarters (April–September) account for the highest catches of tuna by the Fijian longline fleet. The seasonal catch for albacore was highest in the third quarter and lowest in the first, whereas the highest yellowfin and bigeye catches are typically during the second quarter (corresponding to the period with the highest sea surface temperature) and lowest during the fourth.

Figure 4 shows the trends in tuna species composition for the domestic longline fleet. In the early 1990s, when fishing activity was relatively low, albacore accounted for about 50% of the tuna catch but then increased to around 70% - 80% from 1995 onwards with 68% being recorded in 2004. Trends of yellowfin catch throughout the years have remained at 10-20% of total tuna catch since 1995. The percentage composition of bigeye has been progressively declining over the time series, and has remained around 8-10% since 1996. The 2004 tuna catch composition sees a slight increase in albacore and yellowfin and a decrease in bigeye.

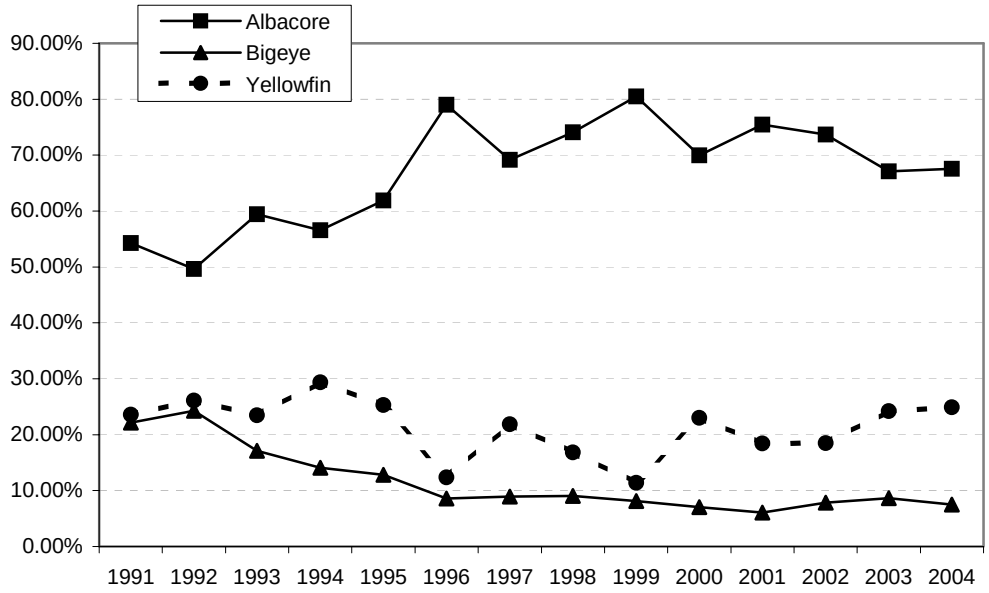

Figure 4. Trends in tuna species composition (by weight) for the Fiji Domestic longline fleet fishing within Fiji's EEZ.

2.1.2 Pole and Line

The Fiji domestic pole and line began in 1976. Averaging around 4,000mt, the domestic fleet had continually supplied PAFCO with mainly skipjack and yellowfin tuna. Unlike the longline fleet, the number of pole and line vessels has decreased over the years with quite a few converting into longliners. No data was provided for the pole-and-line activity.

2.2 F.A.D – Trolling

The Government engaged itself in the deployment of FADs in 1998. They had deployed and maintained FADs around the country to assist the industrial sector (pole-and-line and purse seine) when they were operational, as well as assisting the small-scale sector. The Fisheries Department has promoted small-scale tuna fishing activities. At this stage, catch estimates for this fleet are not available.

3 MARKETING OF CATCHES AND BYCATCHES

In 2004, Fiji exported 66% of sashimi grade tuna to Japan and America. The remaining 34% was exported to China and other countries. Fiji's billfish are also exported mainly to the US, buying close to 43% of the total billfish exports.
Besides the US, the non-target species is exported to China, Thailand, New Zealand and Japan. The Fiji fish for the Fresh Sashimi market is either flown out direct to LA or Japan by Air New Zealand from Nadi or indirectly through New Zealand first by Air pacific/Qantas and then reconnected to the respective destinations by Air New Zealand.

Albacore and skipjack are either processed at the local cannery (PAFCO) or exported to PagoPago. The Pacific Fishing Company (PAFCO) receives its raw materials directly from the domestic and foreign vessels unloading at the Levuka port or indirectly through Freezer Containers from the local fishing companies. The raw fish material supplied to PAFCO is exported as three products i.e. as canned fish, packed tuna loins, and as fishmeal. The canned tuna is mainly exported to the American and Canadian (65%) markets and approximately 25 % to Kobe in Japan. The tuna loins are exported to Bumble Bee in Santa Fe, America for further processing whereas the fishmeal is shipped out mainly to the Philippines and Japan.

The remainder of the bycatch and other damaged fish are sold locally at supermarkets, restaurants or directly to consumers.

4 ONSHORE AND MONITORING DEVELOPMENTS

Onshore developments include the establishment of a new fish-processing factory bringing the total number of processing factories in Suva to 5 and the construction of a fisheries jetty. This would help shorten the time from when the fish are unloaded from the vessels to when it reaches the export markets and also shorten the turn around time of vessels.

Fiji is still serious in the monitoring of its offshore fisheries resources. Since its inception in July 2002, the Fisheries department still maintains its observer programme headed by a national observer coordinator. The team comprises of 11 fully-fledged observers who are continually placed on Fiji licensed vessels. The programme also encompasses port sampling and transhipments.

The Enforcement Section is also responsible for carrying out surveillance activities in harbor and at sea in collaboration with the Fiji Navy. This is done by accompanying naval patrol vessels and EEZ surveillance flights during their quarterly surface and aerial patrols.

Increased monitoring by the two sections has greatly improved the coverage of logsheets from 94% in 2003 to 98% in 2004, port sampling, and unloading data. The year 2004 saw the further upgrading of Fiji's first ever offshore fishery database by SPC-OFP and the department's IT personnel, allowing the department to also monitor and help police Fiji's territorial and archipelagic seas.

5. FUTURE DEVELOPMENTS

Plans are under way to develop a new multi-purpose port in the head of Suva bay to cater for increasing trade volumes as the present wharf is limited by the lack of room to expand.