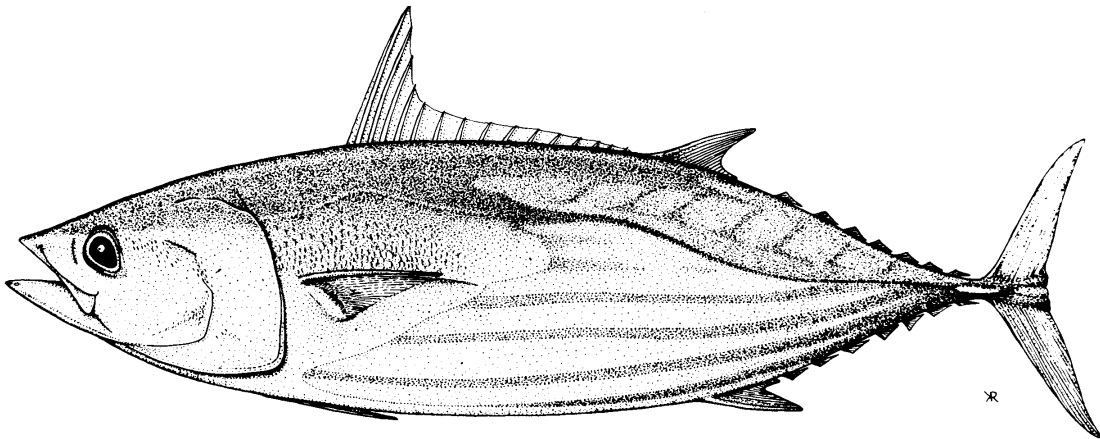




## **Fiji tuna and billfish fisheries**



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July 2002

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## 1. INTRODUCTION

The Fiji fishing zone 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 mainly focusing on pole-and-lining. Now the predominant fishing method is longlining, while pole and line fishing is conducted in a small scale with few artisanal trolling fishers targeting FAD's for the local market.

The Fisheries Division of the Ministry of Fisheries and Forests manages tuna and billfish fisheries in Fiji under the Fisheries Acts, Marine Spaces Act and a Cabinet Guideline on the EEZ and Offshore Fisheries. This year, changes have been made to adopt a new national Tuna Management and Development Plan.

This paper was prepared with the help and guidance of several SPC-OFP staff for presentation to SCTB15 in Honolulu on July 2002. It describes the methods used by Fiji fleets to catch tuna and billfish in the Fijian fishing zone, fishing fleet structure, catch records for five years (1997-2001), marketing of catches, onshore 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.**

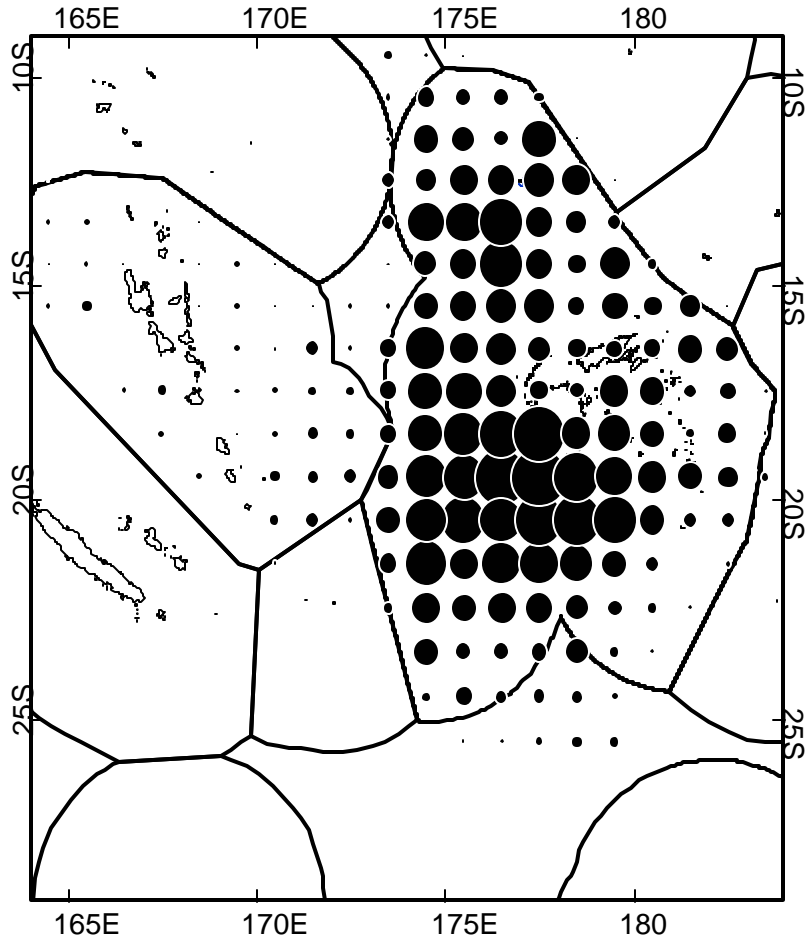
YEARS	DOMESTIC LONGLINE VESSELS	DOMESTIC POLE AND LINE VESSELS
1997	34	5
1998	39	1
1999	43	1
2000	55	1
2001	101	3

The number of longline vessels fishing last year almost doubled that of the previous year's. Altogether, there were 101 domestic longliners fishing during the calendar year, but by December 2001, 7 of these longliners ceased operation.

Initially there were three domestic pole-and-line vessels but by the years end, one had transformed into a longline vessel. The list of foreign purse seine vessels licensed to fish in Fijian waters during 2001 include the US purse seine fleet, fishing under the US Multilateral Treaty, and two Japanese purse seine vessels. There was also one Japanese distant-water pole-and-line vessel licensed to fish in Fiji waters during 2001.

### 2.1.1 Domestic longline

Figure 1 shows the distribution of fishing effort for the Fijian longline fleet during 2001. The majority of the effort was within the Fijian waters with some activity in the high seas and in the neighbouring EEZ Vanuatu, where several vessels are licensed to fish. In Fijian waters, most of the effort is centred on the West and South.



**Figure 1. Distribution of Fijian longline effort for 2001.**

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 an obligation of their license. Landings of this fleet are also monitored to some extent and the Fisheries Department are also in the process of establishing an observer programme for the domestic longline fishery.

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 for the years 1997–1999 at this stage. Estimates for 2001 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). Estimates for 2000 were determined in a similar manner, but in addition, annual landings for several vessels were provided by fishing companies.

Unlike most distant-water longline fisheries, the Fiji domestic fishery lands and markets a number of non-tuna species, although shark and other species not commercially viable (e.g. lancetfish) are typically discarded. It should be noted that the estimation of total catch at this stage does not take into account the bycatch (e.g. shark) discarded at sea, but that this category may be considered in the future with information provided from the Fiji National Observer programme.

Table 2 shows the breakdown of the total catch for each of the past five years, noting that years prior to 2000 have not yet been raised to account for coverage of logsheets and discarded bycatch have not been accounted for.

The total catch by the domestic longline fleet (catches inside and outside the EEZ) during 2001 was 12,219 (11,200mt for the tuna and billfish species). The total catch for 2001 was only a slight increase (~7%) on the total catch for 2000, despite the licensing of nearly double the amount of vessels in 2001. This can be explained to some extent by two factors. During 2001, a total of 37 vessels fished, at most, only six months of the year due to (i) starting their licenses later in the year, (ii) vessels laid up (for one reason or another) and (iii) in one case, the vessel sank. This compares to 2000, for example, when nearly all vessels were licensed to fish from the beginning of the year. In addition to vessel activity, relatively better catches of yellowfin catch were experienced during 2000 (Table 2 and Figure 3), and landed bycatch (for reasons currently unknown) was comparatively lower in 2001 than 2000.

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

SPECIES	CATCH LANDED (MT)				
	1997 <sub>1</sub>	1998 <sub>1</sub>	1999 <sub>1</sub>	2000	2001
ALB	1,842	2,121	2,279	6,065	7,971
BET	409	460	462	687	662
YFT	970	862	725	2,465	2,082
SWO	78	92	104	118	115
SFA	70	100	127	42	33
BLZ	209	198	324	340	186
BLM	40	39	44	34	46
MLS	89	203	218	141	88
SHK	0	0.2	0	134	223
OTHER	541	697	742	1,393	813
<b>TOTAL</b>	<b>4,248</b>	<b>4,772</b>	<b>5,025</b>	<b>11,441</b>	<b>12,219</b>

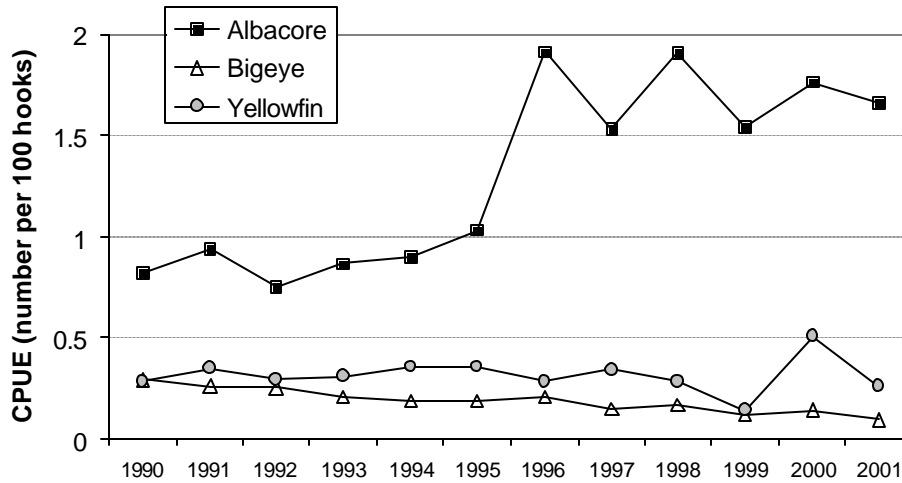
<sub>1</sub> Catches have not been raised to account for logsheet coverage (1997–1999)

Logsheets coverage of the total catch and effort for this fleet is close to 77% for 2001 based on these estimates. The estimated total catch in Fiji waters (Fiji EEZ) for 2001 was 11,092 t, which represents approximately 90% of the total catch (12,219 mt) with the remainder (10%) taken in Vanuatu waters and adjacent high-seas. *It is possible that many of the outstanding logsheets could be from vessels fishing in Vanuatu waters and on the high seas, in which case this proportion may change slightly.* That is, the non-EEZ catch in 2000 was 24%, and the percentage for 2001 may increase as more logsheet data become available.

Since 1997 the total catch has increased significantly (even taking into account the under-estimates for years prior to 2000) and in line with the increase in the number and efficiency of domestic longliners. Last year, tuna made up 88.3% of the total catch landings, billfish and sharks 5.8%, and the remainder the bycatch.

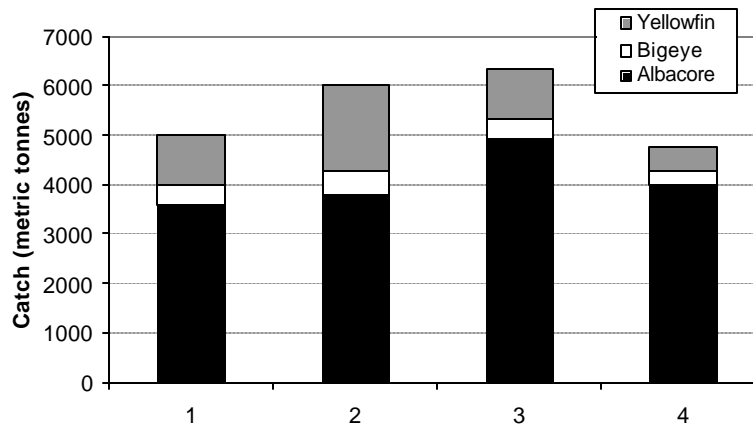
Trends in nominal CPUE are sometimes used as an indicator of abundance, but must be considered in association with other direct (e.g. targeting strategy, patterns of effort, size composition of the catch, recruitment, etc.) and indirect (e.g. environmental) factors affecting the fishery.

Figure 2 shows the trends in tuna CPUE for the Fijian longline fleet. The CPUE for albacore increased in 1996 from being consistently below 1.0 per 100 hooks to around 1.5 per 100 hooks, and has remained at that level ever since. 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 consistently declined over the time series.

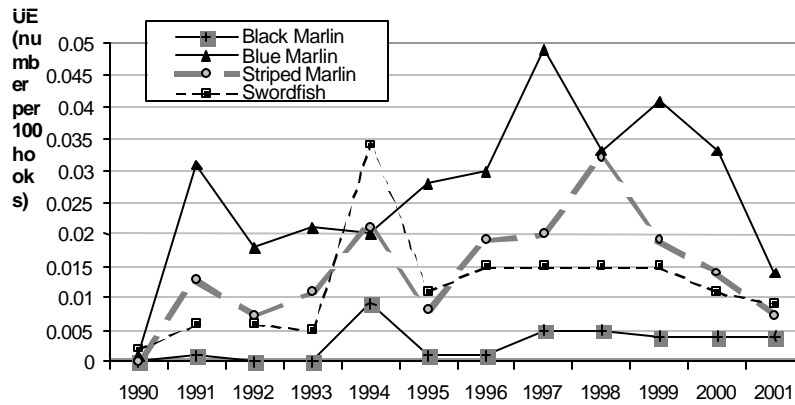


**Figure 2. Annual trends in albacore, bigeye and yellowfin nominal CPUE (number per 100 hooks) for the Fijian longline fleet**

Figure 3 shows the species composition of the catch by quarter. 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.



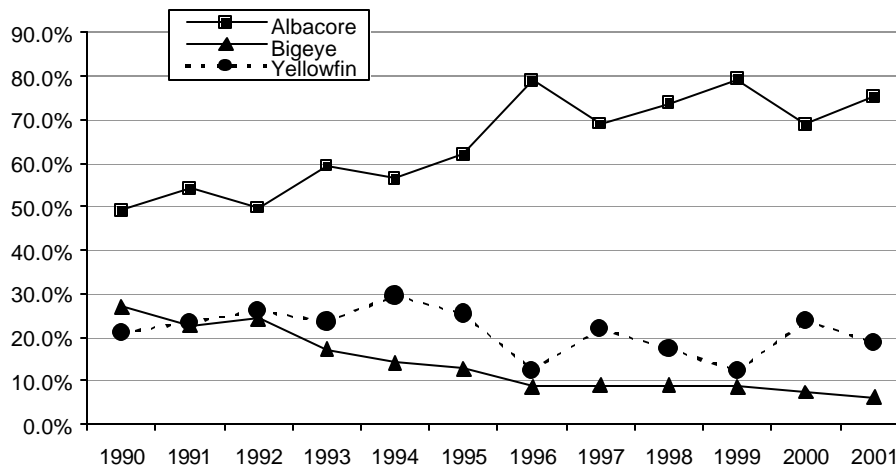
**Figure 3. Catch (metric tonnes) by quarter of albacore, bigeye and yellowfin by the Fijian longline fleet, 1997–2001.**



**Figure 4. Annual trends of billfish CPUE (number per 100 hooks) for the Fijian longline fleet.**

From 1990 to 1993, trends for the billfish – black marlin, blue marlin, striped marlin, and swordfish, were similar i.e. all increased and decreased in 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. *Years 2000 and 2001 saw a decrease in CPUE for all the four billfish species.*

Figure 5 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. 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 steadily decreasing over the time series, from nearly 30% to less than 10%.



**Figure 5. Trends in tuna species composition (by weight) for the Fiji Domestic longline fleet fishing within Fiji's EEZ.**

As a precautionary approach in managing the tuna fishery, the **EEZ** TAC (Total Allowable Catch) set for 2001 was the same TAC used since 1995. These were:

- Tuna longline:     3,000t albacore  
                          2,500t yellowfin  
                          2,000t bigeye
- Tuna pole and line: 8,500t skipjack  
                          1,500t yellowfin
- Tuna purse seine:   7,500t skipjack  
                          2,500t yellowfin

The estimated EEZ catch for albacore for 2000 and 2001 was approximately 5,460 mt and 7,200 mt, respectively. These catches have therefore easily exceeded the original EEZ TAC for albacore for the past two years.

In early 2002, a consultant was contracted to review the Fijian EEZ TAC. The review recommended an increase in the EEZ TAC to 10,000mt, made up of the following components:

<i>Albacore</i>	- increase to 6,500 mt (which is well above the previous TAC (3,000 mt) and above the estimate for 2000, but below the current estimate for 2001)
<i>Bigeye</i>	- reduce to 1,000 mt (well below the previous TAC (2,000 mt), but above all annual catch estimates to date)
<i>Yellowfin</i>	- maintain the 2,500 mt (above the estimated 2000 and 2001 catches)

The Fiji government, in further deliberations with the consultant and under the National Tuna Management and Development Plan, settled on a new EEZ TAC based on the previous history of catches, available information on the productivity of the EEZ, the present mix of gears, and existing regional assessments of the stocks. The new recommendations suggest a limit of 90 vessels in the domestic longline fleet, with a total EEZ TAC set at 15,000mt (albacore, bigeye, and yellowfin). Cabinet has recently passed the new EEZ TAC.

### 2.1.2 Foreign Fleets

Distant-water longline vessels from Taiwan target albacore tuna in the waters west and south of Fiji and offload their catch at the Levuka cannery. Unloadings for this fleet during 2001 included 7,530 mt of albacore tuna from 42 vessels. The foreign longline catch in the Fiji EEZ during 2001 was only 18 mt from three vessels, according to logsheets provided at the port of landing (Levuka).

Two Japanese purse seine vessels were licensed to fish in Fiji waters during 2001. According to logsheets provided by this fleet, there were only four days effort (searching) in Fijian waters but no sets were made.

One distant-water Japanese pole-and-line vessel was licensed to fish during 2001, but no effort was apparently undertaken in Fijian waters.

### 2.1.3 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. Last year, the pole and line fleet consisted of two domestic vessels and a foreign pole and line vessel fishing under the Fiji-Japan Bilateral Agreement.

According to the catch landing figures provided by one of the pole-and-line companies *Tosa Bussan (Fiji) Ltd*, their vessel *Waimanu Catcher* landed 44mt of yellowfin, and 431mt of skipjack for last year (their first year in operation).

## 2.2 F.A.D – Trolling

The Government engaged itself in the ADB ? programme for the deployment of FADs in 1998. They had deployed 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 Division has promoted small-scale tuna fishing activities, however, these have been slow to catch on and very few fishermen persist with these methods. At this stage, catch estimates for this fleet are not available. Through close monitoring of the FAD fishers, the programme is slowly proving to be successful.

## 3. MARKETING OF CATCHES AND BYCATCHES

Fiji exports most of its tuna catch i.e. albacore, bigeye, and yellowfin to Japan and America. Japan imports 61% of the tuna export and the US 37%. The remaining 2% is exported to Canada, China, Australia, and Korea. Fiji's billfish are also exported mainly to Japan and the US, each buying close to 50% of the total billfish exports.

Besides the US and Japan, the bycatch is exported to Australia, Canada, China, England, Korea, and New Zealand. England and New Zealand are the only two countries that import only the bycatch.

Albacore and skipjack are either processed at the local cannery (PAFCO) or exported to PagoPago. The remainder of the bycatch and other damaged fish are sold locally at supermarkets, restaurants or directly to consumers.

Exporters in Fiji are also exporting loins to the EU in small amounts.

#### **4. ONSHORE AND MONITORING DEVELOPMENTS**

No new onshore development was realised in 2001. It was seen as a period of planning. Reviews and assessments of the tuna industry were made towards the drafting of a National Tuna Management Plan. The Management Plan will help identify key areas that need addressing so as to fully develop this fast growing industry and introduce as many locals as possible into the industry.

To date, a new modern processing factory owned by a company *Ocean Harvest*, is being built in Suva. The building, which is hoping to meet EU requirements, should be completed by September this year. Having more EU compliant processing factories will increase Fiji's export of both tuna and tuna products to the European market

Training courses e.g. the observer and port sampling training in June this year, have also begun to cater for the growing demands of having trained people work in the industry. With the inclusion of new observers, the observer programme will now be able cover 10% of the tuna fishing fleet as required under the new Tuna Management Plan. The port sampling still remains the same, covering the Suva and Levuka ports during unloadings and transshipments.

Another monitoring development is the set up of a new data centre where vessel logsheets, port sampling data, unloading data, and export data are verified, entered, and analysed.

#### **5. FUTURE DEVELOPMENTS**

The medium-scale tuna longline fishery has passed the development stage, with more than 90 vessels in the fishery last year. This has been developed by the private sector, and the Fisheries Division is looking at managing this sector under the National Tuna Development and Management Plan for the country. Infrastructure developments such as port facilities, support services (slipways, gear and equipment, skilled tradesmen and engineers, etc), and processing and value adding factories have been planned and is set to be underway in the not too distant future. Another area in which Fiji is also aiming to improve is the availability of airport facilities and cargo space for the timely shipment of fish.

Attempts are being made by the Government to see that PAFCO, a EU recognised cannery, can re-establish itself in the European market. Past issues like the availability of baitfish and the below-market price that PAFCO offered is being reviewed. Solutions to this will hopefully help revive the pole and line skipjack tuna fishery, a major component of the PAFCO cannery.