SIXTH STANDING COMMITTEE ON TUNA AND BILLFISH

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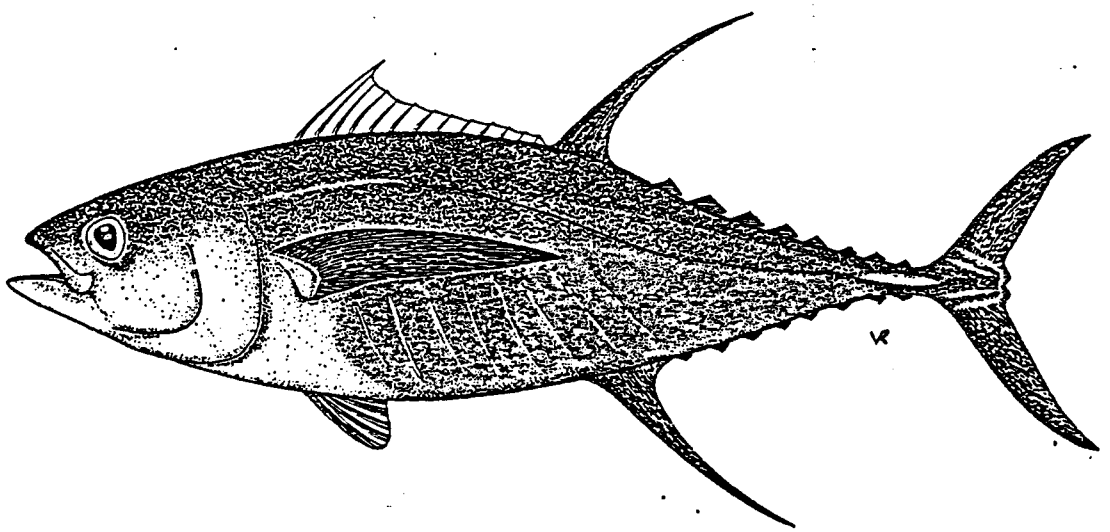
INFORMATION PAPER 2

PRODUCT FLOWS OF TUNA IN THE WESTERN PACIFIC, 1991 WITH LIKELY TRENDS DURING 1992



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1.INTRODUCTION

The destination of the catch of western Pacific tunas after capture, or post-harvest product flow, has continued to be monitored by TBAP since the inception of the Regional Tuna Tagging Project (RTTP) for several reasons:-

- publicity to encourage the return of tags can initially be appropriately directed, and recovery mechanisms put in place;
- comparison of actual tag return rates by fleet and unloading port, against expected numbers of returns can assist in estimating reporting rates;
- validation of declared catches, particular when coverage is incomplete, can be attempted;
- trends in transhipment can be monitored (SCTB5 Action Item 1) and present and future port sampling requirements can be considered.

This most recent analysis, for 1991 with some comment on trends in 1992, thus attempts to trace the complex post-harvest flow of tuna product captured within the western tropical Pacific (the SPC statistical area, plus eastern Indonesia and the Philippines - Figure 1). In some cases, product flow in adjacent areas of the western Pacific, notably Japan, is considered. It must also be recognized that the tuna busines is truly global, and activity beyond the WTP needs to considered if product flows are to be understood. Catches of secondary market species of tunas and tuna-like species (*Auxis, Euthynnus, Thunnus tonggol* etc), billfish and by-catch species are not considered.

Information on product flow, for reasons of commercial confidence, is typically difficult to obtain. For this report, much has been obtained by word of mouth and only in relatively few cases from published sources. In this document, sources are thus not generally identified. The summary presented should be regarded as an attempt to generate discussion, focusing on production for the year 1991 (for which information is more complete), then briefly considering 1992 production and likely future trends.

Product flow is considered first with respect to utilization of the catch, then distribution of the 1991 catch taken by the main gears (i.e. purse seine, pole-and-line, longline). Finally, production in 1992 is briefly discussed, along with trends in catch, processing and consumption.

2. PRODUCT UTILIZATION

2.1 Canning

Production of tuna in the western tropical Pacific (WTP) is now totally dominated in volume terms by **purse seine** catches, which comprised over 60% of the estimated 1991 catch of 1.4 million tonnes in the WTP (SPC area plus the Philippines and eastern Indonesia), and over 80% of the catch in the SPC area (Lawson, 1992). The western Pacific purse seine catch in 1991 provided 61% of the global purse seine tuna catch of 1,825,000 t, and showed an increase of nearly 30% over the 1990 catch, whilst catch in other areas declined (E.Pacific), or increased only marginally (Indian and Atlantic Oceans). The increase in the WTP catch in 1991 was primarily due to high catch rates of skipjack, the highest ever recoeded for most fleets.

With the exception of a small amount of domestic consumption as fresh fish in the Philippines and Indonesia, virtually all of the purse seine catch (total 850,000 t, plus a proportion of Philippine and Indonesian catches) is destined for canning in the western Pacific, and represents the major source of cannery raw material. The species mix handled by WP canneries is approx. 80% skipjack and 10% yellowfin, by weight, with the balance (10%) made up of albacore and other tunas, notably longtail tuna, from various sources.

With the rapid growth of canning capacity first during the late 1970s in Philippines then during the 1980s in Thailand and American Samoa, western Pacific canneries now supply well over half the world's canned tuna production. It is said that three out of four cans of tuna in the international trade originate in the SE Asian/WTP area. Approximate total raw material inputs (tuna) for western Pacific canning locations and likely trends in production are shown below for each location (Table 1), with an estimate of the proportion sourced from the western Pacific, and likely production trends.

Table 1. Estimated 1991 cannery throughput, western Pacific, and likely trends

AREA	No. of major canneries/canning companies †	Est. 1991 throughput ('000 t)	Source of raw material (% W.P.)	Projected production trend
THAILAND	3 (22)	500-520	65-70* %	+
A. SAMOA	2	225	85	stable
INDONESIA	10 (4)	80 ?	80-90	stable
PHILIPPINES	9	110	100	+
JAPAN	2 (35)	200	100	+
FIJI	1	15	100	stable
SOLOMON IS.	1	6	100	+
REP. OF CHINA	?	20 ?	100 ?	?
REP. OF KOREA	12	75	100 ?	+
VIETNAM	?			+
TOTAL	34 ? (79)	1255 -1275	75-80 %	+

* 65-70% of imports, which totalled 360,000 t in 1991; domestic catches contributed a further 90,000t, primarily *Thunnus tonggol*, with the balance from the Indian Ocean.

† number of minor tuna canneries, given in brackets, where known.

Pole and line caught fish (90% skipjack) are also canned, and because of quality considerations, attract premium prices. Production from this source, with the exception of eastern Indonesia, has nevertheless been declining, due to economic factors. Pole-and-line production in the SPC area in 1991 was estimated at 135,000 t (Lawson, 1992), with most of this canned. However, the high quality product from the Japan distant water vessels is used also for fresh fish consumption, tataki, namaribushi, and other products.

Other fish Lesser quantities of albacore tuna (approx. 50,000 t. from the western Pacific, including tropical and sub-tropical areas, plus Indian Ocean sources) are canned as higher priced white meat tuna. The primary source of albacore is *longline* caught adult fish, with lesser quantities of *troll* caught or previously, *driftnet** caught sub-adults.

A considerable quantity of tuna caught by purse seiners in the WTP is canned beyond the region eg. Puerto Rico (whole fish, decreasing), USA west coast (loins, stable), Europe (YF loins, increasing). The export of loins from developing countries with lower labour costs to consuming countries for final packing was increasing rapidly (Thailand was sending approx. 3,000t per month during 1991), but now seems to have stabilized, if not decreased. Indian Ocean product, caught by purse seine (Seychelles transhipment) and pole and line (Maldives), is also imported for canning in western Pacific locations (Thailand, Indonesia). There is also domestic canning of juvenile tuna (< 1 kg - skipjack, yellowfin, *Auxis*) in some countries, notably in the Philippines, as "mackerel". Such production (est. 50,000 t.) is considered only briefly here.

* driftnet fish is still believed taken in the south Indian Ocean

Cannery production, dominated by light meat product (skipjack, yellowfin) and supplying markets in Europe and USA has continued to increase steadily, with possible further production increases expected in Indonesia (1991 raw material inputs were approx. 80,000 t, although growth has slowed due to supply problems), possibly Korea (for an increasing domestic market), and with steady increases in Thailand and Philippines. This is despite temporary setbacks during 1990 in some countries (eg. Thailand) due to dolphin-associated problems, and quality problems with imports into the US during 1991-92 (FDA organoleptic testing of product). It is also possible that new canneries will come on line in the WTP (eg PNG, Marshall Islands).

Inputs of western Pacific caught tuna to western Pacific canneries in 1991 probably exceeded 900,000 t. In other words, 75-80% of the total western tropical Pacific harvest of primary market species was utilised for canning purposes, and mostly within the wider region (including SE Asia).

2.2 Non-cannery tuna consumption

Western Pacific tuna is also consumed as fresh or frozen unprocessed product, either as high quality high value sashimi (sliced raw fish) or for a variety of domestic preparations.

Sashimi

Japan remains the major world market for the high quality fresh or blast frozen tuna (typically adult fish caught by longliners) utilized as sashimi. Domestic landings in Japanese ports in 1991 of fresh and frozen bigeye, yellowfin and bluefin totalled 85,000 t., 38,000 t., and 14,000 t. respectively (Globefish 92). These volumes are lower than total production figures (eg KMT 6332), which presumably include overseas j/v operations, foreign landings etc.

In addition, over 250,000 t. of fresh and frozen tunas and billfish (90% tunas) were imported during 1991, mainly from Korea, Taiwan and Indonesia. Of this amount, approximately 34,000 t. was fresh tuna (chilled and airfreighted, mostly yellowfin and bigeye, with some bluefin), with Taiwan (15,600 t.), Indonesia (8,500 t.), Philippines (3,600 t.?), Palau and Guam the main suppliers. Transhipment through Guam and Palau emerged as increasingly important avenues of supply during 1990, and continued during 1991, with exports also commencing from Yap, Chuuk and Pohnpei. In 1992, for example, over 2,000 to product was transhipped through Yap. Imports of frozen yelllowfin and bigeye were over 145,000 t during 1991, with yellowfin imports significantly down on 1990 levels.

Over 300,000 t. of large tunas (bigeye, yellowfin), mostly from the total western Pacific, is therefore probably utilized in Japan as sashimi or related high quality fresh product. A large quantity of skipjack, from pole-and-line vessels operating in home and offshore waters (cf. distant waters) is probably also consumed, and appears to be increasing in popularity. Total fresh tuna (sashimi) consumption in Japan in 1991 was over 450,000 t.

Other fresh/frozen consumption

A significant proportion of the tuna catch (excluding *Auxis, Euthynnus*) in Philippines and Indonesia, particularly that made by artisanal and municipal vessels, is marketed through a variety of outlets for domestic consumption (est. 40,000 t. and 70,000 t. respectively). Product may be sold in fresh form then dried, salted, boiled etc. High domestic consumption is also true of most artisanal catch in Pacific Island countries, as well as significant proportions of the Japan, Korea and Taiwan landings.

Other processed tuna

Tuna is consumed in a variety of other ways following commercial post-harvest processing, particularly in Southeast Asia. This may include pickling, processing into fish paste, boil-drying (namaribushi) and smoke drying (katsuobushi, arabushi). The lattermost product, supplying specialist Japanese markets, is primarily processed in Japan, but there is limited production elsewhere (eg. Solomon Islands 2,000 t. p.a., Philippines)

for export to Japan. Annual Japanese consumption of smoke-dried product is now approx. 200,000 t (whole fish equivalent).

3.1 PRODUCT MOVEMENT

3.1 Purse seine catches

Disposal of purse seine catches, intended primarily for western Pacific canneries as noted, occurs typically by transfer on the high seas to reefer vessels, but also by direct unloading from vessels to canneries (Pago Pago, Solomon Islands), or in transhipment ports (Tinian). This is however expected to change markedly as MTCs are adopted during 1993. Table 2 below summarizes probable volumes of movement of purse seine-caught fish to various western Pacific cannery locations, for the various fleets. As noted, 75-80 percent of this fish is of western Pacific origin, and 90 percent of overall cannery supply is purse seine caught.

Table 2. Movements of western Pacific purse-seine caught tuna

FLAG	Approx. 1991 catch (est. '000 mt)	Destination by volume (est.)		Route	1992 catch
U.S.A.	205	Pago Pago	120	Direct, reefer, Tinian	195
		Thailand	55	Reefer, Tinian	
		Puerto Rico	25	Reefer	
		Indonesia	5	Reefer	
JAPAN	170	Japan	140	Direct	185
		Thailand	30?	Reefer	
ROK	240	Thailand	100	Reefer	205
		Pago Pago	25	"	
		Puerto Rico	20	"	
		Korea	70	" , direct	
		Indonesia	20	Reefer	
ROC	175	Thailand	120	Reefer, Tinian	220
		Pago Pago	10	Reefer	
		Puerto Rico	5	"	
		R O C	(20)	Reefer, direct?	
		Philippines	?	"	
		Indonesia	20		
PHILIPPINES	130*	Philippines	130	Reefer	(100)
INDONESIA	12†	Indonesia	12	Direct	ceased ops.?
SOLOMON IS.	11	Australia	1	Reefer	(9)
		Pago Pago	4	"	
		Thailand	6		
		Fiji	(1)		
NEW ZEALAND	7	New Zealand	?		?
		Thailand	?		
TOTAL	~860		830-860		~920

* includes catches in Indonesia, Solomon Islands and Papua New Guinea, and some ringnet catches of small tuna.

† excludes catches by foreign flag vessels.

? over 50,000 t in total, but unsure how much is WTP purse seine; 10,000 t or more is known to be from Saipan.

3.2 Pole and line catches

Pole and line catches are made by small to medium size vessels, which irrespective of their operational range, make regular port calls for bait replenishment and supplies. Trip lengths vary from several days

(domestic ice boats) to 30 days or more (long range pole-and-line vessels based in Japanese ports). Catches are therefore unloaded directly to canneries or to transhipment points. As of mid-1992, only 38 Japanese long range pole-and-line vessels, including three research vessels, were still fishing in the WTP.

Table 3 below summarizes the presumed flow of western Pacific pole-and-line catches.

Table 3. Movements of western Pacific pole-and-line caught tuna. (more than 95% skipjack.)

FLAG	1991 catch (est. '000 mt)		Destination by volume (est.'000 mt)		1992 catch (prelim. est.)
JAPAN	Long range	110*	Japan	110	NA
	Coastal } offshore }	115?	Japan	115?	NA
SOLOMON ISLANDS		36	Solomon Is.	7	19.7
			Fiji	8.5	
			Thailand	10	
			Pago Pago	2	
			Japan	7	
			Indonesia	1	
FIJI		4.4	Fiji	4	4.1
KIRIBATI		0.2	Fiji	0.2	0.5
AUSTRALIA		1	Australia	1	0.3
INDONESIA		75?	Thailand	35	
			Japan	20	
			Indonesia	20	
TOTAL		340		357	NA

* includes some catch (20,000 t.?) outside the SPC area. NA - not yet available.

3.3 Longline catches

Longline catches of two types are distinguished

(i) frozen tuna unloaded from conventional blast-freezer equipped longliners of large size (typically 200 GRT plus), which undertake trips of long duration (2-3 months). They operate out of offshore bases, some of which are in the region, (eg. Pago Pago, Levuka) or from domestic ports (eg. Yaizu, Kaohsiung, Pusan); both cannery and sashimi (often second grade) material are produced;

(ii) fresh tuna unloaded from small coastal longliners (less than 100 GRT, and typically less than 20 GRT) which make short trips (< 10 days) and unload at transhipment points; both sashimi and material for lower grade fresh consumption are produced, the former typically being airfreighted to the primary market, Japan.

Statistics are difficult to obtain, particularly for the latter type of operation, but Table 4 below lists production volumes and destinations.

Table 4. **Movements of western Pacific longline-caught tuna, according to vessel type, or capture zone.** (Conventional and sashimi vessels are distinguished, and in the case of Japan, catches in two zones recognized.)

FLAG	1991 Catch (est. '000 mt)		Destination by volume (est. '000 mt)		Use
JAPAN	Coastal and offshore zones	65?	Japan	65	Sashimi
	Distant-water zones (WP)	60	Japan	60	Sashimi, canning*
R O K	Conventional	36	A. Samoa	3	Canning (albacore)
			Japan	33	Sashimi
ROC	Conventional	20?	A. Samoa	12	Canning (albacore)
			Fiji	4.1	Canning (albacore)
			Thailand	(?)	Canning
			Japan	5	Sashimi, canning
	Sashimi†	15-20?	Japan	15	Sashimi, canning
INDONESIA, PHILIPPINES	Sashimi‡	10-15	Japan	10	Sashimi
FIJI	Sashimi	0.6	Japan, USA	0.6	Sashimi
TOTAL		200-210		200-210	

* includes 7,000 t albacore, and increasing amounts of yellowfin, for canning.

† catches landed in Palau, FSM, Guam and Taiwan for transhipment.

‡ includes a large proportion of handline caught tuna, excludes Indian Ocean catches by joint venture vessels in Jakarta, Denpasar.

4. 1991 PRODUCTION AND FUTURE TRENDS

4.1 Fishery production

Tuna fishery production in the western tropical Pacific increasedly markedly during 1991, with purse seine catches in the SPC area increasing by 25% over 1990 catches, and by 300,000 t since 1989. Total purse seine landings in the SPC area approached 850,000 t with resultant impact on cannery supply and fish prices. In 1992, production showed little or no increase for the first time since 1985. Effort limitation on the purse seine fishery was imposed by the PNA group. This, combined with economic difficulties being experienced by several fleets, suggest that 1993 purse seine catches can be expected to decline slightly from 1992. The acceptance of MTCs by most fleets, and resulting transhipment in nominated ports rather than on the high seas, will further this trend.

Conventional longline landings and distant-water pole-and-line catches continued their downward trend, whereas fresh-chilled sashimi longline landings and some domestic pole-and-line catches (E. Indonesia) continue to increase; an increasing number of transhipment/unloading points are being utilized in the region.

4.2 Cannery production

Some increase in capacity and throughput was achieved in Indonesia during 1991 (80,000 t. est.) Both domestic sources, and, increasingly, western Pacific purse seine fish (ROC, ROK), were fuelling this expansion. Although current total capacity in 1992 was in excess of 150,000 t. and increasing, production declined during 1992 due to supply problems. Several new canneries are idle, or have not begun operations. Others are still under construction.

Thailand domestic cannery production may have increased slightly (4%) during 1991, due to some resolution of the dolphin-safe issue and despite increased export of loins for final packing in the U.S., Japan and

Europe. Several major Thai canners embarked on expansion plans, and given adequate fish supply, production seemed likely to increase at a steady rather than rapid rate, in combination with increased involvement in other areas (Europe, Africa). Movement of production capability to southern Thailand, closer to product source and aided by Government investment incentives, was projected. 1992 however saw problems for several major producers with FDA quality inspection in the USA, and subsequent detention orders placed on two of the three major canners. This slowed overall growth considerably. Labour costs continued to increase (now over US$5 per day). Increasing competition from Indonesia was expected and in response to this, several Thai, Philippine and Korean joint-venture involvement in Indonesian-based processing operations went ahead. As noted, supply problems plagued most of these operations during 1992, with the largest operation (PT Mantrust) also experiencing financial difficulties.

Philippines cannery production increases are also projected, subject to adequate product supply. This may be associated with further fishery expansion of distant-water Philippines purse seine fishing in the western tropical Pacific which occurred to a limited extent during 1992 (Indonesia, Solomon Islands). There are also plans for cannery construction at Subic Bay in the future, whilst several new canneries came on stream in 1991/92.

Production in American Samoa and Japan seems unlikely to increase markedly. A long term downward trend will probably continue with Japanese exports, now virtually non-existent; domestic consumption remains buoyant, and total production increased during 1992. Yellowfin is the main species canned. Some increase in production may occur in the smaller Pacific Island canneries in Fiji and Solomon Islands, and as noted, there are plans to construct canneries in several other countries.

Considerable continuing cannery expansion had been occurring in Korea, to meet increasing domestic demand associated with per capita income increases. Current consumption in 1990 was believed to be over 60,000 mt. and increasing. The recession may have slowed this growth. The Taiwan tuna canning sector remains a largely unknown quantity, but exports are generally believed to show a downward trend. Small quantities continue to be exported to the USA.

4.3 Loin production

The recent increase in loin production in the western Pacific and export for final canning elsewhere in 1990-91 has been noted earlier. Cooked loins are exempt from the normal 24% duty imposed on imports to Europe (except for Lome countries), and from similar tariffs in the US. Thailand was exporting approx 3,000 t/mo in 1992 but this has slowed considerably in recent times. Several PLACs (Colombia, Costa Rica and Ecuador) also enjoy this exemption. The future of loining is currently regarded as uncertain.

4.4 Fresh tuna consumption

Further increases in sashimi consumption in Japan are presumably tied to some extent to the health of the Japanese economy, but perhaps increasingly to trilateral supply agreements amongst Japan, ROC and ROK. Low to medium grade sashimi continues in oversupply, although with some improvement during 1992. Continuing increases in consumption at 1980s rates appear unlikely.

CONCLUSION

Both fishery and cannery production of tuna from the western tropical Pacific continued to increase during 1991, with prices reaching new lows due to increased supply, slowing demand, and product flows becoming increasingly complex. 1992 was a year of adjustment and reshaping of markets, and this will probably continue during 1993. There would clearly be considerable value in improving the monitoring of this situation, in terms of verifying total catch estimates and understanding the dynamics of the fishery, which is now the largest tuna fishery in the world.