Chapter 14

The Markets for Chilled Pacific Island Fish in Japan, Hawaii, Australia and New Zealand.

J. Crossland (Japan, New Zealand and Overview)
S. Pooley and K. Kawamoto (Hawaii),
P.W. Philipson (Hawaiian case study) and M.J. Riepen (Australia).

The fishes of the outer reef slope which are the main subject of this chapter have several important advantages over shallow water species for developing an export market. There is a much smaller number of species in deep water than reef and lagoon areas. Several of these species are individually abundant and can be caught consistently which will make marketing easier. Also, deep water species are free from ciguatera fish poisoning. The four main markets in the region for these fish are considered in this chapter.

OVERVIEW

Resources

Traditional fisheries in the Pacific have concentrated on reef and lagoon areas. A wide range of species is taken using a variety of fishing gears including lines, nets and spears. Much of the catch is by subsistence fishermen but in some places such as Fiji a significant commercial fishery has developed. In a few islands lagoons have become heavily exploited and in some cases overfished.

Fishing is also carried on outside the reef. Because of the almost complete absence of a continental shelf around tropical Pacific islands the demersal fish stocks of the outer reef slope are not large. However, there is a small but significant resource of deep bottom fish around most islands. The development of the deep bottom fishery owes much to the

work of the South Pacific Commission (SPC) through its Outer Reef Artisanal Fisheries Project (1974-77) and its successor, the Deep Sea Fisheries Development Project, which began in 1978 and is still continuing. A review of these projects for the period 1974-80 is given in Crossland and Granperrin (1980). In addition a large number of country reports on visits by the Deep Sea Fisheries Development Project have been published and these contain important base line data on catches of bottom fish at many places in the region.

The Species

The most important species of the outer reef slope are the deep water snappers. Some authors include all species in the family *Lutjanidae*, others consider the *etelids* to comprise a separate family, *Etelidae*. The etelids are found in deeper water than the lutjanids and make up the largest part of the catches of deep bottom fish. Second to the snappers in importance are groupers of the family *Serranidae*. A large number of species are caught but only a few of these are taken regularly. Other important families comprise the *Lethrinidae, Pentapodidae, Carangidae* and a variety of small sharks.

The most commonly occurring species of the outer reef slope are listed in Table 14.1. A more detailed listing of deep bottom fishes is given in Brouard and Grandperrin (1985).

Resource Assessment

Estimating resource size of fish populations is a difficult procedure. In the tropical Pacific it is particularly so because of the large number of small islands, multiplicity of species compared to temperate regions and a small research capacity. Despite these difficulties progress has been achieved over recent years and several estimates of yields for deep bottom fisheries have been made.

Much of the research has been carried out in Hawaii by the National Marine Fisheries Service (NMFS) and in Vanuatu by the Office de la Recherche Scientifique et Technique d'Outre Mer (ORSTOM). NMFS scientists developed a method of resource assessment based on production per nautical miles of the 100 fathom isobath. A yield of 272 kg per nautical mile was calculated and when multiplied by the total length of the 100 fathoms line a maximum sustainable yield for the fishery was determined. Brouard and Grandperrin (1983) modified this method and applied it to the situation in Vanuatu.

If this method is generally applicable it would provide a quick way to assess deep bottom resources in different places. However, too much

TABLE 14.1
Common bottom fishes of the outer reef slope

Scientific name	*English name*	*Japanese name*
ETELIDAE		
Aphareus rutilans	small-tooth jobfish	*oguchi ishichibiki*
Aprio virescens	green jobfish	*aochibiki*
Etelis carbunculus	short-tailed red snapper	*hachijo akamutsu*
E. coruscans	long-tailed red snapper	*hamadai*
E. radiosus	long-jawed red snapper	*okuchi hamadai*
P. auricilla	yellow-tailed jobfish	*kimadara himedai*
P. filamentosus	rosy jobfish	*ohime*
P. flavipinnis	yellow jobfish	*kinmehimedai*
P multidens	large-scaled jobfish	*nagasaki fuedai*
Tropidinius amoenus	large-eyed flower snapper	*hana fuedai*
T. Zonatus	banded flower snapper	*shimachibiki*
LUTJANIDAE		
Lipocheilus carnolabru	fleshy-lipped snapper	*kibire fuedai*
Lutjanus malabaricus	scarlet seaperch	
L. timorensis		
L. gibbus	paddle-tail seaperch	
Paracaesio kusakarii	Kusakar's fusilier	*shima aodai*
P. stonei	Stone's fusilier	*yanbaru shima aodai*
SERRANIDAE		
Epinephelus areolatus	yellow-spotted grouper	*omonhata*
E. chlorostigma	brown-spotted grouper	*hosekihata*
E. hoedti	blue grouper	*tsuchihozeri*
E. magniscuttis	large-scaled grouper	
E. morrhua	brown-striped grouper	*iyagohata*
E. septemfasciatus	seven-banded grouper	*mahata*
LETHRINIDAE		
Lethrinus elongata	long-nosed emperor	*kitsune fuefuki*
L. variegatus	variegated emperor	*hose fuefuki*
PENTAPODIDAE		
Gnathodentex mossambicus	large-eyed bream	
Gymnocranius		*tamameichi*

lethrinoides		
CARANGIDAE		
Seriola rivoliana	amberjack	*kampachi*
SHARKS		
Squalus megalops	shortnose spurdog	

reliance should not be placed on it at this stage as conditions may well vary considerably in different geographical locations, particularly the slope of the outer reef, which will effect the area of habitat available to deep bottom fishes.

Ciguatera

Ciguatera fish poisoning is caused by the microscopic dinoflagellate, *Gambierdiscus toxicus*, which is associated with benthic algae in tropical reef areas. It enters the food chain as small fish feed amongst the coral and in turn are eaten by larger fish and finally by man. Ciguatera is not usually fatal but can cause severe illness. It is a difficult problem to deal with because of its variable incidence. Certain species are more likely to be poisonous than others but they may only sometimes be toxic. Also, the same species may be poisonous in one place and not in another.

Ciguatera is most frequently found in fishes living in shallow water reef areas, particularly in lutjanids and serranids. There are also a certain number of species which are found over a wide depth range and sometimes occur in the upper part of the outer reef slope. Such species include *Lutjanus bohar*, frequently toxic, and *L. argentimculatus*, sometimes toxic. However, the true deep bottom species are known to be free from ciguatera, probably because their food chain is separate from that of the shallower living reef species.

JAPAN

Summary

Japanese buyers indicated the following difficulties in marketing Pacific bottom fishes in Japan:

- unfamiliar species;
- bias against tropical species which are considered inferior;
- small supply;

- poor image of quality control from Pacific countries;
- doubts about freshness

The first two difficulties can to some extent be overcome by marketing the fish in Kyushu where tropical species are better known. The air route linking Guam to Kagoshima or alternatively Guam to Osaka should be considered as entry points to reduce internal transport costs.

Irregular supply is a difficult problem to overcome with fresh fish when it is based on the small fishing fleets of Pacific countries. It is likely to be less of a problem if exports are dircted to Kagoshima or Nagasaki where they can be added to an existing supply of the same species from local suppliers. However, regularity of supply should be an important priority for exporters, particularly if a species is little known in Japan and its price level is to be determined.

The small quantities likely to be available from Pacific countries make it difficult to enter the Tsukiji market. Importers and traders are used to dealing in container loads, 10 t lots or more, and there is little interest in handling consignments of a few hundred kg. Furthermore, the administration and transport costs for small consignments are much greater on a per kg basis than for large consignments. This may mean that the importer's commission rate would have to be more than the 5 per cent generally used.

In the other markets visited traders were used to dealing in small lots and more prepared to buy in the quantities likely to be offered by Pacific exporters.

The last two difficulties can be overcome if fish of good quality is regularly consigned to the markets. It is important that exporters use a brand name which becomes known as representing quality. However, even if quality standards are high, imported fish are unlikely to achieve the same price as local fish of the same species. The buyers know that the fish has had further to travel, is probably older and therefore has a reduced shelf life. For these reasons imported fish are usually discounted. A measure of this discount can be obtained from the trade in chilled sea bream from New Zealand to Japan. Fresh New Zealand fish achieve prices up to Y2,500/kg. Fresh local sea bream fetch up to Y3,300/kg, or 32 per cent more than the imported product.

The most promising potential export lies in the development of a market for Pacific groupers. These species were consistently the highest priced bottom fish in the markets studied in Japan; the demand also exceeded the supply. Factors enhancing their potential are their lower buying cost in most Pacific countries and their availability at times of highest price in Japan (the northern winter).

If the highest quality standards are maintained a market exists for the long-tailed red snapper, *Etelis coruscans*. The margins are likely to be

thin on present prices but the fact that Pacific fish are larger than those now caught in Japanese waters may enable a higher than average price to be obtained.

The short-tailed red snapper, *Etelis carbunculus*, is more abundant in the tropical Pacific than E. Coruscans, but does not command the same price. To market this fish profitably would require regular consignments and promotional activities with the aim of raising its price to that of E. coruscans.

The amberjack, *Seriola rivoliana*, is a low priced fish in most Pacific countries but a comparatively high priced one in Japan. If it can be caught in sufficient quantities it would be a species worth sending to markets in Kyushu.

The fusiliers (*Paracaesio* spp.) achieve good prices in most places in Japan but their available quantities would be a limiting factor in developing an export market for them, as they usually comprise only a bycatch in Pacific countries.

The most abundant bottom fishes in the tropical Pacific are the several species of *Pristipomodies*. Unfortunately these do not command a price sufficient to make their export profitable, except possibly from Palau, because of lower air freight costs.

There appears to be little prospect of exports of frozen fish as the cost of production in the Pacific Islands is in most cases greater than potential returns.

Fish market studies were carried out in Tokyo, other parts of Honshu and in Kyushu. Several species of Pacific bottom fish are known and sold in Japan. The most promising market appears to be Kagoshima where the largest quantities of these fish are handled. A list of preferred species was prepared and costs estimated for getting fish from different Pacific countries on to the Japanese market. Calculations of the prices required to make the trade profitable were made, and showed that for several species the required price level was currently being achieved in Japan.

The Japanese Market

Market structure. Japan's total fish catch is at present around 11 million t annually. In addition it imports a further 1.2 million t and is the world's largest importer of fisheries products. In 1982 imports were worth US$4,000 million.

The fish marketing structure in Japan is very complex, made up of many steps in a long chain, with many inter-connections. A detailed description of the marketing and distribution system is given in the report by Ashenden and Associates (1979) to the New Zealand Government.

Fresh fish entering the Tokyo market (Tsukiji) is likely to pass through the following marketing flow: supplier; importer; primary wholesaler (auctioneer); sub-wholesaler (market place dealer); retailer, restaurant or institution; consumer. In Tsukiji market there are seven companies permitted to operate as primary wholesalers, about 1,200 sub-wholesalers, and 300 authorised large buyers who can also buy at auction from the primary wholesalers. The large buyers may have a different product flow. Some fish purchased at auction may be distributed to markets in other parts of Japan where it may again enter the marketing

J Crossland

Figure 14.1 Deep bottom snappers on sale at Tsukiji market, Japan

chain at the primary wholesale level.

Most other large cities and many smaller ones have fish markets. At landing places fish is sold by primary wholesalers on a commission basis for the fishing company or individual fisherman. The number of wholesalers and commission charges (usually 5 to 5.5 per cent) are controlled by regulations. Auction sales may vary from boatloads of frozen fish to boxes of fresh fish to individual fish. After auction the market flow is similar to that described above for Tsukiji. Direct selling by fishermen to their own outlets does not appear to occur at all.

The complex market structure in Japan results from the vast quantity

of fish to be sold and the huge numbers of species and types of products. To enable the physical distribution on this scale requires a careful interlocking of the marketing flow. The end purpose of this system is to enable the individual Japanese housewife or restaurant patron to obtain their requirements on a daily basis from the approximately 60,000 fish retail outlets or hundreds of thousands of sushi bars and restaurants.

Chilled fish market. Very high prices can be obtained for the best quality chilled fish in Japan. Apart from live fish, chilled fish obtains the best price for whole fish. However, the highest prices are only obtainable (Y3,000 to 4,000/kg) if the fish is a species suitable for raw fish eating (sashimi). The fish must also be of the freshest quality. Fish not meeting these criteria will command a much lower price, similar to that for frozen fish.

There are many species of Pacific bottom fishes which are suitable for sashimi and it is this sector of the market which should be aimed for in exports of chilled fish to Japan.

Frozen fish market. Frozen bottom fish supplies much of the product for cooked fish dishes at the restaurant, institutional and consumer level. It obtains a much lower price than chilled fish, with an average purchase cost of 350 Y 'kg for headed and gutted fish.

Frozen fish is largely sold at fixed price, usually in large quantities (10 t lots upwards). The larger quantities required and lower prices achieved make it unlikely that Pacific exporters could enter this market.

There is a specialised sector of the frozen fish market where higher prices can be obtained. This is for fish frozen in the round to -40° or -45° Celcius. If correctly handled and quickly frozen, such fish can be thawed before sale and used for sashimi or sushi (raw fish on rice). It may obtain a price close to that for chilled fish. However, suitable vessels with the required freezing equipment and onshore cold storage at low temperatures are not available at present in Pacific countries, except in Palau.

Regional factors. The Japanese archipelago comprises four main islands and numerous small ones. It stretches over 3,000 km from north to south and lies between latitudes 24° to 45° N. At least 3,200 species of fish have been reported within 200 nautical miles of Japan (Masuda et al. 1984).

With such a range of latitudes and diversity of species it is natural that distinct regional preferences have developed. The value of a fish may be much greater in an area where it is known compared to an area where it is little seen. Knowledge of these factors is important in selecting the best markets for the sale of particular species. For Pacific bottom fishes the

areas where they are best known are Kyushu and the Ryuku Islands.

Seasonal factors. In Japan different species of fish are considered to have a season when they are in the best condition for eating. This is known as the "shun" season. Prices are highest at this time for the particular species. It is unlikely that this factor would affect the fish to be sent from the Pacific.

Other factors such as the seasons for weddings (autumn, spring) or New Year, cause an increase in price for prime species used on such occasions. The demand for groupers is highest towards the end of the year and in the winter. For snappers, which are used as substitutes for sea bream *(tai)*, the highest demand is in spring and autumn.

Species familiarity. An important factor in determining the market price for a fish is its familiarity to the buyer. Fish which are well known will normally realise a higher price than ones which are little or not known. This will hold even if the instrinsic product quality of the unfamiliar species is better than the known species.

Species which are similar to popular Japanese species are easier to sell, even if they are not identical. An example of this is the major trade which has developed in recent years in chilled snapper from New Zealand. the New Zealand species (*Chrysophrys auratus)* is actually a sea bream and closely resembles the Japanese madai *(Pagrus major)*.

It may be possible to market Pacific bottom fishes in a similar way, although even where the same species occur in Japan, they are not well known outside the southern areas.

Field Studies in Japan

Field work was carried out in Japan over the period 26 September to 11 October 1985. During this time discussions were held with government officials, importers, trading companies and fishing companies. Visits were made to markets in Tokyo, other parts of Honshu and Kyushu. The quantities of bottom fish available at the markets during the study was greatly reduced owing to a typhoon passing from the Ryuku Islands to the north of Kyushu between 3 and 6 October. A public holiday on 10 October further reduced the opportunities for market inspection.

Tokyo — Tsukiji

Several species of bottom fish available for export from the Pacific Islands are caught in Japanese waters and sold on the Tsukiji market, but they are seen only in small quantities. Because of their small volume these

species are not separately identified in the market statistics and information on throughput and prices are not directly available. Total daily sales at Tsukiji average 2,500 t.

The following view is based on information supplied by traders and wholesalers and from market observations. Prices quoted are for chilled whole fish.

Etelis coruscans. This species is better known as *onaga* than by its proper Japanese name of *hamadai.* It is seen from almost every day to every 2 to 3 days according to different informants. Quantities are small, usually a few (10 kg) boxes a time with around 50 boxes a week offered for sale.

Supply is from Hachijo (Izu Islands) and sometimes from Kyushu. The preferred size is 2 to 7 kg, but many fish are less than this size.

During the market visit on 2 October one 10 kg box containing 5 fish was seen awaiting auction. Inspection of the sub-wholesalers' displays showed the species on sale at four stalls.

Upon capture the fish are not spiked, but placed immediately in an ice slurry which kills them. The quality of fish seen which had been handled in this way was excellent.

The auction price range quoted was Y1,400 to 1,800/kg with better prices being obtained for larger fish. Observed prices at the sub-wholesaler level were Y2,000 to 3,000/kg. The reported usual mark-up between primary wholesaler (auction) and sub-wholesaler is 10 per cent but may be as much as 50 per cent.

Etelis carbunculus. This species takes its Japanese name, *hachijo akamutsu,* from its resemblance to a better known species *Doerderlinia berycoides* (akamutsu). The name indicates it is found around Hachijo Island. It is much less well known at Tsukiji than E. coruscans, and because of this obtains a lower price. The anticipated market price is Y1,000 to 1,500/kg.

Etelis radiosus. Three specimens of this species 5 to 7 kg in size were on sale at a sub-wholesaler for Y3,000/kg. This species is the least common of the three Etelis species and no information on its availability was obtainable.

Pristipomoides siebodi. This is the only one of the six species c Pristipomoides which was observed at Tsukiji and the only one whic appears to be available in commercial quantities in Japan. The estimate price for imported species is Y1,000/kg.

One box of P. sieboldi was observed at a sub-wholesaler at a price of

Y2,400/kg.

Paracaesio caeruleus. This species was more common than any of the preceding ones. It is caught by line in southern Japan and seen regularly on the market. Auction prices are estimated to be in the range Y1,500 to 2,000/kg. Observed sub-wholesaler prices varied from Y2,000 to 2,800/kg. The size range was 1 to 2 kg.

Epinephelus spp. Groupers are rarely seen at Tsukiji. When available they are reported to fetch Y3,000 to 4,000/kg. The preferred size range is 3 to 5 kg.

Kagoshima

Kagoshima in Kyushu is the most southerly of the major cities of Japan. Because of its location, tropical and sub-tropical bottom fish species are important components of its fish market throughput. The quantities handled are large enough to be recorded separately in market statistics. Quantities and prices for species relevant to this study are given below.

TABLE 14.2

Quantities and average prices for selected bottom fish at Kagoshima wholesale fish market, 1983-84.

	1983		1984	
Species	t	Y/kg	t	Y/kg
Seriola rivoliana	118	1,454	151	1,454
Etelis coruscans	217	1,687	185	1,759
Pristipomoides spp	528	1,395	411	1,484
Groupers	123	1,887	115	1,975
Total bottom fish*	2,878	1,094	2,965	1,064

* Includes other species.

There are 44 wholesalers which buy at auction and have stalls within the market. There are approximately a further 100 buyers who can buy at auction but must resell outside the market. Total volume at the market is declining as a lot of tuna is now unloaded elsewhere. Quantities handled average 131 t per day with highest daily sales of 250 t and lowest of 50 t. Kagoshima market is the eighth largest in Japan.

The Kagoshima market was attended on 4 October. Because of bad weather it was a very small market (about 80 t) and the quantities of bottom fish available were about one third of the usual amount. Nevertheless a large number of species common to both the Pacific Islands and Japan were observed. Many of the local names were different from the standard Japanese names given in Table 14.1 These local names are given in brackets in the summary below.

Etelis coruscans (chibiki) — 10 boxes seen, very small fish (0.5 kg or less).

Seriola rivoliana (aka bara) — a few large specimens (up to 10 kg)

Groupers (ara) — small quantities of several species were on sale including *Epinephelus morrhua, E. septemfasciatus, E. maculatus, Variola louti, Cephalopholis miniatus.*

Other species observed were Pristipomoides sieboldi *(inago), Tropidinius amoenus, Erythrocles schlegeli (akabo), Aprio virescens (aomatsu), Lethrinus elongata (kuchime), Gymnocranius spp (tabame),* goatfish *(umigoi)* and surgeonfish. A single specimen of Lutjanus bohar, frequently ciguatoxic in the tropical Pacific, was also on sale. Many of the larger bottom fish particularly groupers, were marked with their weights and sold individually, as large tuna are auctioned in other markets.

After attending the auction, discussions were held with the manager of the bottom fish section of the market. He provided estimates of prices for several species not recorded separately in the statistics. These were in yen/kg:

Pristipomoides filamentosus (kuromatusu)	1,000-1,500
P. multidens	300
P. flavipinnis	600
Tropidinius amoenus	500
Lethrinus variegatus	600
Lutjanus malabaricus	800
Paracaesio stonei	2,000 (if top quality)

The company operating the market is keen to see throughput increased and is willing to receive samples from the Pacific. It is suggested that the following species would be suitable: *Etelis coruscans, Pristipomoides filamentosus, Paracaesio* spp., groupers. The contact for samples is: Mr Kazuma Higo, Managing Director, Taiyo Marine, 34 Jonan-Cho, Kagoshima-shi.

Nagasaki

Nagasaki has a larger fish market than Kagoshima with an average daily throughput of 500 to 600 t. It is an important landing port for marlins caught by gill netters and for trawl fish from the East China sea. The bottom fish species of interest to this study form only a minor part of the catch. The number of boats fishing for deep bottom species is decreasing because of overexploitation of the stocks. Vessels fishing for tropical species used to travel as far as Indonesia and Australia. Voyages were one month with the catch brought back super chilled. Since the introduction of 200 miles zones this fishery has declined but vessels still land in Nagasaki from fishing grounds as far south as the southern Ryuku Islands.

The fish market at Nagasaki was attended on 5 October. On the same day a typhoon was due over the city and as a result most fishing boats were in port and the market was small. The following species with their local names indicated, were seen at the auction: *Seriola rivoliana* (neri, aka bara) — 2 boxes of small fish, one 20 kg specimen; *Gymnocranius lethrinoides* (hidarimaki) — several boxes; *Lethrinus nebulosus* — 1 specimen about 4 kg; *Epinephelus maculatus* — 1 specimen; a few other groupers.

Statistics on landings and prices for these species were not available. The following is a summary of expected prices and availability obtained from the director of the company managing the market, and from discussions with sub-wholesalers.

Etelis coruscans (onaga) — a few only are sold on the market with 30 pieces the maximum in one day. Price not specified.

Paracaesio caeruleus — reasonably common with prices from Y1, 000/kg upwards.

Seriola rivoliana — commonly seen, but in small quantities; 2-3 kg is the preferred size with prices in the range Y1,500 to 1,800/kg.

Groupers — these are usually in short supply and expensive in winter when they fetch Y2,000/kg upwards.

Lethrinus spp and Gymnocranius spp — these are frequently seen in small quantities and fetch Y1,000 to 2,000/kg.

Sharks — many large sharks are landed as a bycatch from the gill net fishery for marlin. In the whole, gutted form they sell for around Y7,000/piece, for fish 80 kg and upwards.

Yaizu

Yaizu is an important landing port for Japan's distant water tuna fleet. It also has a small market for the sale of coastal fishes. However, the main

purpose of the visit to Yaizu was for discussions with a company which had been involved with the marketing of tropical bottom fish.

Ishihara Suisan Company carried out trial fishing off north-western Australia over the period 1980-82. Using a 2,000 t trawler and fishing in depths of 120-150 m significant quantities of deep water snappers, groupers and other species were caught. The fish were frozen whole (except for a few large species which were headed and gutted). Freezing and holding temperatures were -40° to -45° C.

The main species caught, and their market acceptability were as follows:

Pristipomoides filamentosus	*average*
P. multidens	*low*
Aphareus rutilans	*low*
Gnathodentex mossambicus	*average*
Gymnocranius robinsoni	*good*
Paracaesio caeruleus	*good*
P. stonei	*good*
Seriola rivoliana	*low*
Caranx papuensis	*low*
Lutjanus sebae	*low*
Epinephelus areolatus	*good*
E. morrhua	*good*
E. chlorostigma	*good*

The company found it difficult to market the fish because of their unfamiliarity. The reported prices achieved for frozen Pristipomoides spp was Y500 kg and for groupers Y600 to 700/kg.

Although the company is no longer dealing in these fishes it has been asked by some of its former buyers for product. The company would be prepared to accept samples and act as a trading house for the sale of bottom fish. An importing company would also be required to handle customs and quarantine clearance. Purchase of chilled fish would be on a commission basis but a fixed price could be negotiated for frozen groupers. As this company is fully familiar with many of the species available from the Pacific Islands it has many advantages over a company to whom the species are unknown. The contact for this company is: Mr Tetsuya Ishikawa, Team Leader, Fisheries Division, Ishihara Suisan Co. Ltd, 1234 Yagusu, Yaizu City, Shizuoka Prefecture.

Shimoda

Shimoda is a small port at the south of the Izu peninsula. A major long line fishery (6,000 to 7,000 t year) for alfonsino (*Beryx splendens*) is based in Shimoda. Line fishing boats which fish the Izu Islands and the

Ogasawara Islands also unload at Shimoda. These vessels catch Etelis coruscans and E. carbunculus amongst other species. Etelis carbunculus is much less common than E. coruscans.

Retail prices for Etelis coruscans were reported Y3,000 to 4,000/kg and for E. carbunculus Y3,000/kg. At this time of the year prices are high.

Fishing trips for Etelis spp around Hachijo Island last 5 to 14 days, with fish killed by immersion in an ice slurry and then packed in flake ice. With shorter fishing trips common in the Pacific Islands (1 to 2 days) there is no reason why Pacific fish could not be on the Japanese market in as short or shorter time than fish from the southern islands of Japan.

Okinawa

It was not possible to visit Okinawa during the study but some information is available on the types of fish and prices from that area. The principal fishery is for Etelis coruscans and about 500 t per year is landed. The resource is reported to be depleted and only small fish are now caught. Significant quantities of other tropical bottom fish are also landed. Prices of fresh chilled fish are reported in the range Y1,000 to 3,0000/kg with E. coruscans fetching Y1,500 to 2,000 kg. High prices are paid for groupers, particularly red coloured ones. Some Etelis from around the Ryuku Islands is landed in Nagasaki and at times airfreighted there for onward distribution.

Summary of Japan field study phase

Preferred species

Based on the results of the market survey the following ranking of species is suggested:

Groupers (red)	most preferred
Groupers (others)	
Etelis coruscans	
Paracaesio caeruleus	
Seriola rivoliana	
Pristipomoides sieboldi	
Gymnocranius lethrinoides	
Etelis carbunculus	
Pristipomoides filamentosus	
Lethrinus spp.	
Pristipomoides flavipinnis	
P. multidens	
Aphareus rutilans	

Tropidnius amoenus	
Lutjanus malabaricus	least preferred

Prices

Auction prices for the five most common types of deep bottom fish are summarised in Table 14.3. Only the figures from Kagoshima are based on official statistics, the others are estimates from traders.

TABLE 14.3

Auction prices in yen/kg for deep bottom fish at different markets in Japan.*

	Tsukiji	Kagoshima	Nagasaki	Okinawa
Etelis coruscans	1,400-1,800	1,687	1,500-2,000	
Pristipomoides spp.	1,000	1,112		
Paracaesio spp.		1,395	1,000+	
Groupers		1,889	2,000+	3,000
Seriola rivoliana	1,000-1,500	1,454	1,500-2,000	

* whole chilled fish

Handling and packaging

Japan is the most sophisticated and quality conscious market for seafoods in the world. To achieve good prices in this market the highest standards of fish handling and packaging are essential.

Government regulations

Import quotas affect certain species of fish on the Japanese markets. These quotas are for the protection of the Japanese small-scale fishermen. The species affected by quotas are not those which will be potential exports from the Pacific. However, it should be noted that amberjack, *Seriola rivoliana*, is closely related to the yellowtail, *Seriola quinqueradiata*, which is a quota species. Provided consignments of amberjack are correctly labelled with scientific and Japanese name *(kampachi)* confusion should be avoided.

Import tariffs are applied to various fish species imported into Japan. The sample of Pacific fish imported during this study was subject to a 5 per cent duty. The import system provides for a preferential status in which case no duty is payable.

It is the responsibility of the importer to clear quarantine. Although Japan has a recommended maximum mercury level for fish of 0.4 ppm, problems with this regulation are not anticipated.

HAWAII

Summary

Hawaii has become a significant outlet for Pacific Islands fish. In 1987 fresh fish imports were recorded in Hawaii for the following Pacific Island countries: Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Palau, Tonga and Vanuatu and totalled 170 tonnes. Imports now account for 20 percent of the Hawaiian bottom fish market, and 80 per cent of these imports are sourced from the tropical Pacific.

Demand in the Hawaiian market has continued strongly for some years and, in light of current evolutions in the State fishery, the market is likely to remain in an under-supply situation in the short-term, at least. A number of factors, including attractive prices, availability of airshipment space, species familiarity, high per capita seafood consumption (twice the mainland level) and a relatively less extreme attitude to freshness (compared to Japan, for example) combine to make Hawaii by far the most attractive market for fresh Pacific Islands fish.

Introduction

The remainder of this section (except the case study) is drawn directly from "Status of Hawaii's Bottom Fishery in 1987" (Pooley, S.G. & Kawamoto, K.E. 1988). The consent of the Director, Honolulu Laboratory, NMFS, in allowing the incorporation of this excerpt is gratefully acknowledged.

Recent Developments

The Hawaii deep-sea handline fishery for snappers, groupers, and jacks continued to grow in 1987 although the growth rate apparently levelled off. The fresh fish market for bottom fish remained extremely strong, but because of limited supply, export of bottom fish did not match the growth in the tuna export market. Imports of bottom fish to Hawaii also were high in 1987. Many of these fish were purchased by local wholesalers directly from foreign countries and often exported to the mainland in United States without going through the usual Honolulu market channels.

Although the recorded number of "active"vessels in the Northwestern Hawaiian Islands (NWHI) bottom fish fishery continued to grow in 1987 (from 24 vessels in 1986 to 28 in 1987), by the year's end, only 8 vessels

were fishing full time for bottom fish. The other vessels that landed NWHI bottom fish were engaged in other fisheries as their primary target. The multifishery fleet, which included tuna longliners and albacore trollers, accounted for 7 of the 20 other vessels. Another seven vessels dropped out of the NWHI bottom fish fishery entirely. Switching to another fishery, primarily lobster trapping accounted for three more vessels. Two vessels continued to target bottom fish on a part time basis, and one vessel sank.

The motivations behind the decrease in the number of full-time vessels in the NWHI bottom fish fishery are diverse, but two of the main reasons appear to be that concentrations of bottom fish are more difficult to locate and other fisheries have become much more lucrative. Although revenue per trip increased in 1987 to $17,500, annual revenue per active vessel declined ($83,600) because most vessels made fewer trips in the bottom fish fishery.

Many of the more successful bottom fishery vessels switched to longline tuna fishing in 1987. Market prices for Hawaii's longline-caught tuna skyrocketed during the last quarter of 1987 as exports to Japan were re-developed. This, combined with good conditions in the established spiny and slipper lobster fishery and the promising developments in the deep sea shrimp fishery, has posed a strong incentive for traditional bottom fish captains to shift some or all of their effort to these alternative fisheries.

Early in 1988, the Council approved a plan for limited entry in the NWHI bottom fishery. The plan is path breaking in a number of ways, but its approval by the National Marine Fisheries Service (NMFS) headquarters is not assured. If implemented, the limited entry plan will provide a moratorium on entry into the fishery until conditions for renewed entry are established and will provide for exit from the fishery for vessels that do not take at least three trips per year. The limited entry plan was strongly supported by the fishing industry when it was initiated in 1984 and 1985. However, during the ensuing years when the character of the fishery changed from a full-time, directed fishery to a mixed or part-time fishery, many in the industry began questioning the relevance of limited entry. On the other hand, fishery managers and many of the scientists involved in research on Hawaii's bottom fish have argued that the limited entry plan is the least intrusive means of protecting the fishery in the context of the limited biological and economic information on the fishery.

Hawaii Bottom Fish Market

The bottom fish fishery in Hawaii is monitored in two ways: through

records of the State of Hawaii Division of Aquatic Resources' (HDAR) commercial fishing reports and the NMFS's wholesale market monitoring program (conducted by the Fishery Management Research Program of the Honolulu Laboratory). Both systems have significant limitations. We believe the HDAR data system undercounts landings in Hawaii because of reporting problems, whereas the NMFS monitoring system is limited to a sample of total landings which must be extrapolated. The NMFS data used in this report are scaled to our estimate of total market quantities, based on previous wholesale market research. The scaling factors are confidential because of the limited number of sources from which NMFS's samples are taken. These factors range from one (indicating zero scaling) to two (representing a doubling of our sample).

The NMFS estimates of recent trends for bottom fish sales in Hawaii (Table 14.4) show a significant increase in landings in Hawaii in 1987 and a 12.5 per cent annual growth rate since 1984. All three segments of the Hawaii bottom fish market (landings in the NWHI and the main Hawaiian Islands (MHI) and imports) have grown over the past 4 years, according to our estimates.

The HDAR data on Hawaii landings show a peak in 1986, but the most dramatic growth occurred between 1974 and 1984 (17 per cent annual growth rate). The HDAR data (preliminary monthly reports suggest a decline in Hawaii landings for 1987, whereas the NMFS wholesale market monitoring estimates show an increase. This difference could reflect a number of reporting, adjusting, sampling, and estimating problems which cannot be resolved yet.

Opakapaka and onaga (large snappers) continue to comprise the largest percentage of landings in the NWHI and MHI fisheries, while hapuupuu (sea bass) is another large proportion of the NWHI fishery and uluas (jacks) comprise a secondary proportion of both fisheries (Table 14.5).

The economic value of Hawaii's bottom fish market has grown with landings over the past two years (1987 and 1986), both in terms of gross revenue and average price (Table 14.6). The NWHI segment of the market has shown volume growth over the past four years. The price distribution between NWHI, MHI, and imported fish is shown in Table 14.7, with quality premiums rising for MHI bottom fish. Prices rose by 13 per cent on average. Bottom fish landed from the MHI received 70 per cent more per pound than NWHI bottom fish. Imports, with potentially 20 per cent of the overall market, pose significant price competition to landings in Hawaii, especially for NWHI landings which have a shorter shelf life. The price premiums shown for MHI bottom fish, despite their smaller average size (cf. Ralston and Kawamoto 1988) continue to reward bottom fishing in the MHI.

TABLE 14.4

NMFS estimate of Hawaii bottom fish market volume, by source, 1984-87 (in thousands of pounds)

Year	*Total*	*NWHI*	*MHI*	*Hawaii only*	*Imports*
1984	1,510	661	697	1,358	252
1985	1,913	922	727	1,649	264
1986	2,013	948	746	1,694	319
1987	2,353	1,017	852	1,869	484

Values are reported in pounds, which is the industry standard in Hawaii. One pound equals 0.45 kg.
NWHI = Northeastern Hawaiian Islands; MHI = main Hawaiian Islands.

TABLE 14.5

Species composition of Hawaii bottom fish catch, 1986 and 1987

Species	*1987*	*1986*
Opakapaka	630,800	485,300
Onaga	350,800	371,500
Ehu	97,400	85,800
Hapuupuu	240,400	245,600
Butaguchi (ulua)	222,400	177,600
Other	245,000	256,500
Total	1,786,800	1,622,300

Bottom Fish Imports Into Hawaii

The pattern of bottom fish imports to Hawaii over the past four years is shown in Table 14.8. Imports account for approximately 20 per cent of the Hawaii market. There has been substantial growth (46 per cent per annum growth rate) in total bottom fish imports from 1984 to 1987. Approximately 80 per cent of the imports come from the tropical Pacific, with Fiji and Tonga being major suppliers. The remainder comes from Australia, Japan, New Zealand, and Taiwan and may not represent the same market niche as Hawaii and other tropical Pacific bottom fish. The data do not provide prices; however, if we applied our monitoring

TABLE 14.6

Hawaii bottom fish market revenue, 1986 and 1987
(in million $)

Source	*1987*	*1986*
Northwestern Hawaiian Islands	$2.3	$2.1
Main Hawaiian Islands	3.1	2.3
Hawaii subtotal	5.4	4.4
Imports	1.3	0.8

TABLE 14.7

Price (per pound) distribution by species and product source for the Hawaii bottom fish market, 1986 and 1987

	1986			1987		
	Market	*NWHI*	*MHI*	*Market*	*NWHI*	*MHI*
Opakapaka	$3.41	$3.20	$3.78	$3.56	$3.27	$3.97
Onaga	3.93	3.13	4.39	4.70	3.24	5.12
Ehu	2.56	2.14	3.32	3.17	2.36	3.75
Hapuupuu	1.61	1.56	2.23	1.93	1.87	2.74
Butaguchi (ulua)	1.32	1.07	2.00	1.19	1.16	2.51
Other	2.43	2.39	2.26	2.42	2.11	2.55
Imports	2.38			2.67		
Hawaii only	2.83			3.10		
Total	2.78			3.02		

Market prices include imports (not shown)

TABLE 14.8

Bottom fish imports into Hawaii, 1984-87 (in pounds)

	1984	*1985*	*1986*	*1987*
Groupers	533	6,600	570	3,992
Jacks	1,102	22,301	44,047	9,144
Sea bass	0	169	4,059	11,893
Snappers	150,814	234,609	270,408	446,610
Total	152,449	263,679	319,084	471,640

program's average imported bottom fish price, ignoring species composition and product form, then the 1987 imports would be worth about $1.26 million.

No imports of snappers, groupers, or jacks were recorded from American Samoa, Guam or the Commonwealth of the Northern Mariana Islands in 1987. Landings from American Samoa and Guam were recorded for previous years.

The import figures are derived from the NMFS Market News Service's annual summaries of fishery products imported to Hawaii. The data are compiled by the NMFS Western Pacific Program Office (WPPO) and are from the Food and Drug Administration (FDA) inspection program. These data provide a more complete species breakdown for Hawaii than do U.S. Customs data, but they are incomplete because only lots valued over $1,000 are monitored and because invoices for lots pulled for inspection are not available for WPPO recording. The data cover all sources outside the U.S. Customs area, including American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands. Furthermore, because of a minor sampling problem, annual totals for 1987 needed to be extrapolated. These summaries do not distinguish product form, whether round or fillet. However, in 1987, 94 per cent of the snapper imported into Hawaii was in whole form (this does not include snapper brought to the State from the mainland United States). The data refer only to fresh/frozen imports and not to any processed products. Not all of the imported bottom fish remain in Hawaii; some may be re-exported to the mainland United States by local wholesalers and brokers.

Case Study — Hawaiian Fish Distributors (HFD)

This section describes a case study of the operations of a fish broker operating in Hawaii who buys fish in from various sources and prepares, markets and ships the product to U.S. mainland and Hawaiian buyers. It is typical of the kind of operation that it would be necessary to establish to effectively dispose of marketable surpluses of bottom fish and tunas directly from Pacific island locations.

For reference purposes the following table sets out common Hawaiian names for popular fish.

The processing and shipping operation of HFD is centered on the plant at Kailua-Kona on the island of Hawaii, 45 minutes by air from Honolulu. The principal source of fish is locally based commercial fishermen, but Micronesia has been developed as an additional source of fish, and is particularly useful to augment the number of varieties that HFD is able to offer its customers, particularly in the white fish area.

A graduated scale of payment is used depending on HFD assessment of

TABLE 14.9

Some commonly caught fish in the Hawaiian market, English, Hawaiian, and Scientific Names

English Name	*Hawaiian or local name*	*Scientific Name*
Albacore	Tonbo/Ahipalaha	*Thunnus alalunga*
Amberjack	Kahala	*Seriola dumerilii*
Bonito	Kawakawa	*Euthynnus yaito*
Dolphin Fish	Mahimahi	*Coryphaena hippurus*
Jacks (Trevally)	Ulua/Paio	*Caranx spp.*
Japanese mackerel	Saba	*Scomber japonicus*
Milk Fish	Awa	*Chanos chanos*
Mullet	Ama'ama	*Mugil cephalus*
Omaka	Omaka	*Caranx spp.*
Parrot fish	Uhu	*Family Scaridae*
Red Jobfish	Lehi	*Aphareus rutilans*
Scad, Big-eye	Akule/Aji	*Trachuropscrumeno-*
Scad, Big-eye (young)	Halau/Hahalalu	*phthalmus*
Scad, Mackerel	Opelu	*Decapterus pinnulatus*
Seabass (Grouper)	Hapu'upu'u	*Epinephelus spp.*
Snapper, red	Ehu/Efu/U'la'ula	*Etelis carbunculus*
Snapper	Gindai/Uhikiki	*Pristipomoides zonatus*
Snapper, pink	Kalikali	*Pristipomoides sieboldi*
Snapper, red	Onaga/Ula'ula	*Etelis coruscans*
Snapper, pink	Opakapaka	*Pristipomoides filamento-sus, P. multidens & P. flavipinnis*
Snapper, grey	Uku	*Aprion virescens*
Tuna, big eye	Ahi/Shibi/Menpachi	*Thunnus obesus*
Tuna blue fin	Ahi/Mauguro	*Thunnus orientalis*
Tuna, skipjack	Aku	*Katsuwonus pelamis*
Tuna, yellow fin	Ahi/Yashihi	*Thunnus albacares*
Wahoo	Ono	*Acanthocybium solandri.*

Source: Adapted from Peterson 1976

the quality of the fish being offered; all fish is cored through the belly cavity to assess quality on receipt.

Grade 1 fish is up to Japanese sashimi standard and goes mainly to ethnic Japanese buyers on the US mainland. Tuna of this quality is shipped in headed and gutted form as buyers will not accept loins. About 20 per cent of the fish received is to grade 1 standard, although there are seasonal variations.

Grade 2 fish is still of sashimi quality but not to acceptable Japanese standard. The flesh is of a lighter colour. This fish is all shipped as loins. About 40 per cent of the landings fall into this category and HFD pays only 75 per cent of the grade 1 price.

Grade 3 fish is not suitable for sashimi and is utilised in various cooked tuna dishes. This constitutes the remaining 40 per cent of purchases and only fetches the fisherman 50 per cent of the grade 1 price. This fish is also shipped as loins.

Depending on prices and demand, fish are also bought in from the local auction and other sources within Hawaii, including the Honolulu fish auction. At the time of the preparation of this report several large (25 kg) ehu were being processed into fillets for subsequent sale in Portland and San Francisco. These fish were purchased at the Honolulu market after having been consigned, whole, from Fiji, and flown to the Kona processing operation. HFD uses an agent in Honolulu to make purchases such as this as auction prices allow.

Approximately half the fish purchased is filleted before shipment. Those usually filleted are large bill fish, lower grade tunas, ono and mahi mahi. After removal from the frame, the fillets are washed and placed on absorbent paper to dry, and wrapped in an inner layer of clear cling wrap and an outer layer of butchers paper. Packaging materials consist of a corrugated board outer carton, printed with HFD logo etc. on the outside and coated with wax on the inside. A corrugated board insert is placed in the outer when it is erected to stiffen it. The erected outer is placed over a mould lined with a blue light-weight high-density polythene bag and injected with polyurethane foam. This results in the coating of the entire interior walls and base of the box with approximately 3 cm of insulating foam, faced with the polythene bag. The bag is made oversize so that the top can be folded over as flaps. A single sheet of the same material is made separately to form the insulating interior lid to the container. The completed box measures 100 cm x 40 cm x 40 cm and weighs 5 kg. The completed boxes, while still empty, are kept for 12 to 24 hours in the chill room to assist in fish temperature control.

A second bag of heavy grade low density white polythene is placed inside the box and the fillets, trunks and whole fish placed directly into it. Care is taken to ensure that larger tougher textured fish, such as mahi

mahi, are placed at the bottom. After filling the bag, usually with about 60 kg of fish, the bag is folded closed and five 1 kg single use gel packs are removed from the freezer and placed on top of the bag and the box is strapped shut. Gross weight is in the area of 70 kg. A record is kept of the contents of each box as it is filled and this is written on the outside of each box, and on the air way bill. In the case of fillets, up to eight cardboard internal dividers are used to prevent crushing and shake-down of the product during shipment. This also enables single gel packs to be placed in each compartment, on top of the wrapped fillets.

All top grade sashimi fish are shipped headed and gutted by buyers preference, although HFD is attempting to persuade buyers to accept loins for sashimi fish. Beyond the obvious freight savings, HFD believes that quartering the fish on receipt would allow much quicker chilling and significantly reduce burning. HFD believe sashimi grade fish must be reduced to 3° C or less within four hours of being caught. Headed and gutted tunas are shipped with about eight gel packs in the standard container fitted with a specially moulded base section to hold the trunk in position during shipment. Some fish are shipped whole, particularly smaller bottom fish and sometimes small tunas for display purposes.

In total, shipments from the HFD Kona plant to the US mainland range between 5,000 to 15,000 kg each week. During peak periods up to ten persons are employed falling back to only two or three during slack winter periods. There are three non-stop flights from Kona to San Francisco each day, of which two are United aircraft which are used by HFD. United operates a chill store in San Francisco and is responsible for holding and transhipping on to onwards flights (which are also all United) within the US. On some occasions it is suspected that fish in transit at San Francisco is not being placed in the airport chill store, and HFD is using time/temperature monitors to evaluate this problem. Fish generally takes less than 40 hours to reach the destination airport from Kona; United guarantees delivery to any mainland airport it serves within 48 hours of despatch. HFD is currently shipping fish from Kona to 33 of the mainland States, as far away as New York.

As each box is packed out it is weighed and marked with place in the consignment (e.g. 1 of 3) and has a sticker placed on it showing Air Way Bill (AWB) number, total pieces in shipment, total shipment weight, weight of that piece, destination airport and date. HFD maintains its own series of AWB numbers. A packing slip showing contents is enclosed within the box. HFD transports the packed boxes to the airport on an open flat-bed truck (20 minutes). On arrival they are received by a shipping agent who prepares the AWB and arranges loading, etc. with the airline. A copy of the AWB is attached to the outside of the box. After despatch is confirmed the buyer is contacted by phone and advised of the

estimated arrival time and AWB number. When due he will contact the airline, if not already contacted by them, quote the AWB number and take delivery.

All fish is shipped to order; that is pre-sold. Each day, each of the regular buyers on the US mainland (approximately twenty) is contacted by phone and his requirements are obtained. This occurs between 6 am and 7.30 am, Hawaiian time. This is matched against HFD's available inventory, the order agreed, made up and shipped to catch the first flight to San Francisco which departs at 11.40 am that same morning. Any surplus inventory that remains unsold is moved by contacting, by phone, additional potential buyers until all stock is committed. An additional shipment can be made, if necessary, to clear any residual fish on the second flight to San Francisco that departs at 8.15 pm.

All the mainland buyers are fish distributors themselves, who repeat the above placement process with their own outlets.

In order to upgrade the process of pre-selling the fish bought in prior to shipment, which is a key element in avoiding the potential losses of open auction sales, and the serious losses associated with freezing fish, HFD is establishing a sales office on the US mainland which is linked by computer to the Kona processing operation. As fish is received at Kona it is added to a computerised inventory, which is updated as the fish is shipped or otherwise disposed of. This means that the current stock holding of fish at Kona is always held on the computer there. This computer is linked with another at the US mainland sales office, thereby enabling sales staff to have an accurate inventory of stock to be sold. In practice, because of the time differences, selling against this stock occurs during the Hawaiian night, and the HFD Kona operation is able to start up with a listing of pre-sold orders that have been secured and transmitted to them from the mainland office. This has the advantage of minimising the need for phone selling from Kona, and helps to ensure that the maximum shipment is sent on the early flight.

AUSTRALIA

Summary

Pacific Island bottom fish are are a prime quality white flesh table fish species which are in strong demand on the Australian market. The Australian fresh and frozen fish market is heavily reliant on imports to satisfy local demand with total imports steadily rising to be currently exceeding 65,000 t or 55 to 60 per cent of total apparent annual fish consumption. Large increases have been recorded for both imported whole fish and frozen fish fillets.

With improved economic conditions and a firming of meat prices, demand for table fish species like deep water snapper can be expected to increase, and prices for good quality whole fresh chilled and frozen white flesh fillets to remain firm especially on a spot basis when local supplies are low. This usually occurs in the first two months of each year.

An analysis of the various market segments and marketing channels would suggest that regional suppliers would be advised initially to market its fish through the State Fish Auction Markets in Brisbane and Sydney. In addition to displaying and selling product on the State Auction Markets it might also be advisable to conduct a promotion in Sydney. This could be done in association with the South Pacific Trade Commission and be targeted for a small number of selected reputable seafood restaurants to gauge possible buying interest and price levels. A more focused marketing strategy should only be considered after an evaluation of initial sales on the respective State Fish Auction Markets and from feedback received from the restaurant promotion in Sydney.

Review of Australian Import Regulations

Australia has a relatively open tariff policy in respect of fisheries products. The South Pacific Trade and Economic Co-operation Agreement (SPARTECA) does not place the Forum Island Countries in an advantageous tariff position in respect of fisheries exports to Australia, because, in general, all fresh, chilled and frozen fish regardless of its source enters Australia free of import duty.

Quarantine provisions included in the Australian import regulations are relatively strict. Fish exports from the region will not generally be subject to intensive plant or animal quarantine checks, however food quarantine requirements in respect of mercury testing is of possible concern. The Customs (Prohibited Imports) Regulations specify that all fish and fish products for human consumption with a mean mercury content in excess of 0.5 parts per million are prohibited imports. It can be expected that airfreight shipments from the region will generally be small and consist of a number of different species of fresh chilled fish. If all species are to be tested and/or significant delays in delivery are caused (ie. longer than 1 or 2 days) the economic viability of such trade is in serious doubt.

In discussions with the Australian authorities attention was drawn to the possibility of having species tested for mercury, and if appropriate, be added to the exempt list for mercury analysis as specified in Appendix D24 to the Customs orders. As this would avoid the need for mercury testing of each consignment such a procedure should be carrried out prior to commencing exports to Australia.

Importing into Australia, as in most parts of the world, requires documentation. Familiarization with the completion of the appropriate certificates and forms is essential. The commercial invoice and veterinarian or certificate of origin should clearly state the name of the fish including scientific and if possible common Australian marketing name; whether it is perishable, fresh chilled, frozen or otherwise and its processed form, ie. whole, gilled and gutted, or otherwise processed. The presentation of clear and accurate documentation will ensure rapid processing through Customs.

Fish Marketing

In many States of Australia the control and management of traditional fish auction markets are vested with the State. Such auctions account for a majority of local fresh fish sales and very small percentage of imported fisheries product sales. In Brisbane and Sydney the Fish Marketing Board or Authority is responsible for conducting and managing the fish auction markets and also to co-ordinate and promote the orderly marketing and distribution of fish throughout the respective States. The fish markets are self-financing with commission rate being charged depending on type and quantity sold. These range from 5 to 12 per cent.

The State Fish Auction Markets receive fish in many forms from fresh chilled whole fish to frozen cooked crustaceans and may be sourced from either local supplies or imports. However, in general, the vast majority consists of fresh chilled whole or gilled and gutted fish from local fishermen's cooperatives and individual fishermen.

Buyers at the fish auctions comprise a wide variety of intermediate and end-user markets. Typically they consist of fish processors, wholesalers and/or retailers, supermarket chains and restaurant buyers. On the days of visits there were about 40 to 50 buyers in Brisbane and 100 to 150 in Sydney. Bidding for fish was brisk with resulting price depending on a number of factors including species supply and demand, quality demand, quality, size and form.

Deep bottom fish are relatively unknown on the Australian market. Some species on the Brisbane market would most closely resemble the Pacific islands catch, however the similarity is limited to those species caught in relatively shallow waters. Because Pacific bottom fish are handlined from depths exceeding 100 m and as the Australian fishing industry does not generally utilise such fishing methods, such species are not normally landed and sold on the local market. Snapper (*Chrysophrys*) is sold on all three auction markets and provides some understanding of the table-fish market and serves as a useful reference for potential bottom fish sales. Sydney is dominant in the snapper market selling in

excess of 600 t per annum. Melbourne is reported to sell in excess of 200 t per annum with Brisbane selling less than 50 t per annum. Reasons for the low snapper sales in Brisbane are the lack of supply and the availability of alternative good quality table fish species like emperor, perch, coral trout and barramundi. Prices for snapper are consistently highest in Sydney with margins typically A$0.50 to A$0.70 per kilogram over Brisbane and Melbourne.

Wholesale Distributors and Importers. Wholesale distributors and importers operate in all States in Australia and tend to deal mainly in frozen and processed fish products. However, some also handle fresh chilled gilled and gutted, headed and gutted, and frozen filleted fish especially for some of the more popular species from New Zealand.

Well established reputable companies in this sphere of business usually not only handle and hold a wide range of seafood products but also extend credit and operate cold storage and possibly processing facilities. As such, product lines must be fast moving and/or have high margins. Typically margins in this sector exceed 20 per cent and often 50 per cent on some of the slower or higher risk lines. The Pacific region could have products which are suitable for such marketing. However, price, unknown frequency of supply, and lack of market experience will severely limit potential interest.

Specialist High Quality Table Fish Marketing. This market sector comprises a number of entrepreneurs who deal direct with the restaurant/catering trade and specialist fish retailers and provide a very limited yet high quality and well presented and packaged product. It is an up-market sector with emphasis on quality presentation and packaging.

This sector would be the desired market for much of the air-freighted Pacific Island fish. While a top quality product can be produced in the region this market cannot be considered until high quality and consistency of supply can be guaranteed. The long term objective for regional trade directed to Australia should however be to target to this market sector.

Import Regulations

General. Imports into Australia are regulated by the Commonwealth Government with the various States administering a uniform set of controls. This applies to all customs and quarantine regulations. Each State does however have its own unique legislation relating to the production and sale of edible products which are generally covered under its health regulations.

Customs Tariff. Australia has a relatively open tariff policy in respect of fisheries products. In general all fish, fresh (live or dead), chilled or frozen, whole or filleted imported into Australia is free of import duty. Processed fish products including canned fish attracts a duty of up to 10 per cent. The South Pacific Trade and Economic Co-operation Agreement (SPARTECA) does not place the South Pacific in an advantageous tariff position in respect of fresh chilled and frozen fisheries imports into Australia.

Quarantine. The Commonwealth Department of Health is responsible for import quarantine control. Quarantine controls cover three distinct fields namely plant, animal and food. Plant and animal quarantine controls are administered by the Department of Agriculture or Primary Industry within each State and with respect of food and foodstuffs the State Department of Health or the Australian Government Analytical Laboratories (AGAL) are responsible for carrying out any testing that may be required.

Fish is generally exempt from plant quarantine excepting if the packaging materials are made of plant matter; or the country of origin has certain specified diseases. Fish exports from the region should meet all plant quarantine requirements.

Animal quarantine prohibits the import of certain fish species and in particular the salmonids including salmon and trout. Most other fish and fish products may in general be imported from any country. Animal quarantine checks will typically only be made on fish if the fish is live or the fish products contain milk or egg as for example batter or fishballs.

Food quarantine provisions included in the Australian Customs regulations refer to maximum levels of additives, metals and other agents that may be present in specified foods and foodstuffs. In respect of fish the important provisions relate to the allowable mercury content. Item 18 of the second schedule of the Customs (Prohibited Imports) Regulation states that all fish and fish products (including crustaceans and molluscs) for human consumption with a mean total mercury content in excess of 0.5 parts per million (ppm) with a maximum individual sample concentration of 1.5ppm are prohibited imports. This level of 0.5 ppm was recommended by the National Health and Medical Research Council (NH & MRC) and is included in their Model Food Legislation Reg. A12.

The request for mercury analysis is initiated by the customs inspector at the point of entry. The frequency of testing depends on a number of factors including the track record of the particular species from the country in question and whether it is exempted from normal testing as specified in Appendix D24 of the Customs Orders. New species from a new source will almost certainly be sampled for mercury. Of note in the

testing procedures is the number and type of samples required for mercury analysis which, for small shipments would make such shipments uneconomic if samples were taken.

From discussions with the Customs departments, the various State Health departments and AGAL it is apparent that mercury testing is a procedure which in time takes no longer than one day but which for Queensland may take up to 10 days from the time samples are drawn to results being reported. In N.S.W. and Victoria the corresponding times are one to three days. The difference in times is due to the fact that Queensland only performs mercury testing on a specific weekday whereas the other States do them when and as required.

Health. As stated above, each State is responsible for the legislation and regulation of the production and sale of food and foodstuffs in their respective States. Such regulations cover all goods available for consumption whether imported or locally produced.

Each State (excepting Tasmania and South Australia) has adopted the standards as recommended by the NH & MRC in respect of mercury contents, however, with the production or sale of shark significant differences do occur.

Certificates, forms and Document processing. Importing into Australia requires certain documentation. Regardless of product quality or shelf life the product will not generally be allowed to enter Australia if the appropriate documents, correctly completed, are not submitted. Familiarisation with the correct certificates and forms is essential. The presentation of clear and accurate documents ensures that processing through customs is achieved with maximum speed and efficiency. Typically document processing by customs requires no more than three working days. It is standard with perishable products for the customs clearing agent to request the removal of the goods to a chiller or cold store, and to the market, prior to making the customs entry.

Exporting marketing strategy

Pristipomoides and *Etelis* are prime table fish species and should receive good prices in all markets, especially Brisbane and Sydney. Brisbane is an attractive market as it has a range of tropical species similar to the regional catch. Sydney, however, with its numerous restaurants and relatively high per capita income, has a strong and increasing demand for high quality table fish. The low period in supply also coincides with many regional peak supply periods and in such a period prices paid for good quality white flesh fish are very high, especially for the small table

size fish. Medium and large size fish do not tend to attract the same high prices.

Until trial shipments are sold in the respective markets further refinement of a marketing strategy cannot be advised. Although in the long term sales direct to the restaurant trade are desirable it is strongly advised that initial shipments be auctioned at the Queensland and N.S.W fish auction markets. This will enable the product to be displayed and promoted to many restaurant buyers and will assist in the selection of the most appropriate marketing strategy and/or potential buyers.

In collaboration with displaying and selling product on the respective markets it would also be desirable to conduct a promotion in Sydney. This should be done in association with the South Pacific Trade Commission and should target on a small number of selected reputable seafood restaurants to display and test the product and gauge possible buying interest and price levels.

Whether the Australian market will readily purchase the Pristipomoides and Etelis species at prices required to make the trade viable is difficult to assess. On an opportunist basis supplying fish on low supply periods should provide good returns. However, to ensure the successful development of long term year-round trade, fish from the region will need to be consistently well presented and be of the best quality.

NEW ZEALAND

Summary

There would appear to be significant market for Pacific Islands fish in Auckland sufficient to absorb currently available surplus production from the FFA states mentioned in this section. There is also a potential market for tuna and other pelagic fishes, the size of which is not known. Margins are expected to be tight and supply will be influenced by returns elsewhere, principally the USA market. Possible prices which could be achieved selling at the wholesale level (i.e. to retailers direct) are given in Table 14.10. These are estimates only based on prices realised for similar New Zealand species and will have to be tested by actual experience.

The potential for exporting fresh skipjack and yellowfin appears promising. While large yellowfin (30 kg) can fetch high prices in Japan the price for small fish is much less. However, small fish would be the preferred size for sale at the weekend markets in Auckland. If local companies decided to market purse seine caught skipjack within New Zealand in the fresh form this could weaken the market. On the other hand the skipjack season in New Zealand lasts from December to March

only, leaving the rest of the year when fresh product would be unavailable, unless imported.

TABLE 14.10

Estimated prices per kg for chilled Pacific Islands fish in the Auckland market (wholesale level).

Species	*Form*	*NZ$*	*FJ$*	*WS$*	*T$*	*SI$*
Snappers	whole	4.00	3.92	5.43	3.65	5.45
Breams	whole	4.00	3.92	5.43	3.65	5.45
Emperors	whole	4.00	3.92	5.43	3.65	5.45
Yellowfish	whole	3.00	2.94	4.07	2.74	4.09
Skipjack	whole	3.00	2.94	4.07	2.74	4.09
Snappers	H&G*	9.00	8.82	12.21	8.21	12.26
Groupers	H&G*	9.00	8.82	12.21	8.21	12.26
Dogfish	Trunked	6.00	5.88	8.14	8.17	5.47

*Wing off ("Wing" refers to the pectoral and ventral fins)
Exchange rates as at Feb 1988.

If exporters from FFA member states wish to develop a trade in fish as a joint venture with a New Zealand partner it may be possible to obtain financial assistance through the Pacific Islands Industrial Development Scheme (PIIDS) which was established in 1976. The scheme's main objective is to foster economic development and the growth of employment in island countries. However, since PIIDS assistance is currently only available for manufacturing processing or pioneer agricultural ventures it is unlikely that purely exporting projects would qualify. Details of PIIDS are available in a booklet which can be obtained by writing to:

The Executive Officer
PIIDS Unit
Department of Trade and Industry
Private Bag
Wellington, New Zealand

Introduction

As indicated in the introduction to this chapter, in recent years an

increasing number of Pacific countries have established an export trade in air-freighted fish. The principal market has been the USA (Hawaii) but some fish has gone to Japan. Trade has also developed within the Pacific Islands themselves, such as that from Palau to Guam and the Northern Marianas. This trade has been dependent on good air links, competitive air freight rates and attractive prices in the importing countries. However, not all Pacific countries can take part in it because of the lack of convenient transport or high freight costs.

For some countries, for which exporting to Japan or the USA is difficult, there may be an alternative market in New Zealand. Countries to which this could apply are Fiji, Solomon Islands, Tonga and Western Samoa. Other countries could also be interested provided there are good air connections with New Zealand.

The possibility of exporting frozen fish by sea freight exists, but in most cases this is not a practical alternative. Refrigerated cargo space is available from New Zealand to the islands but shipping companies seldom offer it on the return because of lack of demand.

In the past New Zealand has not been considered a potential market because of its own large fishing industry. However, since the introduction of individual transferable quotas to the catching sector and total allowable catches for most of the main species in October 1986, this situation has changed. There have been severe cuts in the allowable catches for important species on the domestic market (e.g. snapper and grouper). This, plus the competing export market, have resulted in local shortages, particularly in Auckland area, and have forced up prices. At the same time the New Zealand dollar has strengthened against the currencies of the Pacific Islands. There would thus appear to be a market niche which could be supplied by fish from the Pacific Islands.

Marketing niches for Pacific Islands fish

It is likely that marketing opportunities will be primarily for fresh chilled fish. This product is more readily acceptable on the New Zealand domestic market than frozen fish. Most fish in New Zealand is sold fresh. Fresh fish can be sold whole or processed into fillets or steaks before sale. Processing is less satisfactory when carried out on frozen fish, particularly if it has not been blast frozen. However, the export of frozen fish should not be entirely discounted as there may be a market for frozen in the round. Also, larger consignments may be consolidated and advantage taken of cheaper air freight rates.

The principal market is likely to be amongst the ethnic Polynesian population. Large numbers of people originating from Western Samoa, Tonga, Cook Islands, Niue and Tokelau and their descendants live in

New Zealand. The largest number of these are concentrated in the Auckland urban area. Population figures by ethnic origin from the 1986 census showed the following.

TABLE 14.11
Ethnic origin of New Zealand population

	European Origin	*NZ Maori*	*Pacific Is Polynesian Origins*	*Others*	*Total*
New Zealand	2,651,379	404,775	125,850	81,279	3,263,283
Auckland	611,370	91,233	80,822	25,951	809,376

In addition to Pacific Island Polynesians there are numbers of people from Fiji in New Zealand. In total the potential ethnic market in Auckland is larger than any of the urban centres in the Pacific Islands.

People of Pacific Island origin maintain many of the customs of their home countries. Important amongst these are traditional food consumption patterns. Fruit and vegetables from the islands are regularly imported—taro, plantain, banana, coconut, etc. The importance of fish and other seafoods is much greater for Pacific peoples (and New Zealand Maoris) than for the European population of New Zealand. Per capita consumption of fish is considered to be much higher amongst Polynesians than the New Zealand population as a whole, although official figures are not available to confirm this.

Apart from prepared foods (e.g. fish and chips) most of the fish bought by Pacific Islands people is in the whole form. Weekends are traditional buying days in preparation for the family meal on Sunday. Much of the fish for this purpose is bought from the open markets which operate on Saturdays and Sundays at a number of places in greater Auckland. In addition, fish retail shops in suburbs where there is a large Polynesian population sell much of their product in whole form.

Another possible market is to supply premium fish for processing into fillets for sale through retail fish shops. Fish for this purpose could be air freighted in the headed and gutted form. Savings of at least one-third in air freight and packaging costs could be achieved for fish transported in this form.

Suitable species for this market would be deep water snappers and groupers. Both of these have names familiar to consumers in New Zealand where the local snapper is generally considered to be the prime

table fish and groper (a spelling variant of grouper) is another highly regarded species. They could therefore be sold under their usual common names (perhaps as Pacific snapper, Pacific groper) without misleading the public or contravening labelling requirements. In fact, the New Zealand snapper is really a sea bream (family Sparidae) whereas the Pacific snappers are true snappers (family Lutjanidae).

A third possible market may exist for speciality products for high class food retailers or seafood restaurants. Because of their visual appeal species such as the long-tailed red snapper could find a market in New Zealand. Another possibility is the sale of high value crustaceans (tropical rock lobsters, slipper lobsters, reef crabs). This market may not be an easy one to develop but because of the value of the product it would be able to support a relatively high level of freight costs.

The New Zealand Domestic Market

Most fish sold at the retail level in New Zealand is processed before sale. Usually this is into skin off boneless fillets. Some larger fish like groper or ling are cut into steaks or blocks. Whole fish are sold also but represent a much smaller proportion than fillets. The amount of whole fish offered for sale depends on the location of the retail outlet. In areas with large Polynesian populations or other ethnic groups used to buying fish in the round it is readily available.

As previously mentioned, sales of fresh fish predominate, particularly through speciality fish shops. However, increasing quantities of frozen fish are now being sold. Much of this comprises deep water species (orange roughy, oreo dories, hoki) which is sometimes frozen at sea. It is usually thawed before sale and sold as "pre-frozen."

Retail fish prices are currently perceived to be high by New Zealand consumers. This is because most fish is sold as boneless fillets. For most species of fish the yield in this form is 25 to 35 per cent of the whole fish weight. Thus a fish valued at NZ$5/kg whole would produce fillets selling for NZ$14.30 to $20.00/kg. Such prices appear high when compared to those for meat. There are therefore barriers to further price increases for fish at present. In fact, per capita fish consumption began to fall in 1985 after a long period of increasing consumption. This is thought to be due to price resistance. Recent consumption rates for fin fish are given in Table 14.12

Two factors have contributed to price increases over the past two years. Firstly, there was the Goods and Services Tax (GST) introduced on 1 October 1986, which added 10 per cent to all prices. All prices in this report include GST unless otherwise mentioned.

TABLE 14.12
New Zealand fin fish consumption 1980-1986

Year	*Per Capita Consumption (kg)*
1980	13.60
1981	13.51
1982	15.56
1983	23.39
1984	26.45
1985	21.60
1986	19.63

Source: N.Z. Fishing Industry Board

Also on 1 October 1986 a new fisheries management regime was enacted. The scheme is based on individual transferable quotas (ITQs) and total allowable catches (TACs) for all the main commercial species. The size of ITQ a fisherman received was determined by his past catches. The sum of ITQs equals the TAC for each species. An important reason for introducing the scheme was the conservation of the resources. Many species of coastal fish had become overfished. When the scheme was introduced the government reduced TACs below previous catch levels for a number of species. This resulted in a shortage of fish on the local market, particularly prime species like snapper and groper which had strong export markets.

Current price information is given in Table 14.13 (whole fish) and Table 14.14 (Fillets). This information was gathered from fish shops in the Auckland central city area. Herne Bay, Ponsonby and Otara.

TABLE 14.13
Retail Prices for whole fish, Auckland, February 1988 (NZ$/Kg)

Species	*Fish shops* 1	2	3	*Otara market*	*Avondale market*	*Average*
Snapper	6.50	7.50	7.00	6.60-6.80	7.00-7.50	6.98
Golden snapper	6.55	7.50	6.60			6.88
Trevally	3.95*	4.50	3.80	5.00		4.31
Mullet	4.70	4.50	3.80	4.50-500		4.50
Skipjack				6.00		
Paddle crab	5.28	5.00				5.14

*gutted

TABLE 14.14
Retail prices for fish fillets, Auckland, February, 1988 (NZ$/Kg)

Species	*Fish shops* 1	2	3	4	*Average*
Snapper	19.50	19.00	19.00	21.00	19.62
Gurnard	12.85		14.85	13.80	13.83
John Dory	19.75*	19.50	19.60		19.62
Tarakihi	15.95	16.60	17.50	16.95	16.75
Trevally		8.20*	8.80*		8.50
Lemon fish	10.74	9.80	10.85	10.45	10.48

*Skin on

The prices for whole fish show that snapper averaged nearly NZ$7.00/kg. This shows an above average mark-up over the reported wholesale price of NZ$4.00 to $4.25/kg.

Although this study was carried out in the middle of the New Zealand skipjack season, only one outlet offered this species for sale and at the high price of NZ$6.00/kg. It appears that skipjack is caught only for the canning market and no attempt is made to market it locally in fresh form. In general, tuna is very seldom available in Auckland, where there would be a large market amongst the island people. The species most commonly seen is albacore; yellowfin is not available at all.

Much of the snapper sold in whole form is of average to poor quality, particularly that sold through market stalls. Top quality snapper goes mainly to the export market. Overall the freshness and quality of whole fish in Auckland is not good. Surprisingly, it appears to return the retailers a higher profit margin that better quality fish processed into fillets.

The fillet prices shown in Table 14.14 are for the commonly available species in Auckland, and those with which imported fish would compete. Highest average prices are for snapper and john dory (NZ$19.62 for both) and lowest for trevally (NZ$8.50). The prime species groper is becoming increasingly scarce in the Auckland market and is a notable absentee from Table 14.14 because it was not on sale at any of the outlets visited during this survey.

Further information on price levels for New Zealand fish is shown in Table 14.15, which gives export prices at the FOB level for 1987. These prices include packaging and delivery to the departure point. The price

for export quality chilled snapper shows the substantial margin over wholesale prices for the local market.

TABLE 14.15
Average export prices (FOB) for four New Zealand fish 1987. All fish whole expect groper (H & G). (NZ$/Kg)*

Species	*Chilled*	*Frozen*
Snapper	10.46	5.44
John dory	6.54	3.64
Tarakihi	5.99	3.10
Groper	6.86	3.46

*Exclusive of GST

Future price trends on the New Zealand domestic market will be influenced by export prices which in turn will be partly dependent on the exchange rate.

The supply of the prime commercial species snapper and groper to the local market are unlikely to increase in the medium term. The present TACs for these species are 25 to 50 per cent lower than catches a few years ago. If any increases in the TACs are permitted as stocks rebuild they are likely to be small and gradual. Therefore both species will continue to be in restricted supply unless the export markets collapse, which is unlikely. Supplies of other traditional species such as tarakihi, mullet and gurnard are likely to be stable.

It is possible that there may be increasing supplies of fish from the deep water fishery sold on the local market. This is likely to be accelerated if export prices weaken; it may already be occurring for orange roughy. Also, as the deep water species become better known and more accepted by the New Zealand consumer, the premium currently enjoyed by familiar coastal species may decline. This will have more effect on the fillet market than the whole fish market.

Potential export species

Pacific fishes with potential for export to the New Zealand market will be those suitable for the market niches identified above.

For the whole fish trade to the Polynesian community in the Auckland area, suitable species would meet some or all of the following criteria:

- above average price or significant price differential;
- good keeping qualities;
- available in moderate to large quantities;
- available regularly.

Suitable fishes would include snappers, emperors, groupers, breams, rabbitfish, jacks, mullet, yellowfin. If carefully handled skipjack and parrot fishes could also be exported.

For fish to be sold in processed form or marketed directly in competition with local product, suitable Pacific species would, in addition to the above criteria, need to be similar or equivalent to a New Zealand species. This will be necessary for marketing purposes because it is unlikely that any Pacific species would be available in sufficient quantities to justify promotion as a new product in its own right. A suggested list of fishes falling into this category is given in Table 14.16.

TABLE 14.16
Pacific Islands fishes and New Zealand fishes with similar characteristics for marketing purposes.

PACIFIC FISHES		*NEW ZEALAND*	
English Name	*Scientific Name*	*English Name*	*Scientific Name*
Snappers	*Lutjanidae* (many spp)	snapper	*Chrysophrys auratus*
Breams	*Sparidae* (several spp)	snapper	*Chrysophrys auratus*
Groupers	*Epinephelus* spp	groper	*Seriola lalandi*
Mullet	*Mugil* spp	mullet	*Mugil cephalus*
Dogfish	*Mustelus Squalus* spp	rig	*Mustelus anatarcticu*

Fishes which should not be exported are large groupers, trevallies and sharks because of the possibility of high mercury levels. Similarly, species in which ciguatera is known to occur should be avoided. As such species are easily identified problems should not arise.

Transport and packaging

All the FFA states mentioned in this report have at least a weekly flight to Auckland. Not all have non-stop flights but in no cases would transshipment be required. Air links between Auckland and Western Samoa,

Tonga and Fiji can be considered permanent because of the volume of traffic. Direct flights to Vanuatu cannot be considered permanent as they have not always been available in the recent past. Future changes may also affect the service to Solomon Islands.

If any trade in air freighted fish is to develop it will depend on an economic commodity rate being negotiated. The published standard freights offered by airlines would make it quite uneconomic to air freight fish. Nevertheless many thousands of tonnes are so transported throughout the world each year. There is also a substantial trade in fruit and vegetables from some Pacific islands to New Zealand. Air freighted taro from Western Samoa is commonly available in Auckland and retails in the price range NZ$2.20 to $2.90/kg. The value of fish being much higher than this, it should more easily be able to support the cost of air freight.

Packaging requirements for the New Zealand market are not as demanding as for Japan where moulded polystyrene boxes are essential.

For places with non-stop flights to Auckland packing in cardboard boxes (wet lock type) with plastic liners would be adequate. Fish should be kept chilled until loading and cleared immediately on arrival to a cool store. This system is used for the carriage of chilled snapper from Fiji to Hawaii and has proved satisfactory.

If the flight involves stop-overs this sytem may not be adequate. The fish will gain heat while the aircraft is on the ground and there is always the possibility of flight delays. It would therefore seem advisable to use insulated packaging. This could be either a re-usable box or a collapsible type made up before use.

Government regulations

New Zealand Health Department regulations require the following information to be shown on the box or packaging.

(1) name and address of exporter responsible for the fish (full street address is needed, not Post Office box number);
(2) alternatively the name and address of the importer can be shown if he agrees to accept responsibility for the fish;
(3) name of the product;
(4) weight.

The Health Department has a random programme of inspection and testing of imported foodstuffs. Testing for mercury content may be required.

The permitted maximum level is 0.5ppm. This is not an average level (as in Australia) but an individual level.

The Food Regulation 1984 and its two subsequent amendments·

control health aspects of food in New Zealand and should be obtained if more detailed information is required. The Health Department stresses that correct labelling is very important.

There are no quarantine restrictions on the importation of fish for food. The importation of live animals is not permitted without specific approval. This could affect possible imports of live crustaceans (lobsters, crabs).

There is no customs duty on fish imports which are free from import licensing requirements. Most goods from the Pacific Islands enter New Zealand duty free under the SPARTECA agreement.

GST at the rate of 10 per cent is payable by the importer. This is levied on the C and F value plus insurance or other fees charged.

Exchange rates

A factor greatly affecting the economics of exporting to New Zealand is the exchange rate between the currencies of FFA states and the NZ dollar. Reference to the countries considered in this section over the last three years show that all of them have depreciated against the NZ dollar, which is now at recent historically high levels. Since the first quarter of 1985 the NZ dollar has appreciated by 23 per cent against the Western Samoa tala, 39 per cent against the Tonga paanga, 45 per cent against the Vanuatu vatu, 81 per cent against the Fiji dollar and 111 per cent against the Solomon Islands dollar. While the high value of the NZ dollar makes exporting there more profitable some caution would seem desirable in developing an export trade which is sensitive to exchange rate fluctuations.

Importers

Seafoods imported to New Zealand are mostly in cans or other highly processed forms. There is very little fresh or frozen product imported apart from prawns and a few other specialty lines not available from local suppliers. Many New Zealand fish traders are substantial exporters of most kinds of seafoods but have little experience of importing. Therefore to find suitable importers for Pacific fish is not as easy as in Australia, USA or Japan.