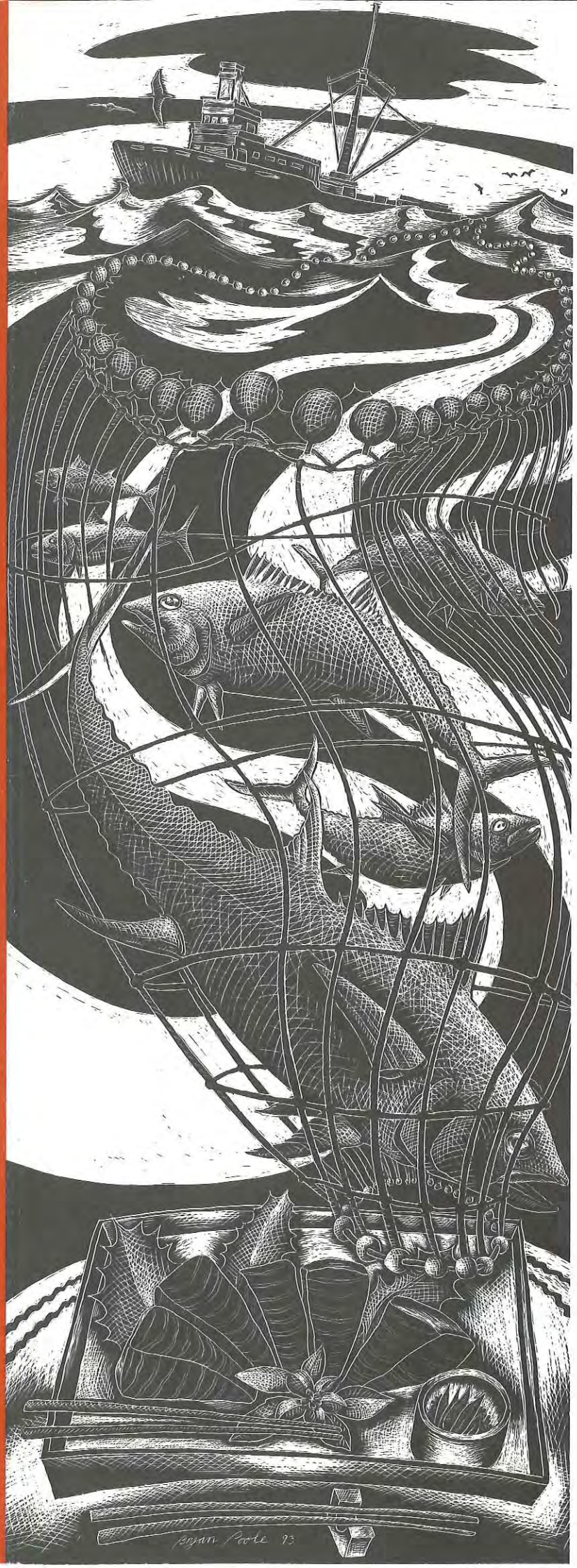

SPECIES IN DANGER

BLUEFIN TUNA

AN EXAMINATION OF THE INTERNATIONAL TRADE WITH AN EMPHASIS ON THE JAPANESE MARKET

Andrea L Gaski

A TRAFFIC NETWORK REPORT

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Andrea L. Gaski

FOREWORD

At the 1992 meeting of the Conference of the Parties to CITES, in Kyoto, Japan, the USA, Canada, Morocco, and other ICCAT nations promised the CITES delegates assembled that new conservation measures for Atlantic bluefin tuna would be enacted, and that the western Atlantic catch quota would be reduced by 50%. These commitments effectively stopped the discussions on the merits of listing Atlantic bluefin tuna on the CITES Appendices and the proposal for listing was withdrawn from discussion as a result of ICCAT's assurances.

However, so far ICCAT has steadfastly avoided many of the questions raised at the Kyoto CITES conference and is avoiding taking the necessary strong measures to safeguard the severely depleted Atlantic bluefin populations from further decline.

Undoubtedly, the catch of bluefin tuna for international markets is a key factor to consider in the conservation and management of bluefin populations. TRAFFIC's report on the trade is the first-ever attempt to describe the global trade and to use Customs trade statistics to assist ICCAT in monitoring the effectiveness of its management policies and actions.

TRAFFIC hopes that this report and our ongoing monitoring will help provide greater transparency of the global trade and draw public attention to the ICCAT management process.

Jorgen B. Thomsen
Director
TRAFFIC International

EXECUTIVE SUMMARY

This study of the international bluefin tuna *Thunnus* spp. trade statistics has been undertaken with the aim of evaluating the usefulness of such data to gain a picture of the trade and, in turn, to bring benefits for management of the species.

Examination of Customs statistics relating to the international trade in bluefin tuna was possible for those countries using a common system of reporting trade, namely the Harmonized System, under which bluefin tuna has a separate category. In 1992, 93 nations or territories used the standardized Harmonized System (HS) of reporting national Customs import and export statistics, but only three countries were currently using HS codes for bluefin tuna: Japan, New Zealand, and the USA. Even for these countries, many factors still complicate comparison of these statistics, including varying reporting periods, use of different units of measure, and different methods for reporting volume and monetary values. Therefore, the Customs data of the USA, New Zealand and Japan were not used in conjunction with one another for the majority of this analysis. Because Japanese import data cover a period of more than 20 years, and because Japan has a prime role in the international bluefin tuna trade, the Japanese Customs import data form the basis of this report.

Japan is undoubtedly the primary consumer of bluefin tuna in the world. It imported an average of almost 2 800 t of bluefin tuna annually between 1970 and 1990 and exported an average of almost 160 t annually between 1970 and 1985. During the same time period (1970-1985), Japan also caught an additional 51 000 t of bluefin annually. Based upon the sum of these imports, exports, and catches of bluefin tuna, Japan consumed an annual average of at least 53 000 t, or the equivalent of about 40% of the world catch of bluefin tuna (according to 1986 catch statistics), or about 440 g of bluefin per citizen of Japan in 1985.

The majority of Japanese imports and catches are brought to the Tokyo Central Wholesale Market which was established by law in 1923. The largest market, Tsukiji, was opened in 1935 and handles about 88%, by volume, of all marine products traded in the Central Market. Bluefin and other fish are transported to the markets and marked and examined before a dawn auction for purchase and distribution. Bluefin fresh prices peaked in 1979 and 1989, and reached their lowest point in 1984 and 1985. The market categorizes and prices bluefin as fresh domestic, fresh imports, fresh *meiji* (which are small bluefin under 7.5 kg, caught primarily by the domestic fleet), and frozen. Fresh domestic fish draws the highest price in the winter months when it is least available, while *meiji* and frozen bluefin prices are steady throughout the year, probably due to their constant availability at all times of the year.

Of almost 60 exporting countries reported in the last two decades, five countries -- Australia, the USA, Taiwan, Spain, and Canada -- dominated the trade to Japan, exporting 78% of all reported Japanese imports. Australia, which was first reported in Japanese imports only in 1979, is now the primary exporter by weight, Japan's total import volume from this country during 1970-1991 exceeding 22 000 t per annum, most of which was made up of frozen bluefin.

Perhaps a third of bluefin caught is consumed outside Japan, notably in the Republic of Korea, (a world fisher of bluefin), and presumably in Spain and Portugal, which are reported as destinations for US fresh bluefin tuna. However, there is not enough statistical information to support these assumptions positively.

Japanese imports statistics do not report the oceanic origin of imported bluefin but US export statistics were used to determine the oceanic source of US-caught bluefin by using the location of the reported Customs district of export. Based upon the fact that fresh bluefin is air-shipped directly to the consuming country, to obtain the best price available, the assumption can be made that the US Customs district of

export is probably in close proximity to the catch area. Accordingly, it is likely that an average of 80% of domestic exports of fresh bluefin tuna from the USA was caught from the Atlantic Ocean, since this amount was reported as exported via east coast Customs districts. The Customs districts most frequently reported in US exports are New York and Boston.

While it is difficult to identify and describe trade routes based upon the limited statistics available, some observations can be made. The Japanese market sets stringent requirements for bluefin tuna quality and freshness, so the only mode of export to Japan for the most valuable bluefin is aeroplane. The US export data confirm that the most valuable fresh tuna is commonly transported by air. Eighty-seven per cent of bluefin, 83% of Albacore *Thunnus alalunga,* 90% of Yellowfin *Thunnus albacares*, and 88% of "other tuna" are exported by air. Three major exporters of bluefin to Japan – Australia, Taiwan and the USA — have more than 50 flights each week to Tokyo.

BACKGROUND

There are almost 22 000 described species of fish in the world, of which more than 13 000 are marine. Perhaps 9000 species of these are exploited in the world's oceans and seas for food or other human use (WRI, 1987). These marine species include the tiny anchovy Engraulidae and the immense basking shark *Cetorhinus maximus*, the peculiar-looking Mola *Mola mola* and the equally peculiar-looking Winter Flounder *Pseudopleuronetes americanus*, the primitive Pacific Hagfish *Eptatretus stouti* and evolutionarily advanced Yellowfin Tuna. Yet despite the diversity of form and take, a large proportion of the total world landings (approximately one hundred million tonnes in 1989) is based on a small number of species. In 1989, only 12 fish species were recorded to have been caught in volumes in excess of one million tonnes, together making up 35% of the total world catch (FAO, 1991). Of these ten marine and two freshwater species, the top three landed catches were of Alaska Pollock *Theragra chalcograuma*, Anchoveta *Engraulis ringens* and Japanese Pilchard *Sardinops melanostictus*.

There are two species of bluefin tuna, the Northern Bluefin Tuna *Thunnus thynnus* and Southern Bluefin Tuna *T. maccoyi*. In terms of volumes caught, these two tuna species do not represent an important proportion of the overall catch of fish: the world bluefin tuna catch in 1986, for example, was only about 96 000 t (or about 0.12%) of the world fish catch for that year. Bluefin tuna is not a part of the staple protein diet of world populations, yet the demand for bluefin tuna is established — about two-fifths of the catch was taken or consumed by just one nation as a luxury food item over the past 20 years. Bluefin tuna fisheries, particularly those of the northern populations in the Atlantic, epitomize the current problem besetting many managers of modern fisheries, that is, how to maximize the biological, economic, and political benefits of a fishery for the present as well as for the future.

The Northern Bluefin Tuna, along with other Atlantic tunas and tuna-like species (billfish Istiophoridae, Swordfish *Xiphia gladius*, etc.), has been managed by an international treaty, the International Convention for the Conservation of Atlantic Tunas (ICCAT), for more than 25 years. Yet, in spite of ICCAT's oversight of bluefin tuna fisheries in the Atlantic and the imposition of some management schemes in the 1980s, the western Atlantic population of Northern Bluefin Tuna has declined by between 77% and 90% and the eastern Atlantic population by about 50% since 1970 (ICCAT, 1991). The reasons for these declines are still under debate. Some believe that the decline in these tuna populations has now been halted in the Atlantic Ocean and that populations are recovering to acceptable levels (only slowly, owing to slow maturation of individuals in the species). Others disagree with even the very basic scientific assumptions upon which ICCAT management is structured, such as isolated populations and spawning age, so doubt that there has been such a significant decline as mentioned above. Still others, particularly conservationists recently entering the debate, believe that ICCAT management schemes are ineffective and an example of the failure of modern fisheries management to balance biological factors with economics and politics.

The Northern Bluefin Tuna in the Atlantic has become a flagship fishery species illustrating (depending on the viewpoint) the efficacy or inefficacy and the sustainability or unsustainability of current fishery practices and management. The benefits and failures of international management of this particular fishery may have direct effects on human fishing communities and countries throughout the world and the debate has come to the forefront of global fisheries issues. At a time when many fishery products' values fluctuate broadly as fisheries stocks decline, the bluefin tuna market has been steadily increasing, owing to consumer demand and rising prices.

INTRODUCTION

Only three countries report the international trade of bluefin tuna specifically in their national Customs statistics — Japan, New Zealand and the USA. Until more countries report details of bluefin tuna imports and exports in their national trade statistics, it will be difficult to assess the full scope and nature of the international trade. The information provided by these three countries' statistics nonetheless allows a good insight into the international trade in bluefin tuna, since the USA and Japan, in particular, have major shares in the world trade of bluefin. Moreover, New Zealand, Japan and the USA all use the same Customs code for bluefin tuna in their statistics, making for ease of correlation between data. Over the past two decades the trade has focused increasingly on the lucrative market of Japan. Of all the countries reported in the Japanese import statistics, five consistently exported the greatest volumes of bluefin to Japan: Australia, the USA, Taiwan, Spain, and Canada. Seventy-eight per cent of the fresh bluefin tuna and 55% of the frozen bluefin tuna imported by Japan during the period, 1976 to 1991 were from these five countries. Other sources of trade data were consulted for this study, and, in so doing, an overall assessment was made of the usefulness of international trade data as a tool for identifying patterns in bluefin tuna trade.

The price commanded by the flesh of bluefin tuna may make it possibly the most commercially valuable marine finfish in the world. While other fish prices appear to have begun to level out around 1988, market prices for bluefin tuna have continued to increase. In order to capitalize on the value of premium quality bluefin, transportation of the fresh product must be rapid and direct, a fact which can be used to substantiate trade data at times, as well as to identify likely catch areas. Most of the fresh bluefin tuna traded travels by air, since the Japanese market has stringent requirements for freshness, colour, and temperature. The most valuable, the fatty, giant bluefins travel in solitary splendour, individually packed in ice and rushed immediately after capture to the market in Tokyo to fetch the highest prices.

METHODS AND PURPOSES OF STUDY

This report is an examination of international trade statistics for bluefin tuna. It attempts to identify consumers, exporters, trade routes, trends, and other characteristics of the trade as reflected by the data. This report does not intend to analyze the dynamics of the Japanese or world bluefin market, nor to speculate on the future of the trade, since international Customs statistics do not provide the detail necessary for such analyses, nor does it intend to compare comprehensively import and export statistics with current reported catches of bluefin by ICCAT or other fishery management organizations.

Purposes

This report was initiated because of the interest of the US National Marine Fisheries Service (NMFS) and the Parties of the International Convention for the Conservation of Atlantic Tunas (ICCAT) in the international trade of the Northern and Southern Bluefin Tuna. Despite extensive fishing of bluefin tuna, little information is available on most aspects of the trade.

The purposes of this report are to determine the usefulness of Customs statistics to (1) identify countries fishing bluefin tuna, particularly those outside ICCAT management schemes, (2) pinpoint oceanic sources of bluefin in trade, (3) examine trade trends, routes, and modes of trade of bluefin tuna, and (4) monitor in the long-term the international trade of bluefin.

While the former three purposes have direct and obvious applications to fisheries management, the fourth purpose — wildlife trade monitoring — may not initially appear to provide long-term benefits to fisheries conservation and management. Monitoring of consumption, particularly long-term monitoring, has been

an important tool in many fields of business, economics, and demographics. Wildlife trade monitoring has also proven to be an equally valuable tool to wildlife conservation since it has contributed information needed for management plans and law enforcement. Long before the present computerized techniques were developed to determine wildlife population size, age classes, and exploitation potential, wildlife managers used data derived from species' harvest to help determine trade trends and stability of exploited populations. Trade monitoring takes harvest monitoring a step further by illustrating global consumer demand and historical trends of markets which may impact harvest and management in the future.

Still another benefit of wildlife trade monitoring for those exploited species which are regulated or studied may be that the information derived may provide baseline data on the status of exploited populations (Hemley, 1993). Wildlife trade monitoring can also highlight the legality and illegality of international trade by identifying trade routes and the illegal exporters and consumers of regulated or protected species. From a conservation standpoint, monitoring of exploited threatened species has proven to be critical to management (Hemley, 1993). Monitoring of exploited species which are not threatened or endangered may prove to be a proactive conservation method to prevent threats to populations and ultimately protect biological diversity.

Methods

The research for this report involved extensive searches for international trade statistics, i.e. Customs import and export data. Most of the searches led to "dead ends," since most countries fishing for bluefin tuna do not report the international trade of bluefin tuna specifically but combine such trade records with other tuna imports and exports. In addition, international trade statistics were not readily available, particularly for the more than 20 consecutive years covered by this report. The best source of international trade statistics was found to be the library of the US International Trade Commission in Washington D.C. However, the Customs or statistics departments of Australia, New Zealand, and the European Community were contacted directly to obtain complete data.

Difficulty was also experienced in obtaining trade statistics for the USA, where the study was undertaken: import and export statistics for the USA were not readily available to the general public. Until 1992, the public had access to international trade statistics for the USA (and for other countries) through the Foreign Trade Room of the US Department of Commerce. As of 1992, however, these resources were no longer available to the public. The library at the US Department of Commerce, another source, does not maintain the monthly US trade statistics by commodity. The only research facility for detailed trade statistics for the USA, by month, commodity, and country is the library of the Bureau of Census in Suitland, Maryland, and even these resources, which are available on microfiche and compact disc, are not complete.

Yet in spite of the limitations of available data, TRAFFIC is confident that the preliminary analyses contained in this report are useful because the data compiled relate to some of the most important bluefin tuna trading countries, i.e. Japan, New Zealand, the USA. Trade data for Japan, in particular, are useful since they relate to more than 20 years and Japan is the world's leading consumer of bluefin tuna.

This analysis was concluded in June 1992 and no further data were collected, additional research conducted, or updated information added thereafter.

THE UTILISATION AND USEFULNESS OF INTERNATONAL TRADE STATISTICS

Problems have always surrounded analyses of international Customs import and export data. Customs data are notoriously difficult to obtain and to use — they come in a variety of formats or systems; are not usually specific enough for the subject under review; do not usually match between one country and another; and/or require additional information to interpret the data. Many of these problems were addressed when the Harmonized Commodity Description and Coding System, or Harmonized System (HS), came into effect in 1988. This system was developed so countries would report their Customs statistics under universally common descriptions and commodity numbers. This resulted in the simplification of many of the day-to-day tasks of Customs officials as well as allowing easier comparisons of international trade statistics for trade and market analyses.

As of April 1992, 93 nations or territories were using the HS, or were expected to use the HS upon their accession to the HS Convention (Table 1). The HS was developed by the Customs Cooperation Council in Brussels, Belgium (von Kirchbach, 1991) and uses some of the structure of other older Customs commodity systems such as the Brussels Tariff Nomenclature (BTN) and Customs Cooperation Council Nomenclature (CCCN) systems.

Table 1

List of countries or territories using the harmonized system of customs commodities (as of 16 April 1992)

Algeria	P	Hungary	P	Philippines*	a
Argentina*	a	Iceland	P	Poland*	a
Australia*	P	India*	P	Portugal*	P
Austria	P	Ireland	P	Saudi Arabia*	P
Bangladesh	P	Israel	P	Senegal	P
Belgium*	P	Italy*	P	Singapore*	a
Botswana	P	Japan*	P	Solomon Islands*	a
Brazil*	P	Jordan	P	South Africa*	P
Bulgaria	P	Kenya*	P	Spain*	P
Burkina Faso	P	Kiribati*	a	Sri Lanka	P
Cameroon	P	Korea (Rep)*	P	St Pierre and	
Canada*	P	Lesotho	P	Miquelon	a
C.A.R.	a	Liechtenstein	a	Swaziland	P
(Central African Rep.)		Luxembourg	P	Sweden	P
Chad	P	Madagascar*	P	Switzerland*	P
Chile*	a	Malawi*	P	Thailand*	P
China	a	Malaysia	P	Togo	P
Colombia	a	Malta	P	Tunisia*	P
Congo	a	Mauritius*	P	Turkey*	P
Cote d'Ivoire	P	Mexico*	P	Tuvalu*	a
Cuba*	a	Mongolia	P	Uganda	P
Cyprus	a	Morocco*	P	UK*	P
Czechoslovakia*	P	Mozambique	a	USA*	P
Denmark*	P	Netherlands*	P	Vanuatu	a
Dominica	a	New Caledonia	a	Venezuela	a
Ecuador	a	New Zealand*	P	Wallis & Futuna	a
Fiji*	a	Niger	P	Yugoslavia	P
Finland	P	Nigeria	P	Zaire	P
France*	P	Norway	P	Zambia	P
Fr. Polynesia	a	Pakistan*	P	Zimbabwe*	P
Germany*	P	Papua New Guinea	a		
Ghana	a	Paraguay	a		
Greece*	P				

* Customs statistics of these countries were examined for bluefin tuna HS commodity codes. (Not included on this list, but also examined, were Brunei, Taiwan, Tonga, and the former USSR.)

P Acceptance, i.e., country is contracting party to the Harmonized System Convention.

a Indicates application only.

Source: Customs Cooperation Council, Brussels, Belgium.

The HS comprises a series of numerical six-digit codes which are identical for every country that uses the system. The first two digits represent the chapter of the commodity; for example, fish, crustaceans, molluscs, and other aquatic invertebrates are in Chapter 3, or 03. The third and fourth digits represent the heading in the chapter; for example, 02 or 03 represent fresh and frozen, respectively. The fifth and sixth digits are the HS sub-heading code; for example, 39 and 49 are "other tuna" (except Albacore, Yellowfin, or Skipjack *Katsuwonas pelamis*) for fresh and frozen categories, respectively. The code for fresh bluefin tuna exports and imports is the same in every country using the HS and consists of the following first six digits: 0302.39. Where over six digits exist, the seventh to tenth, inclusive, represent statistical subdivisions that vary from country to country (USDC, 1989; USITC, 1991; von Kirchbach, 1991).

A trade statistics system not examined for this report, the Standard International Trade Classification (SITC), was developed by the United Nations at the same time as the HS and parallels that system. SITC was developed for economic analysis purposes whereas the HS was developed for Customs purposes. SITC classifies products (e.g. canned tuna), while the HS classifies the trade by raw or semi-raw materials (e.g. tuna). For the purposes of this report, only HS Customs statistics were used because bluefin tuna is the focus and, in most cases, internationally traded bluefin tuna is usually only partially processed, i.e. chilled or frozen.

Based upon an examination of the international trade statistics of more than 40 countries (see Table 1 for a list of these), it would appear that, at present, only three countries are currently using HS codes for bluefin tuna: Japan, New Zealand, and the USA. Table 2 lists the HS codes for these three countries and the possible HS codes for Spain (ICCAT, 1992d): reportedly, Spain, a major fisher of Northern Bluefin Tuna on both sides of the Atlantic, should be using HS codes for bluefin by 1993 (ICCAT, 1992d). Japan has been using the same HS codes since 1988. The USA did not implement the HS Convention until 1989 but has been using HS codes consistently since that time. However, New Zealand developed more explicit HS codes in 1989 that were slightly different than those it used in 1988. Only the 1989 codes for New Zealand are listed in Table 2.

Statistical reporting problems

In spite of the development of the Harmonized System, Customs statistics are not always easy to correlate between countries. In most cases, this is because of the different methods of compiling data. It is generally agreed that import data of a country are a better indicator of international trade than export data (McColl & Quinn, 1991). The United Nations suggests that countries of origin, not countries of re-export, should be reported in Customs import data (McColl & Quinn, 1991) and since it is fairly easy to identify countries of origin, this information is indeed often included. In addition, because Customs import controls include the levying of duties and taxes, the data for imports are probably required to be recorded and compiled more precisely than export data. (In many countries, domestic exports are not taxed, nor is duty applied.)

The United Nations recommends that countries of final destination be identified as the country reported in Customs data for exports (McColl & Quinn, 1991). This, of course, is not always possible, particularly for exports of raw materials that may be partially processed in one country, finished in another, and then exported to a final destination.

Some imports and exports of fisheries products may escape entry into a national system by being transferred at sea from one ship to another, either for processing or onward travel. While it is normally required to report such transfers to the country in which a ship is registered, many such transfers are never reported. This might account for many of the inconsistencies in fisheries statistics.

Table 2

List of harmonized system commodity codes of Japan, New Zealand, Spain and the USA for bluefin tuna (correct for 1992)

Country	Imports or exports	HS code	Description
Japan (as of 1988)	imports only	0302.39.010	BFT, fresh, chilled (except fillets)
		0303.49.010	BFT, frozen (except fillets)
		0304.90.091	BFT, other meat (except fillets)
New Zealand (as of 1989)	imports & exports	0302.39.00.02	SBT, whole and fresh (excluding fillets, livers, roes and other fish meat in 0304)
		0302.39.00.11	SBT, headed and gutted, fresh (excluding fillets, livers, roes, and other fish meat in 0304)
		0302.39.00.21	SBT, other (excluding fillets, livers, roes, and other meat in 0304)
		0303.49.00.02	SBT, whole and frozen (excluding fillets, livers, roes and other fish meat in 0304)
		0303.49.00.11	SBT, headed and gutted and frozen (excluding fillets, livers, roes, and other fish meat in 0304)
		0303.49.00.21	SBT, other fresh (excluding fillets, livers, roes, and other meat in 0304)
		0304.10.00.81	SBT, fresh fillets
		0304.20.00.77	SBT, frozen fillets
Spain (not in effect)	unknown	0303.49.11.19.9B	BFT, frozen
		0303.49.13.10.0J	BFT, frozen
		0303.49.19.10.0D	BFT, frozen
		0303.49.90.10.0F	BFT, frozen
USA (as of 1989)	imports & exports	0302.39.00.20.6	BFT, fresh (except fillets and other meat in 0304)
		0303.49.00.20.3	BFT, frozen (except fillets and other meat in 0304)

BFT = bluefin tuna, presumably both species SBT = Southern Bluefin Tuna

Another factor complicating the comparison of statistics between countries is the duration of the travel time of the fisheries product itself. While most fresh bluefin travels by air and probably arrives within a day or two of export, most frozen bluefin travels by ship, maybe over a period of several weeks and the frozen fish shipment may be held, for any number of reasons, in Customs bond. As a result, many reported exports of bluefin may not be recorded by the importing country until the month, or even year, following export. Moreover, since the USA only began to use HS codes for bluefin in 1989 (when it implemented the Harmonized System Convention), an unknown amount of imports and exports reported in 1989, which appear under the HS, may be carry-overs from the previous year.

A comparison of trade volume, between countries, of a given commodity is often difficult because countries report such volume in a number of different ways. For example, the USA may report trade in two or more ways. The first way is as required for the import or export declaration and is specified by the reporting requirements for the commodity code. For fisheries products, it is usually the actual weight of the import or export, i.e. the net weight. The second way may be the alternative means specified by the commodity code, for example, the number of items. The third form of expression of trade volume is usually the weight of the shipment container and packing. In some countries, the combined weight of the shipment container and the shipment, i.e. the gross weight, is reported. All three countries whose statistics report trade in bluefin tuna using HS codes, Japan, New Zealand, and the USA, also all report the trade volumes by net weight.

International comparisons of the monetary value of imports and exports is even more difficult than those of volume. The value of exports recorded may be the Customs value, i.e. the value subject to duty, or what is known as F.O.B. value or "free on board." F.O.B. value includes the value of the product and any other costs associated with its distribution up to the point of its loading on the carrier. The value of imports may be the Customs value or the C.I.F. value or "Costs, Insurance, and Freight." C.I.F. values can fluctuate for the same country depending on the distance to the country of destination and other factors related to the transport of the product. New Zealand reports its export values as F.O.B. and imports as C.I.F. The USA has, since 1989, reported both Customs value as well as either the F.O.B. or C.I.F. value. Some countries, however, do not identify which value is published in their trade statistics.

Finally, to compound the problems, some countries report trade according to a calendar year rota and others according to a fiscal year rota. Notable within the context of this report are New Zealand, which does the latter, and the USA and Japan, which do the former. New Zealand's fiscal year runs between July and June.

Comparative trade in bluefin tuna

Table 3 compares Japanese imports and New Zealand exports of bluefin tuna and illustrates the difficulty of correlating trade between two countries. Table 4 compares Japanese imports and US exports. Again, the data do not correlate. It should be noted that all imports and exports listed in Tables 3 and 4 are reported in terms of net weight in kilogrammes.

In some cases, even import and export data from the same country do not readily complement each other. Table 5 lists US imports of bluefin tuna according to whether they are for domestic consumption or for non-consumption and lists exports according to whether they are domestic or foreign. (Foreign exports are those which have entered the USA from a foreign country and are then re-exported; goods being transhipped do not clear Customs so are not reported in US Customs statistics at all.) The foreign exports in Table 5 are thus bluefin tuna imported into the USA, cleared through Customs and then re-exported.

Imports for consumption are those which enter the US marketplace within the month of import. In Customs jargon, these imports are described as entering "the national consumption routes." These imports may also be called "special imports" or "goods entering the domestic economy of the importing country" (McColl and Quinn, 1991). The listing of these imports in the "imports for consumption" category does not preclude the possibility that they may be re-exported. Imports that are not for consumption are usually those that are held, for any reason, in Customs bond. According to the data in Table 5, all bluefin tuna imports during 1989-91 entered the USA immediately, i.e. are "imports for consumption". Therefore,

Table 3

Comparison of New Zealand exports and Japanese imports of bluefin tuna, 1983-1991 (kg)

					Inconsistencies in data reporting	
		Japanese imports from	New Zealand exports to		Under-reporting (-) or over-reporting (+) based upon Japanese imports	
Year+	Category	New Zealand	Japan	Others	Directly to Japan	Via other countries**
1983	Fr*	381	—	45	–381	–426
	Frz	251 649	262 590	10 060	+10 941	+881
1984	Fr*	1 921	—	—	–1 921	–1 921
	Frz	116 019	112 644	—	–3 375	–3 375
1985	Fr*	21 280	—	—	–21 280	–21 765
	Frz	42 058	86 308	—	+44 250	+44 250
1986	Fr*	23 468	920	2 372	–22 548	–24 920
	Frz	89 927	84 626	—	–5 301	–5 201
1987	Fr*	1 602	—	26	–1 602	–1 628
	Frz	73 682	75 888	1 992	+2 206	+214
1988	Fr	170	170	—	0	0
	Frz	52 891	—	—	–52 891	–52 891
1989	Fr	235	559	—	+324	+324
	Frz	85 538	—	154 460	–85 538	–239 998
1990	Fr	2 417	3003	2 760	+586	–2 174
	Frz	121 562	116 836	—	–4 726	–4 726
1991	Fr	1 702	4 539	78	+2 637	+2 759
	Frz	36 731	763 508	2 059 492	+726 777	+26 777
Total	Fr	53 176	9 191	2 909	–43 985	–46 894
	Frz	870 957	802 400	2 226 004	–67 657	–234 169++

Fr = fresh; Frz = frozen

+ New Zealand reports trade in fiscal year (July to June); Japanese annual imports were re-figured for this period for this comparison.

* New Zealand statistics are fresh fillets and Japan's exclude fillets.

** Assumes all exported fish eventually is imported by Japan.

++ Excludes 2 059 492 kg exported to Republic of Korea, possibly an important consumer of bluefin.

Source: New Zealand and Japanese Customs statistics compiled by TRAFFIC USA.

Table 4

Comparison between exports from the USA and imports to Japan of bluefin tuna, 1989-1991 (kg)

Year+	Category	Japanese imports from New Zealand	New Zealand exports to		Inconsistencies in data reporting Under-reporting (-) or over-reporting (+) based upon Japanese imports	
			Japan	Others	Directly to Japan	Via other countries**
1989	Fr	889 406	2 928 238	14 626	–2 038 832	–2 053 458
	Frz	5 533	120 626	27 061	–115 093	–142 154
1990	Fr	814 968	1 976 127	32 618	–1 161 159	–1 193 177
	Frz	—	20 934	59 179	–20 934	–80 133
1991	Fr	718 967	1 557 372	14 166	–838 405	–852 571
	Frz	—	72 211	231 416	–72 211	–303 627
1992+	Fr	18 466	115 234	—	96 768	—
	Frz	—	—	—	—	—

Fr = fresh; Frz = frozen

+ Until March only.
* Includes only domestic exports.
** Assumes all exported fish is eventually imported by Japan.

Source: US and Japanese Customs statistics.

Table 5

Comparison between US exports and imports of bluefin tuna, 1989-1991 (kg)

Year	Category	Imports		Exports	
		For consumption	Not for consumption*	Domestic	Foreign ++
1989	Fr	267 991	0	2 942 864	574 865
	Frz	150 375	0	147 687	766
1990	Fr	157 830	0	2 008 745	109 780
	Frz	29 326	0	80 113	0
1991	Fr	194 101	0	1 571 538	48 052
	Frz	38 928	0	303 627	0
1992+	Fr	11 705	0	115 234	13 882
	Frz	23 615	0	0	1 305

Fr = fresh; Frz = frozen

+ Until March only.
* Imports which are held in Customs bond.
++ Re-exported fish originating from another country.

Source: US Customs statistics.

based upon the US method of reporting imports and exports, it is impossible to determine which US imports are re-exported and the country of origin of those imports.

Another reason for inconsistencies might be data entry errors.It is possible that some of the trade may be that of fish with similar names, such as Big Eye *Thunnus obesus* rather than bluefin (Copeland, pers. comm.). [*Note*: There is no specific code for Big Eye Tuna.] Unfamiliarity with the commodity classifications, particularly in the first year using a new system, may have resulted in unintentional, erroneous declarations by traders and brokers who enter much of the information into the US Customs computer system themselves.

Reporting errors may be particularly important with reference to the USA's statistics since, for example, the reported live weight of fresh bluefin exports from the east coast in 1989 (2 939 t) exceeds the quota for bluefin harvest (1 397 t) established by ICCAT for the USA for that year. The estimated live weight of reported domestic exports is equivalent to more than twice the reported landings of western Atlantic bluefin, 1 413 t (NMFS, 1992), for that year. Furthermore, there are additional, frozen exports with an estimated live weight of 141 t, in addition to the fresh exports reported.

For the remainder of this report and because of these inconsistencies, the Customs data of New Zealand and the USA will not be compared with, nor analyzed against, the Japanese data. The Japanese data will form the basis for the international bluefin tuna trade picture. Undoubtedly, the Japanese data are the best available because of the reasons explained above, but also because Japan is the primary consumer of bluefin in the world and 22 consecutive years of import data are available to document the trade. Data from New Zealand and the USA will be used to support, when possible, assumptions about the trade and to provide information not available from the Japanese data.

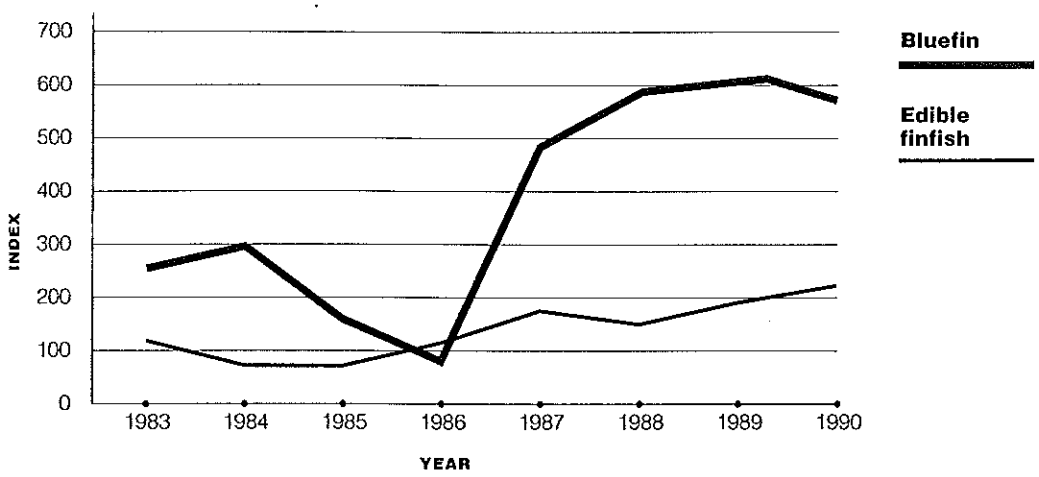
JAPAN'S ROLE IN THE INTERNATIONAL BLUEFIN TUNA TRADE

Imports, exports, and estimated consumption

The lucrative Japanese market for bluefin tuna was "discovered" in 1971 by an enterprising American (Weber, 1990) and, from that time, the international trade in bluefin tuna appears to have begun an upward climb, continuing today. Within three years after the opening of the Japanese market, prices received by fishermen for their catches of bluefin tuna in the USA had increased from US$0.10 to US$1.20 per lb (Stevens, 1989 and Reiger, 1974 in Weber, 1990). In recent years such prices have risen at rates which exceed those for all other edible fin-fish taken by the US fleet (Figure 1). While other fish prices appear to have begun to level out around 1988, market prices for bluefin tuna have continued to increase. From 1986 to 1989, there were notable price increases for all tuna at three separate stages of Japanese market distribution (Figure 2). Average monthly prices for fresh imported bluefin tuna in the Tokyo market exceeded US$50 per kg in 1991. As a result, many fish-exporting countries have tried to take a share of the bluefin market, particularly as most traditional commercial fisheries decline and the prices and demands of world fisheries markets fluctuate.

Figure 1

US ex-vessel price indices* for bluefin tuna and all edible finfish, 1983-1990

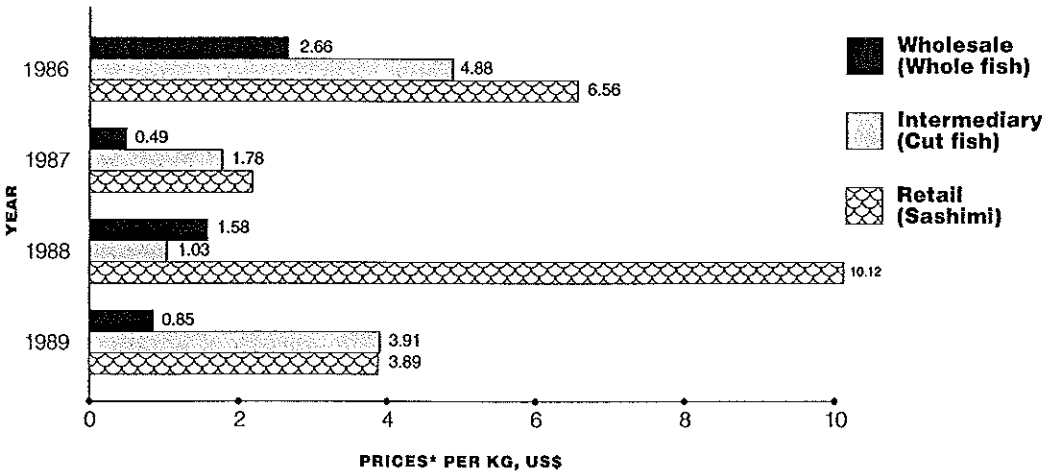


* 1982 = 100

Source: NMFS, 1988; NMFS, 1990.

Figure 2

Annual price* increases of all frozen tuna for three Tokyo distribution states, 1976-1989



*Prices adjusted for inflation into 1991 US dollar values.

Source: Ministry of Agriculture, Fisheries, and Forests.

Although bluefin tuna is reportedly an important fish commodity to Japan, which consumes 40% of the world catch (according to a comparison of 1986 imports to world catch), bluefin does not represent a large proportion of all tuna imports to Japan. Table 6 lists Japanese imports of five categories of fresh and frozen tuna for 1991. Fresh bluefin tuna represented a little more than seven percent of the total volume of all fresh tuna imported by Japan in 1991, while frozen bluefin tuna represented under two percent by volume of all frozen tuna imports for that year and the combined volume of fresh and frozen bluefin tuna imports was not more than three percent of the total volume of all tuna imported by Japan in 1991. However, fresh bluefin tuna represented about 24% of the value of all Japanese fresh tuna imports and frozen bluefin tuna

about five percent of the value of all Japanese frozen tuna imports in 1991 (Table 6), illustrating the luxury nature of the bluefin tuna market in Japan. Figure 3 shows the price of bluefin tuna in six Japanese markets as compared to other "high-value" fin-fish: Sea Bream *Archosargus rhomboidalis*, salmon Salmonidae, Yellowfin Tuna, and Big Eye Tuna.

Table 6

1991 total Japanese tuna imports by category weight and value

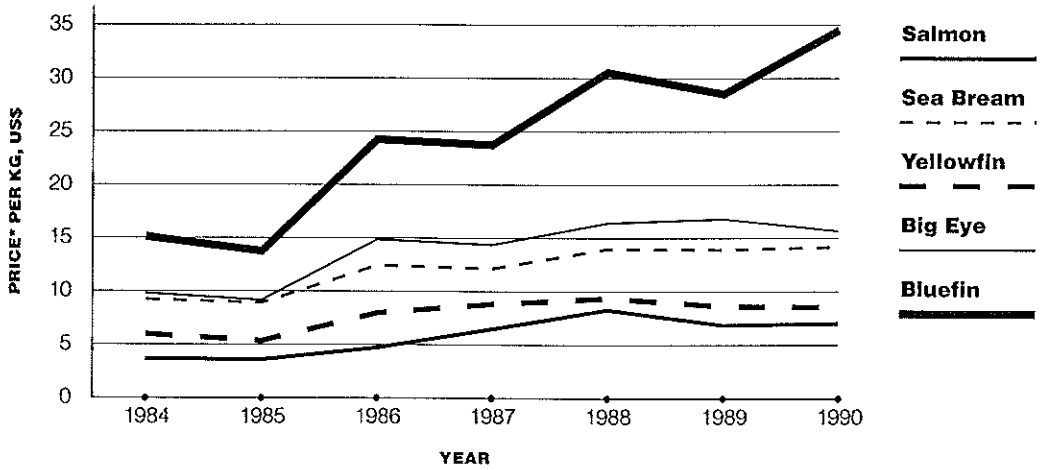
	Fresh		Frozen	
Category	Weight (kg)	(US$)*	Weight (kg)	(US$)*
Albacore	162 985	930 295	4 212 382	5 350 297
Yellowfin	33 102 011	217 245 480	81 862 245	151 601 560
Bluefin	3 502 173	70 781 964	2 985 761	27 604 005
Big Eye	10 266 735	81 526 958	99 658 559	417 263 310
Other Tuna	1 306	39 869	—	—
Total	47 035 210	297 146 710	188 718 947	601 820 040
Percentage bluefin tuna	7.4%	23.8%	1.6%	4.6%

* 1991 Average yen import value = 134.84 yen/dollar, Japanese Customs department.

Source: Japanese Customs statistics compiled by TRAFFIC USA.

Figure 3:

Average annual price* of five high-value fish from six major Japanese markets, 1984-1990



* Prices adjusted for inflation into 1991 US dollar values.

Source: "Fisheries Annual Report" by Suisansha Publishing compiled by TRAFFIC Japan.

At present, Japanese imports of bluefin tuna recorded in Japanese Customs data are separated into three categories as described in Table 2: fresh, frozen, and other meat. None of these categories contain bluefin fillets which are combined with other fish fillets in a general category. Previous to 1976, all bluefin tuna was combined in one category: fresh/frozen. Appendices 1-4 list all Japanese imports in four categories from 1970-1990.

Over the 21-year period of 1970-1990, 58 217 t of bluefin tuna were imported into Japan or an average of 2 772 t annually. These are figures for dressed weight but based upon a conversion of dressed to fresh ratio of 0.85 (ICCAT, 1992b) [gutted bluefin weigh about 85% of the weight of a live fish], this represents approximately 68 491 t of live bluefin or about 3 262 t annually.

Japanese exports of bluefin tuna were separated in the Customs statistics at various times into three separate categories: "fresh/frozen", "fresh", and "frozen". From 1970 to 1975 exports were reported in the same way as imports, under one category of "fresh/frozen". From 1975 until 1985, two new categories superceded the old one: "fresh" and "frozen". None of these categories contained bluefin fillets, which were included in a general tuna fillet category. After 1985, all Japanese bluefin exports were combined into a general tuna category and are no longer identifiable. Appendix 5 lists all Japanese exports for the three categories mentioned for 1970-1985.

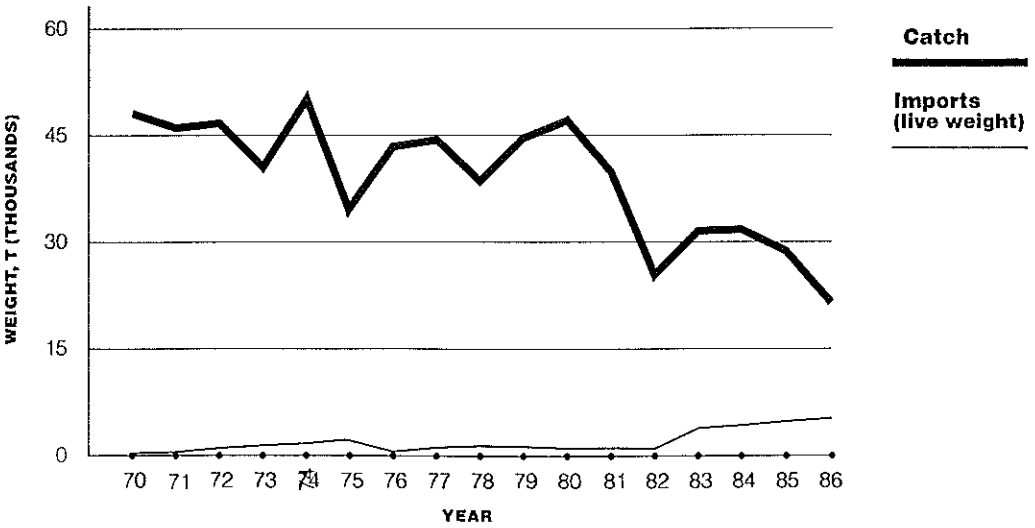
From 1970 to 1985, Japan exported 156 t of bluefin or an annual average of about 10 t. These figures are for dressed weight and represent about 183 t of live weight of bluefin tuna, or about 11 t annually.

Based upon an examination of Japanese imports, exports, and catches of bluefin tuna of both species, Japan catches far more bluefin than it imports (Figure 4). From 1970 to 1985 Japan caught at least 815 223 t of both species of bluefin in the Atlantic and Pacific Oceans[1] or an average of 50 951 t annually.

So according to combined import, export, and catch data, Japan may have consumed 847 539 t of bluefin tuna[2] or an annual average of 52 974 t of bluefin tuna during each of the 16 years from 1970-1985. This represents an annual consumption of 440 g of bluefin tuna per person, using the 1985 Japanese population estimate of 120 837 000 people (United Nations, 1990).

Figure 4

Japanese catch and imports of bluefin tuna, 1970-1986



Source: Bayliff, 1991; 1991; Caton, 1991; ICCAT, 1985; ICCAT, 1989; SCRS, 1991; Japanese Customs statistics.

The Japanese wholesale market

The majority of the imported bluefin is brought directly into Tokyo, to the Tokyo-To Central Wholesale Market (TCWM) system. Tokyo has an elaborate centralized system for marketing marine products, vegetables, fruit, and plants that was established by the Central Wholesale Market Law in 1923. (This law was later superceded by the Wholesale Market Law of 1971.) In 1935, the Tsukiji market, the largest of the markets in the system, opened and has become the largest marine product market in Japan. Besides, Tsukiji, there are 14 other markets in the system although only two handle marine products: Adachi and Ota. Tsukiji and Ota are both located at Tokyo's sea harbour, and Adachi is in the northern part of the city. Table 7 lists the volume and percentage of marine products on sale in the central wholesale market handled by each of these three Tokyo markets in 1991.

Table 7

Volume of trade at the three marine products-markets in Tokyo, 1991

Market	Volume, t	US$ millions	% volume
Tsukiji	747 355	5 599	88.2%
Adachi	66 508	429	7.8%
Ota	33 456	228	3.9%
Total	847 319	6 556	

Source: TCWM, 1991.

As established by law, the Central Wholesale Market structure provides for concentration of goods; establishment of fair prices reflecting supply and demand on the basis of daily auctions; speedy distribution to retailers; quick and accurate payment for goods; reduction of distribution charges; transmission of information on distribution of perishable foods; periodic testing by the health department (TCWM, 1991).

Market structure

Figure 5 illustrates the structure of the Central Wholesale Market system in Tokyo. Bluefin are transported to Tsukiji or the other two markets and are displayed each morning before dawn. The fish are marked with consecutive numbers for auction. The jobbers, or intermediate wholesalers, and other market participants examine the fish to estimate their value before the auction begins. Bluefin buyers look for the following qualities in the carcass: an absence of scars or bruises on the body, especially on the belly; colour of the flesh; and fat content (K. Sato, *in litt., 1992*). Slices of the flesh at the tail-end are cut and left partially attached to the carcass to allow examination of the latter two qualities.

At the conclusion of the auction, the fish are taken to various jobbers' shops in the market structure itself or are transported to other shops in the city. A photo in the centre of this report illustrates the display at one Tsukiji market shop with wholesale prices for the chunks of bluefin ranging from about US$64 to US$88, when converted from yen.

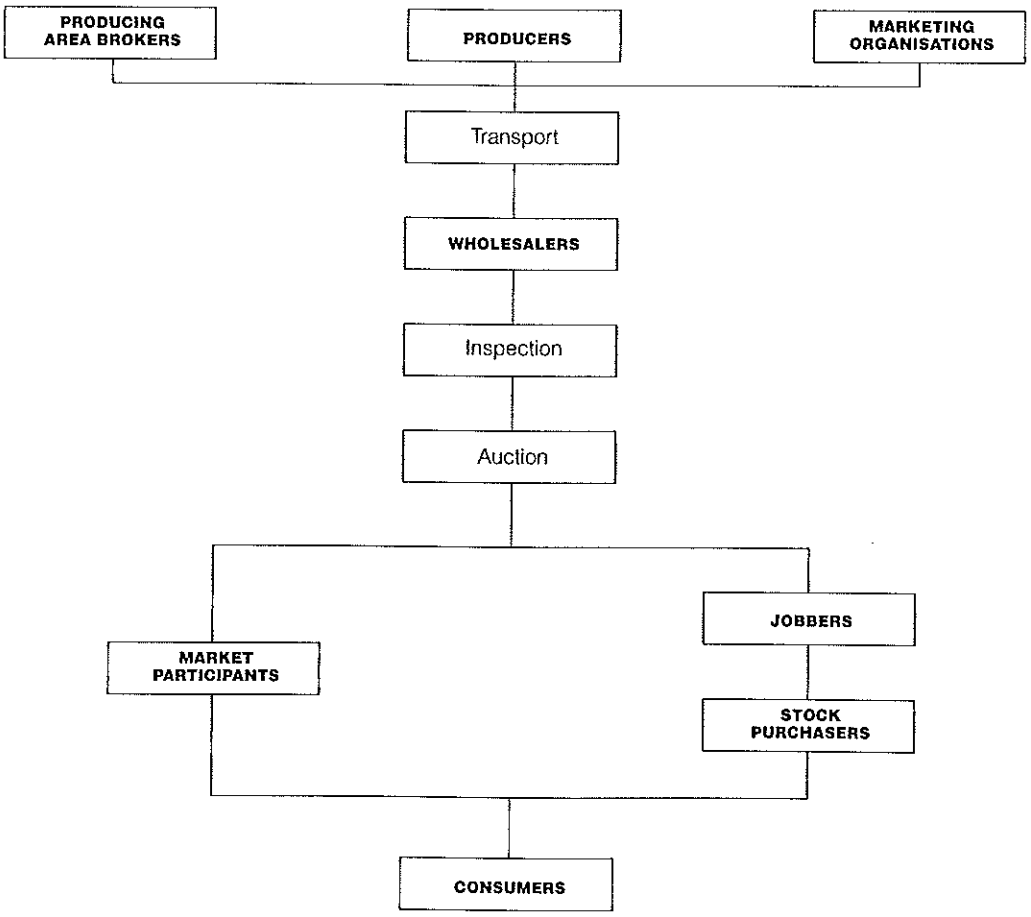
Trends in bluefin market prices in Tokyo

The Tokyo-To Central Wholesale Market issues monthly and annual reports on the volume and prices of the produce passing through the market system, though frozen tuna prices have only been recorded since 1983. This report lists and reviews market prices only briefly.

Figure 6 shows annual average value for fresh and frozen bluefin tuna for 1970-1990, converted into 1991 US dollar equivalents and adjusted for inflation. In most cases, the conversions were based upon the International Monetary Fund's market "par market" rate (IMF, 1991). (IMF's par market rate conversion for 1991 was not available when this report was written so Japanese Customs department conversion rates for imports were used for that year only.) The average price of fresh bluefin has increased in the last 21 years, as shown in Figure 7. Prices peaked in 1979 and ten years later in 1989. Prices reached an all time low in 1984 and 1985.

Figure 5

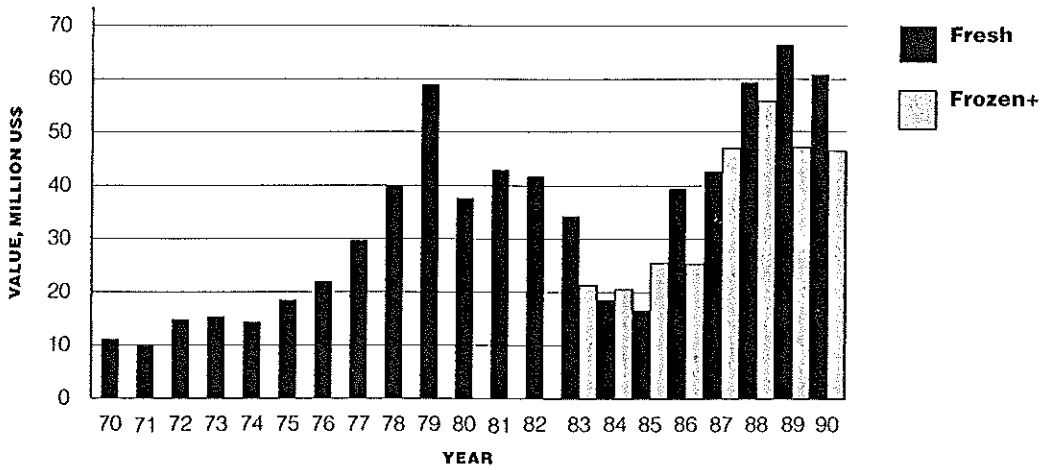
The Central Wholesale Market system, *consisting of 15 individual markets throughout Tokyo, was established in 1935 for the rapid distribution of marine products, meat, vegetables, fruit, and flowers. Wholesalers, permitted by the Ministry of Agriculture, Forestry and Fisheries (MAFF), sell by auction goods consigned to them by brokers, producers, and marketing organisations. Their fixed commission for marine products is 8.5%. Jobbers, or intermediate wholesalers, permitted by MAFF, sell goods purchased from wholesalers to retailers at shops inside the markets. Market participants are retailers, processors, and larger consumers, etc. allowed by the Government to purchase from the wholesalers during the auction. Stock purchasers, after obtaining stock, use their own transport to take the goods to their shops for sale.*



Source: TCWM, 1991.

Figure 6

Total annual value* of Tokyo Central Wholesale Market's fresh and frozen+ bluefin tuna, 1970-1990



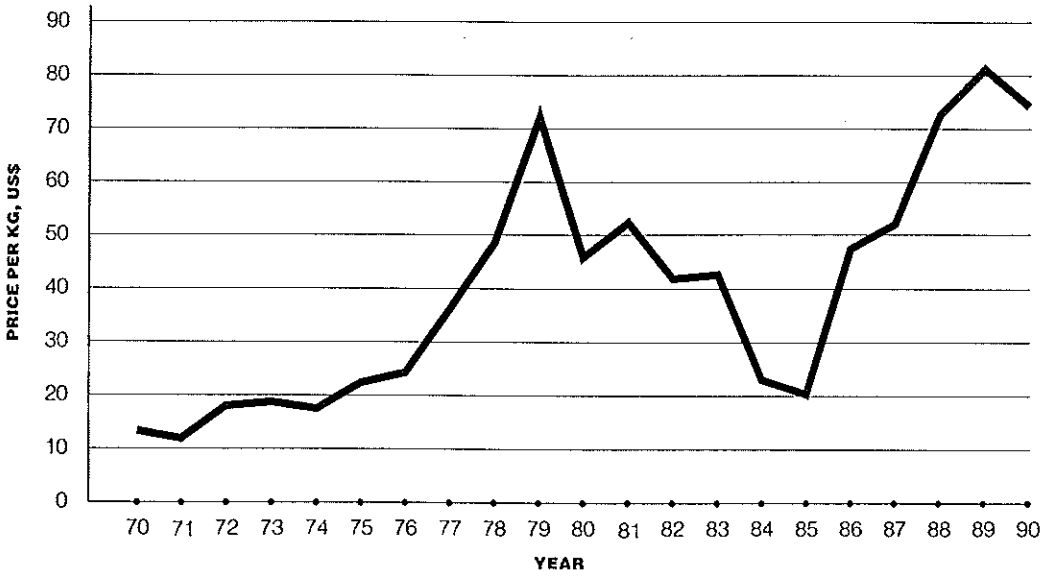
* Prices adjusted for inflation into 1991 US dollar values.

+ Pre-1983 prices not recorded.

Source: TCWM.

Figure 7

Annual wholesale price* of fresh bluefin tuna at Tokyo Central Wholesale Market, 1970-1990

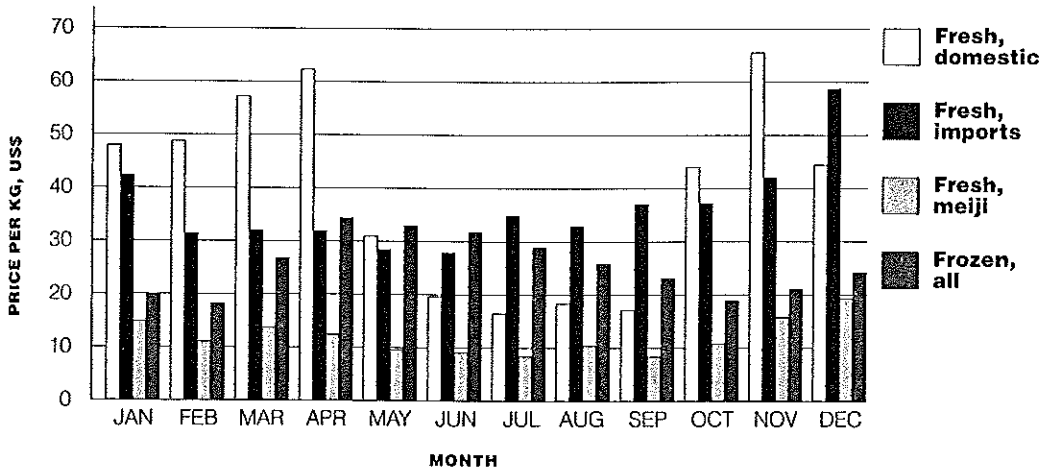


* Price adjusted for inflation into 1991 US dollar values.

Source: TCWM.

Figure 8

1989 monthly Tokyo Central Wholesale Market prices of four categories of fresh and frozen bluefin tuna



Source: TCWM.

The monthly prices for four categories of bluefin from 1989 to 1990 are illustrated in Figures 9 to 10. The four categories are: fresh domestic; fresh imports; fresh *meiji* (smaller than 7.5 kg); and all frozen bluefin. The monthly prices for three of these categories for 1991 are illustrated in Figure 11. Based upon an examination of these three years' monthly price data, fresh domestic fish appear to draw the highest prices in the colder months of the year: January to March or April and October to December. Fresh imports are most competitive with domestic fresh supply in the later months of the year. Meiji and frozen prices seem moderately steady through the year.

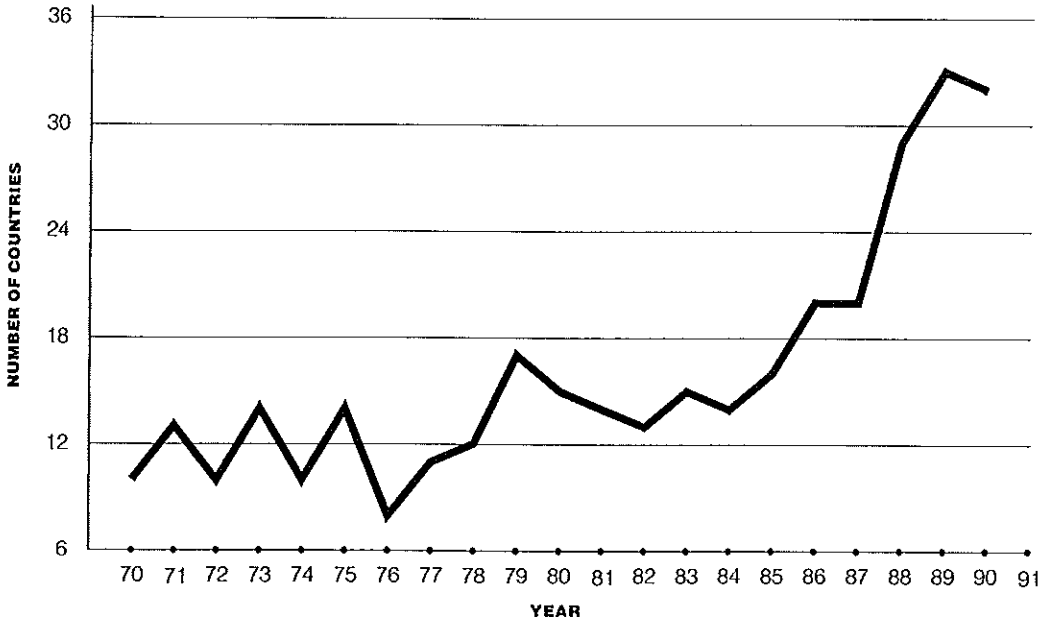
A comparison of market prices and volumes helps to explain the simple dynamics of this market (Figures 11 and 12). Volumes of frozen imports on sale peak in the middle of the year as do those of fresh domestic catch. Supply is high at this time and prices for these are low. Import volumes of fresh fish are low at other times so prices are relatively high. Frozen imports seem to be always available so prices are probably constant for that reason.

Exporters of bluefin tuna to Japan

The number of countries exporting bluefin tuna to Japan has increased over the two-decade period of 1970 to 1991, most significantly in the 1980s (the number of countries exporting bluefin to Japan in the 1970s remained fairly constant at around 14). In 1991, 36 countries, the greatest number in any one year to date, exported either fresh, frozen, or other bluefin meat to Japan. Over the period of 1970-1990, a total of 59 nations exported bluefin to Japan, which imported an annual average 3300 t (live weight) of bluefin during this time.

Figure 9

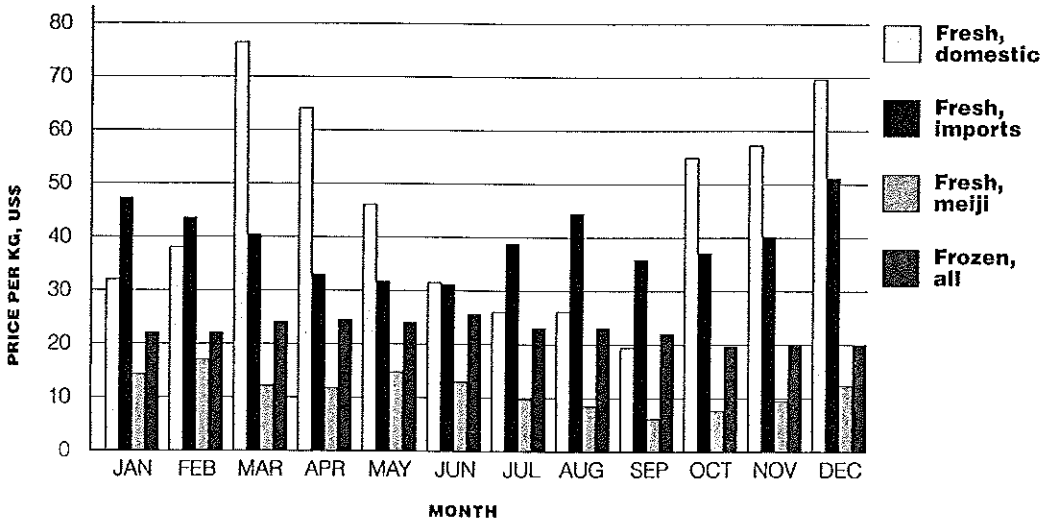
Number of countries reported in Japanese imports of all bluefin tuna, 1970-1991



Source: Japanese Customs statistics compiled by TRAFFIC USA.

Figure 10

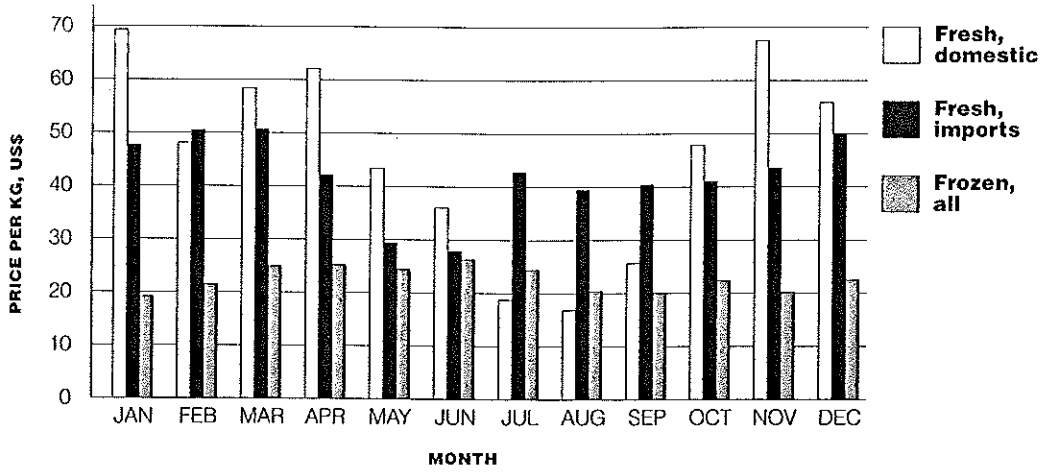
1990 monthly Tokyo Central Wholesale Market prices of four categories of fresh and frozen bluefin tuna



Source: TCWM.

Figure 11

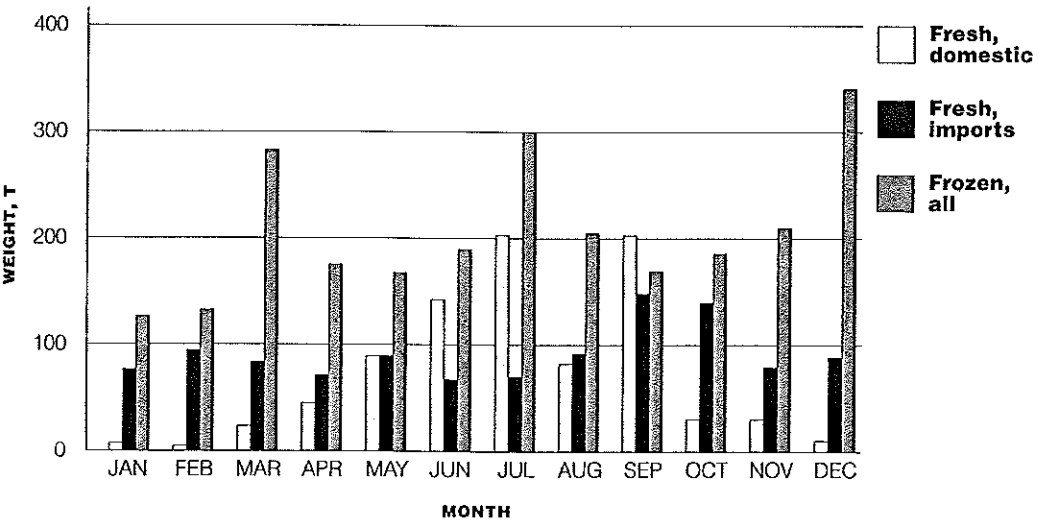
1991 monthly Tokyo Central Wholesale Market prices of three categories of fresh and frozen bluefin tuna



Source: TCWM.

Figure 12

1991 monthly volumes of Tokyo Central Wholesale Market's three categories of fresh and frozen bluefin tuna



Source: TCWM.

Based on Japanese import data (including 1991), the top five bluefin tuna-exporting countries (Table 8) are, in descending order: **Australia**, which exported more than 22 000 t in the 13 years of 1979-1991, or about 1 700 t annually; **USA**, which exported almost 12 000 t in the 22 years of 1970-1991, or about 545 t annually; **Taiwan**, which exported more than 5 600 t in the 19 years of 1972-1991, or about 259 t annually; **Spain**, which exported almost 5100 t in the 14 years of 1978-1991, or about 268 t annually; and **Canada**, which exported more than 4 700 t in the 22 years of 1970-1991, or about 214 t annually.

The combined exports over the period of 1970-1991 of these five countries (Table 8) amounted to more than 49 000 t of bluefin tuna, or annual imports to Japan of about 2 300 t, or about 78% of the total volume

of fresh bluefin tuna imports reported by Japan in this 22-year period. The estimated live weight of the bluefin tuna exported by these countries is a total of about 58 000 t of both species[3]. On average, Australia exported over three times the volume of that exported by the USA, the second-ranking country in terms of exporters of bluefin tuna to Japan, and annually exceeded the combined annual exports to Japan of the USA and the other three top exporting countries.

This domination of trade by Australia began in 1983, the country first being reported in Japanese imports in 1979. Figures 13 to 17 illustrate the trends in annual Japanese imports from these top five countries over the period of 1970 to 1990.

The top five countries exporting bluefin tuna for each year over the period of 1970 to 1991 are listed by rank (first to fifth) in Table 10, along with other exporting countries. Countries other than those mentioned above, have been foremost exporters to Japan, but Australia, the USA, Taiwan, Spain, and Canada have most consistently exported the largest volumes of bluefin to Japan.

Table 9 lists the 59 countries or territories that have exported fresh and/or frozen bluefin tuna to Japan over the last 22 years. (Eighteen of these are also reported in US bluefin tuna imports for 1989-1992 (Appendix 6b).) The map in Figure 18 identifies all countries which have exported bluefin tuna to Japan during the period of 1970 to 1990. Not surprisingly, many of the countries involved in the export of bluefin tuna are those which occur within, or near, either the natural temperate water range, or the spawning areas of either species of bluefin tuna.

Table 8

Volumes of exports of bluefin tuna from the top five countries reported in Japanese imports, 1970-1991+ and their percentages of Japan's total imports in these categories

Country	Weight, t, for each Customs category									
	Fresh & frozen++		Fresh*		Frozen		Other meat**		Total	Annual average+
	t	%	t	%	t	%	t	%		
Australia	269	6	2 214	9	20 015	59	—	—	22 229	1 852
USA	1 711	35	9 294	40	757	2	—	—	11 762	537
Taiwan	433	9	1 176	5	4 380	13	—	—	5 556	278
Spain	—	—	1 812	8	2 760	8	483	55	5 055	388
Canada	793	16	3 922	17	33	>1	—	—	4 749	216
Sub-total	3 207	66	18 419	78	27 944	83	483	55	49 349	
Total imports	4 897		23 663		33 838		881		63 279	2 555

+ USA and Canada from 1970; Taiwan from 1972; Spain from 1978; Australia from 1979.

++ only 1970-1976.

* only 1976-1991.

** only 1988-1991.

Source: Japanese Customs statistics compiled by TRAFFIC USA.

Table 9

Bluefin tuna countries and fish product of export reported in Japanese imports, 1970-1991

Fish product — fresh/frozen (F), fresh (f), and frozen (z)

Country	Year of import																						
	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92
Antilles, N.	F	F	F	F	F	F	z				z			z									
Argentina																z	z		z	z	z	z	
Australia	F	F	F	F	F	F	z	f	fz	f	fz	fz	fz	fz	fz	fz	fz	fz	z	z	z	fz	f
Azores Is.																					f	f	
Brazil									z	z									f				
Canada	F	F	F	F	F	F	fz	f	f	f	f	f	f	f	f	f	f	f	f	f	fz	fz	f
Canary Is.									f	f												fz	
China	F	F						z												z			
Cuba	F					F		z															
Denmark																				f			
Ecuador	F																				f	f	
Fiji																						f	
Fance				F	F	F		f	fz	f	f			f	z	z	f		f	f	f	fz	
Fr. Oceania																				z	z	z	
Germany, Fr																f	f						
Ghana																			z				
Greece																f	fz	f	f	f	f	f	f
Guam										f									f	f	f	f	
Guatemala						F																	

continued

Table 9

Bluefin tuna countries and fish product of export reported in Japanese imports, 1970-1991 — continued

Honduras																	z	z	z	z	z	z	
Hong Kong												f								f		f	
Indonesia				F				z	z	z	z	z	z	z	z	z	z	fz	fz	fz	f	fz	f
Ireland																	f		f	f			
Italy		F		F	F	F	fz	z	fz	z		z	fz	z	z	z	z	z	fz	fz	fz	fz	
Korea, D.P.R.										z											f		
Korea, R.	F	F	F	F	F	F	fz	z	z	fz	fz	fz	fz	f	fz	fz	fz	fz	fz	fz	fz	fz	f
Libya																						f	
M M Car																			f				
Malta																		f		f	f	f	f
Malaysia	F	F		F																f		fz	
Maldives Is.						F				z													
Mexico							f												fz	f	f		
Micronesoa																						f	
Morocco																		fz	fz	fz	fz	fz	
New Zealand										f	fz	fz	fz	fz	fz	fz	fz	z	fz	fz	fz	fz	
Norway	F	F	F	F		F		fz	z	fz										f			
Oman																				f			
Palau																					f	f	
Panama	F	F	F	F	F	F					z		z					z	z		z	z	
Philippines										f		f		z			f						
Portugal																	f	f	f	f	z	fz	f
Porto Rico																					f		
Ryukyu Is.	F	F	F																				

continued

Table 9

Bluefin tuna countries and fish product of export reported in Japanese imports, 1970-1991 — continued

Singapore		F				F				z	z	z	z	z	z	z	z	z	f	f	fz	z			
Solomon Is													z												
South Africa																	fz	fz	z	z					
Spain									f	fz	fz	z	fz	z	fz	fz	fz	fz	fz	fz	fz	f			
Sri Lanka				F																					
St. Vincent																							z		
Taiwan	F		F	F	F	F	fz	fz	fz	fz	fz	fz	fz	fz	fz	fz	fz	fz	fz	fz	fz	f			
Thailand		F	F	F																					
Trinidad																							z		
Tunisia																				f	f	fz	f	f	
Turkey															z	fz	f	f	fz	f	fz	f	f	f	
UK																f				f	f	f	f		
USA	F	F	F	F	F	F	F	fz	fz	f	f	f	fz	f	fz	fz	f	fz	fz	fz	fz	f	f	f	
Uruguay																				z	z	z			
Venezuela																				z	z	fz	z		
West Indies	F																								

Source: Japanese Customs statistics compiled by TRAFFIC USA.

Table 10

Ranking of top five countries exporting bluefin tuna, as reported in Japanese imports, 1970-1991

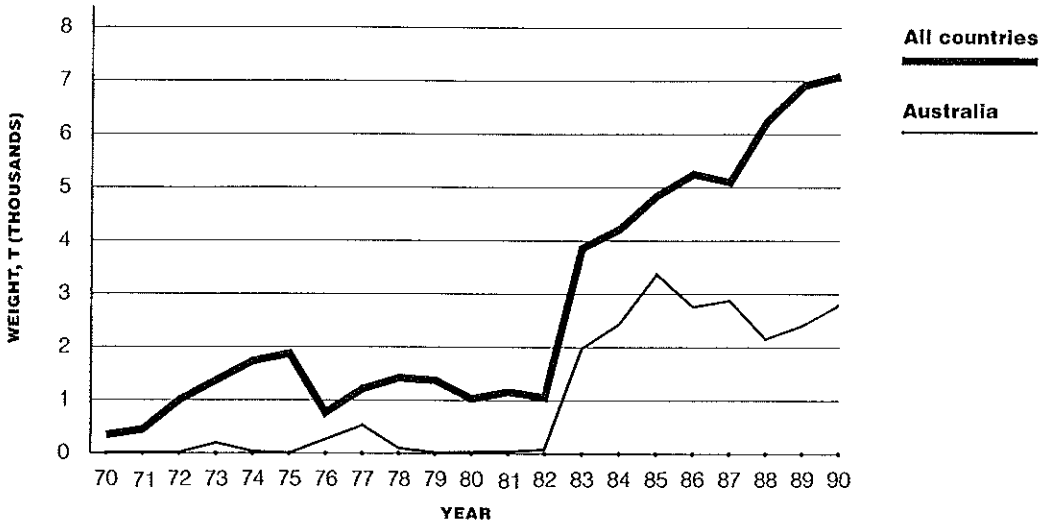
Ranking by volume, first (1) to fifth (5)

Country	Year																						
	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	Total
Australia				3									5	1	1	1	1	1	1	1	1	2	1
USA		5	1	1	4	1	2	1	1	1	1	1	4	2	2	2	2	2	3	3	3	3	2
Taiwan			5	4	5	5	3	3	5	4	4	3	1		3	4		5		2	2	1	3
Spain										2	2	4		5		3	5	3	2	4	4	5	4
Canada	3		4	2	2	4	1	2	3	3	3	2	3	3	4				5	5		4	5
China	1	4																					
Norway	2	2				3		5															
Korea, R.	4			5	3		4										4						
Ryukyu Is.	5	1	3																				
Thaialnd		3	2																				
Italy					1	2	5	4	4			5		4									
France									2														
Brazil										5													
New Zealand													2			5							
Turkey															5		3	4					
Honduras																			4				
Morocco																					5		

Source: Japanese Customs statistics compiled by TRAFFIC USA.

Figure 13

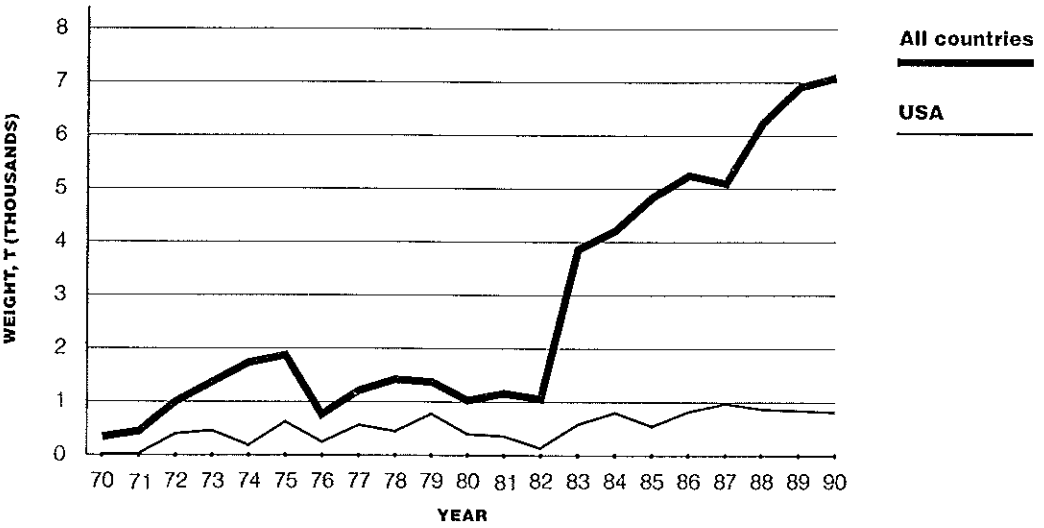
Japanese imports of bluefin tuna from all countries and from Australia, 1970-1990



Source: Japanese Customs statistics compiled by TRAFFIC USA.

Figure 14

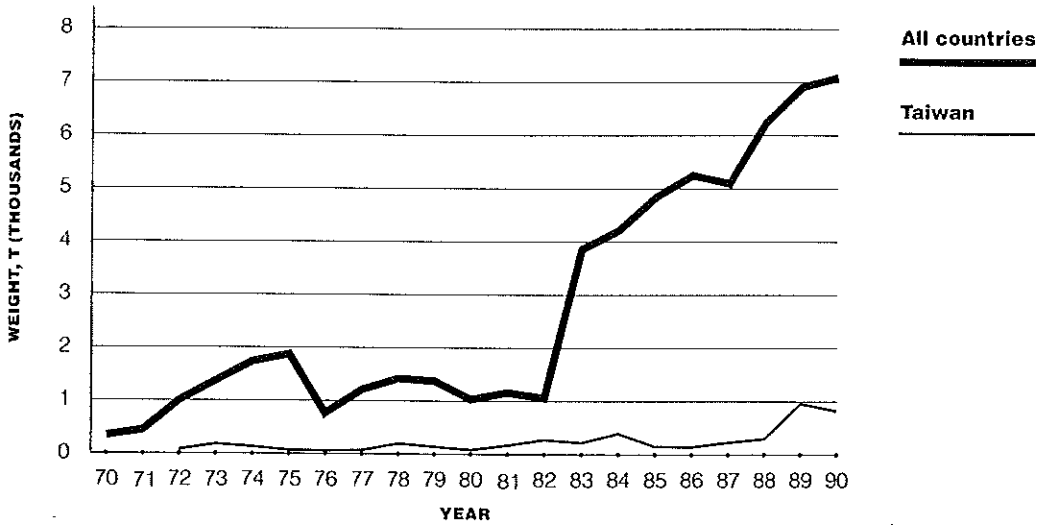
Japanese imports of bluefin tuna from all countries and from the USA, 1970-1990



Source: Japanese Customs statistics compiled, by TRAFFIC USA.

Figure 15

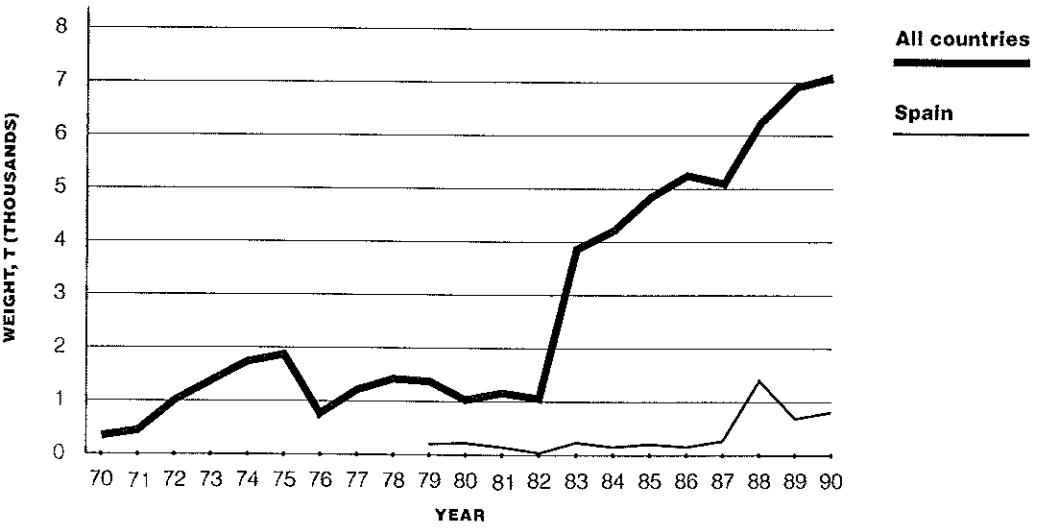
Japanese imports of bluefin tuna from all countries and from Taiwan, 1970-1990



Source: Japanese Customs statistics, compiled by TRAFFIC USA.

Figure 16

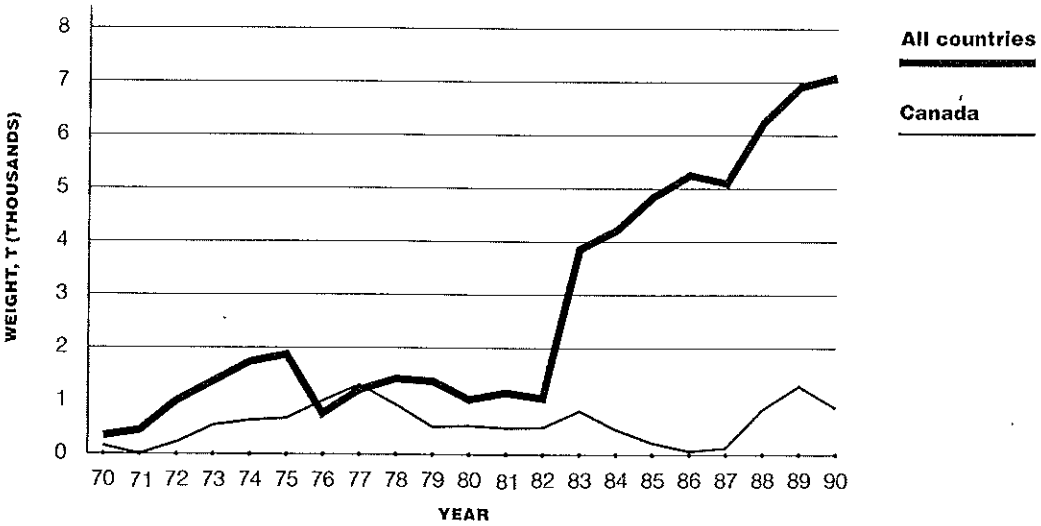
Japanese imports of bluefin tuna from all countries and from Spain, 19701990



Source: Japanese Customs statistics, compiled by TRAFFIC USA.

Figure 17

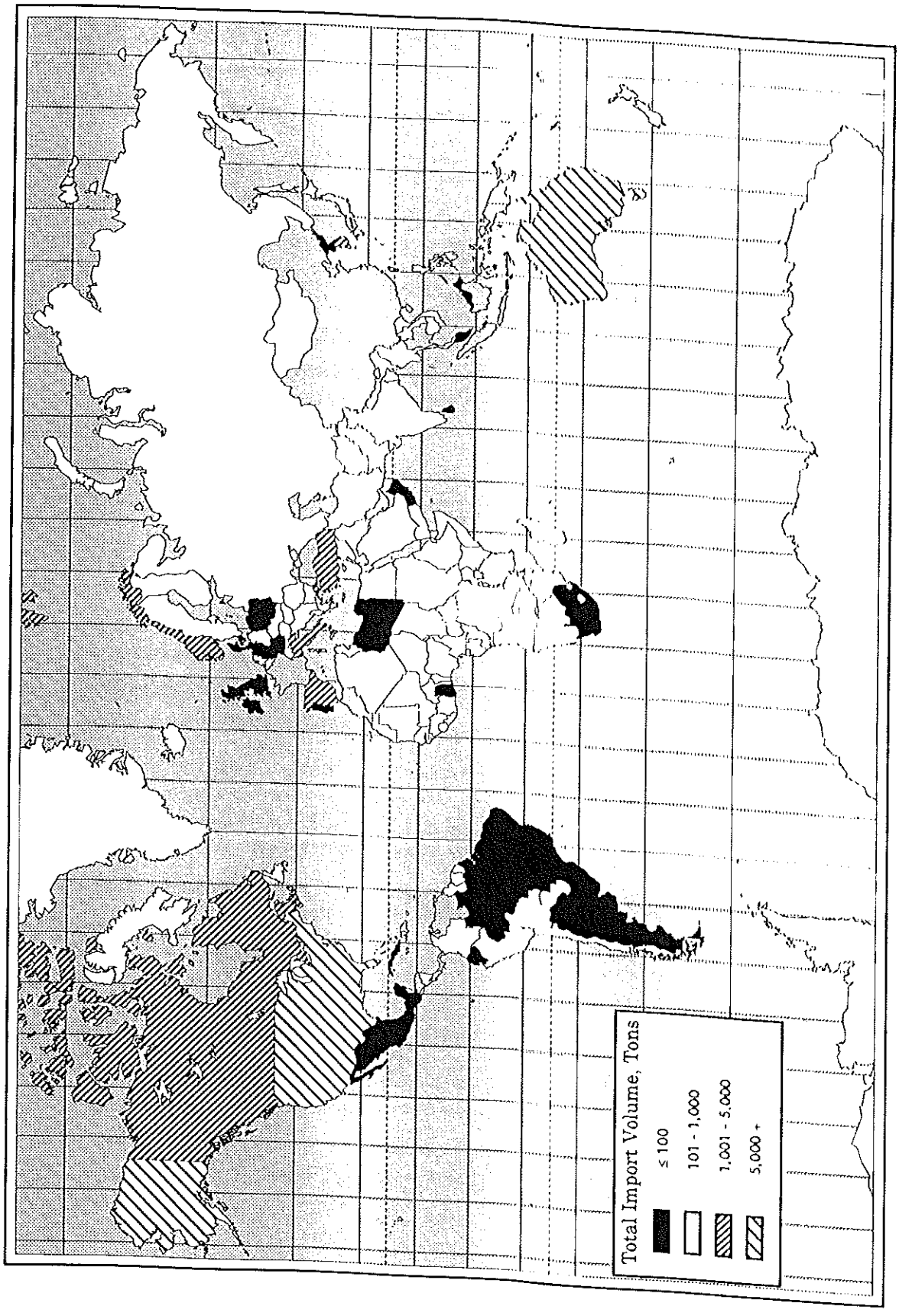
Japanese imports of bluefin tuna from all countries and from Canada, 1970-1990



Source: Japanese Customs statistics compiled by TRAFFIC USA.

Figure 18

Bluefin tuna countries of export and total import volume, reported in Japanese import data, 1970-1990



BLUEFIN TUNA CONSUMER COUNTRIES OTHER THAN JAPAN

Although Japan is the primary consumer of the world's catch of high-value bluefin tuna, an estimated 59 000 t of the 1986 catch of about 96 000 t was probably consumed by other countries[4]. Other countries may also be important consumers of lower value quality bluefin tuna.

An examination of US monthly export data for 1990 (Appendix 6a) reveals exports of fresh bluefin to the the Republic of Korea. Perhaps lesser quality bluefin, i.e. bluefin that did not meet the fat content or physical appearance standards of the Japanese market, was shipped directly the Republic of Korea, as a secondary market. The exports to the Republic of Korea were fresh and air-shipped, probably, therefore, of relatively high value, nd since it would be economically senseless to air-freight fresh fish to a transhipment point if it could just as readily be shipped to its final destination, the Republic of Korea was undoubtedly the final destination for the exports. As further possible evidence of the Republic of Korea as a secondary market for high-value bluefin, Japanese annual exports (Appendix 5) report a small amount of bluefin exported to the Republic of Korea in the mid-1980s. And in 1991, New Zealand exported over 2 000 t of frozen bluefin to the Republic of Korea (Appendix 7).

A comparison of the Republic of Korea's bluefin tuna catch statistics with exports from the Republic of Korea to Japan (see Table 11), the USA, and New Zealand, and in turn, with those countries' exports to the Republic of Korea might yield a pattern of bluefin consumption by the Republic of Korea. Unfortunately, the Republic of Korea's global bluefin catch statistics were not readily available (see Table 11) and the Republic of Korea does not report its imports and exports of bluefin tuna in its own national Customs statistics. Atlantic catch statistics for the Republic of Korea are available, since the Republic is a member of ICCAT. The Republic of Korea also reports its Northern Bluefin Tuna catch in the southern Pacific to Australia, as required under a bilateral agreement with that country, but there are no statistics quantifying the Republic of Korea's northern Pacific catch of Southern Bluefin Tuna. It is uncertain, therefore, what the Republic of Korea's role as a consumer of bluefin is in the world bluefin tuna market.

Spain and Portugal are probable consumers of bluefin, based upon US data for exports of the fresh fish. The USA exported moderate amounts of fresh bluefin to these countries by air, again suggesting that these countries are the final destinations for the tuna. A comparison of the reported catch of bluefin by Spain (Table 11), Portugal and a few other countries with Japanese imports of bluefin (in live weights) from those same countries suggests that at least some of their catch is not being exported. Spain is a significant fisher of bluefin in the eastern Atlantic and sells bluefin tuna in the Madrid fish market for domestic consumption.

Because of the often circuitous shipping routes travelled by frozen fish, US exports of frozen bluefin to other countries may not be significant in determining consumption of bluefin by these countries. Frozen fish, being imperishable, is often held, transhipped, exported, or re-exported before arriving at the final destination. In addition, and despite the fact that export statistics should theoretically report the final destination of the export, as suggested by the United Nations, it is also possible that US exports of frozen bluefin are transferred at sea, for processing or transhipment, from ships registered in the country reported as the destination, to ships of another country. In spite of these variables, it is worth noting that large amounts of frozen bluefin were reported as exported from the USA to France, Germany, Italy, the UK and South Africa. Both France and Italy are significant fishers of bluefin tuna in the east Atlantic and Mediterranean and an examination of their reported catch *vis-a-vis* their reported exports to Japan, suggests that that both might be consumers of bluefin tuna (Table 11).

Table 11

Comparison of world catch of select bluefin tuna-fishing countries and Japanese imports (in live weight+) from those countries, 1985-1989

Weight, t

Country		1985	1986	1987	1988	1989
France	Catch	5 920	3 838	4 863	6 604	4 894
	JP imports	197	968	7 320	157	4 986
Italy	Catch	7 199	2 588	4 562	4 156	4 272
	JP imports	30	29	16	23	10
Portugal	Catch	29	193	163	48	3
	JP imports	0	0.3	0.4	0.2	5.3
Rep. of Korea	Catch*	77	n/a	n/a	n/a	n/a
	JP imports	75	462	106	51	129
Spain	Catch	5 101	3 340	3 392	5 708	5012
	JP imports	234	181	314	1 367	739
Taiwan	Catch*	2 391	534	1001	1046	1 489
	JP imports	183	164	266	347	1 124
Turkey	Catch	2 230	1 524	910	973	640
	JP imports	116	787	286	122	184

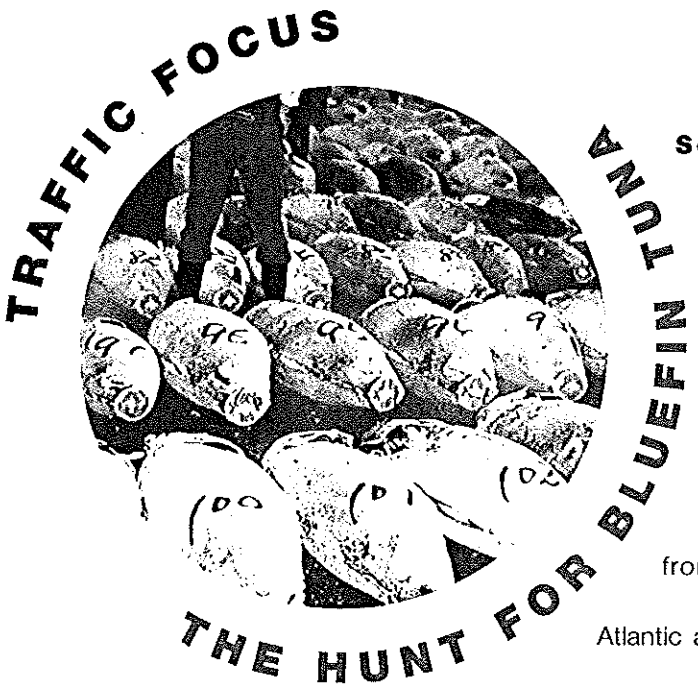
* Catch statistics are incomplete, no northern Pacific data available.

\+ Live weights calculated from Japanese Customs import statistics, based upon a gutted fish to live fish ratio of 0.85 (ICCAT, 1992b).

Source: Catch from Caton, 1991, ICCAT, 1989, and SCRS, 1991; Japanese Customs statistics .

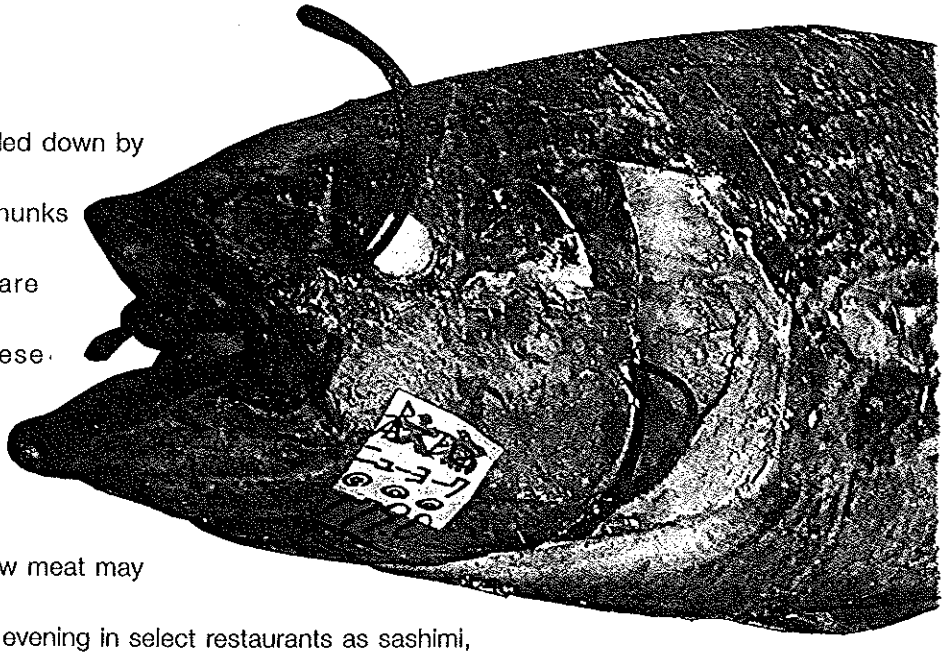
Canada and Mexico were both destinations for US exports of bluefin tuna but, because of the proximity of these countries' borders to the USA, this might represent ship transfers from the US fleet to these countries' fleet rather than actual consumption of bluefin by these countries. There is no information available on bluefin tuna consumption in either country.

There is a small commercial market in the USA for the smaller, non-exportable bluefin particularly along the east coast where smaller sport-fished and commercially fished bluefin tuna are often sold to restaurants. New Zealand exported small amounts of bluefin to the USA, American Samoa, Australia, Papua New Guinea, and Vanuatu over the period of 1983-1991. Japan exported small amounts to various countries, as well (Appendix 5). But none of these exports seems significant in terms of volume, nor do the destinations figure in trade statistics on a yearly basis.



Some fresh specimens of giant bluefin tuna can draw bids of over US$30,000 at the daily early-morning fish auction of Tokyo's Tsukiji Market. Each day, hundreds of frozen and fresh bluefin tuna arrive at Tsukiji by ship and air from the cool water bluefin habitat of the Atlantic and Pacific Oceans. The gutted bluefin are lined up for comparison and measured and graded by market wholesalers looking for freshness and gastronomically appealing fish.

At dawn, bidding begins and some, such as this giant bluefin tuna weighing **more than 330kg**, are rapidly dispatched for further processing.



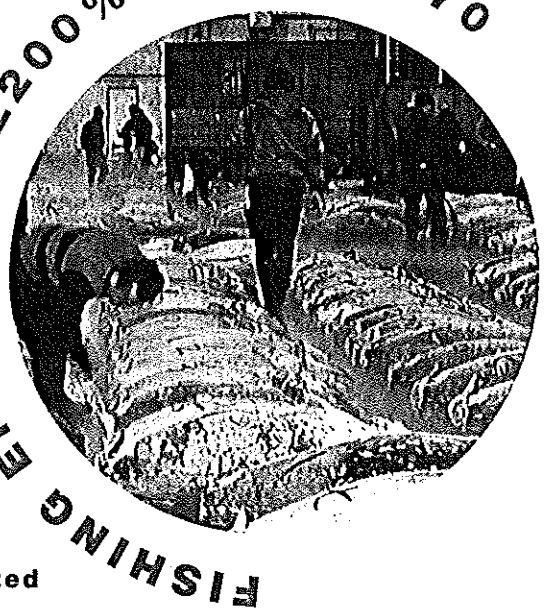
The fish are whittled down by ban-saws into chunks of meat which are sold to Japanese shoppers within just a few hours. The raw meat may appear that same evening in select restaurants as sashimi, thinly sliced and artistically displayed.

The two species of bluefin tuna (Southern and Northern) are the **largest bony fish** in the world and are found only in temperate waters of the **northern Atlantic and northern and southern Pacific Oceans**.

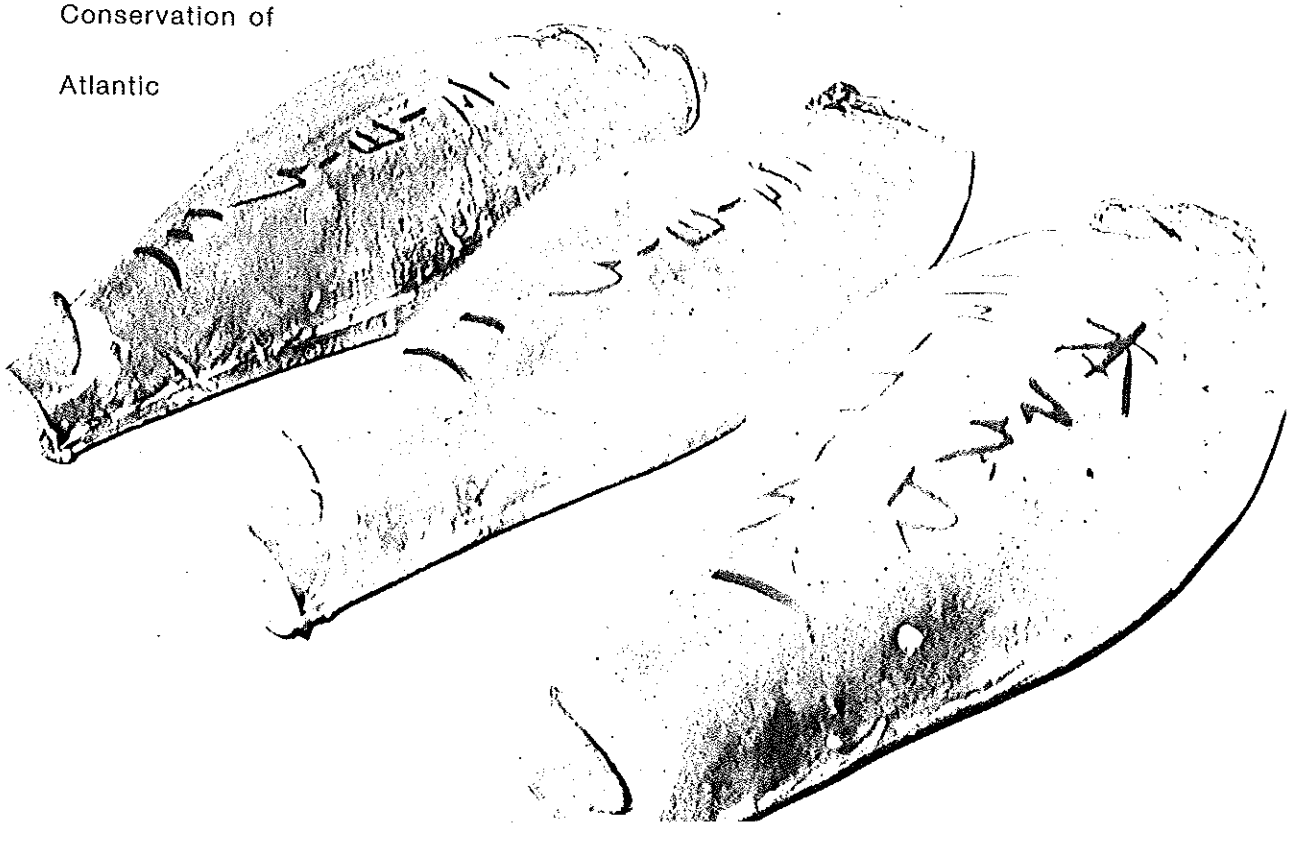
Once sought only by the fishing fleets of Japan, in the last two decades these warm-blooded, highly migratory fish have increasingly been targeted by fishermen throughout the world, primarily for sale in Japan. In the western Atlantic, fishing effort for these deep-water bluefin tuna has **increased by more than 2200%** since 1970.

US$50 OR MORE PER KILOGRAMME

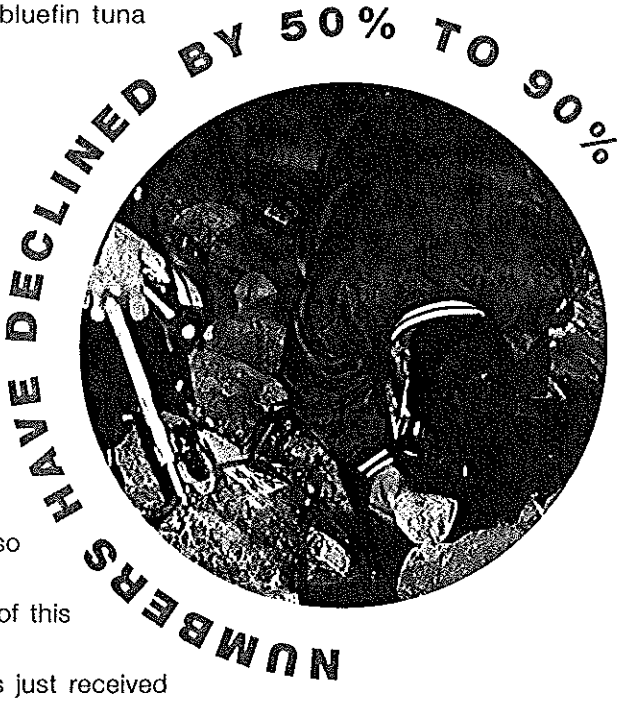
Commercial fishermen, attempting to survive in a world of declining commercial catches, increased controls on catches, and declining values and markets for fisheries products, view the **US$50 or more per kilogramme** that might be obtained from bluefin as a financial bonanza. A fishing boat in the USA might **search for two weeks** in order to land one giant bluefin. Although the world catch of bluefin is small in comparison to world fishery volumes, many countries have entered the competition. According to Japanese records for 1970 to 1991, **59 countries have exported bluefin to the Japanese** market, the primary and most valuable market for bluefin.



Conservationists have become increasingly concerned about bluefin tuna declines throughout the world. The International Convention for the Conservation of Atlantic



Tunas **(ICCAT)**, which has managed tuna in the Atlantic for 25 years has calculated that the population of breeding adult bluefin (eight years or older) in the western Atlantic – the focus of concentrated fish hunts by commercial and recreational fishermen alike, since the largest bluefin consistently occur there – **has declined by possibly 77% to 90%** in slightly over two decades. The eastern Atlantic population, which includes the Mediterranean, has declined by about 50%. An attempt to slow down the international trade in Atlantic populations of bluefin under the regulations of the Convention for International Trade in Endangered Species of Wild Fauna and Flora **(CITES)** failed in 1992, owing to concerted political pressure from major bluefin tuna fishing countries.



Until now there has been no management or regulation of the catch of bluefin outside the Atlantic. There are **no international or multi-lateral agreements managing the Pacific** population of the Northern Bluefin Tuna, so little information is available on the status of this population. The Southern Bluefin Tuna has just received some international protection through a new fishery agreement regulating and managing its take: **the Convention for the Conservation of Southern Bluefin Tuna (CCSBT)** just came into force in mid-1993, reportedly as an attempt to prevent the collapse of this lucrative fishery in the southern hemisphere. One CCSBT signatory, Australia, is a major fisher of Southern Bluefin Tuna and the top exporter of bluefin tuna to Japan.

Bluefin Tuna – A TRAFFIC Network Report
TRAFFIC International, 219c Huntingdon Road, Cambridge CB3 0DL, United Kingdom
TRAFFIC USA, 1250 24th Street, NW, Washington DC 20037, USA
Photographs: A. Gaski, G. Hemley

OCEANIC SOURCES OF BLUEFIN TUNA

Sources of Japanese imports of bluefin tuna

Sources of Japanese imports of bluefin tuna may be grouped by catch region, according to the likely oceanic area of origin of the fish. The regions overlap, i.e the same ocean spans more than one catch region, but each country or territory is assigned to only one region. In many cases, the determination of the region was based upon catches reported (SCRS, 1991; ICCAT, 1992a) by ICCAT, whose mandate is to record Atlantic Northern Bluefin Tuna catches for management purposes. Some ICCAT information indicates possible catch regions used by vessels registered in countries that are not parties to ICCAT. The countries in which these vessels are registered, have little control over them in many cases, and receive no catch information from them. For those countries exporting bluefin to Japan and not listed by ICCAT, guesses were made about the country's catch region, based on its location and potential access to bluefin fishing areas. Because of this speculation, the following estimates of which countries fish within given catch regions may undoubtedly change when more information becomes available.

Appendices 1-4 list all Japanese imports of fresh/frozen bluefin for 1970-1975, fresh for 1976-1990, frozen for 1976-1990, and other bluefin tuna meat for 1988-1990, respectively: all import data are sorted by oceanic fishing region. The Atlantic Ocean category is divided into eastern and western portions, (since ICCAT manages the Atlantic Northern Bluefin Tuna population according to these two regions), giving a total of six catch regions, as determined by this report. They, and the countries or territories fishing within them, are:

Atlantic

Portugal, Venezuela;

Eastern Atlantic

the Azores, Canary Islands, Denmark, France, Germany, Ghana, Greece, Ireland, Italy, Libya, Malta, Morocco, Norway, Spain, Tunisia, Turkey, United Kingdom;

Western Atlantic

Brazil, the Netherlands Antilles, Canada, Cuba, Puerto Rico, and West Indies;

Atlantic and Pacific

Republic of Korea, Honduras, Panama, South Africa, Taiwan, Uruguay;

Western Atlantic and Pacific

Argentina, Guatemala, Mexico, and the USA; and

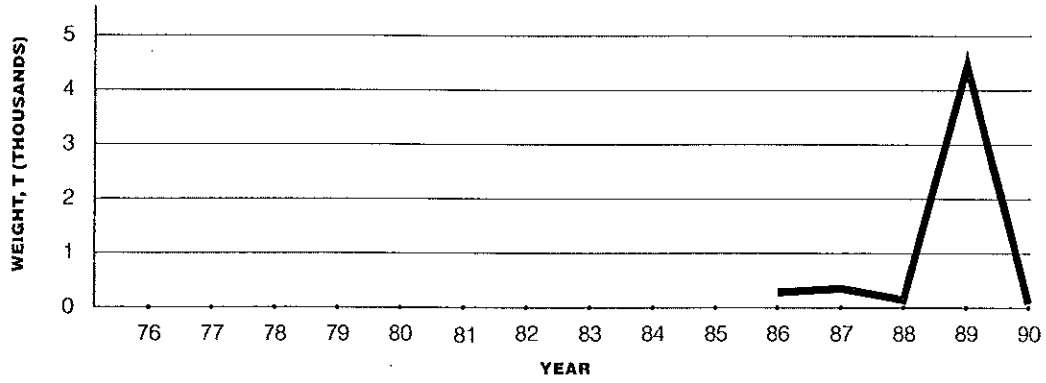
Pacific

Australia, Caroline Islands, China, French Oceania, Ecuador, Guam, Hong Kong, Indonesia, Peoples' Democratic Republic of Korea, Malaysia, the Maldives, Marianna Islands, Marshall Islands, New Zealand, Oman, Palau, Philippines, Ryukyu Islands, Solomon Islands, Singapore, Sri Lanka, and Thailand.

Figures 19 to 30 illustrate the trends in Japanese imports of fresh and frozen bluefin tuna from these regions for the period of 1976-1990.

Figure 19

Japanese imports of fresh bluefin tuna from the Atlantic,* 1976-1990

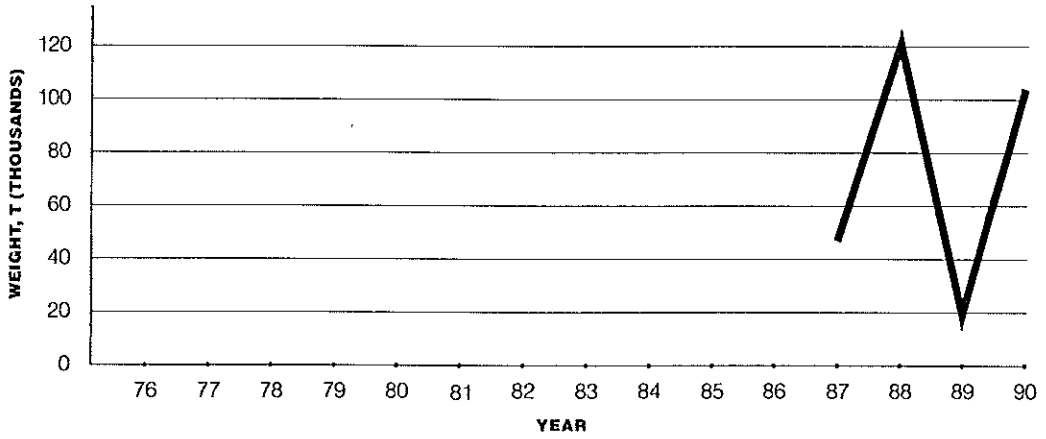


*See report text for countries in this region.

Source: Japanese Customs statistics compiled by TRAFFIC USA.

Figure 20

Japanese imports of frozen bluefin tuna from the Atlantic,* 1976-1990

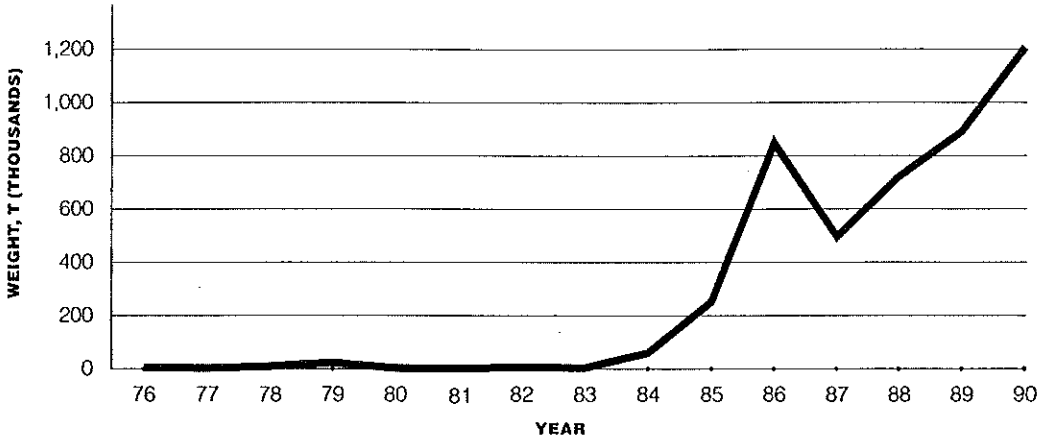


*See report text for countries in this region.

Source: Japanese Customs statistics compiled by TRAFFIC USA.

Figure 21

Japanese imports of fresh bluefin tuna from the eastern Atlantic,* 1976-1990



*Not ICCAT region; see text report for countries in this region.

Source: Japanese Customs statistics compiled by TRAFFIC USA.

Figure 22

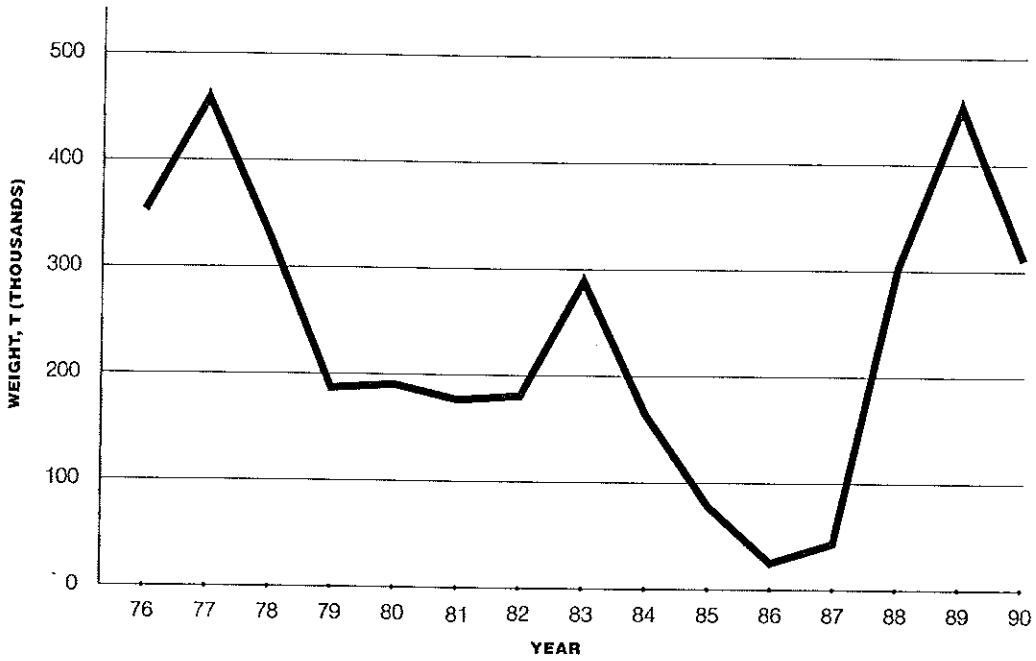
Japanese imports of frozen bluefin tuna from the eastern Atlantic,* 1976-1990

* Not ICCAT region; see report text for countries in this region.

Source: Japanese Customs statistics compiled by TRAFFIC USA.

Figure 23

Japanese imports of fresh bluefin tuna from the western Atlantic,* 1976-1990

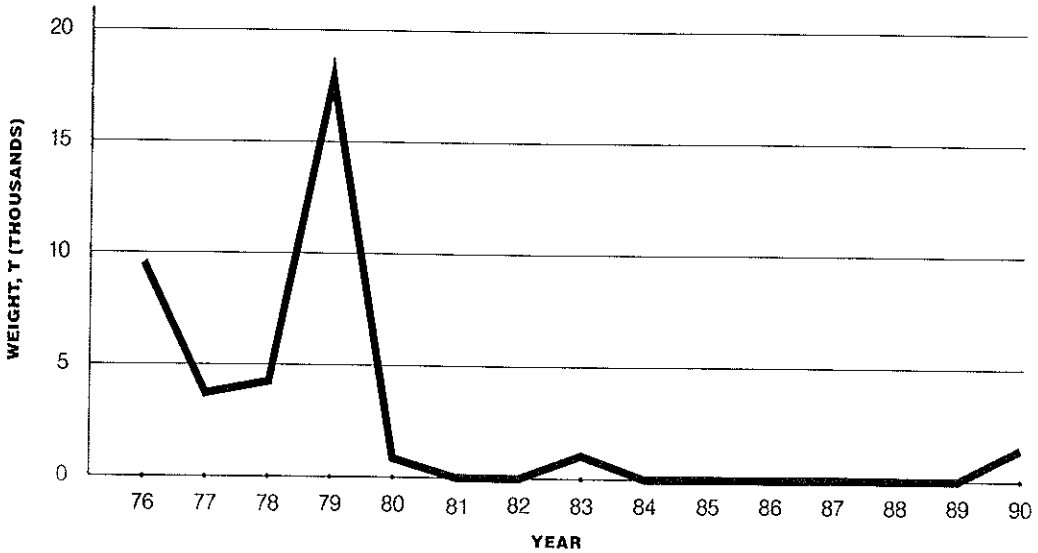


* Not ICCAT region; see report text for countries in this region.

Source: Japanese Customs statistics compiled by TRAFFIC USA.

Figure 24

Japanese imports of frozen bluefin tuna from the western Atlantic,* 1976-1990

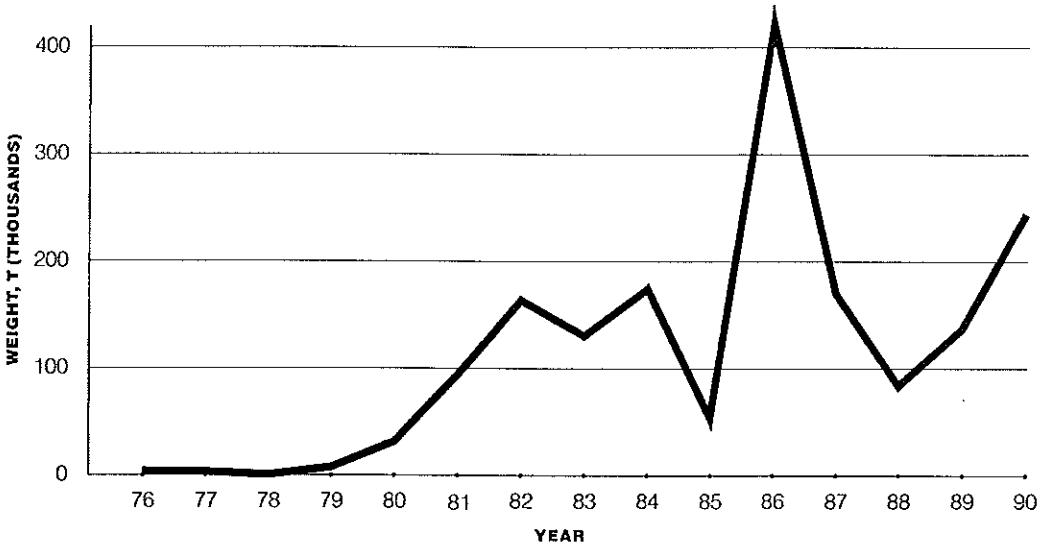


* Not ICCAT region; see report text for countries in this region.

Source: Japanese Customs statistics compiled by TRAFFIC USA.

Figure 25

Japanese imports of fresh bluefin tuna from the Atlantic/Pacific

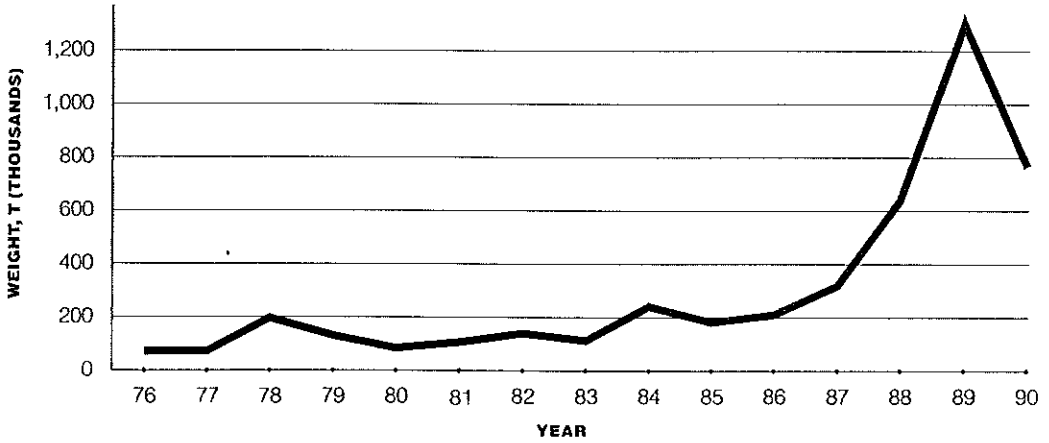


* See report text for countries in this region.

Source: Japanese Customs statistics compiled by TRAFFIC USA.

Figure 26

Japanese imports of frozen bluefin tuna from the Atlantic/Pacific,* 1976-1990

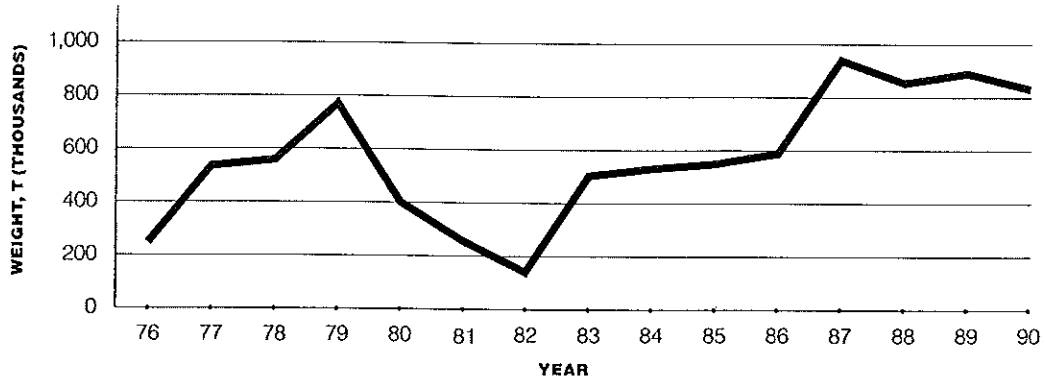


* See report text for countries in this region.

Source: Japanese Customs statistics compiled by TRAFFIC USA.

Figure 27

Japanese imports of fresh bluefin tuna from the western Atlantic/Pacific,* 1976-1990

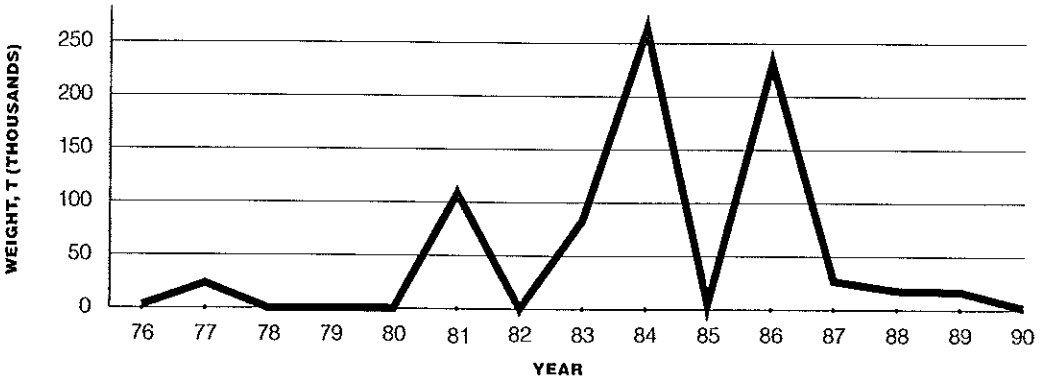


* Not ICCAT region: see report text for countries in this region.

Source: Japanese Customs statistics compiled by TRAFFIC USA.

Figure 28

Japanese imports of frozen bluefin tuna from the western Atlantic/Pacific,* 1976-1990

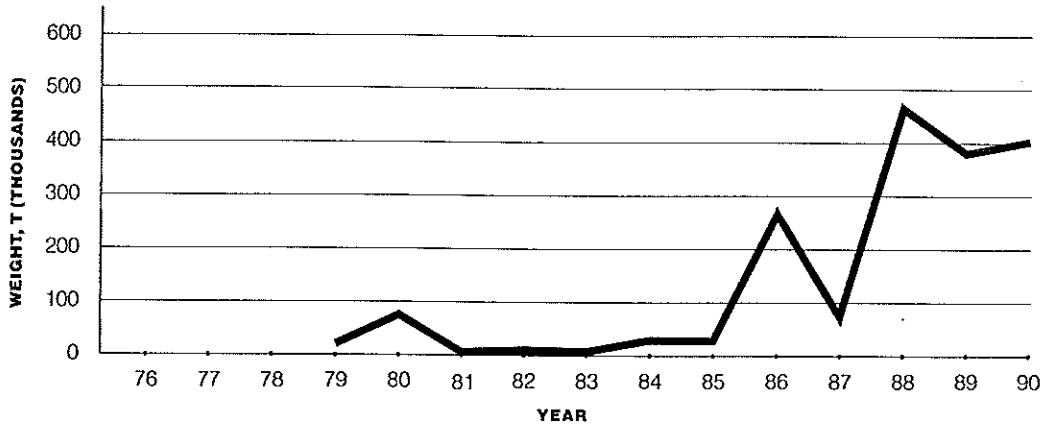


* Not ICCAT region; see report text for countries in this region.

Source: Japanese Customs statistics compiled by TRAFFIC USA.

Figure 29

Japanese imports of fresh bluefin tuna from the Pacific,* 1976-1990

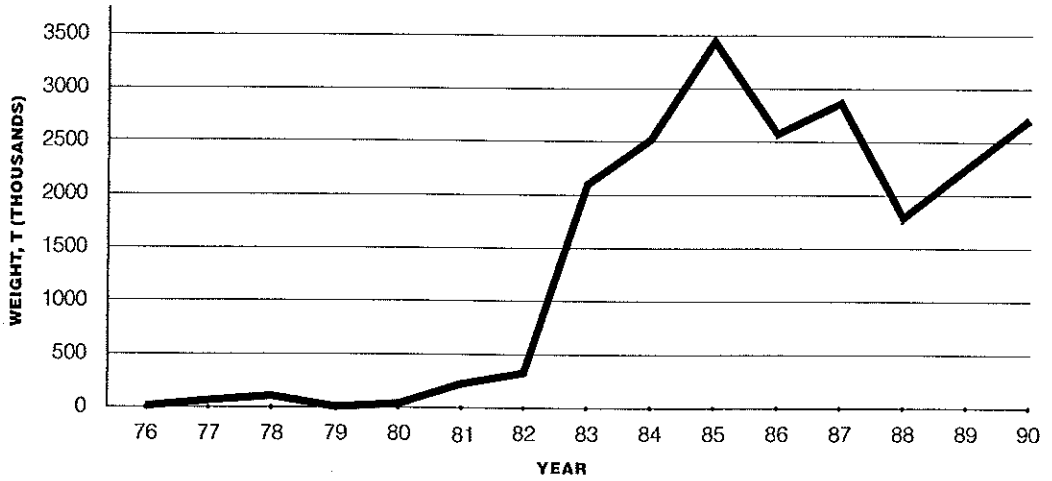


* See report text for countries in this region.

Source: Japanese Customs statistics compiled by TRAFFIC USA.

Figure 30

Japanese imports of frozen bluefin tuna from the Pacific,* 1976-1990



* See report text for countries in this region.

Source: Japanese Customs statistics compiled by TRAFFIC USA.

Sources of bluefin exports from the USA

It is possible to determine roughly the proportion of US exports coming from the Atlantic and the Pacific, based upon the district Customs information in US trade statistics. It is known that fresh bluefin is flown to the primary consumer, Japan, as soon as possible in order to obtain the best price. For this reason, the Customs district of export from where the fresh tuna is exported and the international airport in that district, are probably those nearest to the bluefin catch area.

Table 12 lists Customs districts in the USA for Atlantic and Pacific coast exports, and domestic exports of fresh bluefin tuna, by volume, for 1989 to 1991. Most of these Customs districts have international airports with direct flights to Tokyo or, like Cleveland, have express delivery service companies such as DHL, Emery, or UPS.

Table 13 lists the same information for frozen domestic exports of bluefin tuna. However, the export statistics for frozen bluefin may not be reliable indicators of the region of catch, unlike import statistics, discussed in the following section, for two reasons. Forstly, export statistics do not list the country of origin of the export, and, secondly, the Customs district of export may not be the Customs district of import: fish may be caught in one area and shipped to a completely different Customs district for re-export. In most cases, frozen bluefin does not need to be exported rapidly and is usually transported by ships leaving international ocean harbours.

On average, 80% of the US fresh bluefin tuna exports during the three years reported in Table 12 left the east coast and probably came from the Atlantic Ocean. An average 83% of the frozen bluefin was exported from there as well. The most-used east coast Customs districts of export were New York City and Boston, whose combined exports accounted for about 86% of the fresh bluefin exports from the USA and 65% of such frozen exports. Not only are these cities adjacent to the key bluefin tuna fishing region of the western Atlantic, but New York has about 76 weekly, direct flights to Tokyo, while Boston has 13, thus allowing high-quality tuna to be shipped immediately to Tokyo.

Identification of other bluefin sources

District Customs information in US import statistics (as opposed to export statistics, as discussed in the previous section) can be useful in determining the fishing areas of some other bluefin-exporting countries for several reasons. Import statistics report the country of origin, and the Customs district of import is probably close to the area of catch, since it is doubtful that an exporting country would transport frozen bluefin caught in one ocean to another ocean when the USA has port son west and east coasts. The exceptions to this would be the fleets of Korea, Taiwan and Japan, which fish bluefin tuna in both oceans. However, their catch is undoubtedly intended for consumption in one or more of these three countries and thus would have no bearing on US imports. So, if one assumes that a ship carrying exported bluefin to the USA caught that bluefin in the ocean nearest to the US Customs district of entry, then regions of catch for some countries can be estimated. This means of analysis would only be valuable for frozen fish since fresh imports to the USA would be more likely to arrive by aeroplane.

US statistics, in early 1992, only reported trade with countries whose catch region is already known, with one exception, Mexico. Mexico was reported in US imports in two Customs districts, one in the Gulf of Mexico (Laredo, Texas) and one (Nogales, Arizona) nearer to the known Baja California bluefin fishery in the Pacific. The imports were by "other" transport, presumably truck, which suggests that the location of the catch was close enough not to require air transport. If so, and given the fact that the imports were via US Customs districts adjacent to both Mexican coasts, Mexico is probably fishing bluefin in both the Pacific and Western Atlantic.

It is already known from ICCAT catch statistics that Canada, the Republic of Korea, Spain, and Tunisia fish for bluefin tuna from the Atlantic. It should therefore follow, based on the assumption made above, that the bluefin exported to the USA by these countries should arrive via east coast Customs districts. This was found to be the case — the four countries all exported bluefin to the USA, by ship, through east coast ports of the USA. However, a similar assumption cannot be made for air shipments. For example, US imports statistics note bluefin tuna from Ecuador, imported by air into the east coast Customs district of New York City: the fish could have been caught in any of the previously mentioned catch regions, although it most probably came from the Pacific.

Table 12

US domestic exports of fresh bluefin tuna by customs district of export and likely ocean of catch, 1989-1991

Customs district	Weight, kg 1989	1990	1991	Total	3-year % of fresh
Atlantic Ocean					
New York City	1 822 689	1 247 512	712 536	3 782 737	58.0
Boston	359 087	308 414	316 194	978 101	15.0
Cleveland	216 903	17 427	—	234 330	3.6
Houston/Galveston	43 994	31 393	36 104	111 491	1.7
Dallas/Ft. Worth	45 965	18 997	—	64 692	1.0
New Orleans	—	—	26 555	26 555	0.4
Savannah	7057	—	—	7057	0.1
Detroit	—	—	4 818	4 818	>0.1
Laredo	1 900	—	—	1 900	>0.1
Chicago	609	683	—	1 292	>0.1
Sub-total	2 498 204	1 629 526	1 096 207	5 223 937	
Percentage of total	84.9%	81.1%	69.8%	80.1%	
Pacific Ocean					
Los Angeles	315 998	169 498	37 960	523 456	9.5
Alaska	—	118 324	345 699	464 023	8.4
Hawaii	128 662	91 181	80 722	300 565	5.4
San Francisco	—	266	7 541	7 807	1.4
Nogales	—	—	3 409	3 409	>0.1
Sub-total	444 660	379 269	475 331	1 299 260	
Percentage of total	15.1%	18.9%	30.2%	19.9%	
Total	2 942 864	2 008 745	1 571 538	6 523 147	

+ See Appendix 15 for cities and airports in Customs district.

Source: US Customs statistics.

Table 13

US domestic exports of frozen bluefin tuna by customs district of export and likely ocean of catch, 1989-1991

Customs district	Weight, kg 1989	1990	1991	Total	Percentage of fresh
Atlantic Ocean					
New York City	141	51 079	124 045	175 265	32.9
Boston	117 558	—	57 578	175 136	32.9
Philadelphia	—	—	43 450	43 450	8.2
Houston/Galveston	—	—	26 752	26 752	5.0
Miami	—	10 935	—	10 935	2.1
New Orleans	—	—	8 241	8 241	3.5
Dallas/Fort Worth	2 519	—	—	2 519	0.5
Sub-total	120 218	62 014	260 666	442 898	
Percentage of total	81.4%	77.4%	85.8%	83.3%	
Pacific Ocean					
San Diego	25 309	—	—	25 309	4.8
San Francisco	408	18 099	—	18 507	3.5
Seattle	1 581	—	—	1 581	0.3
Hawaii	171	—	—	171	>0.1
Sub-total	27 469	18 099	43 561	89 129	
Percentage of total	18.6%	22.6%	14.3%	16.8%	
Total	147 687	80 113	303 627	531 427	

+ See Appendix 15 for cities and airports in Customs district

Source: US Customs statistics

TRANSPORTATION AND TRADE ROUTES

It is difficult to identify and describe the patterns of trade of bluefin tuna primarily because there are data for only three of the almost 40 countries currently exporting bluefin tuna. Fortunately, because one of these countries is the primary consumer (Japan) and one is the primary exporter of fresh fish (USA) — see Table 8 — general statements on trade patterns can be made. In addition, because of the stringent requirements for fish quality and freshness dictated by Japan, it is known that trade routes for fresh tuna need to be the fastest possible, i.e., direct flights to the principal marketplace, Tokyo.

US trade data report the amount of imports and exports, by value, in two categories according to the mode of transport — air or ship. Table 14 lists the five categories of US tuna exports for 1991 by transport type: "vessel" (ship), "air", or "other." The category of "other" transport is not reported in US trade data but is determined by subtracting the export values for vessel and air categories from the total export value. The "other" transport type would most probably be truck, since trucks are common haulage transport, large enough to carry a one-ton fish, and can transport the bluefin directly to its transhipment point or, in some cases, its ultimate destination. Most of the bluefin tuna in the "other" category from 1989 to 1992 is to and from Mexico and Canada.

The majority of albacore (83%), yellowfin (90%), bluefin (87%), and "other tuna" (88%) are transported by air. (The "other tuna" category probably includes Big Eye Tuna, another high-value tuna in demand in the Japanese market.) Only fresh Skipjack is more commonly exported from the USA by "other" transport, than by air or by ship. Frozen tuna is most commonly exported by ship for all commodities.

In order to help determine the countries most likely to export fresh and chilled bluefin tuna to the primary market, Japan, a list was made of all weekly direct flights from all countries to Tokyo, the final compilation comprising 95 cities in 42 countries. As defined by the "OAG Desktop Flight Guide" (1992), a direct flight is transportation from the origin to the destination which may be non-stop or have one or more stops. In some instances, direct flights may involve a change of plane. Of these 42 countries, only 11 -- Austria, Bangladesh, Belgium, Egypt, Finland, India, Iran, New Caledonia, Pakistan, Peru, and Russia -- have not been reported in international bluefin trade statistics and most of these do not have pelagic tuna-fishing fleets.

Table 14

1991 US tuna exports by value and transport type

		Vessel		Air		Other		
Commodity	Category	US$	%	US$	%	US$	%	Total value
Albacore	Fr	119 439	4	2 313 489	83	342 769	12	2 775 697
	Frz	28 047	49	5 850	10	23 548	41	57 445
Yellowfin	Fr	87 967	2	4 122 452	90	384 511	8	4 594 930
	Frz	1 565 489	84	37 869	2	267 856	14	1 871 214
Skipjack	Fr	115 906	30	13 674	4	251 225	66	380 805
	Frz	370 054	85	-	-	67 038	15	437 092
Bluefin	Fr	2 400 000	13	15 840 664	87	7 215	>1	18 247 879
	Frz	403 140	69	179 740	31	-	-	582 880
Other tuna	Fr	78 042	1	8 177 977	88	1 005 607	11	9 261 626
	Frz	1 424 870	89	124 584	8	58 753	4	1 608 207

Fr = Fresh; Frz = Frozen.

Source: US Customs statistics.

The following six countries have more than 50 direct flights to Tokyo each week: the USA (471), Hong Kong (82), Australia (56), China (56), Taiwan (55), and Singapore (51). Australia, Taiwan, and the USA are three of the top five countries exporting bluefin tuna over the past 20 years. And the USA may be a major transhipment point for bluefin tuna, owing to its daily average of over 90 direct flights to Tokyo.

CONCLUSION

The introduction and subsequent widespread use of the Harmonized System in national Customs statistics in 1988 has increased the potential for their use in wildlife trade monitoring by providing universal commodity descriptions and methods of reporting. Unfortunately, the existence of this universal Customs system does not mean that it will be used in its entirety by each participatory nation: not all nations trading in a commodity report its trade specifically. Most countries only report import and export trade of commodities which are or may be valuable to the government, such as those which bring in significant tariffs or duties, are significant to the national economy, or have cultural importance. The remaining trade is usually reported in combined commodity categories, such as "other tuna." Based upon the analyses of this report, fisheries trade monitoring using Customs statistics may be possible, but not ideal. Undoubtedly, the data collected and compiled by one entity, an international agency, like the United Nations Food and Agriculture Organization, or an international convention, like the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), are the best basis for trade monitoring, since they are most likely to be compiled in a standard and consistent way. However, these data often only relate to part of the trade in a given commodity.

The international fisheries trade is more complex than comparable large-scale terrestrial wildlife trade. The former can involve the transhipping at sea to ships registered in countries with little or no government oversight of fisheries matters. It can also involve partial processing (cleaning, freezing, etc.) in one or more countries or on ships at sea. Even final processing (canning, etc.) can occur in more than one country. All these factors may obscure the origin of the fish in trade making monitoring, by Customs statistics, potentially an academic exercise without hope of a sound conclusion. The complex international trade of herring and herring products is one example of fisheries trade that would be most difficult to monitor using only Customs statistics. However, the simplicity of the bluefin market based upon one aspect of the trade — the urgency of shipping fresh bluefin immediately in order to obtain the best price — would make accurate monitoring of the fresh bluefin trade possible if more countries reported the trade in a consistent manner.

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NOTES

[10] From 1970-1985, this includes 29 100 t in the east Atlantic, 9 827 t in the Mediterranean, and 18 842 t in western Atlantic of northern bluefin; 244 545 t of northern bluefin in the Pacific; 39 122 t of southern bluefin in the Atlantic; and 473 787 t of southern bluefin in the southern Pacific (compiled from Bayliff, 1991; Caton, 1991; ICCAT, 1985; ICCAT, 1989; SCRS, 1991).

[2] This is determined by subtracting the calculated live weights of exports (183 t) from those of imports (32 499 t) for 1970 to 1985 and adding this to the actual catch (815 223 t) of the Japanese fleet for the same period.

[3] This extrapolation is based upon a gutted bluefin tuna amounting to about 85% of a live one (ICCAT, 1992b).

[4] Many of the world catch figures may also include discarded bluefin so not all of this total catch was available for consumption.

Appendix 1

Japanese imports by weight of fresh/frozen bluefin tuna by region, 1970-1975 (kg)

	Year 1970	Year 1971	Year 1972	Year 1973	Year 1974	Year 1975	Country subtotal
			EASTERN ATLANTIC				
FRANCE	0	0	0	10252	3270	5207	**18729**
ITALY	0	200	0	102945	823698	531009	**1457852**
NORWAY	58679	96055	30868	18251	0	239640	**443493**
subtotal for EASTERN ATLANTIC	**58679**	**96255**	**30868**	**131448**	**826968**	**775856**	**1920074**

Appendix 1

Japanese imports by weight of fresh/frozen bluefin tuna by region, 1970-1975 (kg)

	Year 1970	Year 1971	Year 1972	Year 1973	Year 1974	Year 1975	Country subtotal
			PACIFIC				
AUSTRALIA	10020	7443	14073	190082	39010	8724	**269352**
CHINA	103940	64977	0	0	0	0	**168917**
ECUADOR	91972	0	0	0	0	0	**91972**
INDONESIA	0	0	0	2900	0	0	**2900**
MALAYSIA	287	1556	0	7784	0	0	**9627**
MALDIVES	0	0	0	0	0	2866	**2866**
RYUKYU	28939	115506	84200	0	0	0	**228645**
SINGAPORE	0	27350	0	0	0	10838	**38188**
SRI LANKA	0	0	0	6024	0	0	**6024**
THAILAND	0	67200	304640	29940	0	0	**401780**
subtotal for PACIFIC	**235158**	**284032**	**402913**	**236730**	**39010**	**22428**	**1220271**

Appendix 1

Japanese imports by weight of fresh/frozen bluefin tuna by region, 1970-1975 (kg)

	Year 1970	Year 1971	Year 1972	Year 1973	Year 1974	Year 1975	Country subtotal
			PACIFIC & ATLANTIC				
KOREA	48709	19324	9729	149052	205898	54350	**487062**
PANAMA	14368	1021	2534	1547	10045	33565	**63080**
TAIWAN	0	0	77494	170366	118721	66658	**433239**
subtotal for PACIFIC & ATLANTIC	**63077**	**20345**	**89757**	**320965**	**334664**	**154573**	**983381**

Appendix 1

Japanese imports by weight of fresh/frozen bluefin tuna by region, 1970-1975 (kg)

	Year 1970	Year 1971	Year 1972	Year 1973	Year 1974	Year 1975	Country subtotal
			PACIFIC & WESTERN ATLANTIC				
GUATELMALA	0	0	0	0	0	2015	**2015**
UNITED STATES	5526	32260	394046	463133	197228	618709	**1710902**
subtotal for PACIFIC & WESTERN ATLANTIC	**5526**	**32260**	**394046**	**463133**	**197228**	**620724**	**1712917**

Appendix 1

Japanese imports by weight of fresh/frozen bluefin tuna by region, 1970-1975 (kg)

	Year 1970	Year 1971	Year 1972	Year 1973	Year 1974	Year 1975	Country subtotal
			WESTERN ATLANTIC				
ANTILLES	0	17272	2470	23854	11652	7829	**63077**
CANADA	54878	703	81422	193064	223584	239360	**793011**
CUBA	0	0	0	0	0	47030	**47030**
WEST INDIES	16926	0	0	0	0	0	**16926**
subtotal for WESTERN ATLANTIC	**71804**	**17975**	**83892**	**216918**	**235236**	**294219**	**920044**
TOTALS	**434244**	**450867**	**1001476**	**1369194**	**1633106**	**1867800**	**6756687**

Appendix 2

Japanese imports by weight of fresh bluefin tuna by region, 1976-1990 (kg)

	Year 1976	Year 1977	Year 1978	Year 1979	Year 1980	Year 1981	Year 1982	Year 1983	Year 1984	Year 1985	Year 1986	Year 1987	Year 1988	Year 1989	Year 1990	Country subtotal
						ATLANTIC										
PORTUGAL	0	0	0	0	0	0	0	0	0	0	280	347	138	4462	0	5227
VENEZUELA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	74
subtotal for ATLANTIC	0	0	0	0	0	0	0	0	0	0	280	347	138	4462	74	5301

Appendix 2

Japanese imports by weight of fresh bluefin tuna by region, 1976-1990 (kg)

	Year 1976	Year 1977	Year 1978	Year 1979	Year 1980	Year 1981	Year 1982	Year 1983	Year 1984	Year 1985	Year 1986	Year 1987	Year 1988	Year 1989	Year 1990	Country subtotal
						EASTERN ATLANTIC										
AZORES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1927	**1927**
CANARY ISLANDS	0	0	543	465	0	0	0	0	0	0	0	0	0	0	0	**1008**
DENMARK	0	0	0	0	0	0	0	0	0	0	0	0	0	1862	0	**1862**
FR GERMANY	0	0	0	0	0	0	0	0	0	2345	1039	0	0	0	0	**3384**
FRANCE	0	686	6938	7600	2890	0	0	3336	0	0	823	6222	133	4238	31429	**64295**
GREECE	0	0	0	0	0	0	0	0	0	5830	70920	54219	55913	71611	84289	**342782**
IRELAND	0	0	0	0	0	0	0	0	0	0	2500	0	1874	1205	0	**5579**
ITALY	6171	0	735	0	0	0	1535	0	0	0	0	0	14138	7835	18697	**49111**
LIBYA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1093	**1093**
MALTA	0	0	0	0	0	0	0	0	0	0	0	0	0	3024	3307	**6331**
MOROCCO	0	0	0	0	0	0	0	0	0	0	0	21290	59081	170243	209000	**459614**
NORWAY	0	1353	0	1584	0	0	0	0	0	0	0	0	0	935	0	**3872**
SPAIN	0	0	782	13996	166	0	6157	0	53786	145071	104163	171439	388535	249656	355733	**1489484**

Appendix 2

Japanese imports by weight of fresh bluefin tuna by region, 1976-1990 (kg)

	Year 1976	Year 1977	Year 1978	Year 1979	Year 1980	Year 1981	Year 1982	Year 1983	Year 1984	Year 1985	Year 1986	Year 1987	Year 1988	Year 1989	Year 1990	Country subtotal
TUNISIA	0	0	0	0	0	0	0	0	0	0	0	0	95189	224701	356650	**676540**
TURKEY	0	0	0	0	0	0	0	0	728	98728	668920	243375	103759	156219	140128	**1411857**
UNITED KINGDOM	0	0	0	0	0	0	0	0	4710	0	0	0	2190	521	4142	**11563**
subtotal for EASTERN ATLANTIC	**6171**	**2039**	**8998**	**23645**	**3056**	**0**	**7692**	**3336**	**59224**	**251974**	**848365**	**496545**	**720812**	**892050**	**1206395**	**4530302**

Appendix 2

Japanese imports by weight of fresh bluefin tuna by region, 1976-1990 (kg)

	Year 1976	Year 1977	Year 1978	Year 1979	Year 1980	Year 1981	Year 1982	Year 1983	Year 1984	Year 1985	Year 1986	Year 1987	Year 1988	Year 1989	Year 1990	Country subtotal
						PACIFIC										
AUSTRALIA	0	0	0	12389	10370	0	10067	5713	7878	4491	263270	72576	458126	324841	344588	**1514309**
ECUADOR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1582	**1582**
GUAM	0	0	0	531	0	0	0	0	0	0	0	0	370	1110	1110	**3121**
HONG KONG	0	0	0	0	0	134	0	0	0	0	0	0	0	294	0	**428**
INDONESIA	0	0	0	0	0	0	0	0	0	0	0	1370	5276	51454	45493	**103593**
M M CAR	0	0	0	0	0	0	0	0	0	0	0	0	204	0	0	**204**
MALAYSIA	0	0	0	0	0	0	0	0	0	0	0	0	0	470	0	**470**
NEW ZEALAND	0	0	0	6829	64920	4383	381	1921	20831	23917	1602	0	170	452	6447	**131853**
OMAN	0	0	0	0	0	0	0	0	0	0	0	0	0	270	0	**270**
PALAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4200	**4200**
PHILIPPINES	0	0	0	221	0	1769	0	0	0	0	435	0	0	0	0	**2425**
SINGAPORE	0	0	0	0	0	0	0	0	0	0	0	0	120	2410	256	**2786**
subtotal for PACIFIC	**0**	**0**	**0**	**19970**	**75290**	**6286**	**10448**	**7634**	**28709**	**28408**	**265307**	**73946**	**464266**	**381301**	**403676**	**1765241**

Appendix 2

Japanese imports by weight of fresh bluefin tuna by region, 1976-1990 (kg)

	Year 1976	Year 1977	Year 1978	Year 1979	Year 1980	Year 1981	Year 1982	Year 1983	Year 1984	Year 1985	Year 1986	Year 1987	Year 1988	Year 1989	Year 1990	Country subtotal
						PACIFIC & ATLANTIC										
KOREA	150	0	0	1014	27203	29685	31104	12911	3972	738	343568	89267	32489	71292	132109	**775502**
SOUTH AFRICA	0	0	0	0	0	0	0	0	0	0	0	571	0	0	0	**571**
TAIWAN	3323	3025	659	6390	4352	64837	132390	117826	170357	53547	78267	79863	51858	65534	112042	**944270**
subtotal for PACIFIC & ATLANTIC	**3473**	**3025**	**659**	**7404**	**31555**	**94522**	**163494**	**130737**	**174329**	**54285**	**421835**	**169701**	**84347**	**136826**	**244151**	**1720343**

Appendix 2

Japanese imports by weight of fresh bluefin tuna by region, 1976-1990 (kg)

	Year 1976	Year 1977	Year 1978	Year 1979	Year 1980	Year 1981	Year 1982	Year 1983	Year 1984	Year 1985	Year 1986	Year 1987	Year 1988	Year 1989	Year 1990	Country subtotal
							PACIFIC & WESTERN ATLANTIC									
MEXICO	3284	0	0	0	0	0	0	0	0	0	0	0	0	1387	18904	**23575**
UNITED STATES	242645	535366	557388	769751	402221	255696	141129	502709	530890	549040	588918	939213	855671	889406	814968	**8575011**
subtotal for PACIFIC & WESTERN ATLANTIC	**245929**	**535366**	**557388**	**769751**	**402221**	**255696**	**141129**	**502709**	**530890**	**549040**	**588918**	**939213**	**855671**	**890793**	**833872**	**8598586**

Appendix 2

Japanese imports by weight of fresh bluefin tuna by region, 1976-1990 (kg)

	Year 1976	Year 1977	Year 1978	Year 1979	Year 1980	Year 1981	Year 1982	Year 1983	Year 1984	Year 1985	Year 1986	Year 1987	Year 1988	Year 1989	Year 1990	Country subtotal
WESTERN ATLANTIC																
BRAZIL	0	0	0	0	0	0	0	0	0	0	0	0	242	0	0	**242**
CANADA	353167	458632	329563	187059	190019	176595	180583	288867	163809	77876	25134	43313	302548	453689	310144	**3540998**
PUERTO RICO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	324	**324**
subtotal for WESTERN ATLANTIC	**353167**	**458632**	**329563**	**187059**	**190019**	**176595**	**180583**	**288867**	**163809**	**77876**	**25134**	**43313**	**302790**	**453689**	**310468**	**3541564**
TOTALS	**608740**	**999062**	**896608**	**1007829**	**702141**	**533099**	**503346**	**933283**	**956961**	**961583**	**2149839**	**1723065**	**2428024**	**2759121**	**2998636**	**20161337**

Appendix 3

Japanese imports by weight of frozen bluefin tuna by region, 1976-1990 (kg)

	Year 1976	Year 1977	Year 1978	Year 1979	Year 1980	Year 1981	Year 1982	Year 1983	Year 1984	Year 1985	Year 1986	Year 1987	Year 1988	Year 1989	Year 1990	Country subtotal
					ATLANTIC											
PORTUGAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74506	**74506**
VENEZUELA	0	0	0	0	0	0	0	0	0	0	0	46965	120886	19337	29507	**216695**
subtotal for ATLANTIC	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**46965**	**120886**	**19337**	**104013**	**291201**

Appendix 3

Japanese imports by weight of frozen bluefin tuna by region, 1976-1990 (kg)

	Year 1976	Year 1977	Year 1978	Year 1979	Year 1980	Year 1981	Year 1982	Year 1983	Year 1984	Year 1985	Year 1986	Year 1987	Year 1988	Year 1989	Year 1990	Country subtotal
							EASTERN ATLANTIC									
FRANCE	0	0	93702	0	0	0	0	0	16668	167280	0	0	0	0	0	**277650**
GHANA	0	0	0	0	0	0	0	0	0	0	0	0	53008	0	0	**53008**
GREECE	0	0	0	0	0	0	0	0	0	0	910	0	0	0	0	**910**
ITALY	6460	24870	96440	6060	0	45440	40575	252701	922	25632	24610	13540	5550	954	2512	**546266**
MOROCCO	0	0	0	0	0	0	0	0	0	0	0	6340	6128	631	7109	**20208**
NORWAY	0	19130	17420	8970	0	0	0	0	0	0	0	0	0	0	0	**45520**
SPAIN	0	0	0	186240	218072	147270	36933	228744	97217	53865	49766	95336	773313	378415	338037	**2603208**
TUNISIA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25233	**25233**
TURKEY	0	0	0	0	0	0	0	142159	126440	0	0	6037	0	116343	0	**390979**
subtotal for EASTERN ATLANTIC	**6460**	**44000**	**207562**	**201270**	**218072**	**192710**	**77508**	**623604**	**241247**	**246777**	**75286**	**121253**	**837999**	**496343**	**372891**	**3962982**

Appendix 3

Japanese imports by weight of frozen bluefin tuna by region, 1976-1990 (kg)

	Year 1976	Year 1977	Year 1978	Year 1979	Year 1980	Year 1981	Year 1982	Year 1983	Year 1984	Year 1985	Year 1986	Year 1987	Year 1988	Year 1989	Year 1990	Country subtotal
						PACIFIC										
AUSTRALIA	0	52800	99960	0	17270	40620	68300	1964490	2420036	3352321	2497080	2798463	1702634	2084601	2443699	**19542274**
CHINA	0	9302	0	0	0	0	0	0	0	0	0	0	0	1213	0	**10515**
FRENCH OCEANIA	0	0	0	0	0	0	0	0	0	0	0	0	0	7265	8923	**16188**
INDONESIA	10268	3643	5405	4186	4444	1270	1467	4075	9133	2719	6118	11105	7275	38982	9618	**119708**
KOREA, N	0	0	0	0	4200	0	0	0	0	0	0	0	0	0	0	**4200**
MALDIVES	0	0	0	463	0	0	0	0	0	0	0	0	0	0	0	**463**
NEW ZEALAND	0	0	0	0	5100	169028	251649	116019	92058	84927	73682	52891	83538	121562	248637	**1299091**
PHILIPPINES	0	0	0	0	0	0	0	9990	0	0	0	0	0	0	0	**9990**
SINGAPORE	0	0	0	3559	6233	12291	7453	6192	2562	1948	2680	2149	0	379	0	**45446**
SOLOMONS	0	0	0	0	0	0	186	0	0	0	0	0	0	0	0	**186**
subtotal for PACIFIC	**10268**	**65745**	**105365**	**8208**	**37247**	**223209**	**329055**	**2100766**	**2523789**	**3441915**	**2579560**	**2864608**	**1793447**	**2254002**	**2710877**	**21048061**

Appendix 3

Japanese imports by weight of frozen bluefin tuna by region, 1976-1990 (kg)

	Year 1976	Year 1977	Year 1978	Year 1979	Year 1980	Year 1981	Year 1982	Year 1983	Year 1984	Year 1985	Year 1986	Year 1987	Year 1988	Year 1989	Year 1990	Country subtotal
							PACIFIC & ATLANTIC									
HONDURAS	0	0	0	0	0	0	0	0	0	0	9810	98422	322523	282402	18012	**731169**
KOREA	18311	5601	5854	3450	5317	4448	789	0	16302	62663	134433	1155	10643	38558	17108	**324632**
PANAMA	0	0	0	0	273	0	647	0	0	0	0	65779	57415	0	12240	**136354**
SOUTH AFRICA	0	0	0	0	0	0	0	0	0	0	0	3366	1853	86081	3492	**94792**
TAIWAN	53060	67664	190477	127756	78412	98940	137578	102241	211443	100313	61134	146348	243420	889475	714497	**3222758**
URUGUAY	0	0	0	0	0	1641	280	11525	12680	20007	5093	3078	3409	2316	971	**61000**
subtotal for PACIFIC & ATLANTIC	**71371**	**73265**	**196331**	**131206**	**84002**	**105029**	**139294**	**113766**	**240425**	**182983**	**210470**	**318148**	**639263**	**1298832**	**766320**	**4570705**

Appendix 3

Japanese imports by weight of frozen bluefin tuna by region, 1976-1990 (kg)

	Year 1976	Year 1977	Year 1978	Year 1979	Year 1980	Year 1981	Year 1982	Year 1983	Year 1984	Year 1985	Year 1986	Year 1987	Year 1988	Year 1989	Year 1990	Country subtotal
						PACIFIC & WESTERN ATLANTIC										
ARGENTINA	0	0	0	0	0	0	0	0	0	5205	892	0	3306	350	1790	**11543**
MEXICO	0	0	0	0	0	0	0	0	0	0	0	0	0	11202	0	**11202**
UNITED STATES	3023	23034	0	0	0	107690	0	83040	263270	0	229502	26894	14787	5533	0	**756773**
subtotal for PACIFIC & WESTERN ATLANTIC	**3023**	**23034**	**0**	**0**	**0**	**107690**	**0**	**83040**	**263270**	**5205**	**230394**	**26894**	**18093**	**17085**	**1790**	**779518**

Appendix 3

Japanese imports by weight of frozen bluefin tuna by region, 1976-1990 (kg)

	Year 1976	Year 1977	Year 1978	Year 1979	Year 1980	Year 1981	Year 1982	Year 1983	Year 1984	Year 1985	Year 1986	Year 1987	Year 1988	Year 1989	Year 1990	Country subtotal
							WESTERN ATLANTIC									
ANTILLES	3006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3006
ANTILLES, N	0	0	0	0	867	0	0	1034	0	0	0	0	0	0	0	1901
BRAZIL	0	0	4259	17860	0	0	0	0	0	0	0	0	0	0	0	22119
CANADA	6553	0	0	0	0	0	0	0	0	0	0	0	0	0	1428	7981
CUBA	0	3731	0	0	0	0	0	0	0	0	0	0	0	0	0	3731
subtotal for WESTERN ATLANTIC	9559	3731	4259	17860	867	0	0	1034	0	0	0	0	0	0	1428	38738
TOTALS	100681	209775	513517	358544	340188	628638	545857	2922210	3268731	3876880	3095710	3377868	3409688	4085599	3957319	30691205

Appendix 4

Japanese imports by weight of other bluefin tuna by region, 1988-1990 (kg)

	Year 1988	Year 1989	Year 1990	Country subtotal
		ATLANTIC		
VENEZUELA	0	5970	0	5970
subtotal for ATLANTIC	**0**	**5970**	**0**	**5970**

Appendix 4

Japanese imports by weight of other bluefin tuna by region, 1988-1990 (kg)

	Year 1988	Year 1989	Year 1990	Country subtotal
		EASTERN ATLANTIC		
MOROCCO	154470	6623	26429	**187522**
SPAIN	238787	60397	115022	**414206**
subtotal for EASTERN ATLANTIC	**393257**	**67020**	**141451**	**601728**
TOTALS	**393257**	**72990**	**141451**	**607698**

Appendix 5a

Japanese exports of bluefin tuna, 1970—1985

Destination		Weight, kg 1970	1971	1972	1973	1974	1975	1976	1977
France	FF	—	—	—	—	—	9 817	n/a	n/a
Guam	FF	—	—	—	—	33	1 026	n/a	n/a
Hong Kong	FF	—	—	155	69	2 704	3 574	n/a	n/a
	F	n/a	n/a	n/a	n/a	n/a	n/a	35	—
Italy	FF	22 000	—	—	—	—	—	n/a	n/a
Puerto Rico	FF	—	—	24 960	—	—	—	n/a	n/a
Singapore	FF	—	—	178	—	569	1 002	165	n/a
South Africa	Fr	n/a	n/a	n/a	n/a	n/a	n/a	—	14 491
Thailand	FF	180	—	171	60	199	447	n/a	n/a
UK	FF	226	226	—	—	—	—	n/a	
		n/a							
Total		22 406	226	25 286	297	3 505	9 817	200	14 491

Appendix 5b

Japanese exports of bluefin tuna, 1978-1985

Weight, kg

Destination		1978	1979	1980	1981	1982	1983	1984	1985
Canada	Frz	—	—	47 919	—	—	—	—	—
France	Frz	—	—	—	—	—	—	—	—
Guam	Frz	—	—	—	—	—	—	—	—
Hong Kong	Frz	—	—	11	36	227	—	—	—
Italy	Frz	—	—	—	—	—	—	—	—
Korea, North	Frz	—	—	—	—	—	120	—	—
Korea, Rep.	Frz	—	—	—	—	—	—	200	—
Malaysia	Frz	—	—	—	—	—	—	20	100
The Netherlands	Frz	—	—	—	103	—	—	—	—
New Zealand	Fr	—	—	10 148	—	—	—	—	—
Puerto Rico	Frz	—	—	—	—	—	—	—	—
Saudi Arabia	Frz	—	—	—	—	120	180	—	—
Singapore	Frz	60	—	—	—	150	—	20	82
South Africa	Frz	—	—	—	—	—	—	—	—
Thailand	Frz	—	—	—	—	—	—	—	—
UK	Frz	—	—	—	—	—	—	—	—
USA	Fr	—	—	—	900	—	—	—	—
	Frz	—	34	496	15	—	—	—	—
Total	Frz	60	34	48 426	103	18 843	300	240	182
	Fr	—	—	10 148	900	—	—	—	—
	All	60	34	58 574	1 103	18 843	300	240	182

FF = fresh/frozen Fr = fresh Frz = frozen.

Source: Japanese Customs statistics.

Appendix 6a

US exports of bluefin tuna, 1989–1992*

Country of destination	Category	Weight, kg 1989	1990	1991	1992	Total
Argentina	Frz	—	10 935	—	—	10 935
Canada	Fr	5207	—	—	—	5 207
	Frz	1752	—	—	—	1 752
France	Fr	—	—	1 410	—	1 410
	Frz	—	—	77 733	—	77 733
Germany, FR	Fr	525	—	—	—	525
	Frz	—	—	19 467	—	19 467
Italy	Frz	—	—	61 504	—	61 504
Japan	Fr	2 928 238	1 976 127	1 447 372	115 234	6 576 971
	Frz	120 626	20 934	72 211	—	213 771
Korea, R.	Fr	—	9 842	1 142	—	10 984
Mexico	Fr	3 137	—	3 409	—	6 546
	Frz	25 309	—	—	—	25 309
UK	Fr	5757	—	1 443	—	7 200
	Frz	—	—	26 321	—	20 321
Portugal	Fr	—	—	4 016	—	4 016
South Africa	Frz	—	—	14 084	—	14 084
Spain	Fr	—	22 776	2 746	—	25 522
Turkey	Frz	—	48 224	38 307	—	86 531
Total	Fr	2 942 864	2 008 745	1 571 538	115 234	6 638 381
	Frz	147 687	80 113	303 627	—	531 427

* Through February only.

Source: US Customs statistics compiled by TRAFFIC USA.

Appendix 6b

US imports of bluefin tuna, 1989–1992*1990

Country of destination	Category	Weight, kg 1989	1990	1991	1992	Total
Australia	Fr	—	8 495	—	—	8 495
Canada	Fr	258 540	135 390	166 171	—	560 401
	Frz	538	28 500	3 785	—	32 833
Denmark	Fr	360	—	—	—	360
Fiji	Fr	427	—	—	—	427
Ecuador	Fr	—	564	—	410	974
	Frz	—	—	1 528	—	1 528
Ghana	Frz	—	—	—	88 260	88 260
Greece	Fr	1 705	1 674	130	—	3 509
Indonesia	Fr	—	—	279	—	279
Italy	Fr	—	1 132	216	7 202	8 550
Japan	Fr	—	10	—	—	10
Korea, R.	Frz	146 818	—	33 615	18 900	199 333
Mexico	Fr	—	3 600	8 316	4 347	16 263
	Frz	2 863	—	—	—	2 863
Panama	Frz	—	—	—	5 799	5 799
Spain	Fr	1 878	1 787	—	—	3 665
	Frz	156	713	—	2 510	3 379
Taiwan	Fr	—	573	—	—	573
Tunisia	Fr	5 081	4 605	—	—	9 686
	Frz	—	113	—	199	399
UK	Fr	—	—	217	—	217
Venezuela	Fr	—	—	18 772	—	18 772
Total	Fr	267 991	147 830	194 101	4 347	614 269
	Frz	150 375	29 326	38 928	123 615	342 244

* Only January and February.

Source: US Customs statistics compiled by TRAFFIC USA.

Appendix 7

New Zealand exports of bluefin tuna, 1983–1991

Country of destination	Category	Weight, kg								
		1983	1984	1985	1986	1987	1988	1989	1990	1991
American Samoa	Frz	—	—	—	—	—	—	152 960	—	—
Australia	Fr	45	—	—	—	—	1 992	—	2 760	—
	Frz	—	—	—	2 372	—	—	—	—	—
Fiji	Frz	—	—	—	—	—	—	15 570	3 003	—
Japan	Fr	—	—	—	920	—	170	559	116 844	4 539
	Frz	262 590	112 644	86 308	84 626	75 888	49 943	—	—	763 508
Korea	Frz	—	—	—	—	—	—	—	—	2 059 492
PNG	Frz	10 000	—	—	—	—	—	—	—	—
Vanuatu	Frz	—	—	—	—	—	—	1 500	—	—
USA	Frz	60	—	—	—	26	—	—	—	—

Note: New Zealand changed its commodity codes and descriptions a number of times during this period.

Fr = 1983–1987 fillets only; 1988–1989 excluding fillets, livers, roes and other fish meat; 1989–1991 whole fish excluding fillets, livers, roes and other meat

Frz = 1983–1987 frozen; 1988–1989: two categories — fillets only or excluding fillets, livers, roes and other meat; 1989–1991: two categories — fillets only or headed and gutted fish excluding fillets, livers, roes and other meat.

Source: New Zealand Customs statistics.

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For further information contact:

The Director
TRAFFIC International
219c Huntingdon Road
Cambridge
CB3 0DL
United Kingdom
Telephone: (0223) 277427
Fax: (0223) 277237

The Director
TRAFFIC USA
1250 24th Street, NW
Washington DC 20037
USA
Telephone: (1) 202 293 4800
Fax: (1) 202 775 8287
Telex: 23 64505 panda