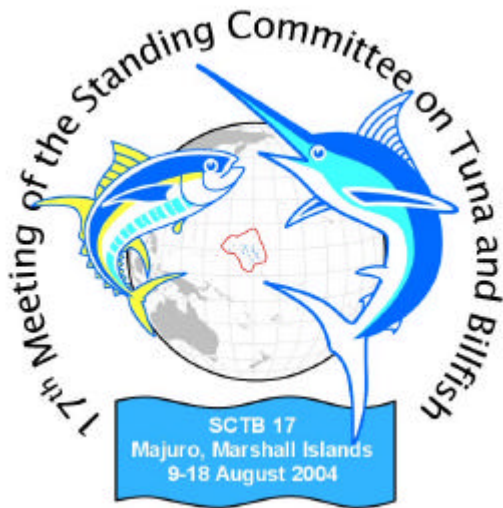


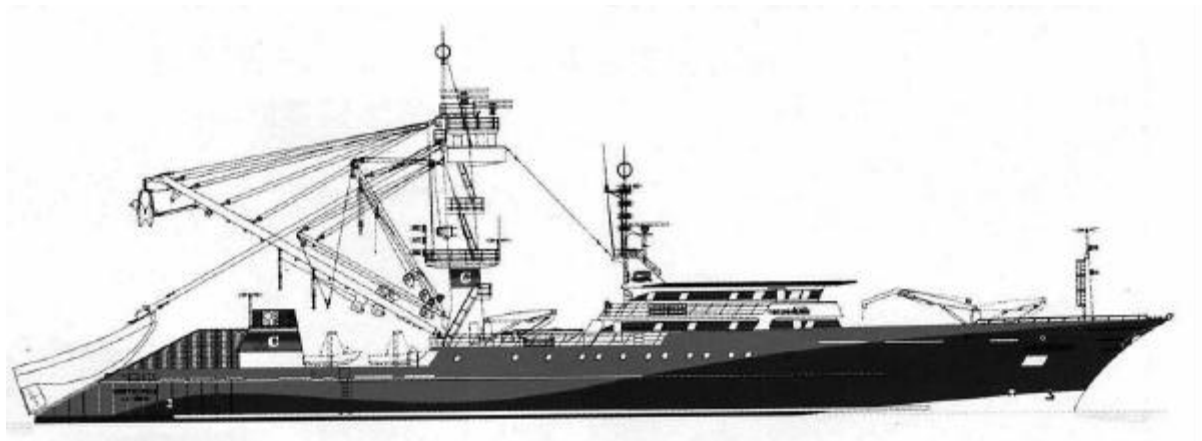
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**ABSTRACT FROM
“REVIEW OF LONGLINE FLEET CAPACITY OF THE WORLD”**

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Review of longline fleet capacity of the world
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EXECUTIVE SUMMARY

This paper estimates the fleet size of the large-scale tuna longline fleet in the world in terms of tuna resources available for the fleet.

The large-scale longliners were defined as those equipped with freezers and fishing for "sashimi" market fish.

Positive lists developed by various Regional Tuna Management Organizations were used to make basic estimates of fleet size.

All the longliners targeting tunas over 200 GRT or about 35 meters in overall length were considered as large-scale longliners.

Duplication of boats among oceans were eliminated to estimate the total number of vessels of entire world fleet.

The Japanese longliner logbook was used to estimate the number of Japanese longliners actively engaged in fishing in three oceans and compared with the official list of licensed longliners. It is obvious that boats frequently fish in more than one ocean in a year and that not all the longliners licensed for one ocean fish in that ocean.

The activities of IUU vessels and the work by Organization for the Promotion of Responsible Tuna Fisheries(OPRT) was reviewed, and the fleet size publicized by the OPRT was used for its members, instead of number of vessels estimated by the Positive Lists. Besides, adding 30 IUU vessels, assumed still in existence, the total large-scale longliners was estimated as 1622.

The current (2001) catches of tunas of commercially important species by large-scale longliners were roughly estimated from the catch data as approximately 400,000 MT. Therefore the average catch per boat per year is 240 MT, which is close to the current economical breaking point (for profit). It appears that almost all the tuna stocks in the world are now harvested at or close to the MSY points, if not in excess. If the fishing patterns and fishing behavior of longliners remain as present, any increase in longline fishing capacity would have a negative impact on tuna stocks. On the other hand, the same level of catches can most likely be made even with a smaller fleet size. A reduction of the fishing fleet size would improve the fisheries competitiveness against other fisheries if other fisheries would take similar actions.

Some elements which may effect on this situation are considered as follows:

- ☞ Species compositions of its catches.
- ☞ Competition with other fishing gears.
- ☞ Competition with small longliners.

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LIST OF ACRONYMS AND CODES

ATL	Atlantic Ocean
FAD	Fish Aggregating Device
FOC	Flag of Convenience
GRT	Gross tons
IATTC	Inter-American Tropical Tuna Commission
ICCAT	International Commission for the Conservation of Atlantic Tunas
IND	Indian Ocean
IOTC	Indian Ocean Tuna Commission
IUU	Illegal, Unreported and Unregulated
MSY	Maximum Sustainable Yield
MT	Metric Tons
LOA	Overall length (of a vessel)
OPRT	Organization for the Promotion of Responsible Tuna Fisheries
PAC	Pacific Ocean
RTMO	Regional Tuna Management Organization
SPC	Secretariat for Pacific Community
TPC	Taiwan Province of China
WCPFC	Western and Central Pacific Fisheries Convention

Gear Codes

LL	Longline
PS	Purse seine

Species Codes

ALB	Albacore (<i>Thunnus alalunga</i>)
BET	Bigeye tuna (<i>Thunnus obesus</i>)
BFT	Bluefin tuna (<i>Thunnus thynnus</i>)
PBF	Pacific bluefin tuna (<i>Thunnus orientalis</i>)
SWO	Swordfish (<i>Xiphius gladius</i>)
YFT	Yellowfin tuna (<i>Thunnus albacares</i>)

1. INTRODUCTION

This paper intends to review the current fishing capacity of large-scale tuna longline fleet in the world. However, in order to achieve this objective, there are several difficulties. Those are as follows:

- ✂✂ The definition of large-scale longline is not very clear,
- ✂✂ Data were not provided by most of the governments of flags
- ✂✂ Among the lists from various sources, there is much duplication of boats.
- ✂✂ Many vessels changed names, particularly when the registration changed
- ✂✂ Registered vessels are not necessarily operational.
- ✂✂ Many small sized vessels are multi-purpose fishing vessels.
- ✂✂ Specifications (particularly size and registration numbers) of the vessels are not always available.

Finally, large-scale longliners are defined as longliners with freezing facilities, that are licensed to fish in distant-waters and which primarily targets on "sashimi" market species.

2 LONGLINE FLEET IN THE WORLD

2.1 Distribution of fisheries and size of fishing vessels

The longline fishery has been developed all over the world for tuna and tuna-like fishes. The fleet has consisted of various sized vessels, from canoe to over 1000 gross ton mother boats. Roughly two categories, i.e. large-scale and small-scale longline, were defined, and the small-scale longline was further sub-divided into three groups.

*Small-scale longliners*¹

- Artisanal longliners.
- Near-shore longliners.
- Off-coast longliners.

Large-scale longliners

These vessels are equipped with freezer, (often super-freezer of the temperature of less than 45° C). Generally the boat size is over 200 GRT. However, since the positive list system (see Section 2.4) is adopted, some boats are being constructed with less than 24 meters in LOA, while all the rest satisfy the definition of large-scale longliners. A trip lasts from a several weeks to over a year.

Most of the vessels of this type that are targeting tunas are owned by interests in Japan, China, Korea, TPC and less in the Philippines. The IUU vessels and those of flag of convenience (FOC) also belong to this category.

There are also vessels which target swordfish. These longliners does not have to have super freezer and many of them have ice well even over 200 GRT. The problem is that all the vessels can not be classified simply into one of these categories using the above criteria.

¹ TAC later agreed upon and recommended a new definition of longline classifications. Artisanal longliners correspond to Small-scale, and the remaining small-scale longliners defined in this report correspond to the Medium-class longliners. The TAC definition of large-scale longline is very similar to the large-scale longline in this report except the TAC definition removed the limitation in vessel size, and hence some small longliners in this report may be included in the large-scale longliners in the TAC classifications.

2.2 Criteria for classifying fishing vessel size

In this study, the fleet statistics are basically composed from lists of registered vessels (see Section 3.1). Most of such lists do not contain ‘the target species’, ‘availability of freezing facilities’, etc. In order to single out the large-scale tuna longliners, a single criterium would be most useful. The parameters which are available for most of the longliners are registered gross tons (GRT), but sometimes only overall length (LOA). Considering all the complex elements, the following criteria were adopted to separate out the large-scale longliners:

- ✂✂ The vessels of 200 GRT or larger
- ✂✂ When the GRT is not available, vessels of 35 meters LOA or greater
- ✂✂ Other circumstantial evidence was also used (e.g. Asian home-based longline vessels fishing in the Atlantic were considered as large-scale longliners)
- ✂✂ Some flexibility was adopted in the final decision.

2.3 Regulations of fishing fleets

The management of fishing fleet size has been most advanced in large-scale longliners. When Japan started licensing system for tuna longliners in late 1940s, already limited entry system (limit of the licensing total GRT) was established. During the development period of tuna fisheries the total allowable GRT was increased until 1970s. Thereafter, no increase has been allowed and for the first time, a reduction in total licensed GRT was introduced in 1982. Further it was reduced in 1999, following the objective of the FAO International Plan of Action for Fishing Capacity.

The Japanese type licensing system with limited entries and a restriction on total GRT, has been adopted by many other countries with large-scale longliners, e.g. Korea, TPC, Philippines, and China. There were many countries, on the contrary, which issued, in past, the licenses without any restrictions (e.g. Panama, Honduras, Belize, Vanuatu, and Cambodia).

2.4 FOC and IUU fleets and international measures.

Tuna longliners registered at a country of open registry has been called “flag of convenience” (FOC). Such fleet existed already in 1960s, mostly operated by owners of Asian tuna longliners. In late 1980s, when fishery regulatory measures such as catch quota were adopted by various Regional Tuna Management Organization (RTMO), FOC changed its characteristics. Those vessels changed the flag to a non-contracting country of the RTMO in order not to be applied the regulations.

Since 2002, ICCAT adopted a new policy to list legal vessels (positive list), instead of IUU vessels (negative list). This system of positive list of longliners was also adopted by IOTC for the Indian Ocean and by IATTC for the eastern Pacific. The Contracting Parties are responsible to provide a list of legal vessels 24 meters or more LOA, that are licensed for fishing in the respective Ocean. The lists were made available for the public in summer, 2003.

2.5 Activities of OPRT

Following the objective of IPOA for fishing capacity, Japan started reducing the longline fleet size. At the same time, with concern of IUU fleet, Japanese industry created a non-governmental organization, “Organization for the Promotion of Responsible Tuna Fisheries” (OPRT), consisted of the membership of tuna producers, marketing and consumers groups. Initial objective of the OPRT was to call back IUU vessels to the countries of owners, legalize them (i.e. fishing under the legal license, observing the regulatory measures and report catches), or otherwise scrap them with some government and/or industry compensation. The number of large-scale longliners owned by the members of OPRT is given in the **Table 1**.

Table 1. Number of large-scale tuna longliners of the members of OPRT, 2001-2003.

Countries	Groups	2001	2002	2003
Japan	Japan Tuna	432	428	420
	Distant waters	34	34	39
	Near coast waters	28	28	25
	Subtotal	494	490	484
TPC		567	562	610
Korea			183	170
Philippines			6	17
Indonesia				14
China		98	100	105
Vanuatu				48
Seychelles				21
Ecuador				5
Total		1159	1341	1474

(As of the end of 2003)

3 CURRENT FLEET SIZE

3.1 Data source

In this study, the positive lists were used to make a basic estimate of fleet size.

Pacific

☞ IATTC vessel list as of Oct. 2003 for the eastern Pacific.

☞ FFA(Foreign Fisheries Agency) list of vessels (non-public) licensed to fish in the FFA waters.

☞ Japanese Government list of Registered longliners in the west-central Pacific

Indian Ocean

☞ IOTC positive list as of Sept. 2003

☞ List of Registered longliners of TPC by Japanese Government

Atlantic Ocean

☞ ICCAT positive list as of Sept. 2003

3.2 Data processing

All the above vessel lists were combined together, and it was tried to eliminate duplicated entries. Duplications are mostly between oceans, since license had been often given to a vessel for more than one ocean.

Table 2. Summary of number of vessels licensed to various oceans (as of Sept. 2003), for tuna longliners reported to be larger than 24 meters in LOA, by fleets. (duplicate means the number of vessels counted twice among the oceans. For criteria of large-scale and small longliners, see Section 2.2.)

	SMALL					LARGE VESSELS				
	Ind	Atlantic	Pacific	Duplicate	TOTAL	Ind	Atlantic	Pacific	Duplicate	TOTAL
Australia	14				14	14	0	2		16
Belize						0	1	20	2	19
Bolivia						1	0	0	0	1
Brazil	11				11					
Cambodia					0	0	0	3		3
Canada		5			5					
China	72	0	149		221	21	60	78	39	120
Cook			2		2					
Frnce	3		14		17					
Ireland		8			8					
Portugal		32			32	12	12	0	6	18
Spain	75	351	73	142	357	57	43	54	80	74
Ecuador			6	0	6			20	0	20
Micronesia					4					
Fiji			37		37					
Georgia								1		1
Honduras							4		0	4
Iceland							1		0	1
Indonesia	722	1	0	1	722	17	0	1	0	18
Iran						1			0	1
Japan	83	35	171	94	195	477	482	480	951	488
Korea						175	1	176	163	189
Madagascar		1			1					
Mexico			6	0	6			3	0	3
Namibia							1		0	1
New			3		3					
Panama	0	10	38	1	47	0	2	15	0	17
Peru								1	0	1
Philippines						39	8	2	9	40
Seychelles	9	2	4	1	14					
South		7			7		10		0	10
St Vincent		5			5		3			3
TPC	0	0	14	3	11	173	163	164	50	450
Thailand						2				2
USA	0	162	28	2	188	0	18	0	0	18
Uruguay		1			1		6			6
Vanuatu		1			1			48		48
Venezuela		13			13		18			18
TOTAL	989	634	545	244	1924	989	833	1068	1300	1590
SWO LL	75	483	87	142	503	69	69	54	86	106
TUNA LL	914	151	458	102	1421	920	764	1014	1214	1484

When gear description is not available for a vessel in the list, some sophisticated guess work was done. After selection of longlines and eliminations of duplicated records, a trial was made to separate large-scale longliners, adopting the criteria as defined in Section 2.2.

The large-scale longliners were further classified into tuna and swordfish longliners. Only those vessels which target on swordfish most of the time are included in the swordfish longliners, mostly by Spain and U.S.A.

3.3 Current fleet size estimated from the Positive Lists

Table 2 summarizes the results of the above processing, by fleets and oceans. Small boats signify those included in the lists (i.e. over 24 meters in total length but less than 35 meters) and yet classified to the class category less than the criteria adopted for large-scale vessels. Also it should be noted that IUU vessels, estimated about 30, are not included in this table.

3.4 Licensed vessels vs. active vessels

As explained in the earlier Sections, the estimated fleet size is based on the number of licensed longliners. However, not all these vessels engaged in actively fishing. The numbers of the Japanese active offshore vessels for each ocean are compared with the total number of Japanese large-scale vessels estimated by positive lists in **Table 3**.

Table 3. Comparison of Japanese large-scale tuna longliners in the positive lists and actively fishing offshore longliners extracted from the logbooks (for 2001).

	Indian	Atlantic	Pacific	Duplicate	TOTAL
Positive lists	477	482	480	951	488
Actively fishing	195	185	178	240	503

There are 39 of government's training vessels, and hence the total active longliners were 542 (see earlier paragraph). However, the government's vessels do not require commercial fishing license.

4 ESTIMATES OF FISHING FLEET SIZE

4.1 Estimates of total large-scale longliners

Unfortunately, there is only fragmental information to estimate large-scale longline fleet size for the past years. Also it became clear that estimation of number of actively fishing vessels is impossible at present and that there are many longliners fishing in more than one ocean. Therefore, the estimate was made for the entire world longline fleet, regardless the ocean, and as current as possible.

Table 4 Comparison of fleet size of large-scale tuna longliners by sources.

Countries	OPRT report (End of 2003)	Positive lists (Sept, 2003)	Active vessels (2001)
Japan	484	488	503
TPC	610	450	
Korea	170	189	
Philippines	17	40	
Indonesia	14	18	
China	105	120	
Vanuatu	48	48	
Seychelles	21	0	
Ecuador	5	20	
Others	0	111	
Total	1474	1484	

In **Table 4**, numbers of large-scale tuna longliners estimated from the positive lists (Sect. 3.3) are compared with OPRT data (Sect. 2.5), for those countries for which data are available from both sources. For Japan, the number of active vessels estimated from the logbook is also compared.

In summary, total of 1484 large-scale tuna longliners was estimated based on the positive lists. Considering that the OPRT data are more recent and include previous IUU vessels, and that the positive list does not exist for west-central Pacific Ocean, it is most likely that this represents under-estimate. For this reason, this estimate (1484) was modified using the data from OPRT for those fleets for which the data are available (+101). Besides, the estimate of the current IUU vessels, i.e. 30 vessels, is added. This modification would come up to that the total number of large-scale longliners is 1615.

4.2 Current catch by large-scale longliners

Total longline catches (in metric tons, MT) of bluefin, Pacific bluefin, southern bluefin, bigeye, albacore and yellowfin tunas (Miyake, in press) were reviewed for the species, area and country. The catches were separated into large-scale, small-scale longliners, and by-catch of swordfish longliners, using the general knowledge on longline fisheries. Since the catches by small-scale longliners are often reported as by unclassified gears (artisanal), and since the size of small-scale longline fleet is not known, it was very difficult to split the catches. Therefore, the results should be considered as a rough estimation.

The results show that for 2001, approximately 390,000 MT of tunas of these species were caught by large-scale longliners, and 200,000 MT were caught by other longliners (small scale and/or longliners targeting swordfish).

5 CONCLUSIONS

In **Table 5**, the longline fleet size is compared with the estimated tuna catches, by small-scale vessels and large-scale longliners.

Table 5. Estimated fleet size and catches for small-scale and large-scale longliners, by ocean. The number of small boats includes only those over 24 meters and hence very incomplete (as of Sept. 2003).

		No. vessels	Est'd catch (MT)	Catch/vessels
Small vessels (not complet)	Indian	914	54673	59.8
	Atlantic	151	29260	193.8
	Pacific	458	112244	245.1
	Duplicate	102		
	TOTAL	1421	196177	138.1
Large-scale Longliners	Ind	920	90620	98.5
	Atlantic	764	108028	141.4
	Pacific	1014	190603	188.0
	Duplicate	1214		
	TOTAL	1484	389251	262.3
	Est'd total	1622	389251	240.0

The small-scale longliners must be considered only as reference, since all the small longliners less than 24 meters are missing from the Table, and since the catches by unclassified gears which are not accounted for include longline. The part for large-scale longliners is valid.

The last row contains the best estimate for total number of large-scale longliners. The annual catch per vessel is 240 MT. Current economical breaking point of catch per boat is roughly 250 MT per year. It is difficult to consider that all the large-scale longliners are currently fishing to its full capacity, due to economical, social and management restrictions. If all these restrictions are removed, their potential catches, even at the current resource abundance levels, would be much greater than what they are producing.

The tuna resources which are available for large-scale longliners are also variable, since it is not the single gear fishery. Some of the major variable elements which effects on the available stocks, other than those of the natural fluctuations, are listed below:

- ☞ The status of resources
- ☞ Regulatory measures.
- ☞ Species compositions of its catches.
- ☞ Allocation among fishing gears.
- ☞ Competition with small-scale longliners.
- ☞ Recent rapid development of tuna farming changed market price structure completely and will be changing in future.
- ☞ Change in age compositions of catches.

This study is very preliminary. The data are not complete and can be improved. Also the past trends in fleet size must be studied to analyze the fleet capacity vs. stocks available. Significant improvement will be ensured by good collaboration with the government concerned.