Report on IOTC data collection and statistics

IOTC Secretariat

1. OVERVIEW

This document summarises the standing of a range of information received in accordance with IOTC resolutions and recommendations from its technical groups; in particular Resolution 01/05 *Mandatory statistical requirements for IOTC Members*. It covers the following major data categories (below) and briefly touches on data on bycatch and non IOTC species.

The document describes the progress achieved in relation to the collection and verification of data, identifies problem areas and proposes actions that could be undertaken to improve them. The progress achieved in relation to previous recommendations for the Scientific Committee is also reported.

A list of recommendations for the improvement in the standing of the data currently available at the secretariat is made for the consideration of the Scientific Committee (next page).

The report covers the following areas:

- Overview
- Recommendations to improve the data available to IOTC
- Availability of IOTC statistics for 2005 (timeliness and completeness of data)
- Status of the IOTC nominal catches (NC), catch and effort (CE) and size frequency (SF) databases (Progress and problem areas)
- Other IOTC data holdings: biological data
- Availability of statistics for the IOTC working parties (current standing of the data used by working parties)
- Progress achieved on the recommendations made by the scientific committee in 2005
- Catalogues of catch effort and size frequency statistics

Major data categories covered by the report

Nominal catches which are highly aggregated statistics for each species estimated per fleet, gear and year for a large area. If these data are not reported the Secretariat estimates a total catch from a range of sources (including: partial catch and effort data; data in the FAO FishStat database; catches estimated by the IOTC from data collected through port sampling; data published through web pages or other means; and data reported by other parties on the activity of vessels (IOTC Resolution 05/04) or on imports of bigeye tuna from vessels under the flag concerned (IOTC Resolution 01/06).

Catch and effort data which refer to the fine-scale data – usually from logbooks, and reported per fleet, year, gear, type of school, month, grid and species. Information on the use of fish aggregating devices (FADs) and supply vessels is also collected.

Length frequency data: individual body lengths of IOTC species per fleet, year, gear, type of school, quarter and 5 degrees square areas.

2. RECOMMENDATIONS TO IMPROVE THE DATA AVAILABLE TO IOTC

The following list of recommendations is provided by the Secretariat for the consideration of the Scientific Committee. The recommendations include actions which the Secretariat considers would lead to a marked improvement in the standing of the data currently available at the secretariat and ultimately the provision of scientific advice to the Commission. In general, these recommendations are made over and above the existing obligations and technical specifications relating to the reporting of data.

1. Improve the certainty of catch and effort data from artisanal fisheries, by:

- Encouraging Yemen, Comoros and Madagascar to implement fisheries statistical collection and reporting systems.
- Encouraging countries having artisanal fisheries, notably Indonesia and Sri Lanka, to collect and report species and gear information.
- Encouraging fisheries data collection agencies in each country, notably India and Sri Lanka, to collaborate and produce one unambiguous set of catch statistics.
- Encouraging members to increase sampling coverage to obtain acceptable levels of precision in their catch and effort statistics.

2. Improve the certainty of catch and effort data from industrial fisheries by:

- Reducing the amount of catches from non-reporting fleets by encouraging all member to uphold their obligations with respect to IUU vessels.
- Urging members to report on total discards of IOTC species.
- Urging members to report on IOTC species taken as bycatch.
- Encouraging members to increase log book coverage in order to produce acceptable levels of precision in their catch and effort statistics.
- Encouraging Indonesia and Taiwan,China to collect and report catch and effort data for their fresh tuna longliner fleets.

3. Increase the amount of size data available to the Secretariat:

- Encouraging members to collect and report size data for artisanal fisheries for yellowfin tuna taken by gillnet, handline and troll fisheries; in particular Yemen, Comoros and Indonesia.
- Encouraging India to report their existing size data.
- Encouraging Taiwan,China to provide size data from their fresh tuna longliners.
- Encouraging Philippines and Seychelles to provide size data from their longline fleets.
- Encouraging members to review their existing sampling schemes to ascertain that the data collected are representative of their fisheries.

4. To estimate the levels of catches of non-IOTC species by:

- Urging members to implementing appropriate sampling programmes to collect data on the catches of sharks, sea-birds, sea-turtles, sea-mammals in the first instance.

5. Reduce uncertainty in the following biological parameters important for the assessment of stock status of IOTC species:

- Conversion relationships: by urging members to develop length-age keys, length-weight keys, processed weight-live weight keys focusing on the major tuna species, swordfish and neritics and sharks in the first instance.
- Sex ratio: by urging members to undertake research on the sex ratios of billfish species.

3. AVAILABILITY OF IOTC STATISTICS FOR 2005

Tables 2i-2v (below) list the fleets for which the Secretariat received or estimated catches for the year 2005. The fleets are listed according to the size of their most recent catches. The standing of the catch, effort, size frequency and craft statistics information received is indicated using colours. Timeliness of reporting and data source are also shown. The availability and standing of statistics for tropical tunas (2i), temperate tunas (2ii), billfish (2iii) and neritic tunas (2iv) are presented separately. The availability of statistics on fishing crafts operating for each fleet is also presented in a separate table (2v). Brief comments on bycatch, discards and Fishing craft statistics and active vessels are made at the end of this section.

Timeliness and completeness of data

IOTC statistics were available for 21 countries before the deadline of June 30 (cf. 19 in 2005). Partial statistics were provided in most cases. Requests were sent to over fifty countries[1] in April-May 2006. Second and third requests were needed in most cases. The amount of data available before the deadline was considerably less than that in 2005.

Table 1 shows the extent to which 2005 catch data was available in the IOTC Nominal Catches (NC) database by the deadline for data submission (30 June) and before the Scientific Committee Meeting (October 2006). 40% of the catch was available by 30 June and 60% of the catch was available by October. The proportion of statistics available for 2004 is shown for comparison. Levels of reporting were lower in 2006, especially for catch and effort and size data.

Late reports compromise the validation, verification and utility of data, especially when data are submitted close to or during Working Party meetings.

Table 1. Proportion of the NC, CE and SF statistics available at the IOTC Secretariat compared to the total catches estimated for 2005 (as of 10th October 2006) and proportion of catches available from the flag country (SO) *versus* total catches so far available.

Statistics available for 2005	Estim. Catch	NC		CE		SF	
		BD	SC	BD	SC	BD	SC
IOTC species 1000t	1480	640	870	490	640	430	470
%Available for 2005		**43**	**58**	**33**	**43**	**29**	**32**
%Available for 2004		61	63	44	46	55	56
Tropical tunas 1000t	1100	560	765	450	590	420	460
Temperate tunas 1000t	**32**	**22**	**22**	**16**	**16**	**3**	**3**
Billfish 1000t	**60**	**25**	**27**	**12**	**13**	**6**	**7**
Neritic tunas 1000t	**290**	**30**	**55**	**17**	**17**	**0.5**	**0.5**

Estim. Catch: Total catches estimated
NC: Amount of catch available
CE: Amount of catch for which catches and effort are available
SF: Amount of catch for which size frequency data are available
SO: Amount of catch available from the flag countries
Available before the deadline for data submission (**BD**, 30th June) and at the time of the Scientific Committee Meeting (**SC**)

[1] Note that specific requests were sent to EC countries having vessels known to operate in the IOTC Area (France, Italy, Portugal, Spain and the UK)

Table 2: Availability of IOTC statistics for the year 2005

Key Tables 2i - 2iv

Gear	Industrial purse seine (**PS**), industrial longline (**LL**) and artisanal gears (**ART**)	**NC** Nominal Catch **CE** Catch and Effort **SF** Size Frequency	Fully available Partially available Not available
Catch	Recent catches amounting to (thousands of tonnes)		
TI Timeliness	Good (before 1st July) Fair (whithin July) Poor (after 1st August)	**SO** Data Source	Statistics fully available from flag country Statistics partially available from flag country Statistics fully available from countries other than flag country No statistics available at all

2i – Tropical tunas (YFT, BET, SKJ)

Gear	Fleet	Availability of statistics					TI	SO	Comments
		Catch	Sps	NC	CE	SF			
PS	EUROPEAN COMMUNITY	298.0	SY						Effort from supply vessels not available
	SEYCHELLES	87.3	SY						Effort from supply vessels not available
	IRAN I R	11.0	YS						
	THAILAND	11.9	SY						CE not available per 1 degree square grid
	JAPAN	4.1	SY						
	AUSTRALIA	0.0	S						CE not available for some grids (confidentiality)
	NEI	28.8	SY						The ex-Soviet fleet is using the Thai flag since October 2005
LL	CHINA	13.1	BY						SF data from observers (September-December 2005)
	TAIWAN,CHINA	107.9	YB						SF only available for some fresh-tuna longliners (IOTC/OFCF)
	JAPAN	27.1	YB						Preliminary catches (not raised)
	INDONESIA	22.7	Y						CE and SF not available per 5 degrees area
	SEYCHELLES	12.8	YB						SF not available for the industrial longline fleet
	KOREA REP	5.8	YB						SF not available per 5 degrees area
	PHILIPPINES	4.5	YB						CE not available per 5 degrees area
	MALAYSIA	2.9	Y						CE not available per 5 degrees area
	EUROPEAN COMMUNITY	1.7	BY						NC and CE not available for all EC flags
	IRAN I R	0.8	Y						
	BELIZE	0.3	YB						CE inconsistent (size of squares)
	OMAN	0.2	YB						
	SOUTH AFRICA	0.1	BY						
	THAILAND	0.1	BY						CE not available per 5 degrees area
	AUSTRALIA	0.1	YB						CE not available for some grids (confidentiality); SF not per area
	MAURITIUS	0.1	YB						
	KENYA	0.0	B						
	GUINEA	0.0	Y						CE not available per 5 degrees area and month
	FRANCE-TERRITORIES	0.0	Y						
	INDIA	0.0	Y						
	SENEGAL	0.0	Y						CE not available per 5 degrees area and month
	NEI-FROZEN[1]	6.1	YB						
	NEI-FRESH[2]	4.1	BY						Data partially available from IOTC/OFCF sampling schemes
Artisanal	MALDIVES	153.8	SY						CE not available per 5 degrees area
	IRAN I R	93.3	SY						
	SRI LANKA	81.3	SY						Data partially available from IOTC/OFCF sampling schemes
	INDONESIA	54.8	SY						
	YEMEN AR RP	31.3	Y						
	OMAN	16.0	Y						
	COMOROS	9.1	YS						
	PAKISTAN	6.3	SY						
	INDIA	5.9	SY						
	FRANCE-TERRITORIES	0.9	SY						
	TANZANIA	0.7	Y						
	EUROPEAN COMMUNITY	0.4	Y						
	MAURITIUS	0.1	Y						
	KENYA	0.1	Y						
	JORDAN	0.0	s						
	UK-TERRITORIES	0.0	Y						
	SEYCHELLES	0.0	Y						
	AUSTRALIA	0.0	S						CE not available for some grids (confidentiality)
	EAST TIMOR	0.0	Y						
	SOUTH AFRICA	0.0	Y						

Sps Yellowfin tuna (**Y**), bigeye tuna (**B**) and skipjack tuna (**S**)

1 Bolivia, Cambodia, Equatorial Guinea, Georgia, Iceland, Mongolia, Namibia, St. Vincent and the Grenadines and Togo

2 Indonesian vessels operating in countries other than Indonesia

2ii – Temperate tunas (ALB, SBF)

Gear	Fleet	Availability of statistics					TI	SO	Comments
		Catch	Sps	NC	CE	SF			
PS	AUSTRALIA	5.3	S						CE and SF not available for some grids (confidentiality)
PS	EUROPEAN COMMUNITY	0.1	A						Effort from supply vessels not available
PS	SEYCHELLES	0.0	A						Effort from supply vessels not available
PS	IRAN I R	0.0	A						
LL	CHINA	0.1	A						
LL	TAIWAN,CHINA	10.4	A						SF only available for some fresh-tuna longliners (IOTC/OFCF)
LL	JAPAN	9.1	SA						Preliminary catches (not raised)
LL	INDONESIA	4.6	AS						CE and SF not available per 5 degrees area
LL	EUROPEAN COMMUNITY	0.8	A						NC and CE not available for all EC flags
LL	BELIZE	0.7	A						CE inconsistent (size of squares)
LL	KOREA REP	0.2	A						
LL	THAILAND	0.1	A						CE not available per 5 degrees area
LL	SEYCHELLES	0.1	A						
LL	MAURITIUS	0.0	A						
LL	PHILIPPINES	0.0	A						CE not available per 5 degrees area
LL	MALAYSIA	0.0	A						CE not available per 5 degrees area
LL	AUSTRALIA	0.0	A						CE not available for some grids (confidentiality)
LL	SOUTH AFRICA	0.0	A						
LL	KENYA	0.0	A						
LL	OMAN	0.0	A						
LL	NEI-FROZEN[1]	0.6	A						
LL	NEI-FRESH[2]	0.2	A						Data partially available from IOTC/OFCF sampling schemes
ART	EUROPEAN COMMUNITY	0.1	A						
ART	AUSTRALIA	0.0	A						CE not available for some grids (confidentiality)
ART	FRANCE-TERRITORIES	0.0	A						

Sps Southern bluefin tuna (**S**) and albacore (**A**)
1 Bolivia, Cambodia, Equatorial Guinea, Georgia, Iceland, Namibia, St. Vincent and the Grenadines and Togo
2 Indonesian vessels operating in countries other than Indonesia

2iii – Billfish (SWO, MARL, SFA, SSP)

Gear	Fleet	Availability of statistics					TI	SO	Comments
		Catch	Sps	NC	CE	SF			
LL	CHINA	0.9	S						
LL	TAIWAN,CHINA	13.5	SM						SF only available for some fresh-tuna longliners (IOTC/OFCF)
LL	EUROPEAN COMMUNITY	7.2	S						NC, CE and SF not available for all EC flags
LL	INDONESIA	3.8	SM						CE and SF not available per 5 degrees area
LL	JAPAN	2.1	SM						Preliminary catches (not raised)
LL	SEYCHELLES	1.3	S						No SF for the industrial longline fleet
LL	GUINEA	0.8	S						CE not available per 5 degrees area and month
LL	MAURITIUS	0.7	S						
LL	KOREA REP	0.6	SM						SF not available per 5 degrees area
LL	MALAYSIA	0.4	SF						CE not available per 5 degrees area
LL	KENYA	0.3	S						
LL	AUSTRALIA	0.3	S						CE not available for some grids (confidentiality); SF not per area
LL	SOUTH AFRICA	0.2	S						
LL	SENEGAL	0.1	S						CE not available per 5 degrees area and month
LL	PHILIPPINES	0.1	S						CE not available per 5 degrees area
LL	BELIZE	0.1	S						CE inconsistent (size of squares)
LL	IRAN I R	0.1	S						
LL	THAILAND	0.0	MS						CE not available per 5 degrees area
LL	OMAN	0.0	MS						
LL	FRANCE-TERRITORIES	0.0	S						
LL	INDIA	0.0	S						
LL	NEI-FROZEN[1]	3.6	MS						
LL	NEI-FRESH[2]	0.2	S						Data partially available from IOTC/OFCF sampling schemes
Artisanal	IRAN I R	12.1	F						
Artisanal	SRI LANKA	4.2	FM						Data partially available from IOTC/OFCF sampling schemes
Artisanal	INDIA	4.1							
Artisanal	PAKISTAN	1.0							
Artisanal	INDONESIA	0.8							
Artisanal	TANZANIA	0.6							
Artisanal	COMOROS	0.4	F						
Artisanal	MAURITIUS	0.3							
Artisanal	KENYA	0.2	F						
Artisanal	OMAN	0.2	F						
Artisanal	UN ARAB EMIRATES	0.1							
Artisanal	EUROPEAN COMMUNITY	0.0	S						
Artisanal	SAUDI ARABIA	0.0	F						
Artisanal	FRANCE-TERRITORIES	0.0	F						
Artisanal	SEYCHELLES	0.0	F						CE not available per 5 degrees area
Artisanal	UK-TERRITORIES	0.0	M						
Artisanal	AUSTRALIA	0.0	S						CE not available for some grids (confidentiality)

Sps Swordfish (**S**), blue marlin and/or black marlin and/or striped marlin (**M**), Indo-Pacific sailfish (**F**) and short-billed spearfish (**P**)
1 Bolivia, Cambodia, Equatorial Guinea, Georgia, Iceland, Mongolia, Namibia, St. Vincent and the Grenadines and Togo
2 Indonesian vessels operating in countries other than Indonesia

2iv – Neritic tunas (FRZ, LOT, KAW, COM, GUT, STS, WAH)

Gear	Fleet	Availability of statistics					TI	SO	Comments
		Catch	Sps	NC	CE	SF			
PS	IRAN I R	1.5	L						
	EUROPEAN COMMUNITY	0.4	F						Statistics incomplete
	SEYCHELLES	0.2	F						Statistics incomplete
	NEI	4.2	L						
LL	INDONESIA	0.1	W						CE and SF not available per 5 degrees area
	CHINA TAIWAN,CHINA	0.0	W						Statistics incomplete
	EUROPEAN COMMUNITY	0.0	W						NC and CE not available for all EC flags
	AUSTRALIA	0.0	W						
	FRANCE-TERRITORIES	0.0	W						
	OMAN	0.0	W						
	BELIZE	0.0	W						CE inconsistent (size of squares)
	KENYA	0.0	W						
	NEI-FROZEN[1]	0.0	W						
	NEI-FRESH[2]	0.0	W						Data partially available from IOTC/OFCF sampling schemes
Artisanal	INDIA	76.0	CK						
	INDONESIA	46.9	CG						
	IRAN I R	42.5	LK						
	THAILAND	17.0	K						NC and CE not fully available per species
	PAKISTAN	15.3	CL						
	MALAYSIA	14.5	KL						NC and CE not fully available per species
	OMAN	12.5	LC						
	MADAGASCAR	12.0	C						
	YEMEN AR RP	10.2	LK						
	UN ARAB EMIRATES	8.4	CL						
	MALDIVES	7.8	FK						
	SAUDI ARABIA	6.4	C						
	SRI LANKA	5.8	CF						Data partially available from IOTC/OFCF sampling schemes
	EGYPT	5.3	C						
	KENYA	1.2	C						
	QATAR	1.0	C						
	COMOROS	0.7	K						
	TANZANIA	0.5							
	AUSTRALIA	0.3	C						CE not available for some grids (confidentiality)
	KUWAIT	0.2	G						
	ERITREA	0.1	C						
	SEYCHELLES	0.1	K						CE not available per 5 degrees area
	FRANCE-TERRITORIES	0.1	W						
	EUROPEAN COMMUNITY	0.1	W						
	BANGLADESH	0.1							
	DJIBOUTI	0.1							
	BAHRAIN	0.1	C						
	JORDAN	0.0	K						
	SUDAN	0.0	C						
	SOUTH AFRICA	0.0	G						
	UK-TERRITORIES	0.0	K						

Sps Longtail tuna (**L**), frigate tuna and/or bullet tuna (**F**), kawakawa (**K**), narrow-barred Spanish mackerel (**C**), Indo-Pacific king mackerel (**G**), streaked seerfish (**S**) and wahoo (**W**)

1 Bolivia, Cambodia, Equatorial Guinea, Georgia, Iceland, Namibia, St. Vincent and the Grenadines and Togo

2 Indonesian vessels operating in countries other than Indonesia

2v – Fishing craft statistics and list of active vessels

Gear	Industrial purse seine (**PS**), industrial longline (**LL**) and artisanal gears (**ART**)
Catch	Recent catches amounting to (thousands of tonnes)
Craft	Number of craft operated (2005) (blank if unknown)
FC	Fishing craft
AV	List of active vessels

Availability		Fully available Partially available Not available
SO	Data Source	Statistics fully available from flag country Statistics partially available from flag country Statistics fully available from countries other than flag country No statistics available at all

Gear	Fleet	Availability				SO	Comments
		Catch	Craft	FC	AV		
PS	EUROPEAN COMMUNITY	298.6	46				Names and characteristics of supply vessels not available
	SEYCHELLES	87.5	11				
	IRAN I R	12.5					
	THAILAND	11.9	6				
	AUSTRALIA	5.3	6				
	JAPAN	4.1	1				
	NEI	33.0	6				Active vessel list available from third parties (IOTC/OFCF)
LL	CHINA	14.3	62				
	TAIWAN,CHINA	140.8	341				Total number of fresh-tuna longliners unknown
	JAPAN	38.2	98				Numbers are preliminary. Active vessels available from other sources
	INDONESIA	35.7	1,187				Total number of fresh-tuna longliners unknown
	EUROPEAN COMMUNITY	16.8	40				
	SEYCHELLES	14.4	25				
	KOREA REP	7.0	28				Active vessel list not provided (vessels available from other sources)
	PHILIPPINES	4.6	25				
	MALAYSIA	3.3	18				
	GUINEA	2.6	3				
	MAURITIUS	1.2					
	BELIZE	1.1	14				
	SOUTH AFRICA	1.0	8				
	IRAN I R	0.9					
	KENYA	0.7	1				Fishing craft and active vessel list not provided
	AUSTRALIA	0.4	6				
	THAILAND	0.3	2				
	SENEGAL	0.3	1				
	OMAN	0.2					
	INDIA	0.0	4				
	FRANCE-TERRITORIES	0.0					
	NEI-FROZEN[1]	11.1	19				Active vessel list available from third parties
	NEI-FRESH[2]	4.5					Active vessel list available from third parties (IOTC/OFCF)
Artisanal	INDONESIA	209.2					
	MALDIVES	183.0	1,103				
	IRAN I R	147.8					
	SRI LANKA	112.4	1,680				Numbers are preliminary
	INDIA	86.2					
	PAKISTAN	43.6					
	YEMEN AR RP	42.2					
	OMAN	29.4	9,614				
	THAILAND	17.0	1,089				
	MALAYSIA	15.2					
	MADAGASCAR	12.0					
	UN ARAB EMIRATES	11.1					
	COMOROS	10.8					
	SAUDI ARABIA	8.2					
	QATAR	7.4					
	TANZANIA	5.8					
	EGYPT	5.5					
	KENYA	1.9					
	MAURITIUS	1.1					
	FRANCE-TERRITORIES	1.1					
	EUROPEAN COMMUNITY	0.7	218				Vessels are below 24 m
	AUSTRALIA	0.4	73				
	ERITREA	0.3					
	KUWAIT	0.2					
	SOUTH AFRICA	0.1	20				
	SEYCHELLES	0.1	305				
	SUDAN	0.1					
	JORDAN	0.1					
	DJIBOUTI	0.1					
	BANGLADESH	0.1					
	BAHRAIN	0.1	1,032				
	UK-TERRITORIES	0.0					
	EAST TIMOR	0.0					

1 Bolivia, Cambodia, Equatorial Guinea, Georgia, Iceland, Namibia, St. Vincent and the Grenadines and Togo

2 Indonesian vessels operating in countries other than Indonesia

- **By-catch**: The statistics of sharks and other non-IOTC species caught by fleets targeting tunas and/or tuna-like species are very poor quality. The statistics are seldom available per species or gear and refer only to the shark carcasses that are retained on board. Almost no statistics are available for other shark products, such as shark fins.
- **Discards**: Discards are only available for Australia and South Africa in 2005. Discard rates are believed to be high, especially from longliners and in purse seiners setting on logs.
- **Fishing craft statistics and active vessels**: Fishing craft statistics are generally available for fleets whose catches are available. Craft statistics are not available, incomplete or inaccurate for many artisanal fleets. The number of non-reporting vessels operating in the Indian Ocean for the period 1992-2005 was re-estimated this year from new information collected through the IOTC Sampling Programs and new vessel records.

4. STATUS OF THE IOTC NOMINAL CATCHES (NC), CATCH AND EFFORT (CE) AND SIZE FREQUENCY (SF) DATABASES

Main progress achieved during 2006

The main progress achieved in the collection and verification of the data in the IOTC Nominal catches (NC), by-catch (BY), catch and effort (CE) and size frequency (SF) databases are summarized in Table 3 below (more information is provided in Section 7, Box 1 and in the Boxes referred to in **FLAG**):

Table 3: Status of the IOTC NC, CE and SF tables: Main Progress Achieved since the last SC Meeting

DB	FLAG/S	PERIOD	SPECIES	DETAILS OF ACTIVITY	SOURCES	CHANGES IN DATA
NC	ALL	1950-2005	ALL	Disaggregation of catches recorded under gear and/or species aggregates in the IOTC database	Nominal Catches tables in the IOTC Database (WPTT-04-06)	No changes in the IOTC Database; the decomposition of the catches was conducted for the WPTT and WPB
	Indonesia **(BOX 2A)**	2002-2005	BET, YFT, SWO	New catches available for longline fleets	DGCF/RIMF/CSIRO/IOTC OFCF Sampling in Benoa, Jakarta and Cilacap	The catches estimated for 2005 are lower
	Taiwan,China **(BOX 2A)**	2000-2005	YFT, BET, SWO	Catches of fresh-tuna longliners available	OFDC Web site	The catches are now available from the internet
	Non-reporting fresh tuna longliners operating under several flags **(BOX 2 A)**	2000-2005	YFT, BET, SWO	Re-estimation of the catches of non-reporting fresh tuna longliners thanks to the new information available (IOTC/OFCF Program)	AFRDEC Sampling FRI Sampling NARA Sampling MFA Maldives SFA background information	Most of the catches refer now to Indonesian vessels based in countries other than Indonesia. Drop in the catches estimated in recent years
	Non-reporting deep-freezing longliners **(BOX 2 B)**	2000-2005	YFT, BET, ALB, SBF	New review of the series of catches from data collected recently	IOTC Vessel Records IOTC Activity Records	Change in recent year catches. Current catches are lower than those previously recorded.
	Non-reporting industrial purse seiners **(BOX 2 C)**	2003-2005	SKJ, YFT, BET	New review of catches	EC Japan IOTC Vessel Records IOTC Activity Records	Catches estimated according to average catches per vessel in previous years. Catches for 2005 refer to January-September (the vessels are currently operating under the Thai flag)
	Thailand	2005	SKJ, YFT, BET	New catches available for industrial purse seiners (ex-NEI-PS)	DOF	Catches available for the last quarter of 2005 (the time the vessels changed the flag to Thailand). The new catch levels are similar to those estimated before for these vessels.
	Seychelles	1999-2005	BET, YFT	New catches available for industrial longliners	SFA	Previous catches referred to processed weights for all species. New catches estimated are higher for this reason
	Sri Lanka **(BOX 3)**	2005	SKJ, YFT, SWO, MAR	New review of catches	IOTC/OFCF sampling (NARA)	The catches estimated for 2005 are much lower than those reported for 2004 (about half as low)
BY	ALL	1950-2005	All shark species	The Secretariat created a Catalogue of data holdings regarding shark species for the WPBy	Background information	No changes in data
CE	South Korea	2003-2005	YFT, BET, SWO	New catches and effort series available for industrial longliners	NOMAF Korea	More complete catch and effort data input for 2003-05 (data need further verification)

DB	FLAG/S	PERIOD	SPECIES	DETAILS OF ACTIVITY	SOURCES	CHANGES IN DATA
	EC Portugal	2005	SWO, BET	Catches and effort data available as per IOTC standards for industrial longliners	DGPA	New Catches and effort input (previous CE data was not available per 5 degrees square grid and month)
	ALL	1950-2005	BET, YFT, SKJ	Catches per month and 5 degrees square grid raised to total catches (Atlas)	IOTC Database Background information	Information prepared for the WPTT; no new data input
SF	China, Taiwan,China, Indonesia Other fresh-tuna longliners	1998-2005	YFT, BET, SWO	Validation and verification of size frequency records (fresh tuna longliners) for data input Estimation of CAS for fresh-tuna longliners	IOTC Sampling Programmes Ship operators (processing plants)	Size data input to the IOTC database (data for 2005 are still under review)
	South Korea	2003-2005	BET, YFT, SBF, SWO, MARL	New Size Frequency Data available	NOMAF Korea (information probably collected by observers)	New data input per 1 degree square grid and month
	Taiwan,China	1980-2003	YFT, BET, SWO, ALB	New data from DWF longliners from Taiwan,China	Data downloaded from the internet	Length data available per month and 10 * 20 degrees areas (same resolution as Japanese data)
	ALL	1950-2005	BET, YFT, SKJ	Building of Catch-At-Size and Catch-At-Age matrices	IOTC Database Background information	Information prepared for the WPTT; no new data input

Problem Areas Identified

Despite the progress achieved regarding the statistics in the IOTC NC, BY, CE and SF databases in recent years, there are still several problems regarding the completeness and quality of the data which should be addressed. The main areas of concern regarding the statistics in these databases are summarized in Table 4 below. Additional documentation about each case is provided in Section 7, Box 1 and the different Boxes referred to in **PROBLEM**, found in the pages following the Table.

Table 4: Status of the IOTC NC, CE and SF databases: Problem Areas Identified

DB	PROBLEM	SPECIES	FLAG/S	PERIOD	REASON/S	PROPOSED ACTION/S
NC	Statistics not available from the flag country **(BOX 3)**	YFT, BET, ALB, SBF, SWO, BIL	PAN, HND, GNQ, BOL, KHM, NAM, TGO, UKR	1980 to Date	Fisheries not monitored by the flag countries	Continue collecting data through the IOTC sampling schemes (fresh-tuna longliners) Identify the fleets for which important tuna catches have been unreported over the years (through retrieval of vessel and, especially, activity records)
		Mainly tropical and neritic tunas	YEM, COM MDG, SOM, MOZ, MMR, KEN, TZA	Various	Statistical system unable to produce reliable estimates of catches (as regards IOTC species)	Identify the deficiencies in data collection and processing in the countries concerned
		All	ARE	Various	Statistics probably available at the country level but not reported	Identify the reasons why the catches are not reported by the flag countries
	Species and/or gear aggregation	Neritic Tunas Billfish	IDN, IND, THA, LKA, PAK, NEI-SUN	1950 to date	Statistical systems unable to produce detailed estimates of catches	Identify the deficiencies in data collection and processing in the countries concerned
	Poor quality	All	Non-reporting DWFNs, PAK, **LKA**, THA, IND, IDN	Various	The catches available are thought unreliable or inaccurate due to inconsistencies found during the verification processes or to the many assumptions made to produce the final catches	Continue the collection of past and recent data through the IOTC sampling programmes in ports of call of fresh-tuna longliners. Continue with the collection of activity records of non reporting fleets Identify the reasons why the catches provided by several countries are of poor quality
BY	Statistics not available from the flag country	All shark species	Most industrial fleets (LL and PS) Some artisanal fleets (IDN)	1950-2005	Same as NC above	Same as NC above
	Species and/or gear aggregation	All shark species	Most industrial fleets (LL and PS)	1952-2005	Same as NC above	Same as NC above

DB	PROBLEM	SPECIES	FLAG/S	PERIOD	REASON/S	PROPOSED ACTION/S
DI	Statistics not available from the flag country or highly aggregated	Undersized or spoiled tunas (YFT, BET, SKJ), Sharks, low-value or spoiled billfishes (SSP, SFA) and other species	All, especially industrial fleets	1952 to date	Most of the discards are unreported and when reported they are usually incomplete and highly aggregated	Collect data on industrial fisheries through observer programs
CE & SF	Statistics not available from the flag country	All, especially Neritic tunas and Billfish	Many artisanal, BLZ (SF), PHL (SF), SYC (SF), Industrial PS (Effort supply vessels and FADs) and non-reporting DWFNs	1950 to date	Catch and effort (size frequency) statistics not collected by the flag country	Assess the availability of records from other sources, especially in fleets which the retrieval of catch and effort (size frequency) records is considered important
					Statistical systems unable to produce reliable catch and effort (size frequency) estimates	Identify the deficiencies in data collection and processing in the countries concerned
					Catch and effort (size frequency) statistics collected by the flag country but no or incompletely reported to the IOTC	Identify the reasons why the catch and effort (size frequency) records are not reported by the flag countries
	Poor Quality	Tropical Tunas Billfish	KOR (CE/SF), BLZ (CE), THA (CE), PHL (CE), JPN (SF)	Various	Inconsistencies found during the validation and verification of catch and effort (size frequency) records or communicated by the sources reporting the data	Identify the reasons why the data are inconsistent and the ways in which these inconsistencies might be reduced (this would require a perfect knowledge about the way the catch and effort statistics are collected and processed in the country reporting the data)
					Low coverage	Identify the reasons why the fleets concerned are poorly covered and the ways in which the fleets might be better monitored Assess the availability of records from other sources, especially in fleets which the retrieval of catch and effort (size frequency) records is considered important

5. STATUS OF THE IOTC FISHING CRAFT STATISTICS (FC) AND ACTIVE VESSELS (AV) DATABASES

The numbers of vessels operating under the flags of countries that do not report their catches to the IOTC are estimated from data reported by other countries. This data includes the numbers (fishing craft) and/or characteristics (Vessels Active Lists) of the vessels operating within their EEZ or calling to ports in their territory.

The catches for non-reporting fleets are estimated by using the estimated vessel numbers (obtained as above) and the catch data for vessels from other (reporting) fleets that operated in the same areas (that the non-reporting fleets were thought to operate in) and targeted the same species.

Data Availability

Data from artisanal fisheries are scarce and inconsistent in many cases. On the contrary, the statistics of industrial fleets are thought fairly complete:

Purse seine fleets: The number of purse seiners fishing for tropical tunas on the high seas (usually referred to as "industrial") is well known. This fleet is flagged mainly from the European Community, Seychelles, Iran, Japan and Thailand.

Longline fleets: There are many more longline fleets fishing tuna in the Indian Ocean, mainly under the flags of China, Taiwan,China, Indonesia, Japan, the Republic of Korea, Philippines, the EC, Seychelles, Equatorial Guinea, Honduras, South Africa, Australia, Vanuatu, Belize, Cambodia, Namibia, Senegal, Togo, Bolivia, Georgia and Mongolia.. The total number of non-reporting longliners has been estimated for 2003-04.

Main Progress Achieved during 2005

The progress achieved in the collection and verification of the data in the IOTC FC and AV databases is summarized in the Table 5 below.

Table 5: Status of the IOTC FC, VR and FTVA databases: main progress achieved

DB	FLAG/S	SOURCES	PERIOD	DETAILS	MAIN RESULTS
FC	Non reporting DWFNs	IOTC Active Vessels List	2000-04	Review to complete the craft statistics	Number of non-reporting deep-freezing longliners better known: Around 40 in recent years
	Non- reporting Fresh-tuna longliners	IOTC Sampling Programmes WASKI Indonesia DGCF Indonesia CSIRO Australia RIMF Indonesia	2000-04	Review to complete the number of fresh tuna longliners operating in the Indian Ocean	Number of Taiwanese and Indonesian fresh tuna longliners input: Around 2,000 boats in all in recent years. Current numbers are decreasing.
AV	All Industrial	AVA Singapore NARA Sri Lanka MAF Oman AFDEC Thailand (IOTC) USTA & CSP Madagascar DGCF Indonesia EC/Japan (list of IUU vessels)	2000-04	Reporting of foreign tuna fleets putting in to ports or licensed to operating within the EEZ of these countries	New vessel and activity records input
	Belize, Senegal, Thailand	INMARBE Belize CRODT Senegal DOF Thailand	2003-05	Submission of names and characteristics of ships fishing for tunas in the Indian Ocean	Number of vessels operating better known

Problem Areas Identified

The main area problems identified in the IOTC database concerning the tuna fleets operating in the Indian Ocean are summarised in the Table 6 below. Several alternative actions to undertake to reduce these uncertainties are proposed in the right column.

Table 6: Status of the IOTC FC, VR and FTVA databases: problem areas identified

DB	PROBLEM	FLAG/S	PERIOD	REASON/S	PROPOSED ACTION/S
FC	Series incomplete for important longline fleets	TWN (fresh-tuna), IDN, BLZ, PAN, HND, GNQ, BOL, VCT	1980 to date	Lack of information, especially regarding the first years of operation	Continue collecting data through the IOTC sampling schemes (fresh-tuna longliners) Identify the fleets for which important tuna catches have been unreported over the years (through retrieval of vessel and, especially, activity records)
	No data or data inconsistent regarding many artisanal fleets	Many artisanal	1950 to date	Statistics not available	Identify the reasons why the statistics are not provided
				Statistical systems unable to produce reliable fishing craft statistics	Identify the deficiencies in data collection and processing in the countries concerned
	Lack of detailed information	All	1950 to date	Incomplete data (vessel size, mechanization, etc. not available)	Identify the reasons why the statistics are not complete
AV	Data not available	ZAF (foreign fleets) TWN (fresh-tuna), HND, EQG	1998-05	Fleets not monitored by the flag countries Statistics available but not provided	Continue the collection of information through the IOTC sampling programmes Continue collecting information on foreign fleets from third sources
	Information incomplete or inconsistent	All industrial, especially non-reporting flags	1995-05	Ship names, identification or characteristics mistakenly recorded Ship characteristics inconsistent between reports Lack of information about ship activity in the Indian Ocean (vessels bearing licenses to operate but not actually operating)	

6. OTHER IOTC DATA HOLDINGS: BIOLOGICAL DATA

Table 7 shows other datasets available at the IOTC Secretariat:

Table 7: Biological data available at IOTC

TYPE OF DATA	RAW DATA	PERIOD	SOURCE
Length-length-weight data of tuna and billfish caught by fresh tuna longliners in the Indian Ocean	Available	2000-05	AFDEC Thailand (IOTC Sampling Programmes) NARA Sri Lanka (IOTC Sampling Programs) RIMF Indonesia (IOTC Sampling Programs) FRI Malaysia (IOTC Sampling Programs) IFREMER Reunion-France (PPR Programme) BRS (Pelagic Observer Program)
Length-length-weight-sex-maturity of tuna and tuna-like species caught by longliners and purse seiners within the EEZ of Chagos	Available	1996-02	MRAG United Kingdom (observer data)
Length-weight-sex data of tuna species caught by longliners from the republic of Korea	Available	2001-03	
Biological data available from Atlantic:			
-Length-length-weight data of tuna and billfish	Not available Available	 1992-04	ICCAT, Literature NMFS Pelagic Observer Program
-Relationships between straight and curved body measurements	Available	1992-04	NMFS Pelagic Observer Program
-Length-length-weight data of sharks	Not available	-	Literature
Biological data available from Pacific:			
-Length-length-weight data of billfish	Not available	2004	SPC, Literature

The Secretariat presented a document to the Working Party on Tropical Tunas on the status of data holdings regarding the biological information available on tuna and billfish species (IOTC-2006-WPTT-03).

7. AVAILABILITY OF STATISTICS FOR THE IOTC WORKING PARTIES

The IOTC Secretariat prepares the data that is used for stock assessment by various IOTC Working Parties. This includes, for each species:

- Total catches, usually made up of the catches retained on board plus those of fish not retained that dies due to the gear (catches discarded plus mortality of unloaded fish caused by gear)
- Nominal CPUE series and trends in average weight from various fisheries and as long in time as possible: These series are derived from the available catches and effort data (CE) and size data (SF), respectively, and might be used by the Working Parties as stock status indicators.
- Catch-at-size (CAS) and/or catch at-age (CAA) tables, i.e. the number of fish caught per length(age) class for each fleet and time-area strata. These tables are used by the Working Parties that use length or age based models to assess the status of the stocks under its responsibility. The Secretariat uses the following data to build these tables:
    - Total catches per fleet and time-area strata: These data are derived from the available catches per area (catch and effort table) and the total catches estimated for each species and fleet.
    - Length frequency data per fleet and time-area strata: These data are derived from the available size data (size frequency data table).

- Other biological information, required for:
  - Standardizing the available size data: The Secretariat uses several types of equations to convert from non-standard size to standard length, as
    - Processed length – Standard length equations
    - (Processed) weight – Standard length equations
  - Estimating sampled weight: The Secretariat estimates the weight of the available size data (samples) to be able to convert from sampled length frequencies to total length frequencies. Several length-weight equations are used, depending on the species and the fishery.
  - Estimating age: The estimated lengths are converted into age by using the available length-age keys.
  - Estimating sex-ratio: Information on the amount of specimens caught by sex is important for some species, notably the swordfish and other billfish. The Secretariat uses information from samples where the sex, apart from the size of each specimen, is recorded to estimate CAS and CAA independently for each sex.

Uncertainty in the data

A summary of the standing of the data to the Secretariat and derived indicators is provided for each of the major tuna species and swordfish below. Summaries for other billfish species is provided in BOX 1. It is anticipated that summaries for the neritic species will be provided in 2007.

The uncertainty in the catch estimates has been assessed by the Secretariat and is based on the amount of processing required to account for the presence of conflicting catch reports, the level of aggregation of the catches by species and or gear, and the occurrence of unreporting fisheries for which catches had to be estimated.

The uncertainty in the catch at size data has been assessed by the Secretariat as is based on the amount of the catch for which size data are not available or are unrepresentative and need to be estimated.

YELLOWFIN TUNA (YFT)

Retained catches are generally well known; however, catches are uncertain for:

- many artisanal fisheries, notably Sri Lanka, Yemen and Comoros
- non-reporting industrial purse seiners and longliners (NEI).

Discards are believed to be low although they are unknown for most industrial fisheries, notably industrial purse seiners.

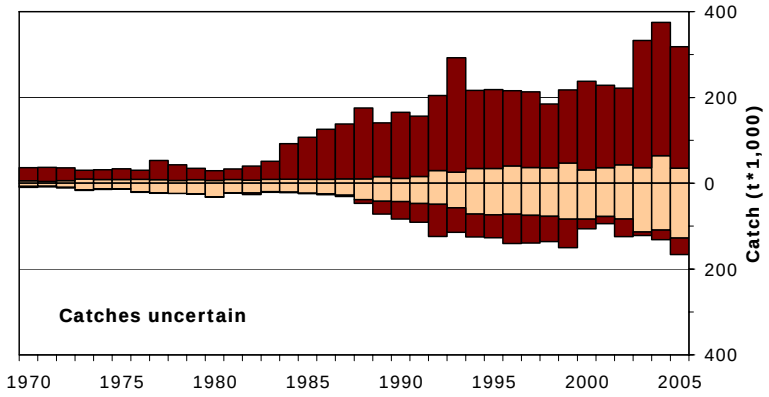


***Figure**. Uncertainty of annual catch estimates for yellowfin tuna. The amount of the catch below the zero-line has been categorised as uncertain according to the criteria given in the text. Light bars represent data for artisanal fleets and dark bars represent data for industrial fleets. Data as of October 2006*

CPUE Series: Catch and effort series are available from various industrial and artisanal fisheries. Nevertheless, catch and effort are not available for important artisanal fisheries or they are considered to be of poor quality:

- poor quality effort data for the gillnet/longline fishery of Sri Lanka
- no data available for the artisanal fisheries of Yemen and Comoros
- no data available for the pole and line fishery of Maldives in recent years.

Trends in average weight can be assessed for several industrial fisheries but they are very incomplete or poor quality for some artisanal gears, namely hand lines, troll lines, many gillnet fisheries (Yemen, Oman, Indonesia) and the pole and line fishery of Maldives in recent years.

Catch-at-Size(Age) table: This is available although the estimates are more uncertain in some years and fisheries due to:

- size data are not available for most artisanal fisheries, notably Yemen (lines and gillnets), Comoros (lines) and Maldives (pole and lines) in recent years
- a paucity of size data available from industrial longliners from the late-1960s up to the mid-1980s
- a paucity of catches per area available for some industrial fleets (NEI).

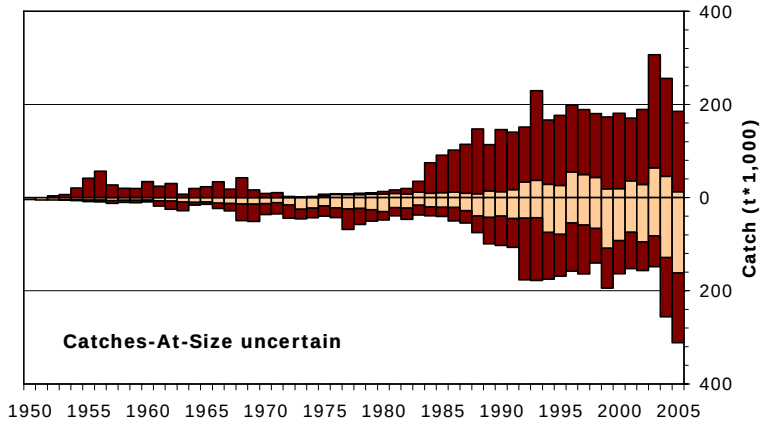


***Figure**. Uncertainty of catch at size data for yellowfin tuna. The amount below the zero-line indicates the amount of catch for which the estimated catch at size has been categorised as uncertain according to the criteria given in the text. Light bars represent data for artisanal fleets and dark bars represent data for industrial fleets. Data as of June 2006*

BIGEYE TUNA (BET)

Retained catches are generally well known; catches are uncertain for non-reporting industrial purse seiners and longliners (NEI) and for other industrial fisheries (Philippines).

Discards are believed to be low although they are unknown for most industrial fisheries, notably industrial purse seiners.

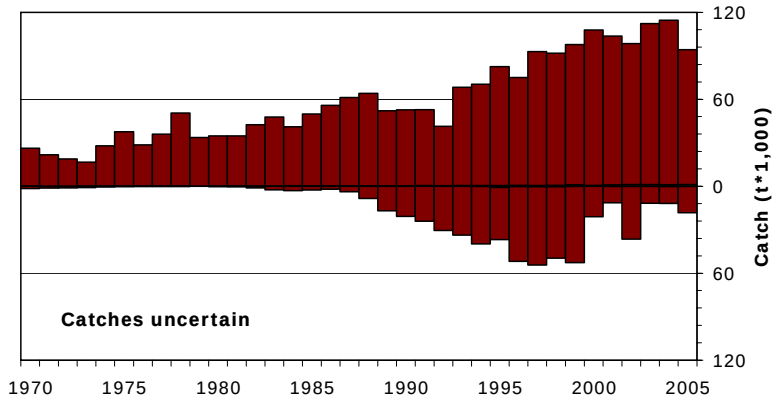


***Figure**. Uncertainty of annual catch estimates for bigeye tuna. The amount of the catch below the zero-line has been categorised as uncertain according to the criteria given in the text. Light bars represent data for artisanal fleets and dark bars represent data for industrial fleets. Data as of October 2006*

CPUE Series: Catch and effort series are available from various industrial fisheries. Nevertheless, catch and effort are not available from some fisheries or they are considered to be of poor quality, especially throughout the 1990s:

- non-reporting industrial purse seiners and longliners (NEI)
- industrial purse seiners of Iran and longliners of Philippines.

Trends in average weight can be assessed for several industrial fisheries although they are incomplete or of poor quality for most fisheries before the mid-1980s and in recent years (for the above fleets plus longliners from South Korea and Seychelles).

Catch-at-Size(Age) table: This is available but the estimates are more uncertian for some years and fisheries due to:

- a paucity of size data available from industrial longliners before the mid-60s and from the early-1970s up to the mid-1980s
- a paucity of catches per area available for some industrial fleets (NEI)

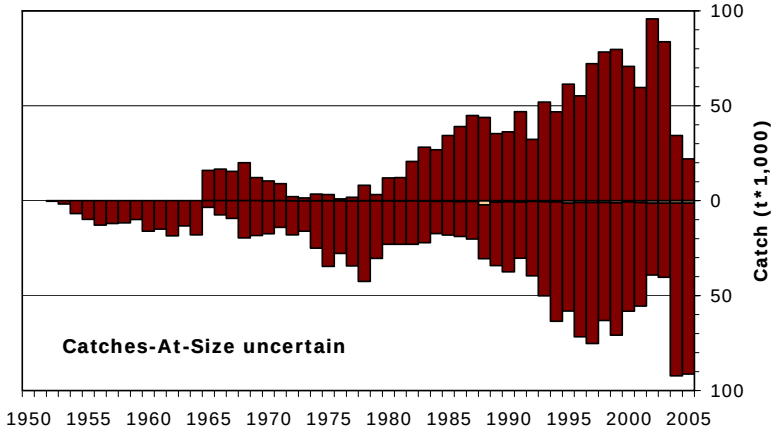


***Figure**. Uncertainty of catch at size data for bigeye tuna. The amount below the zero-line indicates the amount of catch for which the estimated catch at size has been categorised as uncertain according to the criteria given in the text. Light bars represent data for artisanal fleets and dark bars represent data for industrial fleets. Data as of June 2006*

SKIPJACK TUNA (SKJ)

Retained catches are generally well known for industrial fisheries, uncertain for many artisanal fisheries, notably because of:

- catches not being reported per species: About half the catches reported for the Indonesian artisanal fisheries are not per species, a high proportion assigned to the skipjack tuna when the Secretariat breaks them into species
- conflicting catch reports: The Secretariat receives two reports from Sri Lanka containing conflicting catch values for some species.

Discards are believed to be low although they are unknown for most industrial fisheries, notably industrial purse seiners.

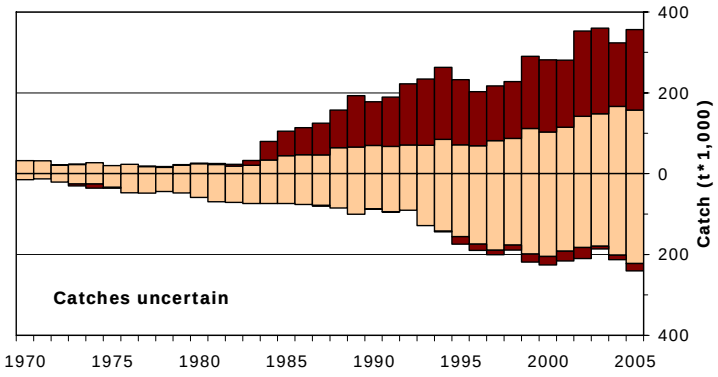


***Figure**. Uncertainty of annual catch estimates for skipjack tuna. The amount of the catch below the zero-line has been categorised as uncertain according to the criteria given in the text. Light bars represent data for artisanal fleets and dark bars represent data for industrial fleets. Data as of October 2006*

CPUE Series: Catch and effort series are available from various industrial and artisanal fisheries. Nevertheless, catch and effort are not available from important artisanal fisheries or they are considered to be of poor quality:

- almost no data available for the artisanal fisheries of Indonesia
- poor quality effort data for the gillnet/longline fishery of Sri Lanka
- no data available for the pole and line fishery of Maldives in recent years.

Trends in average weight cannot be assessed before the mid-1980s and are incomplete for most artisanal fisheries thereinafter, namely hand lines, troll lines, many gillnet fisheries (Indonesia) and the pole and line fishery of Maldives in recent years.

Catch-at-Size(Age) table: CAS are available but the estimates are thought compromised for some years and fisheries due to:

- a lack of size data before the mid-1980s
- a paucity of size data available for some artisanal fisheries, notably most hand lines and troll lines, many gillnet fisheries (Indonesia) and the pole and line fishery of Maldives in recent years
- a lack of some biological information such as length-age keys for the Indian Ocean.

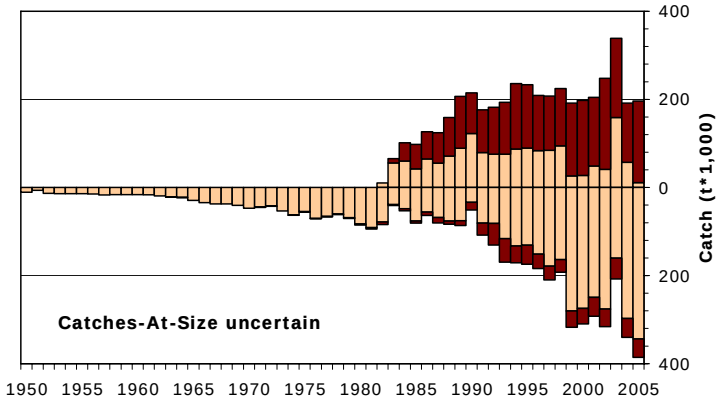


***Figure**. Uncertainty of catch at size data for skipjack tuna. The amount below the zero-line indicates the amount of catch for which the estimated catch at size has been categorised as uncertain according to the criteria given in the text. Light bars represent data for artisanal fleets and dark bars represent data for industrial fleets. Data as of June 2006*

ALBACORE (ALB)

Retained catches are generally well known; catches are uncertain for non-reporting industrial longliners (NEI) and for other industrial fisheries. The catches are believed incomplete for some fleets not targeting albacore (catches retained but not fully reported), mainly industrial.

Discards are believed to be low although they are unknown for most industrial fisheries

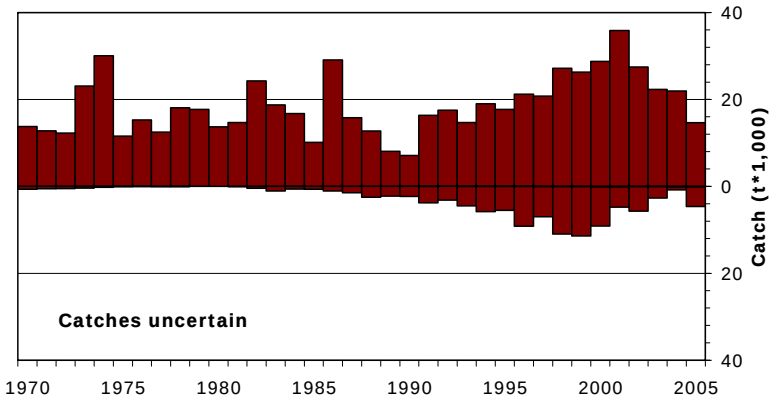


***Figure**. Uncertainty of annual catch estimates for albacore tuna. The amount of the catch below the zero-line has been categorised as uncertain according to the criteria given in the text. Light bars represent data for artisanal fleets and dark bars represent data for industrial fleets.* *Data as of October 2006*

CPUE Series: Catch and effort series are available from various industrial fisheries although the catch recorded might be incomplete when the albacore is not the target species. Nevertheless, catch and effort are not available from some fisheries or they are considered to be of poor quality, especially throughout the 1990s [Non-reporting longliners (NEI)].

Trends in average weight can be assessed for several industrial fisheries although they are incomplete or poor quality for most fisheries before the mid-1980s and in recent years (longliners from **S**outh Korea, Seychelles, Philippines and NEI).

Catch-at-Size(Age) table: The Secretariat has not built CAS or CAA tables for albacore. Nevertheless, it is thought that the amount of size data that are available for this species would make it possible to create CAS. The estimation would, however, be compromised due to:

- a paucity of size data available from industrial longliners before the mid-1960s and from the early-1970s up to the mid-1980s
- a paucity of catches per area available for some industrial fleets (NEI)
- a lack of some biological parameters as length-age keys for the Indian Ocean

SWORDFISH (SWO)

Retained catches are generally well known; catches are uncertain because:

- non-reporting industrial longliners (NEI): The amount of non-reporting longliners targeting swordfish has been increasing in recent years due to the shift of vessels from the Atlantic Ocean to the Indian Ocean.
- conflicting catch reports: The Secretariat receives two reports from Sri Lanka containing conflicting catch values for some species. The catches for South Korean longliners reported as nominal catches and catches and effort are also conflicting, with higher catches recorded in the CE table.

Discards are believed to be low although they are unknown for most industrial fisheries, mainly longliners.

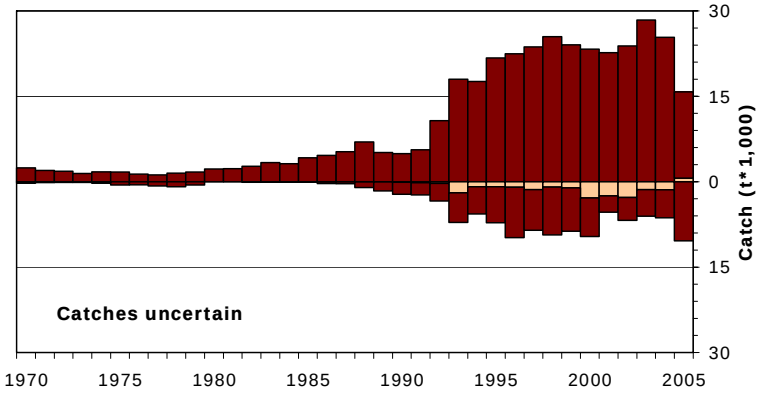


***Figure**. Uncertainty of annual catch estimates for swordfish. The amount of the catch below the zero-line has been categorised as uncertain according to the criteria given in the text. Light bars represent data for artisanal fleets and dark bars represent data for industrial fleets. Data as of October 2006*

CPUE Series: Catch and effort series are available from some industrial longline fisheries. Nevertheless, catch and effort are not available from some fisheries or they are considered poor quality, especially throughout the 90s [Non-reporting longliners (NEI)]. The catch and effort that are available from artisanal fisheries are believed inaccurate (poor quality effort data for the gillnet/longline fishery of Sri Lanka).

Trends in average weight can be assessed for several industrial fisheries although they are incomplete or poor quality for most fisheries before the early-80s and in recent years (low size of samples and time-area coverage for longliners from Japan).

Catch-at-Size(Age) table: CAS are available but the estimates are thought compromised for some years and fisheries due to:

- a lack of size data before the early-80s and from artisanal fisheries (Sri Lanka)
- a paucity of catches per area available for some industrial fleets (NEI)
- a paucity of the biological data available, notably sex-ratio and sex-length-age keys

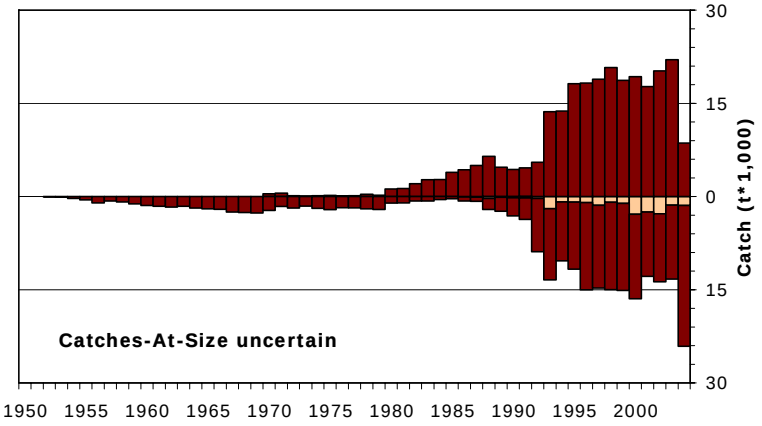


***Figure**. Uncertainty of catch at size data for swordfish. The amount below the zero-line indicates the amount of catch for which the estimated catch at size has been categorised as uncertain according to the criteria given in the text. Light bars represent data for artisanal fleets and dark bars represent data for industrial fleets. Data as of February 2006*

8. PROGRESS ACHIEVED ON THE RECOMMENDATIONS MADE BY THE SCIENTIFIC COMMITTEE IN 2005

The table below lists all recommendations relating to statistics issued during the 2005 Scientific Committee Meeting (IOTC-2005-SC-R). The progress achieved is assessed in each case[2].

Section 5.1 Status of the IOTC Databases

Para.11 The SC noted the following problems

- Late reporting: Less than 45% of the data contributing to the estimate of total nominal catch were available before the deadline for data submission (30 June). Around 30% of the data for CE and SF were available. These figures are lower than those reported in 2005.

- Catch series not available

  - Non-reporting deep-freezing longliners: There are still vessels operating under non-reporting flags. Although the total number of vessels is uncertain the available data seems to indicate a decrease in the number of vessels in recent years.
  - Fresh-tuna longliners: The catches of fresh-tuna longliners from Taiwan,China are available for the period 2000-05. Although there are vessels operating under other non-reporting flags their numbers are thought to be very low
  - Non-reporting industrial purse seiners: The core vessels have been operating since September 2005 under the Thai flag and Thailand has provided catch estimates and other data for the referred period.
  - Artisanal fishery from Yemen: There is no new data available on this fishery although several sources have indicated a likely drop in the catches of yellowfin and other species for 2005.

- Uncertain catch reports

  - Deep-freezing longliners of Seychelles (*para.12*): The Seychelles Fishing Authority provided new catches for the Seychelles longline fleet during 2003-05. The new catches are thought better quality than those existing before.
  - Industrial longliners of Philippines: The catches recorded in the IOTC database for the longline fleet of Philippines are believed to be lower than the actual catch, at least for 2003-05. The amounts of frozen bigeye tuna recorded for Philippines in the Bigeye tuna Statistical Document Programme are higher than those reported as nominal catches by Philippines.
  - Industrial longliners from India: The number of longline vessels operating in India is unknown. The Secretariat received information during 2006 that indicates that the number of Indian longliners operating in the Indian Ocean is much higher than that in the IOTC database. This information is yet to be confirmed.
  - Industrial purse seiners from Iran: The catches provided by Iran for its industrial purse seine fleet refer only to the catches of these vessels within the EEZ of Iran. The Secretariat received reports on the activity of Iranian purse seiners in waters beyond the EEZ of Iran. The catches for this fleet are being revised by Iranian scientists.
  - Artisanal fishery of Sri Lanka: the catches for the gillnet and longline fishery of Sri Lanka for 2005 were revised using new data collected through the ongoing NARA-IOTC-OFCF cooperation. The new catches estimates are about half those estimated for previous years. Therefore, it is likely that the catches provided from the early 1990's until 2004 are higher than the actual catches. The catch series for this country will be revised in the early future.
  - Artisanal fisheries of India: The two reports that the Secretariat receive every year regarding the artisanal fisheries of India are very contradictory. The catches recorded for some species differ greatly depending on the source used.

- Catches not reported by species and/or gear

  The Secretariat estimated total catches per species from the data available. This involved the disaggregation of catches not recorded per species or/and gear into the corresponding species or/and gears. The quality of the catches estimated is reduced due to the high amount of catches that are not available per species, notably those for the artisanal fisheries of Indonesia and India.

[2] Note that the Secretariat might be not fully aware of actions implemented by countries concerning these recommendations

- Lack of catch and effort information for non reporting fleets

    - Non-reporting deep-freezing longliners: No information is available at all on the catch and effort per area and month for these fleets.
    - Fresh-tuna longliners: The catch and effort data available for the fresh-tuna longline fleets operating in the Indian Ocean have been collected through several IOTC-OFCF programmes since 2002. The data collected, however, is not as detailed as it is required for industrial fisheries.
    - Non-reporting industrial purse seiners: Catch and effort data are not available for 1994-97 and 2003-05. Thailand has provided catches and effort for this fleet for September-December 2005 although these data needs further validation.
    - Industrial purse seine fishery of Iran: No catch and effort data are available for this fishery.
    - Baitboat fishery of Maldives (***para.13***): Detailed catch and effort data are not available since 1994
    - Many artisanal fisheries: No catch and effort data are available for other important artisanal fisheries lin recent years, notably India, Comoros, Iran, Pakistan and Indonesia.

- Poor quality catch and effort data

    - Longliners from South Korea: The republic of Korea provided new data for 2003-05. Although the new catch and effort data provided are thought more complete the data series for this country is still thought poor quality for some periods and species (mainly billfish).
    - Longliners from Philippines and Belize: The catch and effort data provided are likely to originate from trip reports instead of logbooks which makes it impossible for the Secretariat to assess the catches and effort as per IOTC standards.
    - Non-reporting industrial purse seiners: The catch and effort data available for this fleet for 1998-2002 do not contain information on the species or the type of school caught.
    - Gillnet and longline fishery of Sri Lanka: The catch and effort data provided do not contain information on the areas fished in spite of the fact that some of these vessels are known to operate on the high seas.

- Lack of size frequency data

    - Longliners from Seychelles, Philippines and Belize: No size data are available for these fleets.
    - Non-reporting deep-freezing longliners: No size data are available for this fleet
    - Non-reporting industrial purse seiners: No size data are available for this fleet
    - Industrial purse seine fishery of Iran: No size data are is available for this fleet
    - Baitboat fishery of Maldives (*para.13*): Size data are not available for 1992-2002. The IOTC-OFCF Project provided funds to strengthen the sampling of tunas and other species in remote atolls during 2003 and all data collected were made available at the termination of the Programme. No data are available since 2004.
    - Artisanal fisheries of Oman and Yemen: Size data are only available for the artisanal fishery of Oman during 2003 (IOTC-OFCF). Data are not available for other years.

- Low sample sizes of size frequency data

    - Longline fishery of Japan: The amount of fish measured per area and the spatio-temporal coverage has been decreasing dramatically in recent years.
    - Longline fishery of South Korea: The recent size data reported for this fishery (2003-05) were collected by observers. Few size data are available before 2003.
    - Many artisanal fisheries: The quality of the size data available in the IOTC database for artisanal fisheries is difficult to assess due to it being in an aggregated format. The size of the samples and area covered out of the total area fished are usually unknown.

Para.14 Fact finding mission to Yemen

The trip to Yemen was postponed in several occasions due to the workload at the Secretariat or other reasons (seasonality of fisheries, security issues, Ramadan). A trip is planned after the Scientific Committee meeting. The Secretariat has been trying to contact several people responsible for the implementation of the new catch monitoring system in Yemen (funded through a World Bank Programme) but there has not been any reply to the messages sent. The tentative Terms of Reference for the trip to Yemen are available.

Section 5.2 Review of data on species

Para.17 Need to obtain size data

- Gillnets of Oman and Yemen: No new data are available for fisheries in these countries.
- Baitboats of Maldives: Apart from the data collected in 2003 through the IOTC-OFCF, the Secretariat has not received any size data since 1992. The Secretariat received information from reliable sources indicating that the quality of the statistics produced by Maldives has been decreasing in recent years (e.g. the collection of size data is very limited and restricted to Male and neighbouring atolls).
- Longline fisheries: The amount of size data available from longline fisheries is still low. The collection of length frequency data through observers might, however, improve the situation in the future. China (2005) and Korea (2003-05) have provided size data collected through observers on vessels under its flag.

Para.18 Billfish catches not available per species

- Sri Lanka: The IOTC-OFCF Programme implemented in Sri Lanka through NARA has provided catch estimates for swordfish and marlins in 2005. The catches estimated for 2005 are considerably lower than those estimated for billfish species in previous years. The species composition and total catches for previous years will be estimated as more information becomes available.
- Fresh-tuna longliners of Thailand and Indonesia: The IOTC-OFCF programmes implemented in Indonesia and Thailand had allowed estimating catches per species for billfish and tunas for these fisheries. The catches in previous years were also estimated upon the data collected through these programmes.
- Sport fisheries of Kenya: The IOTC-OFCF has recently implemented a Programme in Kenya intending to collect and computerize all the data available from sport fishing associations in Kenya. It is likely that most of the catch and effort data that will be collected will be for billfish species.

Para.19 Lack of data for temperate tunas from several longline fleets

No new data are available from non-reporting deep-freezing longliners. It is, however, likely that the number of vessels operating and the average catches of albacore per vessel have been decreasing in recent years due to vessels changing to flags of IOTC CPCs and shifts in target species (from albacore to bigeye tuna), respectively.

Para.20 Paucity of data available on by-catch and discards of sharks

The Secretariat has not received any new data on the total amounts of sharks making up the by-catch and/or discards of Indian Ocean fisheries. The data that are currently collected through the observer programmes implemented by IOTC CPCs may become available in the near future.

Para.21 Identify sources of data relating to fisheries targeting sharks

The Secretariat has been sending messages to countries requesting information on the fisheries harvesting sharks and the contact scientists. A distribution list will be developed using the information received.

Para.22 Collection of data on sharks through observer programmes

Para.23 CPCs to make data from existing programmes available

Australia (longline), China (longline), Taiwan,China (longline), Republic of Korea (longline), Indonesia (fresh-tuna longline) and the EC (purse seine and longline) have indicated that they have observer programmes currently operating, although no detailed data have been made available to the Secretariat.

Para.24 Availability of data on species for which the WP carry out assessments

The amount of NC, CE and SF data available both before the deadline and just prior to the SC meeting was less than that recorded for 2004.

Para.25 Availability of data from Taiwanese longline vessels

The catches of fresh-tuna longliners from Taiwan,China are available for 2000-05.

Length frequency data are now available per quarter and 10*20 degrees area for 1980-2003. These data are of key importance for the preparation of Catch-at-Size tables for the species assessed by the IOTC Working Parties.

Section 5.4 Guidelines for IOTC Tuna Fisheries Observer Programmes

Para.40 Collection of detailed catches and effort data from observers

Same as para.22 above

Section 7.1 Report of the Working Party on Tropical Tunas and presentation of Executive Summaries

Para.48 Pre-meeting timetable

The Secretariat prepared all data requested according to the timetable established by the WP.

Para.49 Collection of key biological parameters, notably reproductive activity and sex-ratio by size

New data on the above was presented in WPTT-2006-09. No detailed data are available with the Secretariat.

Para.50 Computer programmes and all input and output files used by WP for assessment made available to the Secretariat

Some computer programs and input and output files are available with the Secretariat

Para.52 The Secretariat to create a set of stock status indicators for the WP and provide updates of the ES before SC meetings

The Secretariat provided the stock status indicators and executive summaries in time

Section 8. Report of the Working Party on Bycatch

Para.62 (Appendix VII) Recommendations from WPBy

1-. Data: Further develop the IOTC Catalogue on non-tuna data holdings: The Secretariat presented the information available in the IOTC databases in document IOTC-2006-WPBy-03.

3-. Current state of knowledge: Ratios of fin to body weight of sharks: The Secretariat received documents presented to other RFB on the estimated values for sharks, some relating to samples collected in the Indian Ocean. The documents are available with the Secretariat.

4-. Availability of data: The amount of data available on the by-catches and discards of sharks and other species is still very poor.

Para.66 Catches of sharks from logbooks and data for Japanese longline training vessels

No new data have been received on the above issues.

Para.67 Information on seabird by-catches

No new data was received by the Secretariat

Para.68 Information on shark, albatross and turtle by-catches by the SBF fishery (CCSBT)

The Secretariat contacted the CCSBT before the WPBy and several documents were made available. Other documents from the CCSBT are confidential but might be released in the early future.

Section 12. Any other business

Para.107 Production of the IOTC Atlas

The Secretariat has estimated catches (in number and weight) per fleet, month and five degrees square for yellowfin tuna, bigeye tuna, skipjack tuna and swordfish for 1950-2005. Maps of these data are currently presented in the Executive Summaries and could be rapidly re-formated for a future atlas.

Para.108 IOTC Draft of Field manual and glossary

Some parts of the IOTC Field Manual are available with the Secretariat in a draft format. The edition of the manual has been outsourced and the costs are covered through funds from the OFCF. The Secretariat will be publishing the different sections in the IOTC web page as they are finalised.

BOX 1: AVAILABITY OF STATISTICS FOR THE IOTC WORKING PARTIES

BLUE MARLIN(BUM)

Retained catches are poorly known for most fisheries due to:

- catches per species not being available for many artisanal (gillnet/longline fishery of Sri Lanka and artisanal fisheries of India) and some industrial (longliners of Indonesia and Philippines) fisheries
- uncertain catches for non-reporting industrial longliners (NEI)
- catches being incomplete for most industrial fisheries for which the blue marlin is seldom the target species. No catches are available for industrial purse seiners although they are known to occur
- conflicting catch reports: The catches for South Korean longliners reported as nominal catches and catches and effort are conflicting, with higher catches recorded in the CE table
- a lack of catch data for several sport fisheries (Kenya, Mauritius, Madagascar).

Discards are unknown for most industrial fisheries, mainly longliners.

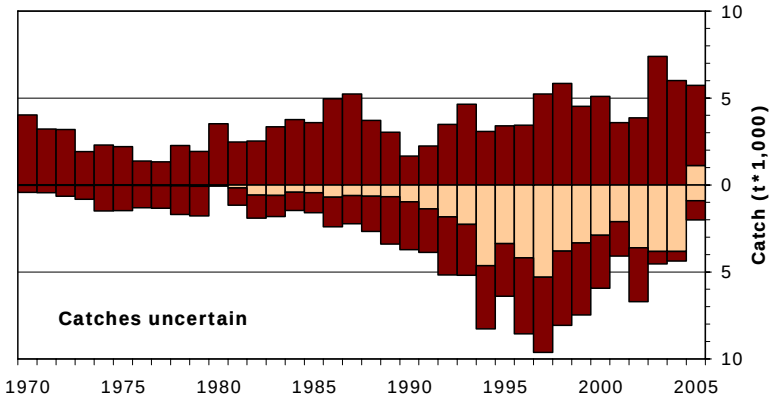


***Figure**. Uncertainty of annual catch estimates for blue marlin. The amount of the catch below the zero-line has been categorised as uncertain according to the criteria given in the text. Light bars represent data for artisanal fleets and dark bars represent data for industrial fleets. Data as of October 2006*

CPUE Series: Catch and effort series are available from some industrial longline fisheries although the catch might be incomplete (the catches of species other than the target are not always recorded in the logbooks). No catch and effort are available from sport fisheries or other artisanal (gillnet/longlines of Sri Lanka) or industrial fisheries (NEI longliners and all purse seiners).

Trends in average weight can only be assessed for the longline fishery of Japan since 1970. The number of specimens measured in recent years is, however, very low.

Catch-at-Size(Age) table: The Secretariat has not built CAS or CAA tables for blue marlin. The paucity of size data available for this species would make it very difficult any attempt to estimate CAS for this species.

BLACK MARLIN (BLM)

Retained catches are poorly known for most fisheries due to:

- catches per species not being available for many artisanal (gillnet/longline fishery of Sri Lanka and artisanal fisheries of India) and some industrial (longliners of Indonesia and Philippines) fisheries
- uncertain catches for non-reporting industrial longliners (NEI)
- catches being incomplete for most industrial fisheries for which the blue marlin is seldom the target species. No catches are available for industrial purse seiners although they are known to occur
- conflicting catch reports: The catches for South Korean longliners reported as nominal catches and catches and effort are conflicting, with higher catches recorded in the CE table
- a lack of catch data for several sport fisheries (Kenya, Mauritius, Madagascar).

Discards are unknown for most industrial fisheries, mainly longliners.

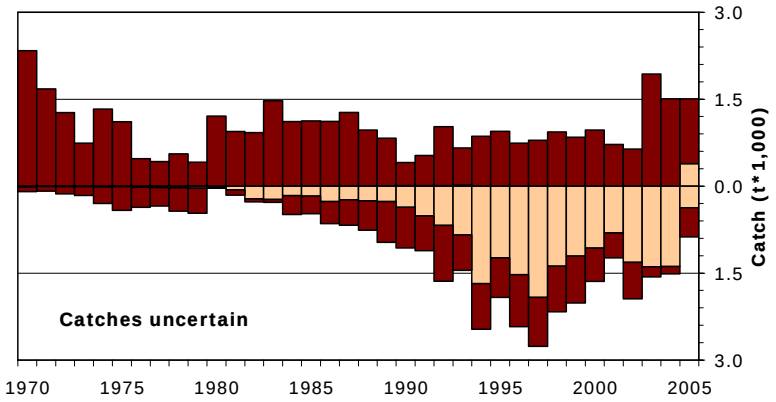


***Figure**. Uncertainty of annual catch estimates for black marlin. The amount of the catch below the zero-line has been categorised as uncertain according to the criteria given in the text. Light bars represent data for artisanal fleets and dark bars represent data for industrial fleets. Data as of October 2006*

CPUE Series: Catch and effort series are available from some industrial longline fisheries although the catch might be incomplete (the catches of species other than the target are not always recorded in the logbooks). No catch and effort are available from sport fisheries or other artisanal (gillnet/longlines of Sri Lanka) or industrial fisheries (NEI longliners and all purse seiners).

Trends in average weight can only be assessed for the longline fishery of Japan since 1970. The amount of specimens measured in recent years is, however, very low.

Catch-at-Size(Age) table: The Secretariat has not built CAS or CAA tables for black marlin. The paucity of size data available for this species would make it very difficult any attempt to estimate CAS for this species.

STRIPED MARLIN(MLS)

Retained catches are reasonably well known; catches are uncertain because:

- catches per species is not not available for some industrial fisheries (longliners of Indonesia and Philippines).
- uncertain catches for non-reporting industrial longliners (NEI)
- catches are believed to be incomplete for most industrial fisheries for which the blue marlin is seldom the target species. No catches are available for industrial purse seiners although they are known to occur
- conflicting catch reports: The catches for South Korean longliners reported as nominal catches and catches and effort are conflicting, with higher catches recorded in the CE table
- a lack of catch data from several sport fisheries (Kenya, Mauritius, Madagascar) and from artisanal fisheries, although the latter are presumed to be low.

Discards are believed to be low although they are unknown for most industrial fisheries, mainly longliners.

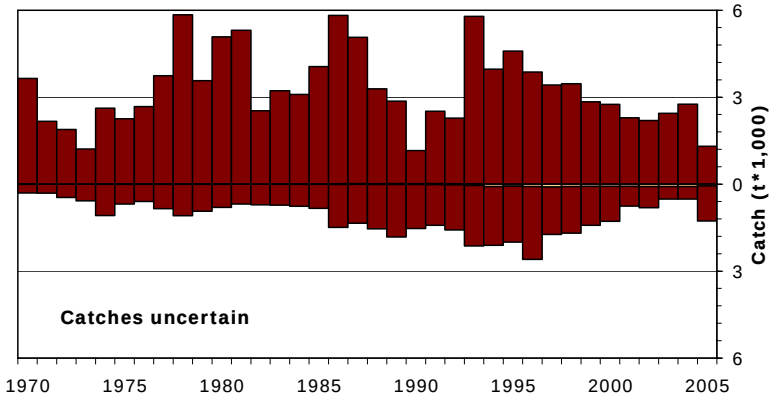


***Figure**. Uncertainty of annual catch estimates for stripped marlin. The amount of the catch below the zero-line has been categorised as uncertain according to the criteria given in the text. Light bars represent data for artisanal fleets and dark bars represent data for industrial fleets. Data as of October 2006*

CPUE Series: Catch and effort series are available from some industrial longline fisheries although the catches might be incomplete (the catches of species other than the target are not always recorded in the logbooks). No catch and effort are available from sport fisheries or industrial fisheries (NEI longliners and all purse seiners).

Trends in average weight can only be assessed for the longline fishery of Japan since 1970. The amount of specimens measured in recent years is, however, very low.

Catch-at-Size(Age) table: The Secretariat has not built CAS or CAA tables for striped marlin. The paucity of size data available for this species would make it very difficult any attempt to estimate CAS for this species.

INDO-PACIFIC SAILFISH (SFA)

Retained catches are poorly known for most fisheries due to:

- catches per species not being available for many artisanal fisheries (mainly India and Indonesia)
- conflicting catch reports: The Secretariat receives two reports from Sri Lanka containing conflicting catch values for this species
- catches being very incomplete for most industrial fisheries for which this species is a by-catch. No catches are available for industrial purse seiners although they are known to occur
- catches being incomplete for many artisanal fisheries (gillnets of Pakistan, pole and lines of Maldives) due to under-reporting.
- a lack of catch data for several sport fisheries (Kenya, Mauritius, Madagascar).

Discards are unknown for most industrial fisheries, mainly longliners (for which they are presumed to be high).

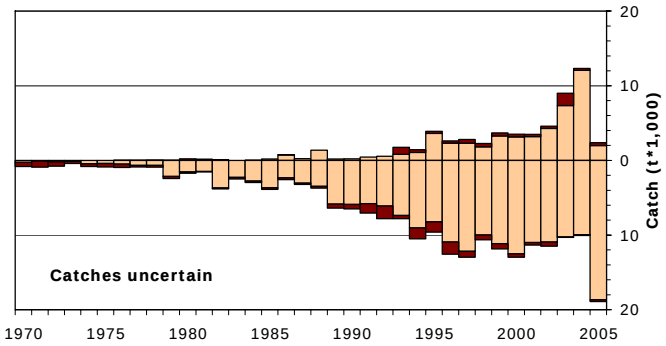


***Figure**. Uncertainty of annual catch estimates for Indo-Pacific sailfish. The amount of the catch below the zero-line has been categorised as uncertain according to the criteria given in the text. Light bars represent data for artisanal fleets and dark bars represent data for industrial fleets. Data as of October 2006*

CPUE Series: Catch and effort series are available from some industrial longline fisheries but they are believed to be poor quality (catches of marlins are incomplete). No catch and effort are available from sport fisheries. The catch and effort that are available from artisanal fisheries are believed inaccurate (poor quality effort data for the gillnet/longline fishery of Sri Lanka).

Trends in average weight can only be assessed for the longline fishery of Japan since 1970 and the gillnet/longline fishery of Sri Lanka since the late 80s. The amount of specimens measured is, however, very low. Furthermore, the specimens discarded might be not accounted for in industrial fisheries, where they are presumed to be of lower size (possible bias of existing samples).

Catch-at-Size(Age) table: The Secretariat has not built CAS or CAA tables for Indo-Pacific sailfish. The paucity of size data available for this species would make it very difficult any attempt to estimate CAS for this species.

SHORT-BILLED SPEARFISH (SSP)

Retained catches are unknown as almost no catches are available for this species due to:

- the catches being very incomplete for most industrial fisheries for which this species is a by-catch. No catches are available for industrial purse seiners although they are presumed to occur
- the catches being incomplete for most artisanal fisheries due to miss-labelling (specimens recorded as other billfish or not recorded per species) and under-reporting
- a lack of catch data for several sport fisheries (Kenya, Mauritius, Madagascar).

The overall lack of information makes it very difficult for the Secretariat to attempt to estimate total catches for this species.

Discards are unknown for most industrial fisheries, mainly longliners, where they are presumed high.

CPUE Series: Catch and effort are seldom available from industrial longline fisheries and the catches are believed incomplete. No catch and effort are available from other fisheries.

Trends in average weight can only be assessed for the longline fishery of Japan since 1970. The amount of specimens measured is, however, very low. Furthermore, the specimens discarded might be not accounted for, where they are presumed to be of lower size (possible bias of existing samples).

Catch-at-Size(Age) table: The Secretariat has not built CAS or CAA tables for short-billed spearfish. The paucity of catch and size data available for this species would make it very difficult any attempt to estimate CAS for this species.

BOX 2: ESTIMATION OF CATCHES OF NON-REPORTING FLEETS

A/ NON REPORTING FRESH TUNA LONGLINE FLEETS

Figure 5: Number of non-reporting fresh-tuna longliners operating in the Indian Ocean from 1973-2004

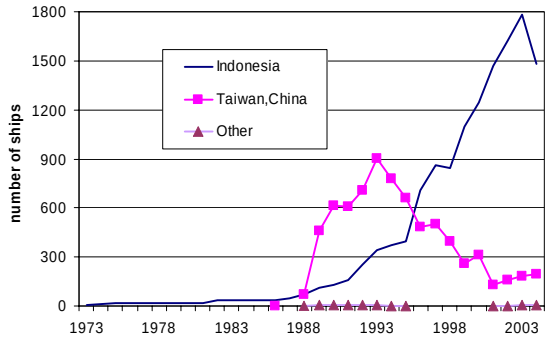
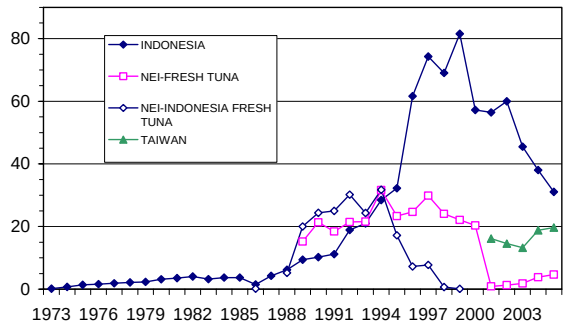


Figure 6: Estimated catches in the Indian Ocean of non-reporting fresh tuna longliners per flag country



The number of non-reporting fresh tuna longliners operating in the Indian Ocean sharply increased since the mid-eighties, topping at about 2,000 vessels in 2003. Almost all longliners operate under the Indonesian flag in recent years, with some still under the Taiwan,China flag. The drop in the number of Taiwanese vessels and catches observed since 1993 is due to re-flagging of many vessels to Indonesia. Taiwan,China is currently estimating catches for its fresh-tuna longline fleet. The catches estimated for 2001-05 are close to those that the Secretariat was estimating before for these vessels (Figure 7).

The estimation of number of vessels and catches has been improving over time, mainly thanks to the information collected through the Sampling Programs implemented by the IOTC in key ports of landing of these vessels in the Indian Ocean. The amount of historical and current information so far collected through these cooperation schemes has helped to improve the estimates in Thailand, Malaysia, Sri Lanka and Indonesia. The collection of past information should continue to allow better estimates of historical catches in countries like Indonesia.

Current catches have been estimated at about 60,000 tonnes, mostly yellowfin tuna (YFT) and bigeye tuna (BET).

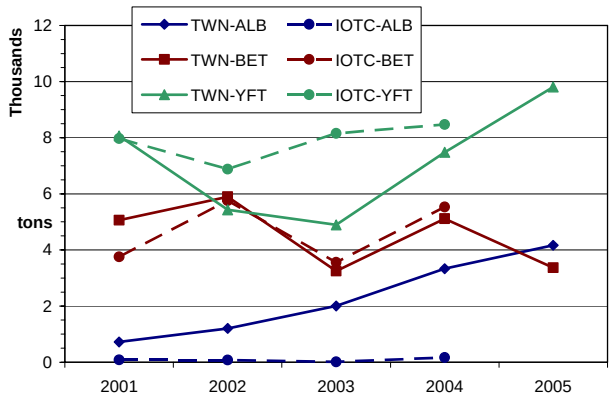


Figure 7: Catches available for Taiwanese fresh-tuna longliners for 2001-05 *versus* the catches previously estimated by the Secretariat

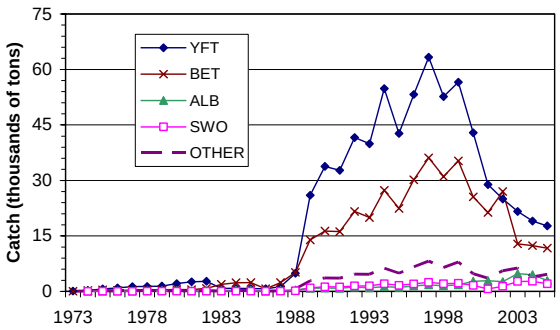


Figure 8: Total catches per species in the Indian Ocean estimated for non-reporting fresh tuna lonfline fleets

B/ NON REPORTING DEEP-FREEZING LONGLINE FLEETS

Figure 9: Number of non-reporting deep-freezing longliners estimated to operate in the Indian Ocean (per flag country)

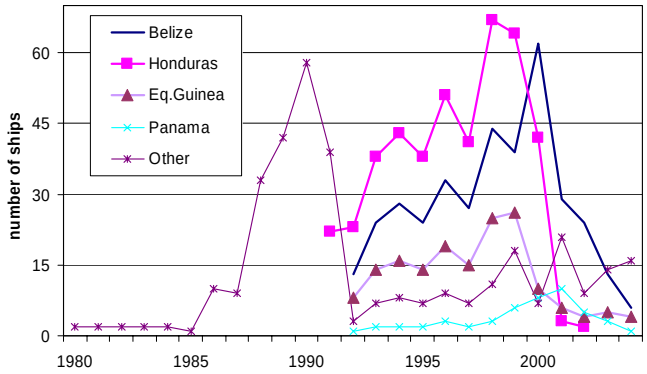
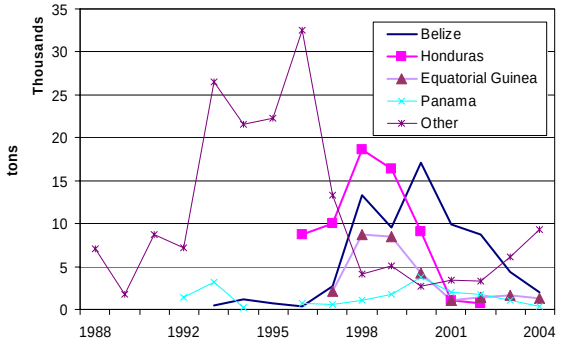


Figure 10: Estimated catches of non-reporting deep-freezing longliners according to the flag of operation



The numbers of non-reporting deep-freezing longliners by flag are estimated by using data collected from various sources. The main sources for these data are the fishing craft statistics and the lists of active vessels. No catches have been estimated for 2005 yet. The main reason is that the Secretariat is waiting to complete the lists of active vessels with information reported from parties regarding the vessels calling to its ports and the catches unloaded.

The total number of longliners estimated to operate in recent years amount to about 30, with total catches estimated at 15,000 tonnes. Honduras, Belize, Equatorial Guinea and Panama were the flags most used by non-reporting longliners over the last decade with an increasing number of vessels operating under other flags as Togo, Mongolia, Namibia, Cambodia, Bolivia and Georgia in recent years. The catch series was estimated according to average catches per vessel and species composition for the Taiwanese or Spanish fleet during that period, assuming that most of the vessels operating under flags of non-reporting countries operate as the vessels from Taiwan,China or Spain, respectively. Although there are many indications to support this, the assumption that the vessels from non-reporting countries are exploiting the same spatio-temporal strata than the Taiwanese or Spanish over time could be wrong for some flags or periods.

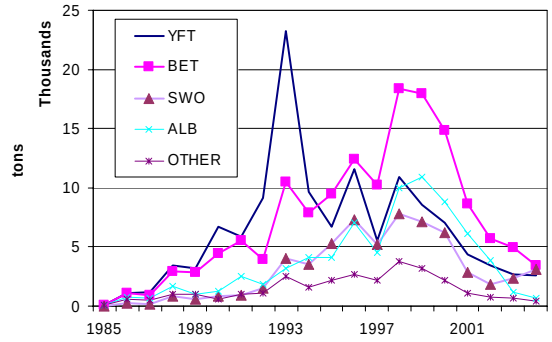


Figure 11: Total catches per species in the Indian Ocean estimated for non-reporting deep-freezing lonfline fleets

The lack of catch and effort and size frequency records regarding non-reporting vessels is of concern.

The dramatic drop in the number of non reporting longliners vessels operating and catches estimated since 2001 is not fully understood. This could be due to the re-flagging of vessels recorded before under this category to flags of reporting countries. The increase in the number of longliners operating in the Indian Ocean reported by Seychelles and Philippines in recent years would support this assumption. The low catches reported by both countries, however, are thought not to account for this dramatic increase in the number of vessels operating. It is, therefore, likely that the catches recorded since 2001 for these two countries have to be updated once that more information become available.

C/ NON REPORTING INDUSTRIAL PURSE SEINE FLEETS

Between 6 and 11 non-reporting purse seiners have been operating in the Indian Ocean since 1995 under several flags. The catches of these vessels, mainly of skipjack, have been ranging between 30,000 and 40,000 tonnes.

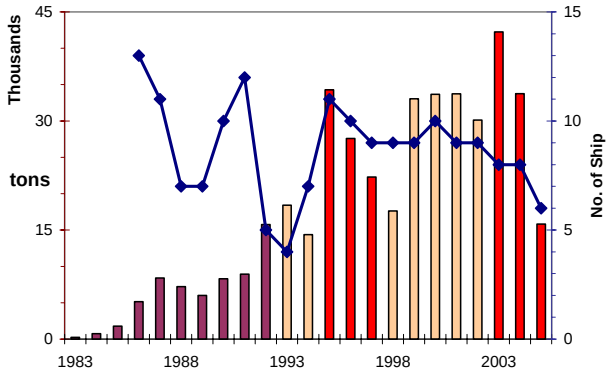
The catches were estimated from two different sources:

- No catch data available (1995-97; 2003-August 2005): The estimate was conducted taking into account past average catch rates for the Soviet Union fleet (to which most of these vessels belonged to) and species composition for the European fleet, assuming that the two fleets exploit the same areas. This assumption could be biased for periods in which the European vessels operate in the EEZs of third countries, which could not be the case with the ex-Soviet vessels.
- Catch data available (1998-2002): The total catches and number of sets per day and area (1 degree square) were provided for the period 1998-2002[3]. The catches of EC purse seiners were used to estimate catches per species and type of set (free or log school). The catches estimated for these years are thought more accurate.

The catches for these vessels are, since September 2005, monitored by Thailand. The first catches provided are thought good quality as far as total catches are concerned but the species composition might be not fully precise, especially concerning the catches of yellowfin tuna and bigeye tuna. Both species are difficult to identify in their juvenile stage and the catches recorded in the logbooks usually need to be adjusted by using alternate data (e.g. data collected through port sampling).

Detailed information about the fleet and catch estimates of non-reporting fleets has been provided in documents presented to the species Working Parties since 2000.

Figure 12: Number of ships and total catches per species in the Indian Ocean estimated for non-reporting industrial purse seine fleets



The catches of Soviet vessels (brown pattern) are also shown for reference

The catches of NEI-PS are shown in red or light orange depending on the estimation procedure (see text on the right)

[3] Catches for 1997 and 2003 were also provided although only for several months.

BOX 3: SRI LANKA AND YEMEN

Tuna and tuna-like fisheries in **Sri Lanka** initiated well before 1950. Catches are available for Sri Lanka since 1950. Nevertheless. the catches gathered at the IOTC Secretariat for this country were considered very poor quality due to the following reasons:

- Catches incomplete, especially in the early years of the fishery.
- Dramatic discrepancies between catches reported by the National Aquatic Resources and Development Agency (NARA) and the Statistical Unit of the Ministry of Fisheries and Aquatic Resources (MOFAR), the two institutions reporting catches to the IOTC.
- Catches highly aggregated per gears and/or species
- Mislabelling, mainly of billfish species

Although the information collected through the recently implemented IOTC/OFCF/NARA sampling is not considered complete and the catches estimated using this information are very preliminary the estimates tend to indicate that the previous catch figures might be dramatically higher than the real catches, mainly due to an overestimation of vessel numbers and its activity (effort).

The catches of swordfish, marlins, skipjack tuna and yellowfin tuna might be affected if the above is confirmed true.

Figure 13 shows the new catches estimated for the gillnet and longline fishery of Sri Lanka in 2005 versus the catches in the IOTC database for 2004 and previous years.

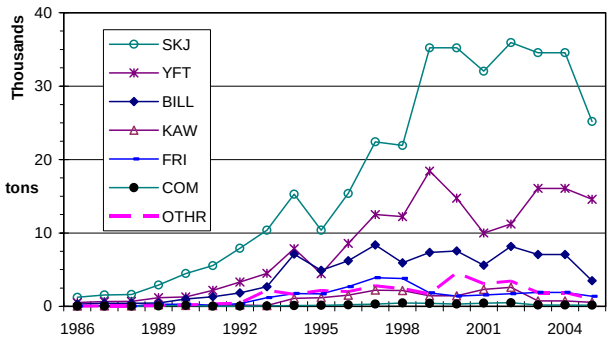


Figure 13 (right): Total catches per species in the Indian Ocean estimated for the gillnet and longline fishery operating in Sri Lanka in 2005 and catches in the IOTC database for previous years

The IOTC Secretariat estimated in 2005 the catches of artisanal boats operating in Yemen for 1950-2004. The new catches estimated are probably more realistic than the previous although they are still uncertain due to the scarce information available and numerous assumptions needed to complete the series. More details about the estimation were provided in a document presented to the latest Working Party on Tropical Tunas (IOTC-2005-WPTT-06). The new catches of yellowfin estimated are more than 30 times higher than those previously in the IOTC database. No new information on the fisheries in Yemen was available at the time of this report.

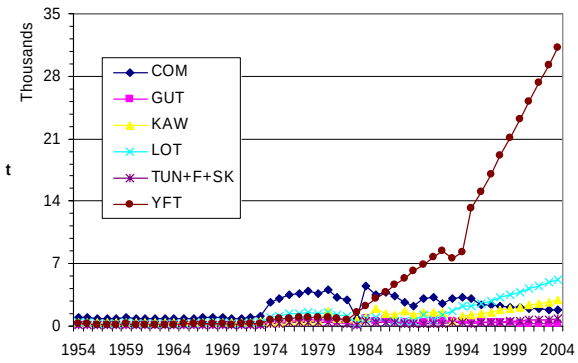


Figure 14: Total catches per species in the Indian Ocean estimated for the artisanal fishery operating in Yemen

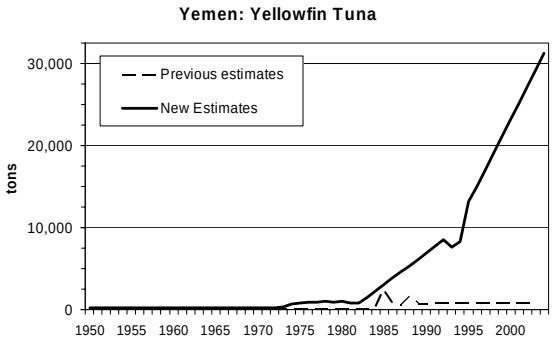
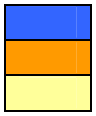


Figure 15: New versus previous catches of yellowfin tuna estimated for Yemen (1950-2004)

IOTC Data Catalogue/
Catalogue des données CTOI

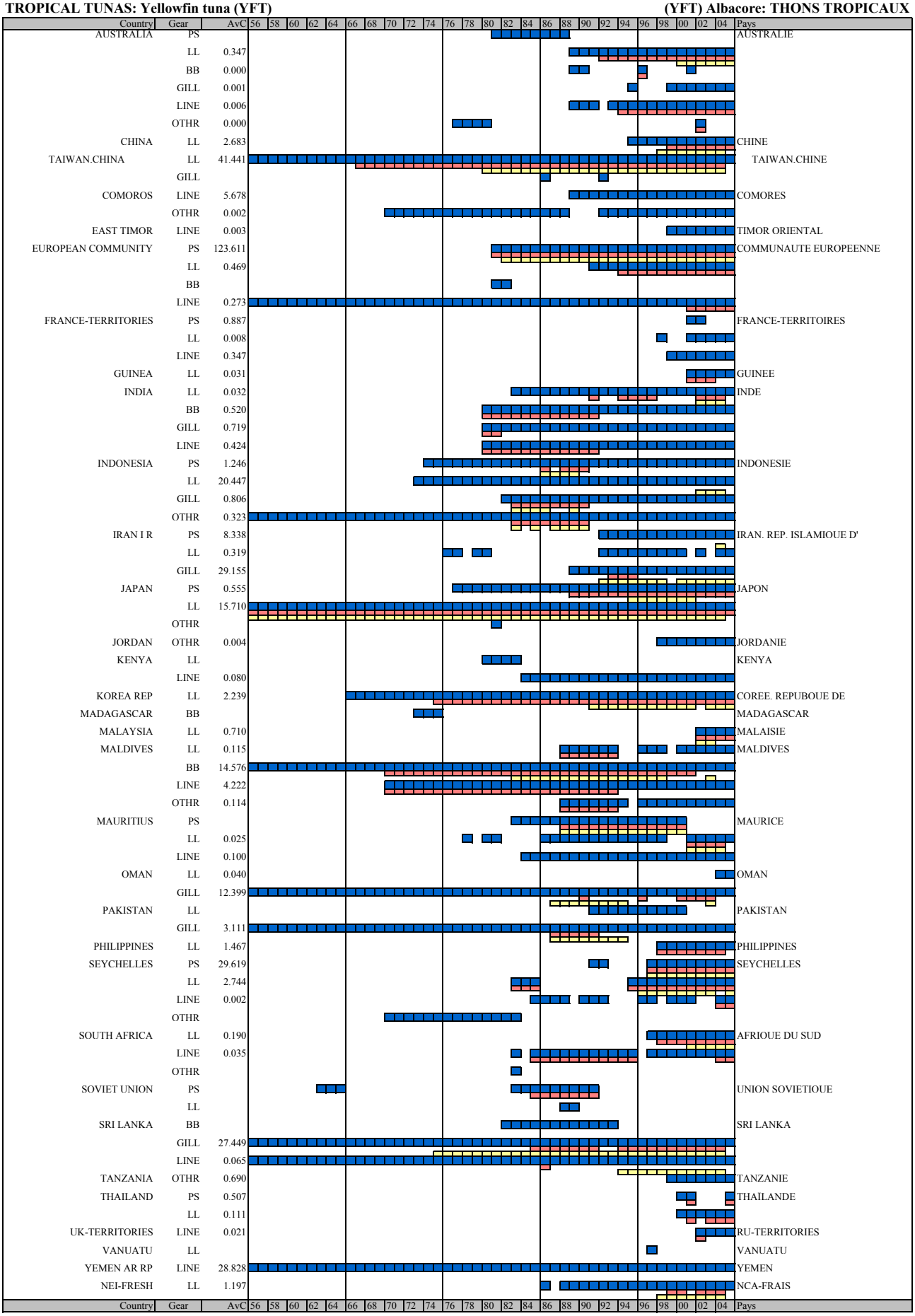
Legend:

AvC	Average Catches 2001-2005 (thousands of tonnes) Prises moyennes 2001-2005 (milliers de tonnes)
	Availability of Nominal Catches Data / Donnees de Captures Nominales Disponibles Availability of Catch and Effort Data / Donnees de Captures et Effort Disponibles Availability of Size Frequency Data / Donnees de Frequences de Taille Disponibles

CATALOGUE OF IOTC NOMINAL CATCHES, CATCH AND EFFORT AND SIZE FREQUENCY STATISTICS

CATALOGUE DES CAPTURES NOMINALES ET DES STATISTIQUES DE CAPTURE ET EFFORT ET DE DISTRIBUTION DE TAILLE A LA CTOI

TROPICAL TUNAS: Yellowfin tuna (YFT) **(YFT) Albacore: THONS TROPICAUX**



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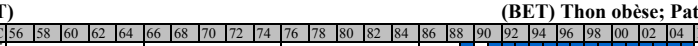
CATALOGUE DES CAPTURES NOMINALES ET DES STATISTIQUES DE CAPTURE ET EFFORT ET DE DISTRIBUTION DE TAILLE A LA CTOI

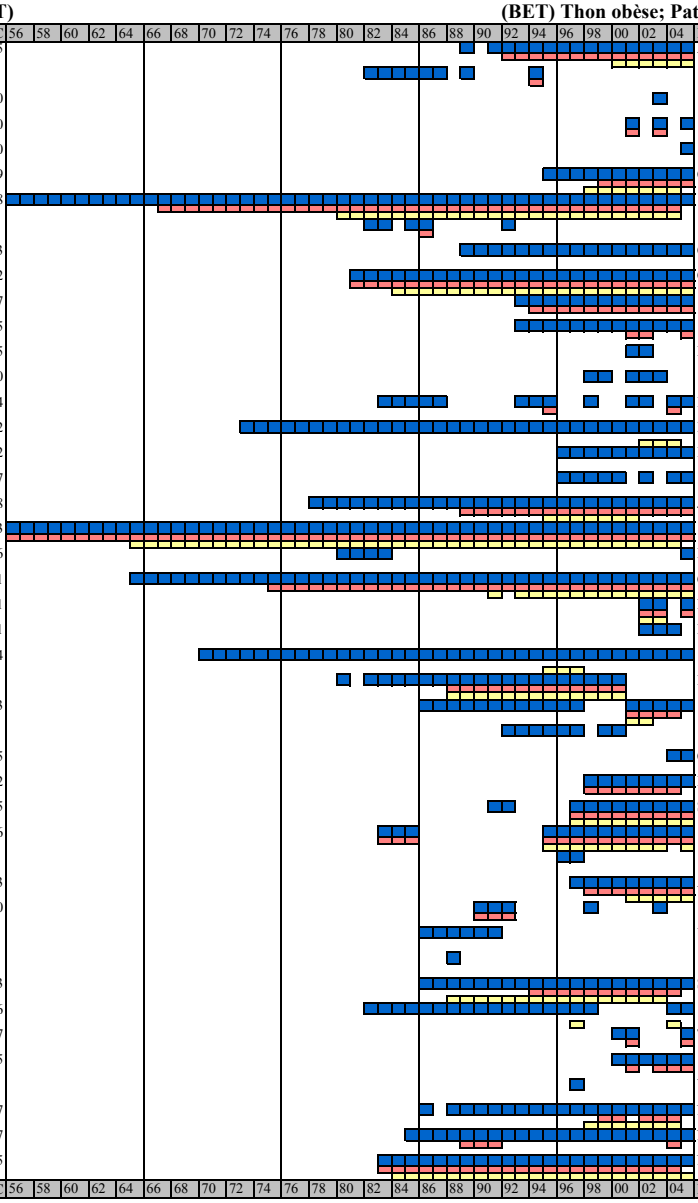
TROPICAL TUNAS: Yellowfin tuna (YFT) **(YFT) Albacore: THONS TROPICAUX**

Country	Gear	AvC	Pays
NEI-FROZEN	LL	2.930	NCA-CONGELE
NOT ELSEWHERE INCLUDED	PS	20.830	NON COMPRIS AILLEURS



TROPICAL TUNAS: Bigeye tuna (BET) **(BET) Thon obèse; Patudo: THONS TROPICAUX**

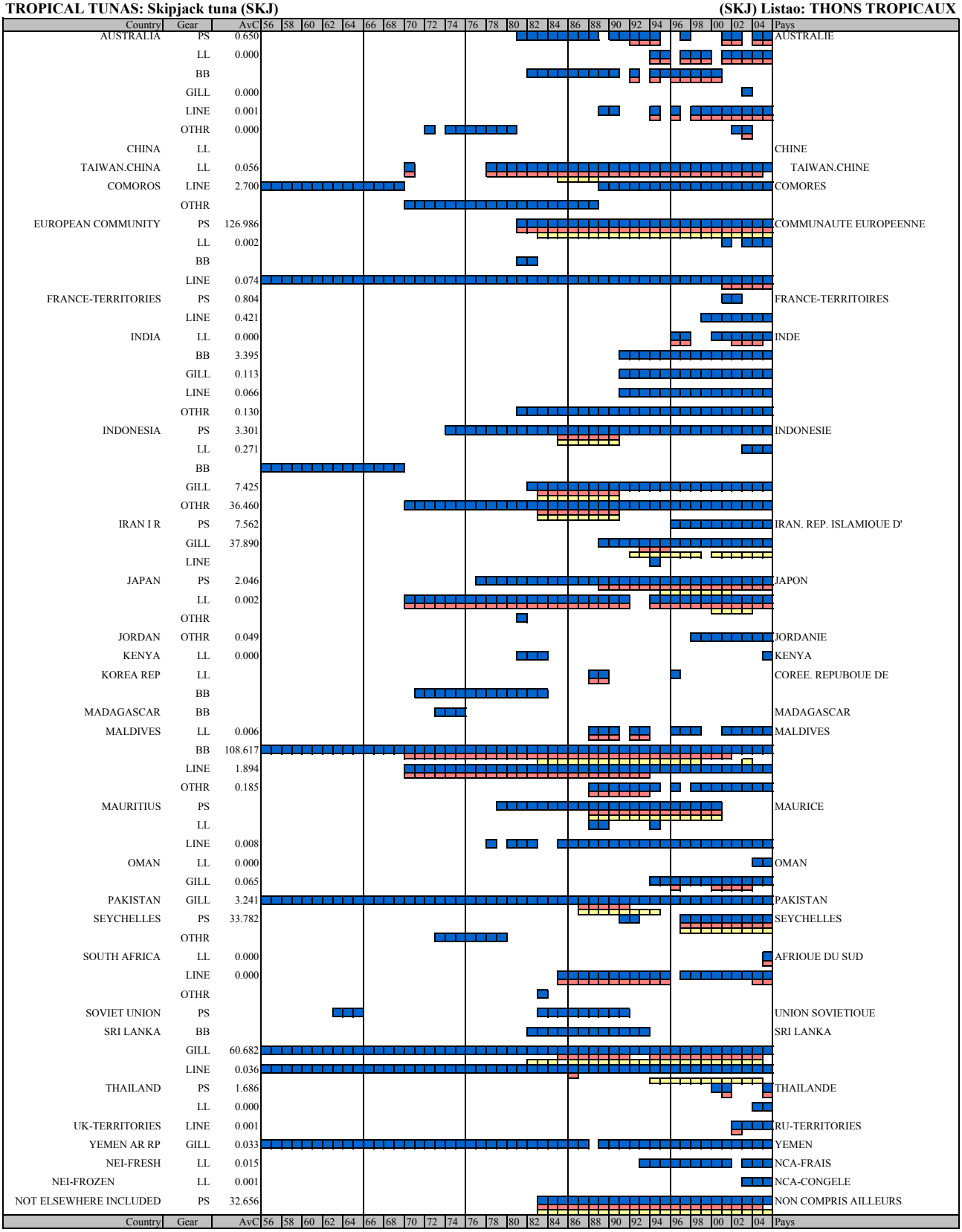
Country	Gear	AvC	Pays
AUSTRALIA	LL	0.275	AUSTRALIE
	BB		
	GILL	0.000	
	LINE	0.000	
	OTHR	0.000	
CHINA	LL	5.509	CHINE
TAIWAN,CHINA	LL	49.888	TAIWAN,CHINE
	GILL		
COMOROS	LINE	0.033	COMORES
EUROPEAN COMMUNITY	PS	15.902	COMMUNAUTE EUROPEENNE
	LL	0.467	
	LINE	0.005	
FRANCE-TERRITORIES	PS	0.115	FRANCE-TERRITOIRES
	LL	0.000	
INDIA	LL	0.004	INDE
INDONESIA	LL	15.882	INDONESIE
IRAN I R	PS	0.202	IRAN, REP. ISLAMIQUE D'
	LL	0.037	
JAPAN	PS	0.668	JAPON
	LL	11.763	
KENYA	LL	0.006	KENYA
KOREA REP	LL	1.531	COREE. REPUBOUE DE
MALAYSIA	LL	0.231	MALAISIE
MALDIVES	LL	0.101	MALDIVES
	BB	1.054	
MAURITIUS	PS		MAURICE
	LL	0.013	
	LINE		
OMAN	LL	0.025	OMAN
PHILIPPINES	LL	1.132	PHILIPPINES
SEYCHELLES	PS	3.805	SEYCHELLES
	LL	3.866	
	LINE		
SOUTH AFRICA	LL	0.143	AFRIQUE DU SUD
	LINE	0.000	
SOVIET UNION	PS		UNION SOVIETIOUE
	LL		
SRI LANKA	GILL	0.063	SRI LANKA
	LINE	0.056	
THAILAND	PS	0.347	THAILANDE
	LL	0.085	
VANUATU	LL		VANUATU
NEI-FRESH	LL	0.787	NCA-FRAIS
NEI-FROZEN	LL	4.627	NCA-CONGELE
NOT ELSEWHERE INCLUDED	PS	3.765	NON COMPRIS AILLEURS



CATALOGUE OF IOTC NOMINAL CATCHES, CATCH AND EFFORT AND SIZE FREQUENCY STATISTICS

CATALOGUE DES CAPTURES NOMINALES ET DES STATISTIQUES DE CAPTURE ET EFFORT ET DE DISTRIBUTION DE TAILLE A LA CTOI

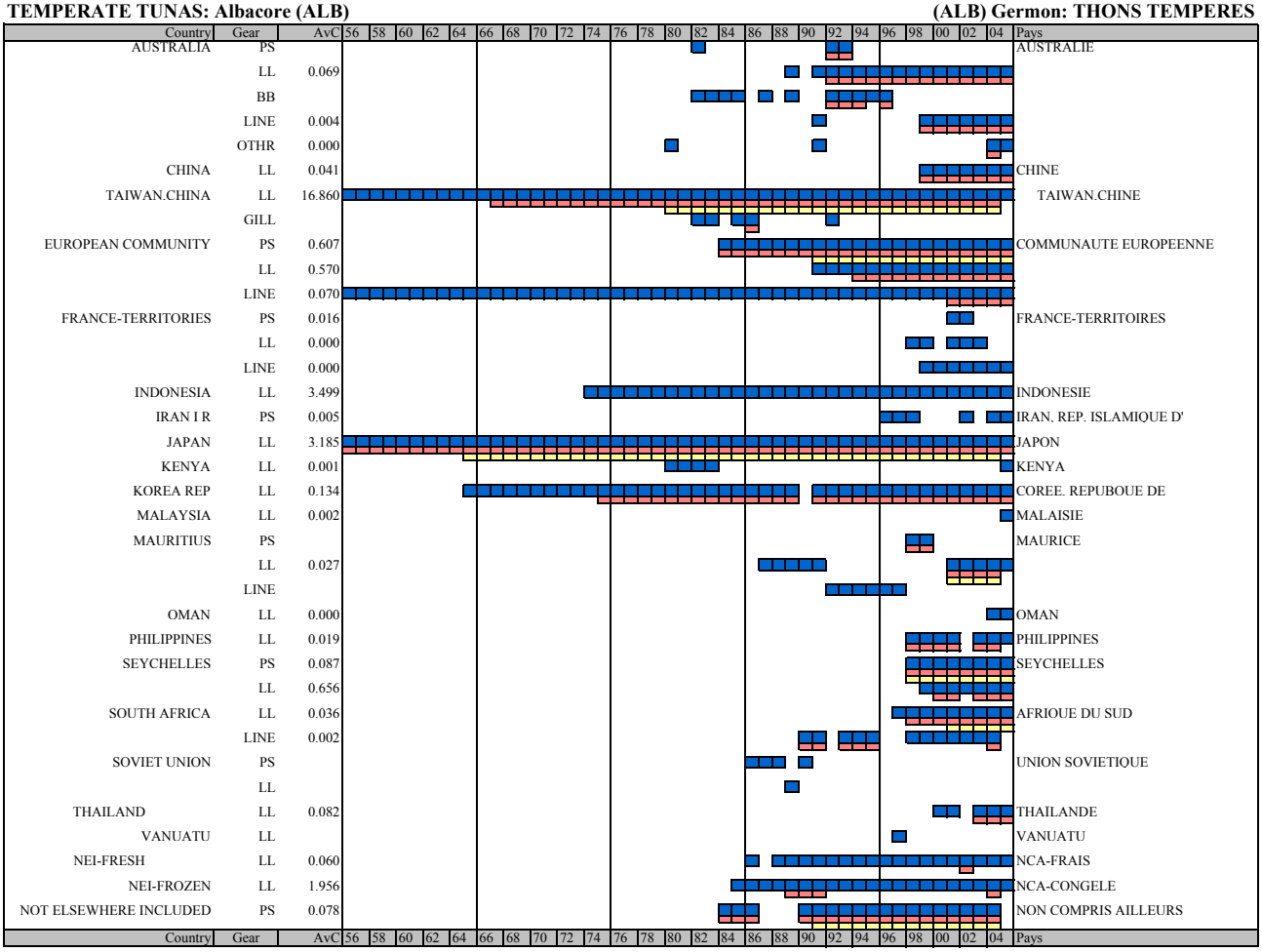
TROPICAL TUNAS: Skipjack tuna (SKJ) **(SKJ) Listao: THONS TROPICAUX**



CATALOGUE OF IOTC NOMINAL CATCHES, CATCH AND EFFORT AND SIZE FREQUENCY STATISTICS

CATALOGUE DES CAPTURES NOMINALES ET DES STATISTIQUES DE CAPTURE ET EFFORT ET DE DISTRIBUTION DE TAILLE A LA CTOI

TEMPERATE TUNAS: Albacore (ALB) **(ALB) Germon: THONS TEMPERES**



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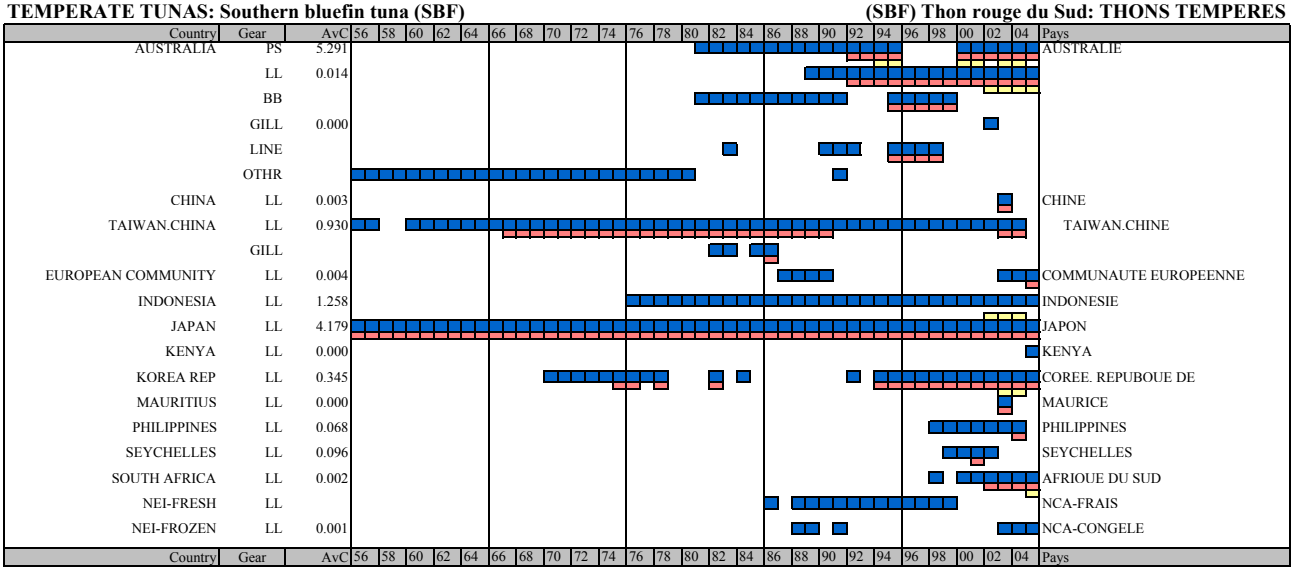
CATALOGUE DES CAPTURES NOMINALES ET DES STATISTIQUES DE CAPTURE ET EFFORT ET DE DISTRIBUTION DE TAILLE A LA CTOI

TEMPERATE TUNAS: Southern bluefin tuna (SBF) **(SBF) Thon rouge du Sud: THONS TEMPERES**



NERITIC TUNAS: Kawakawa, Frigate and Bullet tunas (KAW, FRI, BLT)

(KAW, FRI, BLT) Thonine orientale, Auxide et Bonitou :THONS NERITIQUES

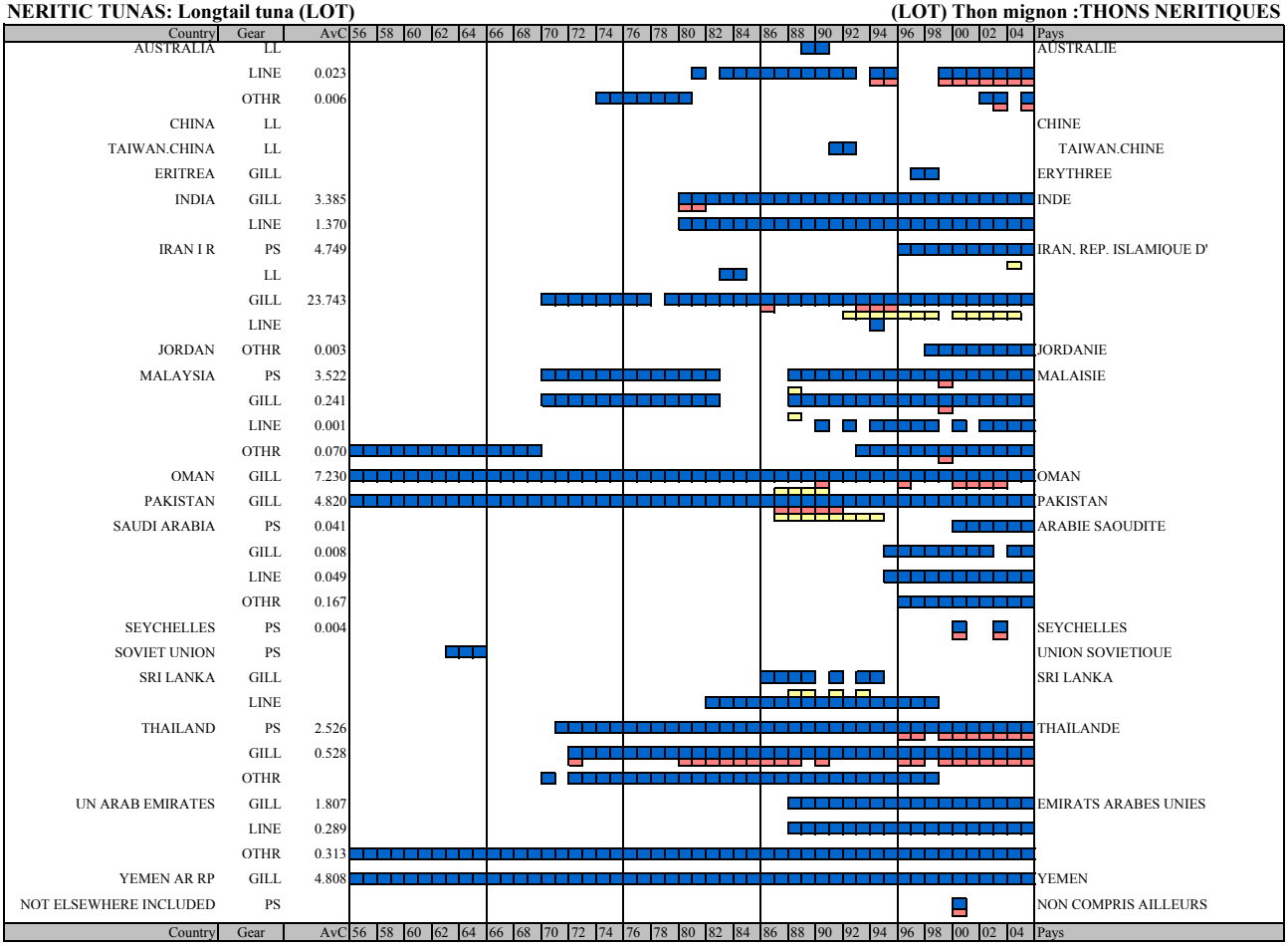
Country	Gear	AvC	Pays
AUSTRALIA	PS		AUSTRALIE
	BB		
	LINE	0.001	
	OTHR	0.000	
COMOROS	LINE	0.184	COMORES
	OTHR		
EGYPT	OTHR	0.354	EGYPTE
ERITREA	GILL	0.007	ERYTHREE
EUROPEAN COMMUNITY	PS	0.334	COMMUNAUTE EUROPEENNE
	LL	0.000	
	LINE	0.023	
INDIA	PS	2.045	INDE
	LL	0.000	
	GILL	19.488	
	LINE	9.619	
	OTHR	4.600	
INDONESIA	GILL	0.269	INDONESIE
	OTHR	8.663	
IRAN I R	PS		IRAN. REP. ISLAMIOUE D'
	LL		
	GILL	14.286	
	LINE		
ISRAEL	OTHR		ISRAEL
JORDAN	OTHR	0.043	JORDANIE
MALAYSIA	PS	8.216	MALAISIE
	GILL	0.077	
	LINE	0.001	
	OTHR	0.070	
MALDIVES	LL	0.002	MALDIVES
	BB	5.757	
	LINE	0.753	
	OTHR	0.090	
OMAN	GILL	2.398	OMAN
PAKISTAN	GILL	1.627	PAKISTAN
SAUDI ARABIA	PS	0.004	ARABIE SAOUDITE
	LL	0.000	
	GILL	0.269	
	LINE	0.132	
	OTHR	0.096	
SEYCHELLES	PS	0.071	SEYCHELLES
	GILL		
	LINE	0.081	
	OTHR		
SOUTH AFRICA	LINE	0.000	AFRIOUE DU SUD
SOVIET UNION	PS		UNION SOVIETIOUE
SRI LANKA	PS	0.978	SRI LANKA
	BB		
	GILL	3.396	
	LINE	0.013	
THAILAND	PS	7.372	THAILANDE
	GILL	0.061	
	OTHR		
UK-TERRITORIES	LINE	0.001	RU-TERRITORIES
UN ARAB EMIRATES	GILL	0.840	EMIRATS ARABES UNIES
	LINE	0.134	
	OTHR	0.145	
YEMEN AR RP	GILL	2.718	YEMEN
NOT ELSEWHERE INCLUDED	PS	0.154	NON COMPRIS AILLEURS

Country | Gear | AvC | Pays

CATALOGUE OF IOTC NOMINAL CATCHES, CATCH AND EFFORT AND SIZE FREQUENCY STATISTICS

CATALOGUE DES CAPTURES NOMINALES ET DES STATISTIQUES DE CAPTURE ET EFFORT ET DE DISTRIBUTION DE TAILLE A LA CTOI

NERITIC TUNAS: Longtail tuna (LOT) **(LOT) Thon mignon :THONS NERITIQUES**



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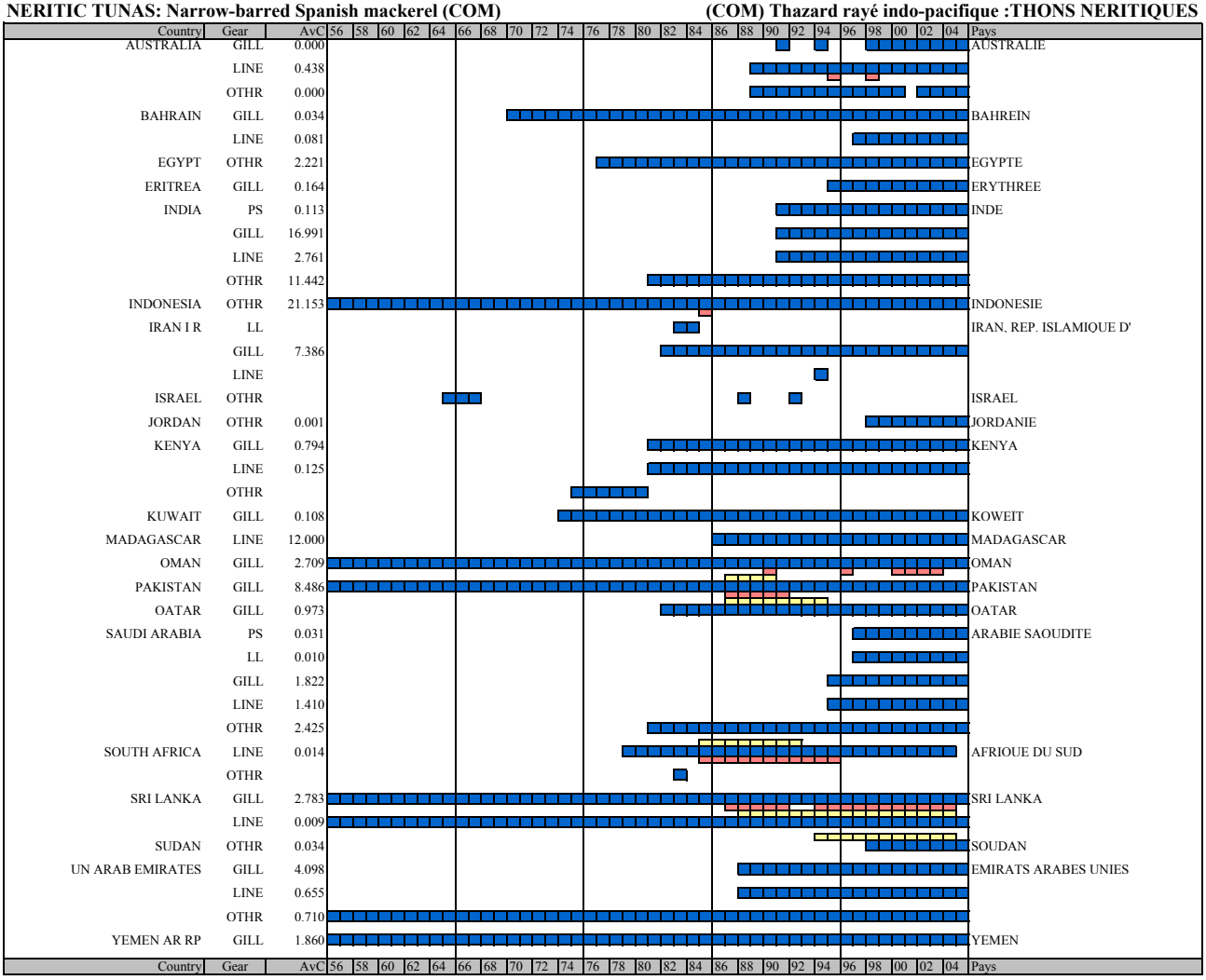
CATALOGUE DES CAPTURES NOMINALES ET DES STATISTIQUES DE CAPTURE ET EFFORT ET DE DISTRIBUTION DE TAILLE A LA CTOI

NERITIC TUNAS: Narrow-barred Spanish mackerel (COM) **(COM) Thazard rayé indo-pacifique :THONS NERITIQUES**



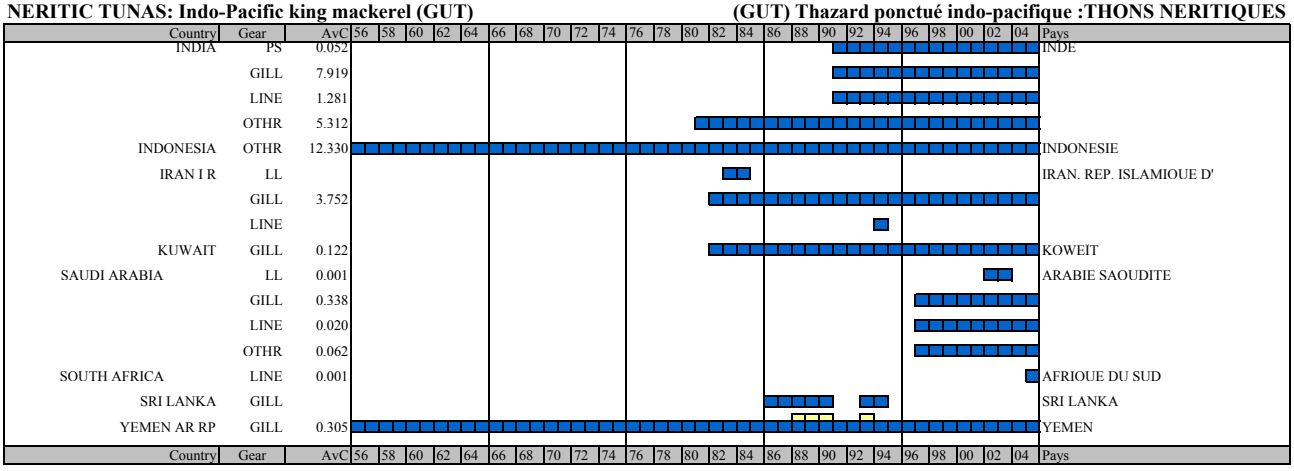
Country	Gear	AvC	Pays
AUSTRALIA	GILL	0.000	AUSTRALIE
	LINE	0.438	
	OTHR	0.000	
BAHRAIN	GILL	0.034	BAHREIN
	LINE	0.081	
EGYPT	OTHR	2.221	EGYPTE
ERITREA	GILL	0.164	ERYTHREE
INDIA	PS	0.113	INDE
	GILL	16.991	
	LINE	2.761	
	OTHR	11.442	
INDONESIA	OTHR	21.153	INDONESIE
IRAN I R	LL		IRAN. REP. ISLAMIQUE D'
	GILL	7.386	
	LINE		
ISRAEL	OTHR		ISRAEL
JORDAN	OTHR	0.001	JORDANIE
KENYA	GILL	0.794	KENYA
	LINE	0.125	
	OTHR		
KUWAIT	GILL	0.108	KOWEIT
MADAGASCAR	LINE	12.000	MADAGASCAR
OMAN	GILL	2.709	OMAN
PAKISTAN	GILL	8.486	PAKISTAN
OATAR	GILL	0.973	OATAR
SAUDI ARABIA	PS	0.031	ARABIE SAOUDITE
	LL	0.010	
	GILL	1.822	
	LINE	1.410	
	OTHR	2.425	
SOUTH AFRICA	LINE	0.014	AFRIOUE DU SUD
	OTHR		
SRI LANKA	GILL	2.783	SRI LANKA
	LINE	0.009	
SUDAN	OTHR	0.034	SOUDAN
UN ARAB EMIRATES	GILL	4.098	EMIRATS ARABES UNIES
	LINE	0.655	
	OTHR	0.710	
YEMEN AR RP	GILL	1.860	YEMEN

56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 00 02 04

CATALOGUE OF IOTC NOMINAL CATCHES, CATCH AND EFFORT AND SIZE FREQUENCY STATISTICS

CATALOGUE DES CAPTURES NOMINALES ET DES STATISTIQUES DE CAPTURE ET EFFORT ET DE DISTRIBUTION DE TAILLE A LA CTOI

NERITIC TUNAS: Indo-Pacific king mackerel (GUT) **(GUT) Thazard ponctué indo-pacifique :THONS NERITIQUES**



Country	Gear	AvC	Pays
INDIA	PS	0.052	INDE
	GILL	7.919	
	LINE	1.281	
	OTHR	5.312	
INDONESIA	OTHR	12.330	INDONESIE
IRAN I R	LL		IRAN. REP. ISLAMIQUE D'
	GILL	3.752	
	LINE		
KUWAIT	GILL	0.122	KOWEIT
SAUDI ARABIA	LL	0.001	ARABIE SAOUDITE
	GILL	0.338	
	LINE	0.020	
	OTHR	0.062	
SOUTH AFRICA	LINE	0.001	AFRIOUE DU SUD
SRI LANKA	GILL		SRI LANKA
YEMEN AR RP	GILL	0.305	YEMEN

56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 00 02 04

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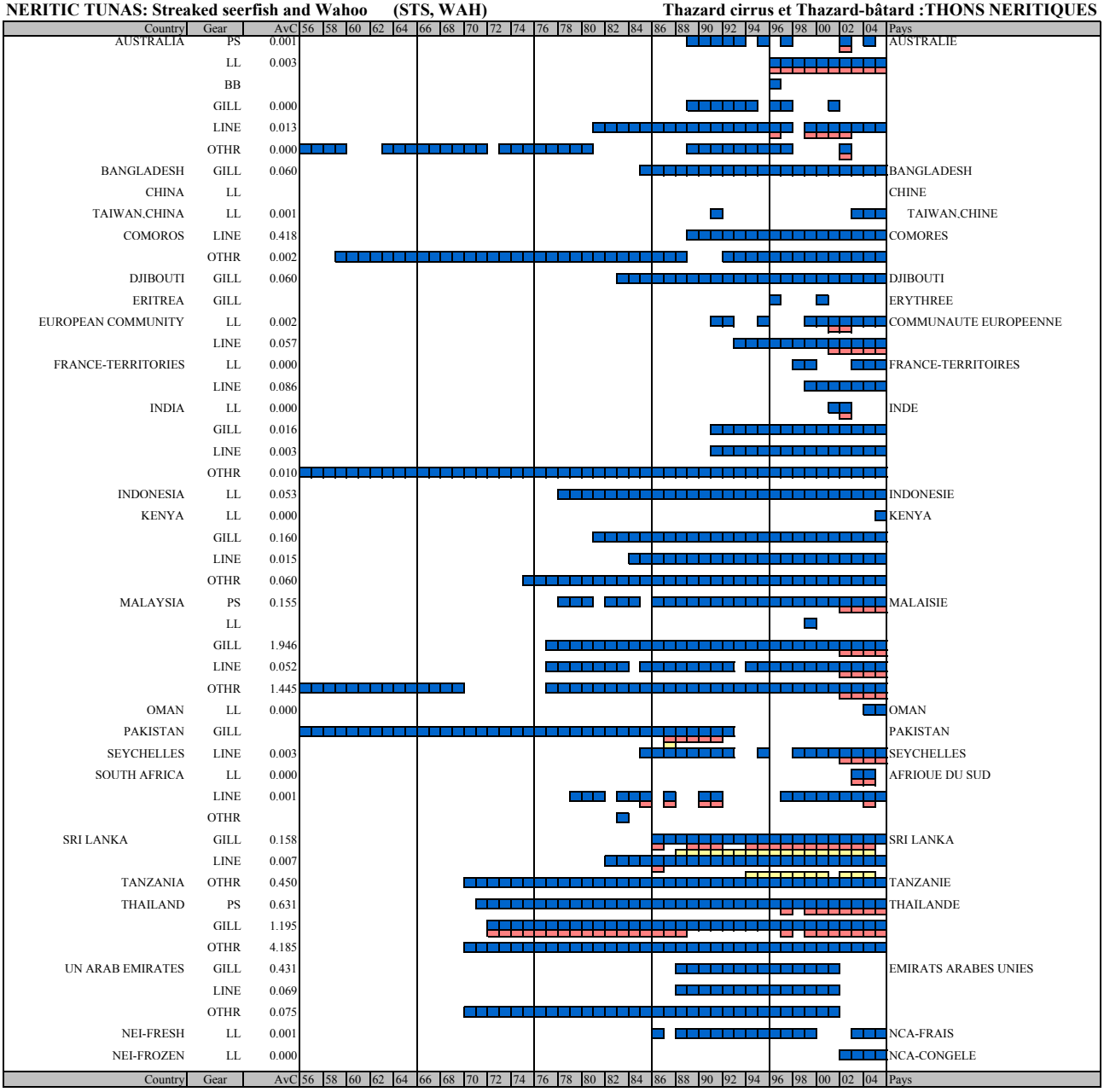
CATALOGUE DES CAPTURES NOMINALES ET DES STATISTIQUES DE CAPTURE ET EFFORT ET DE DISTRIBUTION DE TAILLE A LA CTOI

NERITIC TUNAS: Streaked seerfish and Wahoo (STS, WAH) **Thazard cirrus et Thazard-bâtard :THONS NERITIQUES**



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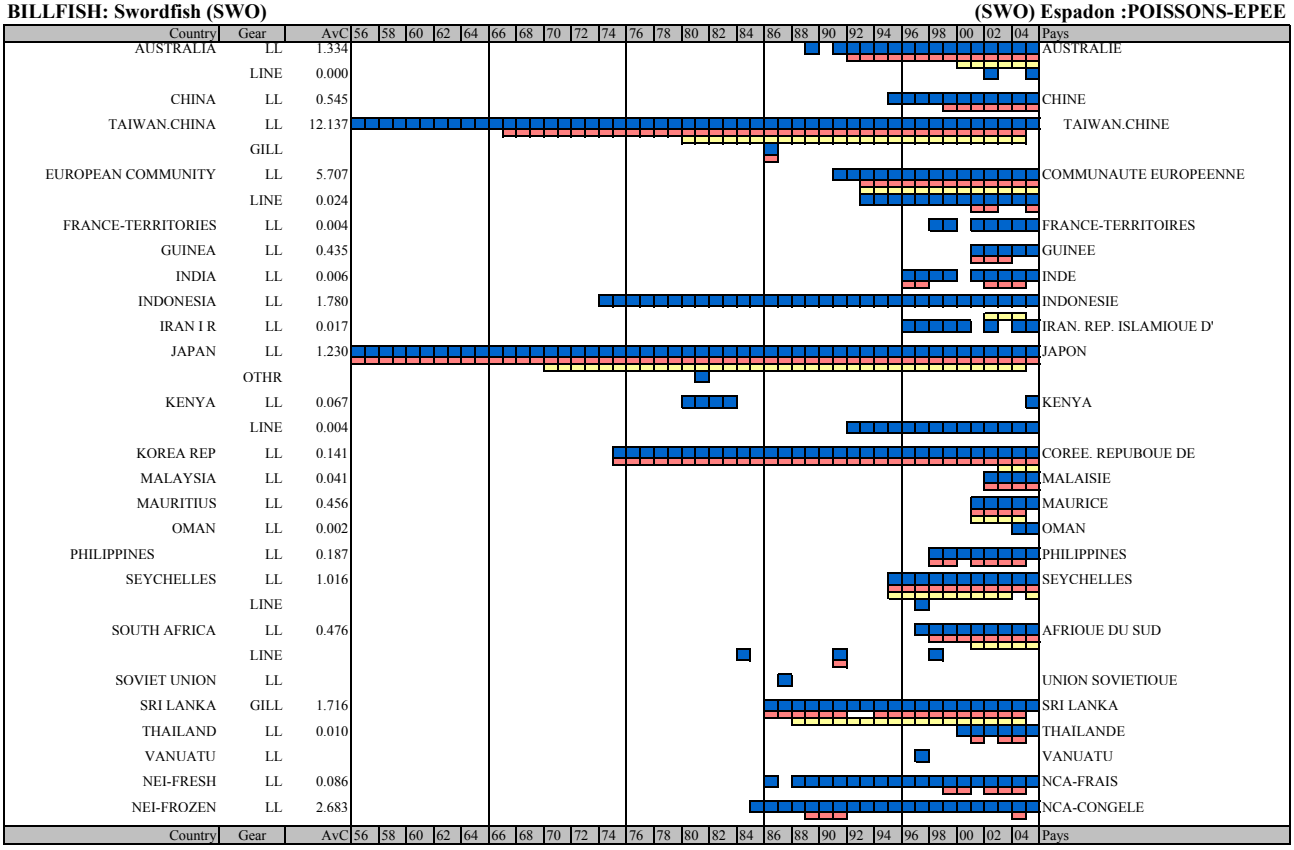
BILLFISH: Swordfish (SWO) **(SWO) Espadon :POISSONS-EPEE**



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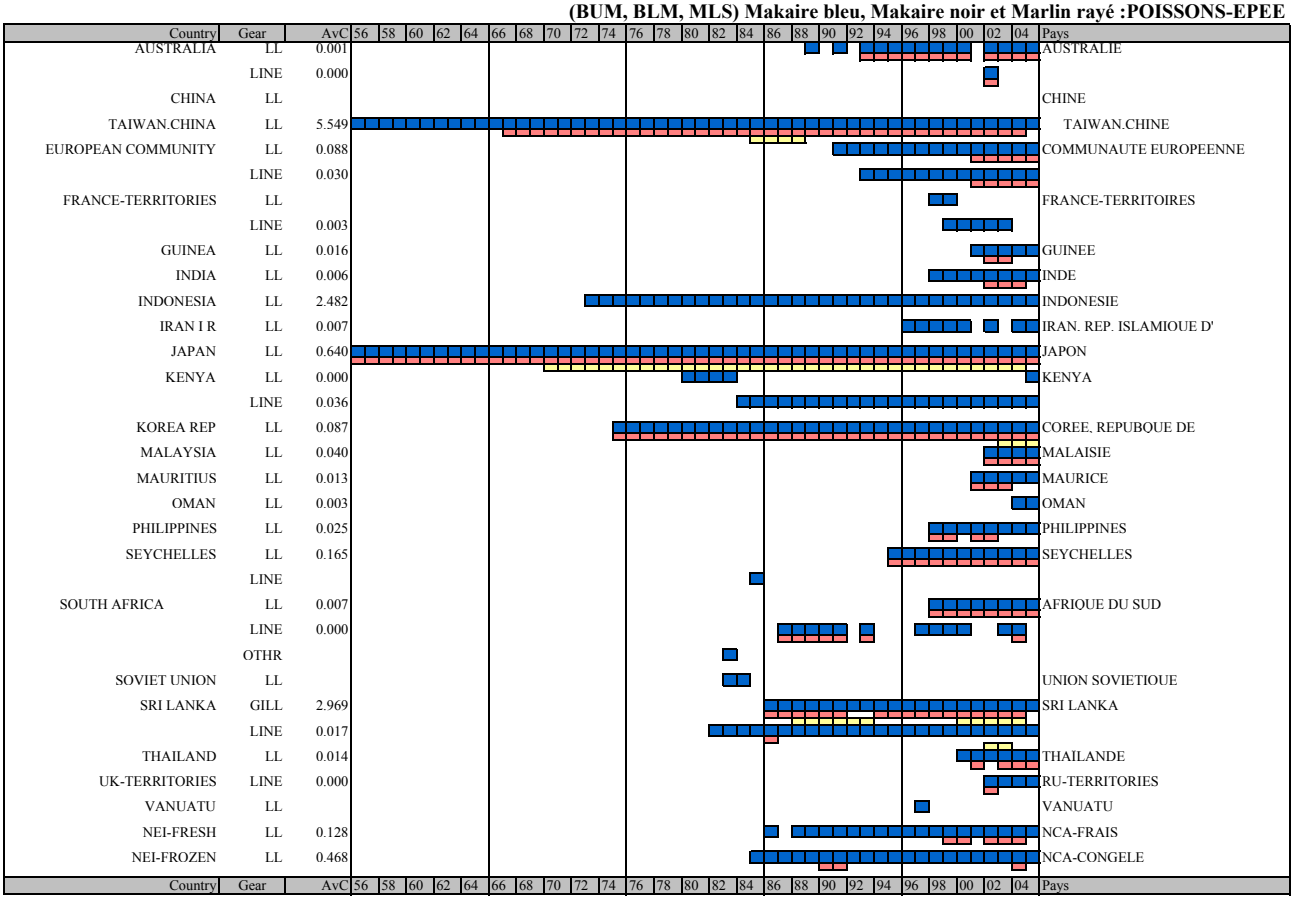
BILLFISH: Blue marlin, Black marlin and Striped marlin (BUM, BLM, MLS)

(BUM, BLM, MLS) Makaire bleu, Makaire noir et Marlin rayé :POISSONS-EPEE



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BILLFISH: Indo-Pacific sailfish and Short-billed spearfish (SFA, SSP)

(SFA, SSP) Voilier indo-pacifique et Makaire à rostre court :POISSONS-EPEE