STATUS OF IOTC DATABASES FOR BILLFISH SPECIES

IOTC Secretariat[1]

Abstract

This document reviews the status of the information available on billfishes in the databases at the IOTC Secretariat as of June 2009. It covers data on nominal catches, catch-and-effort, and size-frequency data.

1. OVERVIEW

This document summarises the standing of a range of information received for billfish species, in accordance with IOTC Resolution 08/01 *Mandatory statistical requirements for IOTC Members and Cooperating non-Contracting Parties (CPC's)*[2].

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.

A list of actions that the Secretariat proposes to be undertaken for the improvement in the standing of the data on billfish species currently available at the Secretariat is made for the consideration of the Working Party (next page).

The report covers the following areas:

- Overview
- Actions proposed to improve the data available on billfish to IOTC
- Overview of billfish fisheries in the Indian Ocean:
  - Catch trends
  - Status of fisheries statistics for billfish species
- Progress achieved on the recommendations made by the WPB in 2008

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 07/04; IOTC Resolution 05/03; IOTC Resolution 08/02) 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, fishing mode, 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, fishing mode, quarter and 5 degrees square areas.

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[2] This Resolution superseded IOTC Resolution 01/05 (*Mandatory statistical requirements for IOTC Members*)

2. ACTIONS PROPOSED TO IMPROVE THE DATA AVAILABLE TO IOTC

The following list is provided by the Secretariat for the consideration of the WPB. The list includes actions which the Secretariat considers would lead to a marked improvement in the standing of the data currently available at the secretariat. In general, these actions are proposed 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:

- CPC's having artisanal fisheries for swordfish and marlins, notably Sri Lanka, to improving their collection and reporting of species and gear information.
- CPC's having artisanal fisheries for sailfish, notably Iran , India and Pakistan, to providing catch and effort data for those fisheries.
- CPC's increasing sampling coverage to obtain acceptable levels of precision in their catch and effort statistics.

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

- CPC's having sport fisheries collecting and reporting catches and effort data to the Secretariat, in particular Mauritius, Seychelles, France(Reunion), Madagascar, Sri Lanka, Thailand and Australia,.

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

- CPC's having industrial fisheries for swordfish, marlins and sailfish to improving their collection and reporting of species information.
- The Republic of Korea revising its nominal catch and catch-and-effort data series for billfish.
- Taiwan,China collecting and reporting catch-and-effort data for marlins and Indo-Pacific sailfish from their fresh tuna longline fleet.
- India and Indonesia collecting and reporting catch-and-effort data for their longline fleets.
- The EC-Spain to provide catches of marlins and sailfish by time and area strata.
- CPC's reporting on IOTC species taken as bycatch.
- CPC's ensuring that logbook coverage is appropriate to produce acceptable levels of precision in their catch and effort statistics.
- CPC's increasing observer coverage to produce acceptable levels of precision in their estimates of retained catches and discards.

4. Increase the amount of size data available to the Secretariat by:

- The EC and India collecting and reporting size data for its longline fleets, notably for marlins and sailfish.
- Taiwan,China collecting and providing size data from their fresh tuna longliners.
- Japan and South Korea increasing size sampling coverage from its longline fleets.
- CPC's having sport fisheries collecting and reporting size data to the Secretariat.
- CPC's collecting and reporting size data for artisanal fisheries for billfish, in particular gillnet fisheries of Iran, India and Pakistan.

- CPC's reviewing their existing sampling schemes to ascertain that the data collected are representative of their fisheries.

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

- Conversion relationships: CPC's submitting to the Secretariat the basic data that would be used to establish length-age keys, length-weight keys, processed weight-live weight keys for billfish species.
- Sex ratio: CPC's undertaking research on the sex ratios of billfish species.

3. STATUS OF FISHERIES STATISTICS FOR BILLFISH SPECIES

Swordfish (SWO)

- **Catch trends**

Swordfish are caught mainly using drifting longlines (95%) and gillnets (5%) (**Figure 1**). Swordfish were mainly by-catch of industrial longline fisheries before the early 1990's with catches slightly increasing from 1950 to 1990 proportionally to the increase in the catches of target species (tropical and temperate tunas).

The catches of swordfish markedly increased after 1990, reaching 35,000 tonnes in 1998 and 36,000 in 2003-04.

Current catch levels are around 30,000 t. The change in target species from tunas to swordfish by part of the Taiwanese fleet along with the development of longline fisheries in Australia, Reunion island, Seychelles and Mauritius and the arrival of longline fleets from the Atlantic Ocean (Portugal, Spain the UK and other fleets operating under various flags[3]), all targeting swordfish, are the main reasons for this significant increase.

Longliners from **Taiwan,China** have been operating in the Indian Ocean since 1954, with catches of swordfish rarely higher than 1,000 tonnes until 1979. Swordfish catches increased gradually from 1,000 in 1979 to 5,000 tonnes in 1988. The catches by the Taiwanese fleet increased dramatically during the 1990's to over 12,000 t per year as the species was increasingly targeted by the fleet. After a peak of 18,000 t recorded in 1995, catches dropped to 12,000 t in 2004, and again in 2005, 2006 and 2007 (6,000 t) (**Figure 2**).

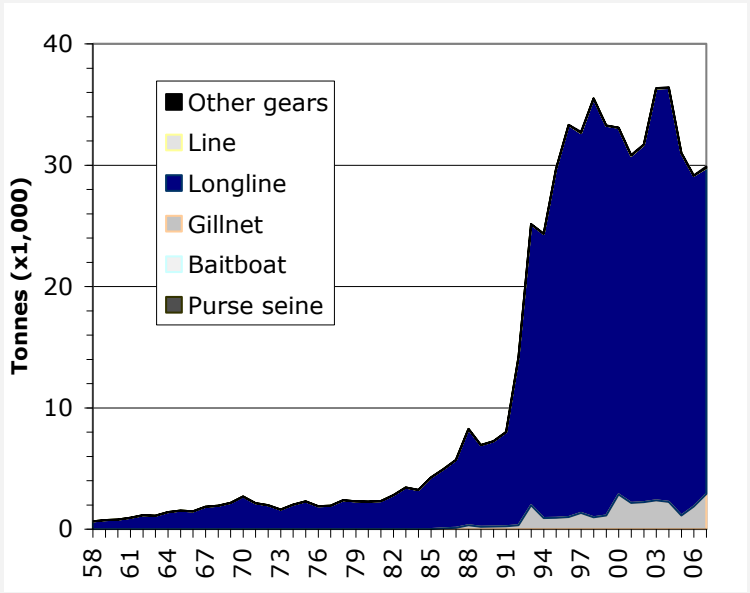

Figure 1: Catches of Swordfish per gear and year recorded in the IOTC Database (1958-2007)

[3] Uruguay, Senegal, Guinea, etc.

Around 5,000 t of swordfish have been recorded in recent years by a fleet of deep-freezing and fresh tuna longliners operating under flags of non-reporting countries (**NEI**). The low catches estimated for 2006 (1,900 t) and 2007 (2,700 t) are considered preliminary and may increase as more information on the activities of non-reporting vessels become available (**Figure 2**).

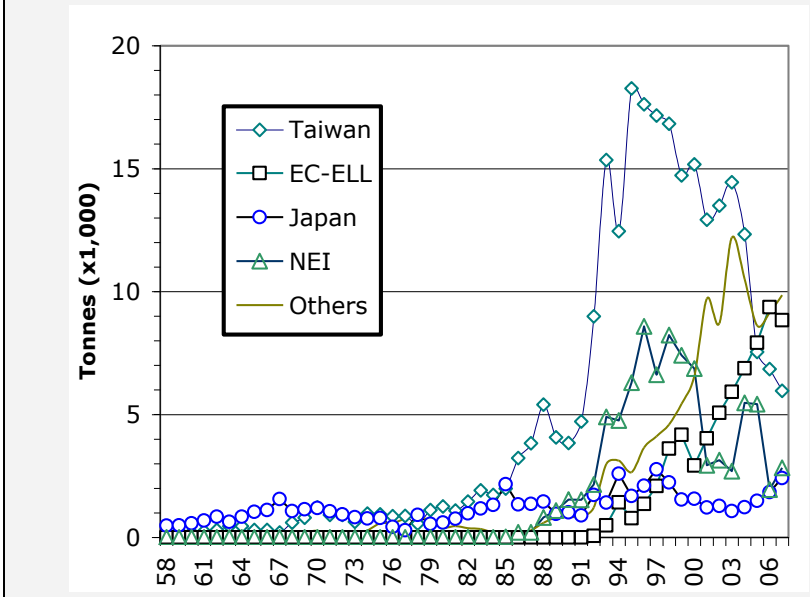

Figure 2: Catches of Swordfish by fleet recorded in the IOTC Database (1958-2007)

The catches of Swordfish of industrial longliners from **Japan** (**Figure 2**) increased proportionally to those of yellowfin tuna, target species of this fleet during the first years of the fishery, to remain quite stable until the early 1990's. The average catches amounted 1,500 tonnes during the last two decades and catches around 2,500 tonnes were recorded in 1994, 1997 and 2007.

In Sri Lanka, swordfish catches have fluctuated between 1,000 and 3,000 t over the last decade. These are taken mostly by boats that use a combination of drifting gillnets and longlines. This said, the first results from the sampling conducted by NARA[4] during 2005 and 2006 with the support of the IOTC-OFCF[5] Project in different locations in Sri Lanka appear to indicate that the historical catches of this species will need to be revisited.

The catches of Indonesian fresh-tuna longliners operating in Indian Ocean waters increased steadily until 2003 (3,000 t), having shown a decreasing trend since thendecreasing . It is, however, likely that the catches recorded for years before 2003 are lower than those that really occurred, as the statistics for this period are thought to be more uncertain (port sampling was initiated in 2003).

During the last decade, several domestic longline fisheries targeting swordfish started to operate in Reunion (EC-**France**), **Australia**, the **Seychelles** and more recently

[4] National Aquatic Resources and Development Agency of Sri Lanka

[5] Overseas Fisheries Cooperation Foundation of Japan

Mauritius, with accumulated catches estimated to be between 2,000t and 3,000t in recent years

Spanish, Portuguese and UK longliners coming from the Atlantic Ocean have been operating since the early 90s with current accumulated catches exceeding the 9,000 t (EC-ELL on **Figure 2**). Around 30% of the catches of swordfish in the Indian Ocean have been taken by vessels operating under the EC in recent years.

The catches of swordfish by longliners from the **Republic of Korea**, recorded since 1965, have not exceeded 1,000 t. The highest catch, 800 t, was recorded in 1978. It is, however, likely that the catches recorded for Korea are lower than those that really occurred as the catches recorded as catches and effort are usually higher than the nominal catches reported by Korea.

- **Status of Fisheries Statistics at the IOTC**

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 catches for South Korean longliners reported as nominal catches and catches and effort are 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.

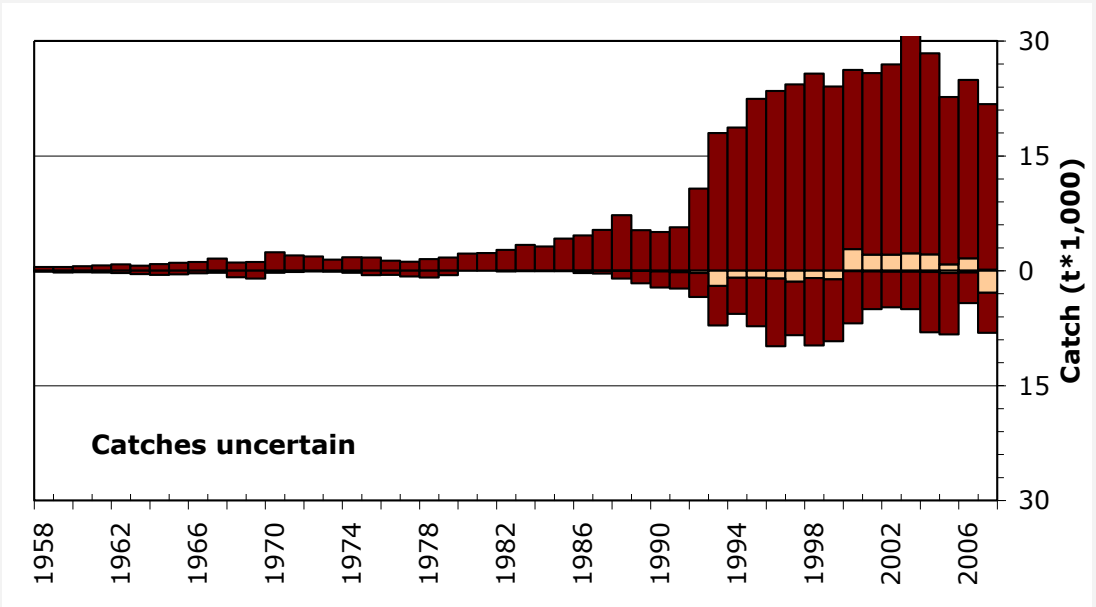

Figure 3. Uncertainty of annual catch estimates for swordfish.

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 June 2009

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 [Indonesia, fresh-tuna

longliners from Taiwan,China, Non-reporting longliners (NEI)] (Figure 4). 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).

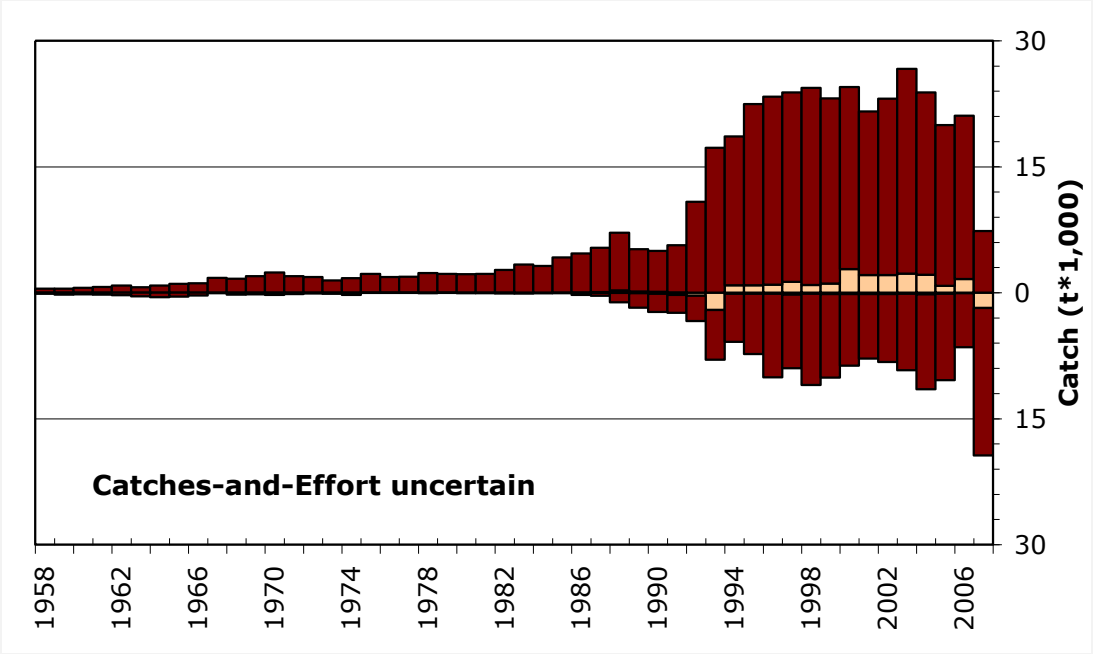

Figure 4: Uncertainty of catch-and-effort for swordfish.

The amount of the catch-and-effort 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 June 2009

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) (Figure 4).

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 most artisanal fisheries
- a paucity of size data available from industrial longliners since the early-1990s (Japan, Seychelles, Philippines, India, China)
- a paucity of catches per area available for some industrial fleets (Indonesia, India, NEI)
- a paucity of the biological data available, notably sex-ratio and sex-length-age keys

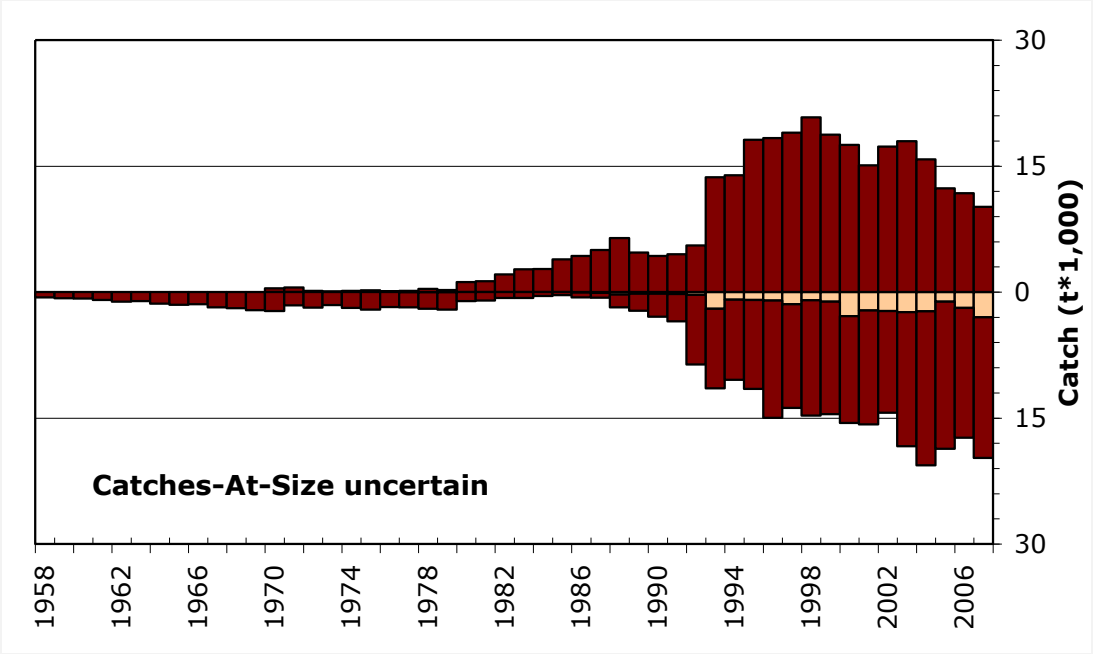

Figure 5. Uncertainty of catch-at-size data for swordfish.

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 June 2009

Blue Marlin (BUM)

- **Catch trends**

Blue marlins are caught mainly under drifting longlines (60%) and gillnets (30%) with remaining catches recorded under troll and hand lines (**Figure 6**). Blue marlins are the by-catch of industrial and artisanal fisheries. The catches of blue marlin are typically close to twice that of black marlin and striped marlin combined.

Catch trends for blue marlin are variable; however, this may reflect the level of reporting. The catches of blue marlin under drifting longlines were more or less stable until the mid-80's, at around 3,000 t, steadily increasing since then. The largest catches were recorded in 1998 (10,000 tonnes), as it is the case with the swordfish. Current catches are around 7,000 tonnes. Catches under drifting longlines have been recorded under Taiwan,China and Japan fleets and, recently, Indonesia and several NEI fleets (Figure 7).

The catches of blue marlin in Sri Lanka (Figure 7) have been high since the mid-1980's as a result of the development of a fishery using a combination of drifting gillnets and longlines. The highest catch (4,600 t) was recorded in 2001, while current catches are around 4,000 t.

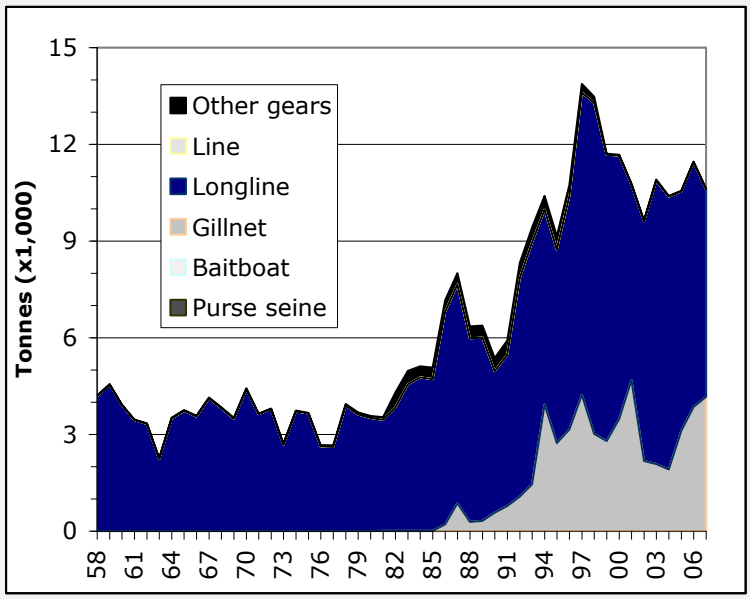

Figure 6: Catches of Blue Marlin per gear and year recorded in the IOTC Database (1958-2007)

However, the catches of marlins have been frequently miss-labelled in Sri Lanka making it uncertain the catches recorded under each species.

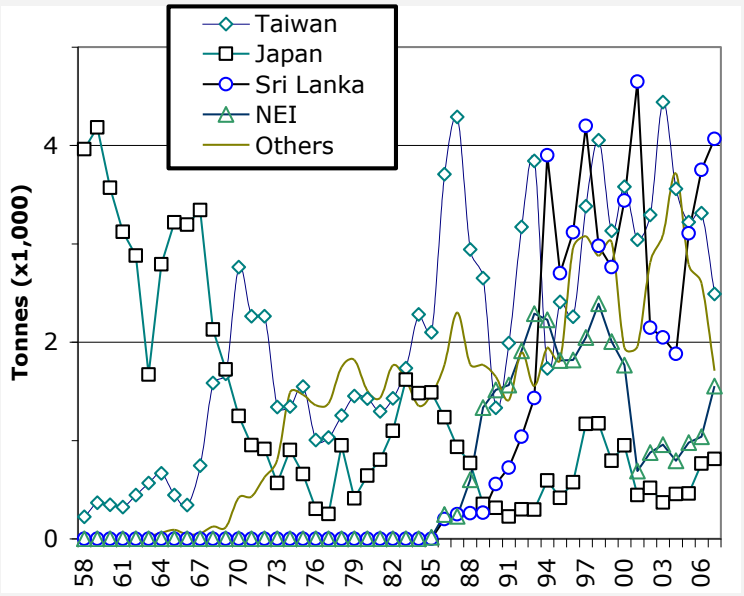

Figure 7: Catches of Blue marlin by fleet recorded in the IOTC Database (1958-2007)

- **Status of Fisheries Statistics at the IOTC**

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, Iran and Pakistan) and some industrial (longliners of Indonesia and Philippines) fisheries
- uncertain catches for non-reporting industrial longliners (India, 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 (Mauritius, Madagascar).

Discards are unknown for most industrial fisheries, mainly longliners.

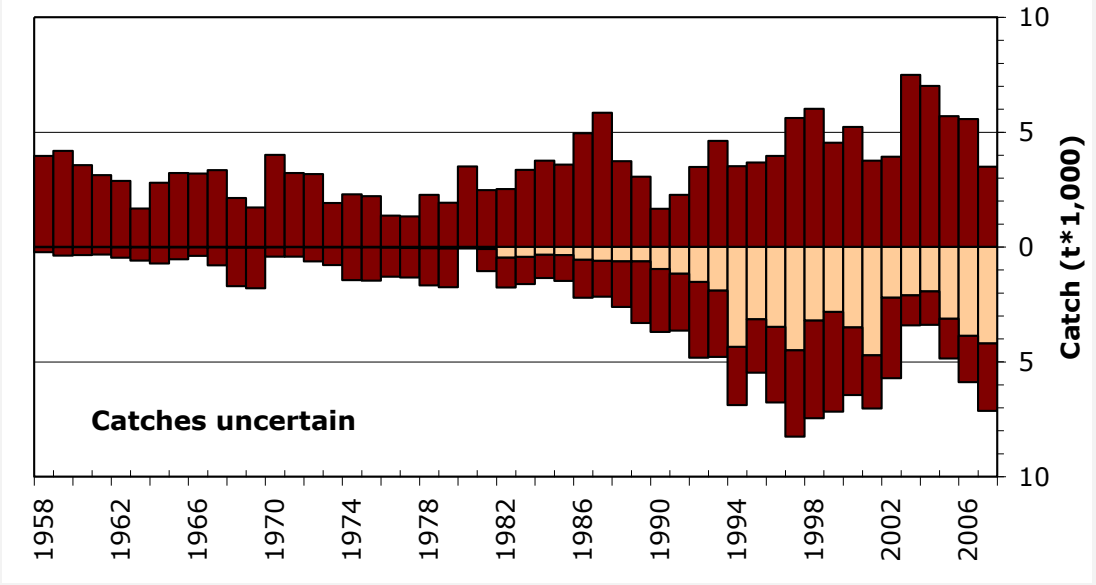

Figure 8. Uncertainty of annual catch estimates for blue marlin.

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 June 2009

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, besides the sport fisheries of Kenya, or other artisanal (gillnet/longlines of Sri Lanka) or industrial fisheries (NEI longliners, Taiwanese fresh-tuna longliners and all purse seiners).

Trends in average weight can only be assessed for the longline fisheries of Japan since 1970 and Taiwan,China since 1980. The number of specimens measured on Japanese longliners 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 and other biological data (e.g. length-weight equations) for this species made it very difficult any attempt to estimate CAS.

Black Marlin (BLM)

- **Catch trends**

Black marlins are caught mainly under drifting longlines (56%) and gillnets (40%) with remaining catches recorded under troll and hand lines (**Figure 9**). Black marlins are the by-catch of industrial and artisanal fisheries.

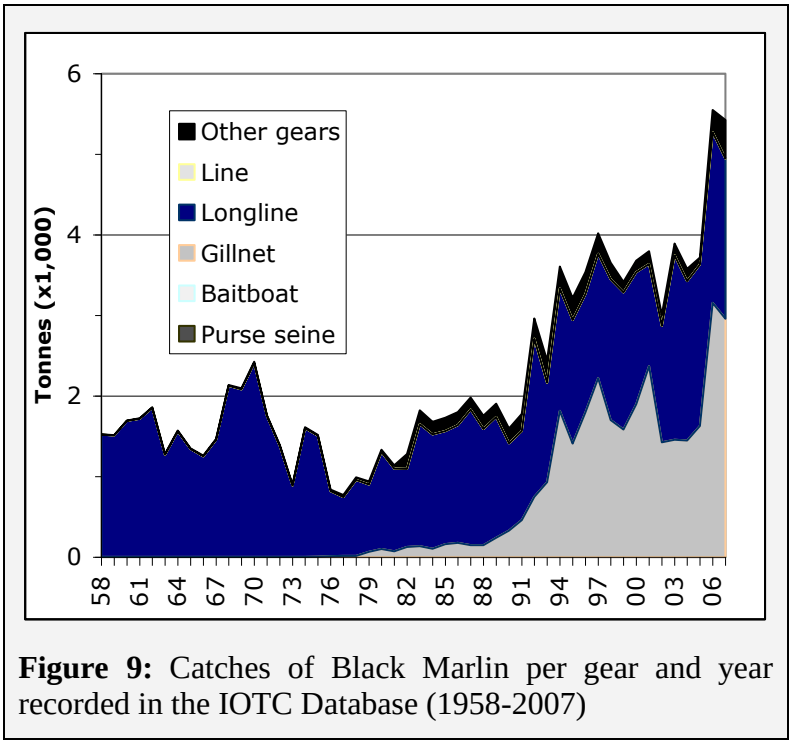

Figure 9: Catches of Black Marlin per gear and year recorded in the IOTC Database (1958-2007)

Catch trends for black marlin are variable; however, this may reflect the level of reporting. The catches of black marlin under drifting longlines have been more or less stable over time, at around 1,500-2,000 t. The largest catches were recorded in 1970 (2,400 t). Current catches are around 2,000 tonnes. Catches under drifting longlines have been recorded under Taiwan, Japan, Korea fleets and, recently, Indonesia and several NEI fleets (Figure 10).

The catches of black marlin in Sri Lanka (Figure 10) have been high since the mid-1980's as a result of the development of a fishery using a combination of drifting gillnets and longlines. The highest catch (1,600 t) was recorded in 2001, while current catches are around 1,000 t.

However, the catches of marlins have been frequently miss-labelled in Sri Lanka making it uncertain the catches recorded under each species.

Indonesia has reported catches of black marlin under gillnets amounting to 700t in 2006 and 2007 (Figure 10), which represents a more than two-fold increase over previous estimates. This may be partially true as many Indonesian longline vessels have changed its fishing gear from longline into gillnet, following years of poor longline catch rates. However, the high catches of black marlin need to be confirmed as they may refer also to other marlins but have been recorded as black marlin due to miss-labelling.

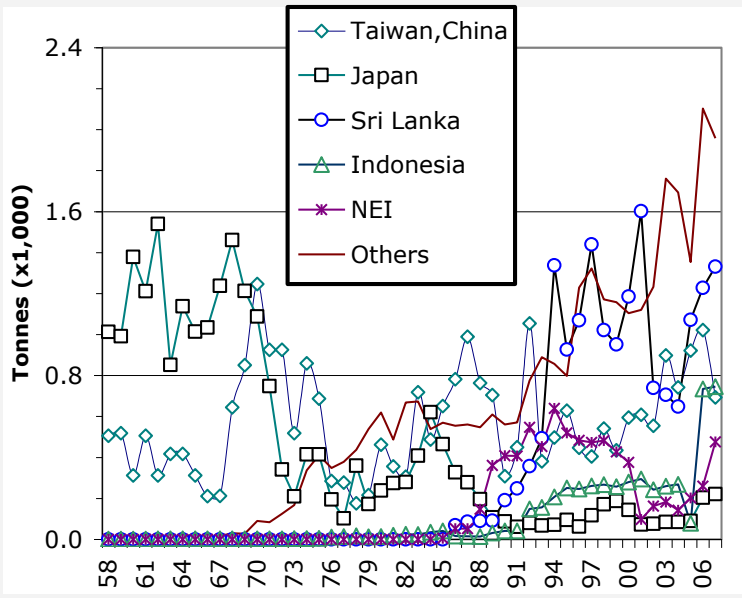

Figure 10: Catches of Black marlin by fleet recorded in the IOTC Database (1958-2007)

- **Status of Fisheries Statistics at the IOTC**

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, Iran and Pakistan) and some industrial (longliners of Indonesia and Philippines) fisheries
- uncertain catches for non-reporting industrial longliners (India, NEI) and the gillnet fishery of Indonesia
- catches being incomplete for most industrial fisheries for which the black 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 (Mauritius, Madagascar).

Discards are unknown for most industrial fisheries, mainly longliners.

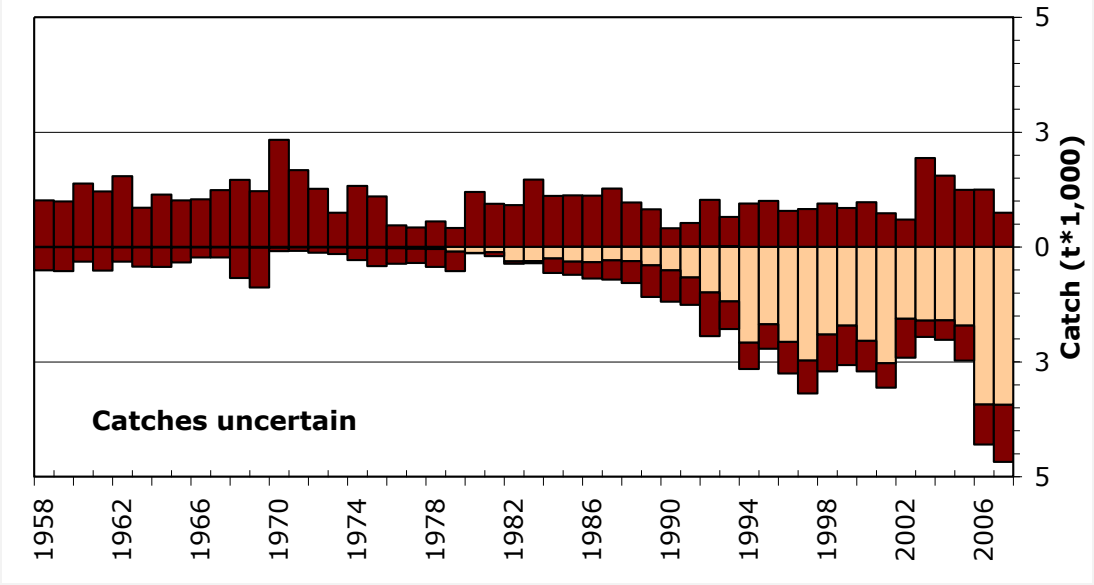

Figure 11. Uncertainty of annual catch estimates for black marlin.

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 June 2009

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, besides the sport fisheries of Kenya, or other artisanal (gillnet/longlines of Sri Lanka, gillnets of Indonesia) 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 and Taiwan,China since 1980. The number of specimens measured on Japanese longliners 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 and other biological data (e.g. length-weight equations) for this species would make it very difficult any attempt to estimate CAS.

Striped Marlin (MLS)

- **Catch trends**

Striped marlins are caught almost exclusively under drifting longlines (98%) with remaining catches recorded under gillnets and troll lines (**Figure 12**). Striped marlins are the by-catch of industrial fisheries.

Catch trends for striped marlin are variable; however, this may reflect the level of reporting. The catches of striped marlin under drifting longlines have been changing over time, between 2,000 t and 8,000 t. The largest catches were recorded in 1993 (8,000 t). Current catches are around 3,000 tonnes.

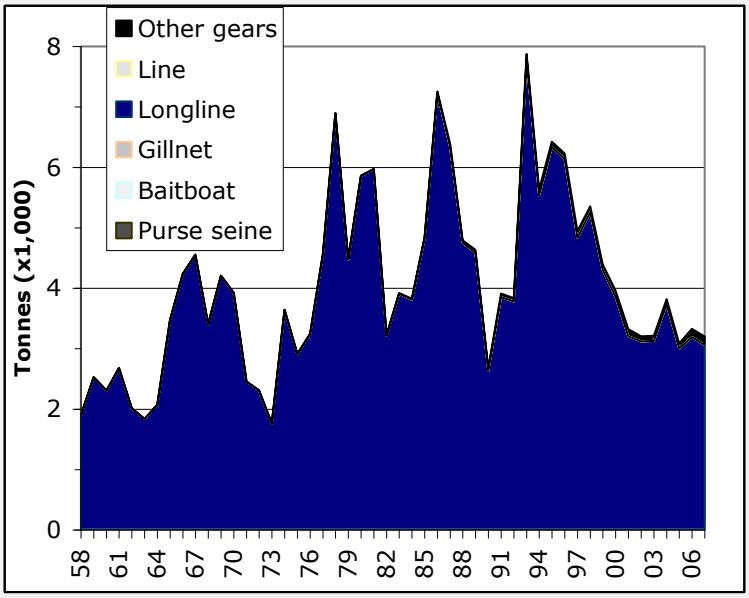

Figure 12: Catches of Striped Marlin per gear and year recorded in the IOTC Database (1958-2007)

Catches under drifting longlines have been recorded under Taiwan,China Japan, Korea fleets and, recently, Indonesia and several NEI fleets (Figure 13). Taiwan,China and Japan have reported large drops in the catches of striped marlin for its longline fleets in recent years. The reason for such decrease in catches is not fully understood.

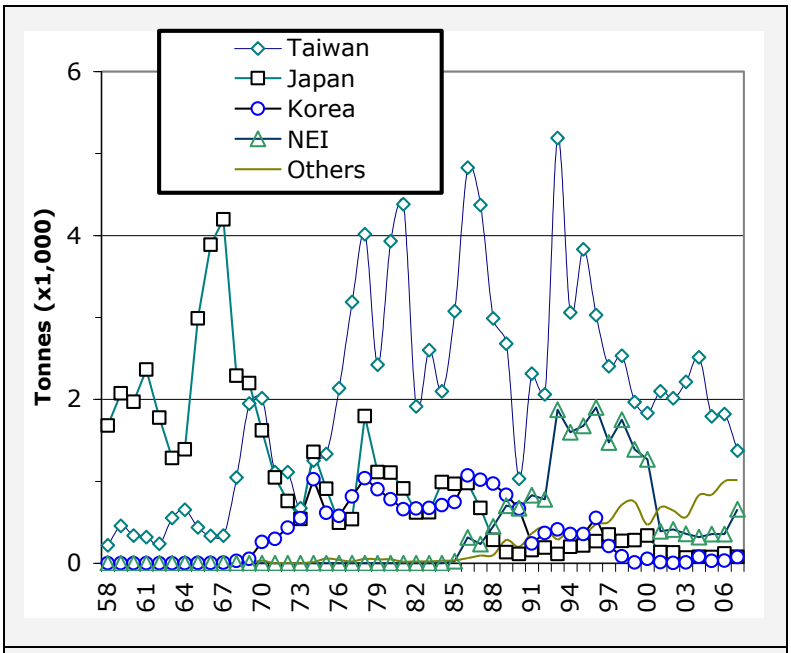

Figure 13: Catches of Striped marlin by fleet recorded in the IOTC Database (1958-2007)

- **Status of Fisheries Statistics at the IOTC**

Retained catches are reasonably well known although they remain uncertain for some fleets::

- catches per species are not available for some industrial fisheries (longliners of Indonesia and Philippines).
- uncertain catches for non-reporting industrial longliners (India, NEI)
- catches are believed to be incomplete for most industrial fisheries for which the striped marlin is seldom the target species.
- 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 (Mauritius, Madagascar).

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

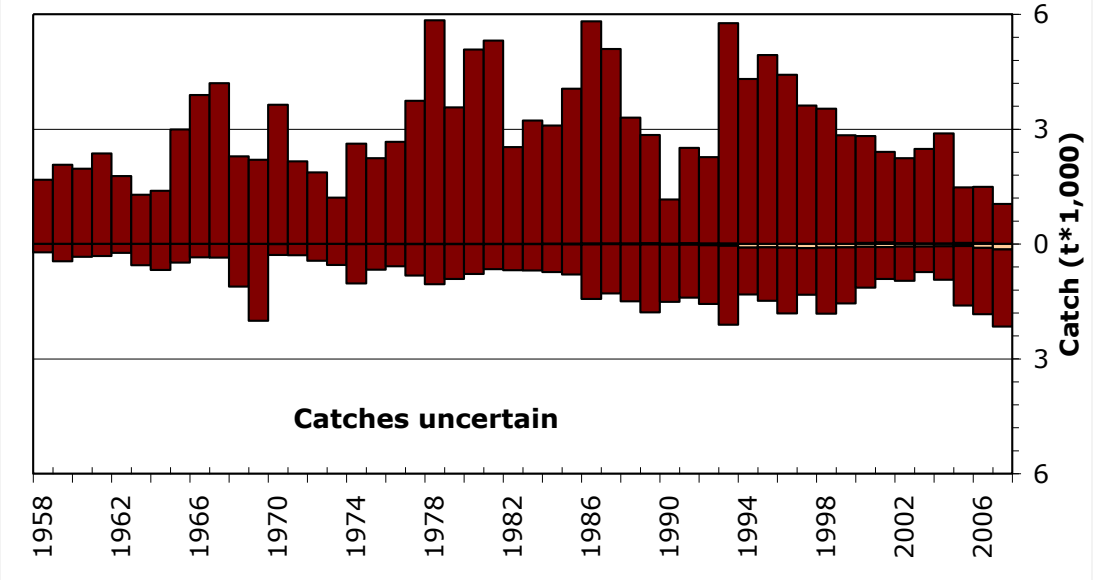

Figure 14. Uncertainty of annual catch estimates for striped marlin.

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 June 2009

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, besides the sport fisheries of Kenya or industrial fisheries (NEI longliners).

Trends in average weight can only be assessed for the longline fishery of Japan since 1970 and Taiwan,China since 1980. The number of specimens measured on Japanese longliners 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 and other biological data (e.g. length-weight equations) for this species would make it very difficult any attempt to estimate CAS.

Indo-Pacific Sailfish (SFA)

Indo-Pacific Sailfish is caught mainly under gillnets (89%) with remaining catches recorded under troll and hand lines (5%), longlines (5%) or other gears (**Figure 15**). Current catches are around the 25,000 t.

The catches of sailfish have greatly increased since the mid-1980's in response to the development of the gillnet/longline fishery in Sri Lanka (Figure 116) and, especially, the extension in the area of operation of Iranian gillnet vessels to areas beyond the EEZ of Iran. Pakistan and India have also important fisheries for this species. Both Iran and India have reported large drops in the catches of sailfish in recent years.

The catches of Iranian gillnets increased dramatically, more than six-fold, after the late nineties, from values averaging the 2,000t in the late 80's to a maximum of 12,600t in 2005. The catches decreased in 2006 and again in 2007, the current catches being half those recorded in 2,005.

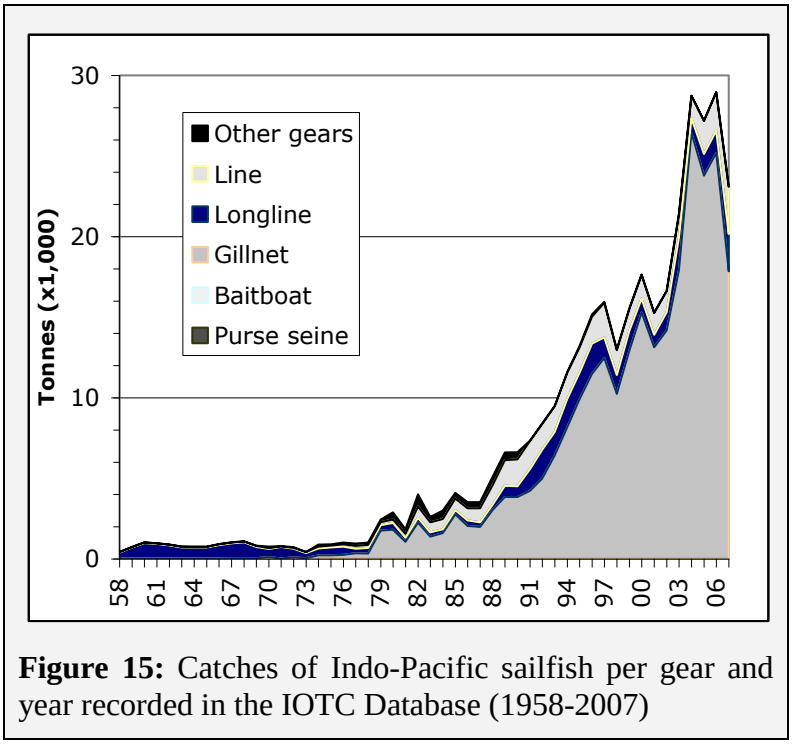

Figure 15: Catches of Indo-Pacific sailfish per gear and year recorded in the IOTC Database (1958-2007)

The catches of sailfish under drifting longlines and other gears do not show any specific trends over the years. However, catches of this species are probably underreported due to its little commercial value.

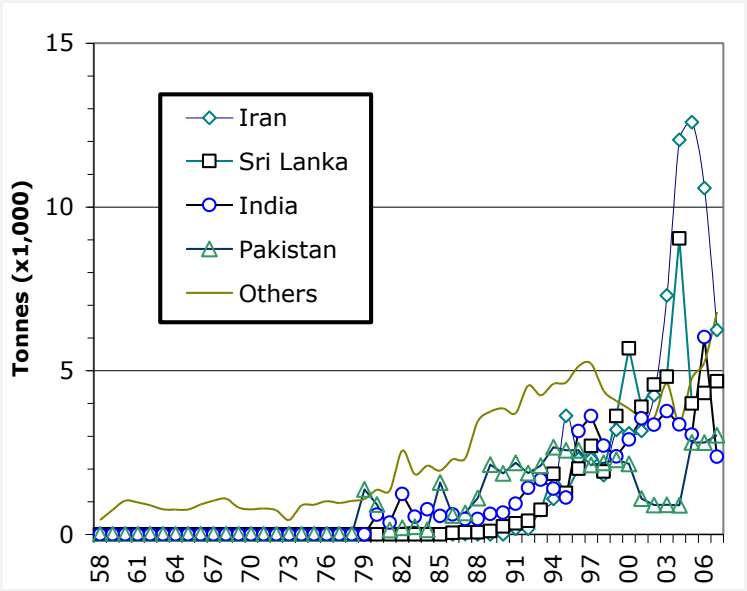

Figure 16: Catches of Indo-Pacific sailfish by fleet recorded in the IOTC Database (1958-2007)

- **Status of Fisheries Statistics at the IOTC**

Retained catches are poorly known for most fisheries due to:

- catches per species not being available for many artisanal fisheries (mainly India and Indonesia)
- 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 (Mauritius, Madagascar, Seychelles).

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

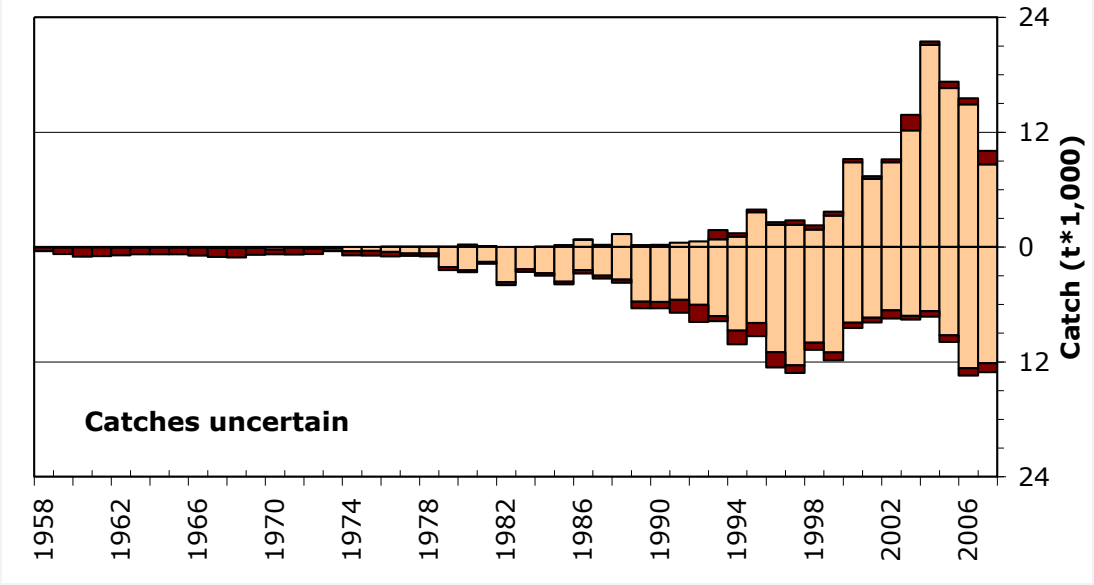

Figure 17. Uncertainty of annual catch estimates for IP sailfish.

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 June 2009

CPUE Series: Catch and effort series are available from some industrial longline fisheries but they are believed to be poor quality (catches of sailfish are incomplete). No catch and effort are available from sport fisheries besides the sport fisheries of Kenya. The catch and effort that are available from artisanal fisheries are believed inaccurate (no data from Iran and Pakistan and 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 IP sailfish. The paucity of size data available for this species would make it very difficult any attempt to estimate CAS.

4. PROGRESS ACHIEVED ON THE RECOMMENDATIONS TO IMPROVE THE DATA AVAILABLE TO IOTC MADE IN 2008

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

- Members having artisanal fisheries for swordfish and marlins, notably Sri Lanka, to improving their collection and reporting of species and gear information.

  Sampling coverage has dropped in Sri Lanka after the end of the IOTC-OFCF (December 2006). The catches of swordfish, marlins and sailfish reported by SriLanka for 2007 are thought, for this reason, highly uncertain.

- Members having artisanal fisheries for sailfish, notably Iran , Oman India and Pakistan, to providing catch and effort data for those fisheries

  Estimates of total catches exist for all these fisheries.

  Oman provided a complete catch-and-effort data series for its fisheries during a visit of IOTC-OFCF Project staff to Oman (December 2008), including catches of IP sailfish for 1985-2007.

  No catch-and-effort data have been received for Iran, India and Pakistan fisheries.

- Members increasing sampling coverage to obtain acceptable levels of precision in their catch and effort statistics.

  Several countries having industrial fleets are known to have initiated observer programmes in recent years. This includes both longline (Japan, Indonesia, China, Taiwan,China, South Korea) and purse seine fisheries (EC, Iran). However, the Secretariat has not received estimates of total bycatch of billfish species for these fisheries as yet.

2. Improve the recovery of existing catch-and-effort data from sport fisheries, by:

- The Secretariat to identify the major sports fishing bodies in the Indian Ocean and approach them regarding access to any available data sets.

  Kenya provided data for its sport fisheries for the period 1980-2006, with more data being collected and processed at the moment. The sport fisheries of Kenya catch mainly IP fish and, to a lesser extent, yellowfin tuna and marlins.

  South Africa has been reporting data for its sport fisheries in recent years.

  No data is available from other countries that are known to have sport fisheries.

- The Secretariat to make a special request to members in this year's SC meeting reminder to integrate analyses of sport fisheries data in their National Reports.

  In an effort to improve reporting the Secretariat created in 2009 new forms for the reporting of statistics to the IOTC and produced new Guidelines For the Reporting of Fisheries data to the IOTC. Both forms and Guidelines will be presented to the next meeting of the Scientific Committee or to a meeting of the Working Party on Data Collection and Statistics, if it is convened before the SC.

  The Secretariat contacted the African Billfish Foundation (ABF) in an effort to identify countries having important sport fisheries and assess data gaps and future activities. The ABF is in the process to appoint a mew Executive Board that will be addressing the Secretariat's request for information.

  In addition the Secretariat has plans to outsource the collection of historical data from sport fisheries in the Indian Ocean Region during this year. The outcome of

this Project will be reported at the next meeting of the WPB.

3. Improve the catch and effort data from industrial fisheries by:

- Members having industrial fisheries for swordfish, marlins and sailfish to improving their collection and reporting of species information. This should include tools to assist fishers and data collectors to correctly identify billfish species

  The observer programmes initiated by some countries in the Indian Ocean region will possibly help to improve estimates of billfish species taken as a bycatch in industrial fisheries.

  The identification of billfish species remains a problem for most artisanal fisheries and some industrial fisheries as the catches of these species are yet to be reported by species.

- The Republic of Korea improving the consistency of its catch and effort statistics.

  The catch-and-effort data series from Korea remains of uncertain quality for billfish species. The reason is the conflicting catch figures reported as catches and effort and nominal catches, as the former, which should represent a sample of the nominal catches for this country, are usually higher than the nominal catches reported for the same years.

- Indonesia and Taiwan,China collecting and reporting catch and effort data for their fresh tuna longliner fleets.

  Both Indonesia and Taiwan,China have implemented catch-and-effort data collection from their fisheries, including the implementation of logbooks on vessels under their flag.

  The IOTC-OFCF Project organized in May 2009 a Workshop on the Implementation of a logbook Programme for the Fisheries of Indonesia, which involved participation from government institutions and the private sector in Indonesia and several international organizations, including IOTC, WCPFC, SPC and the CSIRO. The Workshop agreed on the type of logbook forms to be used for Indonesia's fisheries and the main activities that will need to be initiated to assist the implementation of the logbook programme. The Report of the Workshop is available at the IOTC Secretariat.

- The EC-Spain LL to provide catches of marlins and sailfish by time and area strata.

  Spain has not reported time-area catches for species other than the swordfish. Estimates of total catches are, however, available for all billfish species.

- The UK long line fleet to provide catch and effort for all species.

  The UK provided detailed catch-and-effort data for vessels under its flag for 2007

- Members reporting on IOTC species taken as bycatch.

  Some members report detailed catches of billfish species but these usually do not include the amounts of billfish discarded. The estimates of by-catch of billfish species are likely to improve as more data are collected from the observer programmes currently ongoing in the Indian Ocean.

- Members ensuring that log book coverage is appropriate to produce acceptable levels of precision in their catch and effort statistics.

  The Secretariat does not receive estimates of precision for the catches and effort statistics reported from countries catching billfish species.

- Members with observer programmes to analyse the data collected to estimate retained catches and discards and the precision of these estimates.

The Secretariat has not received estimates of total catches and discards from countries catching billfish species as yet.

4. Increase the amount of size data available to the Secretariat by:

- The EC and India collecting and reporting size data for their longline fleets, notably for marlins and sailfish.

  No size data have been reported for the commercial longline fisheries of India or the EC.

- Taiwan,China collecting and providing size data from their fresh tuna longliners.

  Taiwan,China has implemented sampling in some Indian Ocean ports but no size data have been reported to the Secretariat as yet.

- Japan increasing size sampling coverage from its longline fleet.

  The coverage of size sampling on Japanese longliners is still very low

- Members having sport fisheries collecting and reporting size data to the Secretariat.

  Kenya have reported size data, in particular individual weight measurements of IP sailfish for more than 20 years. No size data have been received from other countries having sport fisheries.

- Members collecting and reporting size data for artisanal fisheries for billfish, in particular gillnet fisheries of Iran, India and Pakistan.

  No size data have been received from any of these countries

- Members reviewing their existing sampling schemes to ascertain that the data collected are representative of their fisheries and provide the results to the Secretariat.

  The Secretariat has not received new information about this matter.

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

- Conversion relationships: Members submitting to the Secretariat the basic data that would be used to establish length-age keys, length-weight keys, processed weight-live weight keys for billfish species.

  The Secretariat has not received any new information from members. To date, the Secretariat has not been able to identify length-weight equations for marlin species.

- Obtaining sex ratio information by size and area.

  The Secretariat has not received new information concerning sex ratio by size and area

- Analysis of the apparent stability in the catch size data and whether the existing data are representative of the fishery.

  The Secretariat is not aware of any analysis conducted on the size data available in the IOTC databases.