

STATUS OF IOTC DATABASES FOR BILLFISH SPECIES

IOTC Secretariat

ABSTRACT

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

CATCH TRENDS (NOMINAL CATCH DATABASE)

Swordfish (SWO)

Swordfish (Annex I: Table 1, Chart 1) are caught mainly under drifting longlines (90%) with remaining catches recorded under gillnets (10%) and other gears (**Chart 4**). Swordfish were mainly by-catch of industrial longline fisheries before the early nineties 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 dramatically increased since to a peak of 40,000 tonnes in 1998, the year in which the maximum catch for the species was recorded.

Current catch levels are around 30,000 tonnes. The change in target species from tunas to swordfish by part of the Taiwanese fleet along with the development of longline fisheries in the region (Australia, Mauritius, Seychelles, Reunion) and the arrival of longline fleets from the Atlantic Ocean (Portugal, Spain), all targeting swordfish, are the main reasons for this dramatic increase.

Catch trends for the species are uneven, higher or lower depending on the reporting fleet and year. The catches of marlins under drifting longlines have been more or less stable over time with maximum catches recorded in 1998 (17,000 tonnes), as it is the case with the swordfish. Current catches are around 8,000 tonnes. Taiwan, Japan and, recently, Indonesia and several IUU fleets have been reporting most of the catches of marlins under drifting longlines.

The catches of marlins in Sri Lanka have been very important since the mid-eighties as a result of the development of a fishery using a combination of drifting gillnets and longlines. The highest catches (8,000 tonnes) were also recorded in 1998 with current catches more than twice below those (3,000 tonnes). The reason why the catches of marlins dropped so dramatically in recent years is not fully known.

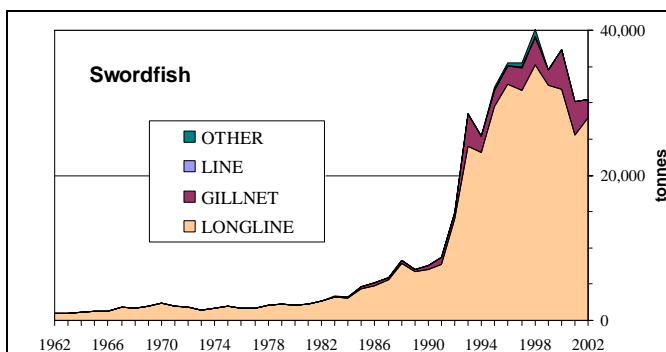


Chart 4: Catches of Swordfish per gear and year recorded in the IOTC Database (1962-2002)

Blue Marlin (BUM), Black Marlin (BLM) and Striped Marlin (MLS)

Marlins (Annex I: Table 2, Chart 2) are caught mainly under drifting longlines (60%) and gillnets (40%) with remaining catches recorded under troll and hand lines (**Chart 5**). These species are by-catch of industrial and artisanal fisheries being only target of some sport fisheries in the region. The catches of Blue Marlin have ever been close to twice the catches of Black marlin or Striped Marlin.

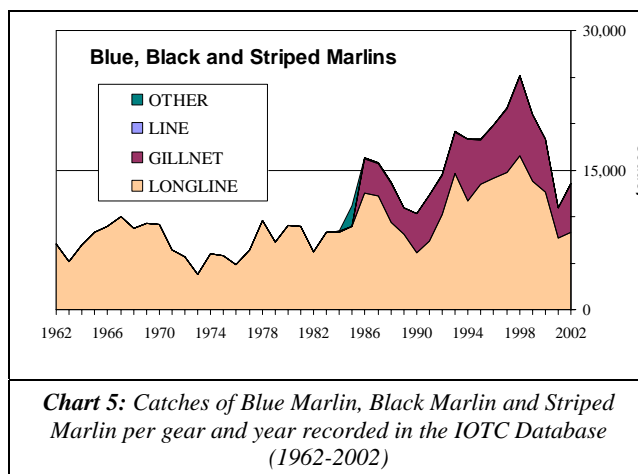


Chart 5: Catches of Blue Marlin, Black Marlin and Striped Marlin per gear and year recorded in the IOTC Database (1962-2002)

Indo-Pacific Sailfish (SFA) and Shortbill Spearfish (SSP)

Indo-Pacific Sailfish (Annex I: Table 3, Chart 3) are caught mainly under gillnets (80%) with remaining catches recorded under troll and hand lines (10%), longlines (7%) or other gears (**Chart 6**). All catches of Shortbill Spearfish are recorded under drifting longlines, although this species is probably bycatch of other artisanal fisheries and mislabelled or reported aggregated.

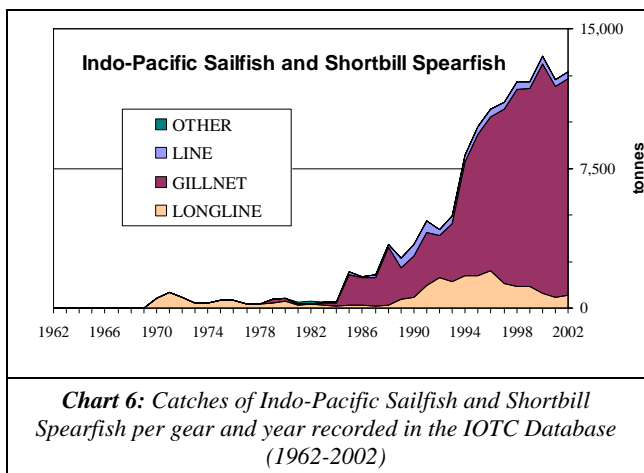
The catches of Sailfish have dramatically increased since the mid-eighties proportionally to the development of the gillnet / longline fishery in Sri Lanka.

Maximum catches were recorded in 2000 (14,000 tonnes) with current catches only slightly lower than those. The catches of both Sailfish and Shortbill Spearfish under

drifting longlines do not show any specific trend with ups and downs over the years. These catches are thought mostly underreported due to both species being of scarce commercial value.

fishery since 1992. Catch and effort statistics are not available for the Taiwanese fleet in 2001 and 2002.

The effort statistics are thought good quality for most of the fleets for which long catches series are available, with the exception of Taiwan (1990-92) and the whole series for Korea. The use of data from Korea is, therefore, not recommended.



SIZE FREQUENCY DATA

For longline fisheries size frequency data is only available since 1970. Japan is the only country that has been reporting size-frequency data on a regular basis. Nevertheless, in recent years, the number of specimens measured is very low in relation to the total catch and has been decreasing year by year. The size-frequency statistics available from the two other main longline fleets are either very incomplete (Taiwan for which only four years are available) or inaccurate (Korea), which invalidates their use. Size data are also partially available for longline fleets that have been targeting swordfish since the early nineties (Reunion, Spain, Seychelles, South Africa and Mauritius). The recovery of size data from port sampling regarding fresh tuna longline fleets operating in Phuket, Penang, Sri Lanka and, recently Indonesia, continued in 2002 and 2003, with many swordfish specimens measured.

DATA AVAILABILITY AND DATA QUALITY

Most of the catches of swordfish and other billfish species had to be estimated for years prior to 1970 due to them not available or not recorded per species for fleets for which billfish species made up part of the catch. Nevertheless, billfish catches are only important for marlin species before that year.

Size data is also available for the gillnet/longline fishery in Sri Lanka from 1988 to 1995.

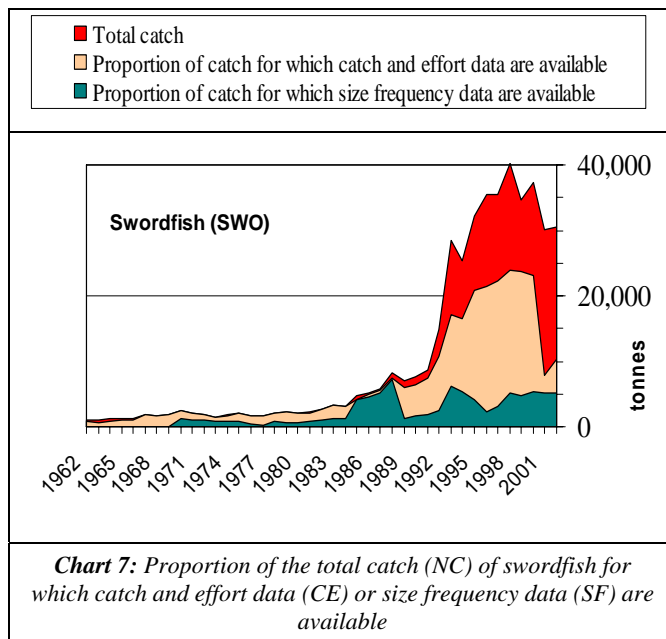
Swordfish (SWO)¹

NOMINAL CATCH DATA

The nominal catch data series of swordfish (SWO) is considered almost complete since 1970. The fleets catching most of the species have been reporting good catch statistics since that year, with the only exception of catches of Illegal and/or Unregulated and/or Unreported (IUU) fleets (recorded as NEI- in the IOTC Database) that have always been estimated by the Secretariat.

In general, the amount of catch for which size data for the species are available has been decreasing over the years (**Chart 7**) and the amount of specimens measured per strata are considered very low. The quality of this dataset is, therefore, thought very poor.

The quality of the catches estimated for IUU fleets is thought poor due to the scarce information available on their activities (only the total number of vessels operating per year is available in most cases). The catches of several fresh tuna longline fleets operating in the Indian Ocean (Indonesia, Thailand, Malaysia, Sri Lanka and Maldives) are also thought uncertain in years prior to 1992. These are thought more accurate in recent years thanks to the implementation of sampling programs in some of these countries to monitor the activities of these fleets.



CATCH AND EFFORT DATA

Catch and effort data are fully or almost fully available up to the early 90s but only partially available since then (**Chart 7**), due to the almost complete lack of catch and effort records from IUU fleets and Sri Lanka gillnet/longline

¹ See Table 1 and Chart 1 in Annex I and Data Catalogues (Swordfish) in Annex II

Blue Marlin (BLZ), Black Marlin (BLM) and Striped Marlin (MLS)²

NOMINAL CATCH DATA

The fleets catching most of the Blue Marlin (BLZ), Black Marlin (BLM) and Striped Marlin (MLS) have usually reported nominal catches for these species but these catches are considered incomplete. Marlins are usually recorded under species aggregates (MARL for the three marlins together or BIL/BILL for marlins and other billfish together or TUX for billfish and tuna species together) or simply not recorded at all. The Secretariat has, in these cases, been trying to estimate or assign the catches of these species but this has not always been possible due to the scarce amount of information available on species making up the bycatch of longline, gillnet or other fisheries. Furthermore, the catches of these species by IUU fleets or fresh tuna longline vessels in Indonesia, so far estimated by the Secretariat, are also considered important.

The quality of the catches estimated for IUU fleets are thought very poor. The catches of several fresh tuna longline fleets operating in the Indian Ocean (Indonesia, Thailand, Malaysia, Sri Lanka and Maldives) are also thought uncertain. The implementation of Sampling Programs to monitor the activities of these fleets has reduced this uncertainty, although the identification of marlin species through port sampling is sometimes difficult³.

The catches of marlins reported for the gillnet and longline fishery of Sri Lanka have been very inconsistent since 1994, with total catches probably fair but trends for each species showing dramatic ups and downs over time. This is probably due to mislabelling when the species are sampled. This dataset is, therefore, considered poor quality.

CATCH AND EFFORT DATA

Catch and effort data are fully or almost fully available up to the early 90s but only partially available since then (**Chart 8**), due to the almost complete lack of catch and effort records from IUU fleets and Sri Lanka gillnet/longline fishery since 1992. Catch and effort statistics are not available for the Taiwanese fleet in 2001 and 2002.

The effort statistics are thought good quality for most of the longline fleets for which long catches series are available, with the exception of Taiwan (1990-92) and the whole series for Korea. The use of data from Korea is, therefore, not recommended. The catch and effort statistics available for the gillnet / longline fishery of Sri Lanka (1986-91) and Taiwanese drifting gillnets (1987-91) are considered good quality.

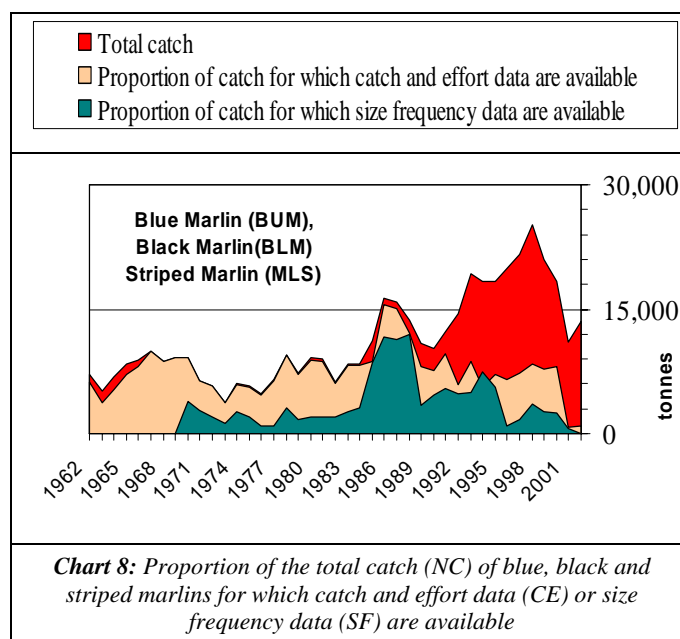
² See Table 2 and Chart 2 in Annex I and Data Catalogues (Marlins) in Annex II

³ Specimens of blue marlin and striped marlin are usually unloaded processed (headed and tailed), which makes it difficult to identify the species

SIZE FREQUENCY DATA

The amount of size frequency data available for marlin species has been low over the time with only regular reports from Japan (longline) and very partial reports from Taiwan (longline) and Sri Lanka (gillnet/longline). Some data is also available from port sampling (Sampling Programs) in recent years.

In general, the amount of catch for which size data for the species are available has been decreasing since the early nineties (**Chart 8**) and the amount of specimens measured per strata are considered very low. The quality of this dataset is, therefore, thought very poor.



Indo-Pacific Sailfish (SFA) and Shortbill Spearfish (SSP)⁴

NOMINAL CATCH DATA

Catches of Indo-Pacific Sailfish or Shortbill Spearfish are usually missing from the reports. When reported, these species are usually aggregated with other billfish (BIL/BILL) or also with tunas (TUX). The catch series is, therefore, considered very incomplete. No catches are available for the species before 1970.

The quality of the catches of SFA recorded for the gillnet/longline fishery of Sri Lanka is considered generally good, although it is likely that the total catches of this fishery have been overestimated in recent years⁵. Gillnet catches recorded for other countries did not usually include detailed catches of these species. The same applies to

⁴ See Table 3 and Chart 3 in Annex I and Data Catalogues (SFA and SSP) in Annex II

⁵ The measure of effort used to raise the catches recorded through sampling is probably wrong with all registered vessels accounted for as if they were active when only some of them really operated during the period concerned

longline and other fisheries in which these species are caught.

CATCH AND EFFORT DATA

The amount of catch and effort data available for both gillnet and longline fisheries have been very low (**Chart 9**), especially since the mid-eighties. Catch and effort data are only available from 1986 to 1991 for the gillnet/longline fishery in Sri Lanka being very scarce for other gillnet or line fisheries. Regarding the longline fisheries, only Japan has reported good statistics of the species over time. The lack of catch and effort data from all fisheries in recent years is of concern, especially taking into account the dramatic increase in the catches of the species since the mid-eighties.

Improvements have taken place in a number of areas. These include:

A better level of reporting: New NC, CE and SF datasets have been obtained from several countries as for South Africa and Seychelles longline fisheries.

Revision of the IOTC databases: Several revisions have been conducted during the last year on the IOTC databases. This has led to new datasets being input, especially regarding CE and SF statistics (Indonesia, Sri Lanka) and to new series of NC data for some countries.

An improved Vessel Record: More information has been obtained on the number and type of vessels operating under flags of non-reporting parties. This information comes mostly from various licensing schemes in the Indian Ocean and has become an important element in the estimation of the catches of non reporting fleets.

Improved estimation of catches of non-reporting fleets: The collection of historical and current information on the landings of small fresh tuna longliners in ports in the Indian Ocean has improved the accuracy of earlier estimates. The more complete Vessel Record also permitted the estimation by flag of the catches of deep-freezing longliners.

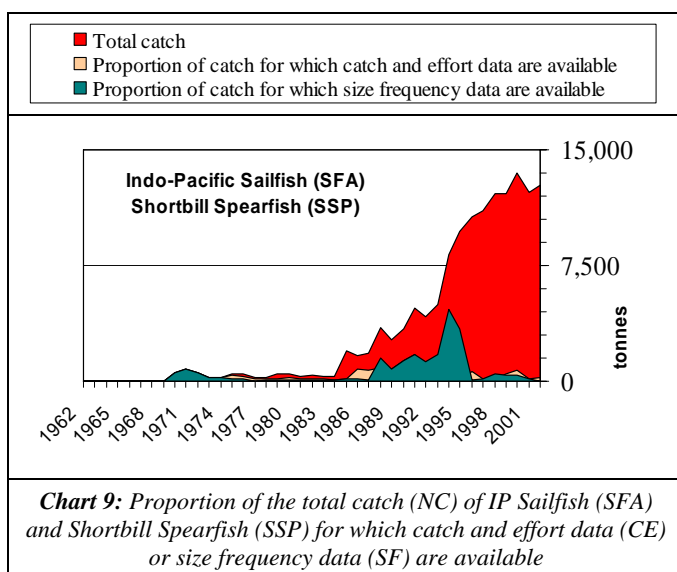
Recovery of historical activity and size data from processing plants: The collection of historical information from operators in different ports of the Indian Ocean has continued since last year. Some 250,000 individual fish weight records by species have been retrieved to date for 1998 to 2002.

IOTC/OFCC sampling programmes: The collection of information on the activities of fresh tuna longliners landing in Phuket, Penang and Sri Lanka has continued during 2002. This has led to more complete and accurate estimates of catches of these fleets. Other valuable data collected in the scope of these programmes refer to length frequencies which will allow length-length, length-weight and weight-length relationships to be established.

Plan of Action in Indonesia: A large scale operation involving several local and foreign institutions was initiated in April 2002 in Indonesia. The primary objective of this multi-lateral cooperation is building the necessary capabilities in the country, so as to allow Indonesia to generate good quality statistics in the near future. Sampling of landings of fresh tuna longliners operating in this country started in June 2002, with more than 2,500 sampling conducted (200,000 fish monitored) between June 2002 and June 2003, with coverage levels ranging from 30% to 40% of the catches unloaded by longliners in Indonesia.

Japan NC and CE: New estimates of catches of Japanese longline vessels for 1950-1969 were conducted during 2002 on the basis of new information reported by Japan. New CE data was also submitted for 1950-2001 to replace previous estimates that did not consider the IOTC boundaries but the FAO ones.

Indonesia NC: The NC for 1975-2001 was replaced by new estimates that took into account the IOTC boundaries in the East.



Size Frequency Data

The amount of size frequency data available for these species has been low over the time with only regular reports from Japan (longline) and partial reports from Sri Lanka (gillnet/longline). Some data is also available from port sampling (Sampling Programs) in recent years.

The lack of size frequency data from most of the fisheries in recent years is of concern (**Chart 9**).

DATA RELATED ISSUES FOR BILLFISH SPECIES

A number of problem areas were identified in the data situation for billfishes:

- Poor knowledge of the catches, effort and size-frequency from fresh tuna longline vessels, especially from Taiwan, China and several non-reporting fleets.
- Poor knowledge of the catches, effort and size-frequency from non-reporting fleets of deep-freezing tuna longliners, especially since the mid-eighties.
- Lack of accurate catch, effort and size-frequency data for the Indonesian longline fishery in recent years.
- Poor knowledge of the catches, effort and size-frequency data for gillnet and other artisanal fisheries, especially the gillnet/longline fishery in Sri Lanka.

Taiwan,China NC: The catches of Taiwanese longliners were updated during 2002 with new catches added for the **Estimation of new series of nominal catches for Billfish species** (IOTC Secretariat): The catches of billfish species in the IOTC database were re-estimated and/or assigned to the corresponding species of billfish for the whole period 1950-2002 (Annex III: Tables 4-9 and charts 11-19; Excel Spreadsheet NCBP_5002.xls).

This process involved the estimation of catches amounting to as much as the 70% of the total catches estimated for the species in recent years (**Chart 10**). The changes in the catches referred mostly to Sailfish and, to a lesser extent, to Marlins (Charts 11-19).

period 1954-1965 and 1966-1978 catches updated.

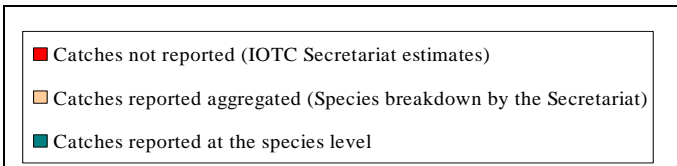
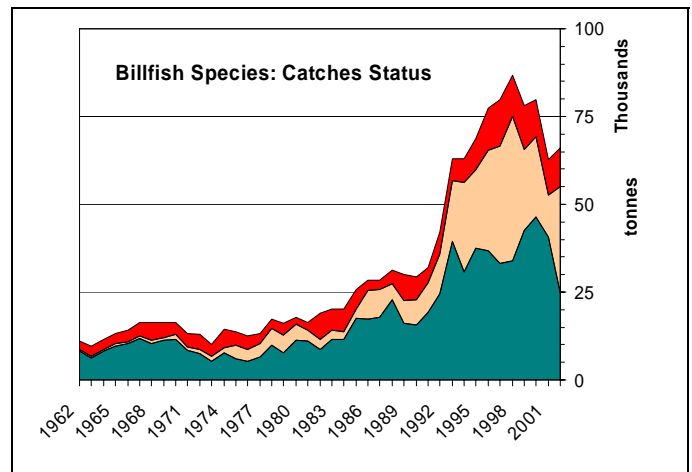


Chart 10: Proportion of the total catches (NC) of billfishes that needed to be estimated by the IOTC Secretariat