

STATUS OF IOTC DATABASES FOR ALBACORE

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Abstract

This document reviews the status of the information available on albacore in the databases at the IOTC Secretariat as of November 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 albacore, in accordance with IOTC Resolution 08/01 *Mandatory statistical requirements for IOTC Members*.

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 recommendations for the improvement in the standing of the data on albacore 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 albacore
- Overview of albacore fisheries in the Indian Ocean:
 - Fisheries and catch trends
 - Status of fisheries statistics for albacore
- Progress achieved on the recommendations outstanding from previous WPTE meetings

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).

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, month and 5 degrees square areas.

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2. ACTIONS PROPOSED TO IMPROVE THE DATA AVAILABLE TO IOTC

The following list is provided by the Secretariat for the consideration of the WPTE. 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 industrial fisheries by:

- Countries having industrial fisheries catching albacore to use the standard IOTC logbooks to collect catch-and-effort data by species, in particular:
 - Longliners from **India, Indonesia, Malaysia, Philippines, and Oman**, including those vessels based outside their flag states.
 - Fresh-tuna longliners from **Taiwan, China**
- Countries ensuring that logbook coverage is appropriate to produce acceptable levels of precision (CV to be initially set at less than 20%) in their catch-and-effort statistics and to report this information to the Secretariat, routinely.

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

- **Taiwan, China** collecting and providing size data from their fresh tuna longliners.
- **India, Indonesia, Malaysia, Philippines and Oman** collecting and providing size data for their longline vessels, including those based outside their flag states
- **Japan** increasing size sampling coverage (to cover a minimum of 10% of the catch (in number) by quarter by 10° latitude – 20° longitude area) from its longline fleet.
- **Japan and Taiwan, China** to analyze the size samples collected from their longline fisheries for tropical tunas in order to verify if the length frequencies derived from such samples are representative of their fisheries.
- **Japan and Taiwan, China** to provide size frequency data as per the IOTC Standards (5 degree square area and month).
- Countries reporting size data to the Secretariat to include information about data source (e.g. data from port sampling, observer programme, etc.), type of measurement, actual sample sizes, sampling coverage and precision of the estimates by fishery and species, routinely.

3. Reduce uncertainty in the following biological parameters important for the assessment of stock status of tropical tuna species by:

- Conversion relationships: Countries catching significant amounts of tropical tunas collecting, preferably through observer programmes, and providing the basic data that would be used to establish length-weight keys, non-standard measurements-fork length keys, processed weight-live weight keys for these species.

3. STATUS OF FISHERIES STATISTICS FOR ALBACORE

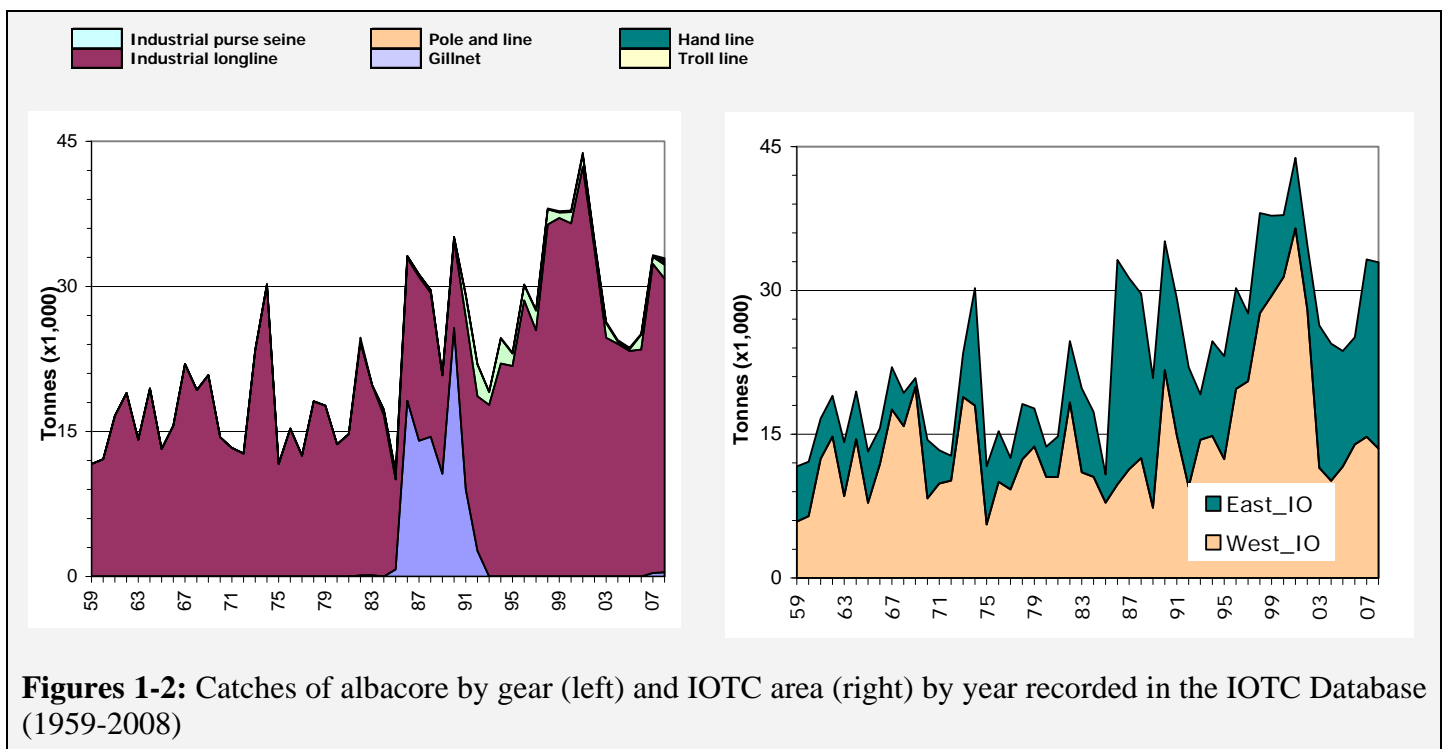
Albacore (ALB)

- **Fisheries and catch trends**

Albacore are caught almost exclusively under drifting longlines (98 %), and between 20°S and 40°S, with remaining catches recorded under purse seines and other gears (Figure 1).

A fleet using drifting gillnets targeting juvenile albacore operated in the southern Indian Ocean (30°S to 40°S) between 1983 and 1992 harvesting important amounts of this species (Figure 1). This fleet, from Taiwan,China, had to stop fishing in 1992 due to a worldwide ban on the use of drifting gillnets. Albacore is currently both a target species and a bycatch of industrial longline fisheries and a bycatch of other fisheries.

The catches of albacore increased rapidly during the first years of the fishery, remaining relatively stable until the mid-1980s, except for some very high catches recorded in 1973, 1974 and 1982. The catches increased markedly during the mid 1980's and early 1990's due to the use of drifting gillnets, with total catches reaching around 30,000 t. Catches increased markedly since 1993, after the drop recorded in 1992 and 1993 as a consequence of the end of the drifting gillnet fishery. Catches between 1998 and 2002 were high (ranging from 34,000 t to 43,500 t, the highest catch ever recorded in the Indian Ocean, in 2001). By contrast, the average annual catch for the period from 2004 to 2008 was 27,900 t. Preliminary estimates for 2007-08 show an increase in the catches of albacore to around 332000 t. The reason for this is the increase in the catches of albacore recorded for the Taiwanese fresh-tuna longline fleet in recent years (2007-08), that represent more than twice the catches in previous years. However, the catches of albacore estimated for recent years are considered uncertain, the main reason being an increase in the activities of fresh-tuna longliners, mainly from Indonesia, and of deep-freezing longliners whose catches have not been reported to the IOTC (especially from India and Indonesia).



Longliners from Japan and Taiwan,China have been operating in the Indian Ocean since the early 1950s and they have been the major fisheries for albacore since then (Figure 3). While the Japanese albacore catch ranged from 8,000 t to 18,000 t in the period 1959 to 1969, in 1972 catches rapidly decreased to around 1,000 t - due to changes in target species, in particular to southern bluefin tuna and bigeye tuna -, then ranged between 200 t to 2,500 t as albacore became a bycatch of this fishery. In recent years the Japanese albacore catch has been around 2,000 to 6,000 t. By contrast, catches by Taiwanese longliners increased steadily from the 1950's to average around 10,000 t by the mid-1970s. Between 1998 and 2002 catches ranged between 21,500 t to 26,900 t, equating to just over 60 % of the total Indian Ocean albacore catch. Between 2003 and 2006 the catches of albacore represented less than 13,000 t. Preliminary estimates for 2007-08 show higher catches, around 15,000 t (or 50% of the total catches of Albacore in the Indian Ocean), the catches of fresh-tuna longliners from Taiwan,China representing more than 80% of these catches.

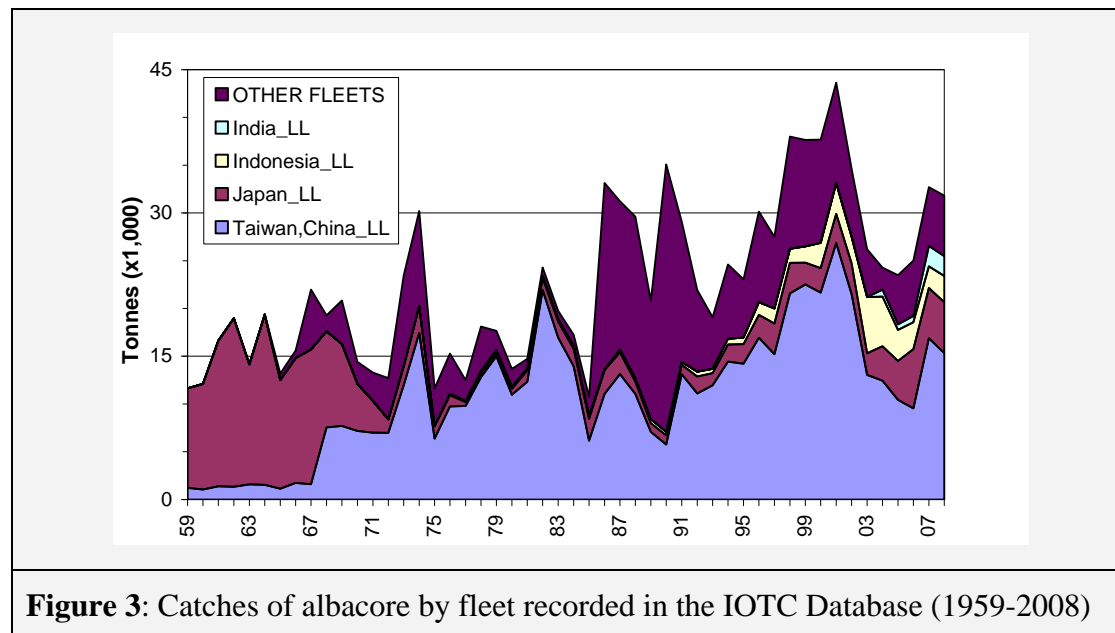


Figure 3: Catches of albacore by fleet recorded in the IOTC Database (1959-2008)

Since 1965 the catches of albacore by longliners from the Republic of Korea have never been above 10,000 t. Albacore catches of around 3,000 t to 5,000 t have been recorded in recent years for a fleet of fresh-tuna longliners operating in Indonesia (Figure 3). However, It is likely that these catches do not represent the total catches of albacore for this fishery. This is due to an increase in the activities of Indonesian longliners in Southern Indian Ocean waters which, strangely, has not reflected into an increase in the catches of this species.

Large sized albacore are also taken seasonally in certain areas, most often in free-swimming schools, by the purse seine fishery. A feature of Indian Ocean albacore fisheries is that it is the only ocean where juvenile albacore are rarely targeted by fisheries. In the Atlantic and Pacific oceans surface fisheries often actively target small albacore to the extent that juveniles contribute to the majority of albacore catches. This, however, does not discount the possibility that the juvenile albacore from the Indian Ocean are not being subjected to significant levels of fishing pressure as the small fish targeted off the west coast of South Africa may have migrated to the Atlantic Ocean from the Indian Ocean.

In addition, it is important to note that fleets of oceanic gillnets from Iran and Pakistan and gillnet and longline vessels from Sri Lanka have extended their area of operation in recent years, to operate on the high seas, far from their countries EEZs. The lack of catch-and-effort data from these fleets makes it impossible to assess if they are operating in areas where catches of juvenile albacore are likely to occur.

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

Retained catches are generally well known (Figure 4); catches are uncertain for:

- Non-reporting industrial purse seiners and longliners (NEI)
- Longliners of India, Indonesia and Malaysia operating in Southern waters

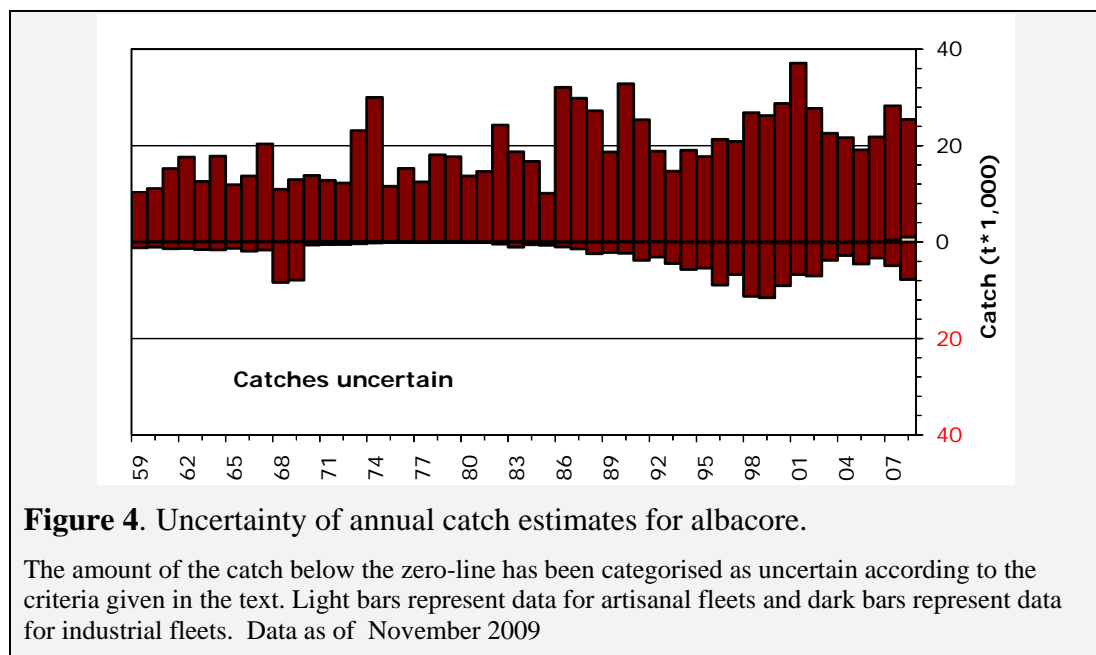


Figure 4. Uncertainty of annual catch estimates for albacore.

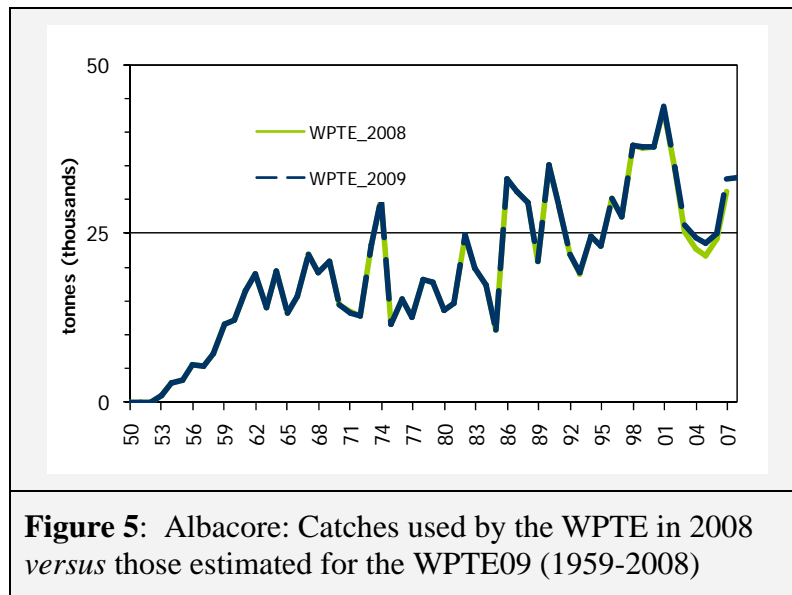
The amount of the catch below the zero-line has been categorised as uncertain according to the criteria given in the text. Light bars represent data for artisanal fleets and dark bars represent data for industrial fleets. Data as of November 2009

Discard levels are believed to be low although they are unknown for most industrial fisheries.

Changes to the catch series: There have not been significant changes to the catches of albacore since the WPTE in 2008 (Figure 5, page 6), other than the catches added for years after 2008. The changes in the catches for the years 2006 and 2007 refer to changes in the catches estimated for fresh-tuna and deep-freezing longline vessels from India and new catches estimated for Indonesia's deep-freezing longline fleet.

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 for the following reasons:

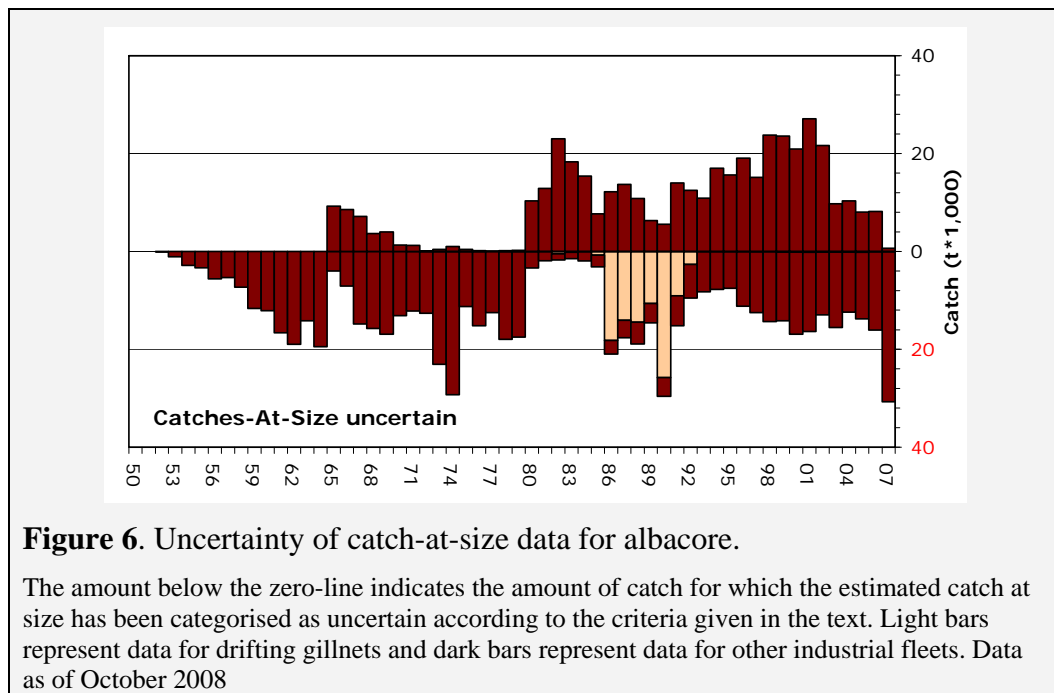
- non-reporting by industrial purse seiners and longliners (NEI)
- uncertain data from significant fleets of industrial purse seiners from Iran and longliners from India, Indonesia, Taiwan, China (fresh tuna) and Philippines.



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 (Figure 6) and in recent years (for the above fleets).

Catch-at-Size(Age) table: This is available but the estimates are more uncertain (Figure 6) for some years and some fisheries due to:

- the lack of size data available from industrial longliners before the mid-60s, from the early-1970s up to the mid-1980s and in 2008
- the paucity of catch by area data available for some industrial fleets (NEI, India, Indonesia, Taiwan, China (fresh-tuna))



4. PROGRESS ACHIEVED ON THE RECOMMENDATIONS OUTSTANDING FROM PAST WPTE MEETINGS

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

- India reporting catches for its commercial longline fleet.

India has not reported catch-and-effort data for its commercial longline fleet. At present more than 130 longliners operate under the flag of India.

- Indonesia increasing sampling coverage on by-catch unloaded by fresh-tuna and deep-freezing longliners operating under its flag.

*The Secretariat has not received new information from **Indonesia** concerning the above issue.*

- Indonesia and Malaysia collecting catch-and-effort information for their fresh tuna and/or deep-freezing longline fleets, including those not based in Indonesia.

*Following a request from the government of **Indonesia**, the IOTC-OFCF Project organized in May 2009 an International Work Shop³ to assist the implementation of a new logbook system for the tuna and tuna-like fisheries of Indonesia. The main objective of the new logbook programme is to improve the quality of the catch-and-effort data collected from the tuna fisheries of Indonesia. Implementation of the new logbook programme will start in January 2010, to cover all Indonesian longliners, including those not based in Indonesia.*

***Malaysia** reported in 2009 partial catch-and-effort data for its longline fisheries for 2008. However, the data were not reported as per the IOTC standards, containing only total catches and effort by month (not by 5° square grid). In addition, the catch-and-effort data reported is thought incomplete, as it does not contain catch-and-effort data for Malay longliners not based in Malaysia.*

- Taiwan,China collecting and providing catch-and-effort data for their fresh tuna longline fleets.

***Taiwan,China** has not provided catch-and-effort data for its fresh-tuna longline fleet in the Indian Ocean, in spite of an increase in the number of fresh-tuna longliners that operate in the area in recent years .*

- Countries having industrial fleets ensuring that logbook coverage is appropriate to produce acceptable levels of precision in their catch and effort statistics.

The next meeting of the WPDCS will consider which levels of precision are appropriate for catch-and-effort data relating to IOTC and dependent species.

- Countries having industrial fleets implementing or increasing coverage of existing Vessel Monitoring Systems in order to be able to validate data collected through logbooks.

The Compliance Section of the Secretariat sent a questionnaire in 2009 to assess implementation of VMS by IOTC CPC's, including questions about levels of coverage and use of information collected through VMS. The Secretariat will inform the next meeting of the WPTE about the results of this study.

- Countries having industrial fleets providing information on the activities of

³ Workshop on the implementation of a logbook programme for the fisheries of Indonesia: Review of issues and considerations (Jakarta, 18-20 May 2009)

vessels presumed to be from non-reporting fleets.

The Compliance Section of the IOTC Secretariat received several reports from IOTC CPC's or other countries in the region about the activities of vessels whose catches had not been reported to the IOTC. The Secretariat estimated catches for these and other vessels whose activities were not monitored by the flag countries. All these catches are presented under the NEI categories; more details about the estimation procedure and current levels of catch are presented in Appendix.

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

- Thailand and Iran to collect and provide size data for their industrial purse seine fleets

Thailand and Iran have implemented port sampling schemes for the collection of length frequency data from their industrial purse seine fisheries. However, considering the type of vessels involved and onboard fish storage practices, the Secretariat believes that the size data collected through port sampling has limited use. To date, Thailand and Iran have not provided length frequency data for its purse seine fisheries.

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

Taiwan, China informed that it has not implemented sampling to collect length frequency data from its fresh-tuna longline fleet.

- Indonesia and Malaysia collecting and providing size data for their longline vessels based in other countries

The Secretariat is not aware of Indonesia or Malaysia having implemented sampling schemes for the collection of size data from its longline vessels based in other countries.

- China, Philippines, Seychelles and South Korea providing size data from their longline fleets.

Seychelles provided during 2009 length frequency data for its industrial longline fishery, for the years 2007 and 2008. Size data are collected by the crew of Seychelles longliners, with sizes collected from the first 30 fish caught on each longline set.

South Korea provided during 2009 length frequency distributions for albacore caught by longliners operating under its flag. Length frequency data are collected through scientific observers. However, the data collected has limited use as observer coverage levels are thought to be too low.

China provided during 2009 observer data for its industrial longline fishery but these data did not include length frequency samples of Albacore

The Secretariat is not aware of Philippines having implemented sampling schemes for the collection of size data from its longline vessels.

- Japan increasing size sampling coverage from its longline fleet.

Japan informed the Secretariat in 2009 about its plans to increase observer coverage in longliners operating in the Indian Ocean. Japan indicated that it expected an increase in the amount of size data collected from its fisheries in the nearby future.

- Countries catching significant amounts of temperate tunas reviewing their existing sampling schemes to ascertain that the data collected are representative of their fisheries.

The next meeting of the WPDCS will consider which levels of precision are appropriate for length frequency data relating to IOTC and dependent species.

3. **Reduce uncertainty in the following biological parameters important for the assessment of stock status of tropical tuna species by:**

- Conversion relationships: Countries catching significant amounts of albacore providing the basic data that would be used to establish length-weight keys, non-standard measurements-fork length keys, processed weight-live weight keys and length-age keys for these species.
- Countries collecting biological information on albacore caught in their fisheries, preferably through observer programmes, and providing this information (including the raw data) to the Secretariat.

*In recent years, the **Republic of Korea** and the **EC** provided samples containing length-weight, processed weight-round weight and fork length-sex for tropical tuna species. The Secretariat has not received biological data from other countries in recent years.*

- Countries conducting studies on growth of Albacore in the Indian Ocean.

The Secretariat has not received new information concerning the above recommendation.

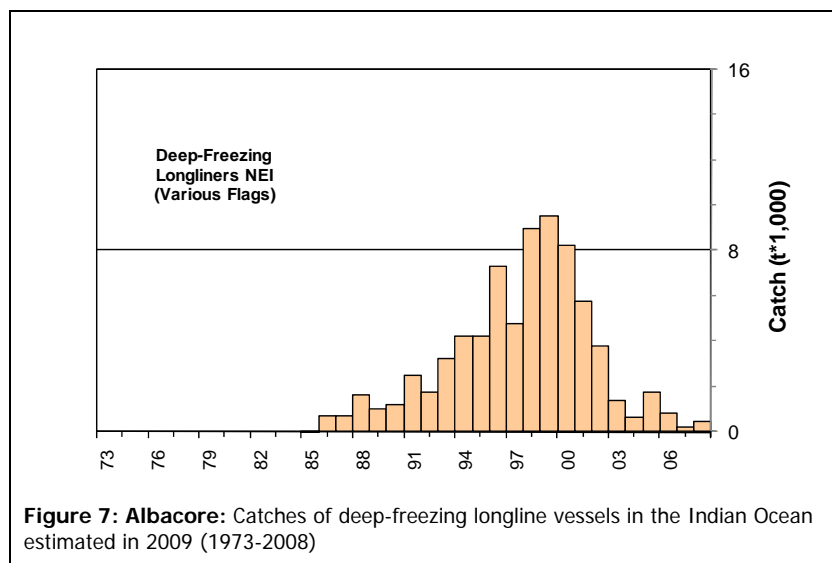
APPENDIX I

ESTIMATION OF CATCHES OF NON-REPORTING FLEETS

The estimates of catches of non reporting fleets were updated in 2009:

The high number of non-reporting fleets operating in the Indian Ocean since the mid-1980's has led to large increases in the amount of catch that needs to be estimated. This reduces confidence in the catch estimates for albacore.

- **Purse seine:** Catches for the six former Soviet Union purse seiners, currently under the Thailand flag, were estimated for January-August 2005 and those for the remaining purse seiner (Equatorial Guinea) for 2005-2006. Total catches were estimated using the number of vessels available, the average catches of the former Soviet Union purse seiners in previous years, and average catches available for other fleets for 2005-06. Total catches were assigned to species and type of school fished according to data available for Thailand purse seiners during the same period (2005-2006). The amount of catch that the Secretariat has to estimate for this fleet has decreased considerably in recent years. It is thought that there are no longer purse seiners operating under flags of non-reporting countries. The catches of albacore estimated for this component have never been above 170 t.
- **Deep-freezing longline (Figure 7):** The catches by large longliners from several non-reporting countries were estimated using IOTC vessel records and the catch data from Taiwanese, Japanese or Spanish longliners, based on the assumption that most of the vessels operate in a way similar to the longliners from Taiwan, China, Japan or Spain. The collection of new information on the non-reporting fleets during the last year, in particular the number and characteristics of longliners operating, led to improved estimates of catches. The number of vessel operating since 1999 has decreased and this has led to a marked decrease in catch levels. The reason for this decrease in the number of vessels (and catches) operating in the Indian Ocean is not fully explained. Nevertheless, this decrease is somewhat proportional to an increase in the number of vessels recorded under other flags, such as Philippines, Taiwan, China, the Seychelles and, recently, Oman, India and Indonesia. The catches recorded for India, Indonesia and Philippines are considered uncertain and probably do not account for all the albacore caught by vessels operating under these flags.



- **Fresh tuna longline (Figures 8-9):** Fresh tuna longline vessels, mainly from China, Taiwan, China, India, Malaysia, Belize, India and Indonesia, have been operating in the Indian Ocean since the early 1970's. The catches of these fleets were, up to

2006, estimated by the IOTC Secretariat by using information from the following three sources:

- Catches reported from the flag countries: Although China reported total catches for its longline fleet they were not reported by gear (fresh-tuna longline or deep-freezing longline). The Secretariat estimated the catches of fresh-tuna longliners by using the total catches reported, the numbers of fresh-tuna longline vessels provided by China and catch rates for fresh-tuna and deep-freezing longlines available from other fleets.
- Information on catches and vessel activity collected through several catch monitoring schemes implemented in the main ports of landing for these vessels, involving the IOTC-OFCF⁴ and/or institutions in the countries where the fleets are based and/or foreign institutions. This applies to Indonesia (2002 - to-date), Thailand (1998 - to-date), Sri Lanka (2002-03), Malaysia (2000-06), Oman (2004-05) and Seychelles (2000-02).
- Information available on the number of fresh-tuna longline vessels operating in other ports or on the activity of those vessels (e.g. the number of vessel unloadings). This applies to India (2005-07), Indonesia (1973-2001), Thailand (1994-97), Sri Lanka (1990-2001; 2004-05), Malaysia (1989-99), Singapore, Maldives and Yemen (recent years). The catches in these ports and years were estimated from the known/presumed levels of activity of the vessels and the average catches obtained in ports covered through sampling.

In 2006 Taiwan,China provided total catches for its longline tuna fleet operating in the Indian Ocean for the period 2000 to 2005. Since then, Taiwan,China has provided catches regularly. The catches provided are higher than those estimated by the IOTC Secretariat for most years. The new catches provided for 2001-05 were used to replace those in the IOTC database. This was done on the assumption that vessels from Taiwan,China have been operating in ports from non-reporting countries and their catches have not been accounted for in previous estimates.

The catches for fleets other than Taiwan,China for 1973-2007 and for Taiwan,China in years prior to 2001 were estimated as explained in the two bullet points above.

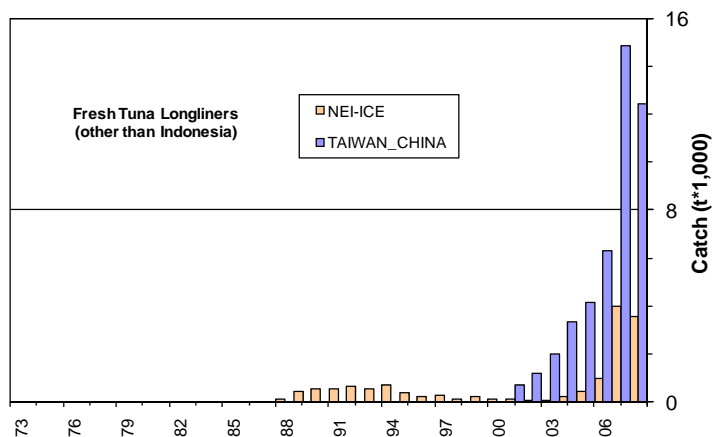


Figure 8: Albacore: Catches of fresh-tuna longline vessels not based in Indonesia (mainly registered in China, Taiwan,China and Indonesia) estimated in 2009 (1989-2008)

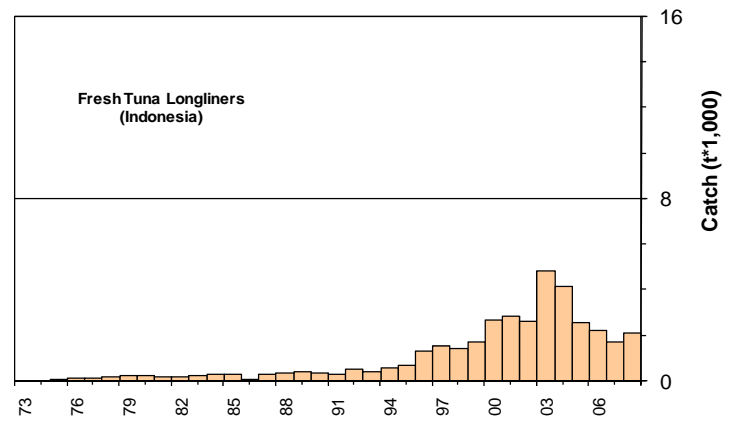


Figure 9: Albacore: Catches of fresh-tuna longline vessels based in Indonesia (domestic and foreign) estimated in 2009 (1973-2008)

⁴ Overseas Fisheries Cooperation Foundation of Japan