STATUS OF IOTC DATABASES FOR ALBACORE

IOTC Secretariat

Abstract

This document reviews the status of the information available on albacore in the databases at the IOTC Secretariat as of September 2008. 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 01/05 *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
- Recommendations to improve the data available on albacore to IOTC
- Overview of tropical tuna 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, 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 WPTE. 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. 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 industrial fisheries by:

- India reporting catches for its commercial longline fleet.
- Indonesia increasing sampling coverage on by-catch unloaded by fresh-tuna and deep-freezing longliners operating under its flag.
- Indonesia and Malaysia collecting catch and effort information for their fresh tuna and/or deep-freezing longline fleets, including those not based in Indonesia.
- Taiwan,China collecting and providing catch and effort data for their fresh tuna longline fleets.
- Countries having industrial fleets ensuring that log book coverage is appropriate to produce acceptable levels of precision in their catch and effort statistics.
- Countries having industrial fleets implementing or increasing coverage of existing Vessel Monitoring Systems in order to be able to validate data collected through logbooks.
- Countries having industrial fleets providing information on the activities of vessels presumed to be from non-reporting fleets.

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
- Taiwan,China collecting and providing size data from their fresh tuna longliners.
- Indonesia and Malaysia collecting and providing size data for their longline vessels based in other countries
- China, Philippines, Seychelles and South Korea providing size data from their longline fleets.
- Japan increasing size sampling coverage from its longline fleet.
- Countries catching significant amounts of temperate tunas reviewing their existing sampling schemes to ascertain that the data collected are representative of their fisheries.

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

3. STATUS OF FISHERIES STATISTICS FOR ALBACORE

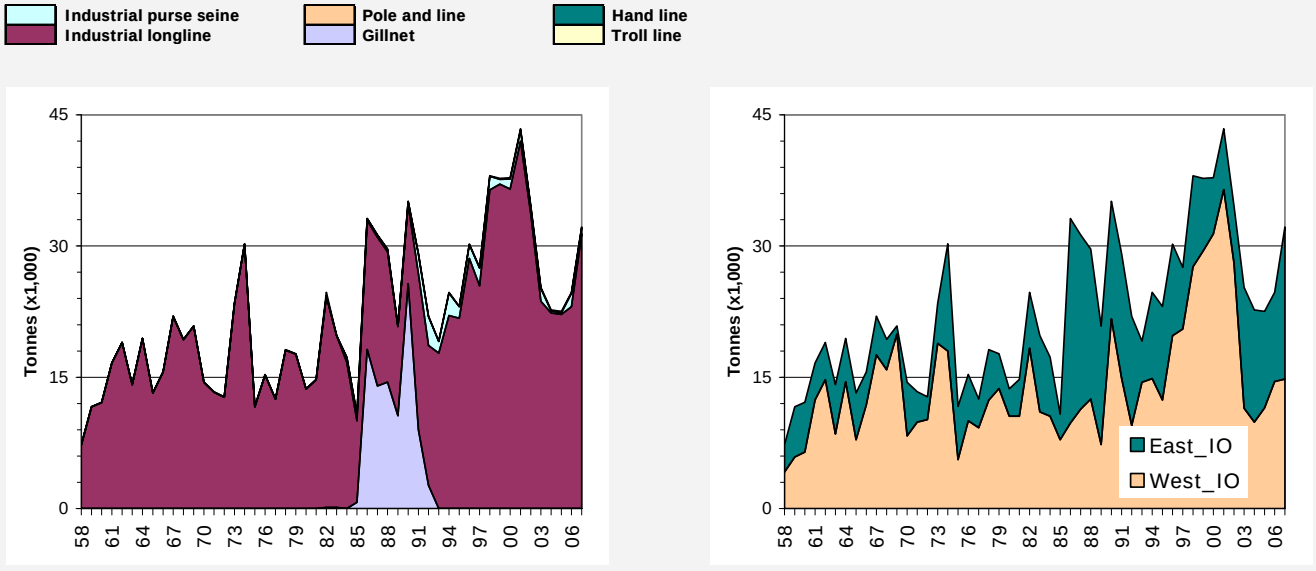
Albacore (ALB)

- **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 have steadily increased 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 relatively high (ranging from 34,000 t to 43,500 t). By contrast, the average annual catch for the period from 2003 to 2006 was 23,500 t. *Preliminary estimates for 2007 show an increase in the catches of albacore to around 31,000 t. 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).*



Figures 1-2: Catches of albacore by gear (left) and IOTC area (right) by year recorded in the IOTC Database (1958-2007)

Longliners from Japan and Taiwan,China have been operating in the Indian Ocean since the early 1950s and they have been the major fishers 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 changing the target species mainly 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 albacore catches by Taiwanese longliners have been less than 13,200 t. Preliminary estimates for 2007 show higher catches, around 17,000 t.

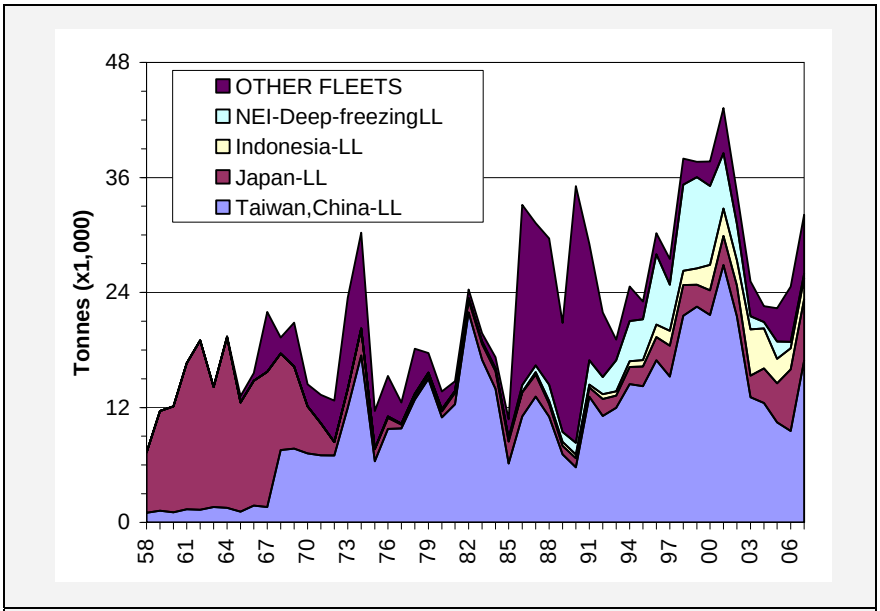


Figure 3: Catches of albacore by fleet recorded in the IOTC Database (1958-2007)

The catches of albacore by longliners from the Republic of Korea, recorded since 1965, have never been above 10,000 t. Important 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). *It is thought that the catches of albacore estimated in recent years for the Indonesian fishery are incomplete. This is due to an increase in the activities of Indonesian longliners in Southern Indian Ocean waters (which 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.

- **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

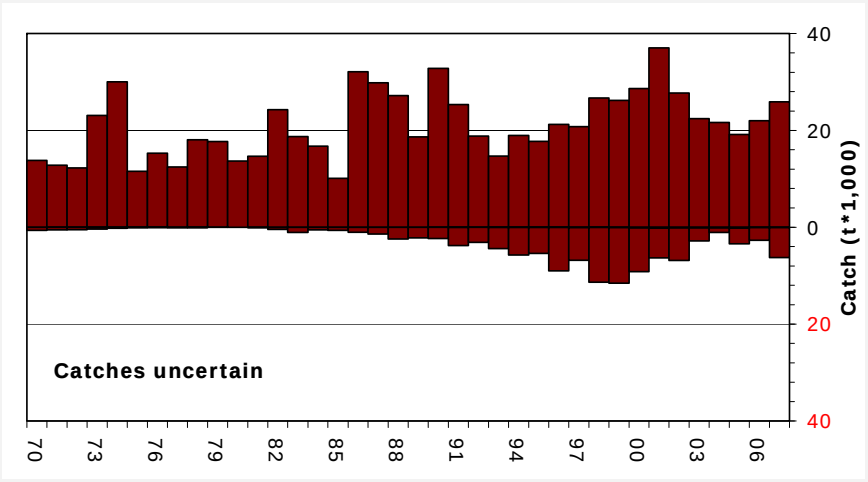


Figure 4. Uncertainty of annual catch estimates for albacore.

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 October 2008

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 2004 (Figure 5), other than the catches added for years after 2002. The changes in the late 1980's and early 1990's are due to changes in the catches that the Secretariat estimates for non-reporting fleets.

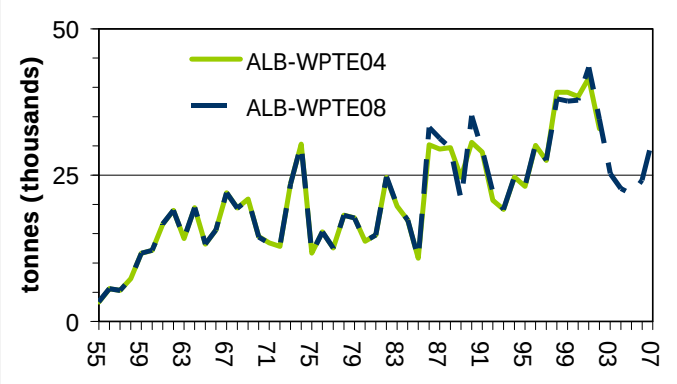


Figure 5: Albacore: Catches used by the WPTE in 2004 *versus* those estimated for the WPTE08 (1958-2007)

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 plus longliners from South Korea and Seychelles).

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 2007
- the paucity of catch by area data available for some industrial fleets (NEI, India, Indonesia, Taiwan,China (fresh-tuna))

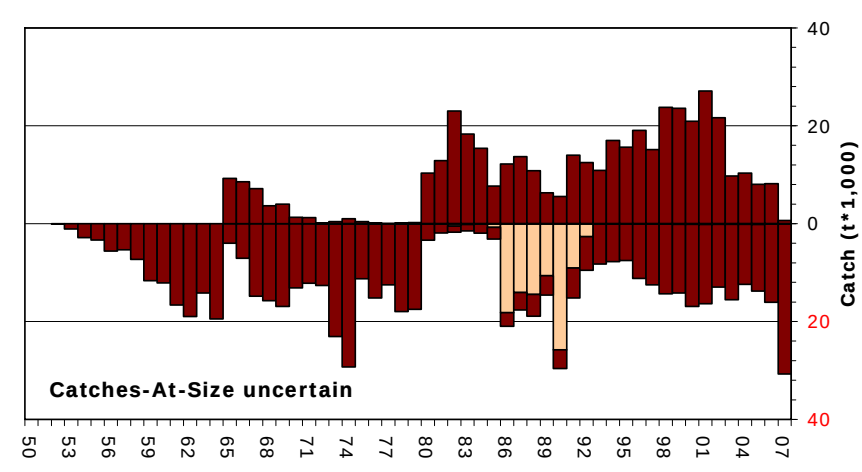


Figure 6. Uncertainty of catch at size data for albacore.

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 drifting gillnets and dark bars represent data for other industrial fleets. Data as of October 2008

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

6.1. Data

The following problem areas were identified in the IOTC database for albacore:

- **Lack of size-frequency data from the Republic of Korea and Philippines, Taiwan,China since 1989 and low sample sizes for the Japanese longline fleet.**

  Taiwan,China provided length frequency data for its longline fishery for 1980-2006.

  Philippines and Korea have not provided length frequency data for this species.

  Sample sizes for Japanese longliners continue to be very low

- **Lack of catch and effort data for the Taiwanese fleets for the area between 20-30°E for the whole time series.**

  Taiwan,China provided catches of albacore in this area for the entire time series (1967-2006)

- **Poor knowledge of the catches, effort and size-frequency from fresh tuna longline vessels, especially from Taiwan,China and several non-reporting fleets.**

  Taiwan,China has provided estimates of total catches for its fresh-tuna longline fleet for 2000-2007. Data on the sizes taken by Taiwanese fresh-tuna longliners was collected in different locations in the Indian Ocean, under the support of the IOTC Secretariat from 1998 to 2001 and, subsequently under the support of the IOTC-OFCF Project from 2002-2006. No length frequency data is available for these fleets for 2007.

  No catches and effort data are available for fresh-tuna longline fleets.

  Taiwan,China informed the Secretariat that efforts are being made to implement a logbook system on Taiwanese fresh-tuna longliners and to implement sampling in several locations of the Indian Ocean.

- **Poor knowledge of the catches, effort and size-frequency from non-reporting fleets of deep-freezing tuna longliners, especially since the mid 1980s.**

  The Secretariat has been revising the catches of non-reporting longliners as more information on vessel types and numbers has been made available. The current catches estimated for this component are much lower than those estimated for previous years.

  The decrease in the number of vessels from non-reporting countries has coincided with an increase in the number of longliners that operate under the flag of some IOTC members (India, Indonesia, Belize, Philippines, Seychelles). The catches of longliners from India and Indonesia are believed incomplete.

- **Lack of accurate catch, effort and size-frequency data for the Indonesian longline fishery in recent years.**

  The IOTC-OFCF Project provided support to the Directorate General for Capture Fisheries and the Research Centre for Capture Fisheries during 2002-06 for the implementation of a multilateral catch monitoring scheme whose main objective was the estimation of total catches and catches-at-size for the Indonesian fresh-tuna

longline fishery. The complete catch series for this component was revised by using new information collected during this time. The resulting catches estimated are thought more accurate than those existing before in the IOTC database.

The IOTC-OFCF Program in Indonesia was discontinued in 2007. Indonesia has continued monitoring the catches of fresh-tuna longliners unloaded in Indonesian ports since 2006. This, however, has not accounted for vessels operating in ports outside Indonesia or for deep-freezing longline vessels, whose numbers have increased considerably in recent years.

The IOTC-OFCF Project is currently cooperating with the Indonesian DGCF in the implementation of a logbook system on Indonesian longliners.

- **Poor knowledge of the catches, effort and size-frequency data for non-reporting purse seiners.**

  The catches of non-reporting purse seiners are currently better known. New catches and effort series for Russian and assimilated vessels were made available during 2007(Evgeny Romanov) and the catches in the IOTC database are considered to be more precise than previous catches. There have not been purse seiners from non-reporting countries operating in the Indian Ocean since 2007.

6.2. Biology

- **The WPTE recommend that review of existing age and growth information be undertaken with a view to obtaining robust information for input into an albacore stock assessment. If the existing information is uncertain then new work to estimate age and growth should be carried out.**

  To date, the Secretariat has not received new information concerning the above recommendation.

- **The stock structure of albacore is uncertain. It is possible that mixing occurs between the Indian Ocean and south Atlantic Ocean populations. The WPTE noted the need for a large scale tagging program, including archival tags, in the Indian Ocean, and possibly incorporating with other fishery organizations, ICCAT. Tagging program may also provide important information to the knowledge of albacore migration in the Indian Ocean.**

  To date, the Secretariat has not received new information concerning the above recommendation.

  No albacore was tagged during the IOTC RTTP Programme.

- **Study related to the maturity of albacore is strongly encouraged by the WPTMT.**

  To date, 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 2008:

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, 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.

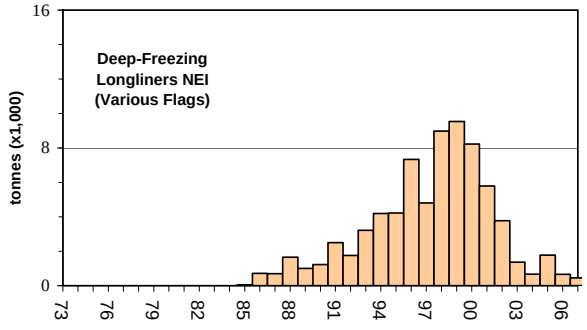


Figure 7: Albacore: Catches of deep-freezing longline vessels in the Indian Ocean estimated in 2008 versus catches estimated in 2007 (1973-2006)

- **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-OFCF[1] 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. The catches for 2006 and 2007 were provided in 2007 and 2008, respectively. 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.

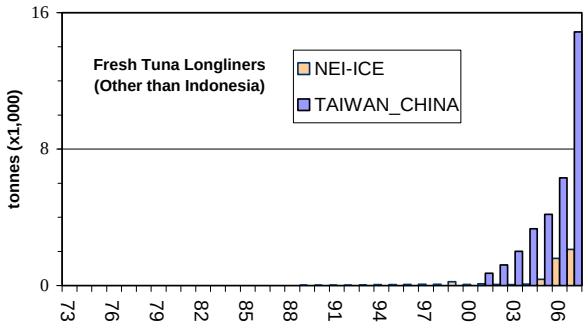


Figure 8: Albacore: Catches of fresh-tuna longline vessels not based in Indonesia (mainly registered in China, Taiwan,China and Indonesia) estimated in 2008 (1989-2007)

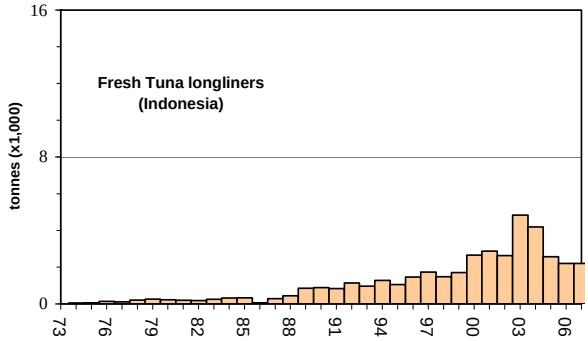


Figure 9: Albacore: Catches of fresh-tuna longline vessels based in Indonesia (domestic and foreign) estimated in 2008 (1973-2007)

[1] Overseas Fisheries Cooperation Foundation of Japan