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REVIEW OF THE STATISTICAL DATA AVAILABLE 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 August 2011. It covers data on nominal catches, catch-and-effort, and size-frequency.

1. OVERVIEW

This document summarises the standing of a range of information received by the secretariat for albacore, in accordance with IOTC Resolution 10/02 *Mandatory statistical requirements for IOTC Members and Cooperating non-Contracting Parties (CPC's)*[3], for the period 1950–2010. Statistics for 2010 represent preliminary catches.

The document describes the progress achieved in relation to the collection and verification of data and identifies problem areas as assessed from the information available.

The report covers the following areas:

- Overview
- Main issues relating to the data available on albacore
- Overview of albacore fisheries in the Indian Ocean:
    - Catch trends
    - Status of fisheries statistics for albacore.

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)).

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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[3] This Resolution superseded IOTC Resolutions 98/01, 05/01 and 08/01

2. MAIN ISSUES IDENTIFIED RELATING TO THE STATISTICS OF ALBACORE

The following list is provided by the Secretariat for the consideration of the WPTmT. The list covers the main issues which the Secretariat considers to negatively affect the quality of the statistics available at the IOTC, by type of dataset and fishery.

1. Catch-and-Effort data from Industrial Fisheries:

- **Longline** fishery of **Indonesia**: The catches of albacore estimated for the fresh tuna longline fishery of Indonesia in recent years are thought to be uncertain, as they cannot be verified using data collected through port sampling. To date, the Secretariat has not received catch-and-effort data for this fishery.
- **Longline** fishery of **India**: In recent years, India has reported very incomplete catches and catch-and-effort data for its commercial longline fishery. The Secretariat has estimated total catches for this period using alternative sources.
- **Drifting gillnet** fisheries of **Iran** and **Pakistan**: To date, none of these countries have reported catches of albacore for their driftnet fisheries.
- Longline fisheries of **Malaysia**, **Philippines**, and **Oman:** None of these countries is reporting catch-and-effort data as per the IOTC standards.

2. Size data from All Fisheries:

- **Longline** fishery of **Indonesia**: Indonesia has reported size frequency data for its fresh-tuna longline fishery in recent years. However, the samples cannot be fully disaggregated by month and fishing area (5x5 grid) and refer mostly to the component of the catch that is unloaded fresh. The quality of the samples in the IOTC database is for this reason uncertain.
- **Longline** fishery of **Japan:** The number of samples reported and total number of fish sampled for the longline fishery of Japan since 2000 has been very low.
- Longline fisheries of **Malaysia**, **Philippines**, and **Oman:** To date, none of these countries has reported size frequency data.

3. Biological data:

- Industrial **longline** fisheries, in particular **Taiwan,China**, **Indonesia**, **and Japan**: The Secretariat had to use length-age keys, length-weight keys, and processed weight-live weight keys for albacore from other oceans due to the general paucity of biological data available from the fisheries indicated.

3. STATUS OF FISHERIES STATISTICS FOR ALBACORE

Albacore (ALB)

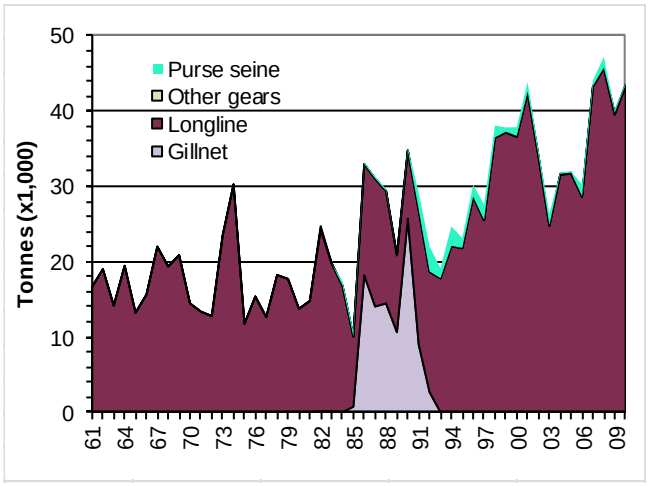
- **Fisheries and catch trends**

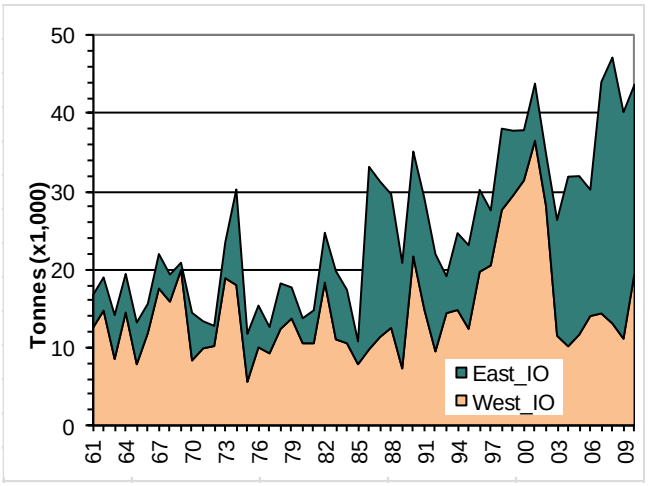
Albacore are caught almost exclusively under drifting longlines (98%), and between 20°S and 40°S, with remaining catches recorded under purse seines and other gears (Figure 1).

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 following the ban on drifting gillnets. Catches between 1998 and 2002 were high (ranging from 34,000 t to 44,000 t, in 2001). In contrast, the average annual catch for the period from 2002 to 2006 was 30,000 t. Record catches of albacore were recorded in 2007, at around 45,000 t, and again in 2008, at 48,000 t. Catches for 2009 are estimated to be at around 40,000 t, which represents a large drop with respect to catches during the previous two years. Preliminary catches for 2010 amount to 44,000 t.

The catches of albacore in recent years come almost exclusively from vessels flagged in Indonesia and Taiwan,China. The catches of albacore reported for the fresh tuna longline fishery of Indonesia have increased considerably since 2003 (Figure 3), due to an increase in the number of Indonesian vessels fishing in the main fishing grounds of albacore, in the south Indian Ocean. The catches of albacore in recent years have been around 17,000 t, which represents around 40% of the total catches of albacore in the Indian Ocean. However, the catches of Albacore estimated since 2003 are considered to be uncertain and may need to be revised in the future, as more information is collected from the fresh-tuna longline fishery of Indonesia.





Figures 1-2: Catches of albacore by gear (left) and IOTC area (right) by year recorded in the IOTC Database (1961–2010)

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. In contrast, catches by Taiwan,China 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 2010 the albacore catches by Taiwan,China longliners have been between 10,000 and 18,000 t, with catches appearing to be on the increase in recent years.

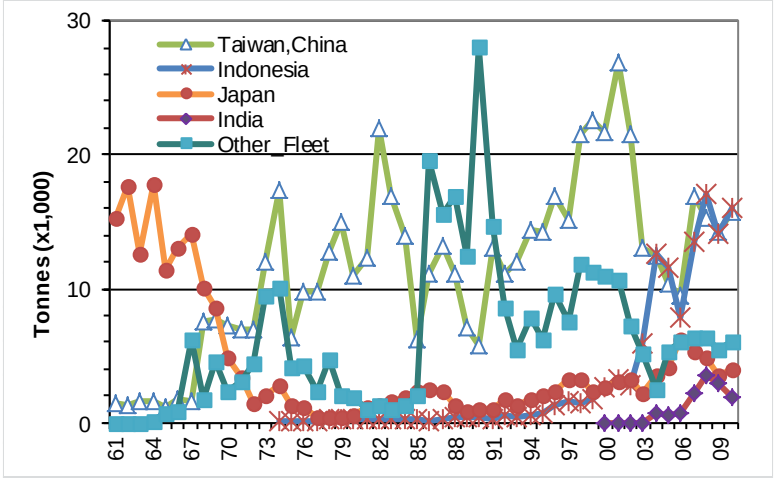


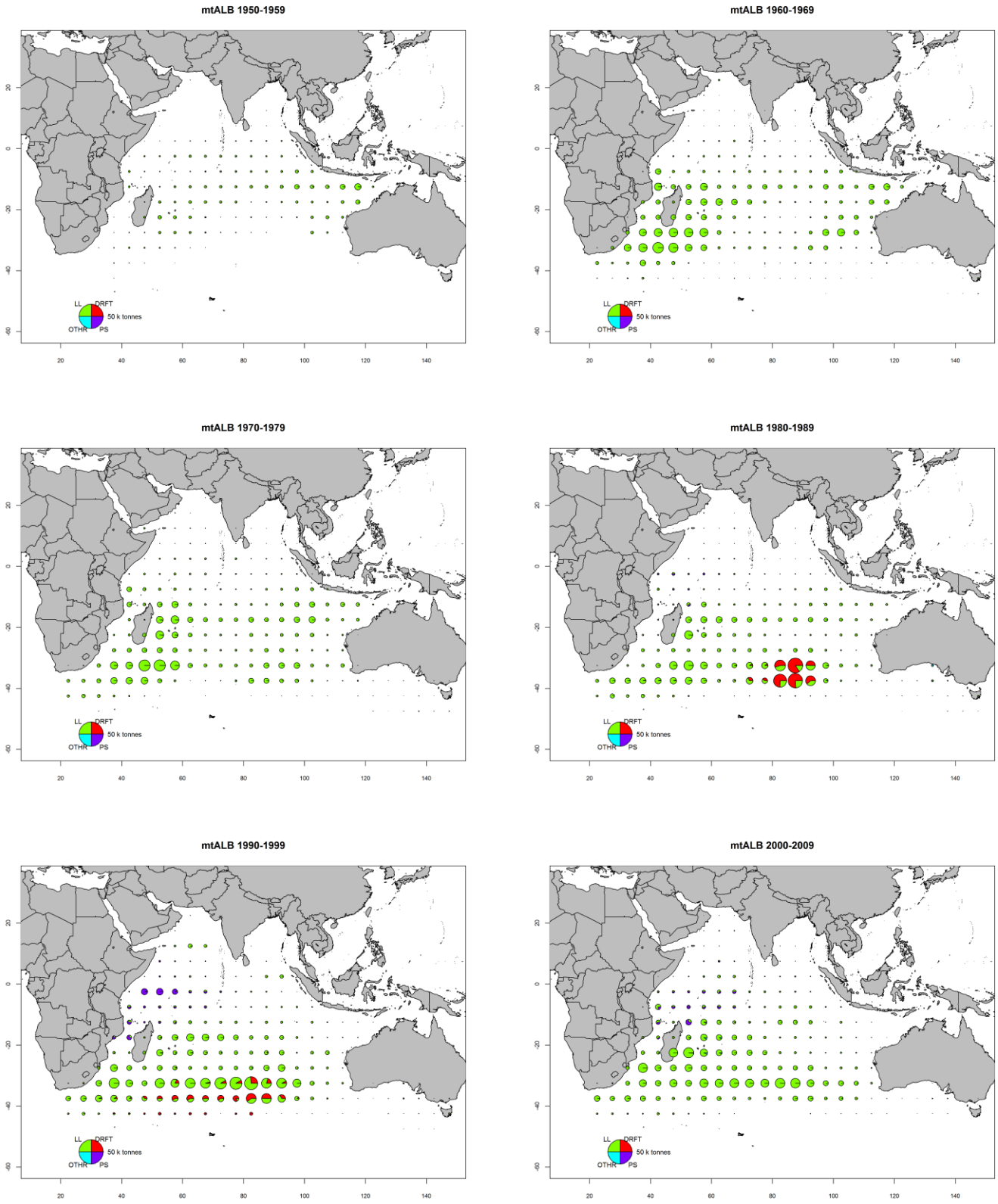
Figure 3: Catches of albacore by fleet recorded in the IOTC Database (1961–2010)

Since 1965 the catches of albacore by longliners from the Republic of Korea have not been higher than 10,000 t.

The majority of the albacore taken by longline fisheries is of large size (15 kg in average). Large sized albacore is also taken seasonally in certain areas, most often in free-swimming schools along with yellowfin tuna and bigeye tuna, 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. 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.

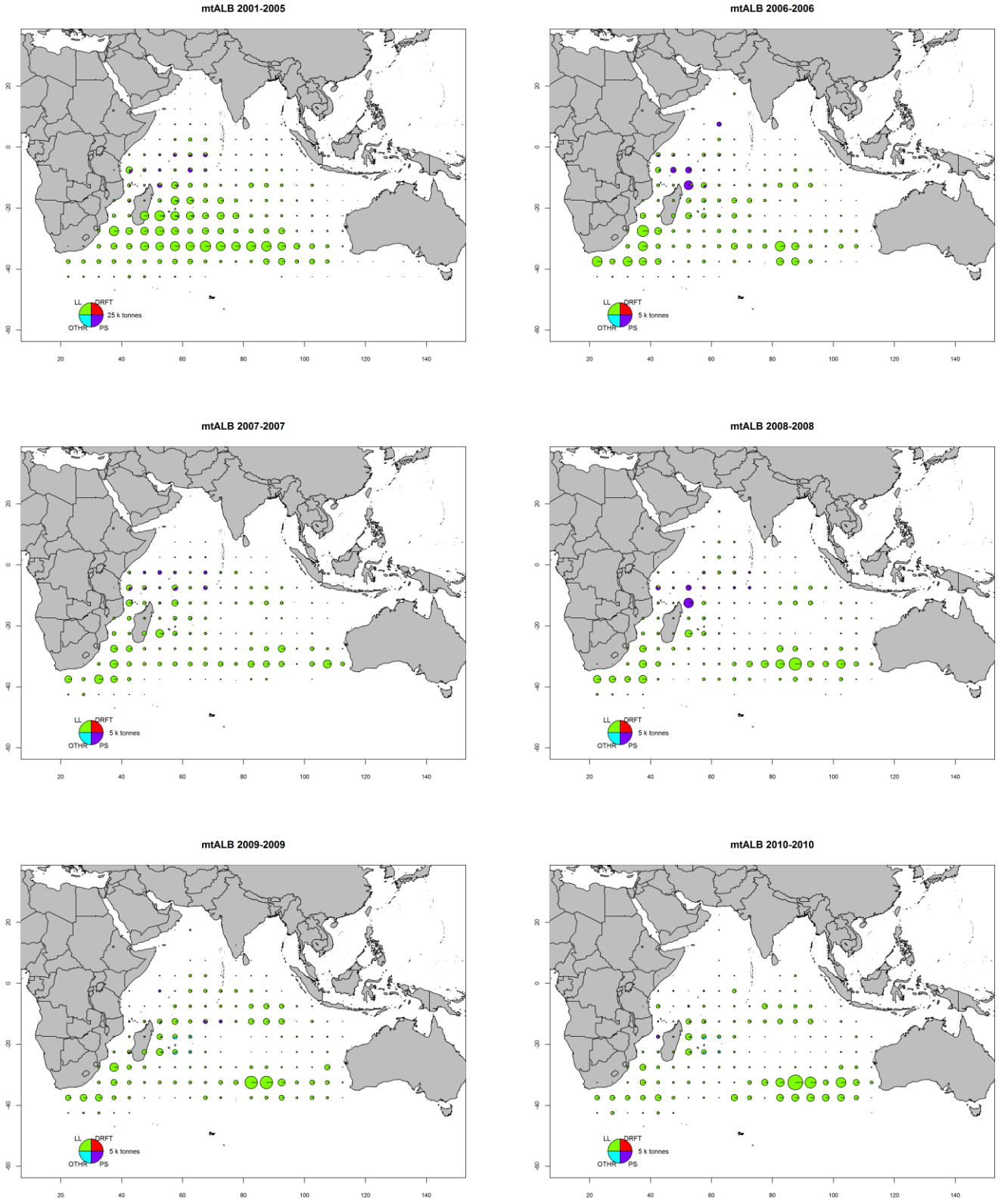
While most of the catches of albacore have come traditionally from the western Indian Ocean (**Maps 1-6**), in recent years albacore has been exploited mostly in the eastern Indian Ocean (**Figure 2**, **Maps 7-12**). The relative increase in catches in the eastern Indian Ocean since the early 2000's is mostly due to increased activity of fresh-tuna longliners from Taiwan,China and Indonesia (not represented in the Map). In the western Indian Ocean, the catches of albacore are mostly the result of the activity of deep-freezing longliners and purse seiners.



Maps 1-6: Time-area catches (total combined in tonnes) of albacore estimated for the period 1950-2010, by decade and type of gear:

Longline (**LL**, green), Driftnet (**DFRT**, red), Purse seine (**PS**, purple), Other fleets (**OTHER**, blue)

Time-area catches are not available for all fleets; catches for those were assigned by 5x5 square and month using information from other fleets. Catches of fresh-tuna longliners are not represented.



Maps 7-12: Time-area catches (total combined in tonnes) of albacore estimated for the period 2001-2005 by type of gear and for 2006-10, by year and type of gear:

Longline (**LL**, green), Driftnet (**DFRT**, red), Purse seine (**PS**, purple), Other fleets (**OTHER**, blue)

Time-area catches are not available for all fleets; catches for those were assigned by 5x5 square and month using information from other fleets. Catches of fresh-tuna longliners are not represented.

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

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

- Longliners of Indonesia, India and Malaysia operating in Southern waters
- Fleets using gillnets on the high seas, in particular Iran, Pakistan and Sri Lanka
- Non-reporting industrial longliners (NEI)

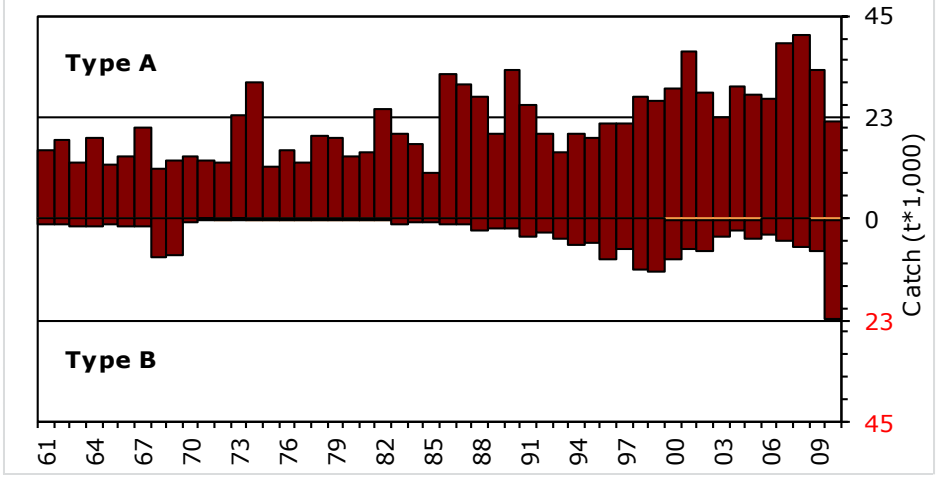


Figure 4. Uncertainty of annual catch estimates for albacore (1950–2010)

*Catches below the zero-line (**Type B**) refer to fleets that do not report catch data to the IOTC (estimated by the IOTC Secretariat), do not report catch data by gear and/or species (broken by gear and species by the IOTC Secretariat) or any of the other reasons provided in the document. Catches over the zero-line (**Type A**) refer to fleets for which no major inconsistencies have been found to exist. Light bars represent data for artisanal fleets and dark bars represent data for industrial fleets.* Data as of August 2011

Discard levels are believed to be low although they are unknown for industrial vessels other than European purse seiners.

Changes to the catch series: The catches of albacore in recent years have changed substantially (**Figure 5**), especially since 2003. This is due to a review of the catches of Indonesian longliners.

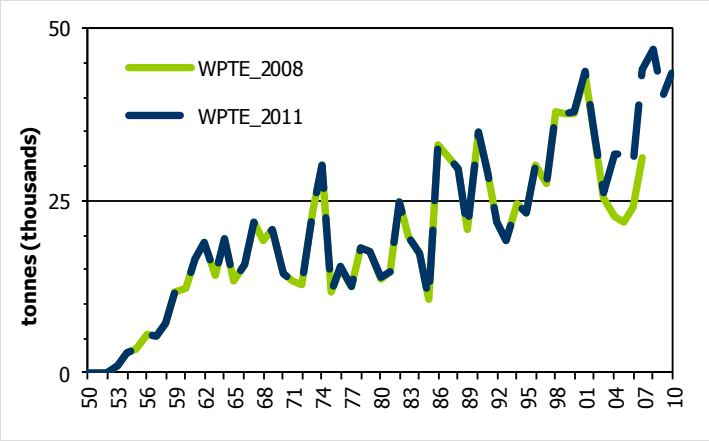


Figure 5: Albacore: Catches used by the WPTmT in 2008 *versus* those estimated for the WPTmT in 2011 (1950–2010)

CPUE Series: Catch-and-effort series are available from various industrial fisheries (**Figure 6**). Nevertheless, catch-and-effort are not available from some fisheries or they are considered to be of poor quality, especially during the last decade, for the following reasons:

- uncertain data from significant fleets of longliners, including India, Indonesia and Philippines.
- non-reporting by industrial purse seiners and longliners (NEI).

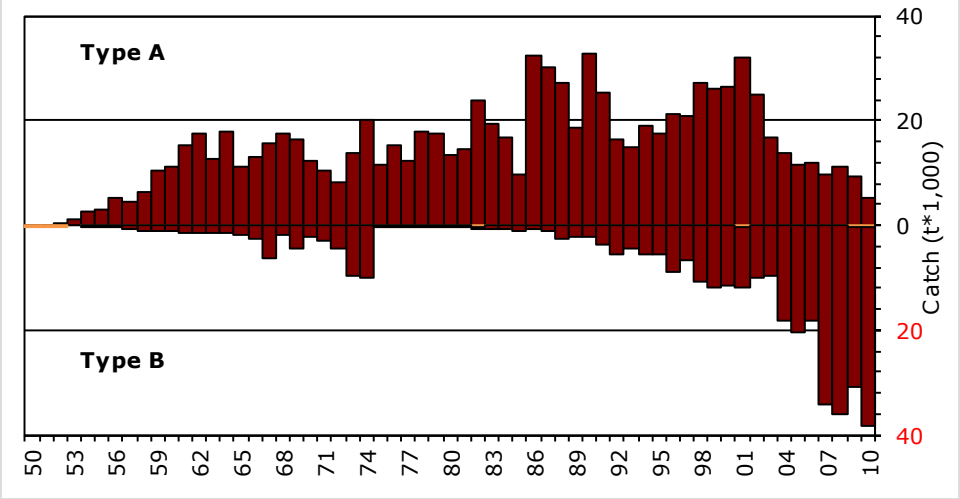


Figure 6. Uncertainty of time-area catches for albacore (1950-2010)

*Catches below the zero-line (**Type B**) refer to fleets that do not report catch-and-effort data to the IOTC, do not report catch-and-effort data by gear and/or species or any of the other reasons provided in the document. Catches over the zero-line (**Type A**) refer to fleets for which no major inconsistencies have been found to exist. Light bars represent data for artisanal fleets and dark bars represent data for industrial fleets.* Data as of August 2011

Trends in average weight can be assessed for several industrial fisheries although they are incomplete or of poor quality for most fisheries before 1980, between 1986 and 1991, and in recent years, for the fleets referred to above (**Figure 7**).

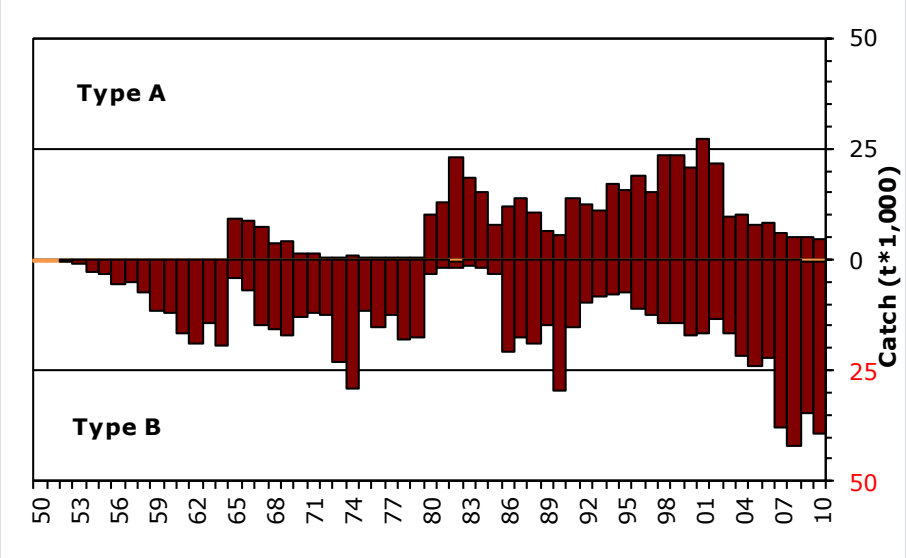


Figure 7. Uncertainty of catch-at-size data for albacore (1950–2010)

*Catches below the zero-line (**Type B**) refer to fleets that do not report length data to the IOTC, do not report length data by gear, species, month, fishing area or any of the other reasons given in the document. Catches over the zero-line (**Type A**) refer to fleets for which no major inconsistencies have been found to exist. Light bars represent data for artisanal fleets and dark bars represent data for industrial fleets.* Data as of August 2011

Catch-at-Size(Age) table: This is available but the estimates are highly uncertain (**Figure 7**) for some periods and fisheries including:

- all industrial longline fleets before the mid-60s, from the early-1970s up to the early-1980s and most fleets in recent years, in particular fresh-tuna longliners.
- the paucity of catch by area data available for some industrial fleets (Taiwan,China, NEI, India and Indonesia).

APPENDIX I

ESTIMATION OF CATCHES OF NON-REPORTING FLEETS

The estimates of catches of non reporting fleets were updated in 2011:

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 8**): The catches by large longliners from several non-reporting countries were estimated using IOTC vessel records and the catch data from Taiwan,China, Japanese or Spanish longliners, based on the assumption that most of the vessels operate in a way similar to the longliners from these countries. 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 and Philippines are considered uncertain and probably do not account for all the albacore caught by vessels operating under these flags.

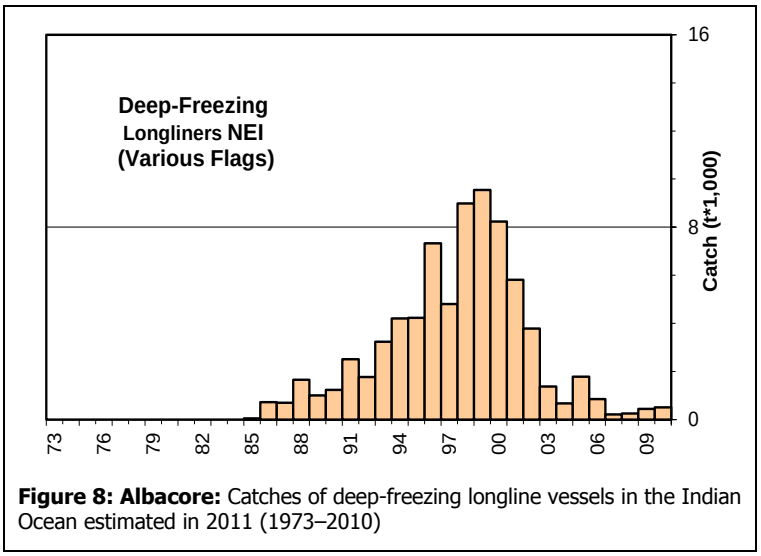


Figure 8: Albacore: Catches of deep-freezing longline vessels in the Indian Ocean estimated in 2011 (1973–2010)

- **Fresh tuna longline** (**Figures 9-11**): 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, before 2006 they were not reported by gear (fresh-tuna longline or deep-freezing longline). The Secretariat estimated the catches of fresh-tuna longliners for this period 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[4] and/or

[4] Overseas Fisheries Cooperation Foundation of Japan

institutions in the countries where the fleets are based and/or foreign institutions (**Figure 9**). This applies to Indonesia (2002 - to-date; **Figure 10**), 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 (2004-10; Figure 11), 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.
- Market data, including exports of frozen Albacore recorded in Indonesia and imports of Albacore for canning, provided through ISSF. This applies to Indonesia (2003-10) and Malaysia (2009-10).

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 1973-2010 and for Taiwan,China in years prior to 2001 were estimated as explained in the two bullet points above.

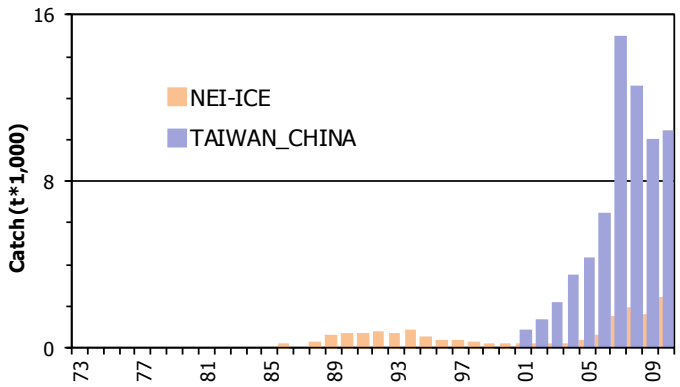


Figure 9: Albacore: Catches of fresh-tuna longline vessels not based in Indonesia (mainly registered in China, Taiwan,China and Indonesia) estimated in 2011 (1989-2010)

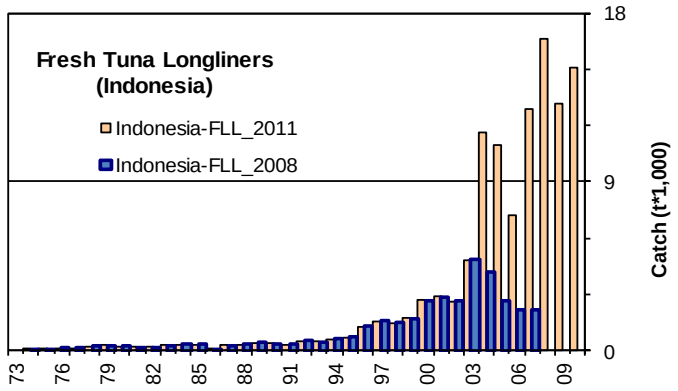


Figure 10: Albacore: Catches of fresh-tuna longline vessels based in Indonesia (domestic and foreign) estimated in 2011 (1973-2010)versus catches estimated in 2008 (1973-2006)

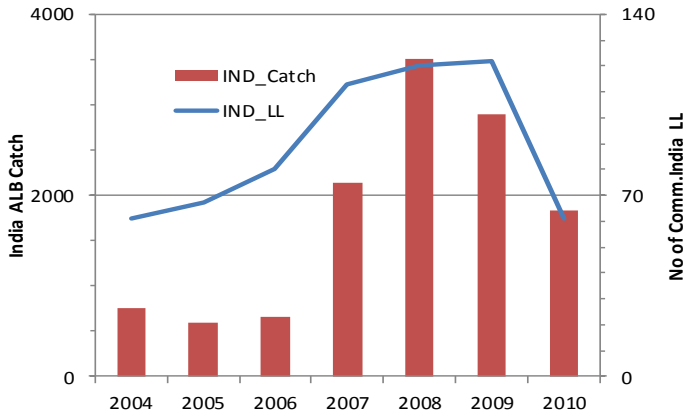


Figure 11: Number of longline vessels flagged in India and catches of albacore estimated for the period 2004-10