**Attachment 12**

**Report on Biology, Stock Status and Management of Southern Bluefin Tuna: 2010**

The CCSBT Extended Scientific Committee conducted a review of fisheries indicators in 2010 to provide information on the stock status. This report updates description of fisheries and the state of stock, and provides fishery and catch information, in the light of these evaluations.

***1. Biology***

Southern bluefin tuna (*Thunnus maccoyii*) are found in the southern hemisphere, mainly in waters between 30° and 50° S, but only rarely in the eastern Pacific. The only known spawning area is in the Indian Ocean, south-east of Java, Indonesia. Spawning takes place from September to April in warm waters south of Java and juvenile SBT migrate south down the west coast of Australia. During the summer months (December-April), they tend to congregate near the surface in the coastal waters off the southern coast of Australia and spend their winters in deeper, temperate oceanic waters. Results from recaptured conventional and archival tags show that young SBT migrate seasonally between the south coast of Australia and the central Indian Ocean. After age 5 SBT are seldom found in nearshore surface waters, and their distribution extends over the southern circumpolar area throughout the Pacific, Indian and Atlantic Oceans.

SBT can attain a length of over 2m and a weight of over 200kg. Direct ageing using otoliths indicates that a significant number of fish larger than 160cm are older than 25 years, and the maximum age obtained from otolith readings has been 42 years. Analysis of tag returns and otoliths indicate that, in comparison with the 1960s, growth rate has increased since about 1980 as the stock has been reduced. There is some uncertainty about the size and age when SBT mature, but available data indicate that SBT do not mature younger than 8 years (155cm fork length), and perhaps as old as 15 years. SBT exhibit age-specific natural mortality, with M being higher for young fish and lower for old fish, increasing again prior to senescence.

Given that SBT have only one known spawning ground, and that no morphological differences have been found between fish from different areas, SBT are considered to constitute a single stock for management purposes.

***2. Description of Fisheries***

Reported catches of SBT up to the end of 2009 are shown in Figures 1 - 3. However, a 2006 review of SBT data indicated that there may have been substantial under-reporting of SBT catches and surface fishery bias in the previous 10 - 20 year period and there is currently substantial uncertainty regarding the true levels of total SBT catch over this period. Historically, the SBT stock has been exploited for more than 50 years, with total catches peaking at 81,750t in 1961 (Figures 1 - 3). Over the period 1952 - 2003, 79% of the reported catch was taken by longline and 21% using surface gears, primarily purse-seine and pole&line (Figure 1). The proportion of

reported catch made by surface fishery peaked at 50% in 1982, dropped to 11-12 % in 1992 and 1993 and increased again to average 35% since 1996 (Figure 1). The Japanese longline fishery (taking a wide age range of fish) recorded its peak catch of 77,927t in 1961 and the Australian surface fishery catches of young fish peaked at 21,501t in 1982 (Figure 3). New Zealand, the Fishing Entity of Taiwan and Indonesia have also exploited southern bluefin tuna since the 1970s - 1980s, and Korea started a fishery in 1991.

On average 80% of the SBT catch has been made in the Indian Ocean, 16% in the Pacific Ocean and 4% in the Atlantic Ocean (Figure 2). The reported Atlantic Ocean catch has varied widely between about 18t and 8,200t since 1968 (Figure 2), averaging about 835t over the past two decades. This variation in catch reflecting shifts in longline effort between the Atlantic and Indian Oceans. Fishing in the Atlantic occurs primarily off the southern tip of South Africa (Figure 4). Since 1968, the reported Indian Ocean catch has declined from about 45,000t to 10,000t, averaging about 21,000t, and the reported Pacific Ocean catch has ranged from about 800t to 19,000t, averaging about 5600t, over the same periods (although SBT data analyses indicate that these catches may be under-estimated).

### *3. Summary of Stock Status*

The 2009 ESC meeting reported the status of the SBT stock in 2009 based on the reconditioned CCSBT Operating Model (OM). The reference set OM and six plausible scenarios all indicated that the spawning stock biomass (SSB) remained at a very low level; typically about 5% or less of $SSB_0$.

As reported in the 2009 ESC, recruitments during the last two decades were estimated to be well below the levels over 1950-1980. Recruitment in the 1990s fluctuated at a low level without any overall trend, but recruitments for 2000 to 2002 were poor. The two following year classes were somewhat stronger, though still below the average 1990s level. Recruitment since 2005 cannot be estimated precisely as yet. Although some data give positive signals, it remains probable that at least some of these year classes were as weak as in 1999-2002.

The 2009 ESC recommended a reduction to the current TAC in order to rebuild the spawning stock and thereby also reduce the risk in the short term of further poor recruitments. Based on this recommendation, the Extended Commission reduced the effective catch limit by about 20% to 9449 t (average annual catch for 2010-11).

Since the assessment in 2009, there have been several positive signals about the outlook for the stock. These include:

- Reduction in the total reported global catch
- Confirmation of increases in longline CPUE since 2007 (as checked in the inter-sessional CPUE analyses)
- Increased scientific aerial survey and SAPUE indices (reflective of potentially improved recruitment of recent year classes).

Increases in a number of CPUE indices in the most recent years, such as the New Zealand domestic fishery and Japanese longline fishery for age classes 4 and 5

suggest stronger year classes in recent years. Caution should nevertheless continue to be exercised in interpreting the longline CPUE data, where there is underlying uncertainty in the past data and regarding potential changes in fishing operation patterns since 2006, which remains to be resolved.

The ESC advice on the estimated status of the stock based on indicators in 2009-10, remains unchanged from the advice provided by the ESC in 2009. The current SSB remains very low, however, the outlook for the stock may be more positive due to the factors described in paragraph 103.

### *4. Current Management Measures*

At its Sixteenth annual meeting, the CCSBT agreed that the status of the southern bluefin tuna (SBT) stock was at a critical stage and that a meaningful reduction in the total allowable catch (TAC) was necessary in order to recover the stock and work toward reaching an interim rebuilding target reference point of 20% of the original spawning stock. Consequently, the CCSBT reduced the SBT global total allowable catch (TAC) for 2010 and 2011 to an average level over the two years of 80% of the previously allocated global TAC of 11,810 tonnes. The Effective Catch Limit for Members and Cooperating Non-Members combined averaged 9449 t annually over 2010-2011. The allocation of the TAC amongst Members and Cooperating Non-Members for the 2010 and 2011 fishing seasons is specified below (in tonnes). To help ensure compliance with the TAC, the CCSBT also adopted a Resolution on Actions Plans to Ensure Compliance with Conservation and Management Measures.

Effective Catch Limit for the 2010 and 2011 fishing seasons

Members

The “Nominal Catch” listed below is the catch before any reductions are applied, the “Allocated Catch” is the reduced catch allocated for 2010 and 2011 and the “Effective Catch Limit” is the effective catch after additional agreed voluntary reductions have been applied.

| | Nominal Catch | Allocated Catch | Effective Catch Limit |
|---|---|---|---|
| Japan | 5,665 | 2,261 | 2,261 |
| Australia | 5,665 | 4,270 | 4,015 |
| Republic of Korea | 1,140 | 859 | 859 |
| Fishing Entity of Taiwan | 1,140 | 859 | 859 |
| New Zealand | 1000 | 754 | 709 |
| Indonesia | 750 | 651 | 651 |

Cooperating Non-Members (for 2010)

| | |
|---|---|
| Philippines | 45 |
| South Africa | 40 |
| European | 10 |

Community

In addition to the reduced TAC, the CCSBT decided that it would work toward implementing a management procedure (MP) in 2011 and that the MP would be the basis for TAC setting in 2012 and beyond. An emergency rule will be developed as part of the MP for exceptional circumstances such as recruitment levels lower than historically low levels. Finally, the CCSBT has agreed to set a TAC of 5,000t-6,000t for the 2012 fishing season in the event that an MP cannot be finalised by 2012, unless the Extended Commission decides otherwise based upon the new stock assessment.

More complete information on the total catch and its allocation is provided in paragraphs 45 to 61 and Attachment 13 of the CCSBT16 Report.

On 1 June 2000, the CCSBT implemented a Trade Information Scheme (TIS) for SBT, in which a CCSBT TIS document must be issued for all exports of SBT. The scheme also requires all Members of the CCSBT to ensure that all imports of SBT are to be accompanied by a completed CCSBT TIS Document, endorsed by an authorised competent authority in the exporting country, and including details of the name of fishing vessel, gear type, area of catch, dates, etc. Shipments not accompanied by this form must be denied entry by Members and Cooperating Non-Members. Completed forms are lodged with the CCSBT Secretariat where they are used to maintain a database for monitoring catches and trade and for conducting reconciliations between exports and imports of SBT.

On 1 July 2004, the CCSBT established a list of fishing vessels over 24 metres in length which were approved to fish for SBT. The list was extended to include all vessels, regardless of size, from 1 July 2005.

On 31 December 2008, the CCSBT established a list of authorised farms that are approved to operate for farming SBT and on 1 April 2009, the CCSBT established a list of carrier vessels that are authorised to receive SBT at sea from large scale fishing vessels. Members and Cooperating Non-Members will not allow the trade of SBT caught by fishing vessels and farms, or transhipped to carrier vessels that are not on these lists.

The CCSBT Vessel Monitoring System (VMS) came into effect immediately after the Fifteenth Annual Meeting of the Commission, on 17 October 2008. It requires CCSBT Members and Cooperating Non-Members to adopt and implement satellite-linked VMS for vessels fishing for SBT that complies with the IOTC, WCPFC, CCAMLR, or ICCAT VMS requirements according to the respective convention area in which the SBT fishing is being conducted. For fishing outside of these areas, the IOTC VMS requirements must be followed.

The CCSBT Transhipment monitoring program came into effect on 1 April 2009. The program applies to transhipments at sea from tuna longline fishing vessels with freezing capacity (referred to as “LSTLVs”). It requires, amongst other things, for carrier vessels that receive SBT transhipments at sea from LSTLVs to be authorised to receive such transhipments and for a CCSBT observer to be on board the carrier

vessel during the transhipment. The CCSBT transhipment program is harmonised and operated in conjunction with those of ICCAT and IOTC to avoid duplication of the same measures. ICCAT or IOTC observers on a transhipment vessel that is authorised to receive SBT are deemed to be CCSBT observers provided that the CCSBT standards are met.

The CCSBT Catch Documentation Scheme (CDS) came into effect on 1 January 2010 and replaces the existing TIS system. The CDS provides for tracking and validation of legitimate SBT product flow from catch to the point of first sale on domestic or export markets. As part of the CDS, all transhipments, landings of domestic product, exports, imports and re-exports of SBT must be accompanied by the appropriate CCSBT CDS Document(s), which will include a Catch Monitoring Form and possibly a Re-Export/Export After Landing of Domestic Product Form. Similarly, transfers of SBT into and between farms must be documented on either a Farm Stocking Form or a Farm Transfer Form as appropriate. In addition, each whole SBT that is transhipped, landed as domestic product, exported, imported or re-exported must have a uniquely numbered tag attached to it and the tag numbers of all SBT (together with other details) will be recorded on a Catch Tagging Form. Copies of all documents issued and received will be provided to the CCSBT Secretariat on a quarterly basis for compiling to an electronic database, analysis, identification of discrepancies, reconciliation and reporting.

### *5. Scientific Advice*

If the Management Procedure (MP) is implemented in 2011 with a 1-year lag, the ESC recommends that the current TAC of 9449t remain for 2012. If the MP is implemented in 2011 with no lag, the ESC recommends that the MP guide the TAC setting for 2012.

Noting the Extended Commission's intent to adopt an MP at its 2010 annual meeting, the ESC recommends that the Extended Commission take steps to ensure accurate future catch and effort reporting.

## 6. Biological State and Trends

Analyses suggest the SBT spawning biomass is at a low fraction of its original biomass and well below the 1980 level as well as below the level that could produce maximum sustainable yield. Rebuilding the spawning stock biomass would almost certainly increase sustainable yield and provide security against unforeseen environmental events. Recruitments in the last decade are estimated to be well below the levels in the period 1950-1980.

Exploitation rate: High fishing mortality
Exploitation state: Overexploited
Abundance level: Low abundance

| SOUTHERN BLUEFIN TUNA SUMMARY (global stock) | |
|---|---|
| Maximum Sustainable Yield | Not estimated |
| Reported (2009) Catch | 10,940 t |
| Current Replacement Yield | Not estimated |
| Current (2009) Spawner Biomass | 44,040 (33,091 – 50,095t)[1] |
| Current (2009)Depletion | $SSB_{2009}$ / $SSB_0$ : 0.036 - 0.051[1] |
| Current Management Measures | Effective Catch Limit for Members and Cooperating Non-Members combined averaged 9449 t annually over 2010-2011. |

[1] These are the ranges in estimates of median spawning biomass obtained from evaluation of the base case and a range of six plausible scenarios during the 2009 Extended Scientific Committee meeting.

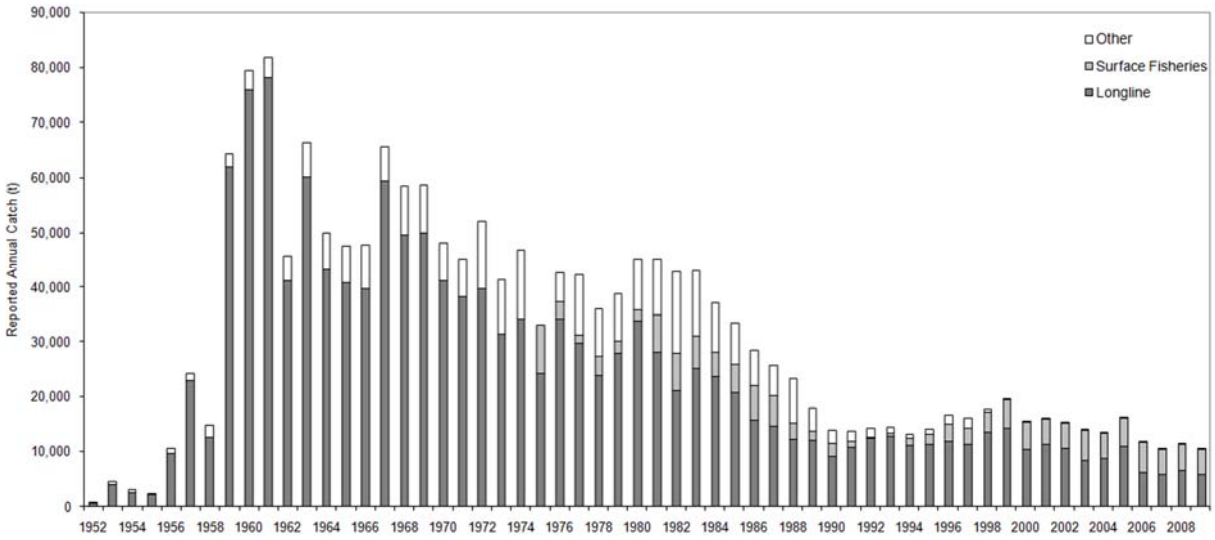


**Figure 1:** Reported southern bluefin tuna catches by fishing gear, 1952 to 2009. Note: a 2006 review of SBT data indicated that catches over the past 10 to 20 years may have been substantially under-reported.

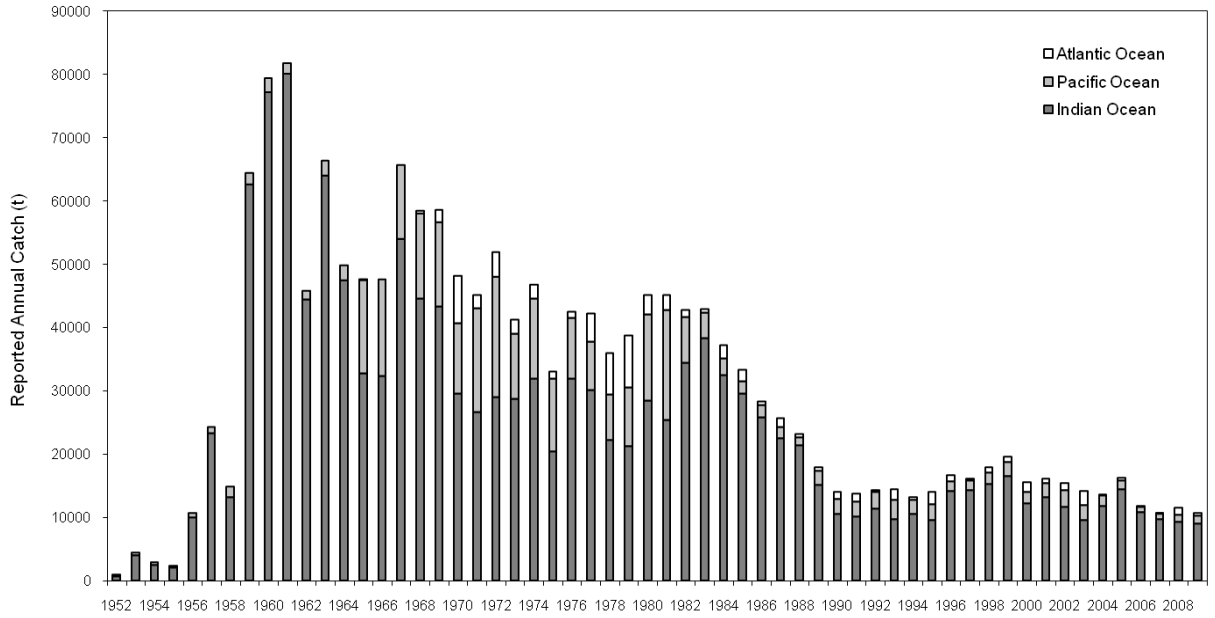


**Figure 2:** Reported southern bluefin tuna catches by ocean, 1952 to 2009. Note: a 2006 review of SBT data indicated that catches over the past 10 to 20 years may have been substantially under-reported.

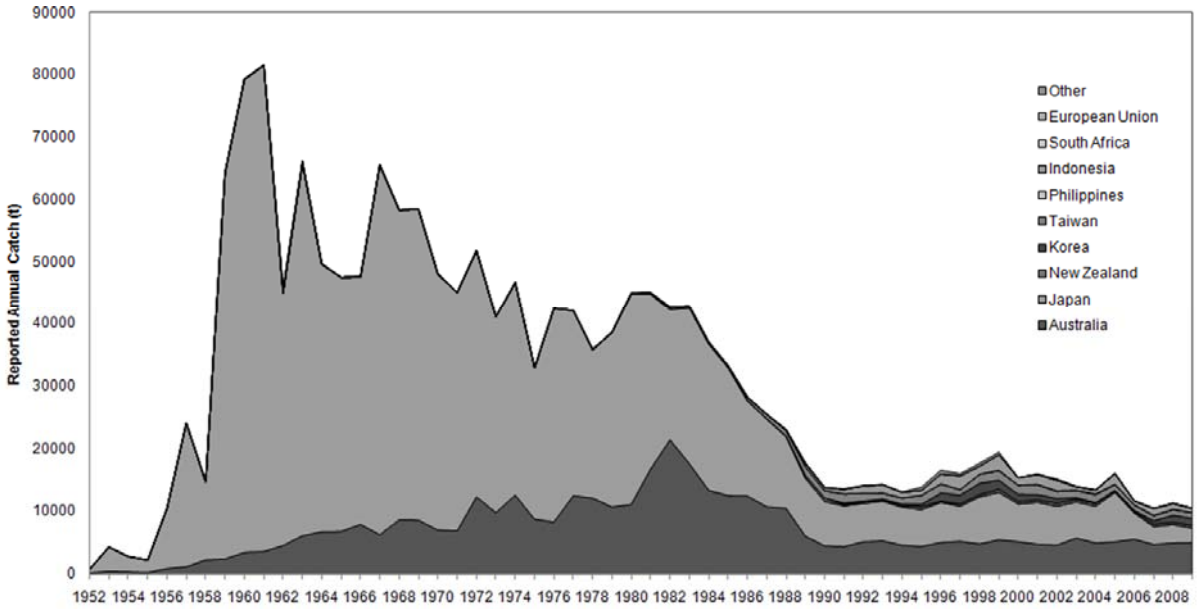


**Figure 3:** Reported southern bluefin tuna catches by flag, 1952 to 2009. Note: a 2006 review of SBT data indicated that catches over the past 10 to 20 years may have been substantially under-reported.

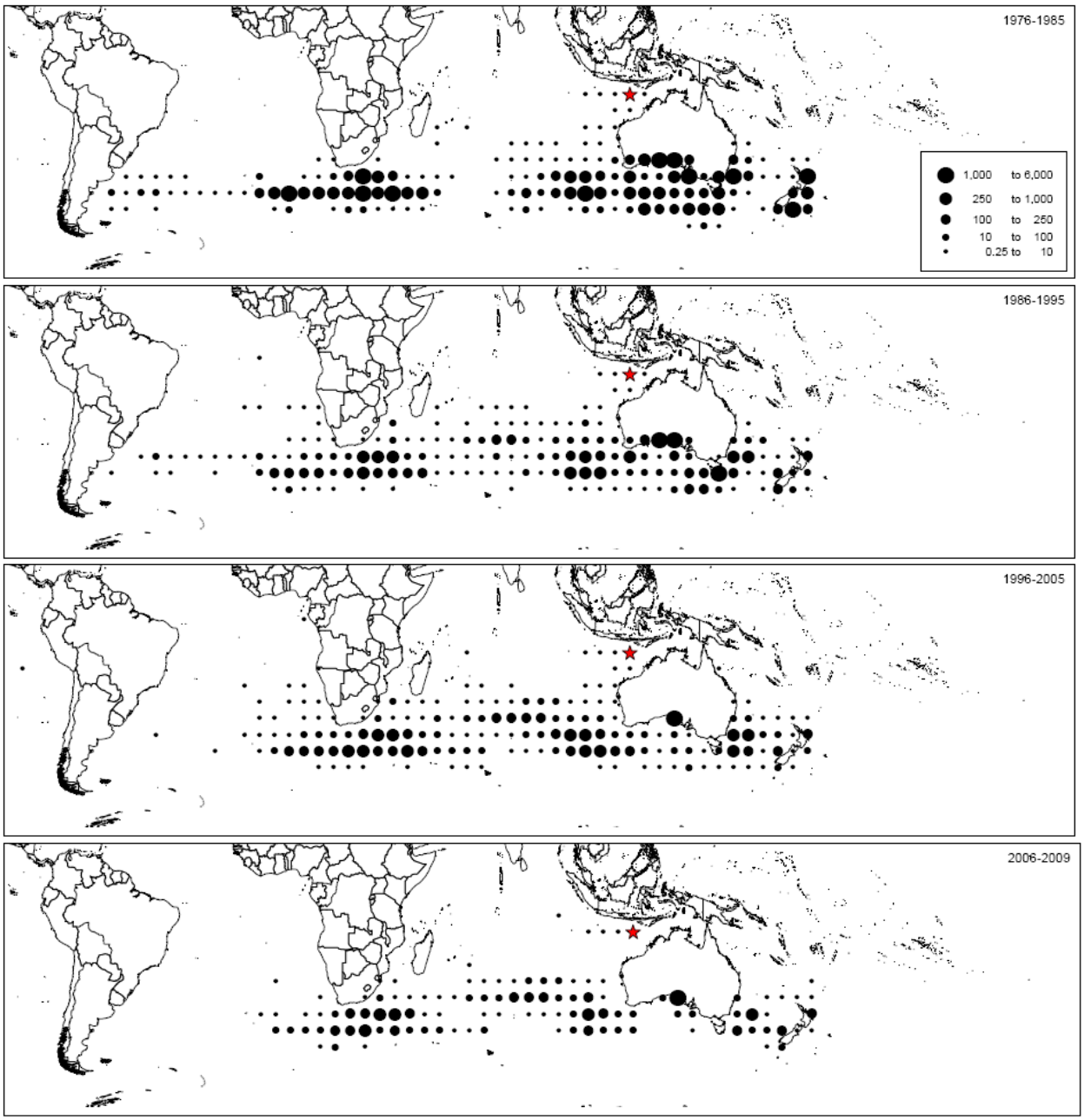


**Figure 4:** Geographical distribution of average annual southern bluefin tuna catches (t) by CCSBT members and cooperating non-members over the periods 1976-1985, 1986-1995, 1996-2005 and 2006-2009 per 5° block by oceanic region. The area marked with a star is an area of significant catch in the breeding ground. Block catches averaging less than 0.25 tons per year are not shown. Note: This figure may be affected by past anomalies in catch.