

**Attachment 9**

**Report on Biology, Stock Status and Management of Southern Bluefin Tuna: 2014**

The CCSBT Extended Scientific Committee (ESC) conducted a review of fisheries indicators and updated the operating model in 2014 to provide updated information on the status of the stock. This report updates description of fisheries and the state of stock, and provides fishery and catch information.

**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 2013 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 81,750 t in 1961 (Figures 1 - 3). Over the period 1952 - 2013, 77.5% of the reported catch was taken by longline and 22.5% using surface gears, primarily purse-seine and pole and line (Figure 1). The proportion of reported catch made by the surface fishery peaked at 50% in 1982, dropped to 11-12 % in 1992 and 1993 and increased again to average 36% since 1996 (Figure 1). The Japanese longline fishery (taking a wide age range of fish) recorded

its peak catch of 77,927 t in 1961 and the Australian surface fishery catches of young fish peaked at 21,501 t 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 79% of the SBT catch has been made in the Indian Ocean, 17% 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 804t over the past two decades. This variation in catch is 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 8,000t, averaging about 19,500t, and the reported Pacific Ocean catch has ranged from about 800t to 19,000t, averaging about 5,200t, over the same periods (although SBT data analyses indicate that these catches may be under-estimated).

### ***3. Summary of Stock Status***

The 2014 assessment suggested that the SBT spawning biomass is at a very low fraction (9%) of its original biomass as well as below the level that could produce maximum sustainable yield. However, there has been some improvement since the 2011 stock assessment. The current TAC has been set using the management procedure adopted in 2011, which has a 70% probability of rebuilding to the interim target biomass level by 2035.

#### Summary of indicators in 2014

There were mixed signals from the indicators in 2014, with no indication of concern. The overall results can be summarised as follows:

- The 2014 scientific aerial survey index of relative juvenile (2-4 year old) abundance is the highest value seen in the time series. Between 2010 and 2014 the index has shown more variation but with an increasing trend. The commercial SAPUE index also increased from 2013 to 2014, but to a lesser extent. The trolling survey index declined slightly between 2013 and 2014.
- Longline CPUE for the Japanese fleet for ages 6 and 7 increased steadily from 2007 to 2012 but decreased in 2013. The CPUE index values for ages 8-11 decreased slightly and gradually from 2008 to 2011 but have increased in more recent years. The CPUE indices for age 12+ has showed a decline from 2008 to 2010 and then fluctuated around a low level afterward; this is expected given the weak recruitment from 1999 to 2002.
- In 2012-13 and 2013-14 there was a decline in the mean length of SBT on the spawning ground, with a new mode of relatively small/young fish in the Indonesian catch. It remains to be determined whether the catch of smaller fish comes from the spawning ground and whether they are mature.

### ***4. Current Management Measures***

#### Total Allowable Catch (TAC)

The primary conservation measure for management of the southern bluefin tuna stock is the TAC.

At its eighteenth annual meeting, the CCSBT agreed that a Management Procedure (MP) would be used to guide the setting of the SBT global total allowable catch (TAC) to ensure that the SBT spawning stock biomass achieves the interim rebuilding target of 20% of the original spawning stock biomass. The CCSBT now sets the TAC based on the outcome of the MP, unless the CCSBT decides otherwise based on information that is not otherwise incorporated into the MP.

In adopting the MP, the CCSBT emphasised the need to take a precautionary approach to increase the likelihood of the spawning stock rebuilding in the short term and to provide industry with more stability in the TAC (i.e. to reduce the probability of future TAC decreases). Under the adopted MP, the TAC will be set in three year periods. For the first three-year TAC setting period (2012-2014), the TAC was set as follows:

- 2012: 10,449 tonnes;
- 2013: 10,949 tonnes; and
- 2014: 12,449 tonnes.

For the second three-year TAC setting period (2015-2017), the CCSBT has set the TAC to 14,647 tonnes per year, with the TAC for 2016-2017 to be confirmed at CCSBT 21 (October 2014).

The current allocations of the TAC to Members and Cooperating Non-Members of the CCSBT for 2014 and 2015 is summarised below. In addition, some flexibility is provided to Members for limited carry-forward of unfished allocations within the three year period.

#### Current Allocations to Members

	<u>2014</u>	<u>2015<sup>1</sup></u>
Japan	3,403	4,737
Australia	5,193	5,665
Republic of Korea	1,045	1,140
Fishing Entity of Taiwan	1,045	1,140
New Zealand	918	1,000
Indonesia	750	750 <sup>2</sup>

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<sup>1</sup> The allocations for 2015 assume that South Africa accedes to the Convention for the Conservation of Southern Bluefin Tuna in time for its allocation to be increased.

<sup>2</sup> The allocation to Indonesia from 2015 will be re-assessed once the planned independent Quality Assurance Review of Indonesia is completed. The above allocations do not take the re-assessment into account.

### Current Allocations to Cooperating Non-Members

	<u>2014</u>	<u>2015</u>
Philippines	45	45
South Africa	40	40 <sup>3</sup>
European Community	10	10

### Monitoring, Control and Surveillance

The CCSBT has adopted a Compliance Plan that supports its Strategic Plan and provides a framework for the CCSBT, Members and Cooperating Non-Members to improve compliance, and over time, achieve full compliance with CCSBT's conservation and management measures. The Compliance Plan also includes a three-year action plan to address priority compliance risks. The action plan will be reviewed, and confirmed or updated every year. The action plan is therefore a 'rolling' document and over time its emphasis will change.

The CCSBT has also adopted three Compliance Policy Guidelines, these being:

- Minimum performance requirements to meet CCSBT Obligations;
- Corrective actions policy; and
- MCS information collection and sharing

In addition, the CCSBT has implemented a Quality Assurance Review (QAR) program to provide independent reviews to help Members identify how well their management systems function with respect to their CCSBT obligations and to provide recommendations on areas where improvement is needed. It is further intended that QARs will:

- Benefit the reviewed Member by giving them confidence in the integrity and robustness of their own monitoring and reporting systems;
- Promote confidence among all Members as to the quality of individual Members' performance reporting; and
- Further demonstrate the credibility and international reputation of the CCSBT as a responsible Regional Fisheries Management Organisation.

The Extended Commission may also consider the outcomes of QARs for fisheries management decision making. The 2014 QAR program has a significant development and continuous improvement dimension.

During 2014, the CCSBT will be giving consideration to:

- Develop a revised Transshipment Resolution;
- Developing a Port State Measures Agreement; and
- Strengthening its Observer Program Standards.

Individual MCS measures that have been established by the CCSBT include:

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<sup>3</sup> The allocation for South Africa will increase to 150 tonnes if it accedes to the Convention by 31 May of the respective year.

## **Catch Documentation Scheme**

The CCSBT Catch Documentation Scheme (CDS) came into effect on 1 January 2010 and replaced the Statistical Document Programme (Trade Information Scheme) which operated since 1 June 2000. 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 transshipments, 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.

## **Monitoring of SBT Transshipments at Sea**

The CCSBT Transshipment monitoring program came into effect on 1 April 2009. The program applies to transshipments 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 transshipments at sea from LSTLVs to be authorised to receive such transshipments and for a CCSBT observer to be on board the carrier vessel during the transshipment. The CCSBT transshipment 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 transshipment vessel that is authorised to receive SBT are deemed to be CCSBT observers provided that the CCSBT standards are met.

## **List of Approved Vessels and Farms**

The CCSBT has established records for:

- Authorised SBT vessels;
- Authorised SBT carrier vessels; and
- Authorised SBT farms.

Members and Cooperating Non-Members of the CCSBT will not allow the landing or trade etc. of SBT caught by fishing vessels and farms, or transhipped to carrier vessels that are not on these lists.

## **List of Vessels Presumed to have carried out IUU Fishing Activities for SBT**

During October 2013, the CCSBT adopted a Resolution on Establishing a List of Vessels Presumed to have Carried Out Illegal, Unreported and Unregulated Fishing Activities For Southern Bluefin Tuna.

At each subsequent annual meeting, the CCSBT will identify those vessels which have engaged in fishing activities for SBT in a manner which has undermined the effectiveness of the Convention and the CCSBT measures in force.

## Vessel Monitoring System

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.

## 5. Scientific Advice

Based on the results of the MP operation for 2015 – 17 in its 2013 meeting and the outcome of the review of exceptional circumstances in its 2014 meeting, the ESC recommended that there is no need to revise the Extended Commission's 2013 TAC decision regarding the TAC for 2015 – 17. The recommended annual TAC for the years 2015-2017 is 14,647.4 t.

## 6. Biological State and Trends

The 2014 assessment suggested that the SBT spawning biomass is at a very low fraction (9%) of its original biomass as well as below the level that could produce maximum sustainable yield. However, there has been some improvement since the 2011 stock assessment and the fishing mortality rate is below the level associated with MSY. The current TAC has been set using the management procedure adopted in 2011, which has a 70% probability of rebuilding to the interim target biomass level by 2035.

Exploitation rate: Moderate (Below  $F_{MSY}$ )

Exploitation state: Overexploited

Abundance level: Low abundance

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### SOUTHERN BLUEFIN TUNA SUMMARY FROM ESC in 2014 (global stock)

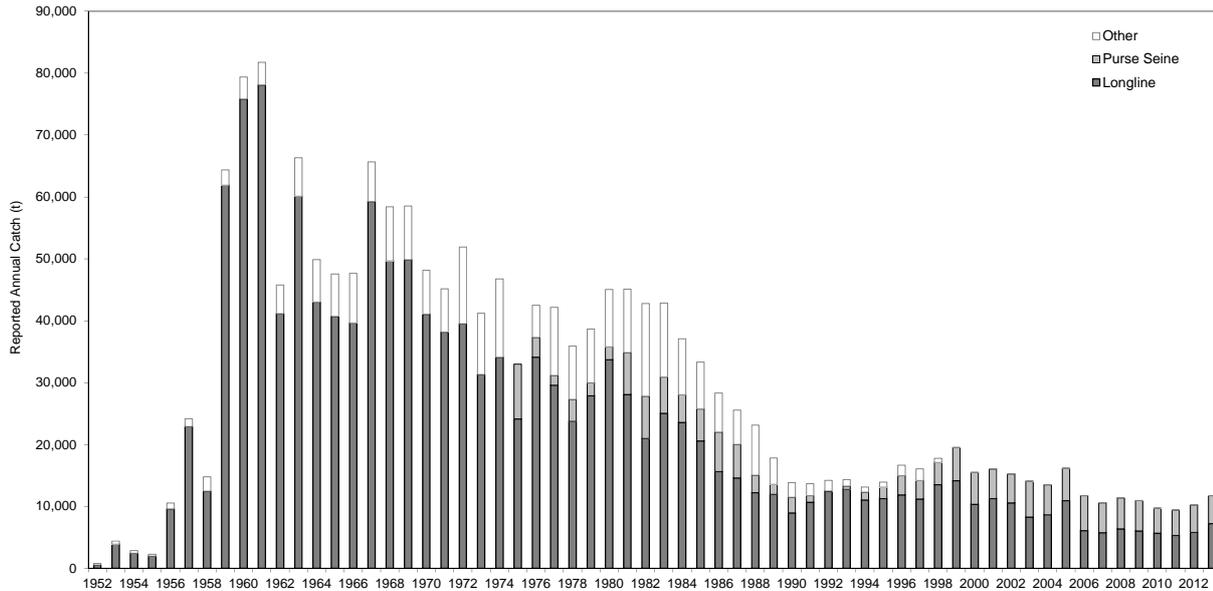
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Maximum Sustainable Yield	33,000 t (30,000-36,000t)
Reported (2013) Catch	11,726 t
Current Replacement Yield	44,600 t (35,500 – 53,600)
Current (2014) Spawner Biomass	83,000 t (75,000 – 96,000)
Current depletion (current relative to initial)	
SSB	0.09 (0.08 – 0.12)
B10+	0.07 (0.06 – 0.09)
Spawner Biomass (2014) Relative to $SSB_{msy}$	0.38 (0.26 – 0.70)
Fishing Mortality (2013) Relative to $F_{msy}$	0.66 (0.39–1.00)

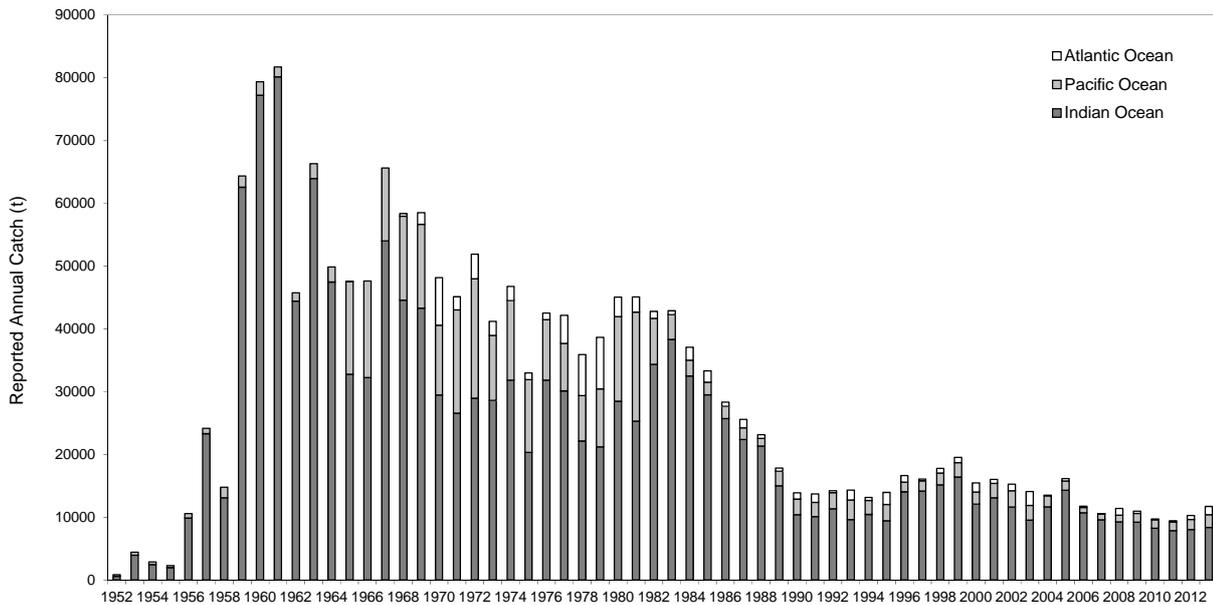
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Current Management Measures	Effective Catch Limit for Members and Cooperating Non-Members: 12,449t in 2014 and 14,647t for the years 2015-2017
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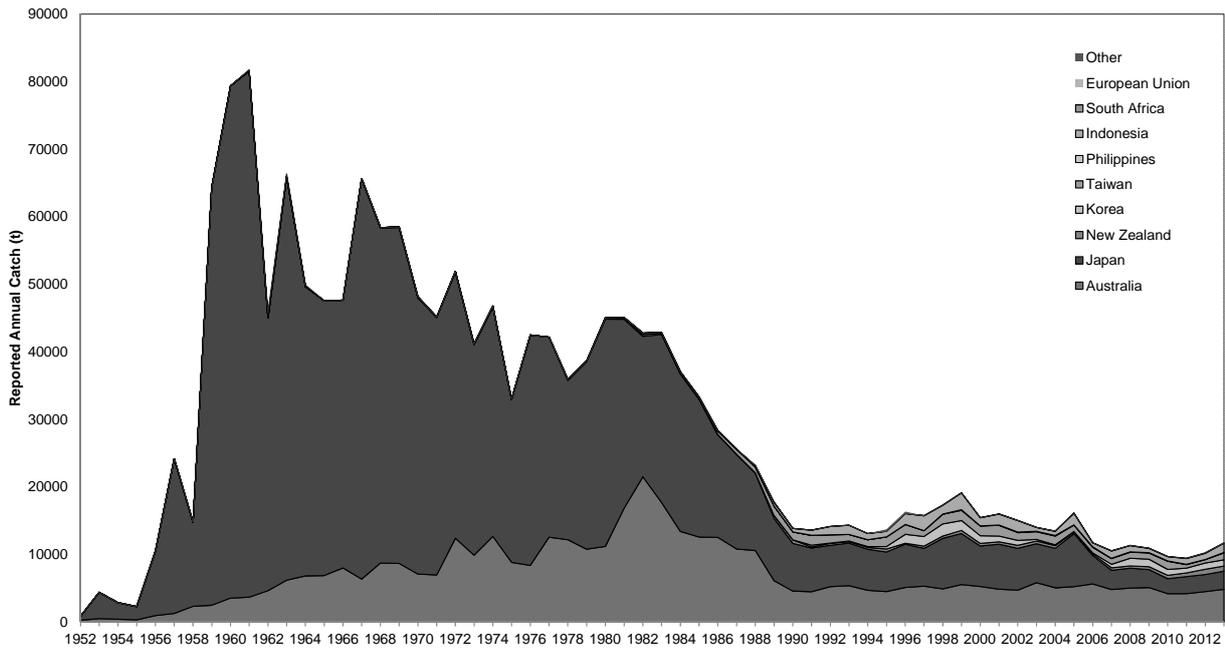
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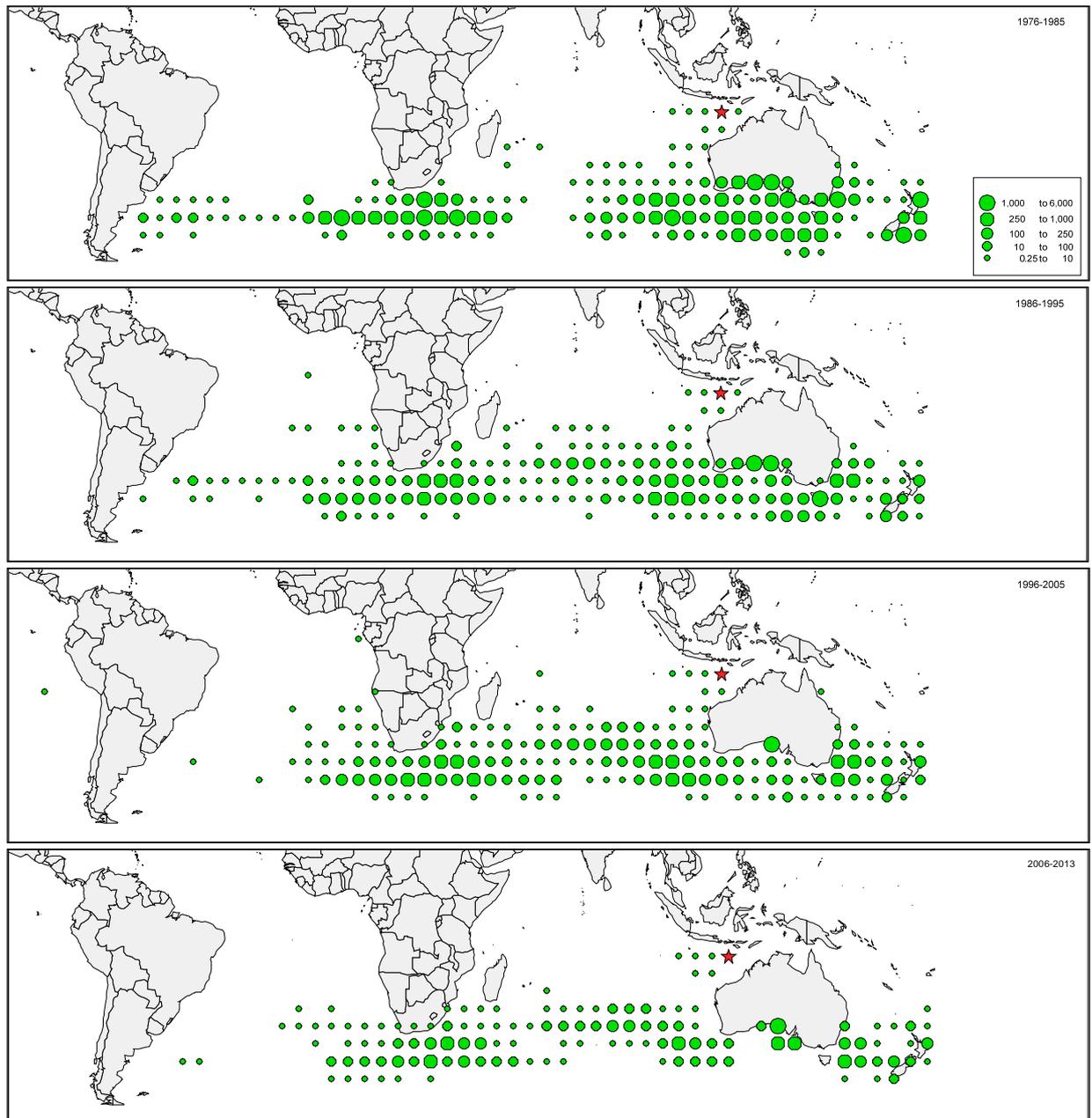
**Figure 1:** Reported southern bluefin tuna catches by fishing gear, 1952 to 2013. Note: a 2006 review of SBT data indicated that catches over the past 10 to 20 years may have been substantially under-reported.



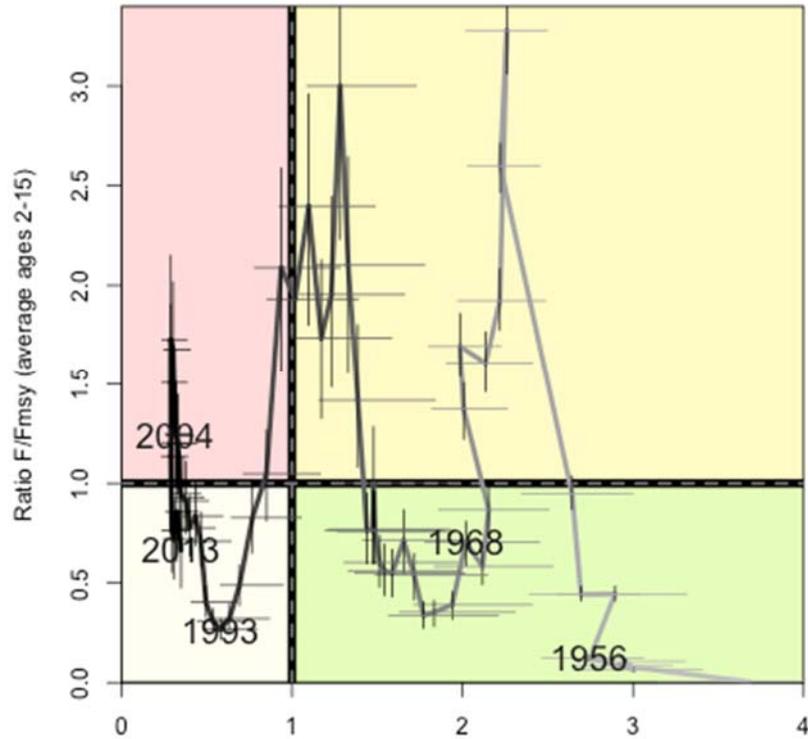
**Figure 2:** Reported southern bluefin tuna catches by ocean, 1952 to 2013. Note: a 2006 review of SBT data indicated that catches over the past 10 to 20 years may have been substantially under-reported.



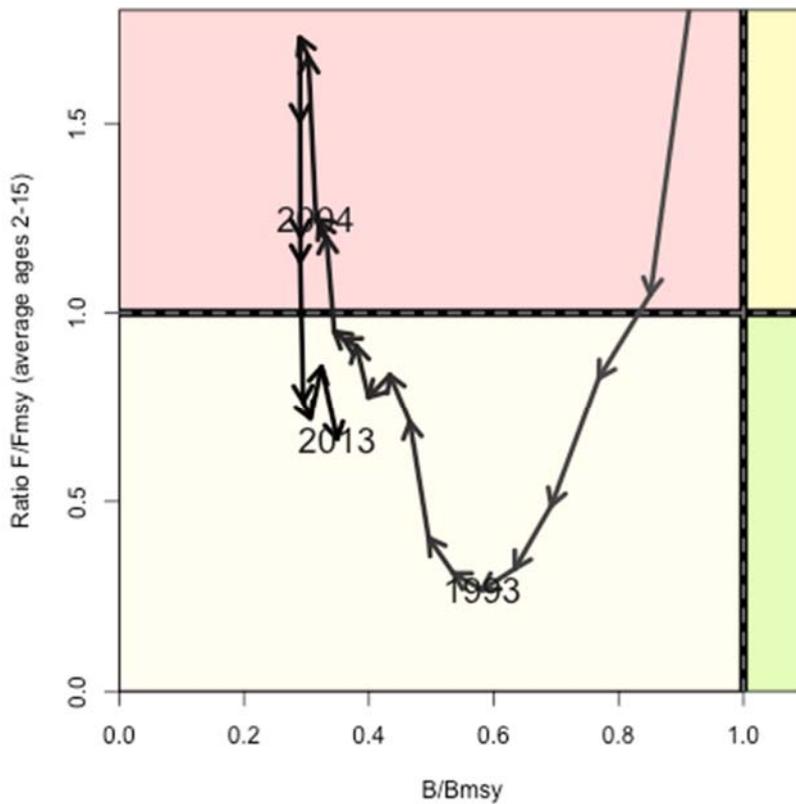
**Figure 3:** Reported southern bluefin tuna catches by flag, 1952 to 2013. Note: a 2006 review of SBT data indicated that catches over the past 10 to 20 years may have been substantially under-reported.



**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 2006-2013 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.



**Figure 5a.** Time trajectory from 1952 to 2013 of median fishing mortality over the  $F_{msy}$  (for ages 2-15) versus spawning biomass ( $B$ ) over  $B_{msy}$ . The fishing mortality rates are based on biomass-weighted values and the relative fishery catch composition and mean SBT body weights in each year. Vertical and horizontal lines represent 25<sup>th</sup>-75<sup>th</sup> percentiles from the operating model grid.



**Figure 5b.** Expansion of left hand quadrants of Figure 5a, focusing on the lower left quadrant.