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Estimating Australia's Recreational Catch of Southern Bluefin Tuna

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ABSTRACT

Knowledge of the historical and current Australian recreational fisheries for SBT is presented, including current management arrangements applying in each state. The available catch and effort data is discussed in terms of spatial and temporal coverage and suitability for estimation of annual recreational SBT catch. Recent or ongoing data collections for charter and private vessels are considered in terms of their relevance for ongoing monitoring of the recreational fishery and aspects of the data collection methodology that affect their value for integration into a national catch database. The options for future monitoring of recreational catch are reviewed and the relative strengths, weaknesses and costs of different monitoring strategies considered. The need for coordination of data collection across the main fishing areas of South Australia, western Victoria and Tasmania is emphasised.

BACKGROUND

Australia's recreational catch of southern bluefin tuna (SBT) is not currently included in its catch reports which are given to the Commission for the Conservation of Southern Bluefin Tuna (CCSBT). In the past SBT has been perceived to have a low harvest by recreational fishers. Anecdotal evidence suggests that there has been some increase in effort and harvest of SBT by recreational fishers in recent years. Currently there is limited data on recreational catch rates and harvest patterns of SBT.

At CCSBT14 and ESC12, Australia advised that it would investigate the impact of recreational catches of SBT on the total Australian catch estimates.

The objectives of this report were the following:

- Identify and obtain recreational data sets that are relevant to the SBT fishery across all jurisdictions.
- Review the fisheries management arrangements, for each jurisdiction, that affect the recreational catch of SBT.
- Evaluate options for an ongoing monitoring program to estimate the recreational catch of SBT.

HISTORIC DISTRIBUTION OF RECREATIONAL CATCHES

New South Wales

The south east coast of New South Wales (NSW) has been an important area for recreational fishers targeting SBT since the late 1930s (Caton 1994). With an increase in the popularity of gamefishing, catch rates of SBT grew to a peak in the 1970s, before declining and becoming virtually nonexistent in the late 1980s. Since then there have been scattered and spasmodic reports of SBT caught off the NSW south coast. SBT have generally been caught on the continental shelf from August to January as the fish follow the cold water from the Southern Ocean, migrating up the east coast of Australia.

Victoria

The south west coast of Victoria from Apollo Bay to the South Australian border is the main area of recreational fishing for SBT. Areas off Portland, Port Fairy and Warrnambool are recognized as some of the best recreational fishing grounds for SBT. The Victorian fishing season runs from January to July, with March, April and May the most productive months.

A large number of recreational fishers travel from Victoria to South Australia (SA) to target SBT. This is particularly apparent by the large proportion of Victorian anglers that can be found at Port Macdonnell at the start of the SBT fishing season (Jones, K. pers. comm.).

South Australia

The main areas of recreational fishing for SBT in SA are Port Macdonnell near the Victorian border, and Coffin Bay and Wedge Island near Port Lincoln. There is also a small amount of fishing effort further up the west coast into the Great Australian Bight. Late December to June is the main season for catching SBT in SA.

There has been a constant catch of SBT by recreational fishers from the early 1900s. As was the case in NSW and Victoria an increase in the popularity of gamefishing and the availability of inexpensive trailer boats from the 1970s allowed for an increase in recreational fishing effort for larger pelagic species including SBT (Caton 1994). The recreational catch of SBT peaked in the late 1970s before declining in the 1980s. Today there are still a number of recreational fishers targeting SBT and it remains a popular activity for trailer boat operators.

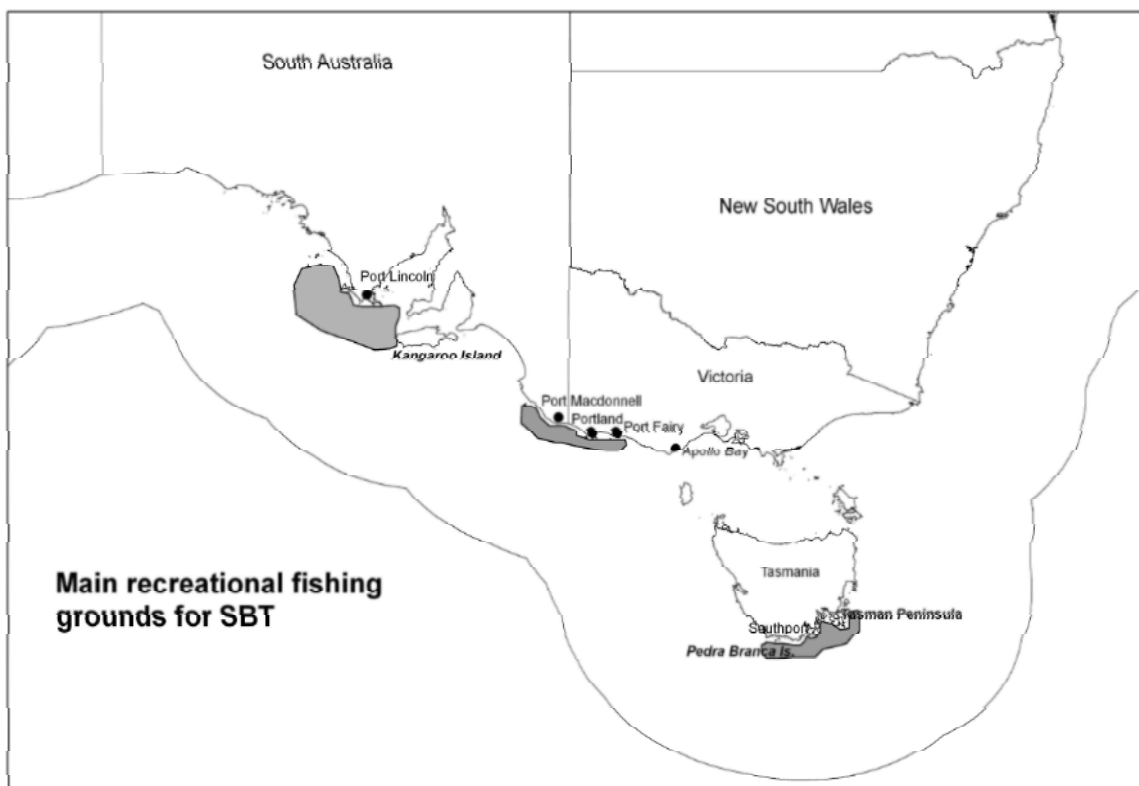


Figure 1. Main recreational fishing grounds for SBT in Australia.

Tasmania

Recreational fishing for SBT in Tasmania is predominantly concentrated around the Tasman Peninsula (Henry and Lyle 2003). The main fishing season for SBT in Tasmania is between late January and August with April, May and June the most productive months. In recent years, similar to NSW, SA and Victoria, there has been an increase in the popularity of gamefishing in Tasmania (Tracy, S. pers comm), with potentially increased catches of SBT off southern Tasmania, particularly off Southport and around Pedra Branca Island (Morton and Lyle 2003).

Western Australia

There is very little information on the recreational catches of SBT in Western Australia (WA), although it appears relatively small numbers are caught, mostly around Busselton south of Perth on the west coast of WA, while a number of juveniles are occasionally caught as far north as Steep Point.

MANAGEMENT ARRANGEMENTS AND REGULATIONS

Recreational fishing for SBT in Australian waters is managed by the various states (NSW, Victoria, Tasmania, WA and SA), which incorporate a range of management techniques and regulations. These include restrictions on bag limits, size limits, licensing schemes, closed seasons, and the establishment of marine parks, sanctuaries and no-take zones.

The bag and size limits are similar across jurisdictions (Table 1). There is currently no minimum size limits in any state for SBT. In all states, anglers are allowed a bag limit of 2 SBT per day with the exception of NSW where anglers are allowed 2 tuna (mixed species) 90 cm or greater and 5 tuna (mixed species) under 90 cm. In SA anglers are allowed a personal bag limit of 2 SBT per day with a boat limit of 6 SBT per day.

Table 1. Management regulations for the recreational catch of SBT by State.

Management arrangements for SBT across states	
Western Australia	No minimum size limit. Bag limit of 2 tuna per person (SBT, yellowfin and big-eye tuna).
South Australia	No minimum size limit. Personal daily limit of 2 tuna (SBT and/or yellowfin tuna). Daily boat limit of 6 tuna (SBT and/or yellowfin tuna).
Tasmania	No minimum size limit. Possession/Bag limit of 2 SBT.
Victoria	No minimum size limit. Bag limit of 2 tuna (SBT, yellowfin and big-eye tuna).
New South Wales	No minimum size limit. 90 cm or greater bag limit of 2 mixed tuna. Less than 90 cm bag limit of 5 mixed tuna. * Mixed tuna includes SBT albacore, big-eye, longtail and yellowfin tuna.

CURRENT DATA SOURCES

The annual Australian SBT fishing season reports to CCSBT provide some historical estimates of annual recreational catch for the years 1994 and 1998 to 2002 (Hobsbawn et al 2007). These estimates were based on limited Tasmanian charter and gamefish club data and expanded to total catches using proportions of tag releases for each fishery area. These historical annual catch estimates are indicative only and may not reflect current recreational catches or fishing patterns (Table 2).

Four recreational fishing data sets were identified to provide insights to the level of harvest and fishing effort for SBT in Australia. These include:

- Charter fishery logbooks;
- Gamefishing tournaments;
- Tag and release reports;
- Surveys.

This report concentrates on data sources for the period 2003 to the present.

Table 2. Indicative estimates of recreational catch (t) by Australian recreational fishers, 1994 to 2007.

Year	Catch (t)
1994	16
1995	insufficient data
1996	insufficient data
1997	insufficient data
1998	38
1999	3
2000	10
2001	60
2002	85
2003	insufficient data
2004	insufficient data
2005	insufficient data
2006	insufficient data
2007	insufficient data

Charter Fishery Logbooks

Submission of catch records is compulsory for charter boat operators in all Australian states, except Tasmania and Victoria. In Tasmania there is a voluntary charter fishery logbook. SBT are a minor component of charter catch in WA and an infrequent catch in NSW. Charter boats are frequently hired to target tuna species in waters off Tasmania and SA.

Charter operators do not routinely provide information on size of SBT retained or released. However, there is potential to use charter logbooks to collect size data of retained and released SBT by recreational fishers.

Table 3. Numbers of SBT retained and released by charter boats in SA and WA.

State	2005		2006		2007	
	Retained	Released	Retained	Released	Retained	Released
SA*	NA	NA	358	432	501	1101
WA	13	NA	17	NA	NA	NA

Source: Department of Fisheries, Western Australia (Knight et al. 2007).

* 200 SA data from September 2005 to June 2006. 2007 data from July 2006 to June 2007.

Gamefishing tournaments

There are numerous gamefishing tournaments held each year in the southern Australian states. In most cases they are hosted by organised gamefishing clubs or recreational fishing associations. Catch records from tournaments are maintained according to the needs of the host body and there is no compulsory reporting from tournament organisers to fisheries management agencies.

There is a tournament monitoring program operating on the east coast, primarily in NSW (Williams and Scandol 2008). Data are collected by radio “schedules” (regular radio reports of catches throughout tournament days) and post-fishing interviews. The NSW Department of Primary Industries manages this ongoing program under the Angling Research and Tournament Monitoring Project. This program does not cover all tournaments on the east coast but the incidence of SBT captures in east coast tournaments is very low. Some tournaments are monitored in Tasmania as part of gamefish surveys (see Survey Section below).

Tag and release

The NSW Gamefish Tagging Program collects information on gamefish tagged and released by recreational fishers throughout Australian waters. The date, location, species and estimated size of tagged gamefish are recorded on a catch card, which is posted to the NSW Department of Primary Industries and the details are entered into a database. The database holds records from as early as 1973, including 4,376 SBT.

Another tagging database is maintained by the Australian National Sportfishing Association (ANSA). The ANSA tagging program, named Austag, has not recorded any SBT captures.

Tagging programs are useful for studying patterns of fishing within and between seasons. The tagging records do not have accompanying data on retained numbers of SBT so they are insufficient for estimation of landed catch. The tagging data are also not suitable for expansion to total catches as they are only representative of a proportion of fishers, mainly those associated with recreational fishing clubs or associations.

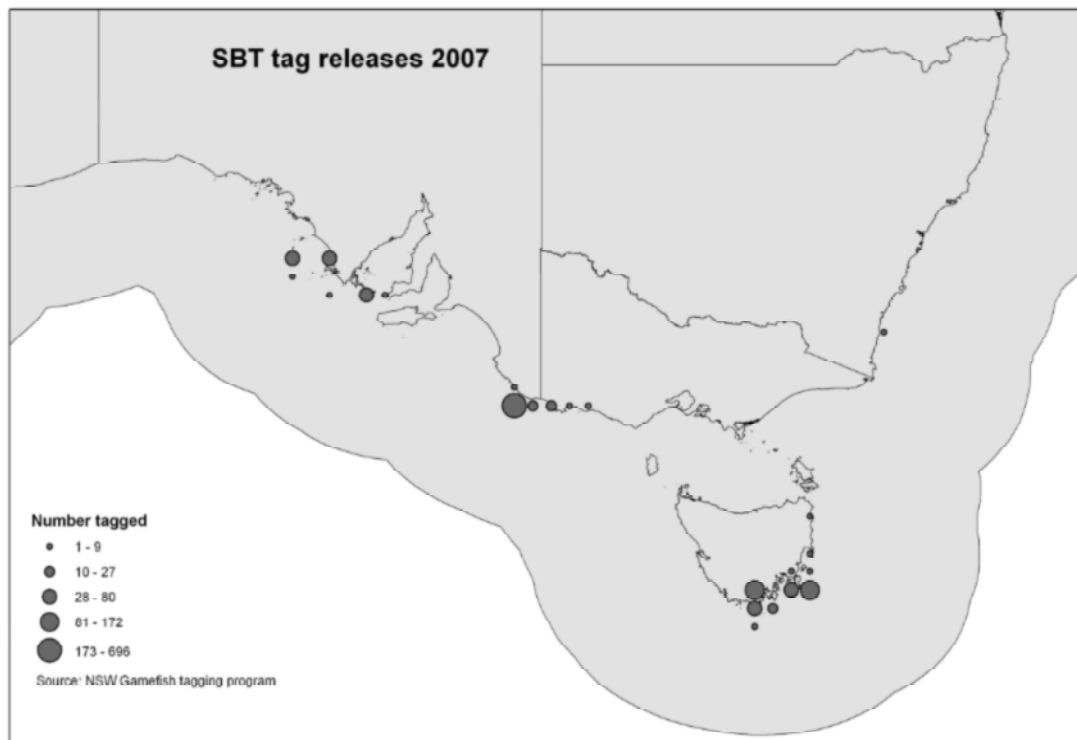


Figure 2. Numbers of tagged SBT reported to the NSW Gamefish Tagging Program in 2007.

Surveys

Onsite surveys

A survey is being conducted in south-eastern Tasmanian waters in 2008 at major access points to the SBT recreational fishery (i.e. boat ramps in the Tasman Peninsula region and Southport in the far south). The methodology is similar to that used in a survey conducted in Tasmania in 2003 (Morton and Lyle 2003). The 2003 survey coincided with a poor season for recreational fishers and the total number of SBT retained was estimated at 112 fish or approximately 2.5 t. Both the 2003 and 2008 surveys are using diary records from a subset of fishers to supplement the onsite survey.

In 2005-06, the Department of Fisheries Western Australia conducted a creel survey of boat-based fishers operating on the south-west coast between Augusta and Kalbarri (Sumner et al 2008). This survey used interviews of fishers returning to boat ramps to collect fishing catch, effort and size data for line-caught species. The survey estimated that 612 SBT weighing 2.3 t, were retained by anglers during 2005-06 for the south-west region. No catch estimates are available for the southern coast of Western Australia, where some recreational fishing for SBT is known to occur.

Offsite surveys

Statewide surveys of recreational fishing are being conducted in SA and Tasmania in 2008. Both surveys are repeating the methodology of the National Recreational and Indigenous Fishing Survey 2000-01 (Henry and Lyle 2003). The surveys include a screening survey of the general population to identify recreational fishers followed by a twelve-month longitudinal survey of fishers by diaries and regular telephone interviews. Some onsite data collection is used to get average sizes of major target species for estimation of total catches.

The National Recreational and Indigenous Fishing Survey 2000-01 report did not contain any estimates of catch for individual tuna species. Tuna were reported as a group because of the relatively low frequency of reporting by the general recreational fisher population and the likelihood of incorrect identification of tuna species by respondents. Although some SBT were reported in the survey, their extremely low frequency precluded publication of total catch estimates.

ESTIMATING FUTURE CATCHES

Options for monitoring SBT catch

Status quo

The current situation for estimating the total Australian recreational catch of SBT is inadequate. A targeted survey for SBT has been completed in Tasmania, but there is no ongoing program of recreational SBT fishing surveys planned. The statewide recreational fishing survey underway in SA may yield estimates of total SBT catch in 2007-08, but the relatively low frequency of SBT capture amongst the state's angler population affects the precision of catch estimates, especially when stratified by area or month. There is almost no reliable data on Victorian catches over the last few years where anecdotal information suggests an increasing effort from SBT gamefishers, although potentially, increases in catches are still expected to be low overall. Information for NSW waters from charter logbooks, tournament monitoring and gamefish tagging records confirm that SBT are a rare capture for recreational fishers in that region.

There is ongoing information available from the charter boat logbooks in WA and this can be used in conjunction with the 2005-06 trailer boat survey of the south-western region to estimate the annual catch. Data are lacking for north and south of the survey area, but these areas appear to have low levels of SBT catch. Given that the WA fishery is minor in comparison to the SA, Victorian and Tasmanian fisheries, monitoring of SBT capture by charter boats may be sufficient in the next few years, provided there is no indication of changing fishing patterns.

Continuation of ad hoc data collection with supplementary sampling

Data collection by state fisheries agencies is usually determined by local or regional management priorities. This means that data collection for fisheries that generally occur outside state waters will be infrequent. Some of the gaps in information on recreational SBT catch could be targeted by supplementary data collection (e.g. onsite surveys in western Victorian ports during one year could provide valuable data on the fishery in this region). However, unless data were also being gathered in adjacent SA waters and Tasmanian waters, an incomplete assessment of the fishery will result. The availability of SBT to recreational fishers and the catch size composition varies significantly between seasons, which may reduce the value of supplementary sampling to fill data collection gaps.

Targeted surveys of core fishery areas and participants

For a complete assessment of the main areas where SBT are caught by recreational fishers in any one season, information needs to be gathered from fishers living and operating in Tasmania, SA and Victoria, as well as those travelling from interstate. The overall low frequency of fishing for

tuna, and especially capture of SBT, amongst recreational fishers means that offsite methods such as telephone surveys and mail surveys are inefficient methods for data collection. Enough knowledge is available on the areas and seasons targeted by recreational fishers who report capture of SBT to allow the trialling of onsite survey methods for the main fishery in south-eastern Australia. The general nature of the fishery (i.e. use of medium-large sized trailer boats launched from access points close to known SBT migration paths) allows onsite surveys to be focussed only on fishers that are likely to capture SBT. The methodology has been proven in two surveys in Tasmania targeted at SBT fishers, while the use of onsite surveys is common for numerous other recreational fisheries. Therefore, state fisheries agencies are well equipped in terms of experienced staff and logistical support for such a project.

The implementation of an onsite survey could also provide opportunity to recruit volunteers for ongoing reporting of catch, effort and size composition via fishing diaries. Diary reporting from a sample of known SBT fishers would allow evaluation of this method as an alternative to onsite surveys in some seasons. The diary component could be integrated with other projects under development that aim to collect catch data from Australian gamefishers and recreational anglers.

Onsite surveys of fishing from privately-owned vessels should also be combined with data collected from charter operators. Contact would need to be made with Victorian charter boat owners to undertake some minimal level of SBT catch reporting that can supplement compulsory SA logbooks and voluntary Tasmanian logbooks.

Approach to monitoring

Methodology

Due to the variability in catch rates and low frequency of SBT captures in the recreational sector an extensive pilot project would be required to determine the level of sampling needed for future ongoing surveys to estimate recreational catches of SBT. Such a pilot project would need to run for a minimum of three years to determine seasonal fluctuations, and the required frequency and spatial distribution of survey effort.

Pilot survey design

To estimate recreational harvest rates, total fishing effort and total harvest for SBT in Australia onsite surveys would need to be conducted at primary access points, which directly intercept anglers when they return from fishing trips. Direct angler surveys provide the most reliable method for estimating catch, as the data can be verified by trained staff in the field (Pollock et al. 1994). Data from the charter boat recreational fishery can be obtained from compulsory logbook data in SA and voluntary logbook data in Tasmania and Victoria.

A pilot survey would collect data from Australian jurisdictions that have been identified as having an active recreational fishery. The data above suggest that these jurisdictions include SA, Victoria and Tasmania. Few SBT are caught in NSW or WA and are absent in Queensland and Northern Territory waters. Primary sampling locations in each jurisdiction are suggested in Table 4. The primary sampling sites could be surveyed through direct interview at access points (trailer-boat launching facilities) and logbook data from the charter boat industry.

Data collected

To estimate recreational harvest rates, total fishing effort and total harvest for SBT in Australia data collection would need to focus on individual trip catches (numbers caught, size of fish landed, numbers released/retained) and effort (hours fished, location fished, method of fishing). The pilot project could recruit anglers to maintain voluntary diary records of catch and effort, which could be used to validate on-site data.

Table 4. Probable locations for sampling and season for pilot study (actual access points, such as trailer-boat launching sites at these locations would be determined in the pilot survey).

State	Locations	Season
South Australia	Coffin Bay, Port Lincoln, Adelaide, Port MacDonnell	December - June
Victoria	Portland and Warrnambool	January - July
Tasmania	Pirates Bay, Southport	January - August

Work being undertaken in State jurisdictions

The Tasmanian Aquaculture and Fisheries Institute (TAFI) are conducting a survey of recreational trailer-boat or charter vessel SBT catch in Tasmania during 2008. TAFI are also currently conducting a telephone and diary survey of the Tasmanian gamefishing sector. The results from these surveys will be available in the latter half of 2008. SA is also conducting a recreational fishing survey during 2008 with the results expected towards the end of the year. However, there are few data for the current recreational fishery in Victoria and preliminary estimates may require surveys of gamefishing clubs. It is expected that data collected from such surveys could be modelled to provide a more robust estimate of sampling intensity, seasonality and spatial sampling requirements for each fishery.

DISCUSSION

Information on the recreational catch of SBT in Australia reviewed in this report highlights the need for a strategic coordinated approach to future monitoring of SBT catch. Ad hoc approaches to data collection for recreational catches of SBT have failed to provide accurate estimates of recreational catch or fishing effort. Previous data suggests that recreational fishing for SBT is a low frequency event with high variability in catch. Existing data suggests that SBT recreational fishing effort and catch are concentrated within waters of SA, Victoria and Tasmania.

A strategic coordinated sampling project, focusing on SA, Victoria and Tasmania would be required in order to provide a robust and accurate estimate of recreational catch. Given that the recreational fishery is concentrated in specific locations, which provides trailer boat access to nearby fishing grounds, any surveys would need to target these specific locations. A three-year survey design is likely to be required to capture seasonal variations in catch and effort. The cost of a multi-year creel and charter survey is likely to be high compared to other options; however it is likely to provide the most robust estimates of catch with the lowest risk. Table 5 provides options and their relative benefits and limitations.

Table 5. Risk benefit table for various survey options.

Options	Benefit	Limitation	Cost
Charter boat survey All states - 1 year	Good data on charter industry, reduced costs & logistics over creel survey	Highest risk approach due to poor demographic, spatial and temporal data, limited to charter fleet – no data from non-charter anglers	Low
Intensive creel & charter survey - 1 primary state - 1 year	Good demographic data on one location, reduced cost over multi-state and multi-year survey	High risk approach due to poor spatial and temporal data, limited to 1 area in 1 year	Moderate
Intensive - creel & charter survey 3 primary states - 1 year	Good demographic & spatial data, reduced cost over multi-year survey	Medium/high risk approach due to poor temporal data, limited to 1 year	Moderate-High
Intensive - creel & charter survey 3 primary states - 3 years	Good demographic, spatial and temporal data	Low risk approach due to good demographic, spatial and temporal data – not data limited	High

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