

24 Southern Bluefin Tuna Fishery

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FIGURE 24.1 Catch in the Southern Bluefin Tuna Fishery, 2011

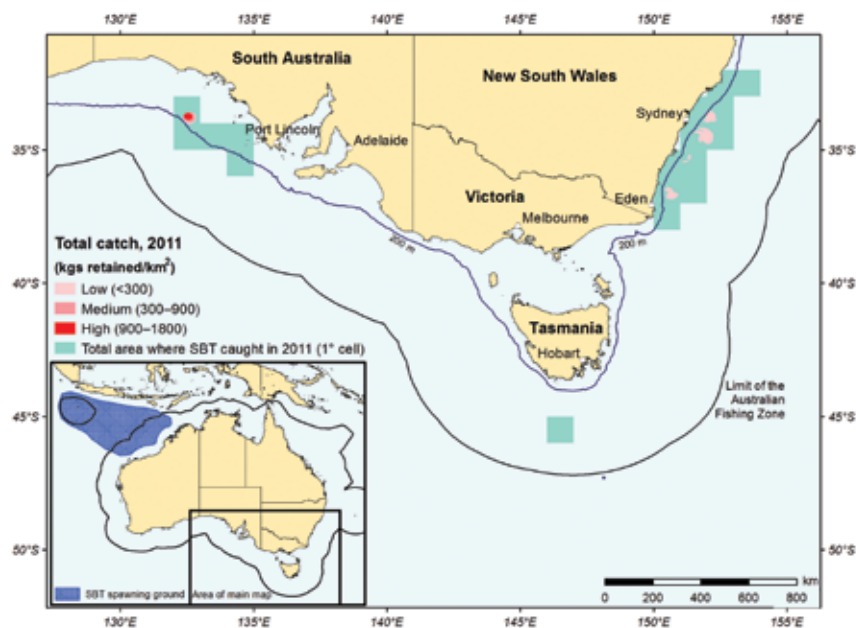








TABLE 24.1 Status of the Southern Bluefin Tuna Fishery

Status	2010		2011		Comments
Biological status	Fishing mortality	Biomass	Fishing mortality	Biomass	
Southern bluefin tuna (<i>Thunnus maccoyii</i>)					Estimated spawning stock biomass is ~5 per cent of initial unfished levels. Although no recovery is yet evident, the level of stock-wide fishing mortality is below that which should allow rebuilding.
Economic status	Estimates of NER are not available.				NER are expected to have increased in 2010–11 as a result of increased prices.

Note: NER Net economic returns.

Fishing mortality	 Not subject to overfishing	 Subject to overfishing	 Uncertain
Biomass	 Not overfished	 Overfished	 Uncertain

24.1 Description of the fishery

Southern bluefin tuna constitutes a single, highly migratory stock that spawns in the north-east Indian Ocean and migrates throughout the temperate, southern oceans. It is one of the most highly valued fish species for sashimi, especially in Japan, and is targeted by fishing fleets from a number of nations, both on the high seas and within the Exclusive Economic Zones of Australia, New Zealand, Indonesia and South Africa. Young fish (1–4 years) move from the spawning ground (off north-western Australia, south of Indonesia) into the Australian Fishing Zone and southwards along the Western Australian coast. Surface-schooling juveniles are found seasonally in the continental shelf region of southern Australia, but the proportion of the juvenile stock that migrates into this area is not known. Juvenile southern bluefin tuna (2–3 years) are targeted in the Great Australian Bight by Australian fishers using purse-seine gear (Figure 24.1). This catch is transferred to aquaculture farming operations off Port Lincoln in South Australia, where the fish are grown to a larger size to achieve higher market prices.

Throughout the rest of its range, southern bluefin tuna is targeted by pelagic longliners, including domestic longliners operating along Australia's east coast (Figure 24.1). Australian and global catch histories are shown in Figures 24.2 and 24.3, respectively. The gross value of production (GVP) in 2010–11 from the Southern Bluefin Tuna Fishery (SBTF) was estimated to be \$30.5 million (Figure 24.4). For most fish caught in the SBTF, this value reflects the value of fish at the point of transfer to pens for farming. The value of wild-caught southern bluefin tuna in 2010–11 was significantly lower in real terms than in previous years, although higher than in 2009–10 (\$25 million). The farmed value of southern bluefin tuna production in 2010–11 (after ranching and grow-out) was \$115.3 million. Reduced supply of bluefin tuna to the global market is understood to have increased the price of southern bluefin tuna through 2011. Figure 24.5 shows the real value of southern bluefin tuna exports.

The *Commonwealth Fisheries Harvest Strategy Policy* (HSP; DAFF 2007) is not prescribed for fisheries, such as the SBTF, that are managed by international management bodies. Significant work has been invested in developing a harvest strategy (management procedure) for southern bluefin tuna. This management procedure (the ‘Bali Procedure’) was adopted by the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) in October 2011 and now forms the basis of setting the global total allowable catch (TAC). The global TAC is then allocated to members and cooperating non-members as agreed by the CCSBT (Resolution on the Allocation of the Global Total Allowable Catch). The Bali Procedure aims to achieve recovery of the stock to 20 per cent of initial unfished biomass (the interim rebuilding target) by 2035, with 70 per cent certainty. Since the Bali Procedure was only adopted in October 2011, no assessment of its performance is made at this time.

Recreational angling for southern bluefin tuna has been popular among game fishing club members in Tasmania and South Australian waters for many years, but there has been increased activity among the general recreational fishing sector in the last five years, particularly in western Victoria waters near Portland and Port Fairy (Rowse et al. 2008). A survey of recreational southern bluefin tuna fishers was conducted in western Victoria, in March to July 2011 (Green et al. 2012). The survey estimated that a total of 19 700 southern bluefin tuna were retained during the survey period, weighing about 240 t. A further 6900 southern bluefin tuna were estimated to have been released by recreational fishers during the survey period. Overall, the data available on the recreational catch of southern bluefin tuna are very limited, and no total estimate of recreational catch is available.

FIGURE 24.2 Southern bluefin tuna catch (Australia) by financial year, 1989–90 to 2010–11

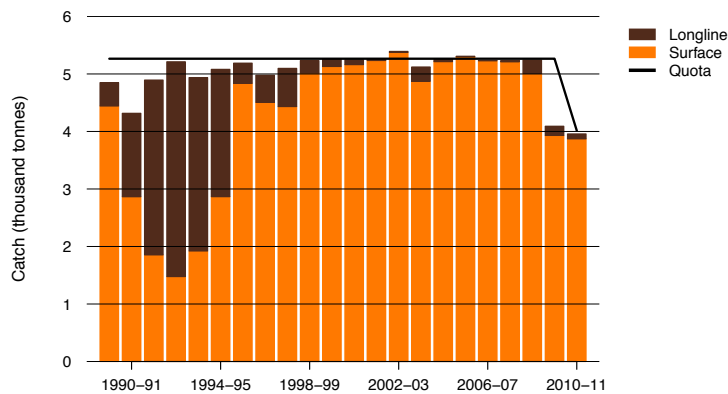
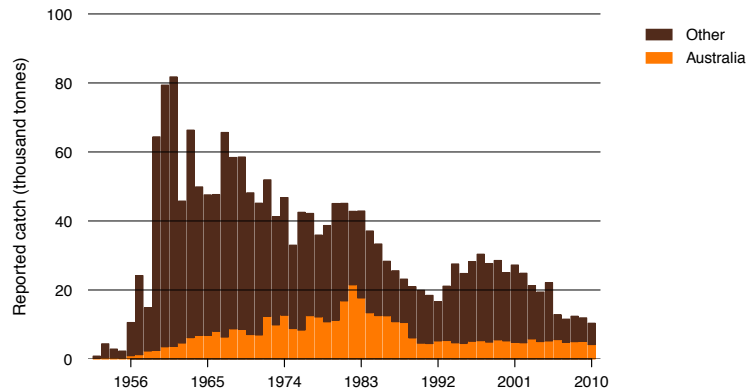


FIGURE 24.3 Southern bluefin tuna catch (global) by calendar year, 1952 to 2010

Note: Total global catches exceeded reported global catches over 1995–2005; some scientists estimate unreported catches to have surpassed 178 000 t over this period (Polacheck & Davies 2008).

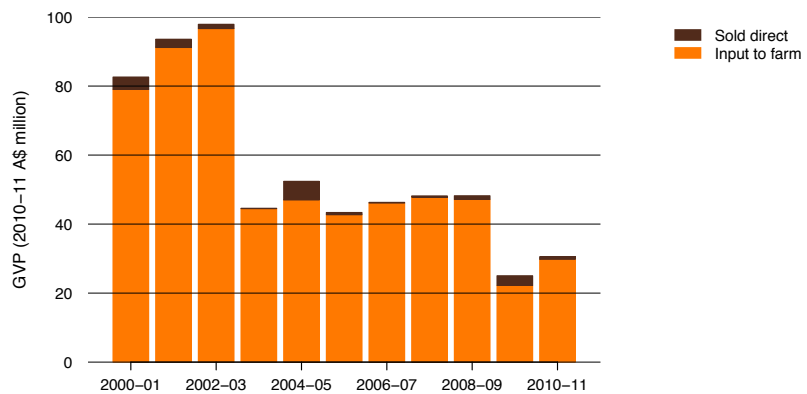
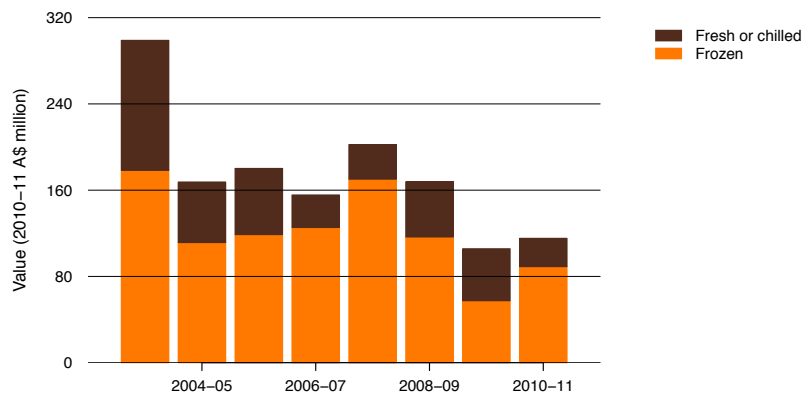
FIGURE 24.4 Real GVP of southern bluefin tuna production, by financial year, 2000–01 to 2010–11**FIGURE 24.5** Real value of southern bluefin tuna exports by financial year and processing methods, 2002–03 to 2010–11

TABLE 24.2 Main features and statistics for the SBTF

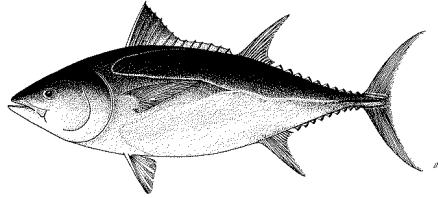
Fishery statistics a		2009–10 fishing season		2010–11 fishing season		
Stock name	TAC	Catch (t)	Real value (2009–10)	TAC	Catch (t)	Real value (2010–11)
Southern bluefin tuna	5 265 b		\$25 million (wild-caught, all methods)	3 939		\$30.5 million (wild-caught, all methods)
Purse seine		3 931			3 872	
Pelagic longline		160			86 c	
Total	5 265	4 091	\$25.0 million	3 939	3 958 d	\$30.5 million
Fishery-level statistics						
Effort	Purse seine: 417 hours; 78 shots			Purse seine: 835 hours; 106 shots		
Fishing permits	96 SFR owners initially allocated quota			96 SFR owners initially allocated quota		
Active vessels	Purse seine: 6; longline: 21			Purse seine: 5; longline: 15		
Observer coverage	Purse seine: 8 shots (10.3%) Longline: 3.6% in ETBF; 2.5% in WTBF			Purse seine: 21 shots (19.8%) Longline: 6.3% in ETBF; 1.7% in WTBF		
Fishing methods	Purse seine, pelagic longline (southern bluefin tuna is a byproduct in longline fishery), minor line (troll and poling)					
Primary landing ports	Port Lincoln					
Management methods	Output controls: TAC, ITQ, area restrictions to control incidental catches in the longline fishery					
Primary markets	International: Japan—frozen, fresh					
Management plan	Southern Bluefin Tuna Fishery management plan 1995 (AFMA 1995; amended 2010)					

^a Fishery statistics are provided by fishing season, unless otherwise indicated. Season is 1 December to 30 November. Real value statistics provided by financial year. ^b A TAC of 8030 t was set for the 2009–10 and 2010–11 seasons (combined). Industry was restricted to a catch of 5265 t in 2009–10. Since a total of 4091 t was taken in 2009–10, the balance (3939 t) was available for the 2010–11 season. ^c Includes a small amount of catch taken by minor line methods (i.e. trolling). ^d Since catches exceed the 8030 t TAC for the 2009–11 season by 19.07 t, Australia has voluntarily reduced its TAC for 2012 by the same amount.

Notes: ETBF Eastern Tuna and Billfish Fishery. ITQ Individual transferable quota. SFR Statutory fishing right. TAC Total allowable catch. WTBF Western Tuna and Billfish Fishery.

24.2 Biological status

24.2.1 Southern bluefin tuna



Line drawing: FAO

Stock assessment

In 2011, a revised operating model (the model that assesses the spawning biomass of southern bluefin tuna, based on a variety of data sources) was used to run various scenarios, using different annual catch levels, to determine the impact on the stock. All the scenarios gave results consistent with previous assessments: that the spawning stock biomass remains at a very low level (approximately 5 per cent of the initial unfished level— $0.05SB_0$; range 0.03 – $0.07 SB_0$; CCSBT 2011a). Very low recruitment was estimated from the late 1990s to the early 2000s, but recent recruitment estimates (2005 to 2011) have increased. There was no updated assessment in 2012, and the fishery indicators show a range of trends. Some stock indicators, such as the Japanese longline catch-per-unit-effort, remain relatively high, but there are concerns about how this should be interpreted because of changes in targeting behaviour. The primary index of relative abundance of juveniles—the scientific aerial survey in the Great Australian Bight—was high in 2011, compared with levels seen at the start of the survey series (1993), but declined in 2012 to the second lowest level obtained in the series. However, taking confidence intervals into account, the 2012 estimate is similar to estimates obtained in 1999 and several years during the period 2005 to 2009 (CCSBT 2012).

Stock status determination

The spawning stock biomass of southern bluefin tuna remains at a very low level. As a result, the stock remains classified as **overfished**.

In October 2011, the CCSBT adopted an agreed management procedure (CCSBT 2011b) to guide the recovery of the stock to the interim rebuilding target and to set the global TAC for 2012, 2013 and 2014. The global TAC for 2011 (the season currently being assessed) was set before the agreement and implementation of the management procedure.

In line with the HSP, targeted fishing of an overfished stock without the implementation of an approved rebuilding strategy is generally classified as overfishing. However, the global catch, as reported to CCSBT, and the catch for the Australian fishery in 2011, was below the agreed TAC set under the management procedure in its first year of operation (2012), indicating that the level of reported

catch in 2011 would be expected to provide for recovery of the stock. The total level of mortality from all sources (e.g. discards from the high-seas longline fleets, recreational fishing), however, is unknown. Currently, there is no clear evidence of stock recovery, based on the differing trends shown by the stock indicators and lack of an updated operating model. The generation time of southern bluefin tuna (16–18 years) and the biology of the species suggest that evidence of recovery may not be apparent for some time. In view of the current uncertainties, the stock is classified as **uncertain** with regard to fishing mortality in 2011.

24.3 Economic status

24.3.1 Key economic trends

Estimates of net economic returns (NER) are not available for the wild-catch sector of the SBTF. However, other economic indicators can be used to determine likely trends in profitability.

The assessment of economic performance in the wild-catch sector is complicated by the vertical integration of the wild-catch and aquaculture sectors. Almost all southern bluefin tuna caught in Commonwealth waters are transferred to aquaculture farms off Port Lincoln. The beach price paid for live fish at the point of transfer to these farms cannot be determined, because operators are generally involved in both catching and grow-out operations. Therefore, beach prices in the fishery are estimated using prices reported on the Japanese market, together with assumptions about product transportation costs.

In 2010–11, the GVP—the value of the catch at the point of transfer to pens for farming—for the SBTF was estimated as \$30.5 million (Figure 24.4). This is significantly lower (in real terms) than in earlier years. The value of the SBTF catch peaked at \$97.8 million in 2002–03, but then declined substantially in 2003–04 to \$46.8 million, mainly driven by a reduction in average unit prices, from \$18.00 per kilogram in 2002–03 to \$9.20 per kilogram in 2003–04. GVP then remained stable at around \$50 million, before reducing to \$25 million in 2009–10 and increasing slightly in 2010–11.

Southern bluefin tuna are farmed to achieve a higher return for harvested fish. Growing fish out to a larger size leads to a higher unit price, since larger tuna fetch higher market prices per kilogram. The value of farmed southern bluefin tuna production in 2010–11 (after ranching) was \$115.3 million.

Nearly all farmed southern bluefin tuna are exported. Therefore, trends in the fishery's GVP can be linked to export trends. The real value (in 2010–11 dollars) of Australian southern bluefin tuna exports decreased by \$220.9 million (66 per cent) between 2002–03 and 2009–10 (Figure 24.5). Most of this decrease is attributed to the reduced price received for fish, resulting from an increase in the exchange rate and increased supplies to international markets from European tuna farms (FAO GLOBEFISH 2011). In 2010–11, reductions in supply were a key driver of an increase in prices on the global tuna market. The supply-side factors generally relate to reduced fishing activity (FAO GLOBEFISH 2011), which resulted in a reduced supply of Atlantic bluefin tuna from Mediterranean farms (Brian Jeffriess, Australian Southern Bluefin Tuna Industry Association, pers. comm., 2012). The real unit price for exported fish increased by 36 per cent between 2009–10 and 2010–11, from \$14.5 to \$19.7 per kilogram (2010–11 dollars). Although this reverses the declining trend in

average export unit prices since 2002–03, average export unit prices in 2010–11 are still less than half the price in 2002–03. The price increases in 2010–11 are likely to have reduced the immediate impact on economic returns of recent TAC reductions. Overall, costs remained stable, while the GVP increased in 2010–11. As a result, NER are expected to have increased in 2010–11.

24.3.2 Management arrangements

The Australian catch is allocated to holders of statutory fishing rights in the fishery via individual transferable quotas (ITQs). ITQs give fishers flexibility to use input combinations that result in the most efficient operation. Transferability of ITQs between fishers also allows the catch to be taken by the most efficient operators in the fishery.

24.3.3 Performance against economic objective

The SBTF is a high-value fishery, and analysis of recent economic trends confirms that the fishery remains profitable. However, given the biological status of the southern bluefin tuna stock, it is likely that a proportion of historical profits (domestically and internationally) have been generated by unsustainable harvest levels. Furthermore, the low biomass level of the stock poses a risk to the future flow of NER from this fishery. If current management arrangements allow the SBT stock to rebuild, this would be considered an improvement in the fishery's economic status. The new management procedure is a significant step in the right direction. Since the procedure was only recently introduced, it is too early to assess its impact on economic performance.

24.4 Environmental status

The SBTF has approval for export until 24 July 2013. Conditions placed on this export approval include increasing confidence in the estimates of purse-seine catches, and developing and using a methodology to derive robust estimates of recreational and charter catch in Australian waters. A commercial trial of stereo-video technology was undertaken in 2011 to determine if such technology could be implemented in the SBTF to increase confidence in the estimates of catch weights. The trial was successful, and this technology is expected to be implemented in the SBTF in 2013. The Australian Bureau of Agricultural and Resource Economics and Sciences and a number of states are currently developing a project to derive estimates of recreational harvest of the stock in Australian waters.

A Level 3 assessment (Sustainability Assessment for Fishing Effects) was conducted on 83 non-target species (6 chondrichthyans and 77 teleosts) to determine the impact of southern bluefin tuna fishing on the sustainability of these species. The risk to the sustainability of these non-target species was assessed as low (Zhou et al. 2009). The priority of the ecological risk management report is to respond to interactions with protected species (AFMA 2009).

In 2010–11, two white sharks (*Carcharodon carcharias*) were caught in a purse seine in the SBTF. The net was dropped, and both sharks were released alive. Interactions with sharks using longline gear are discussed in Chapters 22 and 25. No other interactions with threatened, endangered or protected species were noted in 2010–11.

24.5 Literature cited

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