Chapter 24
Southern Bluefin Tuna Fishery
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FIGURE 24.1 Catch in the Southern Bluefin Tuna Fishery, 2012
24.1 Description of the fishery

Southern bluefin tuna constitutes a single, highly migratory stock that spawns in the north-east Indian Ocean (off north-western Australia, south of Indonesia; Figure 24.1) and migrates throughout the temperate, southern oceans. It is one of the most highly valued fish species for sashimi, especially in Japan. Southern bluefin tuna 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 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 from other fishing nations. Australian domestic longliners operating along the east coast also catch a small amount of southern bluefin tuna as byproduct (Figure 24.1). Australian and global catch histories are shown in Figures 24.2 and 24.3, respectively.
FIGURE 24.2 Southern bluefin tuna catch and TAC (Australia), 1989–90 to 2011–12

![Graph showing Southern bluefin tuna catch and TAC (Australia), 1989–90 to 2011–12](image)

Notes: TAC Total allowable catch.

FIGURE 24.3 Southern bluefin tuna annual catch (global), 1952 to 2011

![Graph showing Southern bluefin tuna annual catch (global), 1952 to 2011](image)
The gross value of production (GVP) in 2011–12 from the Southern Bluefin Tuna Fishery (SBTF) was estimated to be $40.6 million (Figure 24.4). For most fish caught in the SBTF (those not caught by longline), this value reflects the value of fish at the point of transfer to pens for farming. The wild-caught value for 2011–12 is relatively low in historical terms, although it is higher than the value in 2009–10 and 2010–11 ($26 million and $31.3 million, respectively). The farmed value of southern bluefin tuna production in 2011–12 (after ranching and grow-out) was $150 million. Reduced supply of bluefin tuna to the global market is understood to have increased the price of southern bluefin tuna through 2012. This has contributed to an increase in the real value of southern bluefin tuna exports in 2011–12 (Figure 24.5).

**FIGURE 24.4** Real GVP of southern bluefin tuna fishery production, 2001–02 to 2011–12

Notes: **GVP** Gross value of production.
The Commonwealth Fisheries Harvest Strategy Policy (DAFF 2007) is not prescribed for fisheries managed jointly under international management arrangements, such as the SBTF, which is managed under the Convention for the Conservation of Southern Bluefin Tuna 1994. Significant work has been invested in developing a harvest strategy (referred to as the 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 has been used to set the global total allowable catch (TAC) for 2012 and 2013. The global TAC is allocated to members and cooperating non-members as agreed by the CCSBT under the CCSBT Resolution on the Allocation of the Global Total Allowable Catch 2011. The Bali Procedure aims to achieve recovery of the southern bluefin tuna stock to 20 per cent of its initial unfished biomass (the interim rebuilding target) by 2035, with 70 per cent certainty. As the Bali Procedure was only adopted in October 2011, its performance has not yet been assessed in terms of revised quantitative stock assessments (scheduled for 2014).

Recreational angling for southern bluefin tuna has been popular among game-fishing club members in Tasmanian and South Australian waters, but activity among the general recreational fishing sector has increased and spread in recent years, particularly in western Victoria near Portland and Port Fairy (Rowsell et al. 2008). The Victorian Government surveyed recreational southern bluefin tuna fishers in western Victoria in March–July 2011 (Green et al. 2012). The survey estimated that a total of 19 700 southern bluefin tuna were retained during the survey period, with an estimated weight of 240 t. A further 6900 southern bluefin tuna were estimated to have been caught and 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 the national recreational catch is available.
## TABLE 24.2 Main features and statistics for the SBTF

<table>
<thead>
<tr>
<th>Stock</th>
<th>2010–11 fishing season</th>
<th>2011–12 fishing season</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TAC (t)</td>
<td>Catch (t)</td>
</tr>
<tr>
<td>Southern bluefin tuna</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purse seine</td>
<td>3 939 (^b)</td>
<td>3 872</td>
</tr>
<tr>
<td>Pelagic longline</td>
<td>86 (^d)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3 958</td>
<td>$31.3 million</td>
</tr>
</tbody>
</table>

**Fishery-level statistics**

- **Effort**: Purse seine: 835 hours; 106 shots Purse seine: 1 150 hours; 153 shots
- **Fishing permits**: 96 SFR owners initially allocated quota 94 SFR owners initially allocated quota
- **Active vessels**: Purse seine: 5; longline: 15 Purse seine: 5; longline: 11
- **Observer coverage**: Purse seine: 21 shots (19.8%) Longline: 6.3% in ETBF; 1.7% in WTBF Purse seine: 17 shots (11.1%) Longline: 6.2% in ETBF; 17.2% 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—fresh, frozen
- **Management plan**: Southern Bluefin Tuna Fishery management plan 1995 (AFMA 1995; amended 2013)

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\(^a\) Fishery statistics are provided by fishing season, unless otherwise indicated. Season is 1 December to 30 November. Real-value statistics are 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. \(^c\) Australia’s allocation as agreed by the Commission for the Conservation of Southern Bluefin Tuna was 4528 t. However, Australia voluntarily reduced this to account for an overcatch of 19.07 t in the 2009–11 two-year season. \(^d\) Includes a small amount of catch taken by minor-line methods (i.e. trolling). \(^e\) Since catches exceeded the effective TAC for the 2011–12 season by 34 t, Australia voluntarily reduced its TAC for 2012–13 by the same amount.

Notes: ETBF Eastern Tuna and Billfish Fishery. ITQ Individual transferable quota. SBTF Southern Bluefin Tuna Fishery. SFR Statutory fishing right. TAC Total allowable catch. WTBF Western Tuna and Billfish Fishery.
24.2 Biological status

24.2.1 Southern bluefin tuna

Stock assessment

In 2011, a revised CCSBT operating model (the quantitative 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 (CCSBT 2011a). 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—0.05SB0; range 0.03–0.07 SB0; CCSBT 2011a). Very low recruitment was estimated from the late 1990s to the early 2000s, but recent recruitment estimates (2005 to 2011) have increased. The next CCSBT model-based assessment is scheduled for 2014.

A close-kin genetics project has been under way since 2006 and will be finalised in 2013 (CCSBT 2012). The project aims to derive an estimate of spawning stock abundance using genetic techniques. To estimate spawning stock size, the project has developed a stand-alone stock assessment model, independent of the CCSBT operating model. The CCSBT Extended Scientific Committee (CCSBT 2012) noted that the results of this study should be considered in the assessment of southern bluefin tuna, but significant technical issues need to be addressed in finalising the stand-alone assessment model and incorporating the genetic results into the CCSBT operating model.

The Extended Scientific Committee (CCSBT 2012) agreed that it was not prudent to provide quantitative advice based on the preliminary close-kin research until the technical issues had been resolved. However, qualitative advice using the results of the close-kin project noted that, although the results indicate that the spawning biomass may be higher than previously estimated, the proportional productivity of the stock is lower. Thus, the recent productivity of the stock did not differ substantially from previous estimates, and there was no need to revise the Commission's 2011 TAC decision (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 a management procedure (CCSBT 2011b) to guide the recovery of the stock to the interim rebuilding target (20 per cent of initial unfished biomass by 2035, with 70 per cent certainty) and to set the global TAC for 2012 onwards. The global TAC for 2012 was set using the management procedure, which should result in a level of fishing mortality that facilitates recovery of the stock. However, there is no clear evidence of spawning stock recovery in 2012.

The 2012 global catch will be reported in August 2013 and so was not available at the time of preparation of this report. The total level of mortality from all sources (including discards from the high-seas longline fleets and recreational fishing catch) is unknown. In addition, there may be some illegal, unreported and unregulated fishing that is currently unknown and unaccounted for. Therefore, it is uncertain if the total level of mortality is below the level required for rebuilding to occur in line with the management procedure. 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 2012.

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. Most southern bluefin tuna caught in Commonwealth waters 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 catch and aquaculture operations. Therefore, beach prices in the fishery are estimated using prices reported for the Japanese market, together with assumptions about product transportation costs to Japan and costs incurred during the aquaculture phase.

In 2011–12, the GVP for the SBTF —the value of the catch at the point of transfer to farming pens—was estimated as $40.6 million (Figure 24.4). This is lower (in real terms, 2011–12 dollars) than in earlier years, but higher than the levels achieved in 2009–10 and 2010–11. The value of the SBTF catch peaked at $125.5 million in 2002–03, but then declined substantially in 2003–04 to $55.8 million, mainly driven by a reduction in average unit prices, from $23.00 per kilogram in 2002–03 to $11.5 per kilogram in 2003–04. GVP then remained stable at around $50 million, before declining to $26 million in 2009–10; this decline was probably due to a reduction in the TAC and lower prices received as a result of an increase in the exchange rate and increased supplies on the international market. GVP recovered in 2011–12 as a result of an increase in prices on the global tuna market.
The TAC for the SBTF was close to fully caught in 2011–12, indicating that NER are likely to have remained positive. However, effort (hours fished) also increased in 2011–12 by 38 per cent. Together with an increase in fuel prices, this was likely to be associated with some increase in fishing costs.

The value of farmed southern bluefin tuna production in 2011–12 (after ranching) was $150 million. Most of the farmed southern bluefin tuna is exported, mainly to Japan. Therefore, trends in the fishery’s GVP can be linked to export trends. In 2011–12, the supply of tuna on the global market remained relatively low and, therefore, high global tuna prices were maintained (FAO 2012). The real unit price for exported southern bluefin tuna increased by 5 per cent between 2010–11 and 2011–12, from $20.2 to $21.2 per kilogram (2011–12 dollars). Although this stopped the declining trend in average export unit prices since 2002–03, average export unit prices in 2011–12 are still less than half those in 2002–03. The price increases in 2011–12 are likely to have reduced the immediate impact on economic returns of recent TAC reductions.

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, since quota is expected to gravitate to the most efficient operators.

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 have been generated by unsustainable global 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 southern bluefin tuna 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 22 July 2016. 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 whether 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. ABARES, in collaboration with several states, is developing methods to derive robust estimates of the national recreational catch of southern bluefin tuna in Australian waters.

A Level 3 ecological risk 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 these species. The risk to the 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).

No interactions with threatened, endangered or protected (TEP) species were reported on the AFMA website for the SBTF in 2012. Interactions with sharks and other TEP species using longline gear are discussed in Chapters 22 and 25.

24.5 Literature cited


——2009, Ecological risk management report for the Southern Bluefin Tuna Fishery, AFMA, Canberra.


Green, C, Brown, P, Giri, K, Bell, J & Conron, S 2012, Quantifying the recreational catch of southern bluefin tuna off the Victorian coast, research report, Recreational Fishing Grant Program, Department of Primary Industries, Victoria.
