FIGURE 23.1 Purse-seine effort and longline catch in the Southern Bluefin Tuna Fishery, 2018–19 fishing season

Note: SBT Southern bluefin tuna.
## TABLE 23.1 Status of the Southern Bluefin Tuna Fishery

<table>
<thead>
<tr>
<th>Biological status a</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock</td>
<td>2018</td>
<td>2019</td>
<td>Comments</td>
</tr>
<tr>
<td>Southern bluefin tuna (Thunnus maccocyii)</td>
<td>Fishing mortality</td>
<td>Biomass</td>
<td>Fishing mortality</td>
</tr>
</tbody>
</table>

### Economic status

NER are expected to have remained positive in 2018–19, reflecting low levels of quota latency. However, the overfished status of the stock poses a risk to future NER. Economic status will improve as the stock is rebuilt under the management procedure.

a The global assessment of southern bluefin tuna and the default limit reference point from the Commonwealth Fisheries Harvest Strategy Policy (Department of Agriculture and Water Resources 2018) are used as the basis for status determination.

Notes: NER Net economic returns. TAC Total allowable catch.

<table>
<thead>
<tr>
<th>Fishing mortality</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomass</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not subject to overfishing</td>
<td>Subject to overfishing</td>
<td>Uncertain</td>
</tr>
<tr>
<td></td>
<td>Not overfished</td>
<td>Overfished</td>
<td>Uncertain</td>
</tr>
</tbody>
</table>

### 23.1 Description of the fishery

#### Area fished

The Southern Bluefin Tuna Fishery (SBTF) spans the Australian Fishing Zone. Southern bluefin tuna (Thunnus maccocyii) is targeted by fishing fleets from a number of nations, both on the high seas and within the Exclusive Economic Zones (EEZs) of Australia, New Zealand, Indonesia and South Africa. Young fish (1–4 years of age) move from the spawning ground in the north-east Indian Ocean into the Australian EEZ and southwards along the Western Australian coast (Figure 23.1). Surface-schooling juveniles are found seasonally in the continental-shelf region of southern Australia. Current evidence suggests that juveniles return to the Great Australian Bight in the austral summer, but there is some uncertainty about the proportion that returns (Basson et al. 2012). Most of the Australian catch is taken in the Great Australian Bight. Smaller amounts are taken from the longline fisheries, mainly off south-eastern Australia.

#### Fishing methods

Since 1992, most of the Australian catch has been taken by purse seine, targeting juvenile southern bluefin tuna (2–5 years of age) in the Great Australian Bight. This catch is transferred to aquaculture farming operations off the coast of Port Lincoln in South Australia, where the fish are grown to a larger size to achieve higher market prices. Australian domestic longliners operating along the east coast catch some southern bluefin tuna, and recreational fishing for the species has increased in recent years. Throughout the rest of its range, southern bluefin tuna is targeted by pelagic longliners from other fishing nations.
Management methods

The Commonwealth Fisheries Harvest Strategy Policy (Department of Agriculture and Water Resources 2018) is not prescribed for fisheries managed jointly under international management arrangements, such as the SBTF, which is managed under the 1994 Convention for the Conservation of Southern Bluefin Tuna. In 2011, the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) adopted a management procedure (the Bali Procedure) that is analogous to a harvest strategy. This has been used to set the global total allowable catch (TAC) since 2012. The management procedure aims to achieve rebuilding of the southern bluefin tuna stock to 20% of its initial unfished biomass by 2035, with 70% probability.

In 2019, the CCSBT adopted a new management procedure (the Cape Town Procedure) that aims to achieve rebuilding of the southern bluefin tuna stock to 30% of its initial unfished biomass by 2035, with 50% probability. However, this new procedure maintains the 70% probability that the stock rebuilds to 20% by 2035. This new management procedure will be used to set the global TAC from 2021 onwards. The global TAC is allocated to members and cooperating non-members, as agreed by the CCSBT under the 2011 CCSBT Resolution on the Allocation of the Global Total Allowable Catch. The Australian Fisheries Management Authority sets the TAC for the SBTF with reference to Australia’s CCSBT allocation.

The CCSBT has noted that levels of unaccounted mortality may be substantial in the global fishery. A high level of unaccounted mortality may constitute exceptional circumstances because it was not considered when the management procedure was developed. The CCSBT has agreed to a definition of attributable mortality, and members have agreed to manage all sources of mortality within their national allocations. The CCSBT is also working to better account for non-member catch.

Fishing effort

Most of the Australian fishing effort for southern bluefin tuna is by purse-seine vessels in the Great Australian Bight and waters off South Australia. The number of vessels in the purse-seine fishery has been fairly stable, ranging from 5 to 8 since the 1994–95 fishing season. Since 2011, most fishing has occurred in the east of the Bight, closer to Port Lincoln, resulting in shorter towing distances to bring the fish to the aquaculture grow-out cages.

The number of longline vessels fishing for southern bluefin tuna off the east coast of Australia has been more variable, ranging from 11 to 24 vessels during the past 10 years. Effort in the longline sector is largely dependent on available quota.

Catch

The reported global catch of southern bluefin tuna has declined since the peak catches in the early 1960s, and has been fairly stable since the mid 2000s. The Australian catch and TAC were stable from 1990 to 2009 and were then reduced as part of a global reduction in catch. Since adoption of the management procedure in 2011, the global TAC has increased.
### TABLE 23.2 Main features and statistics for the SBTF

<table>
<thead>
<tr>
<th>Fishery/sector</th>
<th>2017–18 fishing season</th>
<th>2018–19 fishing season</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TAC (t)</td>
<td>Catch (t)</td>
</tr>
<tr>
<td>Purse seine</td>
<td>6,528 b</td>
<td>5,124</td>
</tr>
<tr>
<td>Pelagic longline</td>
<td>–</td>
<td>1,035 d</td>
</tr>
<tr>
<td><strong>Total fishery</strong></td>
<td>–</td>
<td>6,159</td>
</tr>
</tbody>
</table>

**Fishery-level statistics**

- **Effort e**
  - Purse seine: 1,137 search-hours; 198 shots
  - Purse seine: 1,366 search-hours; 166 shots

- **Fishing permits**
  - 84 SFR owners initially allocated
  - 82 SFR owners initially allocated

- **Active vessels**
  - Purse seine: 7
  - Longline: 31
  - Purse seine: 7
  - Longline: 20

- **Observer coverage f**
  - Purse seine: 40 shots (20.9%)
  - Longline: 10.8% (of hooks) in ETBF; 13.0% (of hooks) in WTBF
  - Purse seine: 22 shots (14.3%)
  - Longline: 11.7% (of hooks) in ETBF; 12.8% (of hooks) in WTBF

- **Fishing methods**
  - Purse seine, pelagic longline, minor line (troll and poling)

- **Primary landing ports**
  - Port Lincoln (South Australia)

- **Management methods**
  - Output controls: TAC, ITQs, 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

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**Notes:**
- **ETBF** Eastern Tuna and Billfish Fishery.
- **GVP** Gross value of production.
- **ITQ** Individual transferable quota.
- **SFR** Statutory fishing right.
- **TAC** Total allowable catch.
- **WTBF** Western Tuna and Billfish Fishery.
- **—** Not applicable.

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*Table credits and source information are omitted for brevity.*
23.2 Biological status

Southern bluefin tuna (Thunnus maccoyii)

Stock structure
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 23.1) and migrates throughout the temperate southern oceans.

Catch history
Troll catches of southern bluefin tuna off the east coast of Australia were reported as early as the 1920s, but significant commercial fishing for southern bluefin tuna commenced in the early 1950s with the establishment of a pole-and-live-bait fishery off New South Wales, South Australia and, later (1970), Western Australia. Purse-seine gear overtook pole as the main fishing method, and catches peaked at 21,500 t in 1982. Australia’s catch of southern bluefin tuna was relatively stable from 1989 to 2009, when the global TAC and Australia’s TAC were reduced because of the poor state of the biological stock (Figure 23.2). However, the TAC has been slowly increasing with the implementation of the management procedure in 2011. Reported global catch peaked in the early 1960s at more than 80,000 t, before declining steadily until around 2007 (Figure 23.3).

Recreational angling for southern bluefin tuna in Australia has been popular among game fishers for many years, and activity among the general recreational fishing sector has increased in previous years (for example, Rowsell et al. 2008). At present, limited data are available on the recreational catch of southern bluefin tuna, and no total estimate of the national recreational catch is available. Several state surveys have taken place; however, the error associated with these surveys has been estimated to be as high as 47% (Giri & Hall 2015). In 2015, a report on methods to estimate recreational catch of southern bluefin tuna was released (Moore et al. 2015). A survey of recreational fishing for southern bluefin tuna estimated a catch of 270 t with 6% error in 2018–19 (Tracey et al. 2020). Based on these results, and other considerations, the Australian Government announced that 5% of Australia’s CCSBT allocation should be set aside for recreational fishing each year.
Chapter 23: Southern Bluefin Tuna Fishery

FIGURE 23.2 Southern bluefin tuna catch and TAC (Australia), 1989–90 season to 2018–19 season

Note: TAC Total allowable catch.
Source: AFMA

FIGURE 23.3 Southern bluefin tuna catch (global), 1952 to 2018

Note: Total global catches exceeded reported global catches between 1995 and 2005; some scientists estimate that unreported catches surpassed 178,000 t during this period (Polacheck & Davies 2008).
Source: CCSBT
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Stock assessment

The management procedure specifies that a full quantitative stock assessment should be undertaken every 3 years. In 2017, a revised CCSBT operating model (the quantitative model that is used to assess the spawning biomass of southern bluefin tuna, based on a variety of data sources) was used to run various scenarios to determine the impact of fishing on the stock (CCSBT 2017). The updated assessment incorporated the new half-sibling pair data from a close-kin genetic study, as well as parent-offspring pair data, which add to the data included in the previous assessment (Bravington, Grewe & Davies 2014). The 2011 assessment reported the estimated biomass of southern bluefin tuna 10 years and older (B10+) as a proxy for spawning biomass, whereas the 2014 assessment provided a revised estimate of spawning biomass that includes younger fish. The 2017 assessment used a new estimation of total reproductive output instead of B10+, although B10+ is still provided for comparison because the interim rebuilding target is defined in terms of B10+.

The 2017 assessment examined a range of sensitivities, including scenarios for unaccounted catch mortalities. The CCSBT Extended Scientific Committee noted that the 2017 assessment was constrained by the lack of information on sources of unaccounted mortalities, and so the ‘added catch’ sensitivity used in 2014 could be a plausible scenario. However, in contrast to the 2014 assessment, the unaccounted mortality scenarios in the 2017 assessment did not reduce the probability of the stock recovering to 20% of the unfished level by 2035 below the prescribed 70% probability.

The reference set of operating models (or base case) for the assessment indicated that the spawning stock biomass remains below the interim target of 20% of the unfished level. Spawning stock biomass (using the total reproductive output method) was estimated at 13% of the initial unfished level (80% confidence interval [CI] 11–17%) and below the level needed to produce the maximum sustainable yield (MSY; CCSBT 2017). The spawning stock biomass of the B10+ group was estimated to be 11% of unfished levels (80% CI 9–13%); the 2014 estimate was 7% of unfished levels (CCSBT 2014). The ratio of current fishing mortality to the level associated with MSY ($F_{MSY}$) was 0.50 (range 0.38–0.66). An updated stock assessment will be undertaken in 2020 and the results reported in the Fishery status reports 2021.

Stock status determination

The current mean estimate for spawning stock biomass of southern bluefin tuna is 13% of unfished levels. As a result, the stock remains classified as overfished.

The global TAC for 2019 was set based on the outputs from the management procedure, which should result in a level of fishing mortality that facilitates rebuilding of the stock. The reference case for the updated assessment indicates reduced fishing mortality from that estimated in the 2014 assessment. Substantial uncertainty remains about the level of unaccounted catch mortality. However, unlike in the previous assessment, the unaccounted mortality scenarios in the 2017 assessment did not reduce the probability of the stock recovering by the designated time of 2035. In addition, the outlook for the stock appears more positive, with signs of increased recruitment in recent years and projections under the current management procedure of the stock reaching the interim rebuilding target before 2035.
Although caution is warranted and increased recruitment does not indicate increased stock biomass, the outlook for the stock has improved since the 2014 assessment. Given the decrease in fishing mortality noted in the assessment and the fact that the unaccounted mortality scenarios do not impede the probability of recovery, the stock is classified as **not subject to overfishing**. However, future assessments may change the outlook for the stock and will need to be monitored, as will future estimates of unaccounted mortality.

### 23.3 Economic status

**Key economic trends**

Assessment of economic performance in the wild-catch sector is complicated by the vertical integration of the wild-catch and aquaculture sectors. As noted above, most southern bluefin tuna caught 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 wild-catch and aquaculture operations. Therefore, beach prices in the fishery are estimated with reference to export unit values and costs incurred during the aquaculture phase.

In 2018–19, the gross value of production for the SBTF—the combined value of the catch at the point of transfer to farming pens and catch sold direct into global markets—is estimated to have increased by 9% to $43.4 million (Figure 23.4). The increase in production value was driven by higher catch and an increase in average prices. The increase in catch volume consisted of more southern bluefin tuna being transferred into aquaculture farms as well as increased longline catch. Despite an increase in farm input in 2017–18, a generally declining share of southern bluefin tuna has been ranched in recent years. Conversely, catch from eastern Australia has increased (predominantly caught by the Commonwealth Eastern Tuna and Billfish Fishery fleet).

The average price for southern bluefin tuna increased by 4% in 2018–19, although there has been a longer-run decline in southern bluefin tuna prices. Between 2002–03 and 2018–19, the total production value of the SBTF declined by 62% in real terms. Most of the decline in gross value of production (GVP) occurred from 2002–03 to 2010–11 as a result of prices falling and a reduction in quota. Since 2010–11, increases in quota have supported GVP in the fishery, with prices remaining below those in 2010–11 in recent years.

For exports, the value of southern bluefin tuna fell by 66% in real terms between 2002–03 and 2018–19, which was the result of a decline in unit export prices (Figure 23.5). Australia’s southern bluefin tuna industry is highly export oriented, and the decline in price is the result of a number of related factors, including changes in the Australian dollar – Japanese yen exchange rate, falling demand for sashimi tuna in Japan and growth of global bluefin tuna aquaculture production.
Chapter 23: Southern Bluefin Tuna Fishery

**FIGURE 23.4** Real GVP of southern bluefin tuna production, 2008–09 to 2018–19

Notes: GVP Gross value of production. ‘Real’ indicates that value has been adjusted for inflation.

**FIGURE 23.5** Real value of southern bluefin tuna exports, by processing method, 2008–09 to 2018–19

Note: ‘Real’ indicates that value has been adjusted for inflation.
Performance against economic objective

The SBTF typically has very little quota latency within a fishing season, indicating that net economic returns (NER) are likely to be positive. The SBTF is a high-value fishery, and analysis of recent economic trends suggests 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. Rebuilding of the southern bluefin tuna stock under the current management arrangements would be considered an improvement in the fishery’s economic status. The importance of rebuilding the southern bluefin tuna stock is reinforced by the persistence of generally lower southern bluefin tuna prices and the growth in global bluefin tuna aquaculture production in recent years.

23.4 Environmental status

The SBTF has approval for export until 11 November 2022. Conditions placed on the export approval include increasing confidence in the estimates of purse-seine catches, that the management arrangements start accounting for all sources of mortality of southern bluefin tuna, including recreational and Indigenous catch, and that the management arrangements continue to support the recovery of the stock.

A level 3 ecological risk assessment (sustainability assessment for fishing effects) of 83 non-target species (6 chondrichthyans and 77 teleosts) to determine the impact of southern bluefin tuna fishing on these species assessed the risk as low (Zhou, Fuller & Smith 2009). The priority of the ecological risk management report is to respond to interactions with protected species (AFMA 2009).

In accordance with accreditation under the EPBC Act 1999 (see Chapter 1, ‘Protected species interactions’) AFMA publishes and reports quarterly on interactions with protected species on behalf of Commonwealth fishing operators to the Department of Agriculture, Water and the Environment (DAWE). No interactions with protected species were reported for the SBTF in 2019. Interactions with sharks and other protected species using longline gear are discussed in Chapters 21 and 24.

These reported interactions with protected species form a part of the ongoing monitoring by DAWE of the performance of fisheries within their accreditation under the EPBC Act.

23.5 References

AFMA 2009, Ecological risk management report for the Southern Bluefin Tuna Fishery, Australian Fisheries Management Authority, Canberra.


Department of Agriculture and Water Resources 2018, Commonwealth Fisheries Harvest Strategy Policy, Department of Agriculture and Water Resources, Canberra.


Zhou, S, Fuller, M & Smith, T 2009, Rapid quantitative risk assessment for fish species in seven Commonwealth fisheries, report for the Australian Fisheries Management Authority, Canberra.