Chapter 16
Torres Strait Finfish Fishery

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FIGURE 16.1 Area of the Torres Strait Finfish Fishery

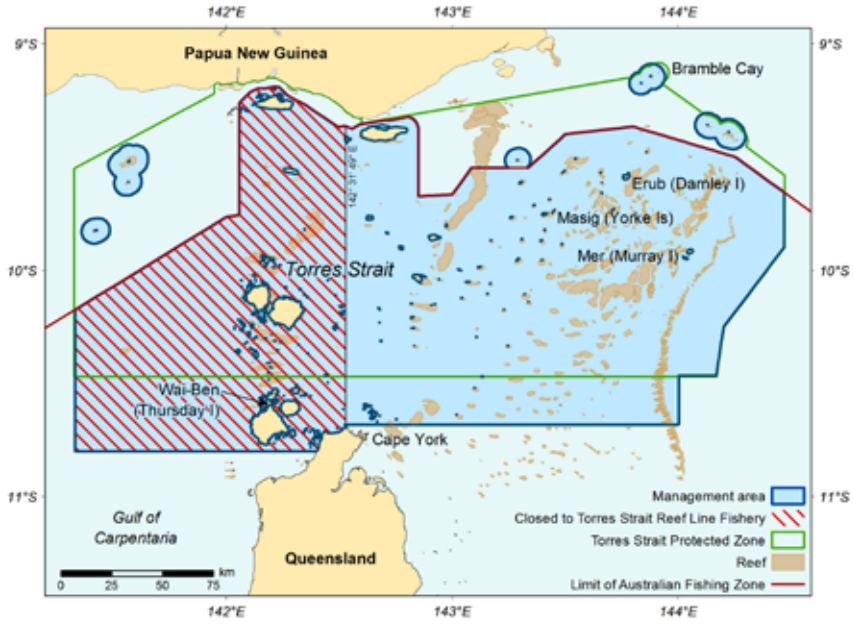


TABLE 16.1 Status of the Torres Strait Finfish Fishery

Biological status					
Stock	2019		2020		Comments
	Fishing mortality	Biomass	Fishing mortality	Biomass	
Coral trout (*Plectropomus* spp., *Variola* spp.)					Recent catches are below levels that are likely to drive biomass below B_{LIM}.
Spanish mackerel (*Scomberomorus commerson*)					Current catch is below the recommended biological catch. Most recent estimate of biomass is above $0.2B_0$.
Economic status					
The key objectives of the fishery are based on socio-economic outcomes. Catch has been relatively stable in the last decade and leasing revenue for the Traditional Inhabitant Sector has increased recently.					

Notes: $0.2B_0$ 20% of unfished biomass. B_{LIM} Biomass limit reference point.

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

16.1 Description of the fishery

Area fished, fishing methods and key species

The Torres Strait Finfish Fishery (TSFF) includes both non-commercial traditional subsistence fishers, and commercial fishers from the Traditional Inhabitant Boat (TIB) Sector and the Non-Traditional Inhabitant Sector. The fishery has 2 components: the Torres Strait Spanish Mackerel Fishery (TSSMF) and the Torres Strait Finfish (Reef Line) Fishery (TSFRLF).

Commercial fishing in the TSSMF and the TSFRLF primarily takes place in the north-eastern region of Torres Strait (Figure 16.1), as most of the fishery west of 142°32'E is closed to commercial fishing in the TSFRLF. This closure is currently under review (AFMA 2020b).

In the TSSMF, commercial fishers target Spanish mackerel (*Scomberomorus commerson*), primarily by trolling from small dories or dinghies. Byproduct is a relatively minor component of catch and primarily composed of other mackerel species (grey, school, spotted and shark mackerel) and small quantities of reef fish (AFMA 2005; Begg et al. 2006).

In the TSFRLF, commercial fishers primarily target coral trout (*Plectropomus* spp., *Variola* spp. – approx. 90% of catch by weight), with smaller catches of other groupers/cods (Serranidae), mackerels (Scombridae), snappers (Lutjanidae), emperors (Lethrinidae) and trevally (Carangidae). Barramundi (*Lates calcarifer*) is also considered part of the TSFRLF, but only small quantities are thought to be harvested. As such, barramundi is not considered further here.

Commercial sectors of the TSFRLF have historically discarded more than half their total catch, in numbers, as bycatch (Williams et al. 2008). The TIB Sector retains a wider range of species than the Non-TIB Sector, mainly for subsistence (Busilacchi et al. 2012, 2013).

Traditional subsistence fishers in Torres Strait take a wide range of finfish species and use a variety of fishing gears, including hook and line, nets, spears, and traps. Subsistence fishers are understood to retain a wider variety of species than commercial fishers, and are estimated to catch a similar amount of reef fish to total commercial catches (TIB and Non-TIB sectors combined; Busilacchi 2008; Busilacchi et al. 2013). Subsistence catches are taken into account in the management of the commercial sectors.

Management methods

The fishery is managed through both input controls (limited entry, vessel restrictions and prohibited species) and output controls (size and catch limits).

The TSFF management plan provides for a total allowable commercial catch (TACC) to be set, although formal quota units have not yet been created or allocated. Instead, non-TIB fishers are required to operate by leasing catch allowances under a temporary annual licence (called a 'sunset licence'). These operators lease this temporary quota for Spanish mackerel, coral trout and other finfish species each year through the Torres Strait Regional Authority. Commercial catches for the TIB Sector are not formally limited, but an agreed proportion of the TACC is set aside each season to minimise the risk of exceeding the TACC.

Although the Commonwealth Fisheries Harvest Strategy Policy (HSP; Department of Agriculture and Water Resources 2018) does not apply to fisheries jointly managed by the Australian Government and other (domestic or international) management agencies, the HSP does represent the government's preferred approach to management. A formal harvest strategy for the TSFF is being developed (AFMA 2019b). In the interim, the proxy limit reference point (LRP) specified in the HSP (20% of unfished biomass, $0.2B_0$) is used by ABARES to determine stock status.

Fishing activity

Commercial effort in the fishery has decreased from peaks in the early 2000s. Several factors have contributed to the decline, including the voluntary surrender of Transferable Vessel Holder (TVH) fishing licences and government-funded structural adjustment. The fishery for coral trout on the Queensland east coast focuses primarily on live export (Campbell et al. 2019). The removal of the ban on live exports in Torres Strait has previously done little to increase activity in the TSFRLF, primarily because of difficulties and costs associated with transporting live fish from remote areas. Live coral trout were exported for the first time in 2017.

Catch in the TIB and TVH sectors has followed the trends in effort, discussed above.

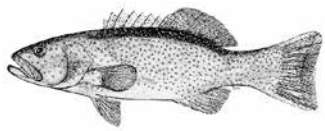
TABLE 16.2 Main features and statistics for the TSFF

Fishery statistics a	2018–19 fishing season			2019–20 fishing season		
Stock	**TACC (t)**	**Catch (t) b**	**GVP (2018–19)**	**TACC (t)**	**Catch (t) b**	**GVP (2019–20)**
Coral trout	134.9	17.3	Confidential	134.9	32.3	Confidential
Spanish mackerel	115.0	64.3	Confidential	82.0	55.7	Confidential
Other	n/a	2.9	Confidential	n/a	4.7	Confidential
Total fishery	**249.9**	**84.5**	**$0.9 million**	**216.9**	**92.7**	**$1.2 million**
Fishery-level statistics						
Effort (days) TSSMF	Spanish mackerel: TIB – 124 **c** Sunset permits **d** – 372 operation-days, 620 tender-days			Spanish mackerel: TIB – 47 Sunset permits **d** – 234 operation-days, 473 tender-days		
TSFRLF	Coral trout: TIB – 201 **c** Sunset permits – 92 coral trout operation-days, 92 tender-days (same for all TSFRLF species)			Coral trout: TIB – 184 Sunset permits – 191 coral trout operation-days, 191 tender-days (same for all TSFRLF species)		
Fishing permits	TIB: 191 mackerel endorsements, 169 line endorsements Sunset permits: 5 mackerel and/or line licences			TIB: 177 mackerel endorsements and/or line endorsements as of 1 October 2019 Sunset permits: 5 mackerel and/or line licences		
Active vessels TSSMF	Spanish mackerel: TIB – 14 Sunset permits – 4			Spanish mackerel: TIB – 15 Sunset permits – 3		
TSFRLF	Coral trout: TIB – 15 Sunset permits – 3			Coral trout: TIB – 12 Sunset permits – 2		
Observer coverage	0 days			0 days		
Fishing methods	Coral trout and mixed reef species: handline, rod and line Spanish mackerel: trolled baits, lures and handlines					
Primary landing ports	Cairns (Queensland); Torres Strait Island fish receivers on Erub (Darnley), Masig (Yorke) and Mer (Murray) islands					
Management methods	Input controls: limited entry, vessel restrictions, prohibited species Output controls: size limits, catch allowances					
Primary markets	Domestic: frozen International: frozen					
Management plan	Torres Strait Finfish Fishery Management Plan 2013					

a Fishery statistics are provided by fishing season, unless otherwise indicated. Fishing season is 1 July to 30 June. Value statistics are provided by financial year. **b** Catch figures include both TIB and non-TIB catch; however, reporting by the TIB Sector has only recently become mandatory through the fish receiver system. **c** Reporting of TIB effort for Spanish mackerel and coral trout through the fish receiver system began on 1 December 2017, so only data for 2018–19 are reported as this is the first season with a full year of data. However, TIB effort is likely to be underestimated because the reporting of effort in the fish receiver system is not compulsory. **d** All finfish and Spanish mackerel catch allowances in Torres Strait are held in trust and managed by the Torres Strait Regional Authority on behalf of the TIB Sector. 'Sunset' permits allow non–traditional inhabitant fishers to fish in Torres Strait, and take finfish and Spanish mackerel leased from the TIB Sector. Sunset permits are issued each year and expire on 30 June each year. Six sunset permits are available for primary boats that carry a small number of tenders.
Notes: **GVP** Gross value of production. **n/a** Not applicable. **TACC** Total allowable commercial catch. **TIB** Traditional Inhabitant Boat. **TSFRLF** Torres Strait Finfish (Reef Line) Fishery. **TSSMF** Torres Strait Spanish Mackerel Fishery.

16.2 Biological status

Coral trout (*Plectropomus* spp., *Variola* spp.)



Line drawing: FAO

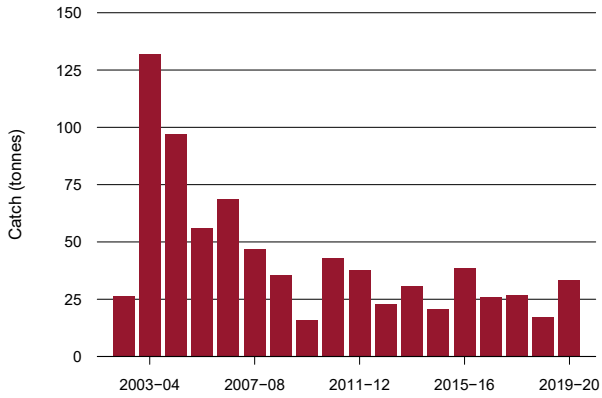
Stock structure

Coral trout in Torres Strait comprises 4 species: common coral trout (*Plectropomus leopardus*), barcheek coral trout (*P. maculatus*), passionfruit coral trout (*P. areolatus*) and bluespot coral trout (*P. laevis*). Each species is likely to be a single genetic stock in Torres Strait (Evans et al. 2010). Catch of individual species is usually not reported in fishery logbooks, although fishers are encouraged to provide an estimate of the proportion of each species in the catch. A single multispecies stock is assumed for assessment and management purposes.

Catch history

Commercial catch of coral trout in the TSFRLF peaked in the 2003–04 season at 132 t before falling below 50 t in 2007–08 (Figure 16.2). Catch has remained below 50 t since then and was 32.3 t in 2019–20.

FIGURE 16.2 Catch history for coral trout in the TSFRLF, 2002–03 season to 2019–20 season



Source: AFMA

Stock assessment

There is currently no finalised and endorsed stock assessment for coral trout in Torres Strait. A preliminary stock assessment was reviewed by the Torres Strait Finfish Resource Assessment Group (TSFFRAG) in March 2019. The draft assessment estimated the mean spawning biomass to be around 80% of unfished levels ($0.80SB_0$), with all model scenarios estimating spawning biomass to be above 65% of unfished levels (AFMA 2019a). However, the TSFFRAG considered the assessment to be preliminary and requiring further peer review and development to ensure that it can be made available for future management decisions.

A management strategy evaluation (MSE) was undertaken for the stock, using catch data up to 2004 (Williams et al. 2007; Williams, Little & Begg 2011). Four constant-catch scenarios, ranging from 80 t to 170 t, were tested. All achieved a biomass of at least 70% of the assumed unfished levels by 2025. The MSE also evaluated the effects of spatial and seasonal closures, and minimum size limits on achieving management objectives.

A significant period of time has passed since the MSE was undertaken, and Torres Strait is a region experiencing environmental change due to climate change (Dutra et al. 2021; NESP ESCC Hub 2018), with potential implications for the productivity of fish stocks. As time goes by, it will become increasingly difficult to assume, without an updated stock assessment, that productivity has remained stable and that the outcomes of the MSE remain valid. There are also uncertainties about catch levels for this stock. For example, catch from the TIB Sector is likely to have been under-reported in the past because it was not mandatory for this sector to report catch-and-effort data before 1 December 2017, and there is no catch reporting for subsistence fishing (AFMA 2017).

Stock status determination

In the absence of an accepted stock assessment, the status of the coral trout stock is primarily evaluated against the results of the MSE. Reported commercial catch in recent years has been below the lowest catch level simulated in the MSE (80 t per year). As such, catches are unlikely to have reduced the stock below the biomass limit reference point. On this basis, the stock is classified as **not overfished** and **not subject to overfishing**.

Spanish mackerel (*Scomberomorus commerson*)

Line drawing: FAO

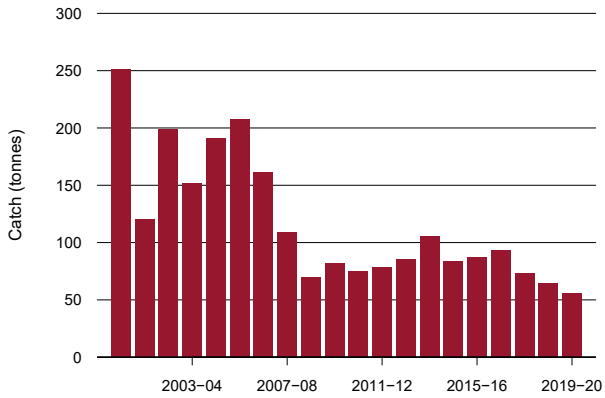
Stock structure

Spanish mackerel in Torres Strait comprise a separate biological stock from Spanish mackerel on the Queensland east coast and further west across northern Australia (Begg et al. 2006; Buckworth et al. 2007).

Catch history

Annual catches of Spanish mackerel declined from a peak of 251 t in 2000–01 to around 70 t in 2008–09. Catches have been relatively stable since, dropping to 55.7 t in 2019–20 (Figure 16.3).

FIGURE 16.3 Catch history for Spanish mackerel in the TSSMF, 2000–01 season to 2019–20 season



Source: AFMA

Stock assessment

An updated stock assessment for Spanish mackerel was completed in 2020 using data to 2019–20 (AFMA 2020, O'Neill et al. 2021). The updated assessment used an integrated age-structured model and input data on catch, effort and length-at-age of Spanish mackerel. A range of exploratory models were run, with the final endorsed assessment comprising 6 model scenarios, all using the full time series of data (from 1940) to form a grid of likely outcomes for the stock.

The median estimated spawning biomass in 2019–20 across the grid of 6 models was 30% (range 26–35%) of the unfished spawning biomass in 1940, which is higher than the 2019 assessment estimate of median spawning biomass ($0.23SB_0$). This is in part due to a recent increase in standardised catch rates following a period of decline (since 2009–10) and evidence for recent recruitment returning to about average levels. None of the median biomass estimates from the 6 model scenarios were below the agreed LRP of 20% of the 1940 spawning biomass level, although the lower confidence intervals of some model runs did fall below the LRP. Recent fishing pressure is not exceeding F_{MSY} (the harvest rate for maximum sustainable yield [MSY] from the stock).

Projections from the 2020 assessment grid of models were used by the TSFFRAG to provide a recommended biological catch (RBC) for 2020–21. The projections assumed average recruitment and tested 5 different constant harvest rates (F_{MSY}, F_{40}, F_{48}, F_{54} and F_{60}) that would rebuild the stock to corresponding biomass reference points levels (B_{MSY}, B_{40}, B_{48}, B_{54} and B_{60}). Projections using F_{MSY} and F_{40} harvest rates indicated that the stock would drop below the LRP at least 10% of the time (based on 1,000 simulation runs). These harvest rates were dropped from further consideration because of the unacceptable risk they posed to the stock. The F_{48} harvest rate was dropped from further consideration on a precautionary basis because it was considered to allow too large an increase in RBC relative to the previous season. The F_{60} harvest rate was also dropped because it represented too small an increase relative to the level that the assessment (including improvements in catch-per-unit-effort and recruitment) indicated was warranted. An intermediate harvest rate (F_{54}) resulted in an RBC of 94 t; projections showed that this would rebuild the stock to $0.48SB_0$ within 12 years, while satisfying the LRP requirements (10% of the time). Based on these results, the TSFFRAG recommended increasing the RBC from 82 t in 2019–20 to 94 t for the 2021–22 season.

A number of issues with the assessment remain under investigation or are a high priority for future investigation, including the potential for hyperstability in the catch rates (that is, catch rates remaining steady despite declines in underlying abundance) and the impact of environmental factors on the stock (AFMA 2020).

Stock status determination

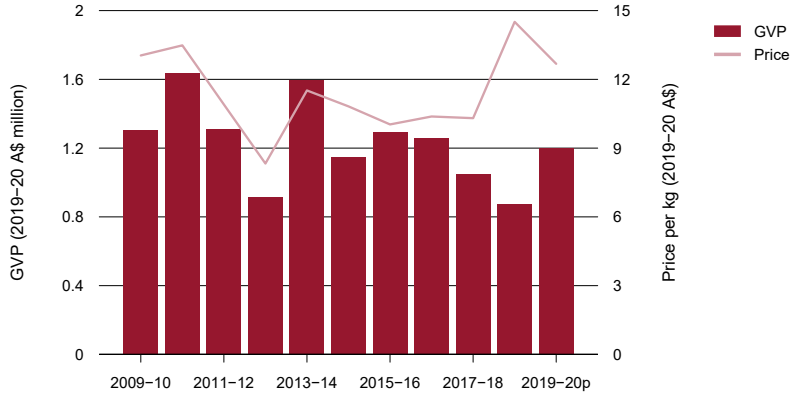
Reported catch for 2019–20 was below the RBC. On this basis, the stock is classified as **not subject to overfishing**. The median estimate of Spanish mackerel spawning biomass in 2019–20 was above the biomass limit reference point for all 6 models run. As a result, the stock is classified as **not overfished**.

16.3 Economic status

Key economic trends

Gross value of production (GVP) for the TSFF has been variable over the period 2009–10 to 2019–20, averaging $1.2 million per year, with most of this GVP attributed to activity by the Non-TIB Sector. Total effort by the TIB Sector is broadly unknown because the 2018–19 fishing season was the first time that TIB effort-days for Spanish mackerel and coral trout were reported. Despite most catch being caught by the Non-TIB Sector, active vessel statistics show that participation of the TIB Sector is currently higher than the Non-TIB Sector, which may indicate that the key objective to promote socio-economic development for traditional inhabitants is being met.

FIGURE 16.4 Real GVP and average price per kilogram for the TSFF, 2009–10 to 2019–20



Notes: **GVP** Gross value of production. **p** Data for 2019–20 are preliminary.

Performance against economic objective

Net economic returns are an unsuitable metric to measure the performance of the TSFF and are unavailable for this fishery. The TSFF management plan pursues a broader set of objectives that together contribute to ensuring that the socio-economic wellbeing of Torres Strait communities is maintained.

The key objectives of the TSFF management plan are to acknowledge and protect the traditional way of life of traditional inhabitants, including their rights in relation to traditional fishing for finfish, and to conserve resources in a way that minimises the impact on the marine environment. Optimising economic viability of the fishery is one objective, but, unlike fisheries solely managed by the Australian Government, targeting maximum economic yield is not a key focus. The quota leasing arrangements in the fishery provide a means to meet the objectives under the Torres Strait Treaty to promote economic development and employment for traditional inhabitants (TSFMAC 2012).

Quota leasing arrangements were introduced in 2008 following a structural adjustment in the fishery. The TIB Sector owns 100% of the TSFF allowable catch. Allowable catch that is not used by the sector is leased to the Non-TIB Sector (TSRA 2020). Leasing arrangements are likely to generate some positive economic returns to Torres Strait.

Leasing revenue is intended to provide investment funding to build the capacity of traditional inhabitant fishing industries in an economical and environmentally sustainable way in the fishery (TSRA 2020). In the 2019–20 financial year, the Finfish Quota Trust account closed with $2 million, $0.3 million higher than 2018–19, indicating some potential positive socio-economic returns to the fishery.

16.4 Environmental status

The TSFF is included on the List of Exempt Native Specimens under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and has export approval until 1 November 2023. Conditions of this approval include that the Protected Zone Joint Authority (PZJA) must:

- complete an ecological risk assessment of the TSFF and develop a risk management strategy
- review the current management measures applied to the take of shark to ensure that they are best practice
- review the appropriateness of the current minimum size limits for Spanish mackerel
- develop a harvest strategy for the TSFF
- ensure that there are sufficient compliance measures in place to ensure sustainable management of the TSFF.

In addition, it was recommended that the Australian Fisheries Management Authority (AFMA) continues to work with the PZJA and the Department of Agriculture, Water and the Environment (DAWE) to implement changes to the *Torres Strait Fisheries Act 1984* to allow reporting requirements to apply to all fishing sectors in the fishery. This includes the reporting of catch, including target and non-target species, and discards; catch-and-effort data, including the location of fishing activity; and interactions with protected species.

No ecological risk assessments have been conducted for the TSFF. The strategic assessment report (AFMA 2012) assumes that the impacts of fishing on the ecosystem are restricted to anchoring, mooring and other anthropogenic activities; vessel accidents, leading to pollution such as oil spills; and potential translocation of species by hull and anchor fouling. The report concludes that direct impacts on the environment are likely to be minimal because of the low-impact nature of the hook-and-line fishing methods used in the fishery.

In accordance with accreditation under the EPBC Act (see Chapter 1, 'Protected species interactions'), AFMA publishes and reports quarterly on interactions with protected species on behalf of Commonwealth fishing operators to DAWE. No interactions with species protected under the EPBC Act were reported in the TSFF in 2020.

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

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