

Chapter 16

Torres Strait Finfish Fishery

A Williams, N Marton and AH Steven

FIGURE 16.1 Area of the Torres Strait Finfish Fishery

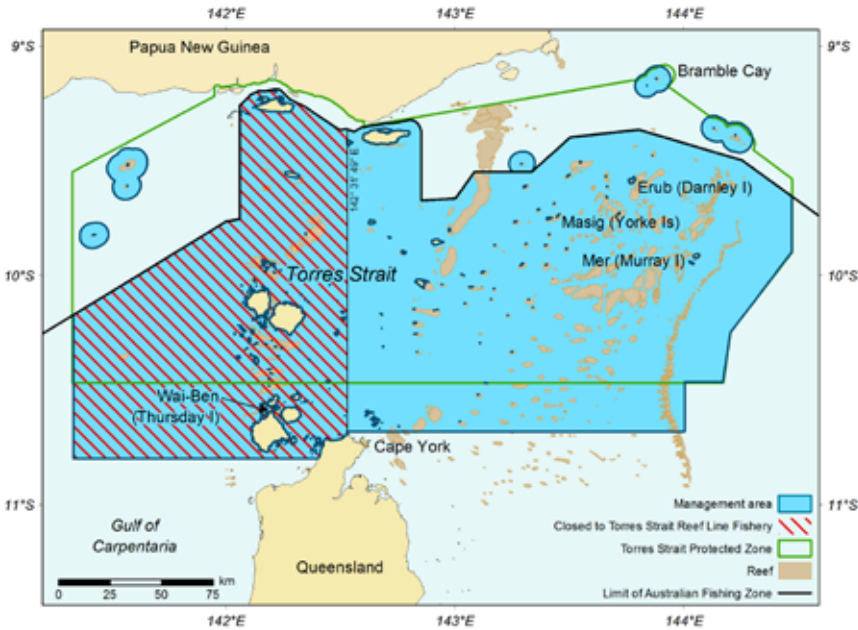








TABLE 16.1 Status of the Torres Strait Finfish Fishery

Status	2017		2018		Comments
Biological status	Fishing mortality	Biomass	Fishing mortality	Biomass	
Coral trout (<i>Plectropomus</i> spp., <i>Variola</i> spp.)					Management strategy evaluation testing suggests that current catches are well below the level likely to lead to biomass declines. Most recent biomass estimate indicated a biomass above 0.6B ₀ .
Spanish mackerel (<i>Scomberomorus commerson</i>)					Current fishing mortality rate is below that required to produce MSY. Most recent average estimate of biomass is above 0.2B ₀ .
Economic status	Estimated net economic returns are not available for the fishery. The economic performance of the fishery in the 2017–18 fishing season is uncertain.				

Notes: B₀ Unfished biomass. B₂₀ 20% of unfished biomass. MSY Maximum sustainable yield.

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

16.1 Description of the fishery

Area fished

Most commercial fishing in the Torres Strait Finfish Fishery (TSFF) takes place in the north-eastern region of Torres Strait (Figure 16.1). A large area of the fishery west of 142°32'E is closed to commercial fishing for the Torres Strait Finfish (Reef Line) Fishery (TSFRLF). The western closure is currently under review (AFMA 2018b).

The TSFF has two components: the Torres Strait Spanish Mackerel Fishery (TSSMF) and the TSFRLF. Two commercial sectors—the Traditional Inhabitant Boat (TIB) and non-TIB sectors—participate in the TSSMF and the TSFRLF.

Fishing methods and key species

Traditional fishing targets a range of species, including those targeted by the commercial sectors, the catch of which is taken into account in the management of the commercial sectors.

The TSSMF targets Spanish mackerel (*Scomberomorus commerson*), primarily by trolling from small dories or dinghies tendered to a larger primary vessel or operating independently. Byproduct is a relatively minor component of catch. Most of the byproduct is other mackerel species (grey, school, spotted and shark mackerel), but small quantities of reef fish, including coral trout, are also retained (AFMA 2005; Begg et al. 2006).

The TSFRLF is a multispecies demersal hook-and-line fishery targeting mainly coral trout (*Plectropomus* spp., *Variola* spp.), with smaller catches of other groupers/cods (Serranidae), mackerels (Scombridae), snappers (Lutjanidae), emperors (Lethrinidae) and trevally (Carangidae). The most recent data indicate that coral trout make up more than 90% of the retained commercial catch (by weight) for both the TIB and non-TIB sectors, while barramundi cod and rock cods represent 5%, and red emperor represents 2%.

Both sectors 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).

A variety of fishing gears, including hook and line, nets, spears and traps, are used by subsistence fishers in the TSSMF and the TSFRLF. Estimated yields of reef fish for the subsistence fishing sector are similar to those for the TIB and non-TIB commercial sectors combined (Busilacchi 2008; Busilacchi et al. 2013). However, the species composition of the subsistence and commercial catches differs: traditional subsistence fishing takes predominantly trevallies (Carangidae), mullet (Mugilidae), sardines (Clupeidae) and rabbitfish (Siganidae).

Management methods

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

A management plan for the TSFF was finalised in 2013. The plan provides for the setting of a total allowable commercial catch (TACC). In 2008, the Australian Government funded a 100% buyback of non-TIB fishing licences, such that the Torres Strait Regional Authority now holds a 100% share of the fishery in trust for Traditional Inhabitants. Non-TIB fishers are required to operate by leasing catch allowances under a temporary annual licence (called a 'sunset licence'). These operators lease quota for Spanish mackerel, coral trout and other finfish species each year through the Torres Strait Regional Authority.

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 2018a). In the interim, the proxy limit reference point specified in the HSP ($0.2B_0$) is used for status determination.

Fishing effort

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, government-funded structural adjustment and logistical difficulties relating to freezer capacity. The fishery for coral trout on the Queensland east coast focuses primarily on live export (QDAFF 2013). 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. In 2017, live coral trout were exported for the first time.

Catch

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

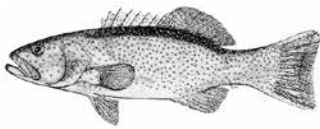
Fishery statistics a		2016–17 fishing season		2017–18 fishing season		
Stock	TACC (t)	Catch (t) b	GVP (2016–17)	TACC (t)	Catch (t) b	GVP (2017–18)
Coral trout	134.9	25.7	Confidential	134.9	25.3	Confidential
Spanish mackerel	187.0	93.2	Confidential	132.0	71.9	Confidential
Other	–	2.2	Confidential	–	1.7	Confidential
Total fishery		121.1	\$1.2 million		98.9	\$1 million
Fishery-level statistics						
Effort (days)						
TSSMF	Spanish mackerel: TIB—not available Sunset permits c—396 operation-days, 849 tender-days			Spanish mackerel: TIB—not available Sunset permits—395 operation-days, 748 tender-days		
TSFRLF	Coral trout: TIB—not available Sunset permits—205 coral trout operation-days, 205 tender-days (same for all TSFRLF species)			Coral trout: TIB—not available Sunset permits—182 coral trout operation-days, 182 tender-days (same for all TSFRLF species)		
Fishing permits	TIB: 266 mackerel endorsements, 248 line endorsements Sunset permits: 7 mackerel and/or line licences			TIB: 163 mackerel endorsements, 143 line endorsements Sunset permits: 7 mackerel and/or line licences		
Active vessels						
TSSMF	Spanish mackerel: TIB—7 Sunset permits—5			Spanish mackerel: TIB—11 Sunset permits—7		
TSFRLF	Coral trout: TIB—11 Sunset permits—4			Coral trout: TIB—13 Sunset permits—3		
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, amount of leased quota					
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 – 30 June. Value statistics are provided by financial year and are in 2017–18 dollars. b Catch figures include both TIB and non-TIB catch; however, reporting by the TIB Sector is not mandatory, so additional unreported catch and fishing effort are likely. c All finfish and Spanish mackerel quotas 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. TACC Total allowable commercial catch. TIB Traditional Inhabitant Boat. TSFRLF Torres Strait Finfish (Reef Line) Fishery. TSSMF Torres Strait Spanish Mackerel Fishery. – not applicable.

16.2 Biological status

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



Line drawing: FAO

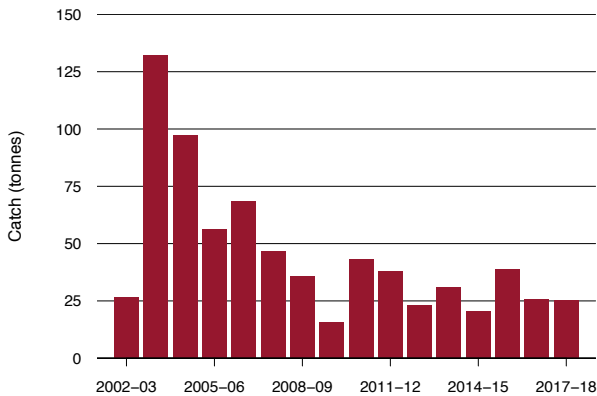
Stock structure

Coral trout in Torres Strait comprise four 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). The species are usually not distinguished in fishery logbooks. Therefore, the status is reported for the TSFF rather than for individual species or stocks.

Catch history

Commercial catch of coral trout in the TSFRLF peaked in 2003–04 at 132 t before falling below 50 t in 2007–08 (Figure 16.2). Catch has remained below this level since then.

FIGURE 16.2 Catch history for coral trout in the TSFRLF, 2002–03 to 2017–18



Source: AFMA

Stock assessment

The coral trout stock in the TSFRLF has not been formally assessed. However, 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 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. Changes in the management and operation of the fishery since the MSE was completed may have diminished the relevance of the results for informing current management. A formal stock assessment is currently being developed, with draft results presented at the March 2019 Torres Strait Finfish Resource Assessment Group meeting. The draft assessment estimated the mean spawning biomass to be around 80% of unfished levels, with all model scenarios estimating spawning biomass to be above 65% of unfished levels (AFMA 2019). The assessment results are considered preliminary and therefore are not used for status determination.

Stock status determination

In the absence of an accepted stock assessment, the status of the coral trout stock is evaluated against the results of the MSE, combined with a comparison of the 2017–18 catch with the historical catch record (Figure 16.2). The biomass in 2004 was estimated to be more than 60% of unfished levels (Williams et al. 2007; Williams, Little & Begg 2011). Reported commercial catch in recent years has been below the historical catch levels and well below the lowest catch level simulated in the MSE (80 t per year). The results of the 80 t catch simulation indicated that the stock would increase to more than 80% of the unfished biomass within 20 years at that catch level (Williams et al. 2007; Williams, Little & Begg 2011).

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. Reporting for the TIB Sector only became mandatory on 1 December 2017 (through the fish receiver system; see Chapter 15), and then only for catch that is sold commercially; reporting is still not required for subsistence fishing. Furthermore, representatives of the TIB Sector have advised that catches in the sector have increased in recent years (AFMA 2017). The unknown catch from the TIB Sector, together with the age of the MSE, give some cause for caution. However, effort for the TIB Sector has historically been around four to five times lower than that for the TVH Sector, with the difference in catch volumes even larger (Williams et al. 2008). As such, while the likely under-reporting and increasing TIB catches are of interest, and should be monitored closely through the new fish receiver system, the likely magnitude of total catches is unlikely to have reached the 80 t level simulated in the MSE in any year since 2004. As a result, the stock is classified as **not overfished** and **not subject to overfishing**.

Spanish mackerel (*Scomberomorus commerson*)



Line drawing: FAO

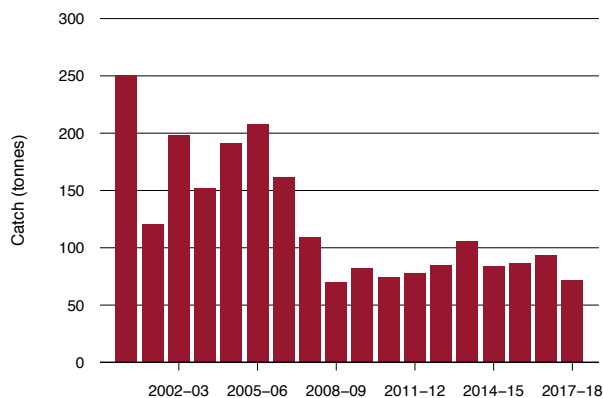
Stock structure

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 and have since remained at approximately 80–100 t (Figure 16.3).

FIGURE 16.3 Catch history for Spanish mackerel in the TSSMF, 2000–01 to 2017–18



Source: AFMA

Stock assessment

The stock assessment of Spanish mackerel in 2006 (Begg et al. 2006) was updated in 2016 using data to 2014 (O'Neill & Tobin 2016) and again in 2018 using data to 2017–18 as part of the harvest strategy development (AFMA 2019). The updated assessments use an integrated age-structured model, and input data on catch, effort and length-at-age of Spanish mackerel. The updated assessments do not use the model region structure or spatial catch data used by Begg et al. (2006) because of a large amount of missing or imprecise location data.

The most recent assessment update in 2019 included additional catch data from 2015 to the end of 2018, including a time series of TIB Sector catches. Recruitment was modelled stochastically, unlike previous assessments when recruitment was deterministic. Four standardised catch-per-unit-effort (CPUE) time series were developed that captured the potential effects of effort creep (either 0% or 1% annual increase in fishing power), and the effect of accounting for the number of dories used (either zero dories, or number of dories reported). All four standardised CPUE time series indicated a continued decline in abundance since 2009. A total grid of 48 models were run that included combinations of the four CPUE series, five natural mortality rates (0.25, 0.3, 0.35, 0.4 and 0.44) and two historical catch time series, one of which incorporated an annual harvest of 100 t between 1979 and 1986 to account for the presumed unreported catches by Taiwanese gillnet vessels. Some model runs, particularly where natural mortality was high and a historical Taiwanese gillnet catch was assumed, failed to converge, and were not included in the final grid of 39 models.

The median estimated spawning biomass in 2017–18 across the grid of 39 models was $0.26SB_0$ (ranging from 0.15 to $0.45SB_0$), with four of the 39 models estimating spawning biomass at below SB_{20} . The median estimated harvest rate (H) in 2017–18 across the models was 0.24, which was below the estimated harvest rate at maximum sustainable yield (MSY) (H_{MSY}) of 0.29.

Projections of the 2019 assessment grid of models included four constant catch scenarios (80 t, 94 t, 110 t and 120 t). The 80 t and 94 t constant catches resulted in increasing spawning biomass across all 39 models. The 110 t and 120 t constant catches were less optimistic, with spawning biomass predicted to decrease to below $0.2SB_0$ for some models with constant catches of 110 t and 120 t. Because of increasing concern around the biomass levels of the stock, the Torres Strait Finfish Resource Assessment Group recommended decreasing the recommended biological catch (RBC) from 125 t in 2018–19 to 94 t for the 2019–20 season. The 94 t RBC was agreed to by the Protected Zone Joint Authority, resulting in a TACC of 82 t after a 10 t subsistence catch and a 2 t recreational catch were deducted.

The potential for hyperstability in the catch rates of Spanish mackerel in Torres Strait remains a concern. Hyperstability occurs when catch rates are maintained while the underlying abundance declines. It is frequently observed in fisheries that target schooling species such as the Spanish mackerel fishery, where most fishing activity is concentrated on large spawning aggregations around Bramble Cay. Although Begg et al. (2006) recommended the collection of finer-scale spatial and temporal data to be reported by fishers to improve the standardisation of catch rates and provide a more robust index of abundance, the reporting of more precise catch-and-effort data has not improved.

Stock status determination

Declining CPUE across the four standardised CPUE series and the potential for hyperstability in catch rates are cause for some concern and will need to be monitored closely in coming years to ensure that the decreased RBC maintains the stock at a desired level. However, the median estimate of Spanish mackerel spawning biomass in 2017–18 was above $0.2SB_0$. As a result, the stock is classified as **not overfished**. Reported catches since 2014–15 have been below the estimated catch at F_{MSY} of 94 t, and the harvest rate in 2017–18 was estimated to be below H_{MSY} . On this basis, the stock is classified as **not subject to overfishing**.

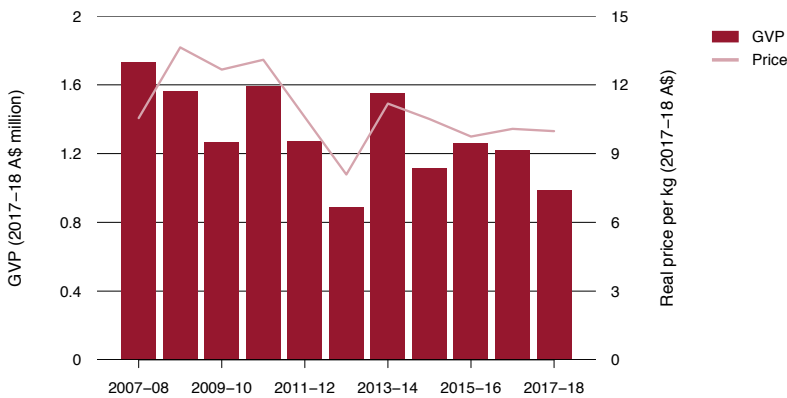
16.3 Economic status

Key economic trends

In the 2017–18 fishing season, coral trout and Spanish mackerel catch declined, in comparison with 2016–17. The decline in catch and unit price for both coral trout and Spanish mackerel has resulted in the lowest gross value of production (GVP) since the 2012–13 fishing season. The decline in 2017–18 GVP is consistent with the overall fall in fishing effort, fishing permits, catch and unit landing prices in the TSSMF and the TSFRLF.

Quota leasing arrangements were introduced in 2008 following a structural adjustment in the fishery. The amount of quota leased for each fishing season is determined by the Torres Strait Regional Authority, based on the level of interest from non-TIB fishers and the amount of quota that Torres Strait community representatives are willing to make available (TSFFWG 2010). Leasing arrangements are likely to generate some positive economic returns to the Torres Strait community as revenue from leasing activity is invested in capacity building for TIB fishers (TSRA 2015). Revenue generated from leased quota was \$291,500 in 2017–18 (TSRA 2018).

FIGURE 16.4 Real GVP and average price per kilogram for the TSFF, 2007–08 to 2017–18



Note: GVP Gross value of production.

Management arrangements

The switch from TVH endorsements to the new leasing arrangements aims to increase community revenue to Traditional Inhabitants of Torres Strait. Leasing arrangements allow quota to be leased to non-TIB fishers, with the leasing revenue used for capacity building of the TIB fishing industry (TSRA 2013).

The Torres Strait Finfish Fishery Management Plan 2013 requires harvest levels to be set at or below levels that maintain biologically viable stocks of target and non-target species, following consultation with the Torres Strait Fisheries Management Advisory Committee and other stakeholders.

Performance against economic objective

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).

Leasing revenue is intended to provide investment funding to build the capacity of Traditional Inhabitant fishing industries. In 2015–16, \$1,000 in grant payments were disbursed, leaving the Finfish Quota Trust account with a closing balance of \$1.3 million at the end of the financial year. No grant payments were made in 2016–17, leaving a closing balance of \$1.5 million at the end of the 2016–17 financial year (TSRA 2016, 2017). In 2017–18, no grant payments were made again, closing the Finfish Quota Trust account with \$1.7 million (TSRA 2018).

Estimates of net economic returns are not available for the fishery. The 2017–18 fishing season's decline in catch and landing prices has coincided with lower effort in the fishery. Total effort by the TIB Sector is broadly unknown. Consequently, there is uncertainty around the economic performance of the fishery in the 2017–18 fishing season. An increase in the number of active vessels in the 2017–18 season, especially across the TIB Sector, may indicate renewed interest in the fishery by customary fishers.

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 18 December 2020.

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.

The Australian Fisheries Management Authority publishes quarterly logbook reports of interactions with protected species on its website. No interactions with species protected under the EPBC Act were reported in the TSFF in 2018.

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Coral trout
Ashley Williams, ABARES