17 Torres Strait Finfish Fishery (Spanish mackerel and reef line)

N Marton, J Woodhams and M Skirtun

FIGURE 17.1 Area of the Torres Strait Finfish Fishery

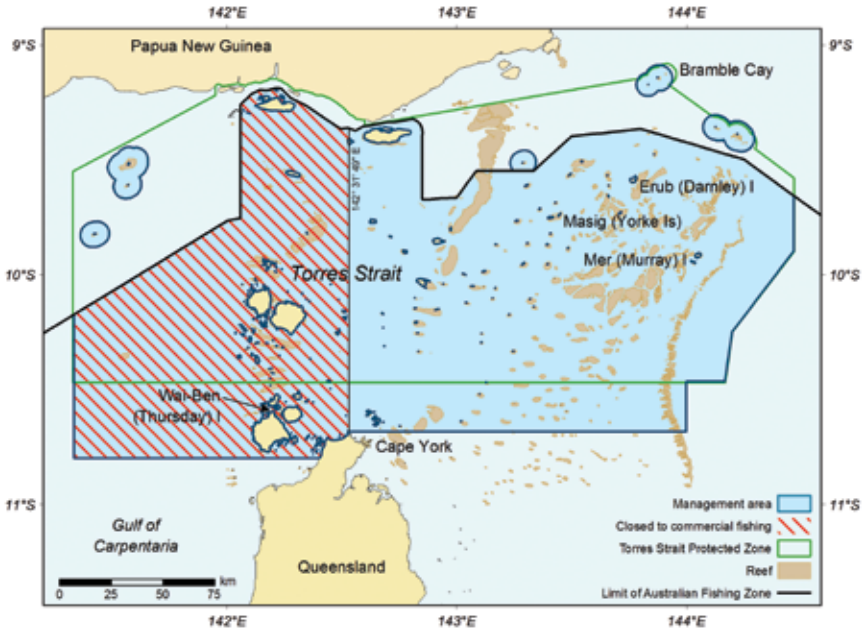


TABLE 17.1 Status of the Torres Strait Finfish Fishery

Status	2010		2011		Comments
Biological status	**Fishing mortality**	**Biomass**	**Fishing mortality**	**Biomass**	
Coral trout (*Plectropomus* spp., *Variola* spp.)					Most recent biomass estimate indicated biomass over $0.6B_0$. Catches in recent years below catch scenarios that led to increased biomass a recent MSE.
Spanish mackerel (*Scomberomorus commerson*)					No scenarios in most recent stock assessment saw biomass below $0.2B_0$. Recent catches have been below MSY.
Economic status	Estimates of NER are not available				Leasing arrangements have generated positive community revenue for Traditional Inhabitants in recent years.

Notes: B_0 Unfished biomass. **MSY** Maximum sustainable yield. **NER** Net economic returns.

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

17.1 Description of the fishery

The Torres Strait Finfish Fishery (TSFF) has two components: the Torres Strait Reef Line Fishery (TSRLF) and the Torres Strait Spanish Mackerel Fishery (TSSMF). The TSRLF is a multispecies fishery mainly targeting coral trout, with smaller catches of tropical snappers, emperors and rock cods. Most commercial fishing activity takes place in the north-eastern region of the Torres Strait (Figure 17.1). A large area of the fishery west of 142°32'E is closed to commercial fishing. Commercial operations are subject to many of the restrictions that apply in Queensland's east-coast commercial reef line fishery (the Coral Reef Fin Fish Fishery); however, red bass (*Lutjanus bohar*) and barramundi cod (*Cromileptes altivelis*), which are no-take species on the east coast of Australia, may be harvested in the Torres Strait.

The TSSMF targets Spanish mackerel, primarily by trolling. The catch is highly seasonal, with most catch taken around Bramble Cay in the far north-east of the Torres Strait (Figure 17.1). A management plan for the fishery is under development. New management arrangements are likely to include provision for a total allowable commercial catch. Non-Indigenous fishers (who hold Transferable Vessel Holder [TVH] licences) in the TSFF now operate under 'sunset licences', which have a predetermined termination date. These operators lease quota for coral trout and Spanish mackerel from the Traditional Inhabitants through the Torres Strait Regional Authority (TSRA) on an annual basis.

A survey of byproduct and bycatch in the TSRLF found that coral trout made up more than 65 per cent of the retained catch (by weight) for both the traditional and non-traditional sectors (Williams et al. 2008a); mackerel (Scombridae) and snapper (Lutjanidae) contributed 23 per cent for both sectors. In contrast to previous studies, Williams et al. (2008a) found that both sectors discarded more than half their total catch as bycatch. The Traditional Inhabitant Boat (TIB) sector retained a wider range of species than the TVH sector. By-product makes up a relatively minor component of catch in the TSSMF. 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).

A study of Islander subsistence catch (non-commercial) found that subsistence fishing yielded similar quantities of fish to the traditional and non-traditional commercial sectors combined (Busilacchi 2008). However, the species composition of the subsistence and commercial catches differed, with traditional subsistence fishing taking predominantly jacks (Carangidae; 31 per cent by weight) and mullet (Mugilidae; 20 per cent by weight), while the commercial sector predominantly caught coral trout (Serranidae; 19 per cent by weight), jacks (Carangidae; 18 per cent by weight) and mackerel (Scombridae; 16 per cent by weight). Since traditional subsistence fishing does not take large quantities of coral trout and Spanish mackerel, it is unlikely that these practices are having a large impact on the fish stocks targeted by commercial fisheries.

The Commonwealth Fisheries Harvest Strategy Policy (HSP; DAFF 2007) does not prescribe management arrangements for fisheries jointly managed by the Australian Government and other (domestic or international) management agencies, such as the fisheries in the Torres Strait. Although the Torres Strait Protected Zone Joint Authority has asked its management forums to provide advice on the application of the HSP to the Torres Strait fisheries, currently no formal harvest strategies are in effect in the TSFF.

Mackerel mothership anchored at Bramble Cay

James Woodhams ABARES

TABLE 17.2 Main features and statistics for the TSFF

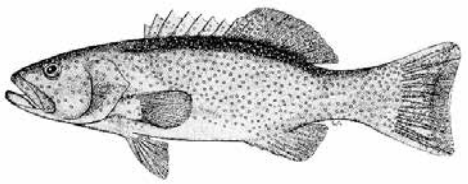
Fishery statistics a	2009–10 fishing season b			2010–11 fishing season		
Stock name	**Leased quota**	**Catch (t)**	**Real value (2009–10)**	**Leased quota**	**Catch (t)**	**Real value (2010–11)**
Coral trout	13	16	$0.16 million	54	42	$0.73 million
Spanish mackerel	105	82	$0.92 million	85	74	$0.59 million
Total		**98**	**$1.08 million**		**116**	**$1.31 million**
Fishery-level statistics c						
Effort (operation days): Spanish mackerel Reef line	 TVH: 239 TIB: 145 TVH: 137 TIB: 192			 TVH: 352 TIB: 0 TVH: 152 TIB: 14		
Fishing licences or endorsements	TVH: 5 mackerel and/or line licences TIB: 161 mackerel endorsements and 145 line endorsements			TVH: 7 mackerel and/or line licences TIB: 148 mackerel endorsements and 129 line endorsements		
Active vessels	TVH: 4 line and mackerel vessels TIB: 55 line and mackerel fishers			Spanish mackerel: 5 TVH and zero TIB Reef line: 2 TVH and 6 TIB		
Observer coverage	0			0		
Fishing methods	Coral trout and mixed reef species: handline Spanish mackerel: trolled baits and lures, handlines					
Primary landing ports	Cairns, Torres Strait Island fish receivers on Erub (Darnley) and Masig (Yorke) Islands					
Management methods	Input controls: limited entry, vessel restrictions, prohibited species Output controls: size limits, the amount of leased quota					
Primary markets	Domestic: frozen International: frozen					
Management plan	A draft management plan has been development and recommended to the PZJA.					

a Fishery statistics are provided by fishing season unless otherwise indicated. Fishing season is 1 July – 30 June. Real value statistics are by financial year. **b** Catch figures include both TVH and TIB catch. **c** Effort, licence/endorsement and active vessel statistics are for the 2010 and 2011 calendar years.

Notes: PZJA Protected Zone Joint Authority. **TIB** Traditional Inhabitant Boat. **TVH** Transferable Vessel Holder.

17.2 Biological status

17.2.1 Coral trout



Line drawing: FAO

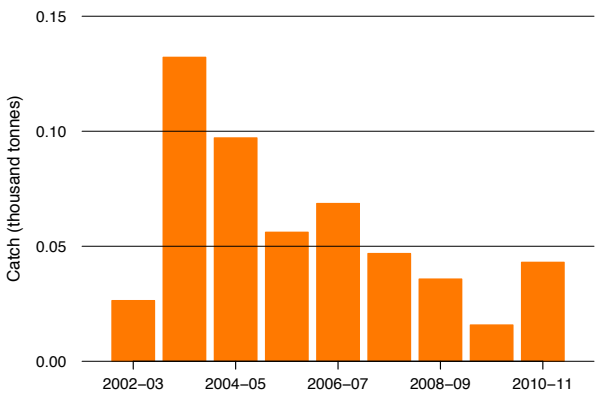
Stock assessment

No formal stock assessment has been conducted for coral trout in the TSRLF; however, a management strategy evaluation (MSE) has been undertaken for the stock (Williams et al. 2007). Four constant catch scenarios, ranging from 80 t to 170 t, were tested. All achieved a biomass of at least 70 per cent of the assumed unfished levels by 2025. The MSE also tested seasonal closures, minimum size limits and effort reductions.

Stock status determination

Results of the MSE, combined with a comparison of the 2010–11 catch with the historical catch record (Figure 17.2), form the basis of the classification of this stock. The biomass in 2004 was estimated to be more than 60 per cent of unfished levels (Williams et al. 2007). 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 suggested that the stock would increase to more than 80 per cent of the unfished biomass within 20 years (Williams et al. 2007). On this basis, the stock is classified as **not overfished** and **not subject to overfishing**.

FIGURE 17.2 Catch history for coral trout in the TSRLF, 2002–03 to 2010–11



17.2.2 Spanish mackerel

Line drawing: FAO

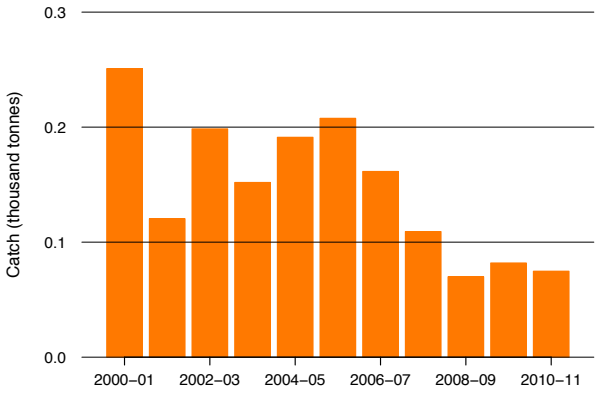
Stock assessment

The only formal stock assessment of Spanish mackerel in the Torres Strait was published in 2006, informed by data to 2003 (Begg et al. 2006). An MSE was also conducted as part of this assessment which examined, amongst other things, various catches over a 20-year period to 2023. The base-case estimate of maximum sustainable yield (MSY) for Spanish mackerel in the Torres Strait was 169 t. The stock assessment concluded that the stock was probably harvested at levels near or exceeding this level up to 2003. Results of the MSE suggested that annual catches of around 150 t per year, or less, would achieve a fishing mortality target of half natural mortality (noting that no formal target or limit reference points have been set for this fishery) and result in a lower risk to the stock (Begg et al. 2006). Although there is significant uncertainty in the 2006 assessment outputs, none of the constant catch scenarios examined within the MSE resulted in the estimated biomass falling below 20 per cent of the unfished biomass ($0.2B_0$). The base-case simulation estimated biomass at $0.37B_0$ (range: $0.26–0.67B_0$). Although there is no formal target or limit reference point for the fisheries, $0.2B_0$ is the proxy specified in the HSP and used in the absence of more specific information. The potential for hyperstability, where catch rates are maintained while the biomass is declining, was raised as a concern for the TSSMF by Begg et al. (2006). In this case, hyperstability is the maintenance of catch or catch rates primarily as a result of the fishing operations focusing on spawning aggregations around Bramble Cay. While Begg et al. (2006) standardised catch rate based on a number of variables, including dory day as the unit of effort, they note that standardisation at a finer temporal scale could give a better index of abundance; however, data to achieve this was not available.

Stock status determination

Since none of the model sensitivities in the stock assessment saw biomass fall below $0.2B_0$, the stock is classified as **not overfished**. Catches from 2007–08 to 2010–11 (Figure 17.3) have been below both the base-case (169 t) and the lower risk estimate (150 t) of MSY in the 2006 stock assessment. On this basis, the stock is classified as **not subject to overfishing**.

FIGURE 17.3 Catch history for Spanish mackerel in the TSSMF, 2000–01 to 2010–11



17.3 Economic status

17.3.1 Key economic trends

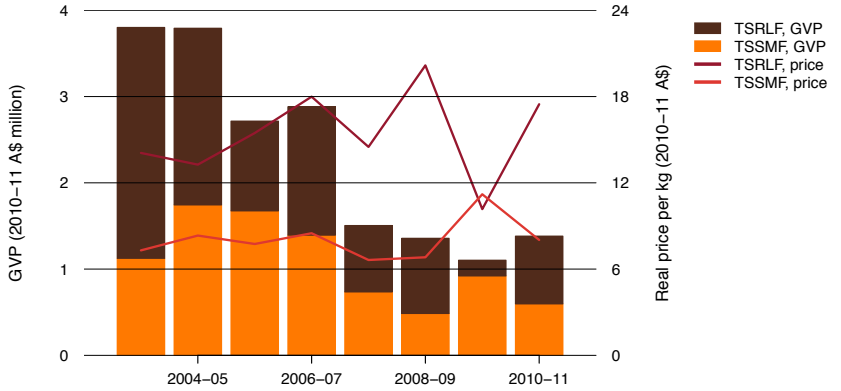
From 2002–03 to 2006–07, the gross value of production (GVP) for the TSFF averaged $3.28 million in real terms (2010–11 dollars). In 2007–08, real GVP fell by $1.38 million (48 per cent) to $1.50 million (Figure 17.4). This fall was largely attributed to substantial declines in catches of coral trout (by 72 per cent) and Spanish mackerel (by 57 per cent). The move to sunset licences for non-Indigenous fishers in 2008 may also have contributed to these changes. Quota leasing arrangements have been in place since this move but GVP has remained below levels that occurred before 2007–08. In 2010–11, the GVP for the TSFF was $1.38 million, 29 per cent higher compared with 2009–10, with the TSRLF contributing $0.8 million and the TSSMF $0.6 million.

The amount of quota leased out for each fishing season is determined between the TSRA and TVH sunset licence holders, based on the licence holders' level of interest (TSFFWG 2010). Nearly all the quota leased out by the TSRA for the TSRLF and TSSMF has been caught in recent years. For coral trout, the 13 t of leased quota in 2009–10 was fully caught; in 2010–11, 42 t of the 54 t of leased quota was caught. For Spanish mackerel, 82 t of the 105 t of leased quota was caught in 2009–10, and 74 t of the 85 t of leased quota was caught in 2010–11. Given the approach to leasing quota in these fisheries, comparing catches with the amount of quota available is not necessarily consistent with the latency analyses used for other fisheries. However, uncaught quota still reflects a decision by fishers not to catch their quota allocation, and this can often be linked to fisher expectations about potential profit to be earned.

Leasing arrangements are likely to generate some positive economic returns to the Torres Strait community, since revenue from leasing activity is invested in capacity building for TIB fishers (TSFMAC 2009). Revenue from leasing quota amounted to around $110 000 in 2009–10 and around $146 000 in 2010–11 (TSRA, pers. comm., 2011 and 2012).

Complications with supply logistics are likely to have negatively affected profitability in both the TSRLF and the TSSMF. Because fishers have limited access to freezing capacity, supply to processors has been inconsistent, leading to a negative impact on marketability and, in turn, prices and catches. The closure of a freezing facility on Murray Island in late 2010 also contributed to this problem (TSRA, pers. comm., 2011). Difficulties in employing crew, restrictions on the landing of live coral trout, remoteness of fishery location and cost pressures (such as high fuel prices) have also been cited as factors that may have constrained fishing effort and potential profitability in both fisheries in past seasons (TSFMAC 2009).

FIGURE 17.4 Real GVP and average price per kilogram by financial year, 2003–04 to 2010–11, for the TSRLF and the TSSMF



Note: GVP Gross value of production.

17.3.2 Management arrangements

The switch from TVH endorsements to the new leasing arrangements is aimed to increase community revenue to Traditional Inhabitants of the Torres Strait. The arrangements allow quota to be leased to TVH sunset licence holders. Although total allowable catches are not applied to the fishery, the leasing of quota to TVH sunset licences holders allows some control over harvest levels and thus sustainability. However, no formal economic or biological target is in place.

In September 2011, the ban on catching coral trout for live export that had been in place since December 2002 was removed (TSFMAC 2012). This may lead to improved profitability in the fishery if price premiums on live fish can be achieved that are in excess of the additional costs associated with handling them.

17.3.3 Performance against economic objective

A key objective of the TSFF is to increase revenue returns to the Traditional Inhabitant fishing community from fishing activities, while ensuring biological sustainability of the fishery. Revenues from leasing provide a source of investment funding for Traditional Inhabitant fishers to increase their capacity in the fishery. The Finfish Quota Trust account has a current balance of $550 000 (TSFMAC 2012). The lifting of the ban on landing live coral trout is likely to increase prices received by traditional and non-traditional fishers and improve profitability of the fishery. In addition, the returns to traditional communities from both fisheries may be improved if infrastructure constraints are addressed.

17.4 Environmental status

The TSFF was undergoing strategic assessment by the Australian Government Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) at the time of drafting (early 2012). The TSFF was last assessed under Parts 10, 13 and 13A of the *Environment Protection and Biodiversity Conservation Act 1999* in September 2008. Export approval was granted through declaring the TSFF a Wildlife Trade Operation for a period of three years (valid until 29 November 2011). An extension was granted in October 2011, pending the implementation of a management plan in 2012.

No ecological risk assessments have been conducted for the TSFF. The strategic assessment report 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 via hull and anchor fouling. The report concludes that direct impacts on the environment are likely to be minimal, because of the nature of the fishing methods used in the fishery (hook and line).

AFMA publishes quarterly reports of logbook interactions with threatened, endangered and protected (TEP) species on its website. There were no reported TEP interactions in the TSFF in 2011.

Spanish mackerel
Annabel Jones AFMA

17.5 Literature cited

AFMA (Australian Fisheries Management Authority) 2005, *Torres Strait finfish bycatch action plan 2005*, AFMA, Canberra.

——2012, *Strategic assessment report, Torres Strait Finfish Fishery*, AFMA, Canberra.

Begg, GA, Chen, CCM, O'Neill, MF & Rose, DB 2006, *Stock assessment of the Torres Strait Spanish Mackerel Fishery*, technical report 66, CRC Reef Research Centre, Townsville.

Busilacchi, S 2008, 'The subsistence coral reef fish fishery in the Torres Strait: monitoring protocols and assessment', PhD thesis, James Cook University, Townsville.

DAFF (Australian Government Department of Agriculture, Fisheries and Forestry) 2007, *Commonwealth Fisheries Harvest Strategy: policy and guidelines*, DAFF, Canberra.

DSEWPaC (Australian Government Department of Sustainability, Environment, Water, Population and Communities) 2007, *Guidelines for the ecologically sustainable management of fisheries – 2007*, DSEWPaC, Canberra.

TSFFWG (Torres Strait Finfish Working Group) 2010, TSFFWG papers, meeting 2010.1, 31 March 2010, Thursday Island, <http://pzja.gov.au/pzja-and-committees/torres-strait-finfish-working-group-tsffwg/>.

TSFMAC (Torres Strait Fisheries Management Advisory Committee) 2009, TSFMAC Meeting 11, agenda item 7.3, update of finfish leasing arrangements for 2009/2010, 11–12 November 2009, <http://pzja.gov.au/pzja-and-committees/torres-strait-finfish-working-group-tsffwg/>.

——2012, Meeting 12, agenda items 5.3—Fisheries Management Instrument No. 8, and 5.4—Finfish leasing arrangements, 21–22 March 2012.

Williams, AJ, Begg, GA, Little, LR, Currey, LM, Ballagh, AC & Murchie, CD 2007, *Evaluation of the eastern Torres Strait Reef Line Fishery*, Fishing and Fisheries Research Centre, technical report 1, James Cook University, Townsville.

——, Ballagh, AC, Begg, GA, Murchie, CD & Currey, LM 2008, 'Harvest patterns and effort dynamics of Indigenous and non-Indigenous commercial sectors of the eastern Torres Strait Reef Line Fishery', *Continental Shelf Research*, vol. 8, pp. 2117–28.