



Australian Government

Department of the Environment and Heritage

**Assessment of the
Torres Strait Finfish Fishery**

December 2005

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This document is an assessment carried out by the Department of the Environment and Heritage of a commercial fishery against the Australian Government Guidelines for the Ecologically Sustainable Management of Fisheries. It forms part of the advice provided to the Minister for the Environment and Heritage on the fishery in relation to decisions under Parts 10, 13 and 13A of the Environment Protection and Biodiversity Conservation Act 1999. The views expressed do not necessarily reflect those of the Minister for the Environment and Heritage or the Australian Government.

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Assessment of the ecological sustainability of management arrangements for the Torres Strait Finfish Fishery

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EXECUTIVE SUMMARY

Background

The Australian Fisheries Management Authority (AFMA), on behalf of the Torres Strait Protected Zone Joint Authority (PZJA) has submitted documents for assessment of the Torres Strait Finfish Fishery (TSFF) under Parts 10, 13 and 13A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

On 2 September 2003 the Minister for the Environment and Heritage (the Minister) signed an Agreement with Senator the Honorable Ian Macdonald, Minister for Fisheries, Forestry and Conservation to initiate the strategic assessment of the fishery. Following public consultation, Terms of Reference for the Environmental Assessment of the TSFF were adopted. The draft submission, *Draft Assessment Report: Torres Strait Finfish Fishery* (the submission), was received by the Department of the Environment and Heritage (DEH) in July 2004. The submission was released for a thirty day public comment period that expired on 15 October 2004. Two public comments were received. AFMA provided a response to the issues raised although no changes were made to the submission as a result of public comment. A final submission for assessment was received from the PZJA on 29 September 2005.

The submission reports on the TSFF against the Terms of Reference, including the Australian Government *Guidelines for the Ecologically Sustainable Management of Fisheries*. The DEH assessment considers the submission, associated documents, public comments and AFMA's response to the comments.

In 1985, Australia and Papua New Guinea (PNG) entered into the Torres Strait Treaty (the Treaty). The Treaty is concerned with sovereignty and maritime boundaries in the area between the two countries and the protection of the traditional way of life and livelihood of traditional inhabitants and the marine environment. The Torres Strait Protected Zone (TSPZ) was established by the Treaty. Australia and PNG exercise sovereign jurisdiction for swimming fish and sedentary species on the respective sides of agreed jurisdiction lines within the TSPZ. The *Torres Strait Fisheries Act 1984* (TSF Act) gives effect in Australian law to the fisheries elements of the Treaty and established the PZJA.

While overall management responsibility for the TSFF rests with the PZJA, AFMA and the Queensland Department of Primary Industries and Fisheries (QDPI&F) jointly deliver day-to-day fishery management programs for the fishery on behalf of the PZJA. The PZJA has had responsibility for managing Spanish mackerel in the Australian component of the TSPZ since its inception and took on management responsibility for commercial fishing of finfish (including barramundi) in April 1999. The TSF Act imposes an obligation on the PZJA to protect the traditional way of life of traditional inhabitants and gives it responsibility for monitoring the condition of, and formulating management policies and plans for, Australian fisheries in the Torres Strait.

The TSFF is a multi-species, multi-gear fishery targeting a range of reef and inshore fish. The fishery is broadly separated into three sectors based on the target species and fishing method used:

- the Spanish mackerel sector;
- the reef-line sector; and
- the net sector.

The PZJA agreed in February 2005 to close the net sector to commercial fishing. The net fishery is only open to Traditional Inhabitants of the Torres Strait and currently has no active fishers. The submission notes that the decision to close the net sector was made after reviewing the fishery over the last two years and recent consultation with Traditional Inhabitants. The net sector has, therefore, not been considered further in this assessment.

A summary of the features of the Spanish mackerel and reef-line sectors is provided in Table 1.

Table 1: Summary of the TSFF (excluding net sector)

	Spanish mackerel Sector	Reef-line Sector
Area	Area of the TSPZ under Australian jurisdiction and the 'outside but near area' ¹ to the south plus three nautical miles surrounding some small islands and outcrops under Australian jurisdiction north of the fishery jurisdiction line. Majority of fishing occurs in the northern Territorial Seas around Bramble Cay.	As for Spanish mackerel but includes a permanent closure for commercial fishing in waters west of 142°31'49"E.
Fishery status	Uncertain.	Uncertain.
Target species	Narrow –barred Spanish mackerel (<i>Scomberomorus commerson</i>).	Coral Trout (<i>Plectropomus</i> spp.).
By-product species	Primarily: School mackerel (<i>S. queenslandicus</i>); Grey mackerel (<i>S. semifasciatus</i>); Spotted mackerel (<i>S. munroi</i>); Shark mackerel (<i>Grammatorcynus bicarinatus</i>); and Coral Trout (<i>Plectropomus</i> spp.). A possession limit of 50 kilogram Spanish mackerel and/or other finfish (20 kilogram limit proposed for future management)	Primarily: Sea-perches and snappers (<i>Lutjanus</i> spp.); Emperors and sea-bream (<i>Lethrinus</i> spp.); Rock cods (<i>Epinephelus</i> spp.); and Mackerels (<i>Scomberomorus</i> spp.) A possession limit of 50 kilogram of mackerel (<i>Scomberomorus</i> spp.) for holders of Torres Strait Prawn Fishery licences (20 kilogram limit proposed for future management)
Gear	Mainly troll lines from dories. Can also be taken by hand lining and drop lining.	Commercial fishers (both indigenous and non-indigenous) use mostly handlines from dories, but may also use fishing rods or mechanical reels. Indigenous fishers also use traditional methods such as spears, hooks, traps and poison derived from plants for both subsistence and commercial fishing.
Commercial harvest (2003/04)	152 tonne (liveweight) (ABARE, 2005)	136 tonne (liveweight) (ABARE, 2005)
Value of commercial harvest (2003/04)	\$0.92 million (ABARE, 2005)	\$1.52 million (ABARE, 2005)
Recreational harvest	Unknown, but considered to be minimal.	

¹ The TSF Act applies in the area of Australian jurisdiction in the TSPZ, and in areas 'outside but near' that zone that have been proclaimed in respect of particular fisheries which Australia and Papua New Guinea have agreed to manage jointly under the Treaty or which are referred to in the Treaty.

Licences issued	Fishing Boat Licences (transferable and limited) 18 licence packages (comprising 18 primary vessels and 35 tender vessels). Traditional Inhabitant Boat Licences (transferable only between Traditional Inhabitants, not limited), 245		10 licence packages (comprising 10 primary vessels and 24 tender vessels). 215
Commercial management arrangements	<ul style="list-style-type: none"> Limited entry for non-indigenous fishers; Fishing method restricted to trolling, hand-lining and drop-lining; Boat replacement policy; Vessel length limit of 20m; Minimum size limits for commercial take of Spanish, Spotted, School, Grey and Shark mackerels and most other byproduct species; and A 50 kilogram retention limit on Spanish mackerel and/or other reef fish. 	<ul style="list-style-type: none"> Limited entry for non-indigenous fishers; Gear restriction of maximum of three fishing lines and a maximum of six hooks/line; Seasonal barramundi closure (1 November to 1 February); Vessel length limit of 20m; Boat replacement policy; Prohibition on retention of live reef fish; and Minimum size limits for commercial take of most species and maximum size limits for some species. 	
Export	Yes, quantity and value not known.	Yes, quantity and value not known.	
Bycatch	Not quantified – considered low.		
Interaction with Threatened Species	Possible interactions with seabirds and marine turtles but considered rare. Potential for interactions with cetaceans, syngnathids, sea snakes and dugongs but not recorded interactions.		

The TSFF operates in the eastern section of the TSPZ and the defined 'outside but near'² area to the south, and includes the Territorial waters surrounding small islands and outcrops, such as Bramble Cay, under Australian jurisdiction to the north of the Fisheries Jurisdiction Line. The reef line sector of the fishery includes a permanent closure for commercial fishing in waters west of 142°31'49"E.

The key target species in the Spanish mackerel sector is the Narrow-barred Spanish mackerel. The main byproduct species taken are School mackerel, (*S. queenslandicus*), Grey mackerel (*S. semifasciatus*), Spotted mackerel (*S. munroi*), Shark mackerel (*Grammatorcynus bicarinatus*) and coral trout (*Plectropomus* spp.).

In the TSFF Spanish mackerel is targeted using troll lines with hooks baited with garfish or, occasionally, an artificial lure. Troll lines are operated from dories of between five and six metres in length which unload to a primary vessel where catch is processed. Primary vessels are typically between nine and sixteen metres in length, have freezing and hold capacity and may stay at sea for over a month.

The reef-line sector targets four species of coral trout (*Plectropomus leopardus*, *P. maculatus*, *P. areolatus* and *P. laevis*) mainly using hooked hand lines operating from dories of less than six metres in length which are supported by larger primary vessels up to twenty metres in length. Fishing rods or mechanically operated reels may also be used at times. The main byproduct species are mackerels (*Scomberomorus* spp.), sea-perches, snappers (*Lutjanus* spp.), emperors and sea bream (*Lethrinus* spp.) and numerous species of rock cods (*Epinephelus* spp.). Mapstone *et al.*

² When part of a fisheries stock under joint management arrangements with Papua New Guinea belongs substantially to the TSPZ but also extends outside but near the Zone, the Treaty allows Australia and Papua New Guinea, in adopting a management plan, to apply the plan in those areas.

(2003) identify the byproduct species as being dominated by Stripey bass (*Lutjanus carpunotalus*), Barramundi cod (*Cromileptes altivelis*) and Tomato cod (*Cephalopholis sonnerati* or *C. miniata*).

Spanish mackerel is found throughout tropical and subtropical waters of the Indo-Pacific, from Africa to Fiji. In Australian waters, it occurs from Geographe Bay in south-western Western Australia, throughout northern Australian waters and down the east coast as far as St Helens in Tasmania (Kailola *et al.*, 1993). Research by the former Queensland Fisheries Service suggests a high proportion of adult Spanish mackerel tend to remain within a local region (site attachment). Available evidence suggests there are two genetically distinct northern and eastern stocks of Spanish mackerel in Australia. The northern stock occurs in the Torres Strait and the Gulf of Carpentaria and the eastern stock is found off Eastern Queensland and New South Wales. The species is fished in Queensland, the Northern Territory, Western Australia and New South Wales as well as in the Torres Strait.

Spanish mackerel is a relatively large, relatively fecund, fast growing, predatory fish. It reaches sexual maturity at a young age (<2 years) at a mature size of 80 to 82 cm fork length for females and 65 cm for males. These characteristics suggest some resilience to fishing pressure. However the species' habit of aggregating for feeding and spawning makes it more susceptible to fishing. The TSFF targets spawning aggregations, which occur between August and December and peak in October. Spanish mackerel is usually captured at or near the surface in coastal areas around reefs, headlands and shoals.

The Australian Spanish mackerel troll fishery has existed in the Torres Strait since prior to the Second World War. Fishing methods have changed little since the 1950s.

Coral trout (*Plectropomus* spp.) inhabit the tropical waters of the Indian and Pacific Oceans. They generally inhabit shallow waters to 100 metres, often in association with coral reefs - from inshore to the steep outer reef margins. Coral trout species such as common coral trout (*P. leopardus*) and bar-cheeked coral trout (*P. maculatus*) mature at around 2 years for females and between 3 and 7 years for males. Size at maturity can vary considerably, with female common coral trout on the Great Barrier Reef maturing from 21 cm to 60 cm fork length. Coral trout are spring-summer spawners, the spawning period varying slightly with latitude along the east Queensland coast.

Commercial reef-line fishing began in the 1950s to 1960s. The fishery has always been conducted from dories with vessels travelling from southern ports. Queensland managed the commercial reef-line fishery until April 1999. Prior to 1999 up to 1,653 vessels licensed under Queensland jurisdiction could potentially fish for reef fish in the TSPZ. After the reef line sector came under Commonwealth jurisdiction in 1999 this number was substantially reduced.

In the TSFF finfish are taken by:

- indigenous fishers for subsistence purposes;
- indigenous fishers for commercial purposes;
- non-indigenous fishers for commercial purposes; and
- non-indigenous recreational fishers and charter operators.

As at October 2005 there were 18 licence packages (comprising 18 primary vessels and 35 tender vessels) and 10 licence packages (comprising 10 primary vessels and 24 tender vessels) for non-indigenous commercial fishers in the Spanish mackerel and reef line sectors respectively. However, most of the catch in both sectors is taken by a much smaller number of active commercial operators. Similarly, while there are 245 and 215 indigenous commercial boat licences available in the Spanish mackerel and reef line sectors respectively, the extent of participation by indigenous fishers is unknown but estimated to be low.

The extent of the subsistence catch is also uncertain. The Bureau of Rural Sciences (BRS) estimates the subsistence catch of Spanish mackerel at around 10 tonnes/year (BRS, 2005). Mapstone *et al.* (2003) report that discussions with indigenous subsistence fishers suggest that the harvest of reef fish for subsistence needs and harvest for sale may involve different species. The extent of finfish catch by recreational and charter fishers in the TSFF is considered to be relatively minor (Mapstone *et al.*, 2003). There are a number of small scale charter boats operating in the Torres Strait but these are considered unlikely to have a significant impact on the reef or mackerel species.

Mackerel species and coral trout are taken by commercial fishers and recreational/charter fishers in other fisheries, notably Queensland's East Coast Reef-Line Fishery.

The Spanish mackerel sector of the TSFF is also one of the PZJA fisheries jointly managed by Australia and PNG in accordance with Article 22 of the Treaty. As such it is subject to catch and management sharing arrangements that provide for access by Australian and PNG fishers to fish for Spanish mackerel in the other country's jurisdictional waters. Australia has not nominated vessels to fish in PNG waters but up to 20 PNG vessels have in the past been endorsed to fish in Australian waters. PNG in 2003 agreed to reduce the number of vessels and limit the available access days of PNG vessels endorsed to fish for Spanish mackerel in Australian waters. To date no PNG operators have used the available licences to fish for Spanish mackerel in Australian waters.

Australian Bureau of Agricultural and Resource Economics (ABARE) estimated that 152 tonnes of Spanish mackerel, valued at \$0.92 million, was taken in the Spanish mackerel fishery and 136 tonnes of reef fish, valued at \$1.52 million, was taken in the reef-line fishery in 2003/04.

The reliability of catch estimates across all sectors of the TSFF is variable. The extent of non-indigenous commercial catch has been monitored through mandatory logbooks in the Spanish mackerel sector since 1989 and in the reef-line sector since 1988. However, commercial indigenous catch has not been reliably reported in the past and estimates of around 29 tonnes in 2002 for reef fish were based on research projects examining individual catch records and sales and processing documents. A docket book system was introduced for Torres Strait seafood buyers and processors in January 2004 to provide a more reliable estimate of Indigenous commercial catch and effort. Research projects are underway to assist with obtaining more accurate estimates of the extent of indigenous community commercial and subsistence catch.

Fishery management measures include maximum and minimum size limits, vessel size limits, limited entry for non-Indigenous fishers, catch retention limits, gear restrictions and a permanent spatial closure for the reef line sector.

The current TSFF logbook does not provide for reporting of bycatch and information on bycatch is restricted to that collected opportunistically by observers and researchers. However the fishing methods used are considered to be relatively selective and bycatch is considered to be minimal. A Bycatch Action Plan (BAP) is being developed and will provide for further bycatch information to be collected on a regular basis.

Species such as seahorse, pipefish, sea dragon, seabird, turtle, sea snake, dolphin, whale and dugong that are currently listed protected species under the EPBC Act occur in the area of the fishery and potentially could interact with fishing operations. Interactions with protected species are required to be reported in the commercial logbook. The limited information available to date suggests that interactions with any protected species group is very low. These interactions are assessed under Principle Two of this report.

The fishery is currently managed by Fisheries Management Notices made under the TSF Act. A statutory management plan for the fishery will be developed over the next two years and implemented in 2007. Regulations in the Spanish mackerel sector are detailed in Fisheries Management Notice No. 67 and those in the reef-line sector are detailed in Fisheries Management Notice No. 51. Recreational harvest, including charter fishing, is managed through provisions in the Queensland *Fisheries Management Act 1994*.

Overall assessment

The material submitted by AFMA demonstrates that the management arrangements for the TSFF meet most of the requirements of the Australian Government *Guidelines for the ecologically sustainable management of fisheries*.

While the fishery has the basis upon which good management arrangements can be implemented, DEH has identified a number of risks that must be managed to ensure that their impacts are minimised:

- the absence of fishery specific management objectives, performance indicators and performance measures and a mechanism for regular review of the management regime;
- the lack of adequate and reliable data appropriate to the scale of the fishery on catch and effort collected from all sectors of the fishery;
- uncertain status of target and key byproduct species;
- the lack of validated catch and effort data for target and byproduct species;
- substantial level of latent effort in the fishery and no cap on catch or effort across all sectors of the fishery; and
- uncertain extent and composition of bycatch;

DEH notes that a number of current research projects and management initiatives will help to address these deficiencies over the next two years. These include:

- the BAP finalised in 2005;
- status assessment of the Eastern Torres Strait Spanish mackerel fishery, due for completion around mid 2006;
- ecological risk assessment of the TSFF, to be concluded over 2006 and 2007;
- evaluation of the Eastern Torres Strait reef-line fishery, due for completion around mid 2006;
- review of management objectives and development of a performance measurement framework; and
- a major resource re-allocation process that will include a catch quota or effort management system to more directly control the extent of commercial harvesting.

While these research projects and other developments will go some way to addressing the above deficiencies, DEH has also made a number of recommendations to ensure that the risks identified above are fully addressed so that the risks of fishing impacts are minimised in the longer term. Through the implementation of the recommendations, the continuation of a responsible attitude to the management of the fishery, and implementation of other management commitments made by AFMA and the PZJA, management arrangements are likely to be sufficiently precautionary and capable of controlling, monitoring and enforcing the level of take from the fishery while ensuring the stocks are fished sustainably. However the longer-term sustainability of the fishery will be heavily dependent on the results of current research and management actions taken in response to those results.

The management regime aims to ensure that fishing is conducted in a manner that does not lead to over-fishing and for fishing operations to be managed to minimise their impact on the structure, productivity, function and biological diversity of the ecosystem. On balance, the fishery is being managed in an ecologically sustainable manner and is working to address existing problems and minimise environmental risks.

The operation of the fishery is consistent with the objects of Part 13A of the EPBC Act. Given the management arrangements specified in Fisheries Management Notices No. 51 and 67, together with

the most recent management measures to reduce latent effort and the intent to introduce measures to cap effort and/or catch, DEH considers that the fishery will not be detrimental to the survival or conservation status of the taxon to which it relates in the short term. Similarly, it is not likely to threaten any relevant ecosystem in the short term. DEH therefore recommends that the fishery be declared an approved Wildlife Trade Operation (WTO) with the actions specified in the recommendations to be undertaken by the PZJA to contain the environmental risks in the long term. DEH considers that the fishery, as managed in accordance with the management regime is not likely to cause serious or irreversible ecological damage over the period of the export decision. Specifically, the WTO declaration would allow the export of product from the fishery for a period of three years.

As the official fishery area encompasses Commonwealth as well as State waters, consideration under Part 13 of the EPBC Act is required regarding the impact of the fishery on listed threatened species, listed migratory species, cetaceans and listed marine species.

Protected species occurring in the fishery area include cetaceans, marine turtles, syngnathids, dugongs and seabirds. While there is potential for interactions with fishing operations, the fishery has no recorded interaction with these or other protected species groups. The actual and potential impact on Part 13 species under the management arrangements is considered low and adequate protection is provided. There are no listed threatened ecological communities in the fishery area.

DEH recommends that the TSFF be declared an accredited management regime under Sections 208A, 222A, 245 and 265 of the EPBC Act. In making this judgement, DEH considers that the fishery to which the regime relates does not, or is not likely to, adversely affect the survival in nature of a listed threatened species or a population of that species, or the conservation status of a listed migratory species, cetacean species or listed marine species or a population of any of those species. DEH also considers that the regime requires that all reasonable steps are taken to avoid the killing or injuring of protected species, and the level of interaction under current fishing operations is low. On this basis, DEH considers that an action taken by an individual fisher, acting in accordance with the regime, would not be expected to have a significant impact on a listed threatened species or listed migratory species protected by the EPBC Act.

Part 10 of the EPBC Act requires that Commonwealth managed fisheries undergo strategic assessment to determine whether actions taken in the fishery have a significant impact on the environment in Commonwealth Marine Areas. Under this Part, the Minister may accredit a management plan to exempt actions taken in accordance with the management plan from further impact assessment approval.

DEH considers, *inter alia*, that there has been adequate assessment of the impacts that actions approved in accordance with the regime have, will have or are likely to have on the marine environment. DEH also considers that actions approved or taken in accordance with the regime will not have unacceptable or unsustainable impacts on the marine environment in a Commonwealth area. DEH therefore recommends that, in accordance with Part 10, the TSFF as managed under the TSF Act and fishery management notices, be accredited under section 33 of the EPBC Act for the matter of national environmental significance "the marine environment".

The implementation of the following recommendations and other commitments made by the PZJA in the submission will be monitored and reviewed as part of the next DEH review of the fishery in three years time.

Recommendations

1. DEH to be informed of any proposed amendment to the management regime for the TSFF to enable DEH to evaluate any impact on the ecological sustainability of the fishery.

2. PZJA to continue to ensure that consultative processes are conducted in a manner that ensures the timely implementation of management responses essential for the sustainability of the fishery.
3. PZJA to develop and apply, during the 2007 fishing season, fishery specific management objectives, performance indicators and performance measures for target, key byproduct and bycatch species, protected species and the ecosystem impacts.
4. PZJA to develop a clear process for determining the reason for a performance measure being triggered and for implementing appropriate management measures within specified timeframes.
5. PZJA to report annually on performance of the fishery against specified objectives and measures, once developed, with the reports to be made publicly available.
6. PZJA to ensure that mechanisms are in place to collect adequate and reliable data on catch and effort, appropriate to the scale of the fishery, from all sectors to ensure sustainable management of finfish resources. Initial priority should be given to the commercial sectors of the fishery. Options for the collection of non-commercial catch and effort data will be evaluated, taking account of outcomes of recent research programs, and appropriate options progressively developed and implemented to improve estimates of non-commercial catch and effort used in stock assessments and management controls.
7. PZJA, within 18 months, to review available options to validate catch and effort data on target and byproduct species in the TSFF. Appropriate validation mechanisms for target and byproduct catch and effort data to be progressively developed and applied in the fishery from the 2008 fishing season.
8. PZJA to continue to work towards developing more refined yield estimates of target and key byproduct species to determine sustainable harvest levels.
9. PZJA to control fishing mortality, through effort controls or other mechanisms across all sectors, to maintain stocks at ecologically sustainable levels.
10. PZJA, within 18 months, to develop and implement an ongoing program to collect information on the composition and abundance of bycatch across the commercial sectors of the fishery.

PART I - MANAGEMENT ARRANGEMENTS

The TSFF is managed by the Torres Strait PZJA, which consists of the Australian Government (represented by the Minister for Fisheries, Forestry and Conservation), the Queensland Government (represented by the Minister for Primary Industries and Fisheries) and the Chair of the Torres Strait Regional Authority (TSRA). The PZJA is responsible for monitoring the condition of Australian fisheries in the Torres Strait and for the formulation of policies and plans for their management. AFMA, in cooperation with the QDPI&F, coordinates and delivers fisheries management and surveillance/enforcement programs in the TSFF on behalf of the PZJA and in accordance with the provisions of the TSF Act and the *Torres Strait Fisheries Regulations 1985*. Recreational fishing, including charter fishing, is managed under Queensland law.

The management regime is described in the following documents, all of which are publicly available:

- the Treaty;
- Guide to Management Arrangements for Torres Strait Fisheries;
- TSFF BAP 2005 (currently in draft);
- Fisheries Notices issued under the TSF Act; and
- Torres Strait Fisheries Five-year Strategic Research Plan.

There are a number of other documents, including research reports, scientific literature and discussion papers, which are integral to the management of the fishery. Of particular note are:

- *A Review of Reef Line Fishing in the Eastern Torres Strait* (Mapstone *et al.*, 2003); and
- *Collation and Review of Islander Commercial Catch History (1988-2003) in the Eastern Torres Strait Reef Line Fishery* (Begg and Murchie, 2004).

DEH considers it important that management arrangements remain flexible to ensure timely and appropriate managerial decisions. Due to the importance of the documents identified above to DEH's assessment of the fishery, an amendment to the existing management regime could change the outcomes of our assessment and decisions stemming from it. A range of measures to address current management issues are either under consideration or pending implementation, including the proposed development of a statutory management plan for the fishery by 2007. Decisions on these issues and effective implementation of management actions will have a significant influence on the capacity of the fishery to comply with the Australian Government *Guidelines for the Ecologically Sustainable Management of Fisheries* that provided the basis for this strategic assessment.

Recommendation 1: *DEH to be informed of any proposed amendment to the management regime for the TSFF to enable DEH to evaluate any impact on the ecological sustainability of the fishery.*

The PZJA receives management advice from the Torres Strait Fisheries Management Advisory Committee (TSFMAC) comprised of Islander, industry and government representatives. A number of working groups, including a Finfish Working Group (FWG) report to the TSFMAC. Scientific advice is received from the Torres Strait Scientific Advisory Committee (TSSAC). Significant management papers are made publicly available on the PZJA web site at <http://www.pzja.gov.au/> and distributed to interested parties. DEH considers that the consultative mechanisms demonstrate a clear commitment to effective consultation with a variety of stakeholders. DEH notes that the PZJA is considering mechanisms to enhance its consultative structure. DEH believes that the consultative mechanisms would be further enhanced by the inclusion of a conservation representative on the TSFMAC.

DEH notes that the Commonwealth, through the National Oceans Office (NOO) and the Department of Agriculture, Fisheries and Forestry (DAFF), have initiated a review of Torres Strait governance under the Treaty that has made a number of recommendations about the governance and consultative structures in the region that will have some bearing on the future consultative arrangements for the fishery.

Timely decision-making is critical for good management. DEH notes that the PZJA has allocated considerable resources to the fisheries consultative structure recognising that it is the backbone for decision-making. A process is underway to up-skill the members of the consultative bodies and this will continue to take more resources.

Recommendation 2: *PZJA to continue to ensure that consultative processes are conducted in a manner that ensures the timely implementation of management responses essential for the sustainability of the fishery.*

The broad management objectives for the TSFF, reflecting the objectives of the TSF Act and the Treaty, are:

- to preserve and protect the traditional way of life of the Traditional Inhabitants;
- to limit catch at a level that maintains the stocks at ecologically viable levels;
- to ensure that access to the fishery is shared fairly between the different stakeholder groups;
- to minimise the impacts of fishing operations on the ecosystem generally; and
- to encourage Islander participation in the fishery, promote economic development in the Torres Strait and employment opportunities for the Traditional Inhabitants.

There are no stated fishery specific management objectives, performance measures and performance criteria in place in respect of target, byproduct or bycatch species as well as protected species and ecosystem impacts. DEH regards this as a significant deficiency and considers that fishery specific management objectives, performance criteria and performance measures need to be formalised and applied. DEH notes that a suite of fishery objectives with supporting performance measures are currently under development by the FWG but this work has been considerably delayed. The draft measures are also fairly broad and not particularly focused on measuring changes in the status of key target or non target stocks. DEH believes that the review of the fishery's objectives should ensure that objectives are clearly specified and that quantitative, measurable indicators against which performance can be assessed are developed.

Recommendation 3: *PZJA to develop and apply during the 2007 fishing season fishery specific management objectives, performance indicators and performance measures for target, key byproduct and bycatch species, protected species and the ecosystem impacts.*

Agreed processes for responding to triggering of performance measures, plus a commitment to timely response action, are critical for sustainable management. As there are no performance measures or indicators for the fishery, no such mechanisms are currently in place.

Recommendation 4: *PZJA to develop a clear process for determining the reason for a performance measure being triggered and for implementing appropriate management measures within specified timeframes*

The TSFF is managed by Fisheries Management Notices made under the TSF Act, pending development of the proposed statutory management plan for the fishery. Regulations in the Spanish mackerel sector are detailed in Fisheries Management Notice No. 67 and those in the reef-line sector are detailed in Fisheries Management Notice No. 51. Management is based largely on input controls supplemented by the use of minimum size limits and closed areas. In the Spanish mackerel sector management measures include:

- limited entry to non-Indigenous fishers;
- fishing method restricted to trolling, hand-lining and drop-lining;
- a boat replacement policy limiting replacement boats to the size of the original boat;
- a vessel length limit of 20m;
- minimum size limits for commercial take of Spanish mackerel (750 mm), School mackerel (500 mm), Grey mackerel (500 mm), Spotted mackerel (600 mm) and Shark mackerel (500 mm); and
- a 50kg take allowance on Spanish mackerel and/or other reef fish.

In the reef-line sector management measures include:

- limited entry to non-Indigenous fishers;
- a maximum of three fishing lines and a maximum of six hooks/line;
- a seasonal barramundi closure (1 November to 1 February);
- a vessel length limit of 20m;
- a boat replacement policy limiting replacement boats to close to the size of the original boat;
- a prohibition on taking of live reef fish; and
- minimum size limits for commercial take of species and maximum size limits for some species.

The effectiveness of these and other management measures is discussed further in Part II of this report. The PZJA introduced measures in 2003 to reduce the significant level of latent effort in both the commercial reef line and Spanish mackerel sectors of the fishery. The process involved revocation of entitlements that did not meet specified catch history criteria between 1999-2002 for the reef line sector and 1997-2002 for the Spanish mackerel sector. The submission notes that this process has reduced the number of potential entries to the reef line sector by approximately 90% and by 59% for the Spanish mackerel sector.

The PZJA will undertake a program of resource re-allocation for the TSFF and Torres Strait Tropical Rock Lobster Fishery (TSTRLF) in order to provide greater indigenous access to commercial sector resources. This program will include implementation of management arrangements to reallocate and restructure the commercial fishing effort in the TSFF and in the process address the existing catch and effort pressures on resources in the fishery. The main mechanisms for these changes will entail either a Total Allowable Catch (TAC) system delivered through Individual Transferable Quotas (ITQs) or an effort management system such as Individual Transferable Effort (ITE) units. The PZJA proposes a short term re-allocation by 2007 of 50:50 shares of TAC or TAE units between traditional inhabitants and non-traditional inhabitant commercial fishers, with a longer term goal of 70:30 share between traditional inhabitants and non-traditional inhabitant commercial fishers. Further discussion on proposed management changes and effort control systems is provided in Part II of this report.

QDPI&F's Boating and Fisheries Patrol (QB&FP) conducts compliance and enforcement activities in the Torres Strait on behalf of the PZJA. This includes an at-sea surveillance program. The submission provides no indication of the nature or extent of compliance and enforcement activity specific to the TSFF, although AFMA has advised that no compliance breaches in the TSFF were reported in recent seasons in the fishery. Concerns were raised during the public comment period regarding the level of compliance and enforcement in the fishery, and also through consultative processes such as the TSFMAC on the increasing level of foreign fishing vessel (FFV) incursions into Australian waters of the Torres Strait to illegally harvest finfish and other species.

DEH notes a compliance risk assessment for Torres Strait fisheries was conducted in 2004 and approved by the PZJA in February 2005 and that a compliance plan is being developed to address the significant risks identified. DEH also notes that the impact of FFVs in northern Australian waters is being addressed through diplomatic processes with Indonesia and New Guinea. DEH considers that while the existing compliance framework appears to be generally adequate for the existing scale of fishing in the TSFF, further attention may need to be given to addressing, through the new compliance plan, the potential internal and external risks to the TSFF, particularly in relation to any new management systems resulting from the current resource allocation review.

The PZJA Annual Report describes PZJA activities in, and the condition of, the TSFF. AFMA also reports on its performance in management of the Torres Strait fisheries in its Annual Report. However, as there are no performance measures or indicators currently in place, there are currently no regular reports available for public viewing. Information on the fishery on the PZJA website is also several years old and therefore does not provide an accurate indication of the status of the fishery. Until such time as the proposed TSFF management plan is implemented, the PZJA should report annually on performance of the fishery against specified objectives and measures, once developed, with the reports to be made publicly available. The proposed management plan should also provide for the regular review of management arrangements and their assessment against specified performance criteria.

Recommendation 5: *The PZJA to report annually on the performance of the fishery against specified objectives and measures, once developed, with the reports to be made publicly available.*

Fishery-dependent data relating to target and byproduct species are collected on a regular basis in the fishery. No fishery-independent information is collected. Discussion of the information collection system can be found in Part II of this report.

An analysis of the fishery's capacity for assessing, monitoring and avoiding, remedying or mitigating any adverse impacts on the wider marine ecosystem in which the target species live and the fishery operates is contained under Principle Two of this report.

Management arrangements in the TSFF take into account the impact of management of the Queensland East Coast Reef Line Fishery as well as developments in the PNG Fishery for Spanish mackerel in the TSPZ. A catch sharing arrangement in accordance with Article 22 of the Treaty exists between Australia and PNG with respect to the catch of Spanish mackerel. Under these arrangements PNG is entitled to an agreed number of vessel days to fish for Spanish mackerel in Australia's area. PNG has not, however, exercised its rights to date under the agreement. Both Australia and PNG have recently agreed to suspend the catch sharing arrangements for Spanish mackerel in Australia's area for 2006 on the basis that PNG has no immediate interest in the Spanish mackerel fishery and Australia is taking measures to reduce the extent of activity in the TSFF.

The membership of both Commonwealth and Queensland on the PZJA facilitates the development of consistent and complementary management arrangements across jurisdictions for potentially shared stocks of Spanish mackerel and demersal reef fish. AFMA and QDPI&F, along with other northern jurisdictions, participate in the annual Northern Australian Fisheries Management Workshop (NAFMW) which provides a forum for State, Federal and Territory fishery agencies to address the status, future research and management priorities of commercially important species across northern Australia and identify and pursue complementary management activities.

DEH considers that the current management arrangements comply with all relevant threat abatement plans, recovery plans, the National Policy on Fisheries Bycatch, and bycatch action strategies developed under that policy. DEH expects that AFMA will also ensure compliance with any future plans or policies as they are developed.

The Treaty is the primary regional instrument underlying management of the TSFF. The relationship between the Treaty and management of the TSFF has been outlined above. The prime

international regime affecting the fishery is the United Nations Convention on the Law of the Sea. The management regime essentially complies with this. Other international regimes are applicable to fisheries management but do not explicitly involve this fishery. For example, the 1992 Convention on Biological Diversity and in particular the 1995 Jakarta Mandate require that, in relation to the sustainable use of marine and coastal biological diversity, the precautionary principle should apply in efforts to address threats to biodiversity. While these agreements are not specifically addressed in the Submission, the fishery's compliance with their requirements can be assessed by examination of Part Two of this report. The application of the International Convention for the Prevention of Pollution from Ships (MARPOL) to vessels operating in the fishery is explicitly discussed under Principle 2, Objective 3.

DEH considers it is incumbent on all authorities to develop a thorough understanding of the framework of national, regional and international agreements and their applicability to export-based fisheries for which they are responsible.

Conclusion

DEH considers that the TSFF management regime is documented, publicly available and is developed through a consultative process. However there is a need for the development of fishery specific management objectives and performance criteria for each sector of the fishery by which the effectiveness of the management arrangements can be measured and reviewed. In addition, there is scope to increase the transparency regarding reporting on the performance of the fishery.

The management arrangements are likely to be capable of controlling the harvest through a combination of input controls and technical measures appropriate to the size of the fishery and the intention to implement further systems to directly control catch and effort. Periodic review of the fishery is currently limited but should be provided for in the pending development of the TSFF management plan. While there are limited means of enforcing critical aspects of the management arrangements, a compliance risk assessment has been undertaken and a risk-based compliance plan developed to ensure that the nature and level of enforcement of the management arrangements are appropriate to the scale of the fishery.

The management regime takes into account arrangements in other jurisdictions, and adheres to arrangements established under Australian laws and international agreements.

DEH considers that there is scope to further refine the management arrangements and has provided a number of recommendations for improvements in the longer term.

PART II – GUIDELINES FOR THE ECOLOGICALLY SUSTAINABLE MANAGEMENT OF FISHERIES

Stock Status and Recovery

Principle 1: *‘A fishery must be conducted in a manner that does not lead to over-fishing, or for those stocks that are over-fished, the fishery must be conducted such that there is a high degree of probability the stock(s) will recover’*

Maintain ecologically viable stocks

Objective 1: *‘The fishery shall be conducted at catch levels that maintain ecologically viable stock levels at an agreed point or range, with acceptable levels of probability’*

Information requirements

Overall catch data across all the various fishery sectors is generally limited. Logbook reporting of catch and effort has been mandatory for non-indigenous fishers in the Spanish mackerel sector of the TSFF since 1989 and since 1988 for the reef line sector. Standardised logbooks were introduced in both sectors in 2003. Data collected include catch (number and weight) of target and byproduct species, fishing method, hours fished and location (latitude/longitude).

Indigenous commercial catch data is very limited as it has not historically required logbook reporting. In January 2004, AFMA introduced the Torres Strait Seafood Buyers and Processors Docket Book to community and commercial freezers in the Torres Strait to improve catch and effort data collection for the commercial Indigenous sector of the fishery. This docket book provides for voluntary reporting of species catch weight, days fishing, number of divers/fishers, area fished, along with additional catch disposal details. The submission does not provide an indication of the proportion of indigenous fishers that provide details through this docket book system, although AFMA has indicated that all known buyers are presently using the docket book system and that indigenous fishers supported the system and the majority were using it. AFMA has also dedicated resources to the education and awareness of fishers and fish receivers on the need to provide catch and effort data through this process.

No systems are in place to quantify the regular take from subsistence fishing or recreational fishing. The Torres Strait Co-operative Research Centre (Torres Strait CRC) is undertaking a research project, *Modeling the impact of multiple harvest strategies in the Eastern Torres Strait reef-line fishery*, on the best means of monitoring and quantifying subsistence catch from the various Islander groups.

There is no ongoing fishery-independent data available on any of the fishing sectors in the TSFF. The Queensland long term monitoring program collected observer effort and fish size data on Spanish mackerel catch around Bramble Cay from 1999-2002 and since that time monitoring of Spanish mackerel stocks has relied on the voluntary participation of three commercial fishers. DEH notes and welcomes the TSFMAC endorsement of a longer-term monitoring program to support Spanish mackerel stock assessment in the TSFF.

The Torres Strait fisheries research program is designed to identify and investigate key biological parameters of fish stocks in the Torres Strait and to provide advice on which to base rational and effective fisheries management programs. Relatively little research has been conducted on stocks in the TSFF. In 2003 the Cooperative Research Centre for the Great Barrier Reef World Heritage Area (CRC Reef) funded the establishment of the Torres Strait CRC as a research, education and extension program in Torres Strait which has seen the initiation of three projects relevant to the TSFF:

1. Evaluation of the Eastern Torres Strait (ETS) reef-line fishery;
2. Modeling the impact of multiple harvest strategies in the ETS reef-line fishery; and
3. Status assessment of the ETS Spanish mackerel fishery

The results of these studies are not yet available but are due for completion in the next 12 months. A significant component of these studies involves the collation of existing data on catch and effort, and the biological characteristics of species taken in the various commercial and traditional sectors of the fishery, along with determining appropriate monitoring and sampling programs to support the longer term assessment of stock status trends.

Recent research (Begg and Murchie, 2004) has recommended that an on-going structured reporting system consistent across the Torres Strait be implemented with more refined measures of species harvest, spatial resolution of fishing activities and fishing effort. This is particularly relevant for the historically data-poor indigenous fishing sectors. DEH also notes existing deficiencies, in both indigenous and non-indigenous commercial sectors, in logbook and docket book data including catch reporting at species group level, inadequate data on the spatial scale and extent of fishing effort. DEH considers that more accurate and reliable information on catch and effort from all sectors of the fishery is vital to enhance the stock assessment process and develop more robust estimates of sustainable harvest limits for key species.

DEH appreciates the difficulties of obtaining data from non-commercial sectors of this fishery. However, the resource re-allocation process currently underway in the TSFF suggests an increasing need to focus on obtaining more reliable estimates of harvests from all sectors of the fishery, not just the commercial side. DEH supports the finding of Begg and Murchie (2004) that there is a need to collect and analyse information on subsistence harvest of reef fish to complement data collected on commercial Islander harvest and ultimately for input into a formalised assessment and management strategy evaluation of the fishery. DEH considers it appropriate that the outcomes of recent research work on monitoring take from non-commercial sectors be incorporated in some form in the ongoing assessment and management of the fishery.

Recommendation 6: *PZJA to ensure that mechanisms are in place to collect adequate and reliable data on catch and effort, appropriate to the scale of the fishery, from all sectors to ensure sustainable management of finfish resources. Initial priority should be given to the commercial sectors of the fishery. Options for the collection of non-commercial catch and effort data will be evaluated, taking account of outcomes of recent research programs, and appropriate options progressively developed and implemented to improve estimates of non-commercial catch and effort used in stock assessments and management controls.*

There is currently no mechanism in place to verify the data collected through the logbook or docket programs. The current stock assessment relies heavily on catch and effort data derived from logbooks and docket books and it is therefore important that this data is independently validated by some other means. The current research projects evaluating the status of both the Spanish mackerel and reef line sectors of the fishery have observer components to verify catch details, however there is no commitment at this stage to include observer programs as part of the ongoing management arrangements in any sector of the fishery. DEH notes that previous reviews of commercial catch in the fishery suggested means of obtaining more robust information such as collation of current and historical Islander freezer catch records.

DEH appreciates the logistical and cultural difficulties in obtaining and verifying data across the various sectors of the fishery. However, DEH has concerns, given the uncertain status of most stocks in the fishery, with the over-reliance on unvalidated data to inform stock assessment and fishery performance measurement. The abovementioned research projects currently evaluating information on the commercial Spanish mackerel and reef line sectors and subsistence fishing across the fishery should be able to provide a number of options to validate available catch and effort information, particularly for key target and byproduct commercial species.

Recommendation 7: *PZJA, within 18 months, to review available options to validate catch and effort data on target and byproduct species in the TSFF. Appropriate validation mechanisms for target and byproduct catch and effort data to be progressively developed and applied in the fishery from the 2008 fishing season.*

Assessment

There is currently no sound estimate of the status, potential productivity or the sustainable yield of stocks in either the Spanish mackerel or reef line sectors of the fishery. The current status of target and byproduct species in the TSSF is uncertain. Formal stock assessments for either Spanish mackerel or the target reef line species of coral trout or other reef line species have not been undertaken and there is currently inadequate information to inform reliable stock assessments for either sector. The available catch and data information on the TSFF indicates that the catch rates for the predominant non-indigenous commercial sector of the Spanish mackerel fishery have been fairly stable in recent years, with a peak of 124 tonnes of fillet landed in 2002-03. BRS estimated the annual harvest of Spanish mackerel in the years leading up to 2000 by the non-indigenous commercial sector to be around 100 tonnes annually. This trend has continued in 2003-04 and 2004-05 with catches being approximately 95 tonnes and 105 tonnes fillet weight respectively.

Fishing activity for Spanish mackerel tends to target the more productive waters around Bramble Cay in the northern Territorial Seas. Catch returns indicate that most of the Spanish mackerel harvest is taken by a small number of non-indigenous commercial operators, with the submission noting recent logbook data showing most of the catch taken by five specialist vessels and four part-time vessels around Bramble Cay.

The non-indigenous commercial catches in the reef line sector have varied from 25 to 163 tonnes between 1989 and 2002, with catch and effort peaking in 1998. The majority of the catch comprises four species of coral trout, with other species including groupers, emperors and snappers. The 2003-04 catch was 136 tonnes. The submission provides limited information on the catch and effort trends in recent years. Mapstone *et al.* (2003) noted that non-indigenous commercial reef line catch was generally in the vicinity of 120 tonnes from 1994 to 1999 (apart from the peak in 1998), with an equivalent effort generally around 2,500 to 3,000 dory days. The 2004 BRS Fishery Status Report suggests that TSFF reef fish stocks were relatively healthy as their catch rates were substantially higher than for equivalent species on the Queensland east coast.

The PZJA Web site indicates that the non-indigenous commercial effort in the fishery is predominantly from a small number of vessels, with only four full time primary commercial fishing boats operating in the reef line sector along with several other primary vessels on a part time basis.

Analysis of available indigenous commercial fishing records from the main reef line fishing communities (Darnley, Murray and Yorke Islands) by Begg and Murchie (2004) indicated an increase in recent years in indigenous harvest and fishing effort, reaching around 29 tonnes (including mackerel species) and 1,064 fishing days in 2002, whilst noting that indigenous fishing catch and effort figures are highly likely to be underestimated given the limited data available to date.

The current CRC Torres Strait projects, *Status assessment of the Eastern Torres Strait Spanish mackerel fishery* and *Evaluation of the ETS Reef-Line Fishery*, are expected to make available a more comprehensive collation of indigenous and non-indigenous harvest and fishing effort records by mid 2006. These projects will also provide for a more robust assessment of fishing and stock trends that takes account of fishing activity across the various Torres Strait finfish sectors. DEH has previously recommended in the report (see **Recommendation 6**) that the outcomes of these projects be used to establish mechanisms for the ongoing collection of reliable catch and effort data across both the commercial and non-commercial sectors of the TSFF.

The outcomes of the above two projects are expected to provide the basis for developing appropriate stock assessment models and harvest strategies along with obtaining appropriate

biological information and catch and effort data to inform future assessments. As previously noted, both projects are due to be completed in mid 2006. DEH considers that, in the context of implementing the outcomes of these projects, priority should also be given to establishing precautionary yield estimates for target and key byproduct species so that appropriate supporting measures can be introduced to ensure stocks are not overfished.

Recommendation 8: *PZJA to continue to work towards developing more refined yield estimates of target and key byproduct species to determine sustainable harvest levels.*

Given the uncertainty with the status of stocks in the TSFF, the cumulative impacts on stocks across the various fishery sectors and the vulnerability of some species to overfishing due to their biological characteristics (eg small cods and groupers), DEH also considers some priority should be given to the development of precautionary reference points, based around the sustainable yield estimates, for the target species to ensure harvesting remains at sustainable levels. These preliminary reference points need to take account of the stock status and management arrangements for stocks of species that may be targeted or caught by other fisheries. DEH considers this work should be undertaken in the context of developing and implementing performance indicators and measures for target and byproduct species as required under **Recommendation 3** of this report.

Research conducted by the former Queensland Fisheries Service has determined that a high proportion of adult Spanish mackerel tend to remain within a local region and that there are distinct populations of the species off Western Australia, off Weipa, in the Torres Strait and on the east coast of Queensland. There is evidence to suggest two genetically distinct northern and eastern stocks of Spanish mackerel in Australia, a northern stock in the Torres Strait and the Gulf of Carpentaria and an eastern stock off Eastern Queensland and New South Wales. Spawning aggregations are known to occur around Bramble Cay in the north-eastern region of Torres Strait during spring and early summer. The submission notes that the FWG is addressing the relevant monitoring and assessment requirements to provide a sound basis for managing the stock dynamics of Spanish mackerel.

Mapstone *et al.* (2003) note that most of the demersal reef fish species harvested commercially in the Torres Strait are the same as those harvested in the east coast line fishery and that some research has been conducted elsewhere on these species. However Mapstone *et al.* note that it is not clear whether research on these species in other fisheries is applicable in the Torres Strait. The sampling and biological analysis components of the current *Evaluation of the ETS Reef-Line Fishery* project should provide further information on the stock dynamics for key reef line species and the requirements for future research to support effective stock management.

As previously noted, there is limited information on the overall removals of fished stocks across all the relevant sectors of TSFF. While mechanisms have been in place to monitor the retained, commercial non-indigenous catch since the late 1980s, there is no requirement to record bycatch in logbooks, hence no provision for discards to be closely monitored. AFMA has advised that the existing logbooks are to be reviewed and provision made for recording bycatch, including discards of commercial species, in the new logbooks. The review process will commence in early 2006.

More formal monitoring of commercial non-indigenous catch began in 2004 through the docket book system and is expected to provide the basis for reliable ongoing indigenous commercial catch. Broad estimates of indigenous commercial harvest levels have been obtained from the abovementioned Begg and Murchie (2004) project using available community freezer records and from Poiner and Harris (1991) and Harris *et al.* (1994) that respectively examined the harvest of Spanish mackerel and reef fish from Yorke Island and the harvests of reef fish from eastern Torres Strait communities between 1991 and 1993. This information should be updated in 2006 with more robust and contemporary catch and effort estimates from the current Torres Strait CRC evaluation projects of the Spanish mackerel and eastern Torres Strait reef line sectors.

As previously noted, there is no reliable estimate of the extent of subsistence fishing in the TSFF, although options to address this are expected to be provided by the current Torres Strait CRC project *Modeling the impact of multiple harvest strategies in the Eastern Torres Strait reef-line fishery*. BRS cites an estimate of 10 tonnes annually for subsistence take of Spanish mackerel from the TSFF, although it is unclear how this estimate was reached.

While the extent of recreational fishing has not been quantified or monitored, there is anecdotal evidence of minimal recreational fishing activity in the TSFF. Mapstone *et al.* (2003) notes that there are few reef fishing charter operations in the eastern Torres Strait and recreational fishing is infrequent in the Torres Strait region and mainly undertaken around the more populace areas such as Thursday Island.

Recommendation 6 of this report will require the development and implementation of further mechanisms to enhance the reliability of stock removal estimates from across the various sectors of the TSFF to support a more robust stock assessment process and appropriate stock management measures. As indicated in Part I of this report, illegal harvesting of by FFVs may be a further factor to consider in assessing the impacts on stocks in the TSFF. DEH expects that further consideration of illegal catch impacts and measures to counter illegal activities will be addressed in the context of **Recommendation 6** of this report and the development of the compliance plan for Torres Strait fisheries.

Removals of TSFF species from other Torres Strait fisheries are available from the respective catch monitoring systems. Reef line fish species are taken as byproduct in the Spanish mackerel sector of the TSFF as well as the Torres Strait Prawn Trawl Fishery and, to a lesser extent, the TSTRLF.

Management response

The current TSFF management regime aims to maintain ecologically viable stock levels through a range of input and output controls as outlined in Part I of this report.

There are no reference points currently in place for target or byproduct species to trigger management actions. The development of appropriate reference points is expected to be a significant component of the new management model for the fishery being developed and implemented in the context of the resource re-allocation program and development of a management plan for the fishery. Suitable reference points will also be dependant on the development of appropriate preliminary yield estimates for target and key byproduct species as recommended earlier in this report (see **Recommendation 8**). DEH believes that the development of the preferred management option for controlling catch/effort should include the establishment of such trigger points. DEH recommended the development of performance criteria for the fishery along with a clear process for when performance measures are breached (see **Recommendations 3** and **4**).

Neither the Spanish mackerel nor reef line sectors currently have direct management controls in place to cap the amount of catch or effort in the TSFF. The primary management measures that currently limit catches are minimum size limits for commercial mackerel species, a possession limit of 50 kilograms in the Spanish mackerel sector for mackerel and/or reef fish and minimum size limits for all commercial species (and maximum size limits for some species) taken commercially in the reef line sector. There is a permanent closure by line fishing methods for the western area of the reef line sector. Protection against targeting of the spawning aggregations of Spanish mackerel also exists through a fishing closure during daylight hours for non-indigenous commercial Spanish mackerel licence holders from August to December around Bramble Cay and Black Rocks that also includes restricting fishing to trolling methods. The PZJA has recently endorsed the development of 10 nautical mile exclusion zones for non-indigenous commercial fishers around Murray, Darnley, Yorke and Stephen Islands. Further consultation on these exclusion zones will be undertaken in 2006 prior to their implementation.

In response to the substantial amount of latent effort in the fishery, in June 2003 the PZJA endorsed recommendations to remove latent effort through the application of latent effort qualifying criteria. This process was completed in 2005 and has reduced the number of potential entries to the reef line sector by approximately 90% and by 59% for the Spanish mackerel sector. While this has been largely successful in reducing the potential for activation of effort in the non-indigenous sector of the TSFF, it has not eliminated that potential in the indigenous sector, where a substantial number of licences exist that are currently inactive. Currently most of the reef fish harvested in the indigenous commercial sector are by a small number of fishers on each island and indigenous licences are unlimited. Concerns regarding management of effort in the fishery were also raised in public comment.

As mentioned in Part I of this report, the PZJA has acknowledged the need to cap real fishing effort and develop and implement direct controls on both effort and catch, along with applying a process that provides for effective resource allocation between competing sectors of the fishery. A resource allocation specialist group formed in 2005, comprising membership from DAFF, AFMA, QDPI&F, TSRA and other experts, has been examining options for appropriate resource allocation in both the TSFF and the TSTRLF. The consultative bodies for the fishery have also discussed several different management systems to potentially address these sustainability concerns, including the possible introduction of ITQs, ITE units or other measures of direct catch and effort monitoring and control. A program to implement these changes has been recently endorsed by the PZJA that includes development of preferred options for a catch quota or effort management system in 2006 for implementation in 2007.

DEH considers that the absence of overall limits on commercial catch and effort places stocks across the fishery at continuing risk of overexploitation and urges the PZJA to give continuity priority to developing and implementing these proposed changes to management arrangements to ensure fishing mortalities are controlled at sustainable levels.

Recommendation 9: *PZJA to control fishing mortality, through effort controls or other mechanisms across all sectors, to maintain stocks at ecologically sustainable levels.*

The submission notes that byproduct in the fishery is primarily coral trout species in the Spanish mackerel sector and mackerels, sea-perches, snappers, emperors, sea bream and rock cods in the reef line sector. Byproduct catch and effort is recorded in logbooks. Mapstone *et al.* (2003) reported that byproduct of coral trout species in the Spanish mackerel sector amounted to less than 10 tonnes/year in the 1990s, except in 1997 and 2000 when more than 20 tonnes were reported. While the Spanish mackerel sector limits the extent of byproduct each trip through 50 kg retention limits of Spanish mackerel and/or other finfish species, there is currently no limit on take of byproduct species, although most of the reef finfish species taken as byproduct would be subject to size limits.

DEH notes that research in the Queensland East Coast Reef Line Fishery had found some of the species taken as byproduct in the reef-line sector of the TSSF (such as small cods and groupers) to be vulnerable to overfishing since they are long lived, take several years to reach maturity and reach their relatively small legal size at an early age (Mapstone *et al.*, 2003). The submission notes that information is being collected on key byproduct species of red emperor and barramundi cod. The submission also notes the pending Ecological Risk Assessment (ERA) that will consider the impacts of the fishery on the ecosystem and address identified high risks (that may include byproduct species) with appropriate management responses. DEH expects that the outcomes of the abovementioned evaluation projects by the Torres Strait CRC of both the Spanish mackerel and reef line sectors will also inform the ERA process and provide further information on the status of byproduct species and indications of future research and monitoring priorities. DEH has previously recommended in this report the development of specific management objectives and performance criteria for key byproduct species (see **Recommendation 3**) and considers that the development of these measures should take particular account of the vulnerability of certain byproduct species to fishing pressure in the region.

Conclusion

There is very limited information available on the status of target and byproduct stocks in the TSFF. DEH acknowledges the recent improvements in data collection, the reduction of latent effort, the prospect of significantly better information on stocks arising from current research, including an ecological risk assessment, and the current consideration of a cap on effort in the TSFF.

DEH believes that, taking into account the relatively small scale of the fishery, the initiatives outlined above and the implementation of the recommendations made by DEH, the management regime is appropriately precautionary.

Promote recovery to ecologically viable stock levels

Objective 2: *‘Where the fished stock(s) are below a defined reference point, the fishery will be managed to promote recovery to ecologically viable stock levels within nominated timeframes’*

The status of stocks is uncertain and there are no defined reference points. The submission provides a limited basis on which to judge whether the stocks are overfished, although it does indicate that catches and/or catch rates in both the Spanish mackerel and reef line commercial sectors have been relatively stable in recent years. The outcomes of the current Torres Strait CRC projects evaluating both the Spanish mackerel and reef line sectors are expected to provide further information on the stock status of key species in the TSFF.

DEH has made a number of recommendations in this report to enhance the management of target and byproduct species, development of performance indicators and measures (see **Recommendation 3**), adequate and reliable information collection systems across all sectors for target and key byproduct species (see **Recommendation 6**), data validation measures (see **Recommendation 7**) and defined yield estimates (see **Recommendation 8**), along with measures to control the level of fishing mortality through effort controls (see **Recommendation 9**) and ensure that effort levels in the fishery are managed at ecologically sustainable levels (see **Recommendation 10**).

DEH considers that, in combination, these measures should provide a sounder basis for managing stocks at more precautionary levels. DEH notes and commends the current commitment of the PZJA to reduce effort in order to ensure that overfishing does not occur.

Conclusion

DEH notes the uncertainty surrounding the status of most species in the fishery and expects that the suite of recommendations made in this report, along with the outcomes of current research and proposed actions to control effort across the fishery, will assist the PZJA in ensuring that stocks are not overfished in the short term and are maintained at ecologically sustainable levels in the medium to longer term.

Ecosystem impacts

Principle 2: *‘Fishing operations should be managed to minimise their impact on the structure, productivity, function and biological diversity of the ecosystem’*

Bycatch protection

Objective 1: *‘The fishery is conducted in a manner that does not threaten bycatch species’*

Information requirements

There is currently no routine collection of bycatch data in any sector of the fishery. The submission indicates that the only data available are those collected opportunistically by observers and researchers. The current logbooks provide for recording of protected species interactions, however there is currently no specific provision for recording of other bycatch species, including discards of commercial species. The absence of bycatch recording systems would appear to inhibit the PZJA meeting some of its obligations for key bycatch species in the region, such as the requirement of the National Plan of Action (NPOA) for the Conservation and Management of Sharks (Shark Advisory Group and Lack, 2004) that all shark catch and bycatch be recorded by species.

The draft BAP for the TSFF provides for existing commercial logbooks to be revised during 2005 to allow the future recording of bycatch species. The current Torres Strait CRC project evaluating the reefline sector will also provide observer information on species, size and composition of bycatch. The draft BAP provides for further development of ongoing observer programs once the outcomes of this project are evaluated.

The submission asserts that discards are predominantly of target commercial species that are outside the size limit range. However, no information on the life status or likely survival of these discards is available. This information may be important for stock assessment purposes and consideration should be given in future research to addressing the survivability of discards.

DEH accepts that the relatively small scale of active operations and selectivity of gear used in the fishery may constrain the overall levels of bycatch taken in the TSFF. However, this assumption cannot be verified in the absence of routine collection of reliable information, appropriate to the scale of the fishery, on the composition and abundance of bycatch. DEH encourages the introduction of logbook reporting of bycatch in the TSFF. However, as logbooks currently apply only to the non-indigenous commercial sectors of the fishery, there is no commitment within existing management arrangements to an ongoing program to verify changes in the extent and composition of bycatch across the other fishery sectors. DEH considers that the PZJA still needs to ensure that at least the indigenous and non-indigenous commercial sectors of the fishery, which account for the majority of fishing activity and catch across the fishery, develop and implement ongoing mechanisms to monitor bycatch sufficient to identify changes in the composition and quantity of bycatch across the TSFF.

Recommendation 10: *PZJA, within 18 months, to develop and implement an ongoing program to collect information on the composition and abundance of bycatch across the commercial sectors of the fishery.*

The collection of information on bycatch of threatened, endangered and protected species is discussed under Objective 2.

Assessment

The submission and the draft BAP assert that the available data (anecdotal information from active fishers and sampling work undertaken by researchers) suggest that bycatch incidents are rare and primarily consist of under and oversize target species. The draft BAP claims that the major discards in the Spanish mackerel fishery are tunas, trevallies, barracudas and sharks, rays and sawfish. Of these, tunas and trevallies are generally able to be released in good condition and post-release mortality is thought to be low. Barracudas pose a danger to fishers and are less likely to be released in good condition and to survive release. Sharks usually break the troll line and are left with the hook, which eventually rusts. The draft BAP asserts that the survival rate of hooked sharks is probably high. Neither the submission nor the draft BAP provide information on the main bycatch species in the reef line sector, apart from noting that the level of bycatch is likely to be relatively low due to the use of small scale handling methods.

DEH accepts that the line methods used by the TSFF are relatively passive and allow for the release of bycatch species, mostly in good condition. DEH notes that the minimum size limit for Spanish mackerel reflects research regarding the likely level of mortality associated with different sized fish. The selected size limit is thought to result in a level of post-release mortality that does not compromise the effectiveness of the minimum size limit regulation.

The draft BAP provides for the analysis of bycatch trends through logbook data and other sources of information such as observer programs and for the review of existing measures such as size limits and the subsequent development of appropriate bycatch mitigation measures.

No formal risk analysis of bycatch species has yet been conducted in the TSFF. As previously noted in this report, an ERA is being conducted to assess the risks that the fishery poses to the sustainability of species, including bycatch species, and habitats that the fishery interacts with. DEH notes that the initial scoping phase of the ERA has been completed and that AFMA expects the second phase ERA to be undertaken during 2006 and 2007. The draft BAP includes a commitment to develop and implement interim mitigation measures within 8 months of a medium to high risk being identified by the ERA, and to pursue further research on species identified by the ERA process as medium to high risk.

DEH notes that the draft BAP has committed to the development of threshold reference points for indicator bycatch species and the development of management responses when these threshold reference points are reached. The ERA process and current research in the fishery should provide the impetus to identify the key indicator species and appropriate reference points and management responses. DEH has recommended earlier in this report the development of performance indicators and measures for key bycatch species (see **Recommendation 3**).

Management response

DEH notes that while the draft BAP focuses on quantifying the extent of bycatch and understanding the impacts on bycatch species, one of the primary aims of the BAP is also to reduce the overall levels of bycatch in the fishery. The draft BAP does not stipulate specific measures to reduce bycatch, although some of these may be derived from the proposed fishery code of practice that will be developed to minimise the incidental capture of protected species. Other actions in the draft BAP that are likely to promote further measures to reduce bycatch include collation and annual analysis of all available bycatch data, required response to any ERA findings of species at medium to high risk, educating operators about the value of providing accurate catch information (including on protected species), the development of a handbook for TSFF operators (including information on bycatch issues, including bird recovery procedures) and the implementation of an Islander community extension program.

DEH notes that, consistent with the NPOA for the Conservation and Management of Sharks, the PZJA has prohibited shark finning in the TSFF. The PZJA has also endorsed that, subject to the outcomes of further consultation with Traditional Inhabitants, the take of hammerhead sharks, tiger sharks and all other sharks greater than two metres in length be prohibited and that Maori wrasse be declared a no take species in the TSFF.

The current and proposed area closures and the pending controls on the level of effort should also contribute to containing the amount of bycatch in the fishery.

DEH believes that if the proposed initiatives are implemented as provided for in the draft BAP there is a high chance that the fishery will not threaten bycatch species. The BAP is expected to be finalised by the end of 2005.

Conclusion

DEH considers that, given the mode of operations and small scale of the fishery, there is a high likelihood the fishery is conducted in a manner that does not threaten bycatch species. Should this

situation change, or a risk assessment process indicate otherwise, DEH expects that the PZJA would implement appropriate actions to ensure that bycatch species are not threatened by this fishery.

Recommendations have been made to ensure that the risks of unacceptable impact on bycatch species are detected and minimised in the longer term.

Protected species and threatened ecological community protection

Objective 2: *'The fishery is conducted in a manner that avoids mortality of, or injuries to, endangered, threatened or protected species and avoids or minimises impacts on threatened ecological communities'*

Information requirements

Since late 2002 commercial non-indigenous fishers have been required to report interactions with endangered, threatened and protected species in the TSFF logbook and a detailed wildlife and protected species information sheet. While the docket book data collection system for the indigenous sectors does not include specific provision for reporting interactions with endangered, threatened and protected species, the submission notes that the Islander community extension program included in the draft BAP provides for educating fishers on recording protected species interactions.

The draft BAP also provides for developing handouts on bycatch issues, including bird and other wildlife recovery procedures, the inclusion of monitoring protected species interactions in future research projects and the development of further observer programs to verify bycatch impacts, including protected species interactions.

Assessment

A wide range of protected species occur in the area of the fishery, including turtles, seabirds, whales and other cetaceans, syngnathids, sharks, sea snakes and dugongs. The submission and the draft BAP note that seabirds such as brown, redfooted and masked boobies and streak and wedgetail shearwaters, dugongs and turtles have the most potential for interactions with fishing activity in the TSFF. The submission notes that given the gear used, the areas fished and the relatively low scale of fishing operations, the risks of interactions with these species is generally low. The submission advises that no protected species interactions were reported in 2003 (based on the latest available information from logbooks).

DEH notes that none of the seabird species known to frequent the Torres Strait are listed threatened species. The submission and draft BAP indicate that while seabird bycatch in the TSFF is uncommon there is still the potential due to the use of baits and the diving capabilities of some birds such as boobies. The submission also states that turtles are sometimes, albeit rarely, taken in the TSFF, although no information is available on the species taken. DEH notes that the Recovery Plan for Marine Turtles in Australia identifies the Queensland Reef Line Fishery as being suspected of having an impact on marine turtles. The reef-line sector of the TSFF is likely to have a similar impact.

DEH considers that the TSFF is unlikely to pose a threat to seabirds and turtles in the area but encourages the PZJA to closely monitor data from logbooks and other sources to ensure that any changes in interactions are detected and mitigation measures are implemented promptly where necessary.

No formal risk analysis of endangered, threatened or protected species interactions has yet been conducted in the TSFF. As previously mentioned an ERA of the TSFF will be completed for the fishery over 2006 and 2007 and should identify medium to high risk protected species and appropriate management responses. The draft BAP provides for appropriate mitigation measures to

be developed and implemented within 12 months of a risk being identified by the ERA process for protected species.

There are no listed ecological communities in the fishery area.

Management Response

As indicated previously, the draft BAP includes actions relevant to endangered, threatened and protected species, including the implementation of appropriate measures to reduce interactions with protected species identified by the ERA to be at risk, development of a code of practice for fishers to minimise incidental capture of protected species and a handbook on wildlife recovery procedures.

DEH supports the development of the code of practice but believes adoption and implementation of the code needs to be monitored and complemented by mandatory management measures if required.

The current permanent area closures and the pending controls on the level of effort should also contribute to containing the amount of protected species interactions in the fishery.

The submission notes that several techniques are available to successfully release incidentally captured species from the hook gear used in the fishery and that most incidental captures, including protected species, are released alive.

DEH considers that the relatively small scale of line operations used in the fishery presents minimal risks to protected species populations but encourages the PZJA to enhance the monitoring of and response to protected species impacts in line with the initiatives proposed in the draft BAP.

Conclusion

DEH notes that due to the small scale of the fishery and the fishing methods used there are likely to be minimal interactions with protected species in this fishery and considers that the fishery is conducted in a manner that avoids mortality of, or injuries to, endangered, threatened or protected species and avoids or minimises impacts on threatened ecological communities. Should this situation change, or a risk assessment process indicate otherwise, DEH suggests that appropriate actions be undertaken to ensure the fishery avoids mortality, injury to these species and avoids or minimises impacts on threatened ecological communities.

Recommendations have been developed earlier in this report that will assist in ensuring that the risk of unacceptable impact on protected species is minimised in the longer term.

Minimising ecological impacts of fishing operations

Objective 3: *'The fishery is conducted, in a manner that minimises the impact of fishing operations on the ecosystem generally'*

Information requirements

There is limited information available to confirm the nature and extent of the impact of the TSFF on the ecosystem generally. The submission and the draft BAP note that the type of gear and fishing methods used in both the Spanish mackerel and reef line sectors are likely to have a negligible risk of impacting on benthic habitats.

The Torres Strait CRC has approved funding for a number of research projects that will contribute to a better understanding of potential impacts on the surrounding ecosystem, including mapping the characteristics of key biotic and physical attributes and examining the biophysical processes of the Torres Strait marine ecosystem. The ERA process will also consider the broader ecological impacts of the fishery.

DEH is concerned at the lack of information collection and research covering the fisheries impact on the ecosystem and environment generally. However, DEH understands that this lack of information is the case across a range of Australian and international fisheries and until appropriate

research techniques and programs are developed and implemented this will continue to be the case. DEH strongly supports research in this area.

Assessment

The TSFF may affect food chains through the removal of the target and byproduct species, the capture of bycatch species, and the reintroduction of discard species. The impact of the removal of bycatch species on food chains in the TSFF has not been assessed. There is potential for the ERA process to address this issue.

The submission claims that the fishery does not have a significant impact on the marine environment because of the small scale of the fishery and the fishing methods used. DEH accepts that the impact of the fishery on the ecosystem is likely to be low due to the small scale of operations across the fishery and the relatively passive fishing methods used. In addition, the permanent and temporal closures in the fishery provide a range of refuges for species affected by the fishery.

The submission indicates that the Spanish mackerel fishery uses garfish, taken en route to the TSFF fishing grounds, as bait. Mapstone *et al.* (2003) report that locally caught finfish and frozen packaged pilchards are used for bait in the reef-line sector.

Management response

The submission commits the PZJA to responding to the findings of the ERA by targeting data collection and research at high-risk species and implementing precautionary management measures to reduce the risk to high-risk areas. As previously mentioned, the draft BAP includes a range of bycatch reduction and mitigation measures along with community extension programs that should serve to reduce the impact of the fishery on the ecosystem generally.

Impacts on water quality through the discharge of plastic wastes and pollution from vessels are controlled under MARPOL legislation. The Torres Strait Treaty also requires its parties to:

- ensure that vessels observe generally accepted international regulations, procedures and practices for the prevention, reduction and control of pollution from ships; and
- to protect the marine environment through measures for the prevention and control of pollution or other damage to the marine environment, in particular from the release of toxic, harmful or noxious substances by dumping at sea and pollution or other damage from vessels.

The NOO is currently leading a regional marine planning process in the Northern Region, which encompasses the area of the TSFF. The planning process aims to ensure the ecologically sustainable use of the resources in the planning area and will help to integrate management across jurisdictions and sectors. It will also examine potential candidate areas for the National Representative System of Marine Protected Areas (NRSMPA). The regional marine planning process is a potential vehicle for pursuing sustainable fisheries objectives, particularly where cross-sectoral or cross-jurisdictional approaches are required. Due to significant ecological and institutional differences in the Torres Strait, regional marine planning in that area is being progressed through a separate, but concurrent process, to the overall Northern Region marine planning process.

Conclusion

DEH considers that the fishery is conducted in a sufficiently precautionary manner to minimise the impact of fishing operations on the ecosystem generally. DEH notes that should circumstances alter significantly in the fishery, appropriate assessments and additional actions should be promptly identified and implemented.

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LIST OF ACRONYMS

ABARE	Australian Bureau of Agricultural and Resource Economics
AFMA	Australian Fisheries Management Authority
BAP	Bycatch Action Plan
BRS	Bureau of Rural Sciences
CRC Reef	Cooperative Research Centre for the Great Barrier Reef World Heritage Area
DAFF	Department of Agriculture, Fisheries and Forestry
DEH	Department of the Environment and Heritage
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ERA	Ecological Risk Assessment
ETS	Eastern Torres Strait
FFV	Foreign Fishing Vessel
FWG	Finfish Working Group
ITE	Individual Transferable Effort
ITQ	Individual Transferable Quota
MARPOL	International Convention for the Prevention of Pollution from Ships
NAFMW	Northern Australian Fisheries Management Workshop
NOO	National Oceans Office
NPOA	National Plan of Action
NRSMPA	National Representative System of Marine Protected Areas
PNG	Papua New Guinea
PZJA	Torres Strait Protected Zone Joint Authority
QB&FP	Queensland Boating and Fisheries Patrol
QDPI&F	Queensland Department of Primary Industries and Fisheries
Torres Strait CRC	Torres Strait Co-operative Research Centre
TAC	Total Allowable Catch
TSF Act	<i>Torres Strait Fisheries Act 1984</i>
TSFF	Torres Strait Finfish Fishery
TSFMAC	Torres Strait Fisheries Management Advisory Committee

TSPZ	Torres Strait Protected Zone
TSRA	Torres Strait Regional Authority
TSSAC	Torres Strait Scientific Advisory Committee
TSTRLF	Torres Strait Tropical Rock Lobster Fishery
WTO	Wildlife Trade Operation