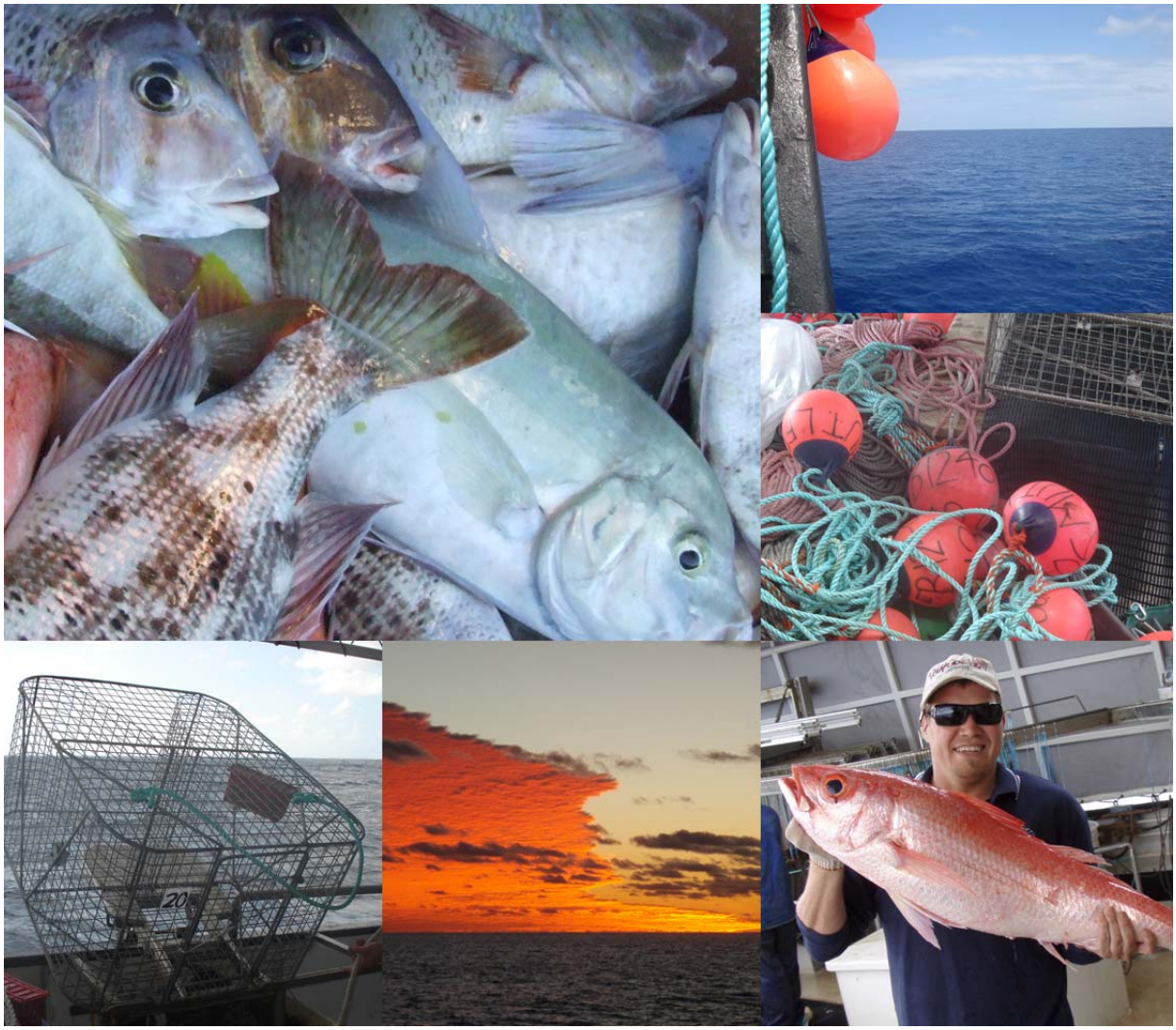
Australian Government
Australian Fisheries Management Authority

STRATEGIC ASSESSMENT REPORT
September 2010

CORAL SEA FISHERY



www.afma.gov.au
Protecting our fishing future
Box 7051, Canberra Business Centre, ACT 2610 Tel (02) 6225 5555 Fax (02) 6225 5500
AFMA Direct 1300 723 621

Executive Summary

This report has been prepared by AFMA for the assessment of the Coral Sea Fishery (CSF) as an approved Wildlife Trade Operation under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) by the Department of the Environment, Water, Heritage and the Arts (DEWHA).

On 16 November 2007, DEWHA advised AFMA that it was satisfied that the operation of the CSF was consistent with the objectives of the wildlife trade provisions in Part 13A of the EPBC Act, and that it is unlikely to be detrimental to the survival or conservation status of any taxon to which the fishery operation relates, or threaten any relevant ecosystem in the short term. The Wildlife Trade Operation (WTO) approval was provided for a relatively short period of 16 months, to provide for reassessment of the fishery once key management arrangements such as the ecological risk assessment and harvest strategy for the fishery were completed. The WTO approval has since been extended a number of times and is now due to expire on 19 November 2010.

The WTO declaration was subject to conditions which have been outlined in this report and which have been met by AFMA.

The CSF is a relatively small but diverse fishery, targeting a wide range of species with methods including line, trap, trawl and hand collection. Entry to the CSF is limited to the existing 16 fishing permits. The CSF operates over a large area encompassing a diverse range of habitats and species from east of Sandy Cape (Fraser Island) to east of Cape York. The Fishery commences east of the Great Barrier Reef Marine Park (GBRMP) and extends to the edge of the Australian Fishing Zone (AFZ).

The CSF is part of the Coral Sea Conservation Zone, declared in 2009 by the Minister for Environment Protection, Heritage and the Arts. It excludes the areas of the Coringa-Herald and Lihou Reef National Nature Reserves. Together the Nature Reserves cover approximately 17,000 square kilometres of coral reef habitat and contribute significantly to conservation objectives in the region.

The fishery is managed by AFMA in consultation with a range of stakeholders under the *Fisheries Management Act 1991* (the Act). Policies such as harvest strategies, bycatch and discard work plans and voluntary industry codes also contribute to the management of the fishery.

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1 Description of the fishery

The CSF lies east of the Great Barrier Reef Marine Park (GBRMP) and extends to the edge of the Australian Fishing Zone (Figure 1). The fishery extends north from Sandy Cape (Fraser Island), to Cape York. It excludes the areas of the Coringa-Herald and Lihou Reef National Nature Reserves. Together the Nature Reserves cover approximately 17,000 square kilometres of coral reef habitat. The CSF often experiences adverse weather conditions which can make fishing difficult at certain times of the year.

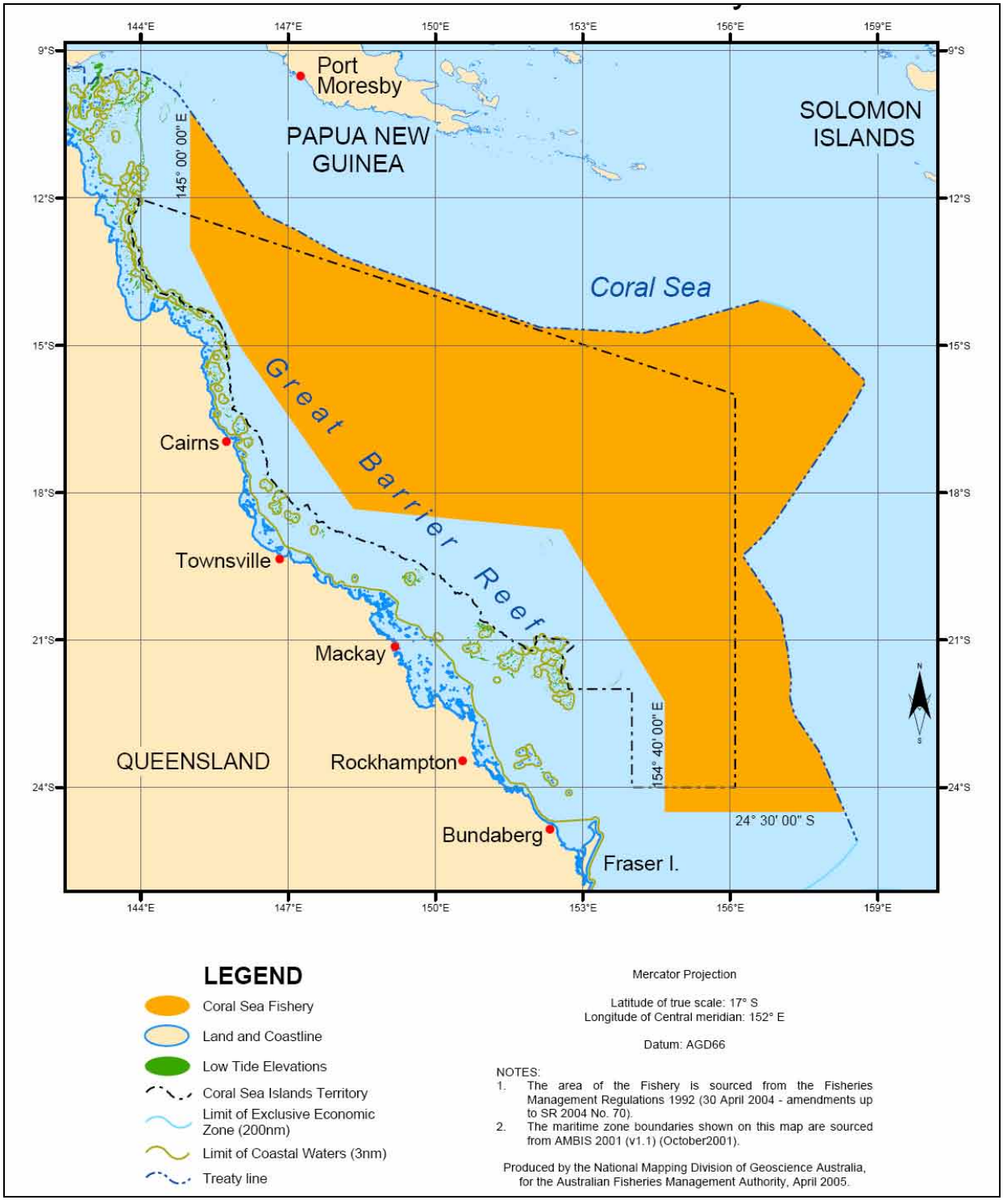


Figure 1. Area of the Coral Sea Fishery

The CSF is a diverse fishery employing a range of fishing methods to target a wide variety of species. Participation in the CSF is limited to 16 fishing permits, this means that new entrants to the fishery must purchase an existing permit and transfer this into their name before entering the fishery. AFMA maintains a register of all Commonwealth fishing permits on its website.

Table 1. Summary of the Coral Sea Fishery by sector

	Number of Permits	Target species	Fishing method/gear
Trawl and Trap	2	Tropical finfish and crustaceans	Otter trawl, demersal finfish traps
Line and Trap	8	Classes Chondrichthyes (cartilaginous fishes) and Osteichthyes (bony fishes)	Demersal longlines, trotlines, droplines, handlines and demersal finfish traps. Automatic baiting is available for use with the longline method, subject to application and additional conditions being met.
Lobster and Trochus	3	Tropical Rock Lobsters (*Panulirus ornatus, P. versicolor* and to a lesser degree *P. pennisiulatus*) Trochus (*Trochus niloticus* or *Tectus pyramis*)	Hand collection with or without underwater breathing apparatus.
Aquarium	2	Classes Chondrichthyes (cartilaginous fishes) and Osteichthyes (bony fishes) Live rock (limestone covered with coralline algae and other encrusting species) Coral is not permitted to be taken in the CSF.	Cast, scoop and seine nets, and handlines with barbless hooks may be used with or without the aid of underwater breathing apparatus Live rock collection using non mechanical implements
Sea Cucumber	2	Amberfish (*Thelenota anax*) Blackfish (probably *Actinopynga miliaris*) Black teatfish (*Holothuria whitmaei*) Greenfish (*Stichopus chloronotus*) Lollyfish (*Holothuria atra*) Prickly redfish (*Thelenota ananas*) Sand fish (*Holothuria scabra*) Surf redfish (*Actinapyga mauritiana*) White teatfish (*Holothuria fuscogilva*) Deepwater redfish (*Actinopyga echinites*) Elephant trunkfish (*Holothuria fuscopunctata*) Curry fish (*Stichopus hermanni*)	Hand collection with or without underwater breathing apparatus.

Target and bycatch species

Target species

The CSF catches a wide range of species (Table 1). Analysis of AFMA Logbook data (excluding Aquarium sector data) revealed at least 198 different species have been caught in the CSF since 1998. Approximately 25% of these species were caught exclusively by CSF operators; remaining species were also caught by other AFMA fisheries.

The species caught varies depending on the methods used as well as the areas and times fished. Due to the variability in species caught and fishing effort expended across the different fishery sectors, the distinction between target and bycatch species can be difficult to make.

The Lobster and Trochus, Aquarium, and Sea Cucumber sectors employ methods which are highly selective and able to avoid bycatch species.

The Line and Trap, and Trawl and Trap sectors target a wide range of species and there is no clear distinction between target and bycatch species in these sectors; this is also indicated by the variable catch compositions over time.

All permits in the CSF prohibit the taking or carrying of the following tuna and tuna like species:

- fish of the family Scombridae except fish of the genera *Scomberomorus*, Scomber;
- *Acanthocybium, Grammatorcynus* and *Rastrelliger* (commonly known as mackerels);
- fish of the families *Istiophoridae* and *Xiphiidae* (commonly known as billfish); and
- fish of the family *Bramidae* (commonly known as pomfrets or ray's bream).

An outline of the species retained in the greatest volumes by each sector (excluding the Aquarium sector), is presented in Table 2.

Bycatch species

The CSF is an opportunistic fishery targeting a wide range of species. Less commercially valuable species are discarded.

All trap operators are required to release all non-finfish in a manner that best assures their survival.

There is no bycatch in the Sea Cucumber, Aquarium, and Lobster and Trochus sectors.

Trawl operators are required to use nets with a specified minimum mesh diameter to limit bycatch and also utilise a Bycatch Reduction Device (BRD) when trawling for crustaceans.

Line operators must use specified bird scaring devices whenever using automatic longline gear.

All line, trap and trawl operators are required to release live deepwater shark species, however may retain a small quantity of these species subject to strict trip limits if these animals are brought aboard dead.

Table 3 outlines the top ten discarded species by catch weight over the past five years.

Table 2. Top ten species by total retained weight determined from logbooks over the period 2004/05-2008/09 inclusive.

Common Name	Scientific Name
Line	
Bar Rockcod	*Epinephelus ergastularius and E. septemfasciatus*
Blacktip shark (mixed)	*Carcharhinus spp.*
Blue-eye Trevalla	*Hyperoglyphe antarctica*
Flame Snapper	*Etelis coruscans*
Paddletail Seabream	*Gymnocranius euanus*
Rosy Snapper	*Pristipomoides filamentosus*
Ruby Snapper	*Etelis carbunculus*
Scalloped Hammerhead	*Sphyrna lewini*
Tiger Shark	*Galeocerdo cuvier*
Whitetip Reef Shark	*Triaenodon obesus*
Trawl	
Alfonsino	*Beryx splendens*
Flame Snapper	*Etelis coruscans*
Gemfish[1]	*Rexea solandri*
Giant scarlet prawn	*Aristaeopsis edwardsiana*
Hapuku and Bass Groper	*Polyprion spp.*
Longfinned bullseye	*Cookeolus japonicus*
Prawns (mixed)	Families Penaeoidea and Caridea
Red spot king prawns	*Melicertus longistylus*
Redbait (mixed)	*Emmelichthys spp.*
Temperate basses & rockcods	Families Percichthyidae and Serranidae
Trap	
Grass Emperor	*Lethrinus laticaudis*
Paddletail Seabream	*Gymnocranius euanus*
Pelagic morid and eucla cods	Families Melanonidae, Moridae and Euclichthyidae
Purple Rockcod	*Epinephelus cyanopodus*
Red Emperor	*Lutjanus sebae*
Redthroat Emperor	*Lethrinus miniatus*
Rockcod (mixed)	*Aethaloperca, Anyperodon* and *Epinephelus spp.*
Rosy Snapper	*Pristipomoides filamentosus*
Sea Perch	*Lutjanus spp.*
Spotcheek Emperor	*Lethrinus rubrioperculatus*

[1] Eastern Gemfish is considered overfished in the Southern and Eastern Scalefish and Shark Fishery (SESSF) and subject to a stock rebuilding strategy. The status of Gemfish stocks in the CSF is uncertain and no linkage with SESSF stocks has been determined. There is no evidence that the historically low and highly variable catches in the CSF are unsustainable and at the time of writing there has been no reported catch of Gemfish in the CSF since 2007. The CSF Harvest Strategy monitors the catch of all species and ensures significant changes are investigated.

Table 3. Top ten species by total discarded weight determined from logbooks over the period 2004/05-2008/09 inclusive.

Common Name	Scientific Name
Line	
Tawny Shark	*Nebrius ferrugineus*
Blacktip sharks	*Carcharhinus spp.*
Whaler Shark	Family Carcharhinidae
Tiger Shark	*Galeocerdo cuvier*
Red Bass	*Lutjanus bohar*
Scalloped Hammerhead	*Sphyrna lewini*
Shark other	Sharks - other
Scarlet Sea Perch / Large Mouth Nannygai	*Lutjanus malabaricus*
Tripletail Maori Wrasse	*Cheilinus trilobatus*
Sandbar Shark	*Carcharhinus plumbeus*
Trawl	
Cardinal Fish	Family Apogonidae
Lantern fishers	Family Myctophidae
Mackerel	*Scomber scombrus*
Mixed fish	Mixed fish
Jack Mackerel	*Trachurus declivis*
Mixed prawns	Families Penaeoidea and Caridea
Skates and rays	Skates and rays
Scarlet Sea Perch / Large Mouth Nannygai	*Lutjanus malabaricus*
Skates	Family Rajidae
Trap	
Red Bass	*Lutjanus bohar*
Scarlet Sea Perch / Large Mouth Nannygai	*Lutjanus malabaricus*
Starry Trigger Fish	*Abalistes stellaris*
Leatherjacket	Families Balistidae and Monacanthidae
Sea Perch	*Lutjanus spp.*
Whitetip Reef Shark	*Triaenodon obesus*
Schooling Bannerfish	*Heniochus diphreutes*
School & Gummy family	Family Triakidae
Shark other	Sharks - other
Eel	Family Congridae

Fishing areas

The CSF lies east of the GBRMP and extends to the edge of the Australian Fishing Zone, it extends north from Sandy Cape, Fraser Island, to Cape York but excludes the area of the Coringa-Herald and Lihou Reef National Nature Reserves, an area spanning approximately 17,000 square kilometres (Figure 1). Spatial management tools including a rotational reef harvest strategy; 'Move-on' provisions, requiring fishers to move to new anchorage once a certain amount of catch has been taken are also used in the CSF.

The majority of effort is concentrated in two regions, between Cape Melville and Townsville in the north, and Mackay and the southern boundary of the fishery.

2 Management arrangements

The *Fisheries Management Act 1991* (the Act) and the *Fisheries Management Regulations 1992* provide the principal legal framework for the management of the CSF.

A limited number of fishing permits are granted each year under the Act; these permits are subject to conditions set out in section 32(5) of the Act as well as conditions specified on the permits. Each permit includes conditions specific to the sector to which it relates and may contain conditions specific to the particular permit. Conditions may include limits on the number of persons able to fish under the permit at any time, gear restrictions, species size limits, trigger limits and total allowable catch limits (TACs) as well as spatial controls.

Through an approach known as ecosystem based fisheries management (EBFM), AFMA aims to minimise the impacts of Commonwealth managed fisheries on all aspects of the marine ecosystem. AFMA's adoption of EBFM is a significant departure from traditional fisheries management with the focus shifted from the direct management of target species to also considering the impacts on bycatch species, protected (TEP) species, habitats, and communities. This approach is supported through a range of policies such as Harvest Strategies, Bycatch and Discard Work Plans and voluntary industry codes of practice. Management of the fishery is designed to be precautionary, monitoring activity and collecting data for more detailed analysis as fishing activity increases. This approach effectively minimises costs to the fishery while fishing activity and risks of impact are low; the level of assessment increases as fishing increases.

Fishing permits

All CSF fishing permits are granted for the duration of the financial year (1 July – 30 June) after which time the holder of the permit may be invited to reapply for another permit. Persons have three months to reapply for a permit following the expiration of their fishing permit and must not fish without a copy of a current fishing permit authorising their activity on board their boat.

3 Changes to management arrangements

Wording relating to the carriage of Observers, protected species interactions, Integrated Computer Vessel Monitoring System (ICVMS or VMS) requirements, and shark landing requirements have been clarified and standardised with other Commonwealth fisheries. Other minor changes have been made to conditions to clarify their intent and increase their enforceability; these include the following:

- Limits on the number of operators able to fish under each concession were removed from sea cucumber, lobster, trochus and aquarium collection permits. This limitation was difficult to enforce and is unnecessary while limits on the number of tender boats, TACs, catch and effort triggers, and spatial management measures such as the rotational zone plan and move-on provisions remain in force.
- Requirement to submit trip reports removed as this represented a duplication of effort. Information already obtained through logbooks, catch disposal records, Observer reports, ICVMS and other reporting mechanisms such as Crimfish and the Customs hotline.
- Reporting requirements clarified to ensure logbook (including TEP interactions) and catch disposal records are completed and submitted to AFMA.
- Prior reporting requirements removed consistent with other Commonwealth managed fisheries; all fisheries (and all vessels in the CSF) are now monitored using ICVMS.
- Observer coverage made more consistent for all line fishing permits. Minimum 25% observer coverage now specified on all line fishing permits; this represents an increase in observer coverage for some operators.

- Removal of the provision to reduce Observer coverage once a certain amount of fishing activity has been observed. Given the generally low and often variable activity in the fishery this provision has not been applicable or necessary. Observer coverage is considered a useful means of collecting additional information on the fishery.
- Procedures for measuring nets and trochus clarified. This helps industry follow a consistent approach, more consistent with other fisheries. Actual net mesh and trochus size limits were not changed.
- All non finfish species taken with demersal finfish traps to be released in a manner that best ensures their survival. This condition was introduced to encourage the pursuit of best practice rather than in response to catch levels or release practices.
- Limit of 15,000 hooks able to be used, stowed, or secured onboard the boat at any time now extended to all line methods in the CSF. This limit previously only applied to automatic longline methods. In practice, methods other than auto-longline use fewer than 15,000 hooks.
- Shark processing requirements clarified and standardised with other Commonwealth fisheries. Shark fins now must remain naturally attached to the carcass. This better facilitates identification of species from which fins are taken and limits opportunities to mix and match more valuable carcasses with fins.
- Trip limits introduced for certain deepwater shark species. Although not presently considered overfished (based on extremely low and infrequent catch), these arrangements recognise that deepwater sharks may be more susceptible to overfishing. These precautionary limits align the CSF with measures being taken in the SESSF.
- Clarification of bird scaring device requirements to ensure their use at all times while using automatic or randomly baited longlines. AFMA acknowledges that the risk of interacting with seabirds in the CSF is low given the limited activity and latitude of the fishery. Logbook and Observer records show no reported interactions with any seabirds in the CSF to date.
- Removal of conditions requiring compliance with the *Fisheries Management Regulations 1992*; these requirements are implicit in all fishing permits.
- Depth limit for auto-longline operators now ensures no more than 50% of hooks are set in waters ≤200m deep when an Observer is on board. This strengthens the intent of the previous condition.
- Catch limits and move on provisions for the sea cucumber sector were clarified. These requirements now stipulate whole wet weights, not processed weights; this was previously ill-defined.

Four Harvest Strategies were developed for the CSF under the Commonwealth Harvest Strategy Policy. These were finalised on 12 December 2007 and have been implemented since 1 July 2008. Following this period of implementation, the Harvest Strategy triggers and responses are now being reviewed to ensure they are both efficient and effective. The review is scheduled for completion during 2010/11.

Interim management arrangements for Humphead Maori Wrasse were introduced, limiting catch to a total of 10 individuals for the period 19 May – 19 November 2010. Humphead Maori Wrasse is listed in Schedule 2 by the Convention on International Trade in Endangered Species (CITES). AFMA, with the input of Industry and scientific experts, has developed more informed, but still highly precautionary management arrangements for this species; these arrangements are outlined below.

A Stewardship Action Plan has been developed by ProVision Reef for the Aquarium collection industry. This document encourages sustainable practice and also considers the impacts of climate change on fisheries. State and Commonwealth management agencies have had input into this document and both CSF Aquarium sector concession holders are signatories to this Action Plan.

Management of species listed under the Convention on International Trade of Endangered Species (CITES)

The only CITES listed species taken in the CSF is the Humphead Maori Wrasse (*Cheilinus undulates*); this species is listed under CITES Appendix II. Appendix II includes species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization incompatible with their survival (www.cites.org).

Humphead Maori Wrasse is a highly prized food fish in some countries, and has been heavily exploited for the live fish (seafood) trade through its core range in southeast Asia (Sadovy et al. 2003). Much of the catch for the live fish trade in these source countries is of small, juvenile fish (Russell, 2004).

In Australia's Commonwealth-managed fisheries, catches are much lower, with individual fish sold to major aquaria around the world for public display and education purposes.

The current rate of exploitation of Humphead Maori Wrasse in the CSF is considered negligible by prominent scientific experts, however the CITES listing requires member nations, including Australia, to ensure trade of this species does not jeopardise the survival of the species. For this species to be exported, the EPBC Act requires a non-detriment finding to be determined.

AFMA has provided a detailed submission to DEWHA, to inform the decision on a CITES non-detriment finding, and allow management arrangements for Humphead Maori Wrasse to be included as part of the approved WTO for the CSF.

The submission includes detailed information about the species, its biology, distribution, population densities and preferred habitats, as well as current management and sources of mortality. The submission proposes a highly conservative catch limit of 50 Humphead Maori Wrasse per annum from the CSF. This limit is considered well within the bounds of sustainability by prominent fisheries scientists with expertise in this species, and unlikely to have a measurable impact on Humphead Maori Wrasse populations in the CSF or elsewhere within their range.

AFMA will monitor the take of Humphead Maori Wrasse, including any discards should these occur, and manage any changes and potential risks through the CSF Harvest Strategy and Bycatch and Discard Work Plan.

4 Consultation processes

AFMA consults a range of stakeholders about any development, implementation and review of fisheries management arrangements in the CSF. An annual stakeholder meeting is also held at least once a year (typically in March/April) to discuss issues relevant to the management of the fishery. AFMA also seeks to consult DEWHA before any significant amendments to management arrangements are implemented.

AFMA considers wherever possible the overlap of species and management issues with adjoining Queensland State fisheries and where appropriate consults Queensland State fisheries managers, Great Barrier Reef Marine Park Authority (GBRMPA) managers and Queensland Scientific Advisory Groups (SAGs) in developing and implementing management arrangements for the CSF. The SAGs provide scientific advice to Queensland State fisheries managers and are considered experts in their field. The Chairs of the two relevant SAGs are also involved with other fisheries in State and Commonwealth waters and bring invaluable expertise to the management of the CSF, ensuring it remains wherever possible, aligned with these related State and Commonwealth fisheries.

AFMA undertake to consult as widely as practicable to develop sound fisheries management arrangements.

5 Outcomes of review processes

AFMA undertake regular reviews of management arrangements in all managed fisheries, including the CSF. This includes review of fishing permit conditions and management arrangements more generally. Details of recent changes are outlined in section 3 of this submission.

The CSF Harvest Strategy is currently undergoing review to ensure the fishery remains ecologically sustainable and economically efficient. This review seeks to incorporate feedback and advice from stakeholders including Queensland State fisheries managers, DEWHA, BRS, scientific experts and Industry. The current review is also informed by a review undertaken by CSIRO during 2009 (previously supplied to DEWHA).

AFMA also commissioned an independent review of the methodology used to undertake the *Coral Sea Fishery Qualitative Risk Analysis Part 1: Protected (TEP) and Chondrichthyan Species.* The advice from this review was used to refine elements of the risk analysis report and will be used to inform subsequent risk analyses using this methodology.

6 Harvest strategies – an overview

The *Commonwealth Fisheries Harvest Strategy Policy 2007* and associated guidelines provides a consistent framework for taking the available information about a particular fish stock and applying an evidence-based, precautionary approach to setting harvest levels on a fishery by fishery basis. Harvest strategies set out the management actions necessary to achieve defined biological and economic objectives in a fishery.

Harvest strategies contain:

- a process for monitoring and conducting assessments of the biological and economic conditions of the fishery; and
- rules that control the intensity of fishing activity according to the biological and economic conditions of the fishery (as defined by the assessment). These rules are referred to as decision rules.

With a harvest strategy in place, fishery managers and industry are able to operate with greater confidence, management decisions are more transparent, and there should be fewer unanticipated outcomes necessitating hasty management responses.

Harvest strategies for the CSF were developed in December 2007, and implemented with the start of the fishing year in July 2008. AFMA is currently in the process of consolidating the four existing Harvest Strategies for the CSF into a single Harvest Strategy for the CSF. During this process some triggers are being refined and rationale for triggers and responses is being more clearly specified. This exercise seeks to make the document more accessible to stakeholders, more consistent between sectors and with the format of other Commonwealth Harvest Strategies, as well as ensuring it remains both efficient and effective.

The revised CSF Harvest Strategy will still retain triggers tailored to each sector of the fishery and will continue to ensure fishery development is linked to assessment and evolving management actions.

The extent and cost, of management responses specified in the Harvest Strategy remains linked to the potential risk to the fishery and level of uncertainty it presents. The first trigger point and decision rule aims to detect and determine why the change has occurred, its extent and possible implications, and appropriate management responses. Reaching a higher trigger point requires fishing for the relevant species to be restricted until an assessment can show that it can continue by way of a revised trigger point. Following any assessment, trigger limits may be revised up or down.

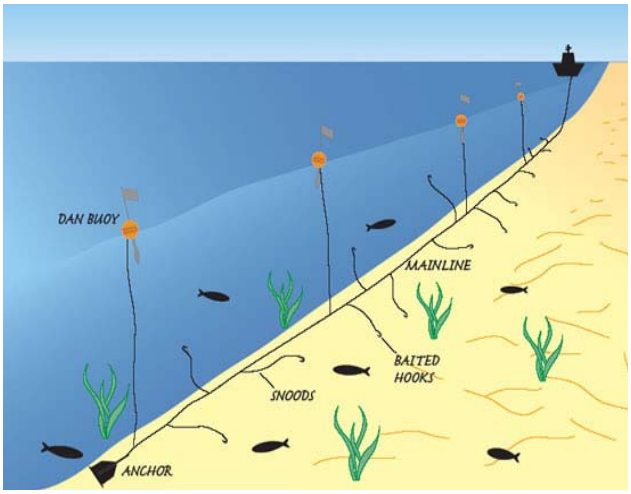
7 Fishery sectors – gear and method descriptions

Descriptions from Kailola et al, 1993.

Line and Trap sector

Line and Trap sector permits allow the use of demersal longline, setline, dropline and trotline methods. Permit conditions aim to minimise interactions with protected species and include the use of tori lines, hook and depth limits and Observer coverage.

Demersal Longline



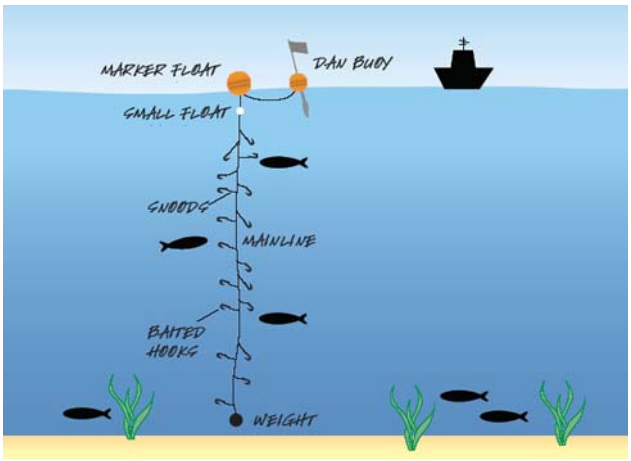
A demersal longline consists of a sinking main-line constructed of 6-8mm diameter synthetic rope with snoods (branch lines) about 1 metre long attached at intervals of 6 to 10 metres. Each snood carries a hook at one end and is attached to the main-line at the other end either permanently or by means of a 'snood clip'.

The gear is divided into a number of 'sets' which each has a certain number of hooks. Each hook is baited before the gear is deployed into the water. The hooks together with the main-line and an anchor weight at each end are placed on the seabed. A buoy and dan pole with flag attached by way of buoy-line to the main-line at each end for retrieval of the gear. The main-line is hauled from one end over a roller mounted on the gunnels by a line hauler.

Demersal longlines can be set in deep water on the continental slope and in strong tidal currents where it is more difficult to set other gear. The steep rocky slopes of seamounts and plateaus are usually targeted in depths ranging from 30 to 500 metres, most typically 370 metres (Furlani et al. 2007).

Auto-longline uses the same method as demersal longline except automated baiting allows for deployment of more hooks in a shorter time period. Use of automatic or random baiting equipment with demersal longline gear is specifically prohibited unless otherwise stated in the permit conditions. AFMA will permit the use of such equipment by some operators in the fishery, subject to application and additional conditions such as conditions relating to bycatch reduction for seabirds. A minimum depth limit of 200 metres (unless an observer is on board) also applies to operators of automatic/random baiting equipment. At the time of writing, only one longline permit allows automatic/random baiting.

A trotline is very similar to the demersal longline described above. The main-line of a trotline has a small float attached to suspend it off the seabed, avoiding snagging on the bottom. The snoods (also called trots) are attached to the main-line in a similar way to demersal longlines at intervals of 6 to10 metres. These snoods are weighted and hang vertically under the main-line and act like a series of short droplines. Trotlines are deployed and retrieved in a similar way to demersal longlines. All hooks are baited before deployment with similar baits to demersal longlines.



Dropline

A dropline consists of a main-line, usually made of synthetic rope, set vertically in the water with a weight on the bottom and floats attached at the surface. Between 10 and

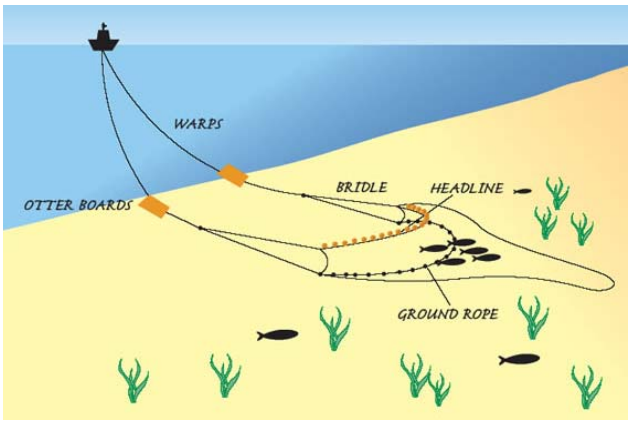
100 short snoods are either clipped or permanently attached to the main-line at regular intervals at one end and have a hook on the other.

The hooks are baited before the gear is deployed. Gear is deployed by dropping the weighted end of the main-line overboard and letting the main-line run off, either attaching the snoods as the line deploys or allowing permanently fixed snoods to run off 'shooting rails'. The gear is retrieved by a line hauler (powered winch) with the caught fish removed from the snoods as they come aboard.

Setline

Setline is the simplest form of fishing. A setline (or handline) is a line to which one or more lures or baits are attached. Setlines are set and retrieved manually, although electric or hydraulic motors are available to reduce labour.

Trawl and Trap sector



Demersal and mid-water otter board trawl gear is used in this sector to target bony fish and crustaceans. Demersal trawling is the term used to describe the fishing method where a net is towed along, or just above, the ocean floor in depths of water ranging from a few metres to 1,500 metres. A trawl net is attached to the vessel by two long wires, called warps which are attached to an otter board either side of the net. The net opening (mouth) is spread horizontally by the outward force acting on the otter boards as they are towed through the water. The bottom of the net opening is called the footrope and is heavier than the headline and normally in contact with the bottom. The footrope is often rigged with rubber rollers to minimise the damage to the seafloor and allow it to move across the substrate without becoming snagged. The top of the mouth (headline) is lifted vertically by a series of floats.

Otter trawling relies on the principle of herding fish inward from the otter boards and the sweep (wire from otter board to the headline and footrope) towards the mouth of the trawl net. Fish have a natural tendency to swim away from the otter boards, sweeps and net wings and fall backwards, towards the codend. The codend is the end of the net where the fish are caught. The size of the mesh in the codend is one of the most important factors in the size and shape of fish that are caught and those that escape.

A trawl shot involves the net being deployed from the stern of the vessel by way of winches. The net is then towed along the bottom, usually at around 3 knots for a period of time before being hauled up toward the vessel. The fish are contained in the codend, which is fastened with a rope to release the catch on the vessel deck.

Trawl sector permit conditions aim to minimise interactions with protected species and specify a minimum net-mesh size and the use of Bycatch Reduction Devices (BRDs) when trawling for crustaceans.

Provision for demersal finfish traps are included on all CSF permits that allow either Line or Trawl methods. Fish traps are devices which fish enter voluntarily but from which they are prevented in some way from escaping. Fish are enticed into the trap either by bait or because the trap appears to provide some sort of refuge. Demersal finfish traps are set on the sea floor with a haul-in line, surface float and dan buoy to mark their position. Traps are left to fish from 20 minutes to 24 hours.

Galvanised steel traps are used in the CSF and there are limits on the number and size of traps used. All traps must be fitted with sacrificial anodes (of no more than one month life span fitted to trap doors) to avoid ghost fishing if the traps are lost. Traps in the CSF are typically set at between 60 and 120 metres depth, with most catch occurring between 80-100m depth.

Lobster and Trochus sector

Lobster and Trochus sector permits allow hand collection with or without the use of underwater breathing apparatus. Diving usually occurs within 30 metres of the surface.

The level of catch and effort is generally very low but can be highly variable across years. Effort is generally focused on three reefs closest to the GBRMP.

Aquarium sector

The Aquarium sector generally operates within the 30 metre depth range, however there are no limitations associated with the permits. While a diverse range of fish species (over 500 species) are targeted for the aquarium trade, much of the trade tends to be focused on a limited number of species such as blue green chromis and humbugs (Roelofs and Silcock 2008). Collection of live rock by hand or use of non mechanical implements is also permitted, subject to an annual catch limit.

Aquarium sector permits allow operators to use their hands, barbless hook and line, cast nets and seine nets and/or scoop nets for herding and catching fish. Underwater breathing apparatus (such as SCUBA or Hookah equipment) may also be used. Gear restrictions are in place for this sector and the use of chemicals and or explosives for taking fish is prohibited.

Each permit specifies a maximum number of tender boats and harvest strategy trigger limits also apply to catch and effort.

Both effort and catch can be highly variable in the CSF Aquarium sector. The current operators of CSF Aquarium sector permits also have permits that allow them to operate in the GBRMP, these are issued and managed by the Queensland Department of Employment, Economic Development and Innovation (QDEEDI). Logbook records of Aquarium catch and effort are shared across the GBRMP and the CSF. Operators are prohibited from fishing in more than one jurisdiction on any trip where they are fishing under the authority of their CSF fishing permit.

Sea Cucumber sector

Collection of sea cucumber may only be done by hand with, or without the use of underwater breathing apparatus. Limits apply to the number of tender boats that can be used and limits also apply to individual species, total catch and catch per reef. A rotational harvest plan is also in place for this sector.

8 Other types of permits

Fish Receiver Permits

All CSF permit holders, with the exception of the Aquarium sector, are required to unload their catch to a licensed Commonwealth Fish Receiver Permit holder. This requirement is stipulated in CSF fishing permit conditions.

Validation of Aquarium sector catch is not practical using Fish Receivers and is instead managed as part of AFMA's Compliance program.

Fish Receiver Permits are granted for 12 months duration and cannot be issued to the same person who holds a fishing permit. They cannot be transferred.

Fish Receivers are required to complete the Catch Disposal Record (CDR) within 50 metres of the point the consignment is unloaded however this can be extended to 500 metres upon written application to AFMA for an exemption.

Scientific Permits

Scientific Permits are granted for the purposes of conducting scientific research in a specified area of the Australian Fishing Zone (AFZ). Although they do not generally relate to a specific fishery, they are subject to conditions, consistent with the *Fisheries Management Act 1991* and are considered on a case by case basis by relevant fisheries managers and licensing staff. Applications for the grant of a scientific permit must contain all information that AFMA requires

for proper consideration of the application. Scientific Permits are granted for a maximum duration of six months and are not transferable.

9 Allocation between fishing sectors

Commonwealth Fisheries

AFMA manages all fishing in the area of the Coral Sea, which is commercial in nature. The Eastern Tuna and Billfish Fishery, Eastern Skipjack Tuna Fishery and the Southern Bluefin Tuna Fishery all overlap the CSF area of waters. These fisheries operate pelagically targeting Tuna and Tuna-like species. All CSF concessions are prohibited from targeting or being in possession of Tuna or Tuna-like species. The Southern and Eastern Scalefish and Shark Fishery and Southern Squid Jig Fishery are adjacent to the southern bounds of the CSF and the Torres Strait fisheries bound areas of waters to the north of the CSF; these fisheries are managed separately to the CSF.

Recreational and Charter Fisheries

Recreational and charter fishing in the area of the Coral Sea is managed by the QDEEDI. A number of charter operators run recreational fishing trips into the area of the Coral Sea. The fishery is remote and consequently only a small number of recreational trips are run each year. Catch from these trips is thought to be small.

Indigenous Fisheries

Indigenous Fishing in the area of the Coral Sea is managed by the QDEEDI. Due to the CSF's distance from the coastline, the level of indigenous fishing in this area is thought to be minimal or non-existent.

State Managed Commercial Fisheries

A number of commercial fisheries exist in Queensland State managed waters adjacent to the western bounds of the CSF.

10 Status of export approval/accreditation under the *Environment Protection and Biodiversity Act 1999*

The CSF was last assessed in 2007 under section 33, Parts 13 and 13A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Harvesting operations in the CSF were declared an approved Wildlife Trade Operation on 16 November 2007 until 19 March 2009; this approval was subsequently extended a number of times and now expires on 19 November 2010. The current approvals for the CSF are subject to a range of conditions and recommendations to improve management of the fishery. Details of the fishery's progress against these conditions and recommendations are detailed in section 31 of this report.

11 Observers

The Observer's role is to collect independent, accurate and reliable data on Commonwealth fishing operations, catches, and interactions with the environment and TEP species. This includes:

- collection of vessel activity, catch data, and TEP species interactions (in addition to official logbooks);
- collection of data for implementing harvest strategies, research programs, supporting marine management and other issues relevant to environmental awareness and management; and
- monitoring compliance of the vessel with its fishing agreements and obligations.

All CSF fishing operators must be able to facilitate carriage of an AFMA Observer if requested to do so. All CSF fishing operators must also comply with the following minimum observer coverage requirements as stated on their fishing permit. It is the responsibility of the

concession holder to monitor their observer coverage and notify AFMA at least 72 hours prior to departure to arrange for an observer as necessary.

Line and Trap sector and Trawl and Trap sectors

Operators in these sectors are required to carry an Observer on their first trip of the period starting 1 July – 30 June, and every fourth trip thereafter, covering at least 25% of all shots and trap lifts each year.

Sea Cucumber, Aquarium, and Lobster and Trochus sectors

There is no prescribed minimum Observer coverage for these sectors. Given the lack of bycatch, low risk of TEP interactions, and the observer's inability to observe fishing activity while diving. The cost of routine Observer coverage in these sectors outweighs the potential benefits. AFMA reserves the capacity to prescribe Observer coverage as required in these sectors as well as others.

Recent Observer coverage is outlined in section 32.

12 Catch verification

In addition to Observer coverage, catch verification is also facilitated using a system of AFMA authorised fish receivers and catch disposal records (CDRs). These apply to all sectors with the exception of the Aquarium sector.

Why catch verification is so difficult in the Aquarium sector

The Aquarium sector catches an extremely diverse range of species (~650+). Maintaining low stress levels after they are caught is crucial to their survival and health, particularly where these animals are to be exported. To maintain their health during the trip back to port, clean sea water is circulated through the holding tanks; this ceases as the boat approaches port. Industry has advised that the water quality within the port differs from that further offshore and cannot be circulated through the holding tanks without affecting the health of the catch. Assuming Observers have the necessary, highly specialised skills to identify Aquarium species, this identification and validation process would take several hours and would require water from within the port to be circulated through the holding tanks. The validation process would also increase the time the fishers (divers) are required to be involved as each diver is responsible for the wellbeing of the fish they have caught up until they are sold. The cost of Observer time and requisite training would also be significant.

For these reasons, the risks associated with misreporting are managed through AFMA's Compliance program.

13 Vessel Monitoring Systems

All AFMA licensed vessels in the CSF must operate an AFMA approved Integrated Computer Vessel Monitoring System to allow AFMA to monitor their activity.

14 Protected species, threat abatement plans, recovery plans, domestic and international agreements

Interactions with Protected Species

"Interaction" means any physical contact an individual (person, boat or gear) has with a protected species that causes death, injury or stress to the individual directly resulting from fishing activities. This includes any collisions, catching, hooking, netting, entangling, or trapping of a protected species.

CSF line, trawl, trap, and hand collection operators (other than Aquarium) are required to report interactions with protected species in their Commonwealth logbook. Aquarium operators must report interactions with protected species in the "comments" section of their relevant Queensland Logbook. Completed original logsheets must be submitted to AFMA. No protected species interactions have been reported in the CSF to date.

Seabird Threat Abatement Plan

The Threat Abatement Plan 2006 for the incidental catch of seabirds during oceanic longline fishing operations (TAP) applies to the CSF. This TAP is closely linked to recovery plans for threatened seabirds caught on longlines and Australia's National Plan of Action – Seabirds prepared to meet Australia's commitment to the Fisheries and Agriculture Organisation *International Plan of Action for reducing the Incidental Catch of Seabirds in Longline Fisheries*.

Auto longline fishing operations are currently required to carry observers for one in every four trips (or one in every three trips if using certain types of random/automatic baiting gear). Tori poles and streamers are also compulsory for auto longline operations and deter birds from interacting with baits.

Bycatch and Discard Work Plan

AFMA has undertaken a qualitative risk analysis for protected species (and chondrichthyans) in the CSF and the results have been used to develop a Bycatch and Discard Work Plan for the fishery. This Work Plan specifies mitigation strategies to ensure interactions with protected species remain low.

All trawl operations targeting crustaceans in the CSF must operate a Turtle Excluder Device (TED) at all times. If two or more interactions with a turtle, cetacean or EBPC Act 1999 listed chondrichthyan species are detected in a single year while trawling, AFMA will convene a panel involving scientific experts, Industry members and relevant managers to review the risks and consider whether existing mitigation strategies require amendment. This may include consideration of TED design and operation and/or other mitigation measures.

The panel will be convened and required to make its recommendation to AFMA within three months of the interactions being detected. Any resulting management arrangements will be implemented with immediate effect and apply until such time as it can be shown that risks to the aforementioned species have been otherwise mitigated.

Protected Species Identification Guide

To help operators accurately report their protected species interactions, AFMA has produced a protected species identification guide. This guide covers the range of protected species that AFMA managed fisheries do, or have the potential to, interact with during their normal fishing operations. The guide provides pictures of these species along with an indicative distribution and key biological information. All CSF boats have been provided with a copy of this identification guide.

15 Impacts of the fishery on the ecosystem

Ecological Risk Assessments

Through an approach known as ecosystem based fisheries management (EBFM), AFMA aims to minimise the impacts of Commonwealth managed fisheries on all aspects of the marine ecosystem. AFMA's adoption of EBFM is a significant departure from traditional fisheries management with the focus shifted from the direct management of target species to also considering the impacts on bycatch species, TEP species, habitats, and communities.

Key to AFMA's implementation of EBFM has been to develop and implement an ecological risk management (ERM) framework. The framework details a robust and transparent process to assess, analyse and respond to the ecological risks posed by Commonwealth managed fisheries.

The ERM framework progresses through a number of steps and involves a hierarchy of risk assessment methodologies progressing from a comprehensive but largely qualitative analysis at Level 1 to a quantitative analysis at Level 3. This approach means low risk activities can be screened out and attention can be focused more intensive and quantitative analyses on those activities assessed as having a greater environmental impact on AFMA managed fisheries.

The initial assessment stage involves the development of a qualitative ecological risk assessment (ERA) for each individual fishery. Ecological Risk Assessments assess the

impact, direct and indirect, that a fishery's activities may have on the marine ecosystem. These assessments provide the foundation for further risk assessment and analysis.

Eight Level 1 ERAs were completed for the CSF in 2006. It was decided at that time not to continue the assessment of the fishery to the Level 2 stage due to a paucity of catch and effort data. In reaching this decision AFMA also took account of the relatively high of cost of management versus the low GVP of the fishery.

The 2007 WTO approval was conditional on AFMA progressing ERAs for the CSF to Level 2. In recognition of the ongoing data limitations, AFMA and DEWHA agreed that this assessment would be need to be qualitative in nature and would be undertaken in two parts. The first part focussed on Chondrichthyan and Protected (TEP) species; this has been completed and results are presented in section 30 of this report. As traditional risk assessment processes are difficult to apply to the CSF, an expert-based group workshop approach will be used to identify high risk species for all sectors of the Fishery. This process is expected to be completed by 19 November 2010.

16 Spatial issues

Two Marine Protected Areas Coringa-Herald National Nature Reserve and Lihou Reef National Nature Reserve exist within the bounds of the CSF and cover an area of approximately 17,000 square kilometres. No commercial fishing is permitted in these reserves and management provisions are in place to detect any illegal fishing in these waters.

Provisions are in place for the Lobster and Trochus and the Sea Cucumber sectors which require fishing operators to move their mother-ship once a specified amount of quota or effort is reached. These measures help prevent localised depletion within the fishery.

Since July 2005 fishing permit holders targeting sea cucumbers have been signatories to the Memorandum of Understanding (MOU) in relation to the Queensland Sea Cucumber Association for the Waters under Australian Fisheries Management Authority Jurisdiction (2005–2008). This stipulates a three-year rotational harvesting strategy for sea cucumber on 21 reefs within the Coral Sea. The conditions of this memorandum are incorporated into the permit conditions and management arrangements for the sector.

Auto-longliners must fish in waters deeper than 200 metres unless an Observer is on board. If an Observer is on board 50% of hooks may be set shallower than 200 metres.

A MOU has been negotiated between the Coral Sea Fishers Association (CSFA) and the Cod Hole and Ribbon Reef Operators Association (CHARROA). Under the MOU, the CSFA has agreed not to hook fish within two kilometres of particular reefs in the CSF (Osprey Reef, Bouganville Reef, Flora Reef, Dart Reef and Heralds Surprise reef) in order to preserve iconic species of importance to tourist operators. In addition, a circular area with 0.75 nautical mile radius around CHARROA moorings at Osprey Reef, namely North Horn and Admiralty Anchor is protected from all fishing of sharks, rays, potato cod, Maori wrasse, Queensland groper, anemones and anemone fish.

17 Performance of the fishery against objectives, performance indicators and performance measures

The CSF is managed in accordance with the objectives specified in section 3 of the *Fisheries Management Act 1991*. The CSF's performance against these objectives is outlined in the AFMA Annual Report available at:
www.afma.gov.au/information/publications/corporate/annual/default.htm

18 Compliance risks present in the fishery and actions taken to reduce these risks

Compliance risks in the fishery include illegal fishing by unlicensed operators and fishing by licensed operators contrary to specified permit conditions. Illegal fishing by licensed operators could potentially include fishing in excess of allocated quota, non-compliance with size and gear restrictions and contravention of rotational harvest plans and spatial closures.

Measures taken to monitor compliance with CSF permit conditions and management arrangements include:

- patrols and investigations to ensure vessels operating in the area have the appropriate permits and are complying with the conditions of these permits.
- all Commercial fishing vessels are required to have an operational ICVMS installed when operating in the CSF., the data collected is used by AFMA to monitor activity in the fishery and verify other reported information.
- all relevant information about fish taken in the CSF as well as information on bycatch, discards and interactions with protected species must be accurately and fully recorded and submitted in appropriate logbooks. Catch Disposal Records are also required for all sectors other than the Aquarium sector. Observer coverage also collects data and raises awareness of various management issues and obligations.
- AFMA Fisheries Officers conduct both vessel and fish receiver premise inspections in accordance with section 84 of the *Fisheries Management Act 1991* (FMA).

AFMA's Compliance team undertake risk assessments to target their activities; monitoring activity is also targeted based on intelligence received and may also be opportunistic. This may include random inspections and other covert investigations.

19 Compliance with threat abatement plans, recovery plans, domestic and international agreements

The *Threat Abatement Plan 2006 for the incidental catch of seabirds during oceanic longline fishing operations* (TAP) applies to the CSF. This TAP is closely linked to recovery plans for threatened seabirds caught on longlines and Australia's *National Plan of Action – Seabirds* prepared to meet Australia's commitment to the Fisheries and Agriculture Organisation *International Plan of Action for reducing the Incidental Catch of Seabirds in Longline Fisheries*.

Auto longline fishing operations are currently required to carry Observers on the first trip of every fishing season and on one in every four trips (or one in every three trips if using certain baiting systems) thereafter.

Tori poles and streamers are compulsory for auto longline operations and deter birds from interacting with baits. AFMA has detected no infringements of these provisions in the CSF to date.

The recovery of marine turtles is promoted through *The Recovery Plan for Marine Turtles in Australia*, *2003*. Turtle exclusion devices have been required to be fitted to nets during trawl operations targeting crustaceans in the CSF. Observers are required on one in four trawl trips. Additional requirements are specified in the Bycatch and Discard Work Plan for the fishery. No interactions with marine turtles have been reported to date. During a trial of trawling for crustaceans at depths exceeding 400 metres during 2007 Observer coverage was compulsory; no interactions with marine turtles were observed during this period.

20 Catch data

The CSF recorded a commercial harvest of 53 tonnes for the 2008/2009 financial year with an estimated value of approximately $956,000. Markets are largely domestic, however some sea cucumber and aquarium fish are exported.

Catch data for the CSF is collected via logbooks. This data is verified by a combination of catch disposal records and Observer coverage for most sectors. Catch data for the CSF is outlined in sections 21, 22 and 24. AFMA's new Information Disclosure Policy, approved by the AFMA Commission at its June 2010 meeting, allows AFMA to publicly disclose the following fishing information for all fisheries, as long as it is consistent with Australia's obligations under international law:

- total fishing season catch and effort statistics for each species aggregated by fishing gear, sector and/or fishery (i.e. the five-boat rule does not apply); and
- total area of waters fished within a season by fishery, sector and/or method, irrespective to the number of boats in the fishery. This 'footprint' will be reported at a minimum spatial resolution of one degree square and will not include levels of effort or catch when there is less than five boats.

21 Total catch of target species (including retained and discarded catch)

The CSF catches a wide range of species on a largely opportunistic basis, as such, the distinction between target and non-target species is difficult to make. Species encountered by the CSF and other fisheries are recorded in logbooks. It should be noted that many species reported in the data are taken as bycatch by fisheries other than the CSF and may be discarded by these fisheries and also the CSF. The total catch of all species in the CSF for the period 1999/00 - 2008/09 is outlined in Table 4 below. This data includes all sectors except the Aquarium sector.

The total discard rate is generally low for the CSF, ranging between 1% and 11% of the total catch. It is unlikely that all species retained in the catch are target species due to the often exploratory nature of the fishery. Retained catch during 2008/09 was less than 16 tonnes.

Table 4. Total retained and discarded catch in the CSF 1999/00 – 2008/09. Catches are whole weights from logbooks.

Fishing year	Retained catch (whole wt kg)	Discarded catch (whole wt kg)	Total catch (whole wt kg)	Percentage discard
2008/09	15,927	1075	17,002	6%
2007/08	114,394	9290	123,684	8%
2006/07	182,060	21245	203,305	10%
2005/06	255,943	33165	289,108	11%
2004/05	171,279	4627	175,906	3%
2003/04	200,233	5441	205,674	3%
2002/03	163,010	2074	165,084	1%
2001/02	150,644	1792	152,435	1%
2000/01	123,005	3047	126,052	2%
1999/00	61,197	500	61,697	1%

22 Total catch of target species taken in other fisheries

It is unlikely that all species retained in the catch are target species due to the often exploratory and investigative nature of the fishery. The top ten species by retained catch weight are outlined in Table 5.

Maps of the fisheries listed in Table 5 can be found on the AFMA website at http://www.afma.gov.au/fisheries/fisheries_map.htm.

Of the 11 fisheries listed in Table 5, only the Eastern Tuna and Billfish Fishery (ETBF) has any spatial overlap with the area of the CSF. The Torres Strait Fisheries are located immediately north of the CSF, and although the Gillnet Hook and Trap and Great Australian Bight Fisheries are part of the Southern and Eastern Scalefish and Shark Fishery, these sub-fisheries do not extend to the CSF. Other fisheries such as the Eastern Skipjack, Southern Squid Jig and Southern Bluefin Tuna fisheries also overlap the CSF area but target different species and consequently do not feature in Table 5.

The High Seas Fishery (HSF, formerly High Seas Trawl and High Seas Non-trawl Fisheries) had the greatest overlap in terms of the number of the top ten CSF species caught. These top ten CSF species comprised only 2% of the total HSF catch compared to 31% in the CSF, however the quantities landed by both fisheries were low. Sea bream snapper was the species caught in the greatest quantity by the HSF. This species contributed less than one tonne of the catch taken in the CSF over the three year period however; this equates to less than 1% of the total CSF catch for the period.

All other species were caught in quantities of less than ten tonnes over the three year period. No significant overlap is evident from Table 5 between the top ten species caught in the CSF and adjacent fisheries. The quantities of species caught are not considered significant enough to impact sustainability.

Table 5. Retained catch of the top ten species for each of the Line, Trap, Trawl and Hand collection sectors of the CSF, relative to adjacent Commonwealth fisheries for the period 2006/07 – 2008/09.

IMPORTANT NOTE: Due to low and variable catches in the CSF, a three year period was used to determine the top ten species. Where species occurred in the top ten for multiple sectors, these catches were then grouped. Catches are whole weights in tonnes from logbooks. AFMA databases do not include all Torres Strait fishery sectors; consequently, only the Torres Strait Prawn Trawl sector is represented in Table 5.

Species	Coral Sea	Cwlth Trawl	Eastern Tuna and Billfish	Great Australian Bight	Gillnet Hook and Trap	High Seas	Northern Prawn	North West Slope	Torres Prawn	Western Deepwater Trawl	Western Tuna and Billfish	Total from adjacent fisheries
Hand Collection												
White teatfish	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
Prickly redfish	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
Black teatfish	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
Blackfish	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
Line, Trap and Trawl												
Paddletail sea bream	25.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
Blacktip shark (mixed)	20.9	0.1	6.5	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	*6.9*
Rosy snapper	20.5	0.0	0.0	0.0	0.1	9.3	0.0	0.0	0.0	1.5	0.0	*10.9*
Flame snapper	5.8	0.0	0.8	0.0	1.1	0.5	0.0	0.0	0.0	0.0	0.0	*2.4*
Rockcod (mixed)	5.2	0.6	0.0	0.0	0.2	2.3	0.0	0.0	0.0	0.1	0.0	*3.2*
Rusty jobfish	2.9	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	*0.3*
Trevallies	2.6	0.0	0.0	2.8	0.7	0.0	0.0	0.1	0.0	0.0	0.0	*3.7*
Amberjack	1.9	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	3.2	0.0	*4.7*
Green jobfish	1.7	0.0	0.0	0.0	0.0	8.1	0.0	0.0	0.0	0.0	0.0	*8.1*
Sea bream snapper	1.0	0.0	0.0	0.0	0.0	32.1	0.0	0.0	0.0	0.0	0.0	*32.1*
Total (these 14 species)	*97.8*	*0.7*	*7.3*	*2.9*	*2.1*	*54.3*	*0.0*	*0.1*	*0.0*	*4.8*	*0.1*	*72.3*
Total fishery catch (all species)	*312.4*	*42,642.6*	*18,234.3*	*9,862.4*	*12,034.0*	*2,282.8*	*18,694.1*	*235.4*	*2,872.3*	*124.7*	*1,103.0*	*108,085.6*

23 Catch of byproduct species (reported by species)

Please see sections 21 and 22.

The CSF catches a wide range of species on a largely opportunistic basis; the distinction between target and non-target species is difficult to make.

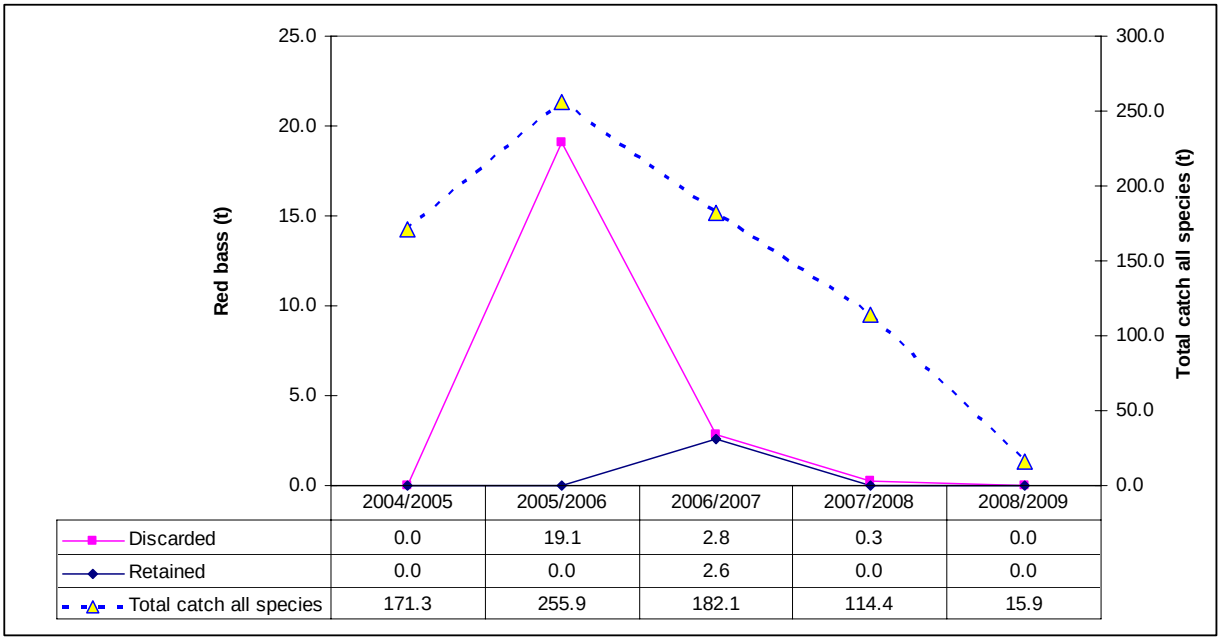
24 Total catch of bycatch species (reported by species if possible)

The CSF catches a wide range of species on a largely opportunistic basis; the distinction between target and non-target species is difficult to make. Complete records of total catch and total discards are appended to this submission.

At least 69 different species are represented in AFMA's discard data over the period 1998/99 – 2008/09. The quantity of catch discarded each year varies but on average is less than 7.5 tonnes per annum for the line, trap and trawl sectors combined.

There was a spike in discards in 2005/06, largely attributable to high discard levels of Red Bass caught by trap method. Observer reports indicate that most Red Bass are discarded in a live and vigorous condition, however, since 2005/06 the discard levels have fallen significantly. There are no records of any Red Bass being caught prior to 2004/05.

During 2006/07 and 2007/08 AFMA clarified that Red Bass caught in the CSF could be legally landed and sold in Queensland. The increased retention of this species seen in 2006/07 may be linked to this. There has been a general decline in fishing activity since this time however, so ongoing trends are difficult to determine. Figure 2 below outlines these trends.



	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Discarded	0.0	19.1	2.8	0.3	0.0
Retained	0.0	0.0	2.6	0.0	0.0
Total catch all species	171.3	255.9	182.1	114.4	15.9

Figure 2. Total Red Bass caught in the Coral Sea Fishery 1998/99-2008/09.

25 Harvest by each sector (i.e. commercial, recreational, indigenous and illegal)

All AFMA licensed vessels in the CSF must operate ICVMS to allow AFMA to monitor their activity. There is no evidence of illegal harvesting by CSF or other fishing vessels.

A number of charter operators run recreational fishing trips into the CSF. The fishery is remote and consequently only a small number of recreational trips are run each year. Catch from these trips is thought to be small. Recreational fishing in the area of the CSF is managed by QDEEDI.

Due to the CSF's distance from the coastline, the level of indigenous fishing in the CSF is thought to be minimal or non-existent. A project funded by the Fisheries Research and Development Corporation (FRDC) entitled the *National Recreational and Indigenous Fishing Survey* (Project No. 99/158) provided no additional information on indigenous fishing in the waters of the CSF.

Commonwealth commercial fisheries

Please see sections 21, 22 and 24.

A number of other Commonwealth fisheries overlap or are located near to the CSF.

The Eastern Tuna and Billfish Fishery, Eastern Skipjack Tuna Fishery and the Southern Bluefin Tuna Fishery all overlap the CSF area of waters but operate pelagically targeting tuna and tuna-like species. All CSF concessions are prohibited from targeting or being in possession of tuna or tuna-like species.

The Southern and Eastern Scalefish and Shark Fishery (SESSF) and Southern Squid Jig Fishery are adjacent to the southern bounds of the CSF. The SESSF is a large fishery comprised of many sectors and sub-fisheries. Key species taken in the CSF are not taken by sectors of the SESSF located near the CSF and those species taken by SESSF sectors located further south appear in very small quantities (see Table 5 above). The Southern Squid Jig Fishery is also not represented in Table 5 as squid were not targeted or caught in significant numbers in the CSF. A range of fisheries exist in the waters of Torres Strait, north - north/west of the CSF. These fisheries include prawn, tropical rock lobster, Spanish mackerel, barramundi, pearl shell, dugong and turtle, finfish, crab, trochus and sea cucumber The linkages between the Torres Strait and Coral Sea fisheries have not yet been explored.

State commercial fisheries

A number of commercial fisheries exist in Queensland State managed waters adjacent to the western bounds of the CSF. The linkages between the stocks in the CSF and inshore waters are unknown at this time. Stocks are managed separately and operators in the CSF are prohibited from fishing in any other fishery on the same trip as fishing in the CSF; in this way, State and Commonwealth catches can be clearly differentiated. AFMA does not collect data on State managed fisheries.

Recreational fisheries

Recreational anglers fish in the same waters as the CSF. Because the CSF lies some distance from the coast and outside the Great Barrier Reef, most recreational fishing is undertaken by charter fishing operators.

Recreational catch is relatively small and appears to be well managed by Queensland state fisheries managers. AFMA does not collect data on State managed fisheries.

26 Effort data including information on any trends

Catch, effort and Catch per unit effort (CPUE) data for the various fishing methods used in the CSF (excluding the Aquarium sector) are outlined in Table 6 for the last five years.

Please note that this data has not been standardised, for example, dive effort may include snorkelling, SCUBA or HOOKAH and longline may include different automatic baiting gears, or the use of non-automated systems. AFMA logbooks for the hand collection sector have recently been updated to provide better resolution of dive methods used, however this information and specific information on longline methods used were not available at the time of compiling this submission.

The lack of standardisation of catch and effort data, within and between methods, the generally low activity and often exploratory nature of the fishery make CPUE a very poor indicator of fishery performance. This information is provided for reporting purposes only.

Table 6. Catch, effort and catch per unit effort (CPUE) for CSF methods. Note: this logbook data has not been standardised and does not include Aquarium sector data.

Fishing year	Dive hours	Catch (Kg whole weight)	CPUE (total catch/ total effort)
2004/05	142.0	3971.0	28.0
2005/06	161.5	6282.0	38.9
2006/07	166.8	9186.0	55.1
2007/08	96.0	2939.0	30.6
2008/09	118.0	2579.0	21.9
Fishing year	**Trap lifts**	**Catch (Kg whole weight)**	**CPUE (total catch/ total effort)**
2004/05	10185	70483.5	6.9
2005/06	10966	94569.5	8.6
2006/07	6516	48200.0	7.4
2007/08	11147	53929.0	4.8
2008/09	0	0.0	
Fishing year	**Trawl hours**	**Catch (Kg whole weight)**	**CPUE (total catch/ total effort)**
2004/05	92.6	789.5	8.5
2005/06	0.0	0.0	
2006/07	948.4	96603.0	101.9
2007/08	0.0	0.0	
2008/09	0.0	0.0	
Fishing year	**Dropline hooks[2]**	**Catch (Kg whole weight)**	**CPUE (total catch/ total effort)**
2004/05	4275	1546.5	0.4
2005/06	12656	11543.0	0.9
2006/07	21902	10772.5	0.5
2007/08	11990	12021.5	1.0
2008/09	5532	5372.5	1.0
Fishing year	**Handline hooks**	**Catch (Kg whole weight)**	**CPUE (total catch/ total effort)**
2004/05	5	48090.0	(probable error in hooks reported)
2005/06		33896.0	
2006/07	38	1735.0	45.7
2007/08	0	0.0	
2008/09	0	0.0	
Fishing year	**Longline hooks[2]**	**Catch (Kg whole weight)**	**CPUE (total catch/ total effort)**
2004/05	206541	46398.5	0.2
2005/06	66630	107777.5	1.6
2006/07	18952	14724.5	0.8
2007/08	198973	45504.0	0.2
2008/09	63260	7975.0	0.1
Fishing year	**Trotline hooks**	**Catch (Kg whole weight)**	**CPUE (total catch/ total effort)**
2004/05	0	0.0	
2005/06	704	1875.0	2.7
2006/07	1900	839.0	0.4
2007/08	0	0.0	
2008/09	0.0	0.0	

[2] Hook numbers for dropline and longline are calculated by multiplying the number of line lifts by the average number of hooks per line.

27 Spatial issues/trends

Two Marine Protected Areas (Coringa-Herald National Nature Reserve and Lihou Reef National Nature Reserve) exist within the bounds of the CSF and cover a total area of approximately 17,000 square kilometres. No commercial fishing is permitted in these reserves and management arrangements are in place to detect any illegal fishing in these waters.

Provisions are in place for the Lobster and Trochus and the Sea Cucumber sectors which require fishing operators to move their mother-ship once a specified amount of quota or effort is reached. These measures help prevent localised depletion within the fishery.

Since July 2005 fishing permit holders targeting sea cucumbers have been signatories to the *Memorandum of Understanding in relation to the Queensland Sea Cucumber Association for the Waters under Australian Fisheries Management Authority Jurisdiction (2005–2008)*. This stipulates a three year rotational harvesting strategy for bêche-de-mer on 21 reefs within the Coral Sea. The conditions of this memorandum were incorporated into the permit conditions and management arrangements for the sector from 1 July 2006.

Auto-longliners must fish in waters deeper than 200 metres unless an observer is on board. If an observer is on board 50% of hooks may be set shallower than 200 metres.

A MOU has been negotiated between the Coral Sea Fishers Association (CSFA) and the Cod Hole and Ribbon Reef Operators Association (CHARROA). Under the MOU, the CSFA has agreed not to hook fish within two kilometres of particular reefs in the CSF (Osprey Reef, Bouganville Reef, Flora Reef, Dart Reef and Heralds Surprise reef) in order to preserve iconic species of importance to tourist operators. In addition, a circular area with 0.75 nautical mile radius around CHARROA moorings at Osprey Reef, namely North Horn and Admiralty Anchor is protected from all fishing of sharks, rays, potato cod, Maori wrasse, Queensland groper, anemones and anemone fish.

Catch Disposal Records for the period 1999/00 – 2008/09 show the ports of unloading for the CSF; these include Brisbane, Bundaberg, Cairns, Darwin, Gladstone, Hervey Bay, Hobart, Mooloolaba, Townsville and others unnamed.

The majority of catch has been landed in Cairns, however Bundaberg, Townsville and Brisbane are also significant ports for the CSF. Together these four ports accounted for almost 98% of the catch unloaded over the past five years by weight. Aquarium catch is not reported in CDRs, however is also landed in Cairns.

Figure 3 shows the areas fished by the various CSF sectors, excluding the Aquarium sector.

The range of areas fished in the CSF shows the often exploratory nature of the fishery. The recent decline in the number of areas fished may be due to the overall reduction in fishing effort. Fishing operators have indicated they are reducing their effort in the CSF and focussing on other fisheries while the Marine Bioregional Planning process is being undertaken.

In 2008/09 the areas fished included waters south of Cairns, as well as waters between Bowen and Rockhampton. Reefs in these areas include Flora, Holmes, Flinders, Mellish, Frederick, Kenn, Wreck and Cato.

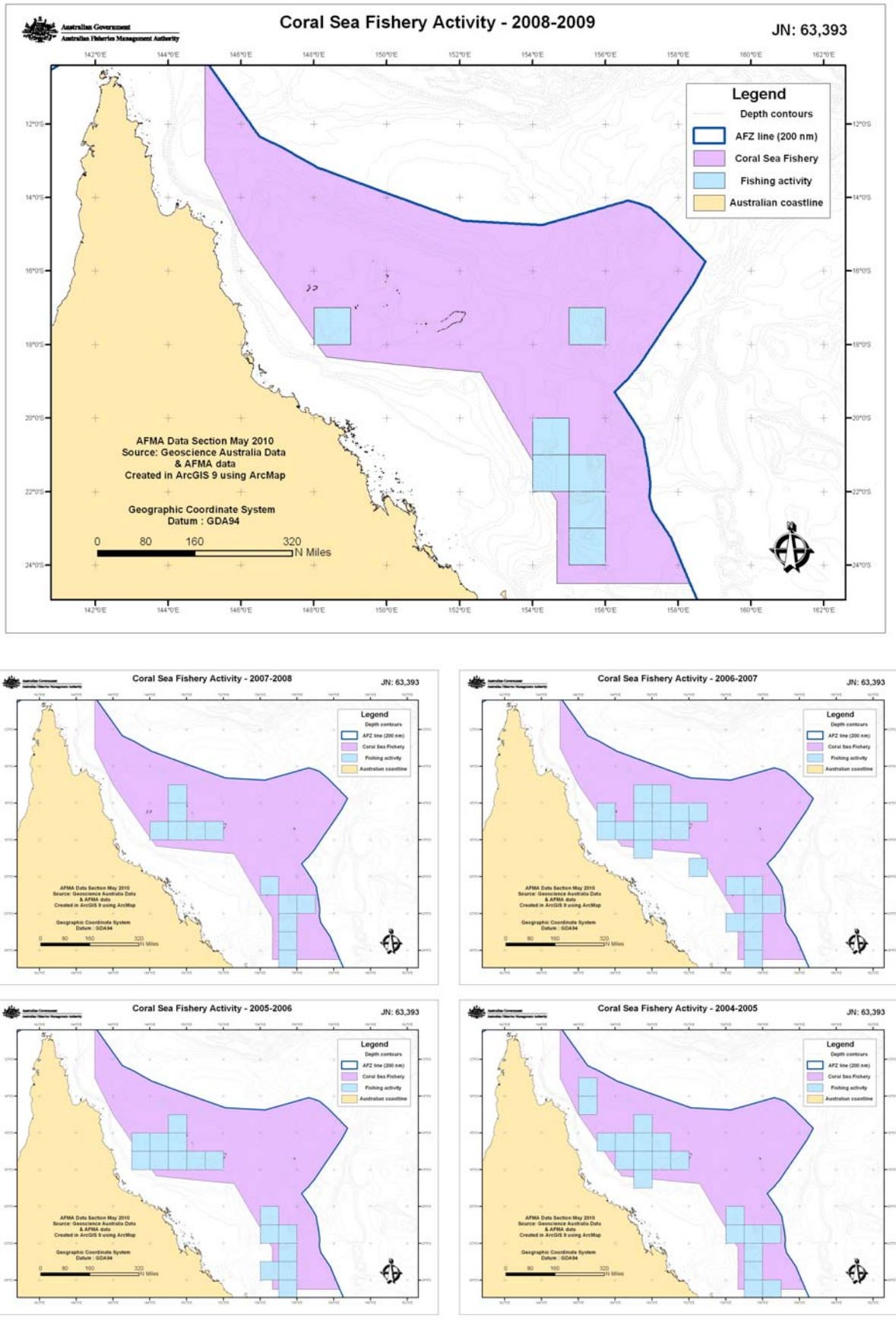


Figure 3. Fishing activity in the Coral Sea Fishery 2004/05-2008/09 (all sectors excluding Aquarium sector) to a scale of one degree.

28 Status of target stock

Stock status

The Bureau of Rural Sciences (BRS) Fishery Status Report 2008 reported two sea cucumber species (surf redfish and sandfish), lobster and trochus stocks as not subject to overfishing, however their overfished status remains uncertain. Other stocks in the CSF are classified as uncertain with respect to being overfished or subject to overfishing.

The Reducing Uncertain Stock Status (RUSS) project being undertaken by BRS is anticipated to clarify the status of remaining stocks. The relatively small number of operators, limited fishing effort and relatively low GVP of the fishery make research and stock assessments in this fishery otherwise very difficult. Management arrangements, including harvest strategies for all sectors of the fishery are based on precautionary catch and effort limits and triggers requiring investigation of any detected changes in the fishery. In this way AFMA manages for the uncertainty in the fishery.

Resource concerns

There are no identified resource concerns in the CSF at this time. Harvest strategies in place for the fishery are designed to detect any significant change and facilitate adaptive management.

Results of stock assessments

An assessment of logbook and catch data was performed for the Sea Cucumber sector in 2002 and this led to the Total Allowable Catch limits (TACs) being reduced. There have been no other stock assessments undertaken in the CSF since this time. Management arrangements have established precautionary low level TACs for sea cucumber species of global concern.

Probable stock sizes are being calculated by BRS for a number of sea cucumber species as part of the RUSS project. This work is expected to be completed during 2011.

Results of stock recovery strategies

AFMA introduced measures to recover stocks of certain sea cucumber species in 2002. These measures included Total Allowable Catch limit (TAC) reductions and the introduction of a rotational harvest strategy to prevent localised depletion. The results of these measures have not yet been assessed. Concession holders have agreed that AFMA will maintain the current precautionary limits until such time as Industry or other sources indicate that a review may be necessary. Any change would require some assessment of stock levels and consideration of sustainable catch limits.

The Commonwealth Harvest Strategy Policy, under which the harvest strategy for the CSF has been developed, specifies measures to be undertaken to prevent overfishing and recover overfished stocks to sustainable levels.

29 Interactions with protected species

Frequency and nature of interactions

No interactions with protected species in the CSF have been recorded in logbook data or Observer reports to date. This may be attributable to the limited fishing effort and small number of operators (limits habituation and association of fishing boats and gear with food), the latitude of the fishery (fewer birds relative to more southern latitudes) and the fact that several sectors of the fishery use hand collection.

Management action taken to reduce interactions, and results

Conditions attached to permits specify measures that must be undertaken by operators to avoid interactions with protected species. These include gear restrictions such as minimum net-mesh size and use of Turtle Excluder Devices on trawl permits, the use of Tori lines and other provisions aimed at avoiding interactions with sea birds on line permits, regulations

relating to the discharge of offal, and requirements to report any interactions to AFMA, supported by AFMA Observer reports. Additional measures are also specified in the CSF Bycatch and Discard Work Plan.

30 Impacts of the fishery on the ecosystem

Traditional risk assessment processes are difficult to apply to the CSF. AFMA attempts to manage uncertainty by implementing precautionary management arrangements, monitoring the fishery and linking development to investigation and assessment.

Despite the generally low catch and effort, the fishery has potential to interact with an extremely diverse range of species (~850), with an equally diverse range of methods. The low fishing effort (16 concessions, some of which are inactive) compounds the situation and means there is limited data and little capacity for Industry to fund research. Given these constraints, the most practical means of determining risk in the CSF is to utilise the experience and expertise of people such as researchers, managers and industry members. AFMA acknowledges there is some uncertainty associated with this approach and seeks to manage this with precautionary management arrangements to ensure the fishery is sustainable.

Results of Ecological Risk Assessments

During 2006 AFMA completed a qualitative Scale, Intensity, Consequence Analysis (SICA) for all CSF sectors. The potential risks identified, and management responses are outlined below.

Table 7. CSF Scale, Intensity, Consequence Analysis – potential risks and responses.

Risk identified	Mitigation response undertaken
Translocation of species (through bilge water and marine fouling organisms).	*National biofouling management guidelines for commercial fishing vessels* have been developed by the Department of Agriculture Fisheries and Forestry in consultation with the Fishing Industry.
Anchoring/mooring and other anthropogenic activities as a habitat hazard	Industry agreements resulted in some designated mooring sites. Remaining risk is considered to be low due to the low number concessions and broad spatial area of the fishery.
Other fisheries in the region as a community hazard	Resource competition in the CSF is outlined in section 22 of this submission and is considered negligible. AFMA has introduced precautionary management arrangements in the CSF which contribute to actions taken in other fisheries, and avoid risks in the CSF (for example limitations on the take of deepwater sharks).
Fishing activity with and without capture disturbing physical processes and impacting on habitats and target and byproduct species	Operators in the CSF are required to adhere to the following: • set and haul traps individually (limiting impact on benthos and reducing potential for trap loss); • construct traps from metal not nylon (reducing potential for entanglement and better facilitating degradation of lost traps); • use sacrificial anodes on trap doors (avoiding ghost fishing by lost traps), and • adhere to depth restrictions for auto-longline operations.
Gear loss	See above for trap arrangements. Information on gear loss is also collected through fishery logbooks and Observers.
Provisioning (providing food resources) for TEP and other species	Low and variable activity in the CSF limits habituation of TEP and other species and Regulations also apply to the discharge of offal.
Discarding as a hazard to target and byproduct species	A Bycatch and Discard Work Plan has been developed for the CSF, and provides for monitoring and ongoing development and refinement of mitigation responses.
Concerns regarding exploitation levels of certain species	All species are monitored against conservative catch and trigger limits as part of the CSF harvest strategy. Development of the fishery is linked to demonstrating sustainability. Management strategies will continue to be refined where appropriate.

A semi-qualitative risk analysis concentrating on potential risks to chondrichthyan and TEP species was undertaken in 2008. This analysis has been completed and provided to DEWHA.

One hundred and nine TEP species including 13 birds, 44 sea horses and pipefish, 23 reptiles, 28 cetaceans and one chondrichthyan; and a further 109 chondrichthyan species were assessed for all sectors of the CSF. This included consideration of species productivity, species distribution and post-capture mortality.

In fisheries with similar gear types and practices, gear selectivity and spatial overlap risk scores were used as a guide for assessing risk levels to species groups. Where there was no information for a species or animal group, the highest level of risk was assumed.

The hand collection sectors including Aquarium, Lobster and Trochus, and Sea Cucumber, were assessed as low risk to all TEP and chondrichthyan species. These sectors employ methods that result in zero bycatch and have limited interactions with non-target species. Consequently, these sectors require few mitigation responses.

The Trawl sector was found to represent a medium to high level of risk to all TEP and chondrichthyan species and a high risk to marine turtles and bathyl sharks. The Demersal and Auto-Longline component of the Line sector was found to represent a high risk to marine turtles and, given the targeting of sharks by the sector, a high risk to all chondrichthyan species. The other components of the Line sector were found to present a similar level of risk to TEP and chondrichthyan species and were assessed as high risk to marine turtles and all chondrichthyans.

The Trap sector is only permitted to take bony-fish (Class Osteichthyes), the traps restrict the entry of certain types of animals due to the shape of the trap entrance, and traps allow the safe release of non-target species. Consequently, this sector was assessed as representing a low to medium risk to TEP and chondrichthyan species.

As traditional risk assessment processes are difficult to apply to the CSF, an expert-based group workshop approach will be used to identify high risk species for all sectors of the Fishery. This process is expected to be completed by 19 November 2010.

Management action taken to reduce impacts, and results

AFMA is already implementing numerous measures which mitigate ecological risks in the CSF; these measures are outlined throughout this document.

Turtle Exclusion Devices (TEDs) are required to be used whenever trawling for crustaceans in the CSF, however, the risk of interacting with a turtle at the depths trawled are considered negligible (Limpus, 2008); the greatest risk occurs during setting and hauling, the latter of which facilitates the release of the turtle alive even if caught in the net. AFMA has also recently further developed its management arrangements for turtles and other protected species as well as other species through the Bycatch and Discard Work Plan.

There have been no interactions with turtles reported in either logbook records or by AFMA observers in the CSF. Consequently, no additional mitigation measures are considered necessary at this time.

Targeting of chondrichthyan species, primarily sharks by the CSF is not prohibited and current catches of these species are considered sustainable. All deepwater sharks are required to be released alive and limited retention is allowed for animals brought aboard dead; this allowance facilitates data collection. Harvest strategies in place for the CSF prescribe conservative catch limits for other key species and trigger limits for all species. No further mitigation measures are considered necessary at this time.

31 Progress in implementation of recommendations and conditions resulting from the previous assessment of the fishery

Progress in implementing each recommendation and condition

AFMA reports its progress in implementing recommendations and conditions resulting from strategic assessments of the CSF to DEWHA biannually. A progress report was provided to DEWHA in September 2008 and subsequently as part of AFMA's submission for reassessment in January 2009. Since this time AFMA has been actively involved with DEWHA in developing further measures for the improvement of the fishery and the approvals have been extended several times to provide sufficient time for proper consideration of the fishery. An outline of progress to date is provided in Table 8.

Table 8. Conditions and recommendations to AFMA on the ecologically sustainable management of the Coral Sea Fishery.

Performance Criteria	Achievement	Deadline
Condition 1: Operation of the fishery will be carried out in accordance with the CSF management regime made under *Statement of Management Arrangements, Coral Sea Fishery 2007*, in force under the *Fisheries Management Act 1991*.	Yes	Ongoing
Condition 2: The Australian Fisheries Management Authority (AFMA) to inform the Department of the Environment, Water, Heritage and the Arts (DEWHA) of any intended amendments to the management arrangements that may affect the criteria on which *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) decisions are based.	Yes DEWHA is actively involved in AFMA meetings and stakeholder consultation where management arrangements are developed and discussed. AFMA and DEWHA Officers have maintained regular contact and where significant management developments have occurred, such as the development of the CSF Bycatch and Discard Work Plan, AFMA has sought DEWHA input and clearance.	Ongoing
Condition 3: AFMA to produce and present reports to DEWHA annually as per Appendix B to the *Guidelines for the Ecologically Sustainable Management of Fisheries - 2nd Edition*.	Yes	Completed AFMA has produced reports and worked closely with DEWHA over the past 12 months in the development of new arrangements.
Condition 4: AFMA to develop and finalise the Harvest Strategy for the CSF by 31 July 2008.	Yes All CSF harvest strategies were finalised on 12 December 2007. They are now being reviewed to ensure they are efficient, effective and account for new information and management initiatives.	Completed

Performance Criteria	Achievement	Deadline
Condition 5: By 19 March 2009 AFMA to finalise the Ecological Risk Assessment (ERA) for the CSF. AFMA to then identify and implement appropriate management responses, to address and mitigate risks and impacts identified in the ERA.	Yes AFMA completed a risk assessment for chondrichthyan and TEP species in 2009 and management responses have been incorporated into the CSF Bycatch and Discard Work Plan and permit conditions. As traditional risk assessment processes are difficult to apply to the CSF, an expert-based group workshop approach will be used to identify high risk species for all sectors of the Fishery. This process is expected to be completed by 19 November 2010.	Ongoing Report submitted to DEWHA in 2009 and ongoing consultation with DEWHA to progress remaining risk assessment activities. Anticipated completion November 2010.
Recommendation 1: AFMA to continue to cooperate with QDPI&F to pursue complementary management and research of shared stocks for all target and by-product species.	Yes AFMA worked with QDEEDI on issues relating to multi-jurisdiction trips, chondrichthyans, and the landing and sale of red bass in Queensland during 2007-2008. QDEEDI staff participated in research and Industry meetings for the CSF in 2009 and are regularly consulted on a broad range of management issues. AFMA has participated in Queensland Management Advisory Committee and Scientific Advisory Group (SAG) meetings. AFMA continues to utilise the expertise of Qld SAG Chairs. QDEEDI is currently participating with AFMA to progress risk assessments, review harvest strategy triggers and may also be engaged in discussions to develop catch limits for chondrichthyan and other key species in the CSF.	Ongoing
Recommendation 2: AFMA to develop performance measures and performance indicators that take account of fishery impacts on bycatch species, protected species and the ecosystem for all sectors of the CSF by 31 December 2008.	Yes Harvest strategies for the CSF have been developed which take into account all species, including bycatch species. These species are monitored and assessed as required under the harvest strategy to mitigate any impacts. A Bycatch and Discard Work Plan was developed for the CSF in July 2010. Management arrangements and voluntary industry practices, such as rotational harvest strategies and designated mooring points are in place to limit impacts from fishing on the environment.	Completed

Performance Criteria	Achievement	Deadline
Recommendation 3: AFMA to continue monitoring compliance with CSF permit conditions, management arrangements and bycatch and protected species policies and plans. Within 3 months of becoming aware that a breach of the management arrangements has occurred, AFMA to develop a clear timetable for the implementation of appropriate management responses.	Yes No breaches detected. All line, trap and trawl fishing permits require Observer coverage on the first trip and then on at least 25% of subsequent fishing trips each fishing year. Permit conditions are reviewed and updated as necessary each year. The Harvest Strategy and Bycatch and Discard Work Plan also have review mechanisms specified to ensure they remain effective.	Ongoing

How the measures implemented have improved the fishery

The development of harvest strategies for the CSF has provided a comprehensive framework for monitoring activity and changes in the CSF. The harvest strategies contain measures tailored to each sector of the fishery; in this way they are best able to cater to the diverse fishing methods, species and areas which make up the CSF. AFMA are still working to improve the data systems necessary to best implement the harvest strategies and it is hoped that this ongoing process will improve the available information on the fishery.

The ERA process has allowed AFMA to identify key risks in the fishery and better target mitigation measures. This process is expected to be completed in 2010. Results of these risk assessments are used to update management arrangements specified in permit conditions (for example deepwater sharks) as well as in Bycatch and Discard Work Plans (for example TED usage for a range of animals including marine turtles).

The continual refinement of CSF fishing permit conditions has sought to make management of the fishery more streamlined, the conditions easier to comply with and to enforce. Further details of how recent management changes have improved the fishery are outlined in section 3 of this submission.

32 Research and Monitoring

Results of any research completed relevant to the fishery, including how results will be incorporated into management of the fishery

AFMA has issued a number of scientific permits in the area of the CSF. These permits have a maximum duration of six months each and research reports are required to be submitted to AFMA following completion of their authorised activities.

Research has included tagging and genetic study of chondrichthyan species and nautilus species. Although nautilus are not currently targeted by the CSF, this research is considered useful in improving understanding of this species in the fishery.

AFMA convened a Chondrichthyan Technical Working Group to assess the impacts of fishing, across all Commonwealth fisheries on chondrichthyan species. This group comprised eminent researchers in this field and delivered recommendations on ways in which AFMA can continue to improve its management of chondrichthyan species. Recommendations from this group have been published in the *Chondrichthyan guide for fisheries managers* (Patterson and Tudman, 2009) and have been used to inform the Bycatch and Discard Work Plan for the fishery.

Reducing Uncertain Stock Status

The Reducing Uncertain Stock Status (RUSS) project is being undertaken by the Australian Bureau of Agricultural and Resource Economics – Bureau of Rural Sciences (ABARE–BRS) in collaboration with the Commonwealth Scientific and Industrial Research Organisation

(CSIRO). The following information outlining the activities and anticipated outcomes has been provided to AFMA by ABARE–BRS and is included in this submission as it has the potential to inform management arrangements for the fishery in the future. The RUSS project is due to be finalised by 30 June 2011.

Sea cucumber sector

Spatial stock assessment and status determination for black teatfish, white teatfish, surf redfish and prickly redfish. This is anticipated to result in reef/habitat area estimates, survey density estimates, estimates of current and unfished biomass, and yield estimates. ABARE–BRS may also look into other sea cucumber species; however this will be time and data dependent.

Trochus sector

Trochus has been included in the spatial assessment for sea cucumbers and a similar set of results will be produced for this stock.

Management Strategy Evaluation

As part of the RUSS project, CSIRO is undertaking Management Strategy Evaluation (MSE) of sea cucumber (and possibly trochus) harvest strategies for the Coral Sea and Torres Strait. A spatially explicit MSE framework has been developed that attempts to capture the meta-population structure of the different sea cucumber species and their related fisheries. The objective of this work is to determine whether ABARE–BRS can use implemented harvest strategies to derive status classifications for annual Fishery Status Reports.

Aquarium sector

High risk species identified through the Queensland Marine Aquarium Fish Fishery (MAFF) risk assessment process may be used as the basis for identifying high risk species in the CSF Aquarium sector through the current Coral Sea Fishery expert based group workshop. Footprint analyses for the sector are also being undertaken. ABARE–BRS may also undertake work on species/species group abundance, informed by studies from similar fisheries.

Line and Trap sectors

Biomass scenarios will be developed for deep reef scalefish, shallow reef scalefish and sharks using density estimates from similar habitats. Potential yields for these groups will then be estimated using CSF bathymetric and reef habitat strata. Analysis is likely to be undertaken at the species level (where possible). Work being undertaken on sharks is challenging and may not yield useful results.

Trawl sector

Catch rate standardisation and where appropriate, production models will be attempted for alfonsino and gemfish in the CSF. These analyses are dependant on the availability of data. Additional analyses may also be undertaken.

Description and results of monitoring programs used to gather information on the fishery (such as observer programs, long term monitoring programs etc)

Catch disposal records are used to verify and monitor catches in all sectors except the Aquarium sector. Prior to landing reports are used in the Aquarium sector and require operators to specify what catch they have prior to landing.

Integrated Computer Vessel Monitoring Systems are compulsory for all vessels operating in the CSF. Vessel Monitoring Systems are used to monitor vessel operations.

Compulsory observer coverage applies to all CSF permits except the Aquarium, Sea Cucumber and Lobster and Trochus sectors. In these hand collection sectors, where bycatch does not occur, observer coverage is undertaken on an opportunistic basis.

Observer coverage

A total of 290 fishing days were observed in the CSF over the past four fishing years (2005/06 – 2008/09). This included eight different boats, 18 different trips and a range of different fishing methods including line, trap, trawl and hand collection (Aquarium sector). Details of the Observer coverage over this period are outlined in Table 9.

Table 9. Observer coverage over the period 2005/06 – 2008/09.

Fishing year	Days observed	Methods observed	Number of trips	Number of boats
2005/06	13	Hand collection (Aquarium)	2	2
	25	Trap	2	1
2006/07	33	Trap	3	3
	97	Trawl	2	1
	6	Line	1	1
2007/08	42	Trap	3	2
	21	Line	2	2
2008/09	14	Trap	1	1
	24	Line	2	1

Results of collaborative research undertaken for the fishery

AFMA utilise the assistance of industry members wherever possible to collect information on the fishery.

Collaborative arrangements recently established with the Queensland Scientific Advisory Groups are encouraging the development of consistent approaches and collaborative research.

33 References

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34 Appendices

Appendix 1: Logbook catch records for the Coral Sea Fishery, 2004/05 – 2008/09: Total retained catch (whole weights in kilograms).

Appendix 2: Logbook catch records for the Coral Sea Fishery, 2004/05 – 2008/09: Total discarded catch (whole weights in kilograms).

Appendix 1: Logbook catch records for the Coral Sea Fishery, 2004/05 – 2008/09 - Total retained catch (whole weights in kilograms)

	2008/2009		2007/2008			2006/2007				2005/2006			2004/2005			
	Diving	Line	Trap	Diving	Line	Trap	Diving	Line	Trawl	Trap	Diving	Line	Trap	Trawl	Diving	Line
Alfonsino	0	0	0	0	0	0	0	0	69672	0	0	0	0	0	0	40
Amberfish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Amberjack	0	560	398	0	683	76	0	152	0	244	0	814	152	0	0	674
Ambon Emperor	0	0	0	0	0	0	0	0	0	0	0	0	180	0	0	0
Bar Rockcod	0	211	15	0	1721	88	0	1355	0	116	0	3123	21	110	0	7994
Barracouta	0	0	0	0	20	0	0	0	0	0	0	10	0	0	0	5
Barramundi cod	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bastard Trumpeter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bigeye Trevally	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bigeyes (mixed)	0	0	7	0	0	0	0	0	0	0	0	0	0	35	0	5
Bigscale Pomfret	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bigspine Boarfish	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0
Black teatfish	388	0	0	494	0	0	671	0	0	0	604	0	0	0	274	0
Blackfish	23	0	0	263	0	0	206	0	0	0	118	0	0	0	115	0
Blacktip Rockcod	0	48	326	0	10	193	0	229	0	0	0	152	0	0	0	16
Blacktip shark (mixed)	0	1236	0	0	19641	0	0	0	0	0	0	35560.5	0	0	0	6480
Blue Morwong	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
Blue Shark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blue Warehou	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blue-eye Trevalla	0	52	0	0	83	0	0	5	0	0	0	6	0	0	0	236
Bluespotted Emperor	0	0	184	0	0	347	0	0	0	491	0	1	2	0	0	0
Bluespotted Rockcod	0	2	0	0	0	0	0	0	0	0	0	48	16	0	0	0
Bluespotted Trevally	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bluestriped Goatfish	0	10	13	0	0	0	0	0	0	0	0	0	0	0	0	0
Bluestriped Snapper	0	0	150	0	0	101	0	0	0	88	0	15	179	0	0	0
Boarfishes	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
Bream (mixed)	0	65	0	0	0	0	0	79	0	0	0	53	0	0	0	90
Broadnose Shark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bronze Whaler	0	0	0	0	0	0	0	0	0	0	0	4017	0	0	0	10.5
Bugs - Shovel nosed and slipper lobsters	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cobia	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0

	2008/2009		2007/2008			2006/2007				2005/2006			2004/2005			
	Diving	Line	Trap	Diving	Line	Trap	Diving	Line	Trawl	Trap	Diving	Line	Trap	Trawl	Diving	Line
Cocoa Snapper	0	0	0	0	61	0	0	0	0	0	0	30	0	0	0	0
Collar Seabream	0	0	0	0	0	0	0	0	0	0	0	136	0	0	0	0
Comet Grouper	0	52	260	0	149	276	0	93	0	118	0	456	819	0	0	904
Commercial Scallop	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common Coral Trout	0	38	962	0	0	592	0	1367	0	1330	0	783	0	0	0	0
Common Pike Eel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common Sawshark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Conger eels	0	0	0	0	0	9	0	0	0	0	0	0	0	5	0	2
Coral trout (mixed)	0	6	0	0	0	0	0	0	0	303	0	7	454	0	0	72
Curryfish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Darwin's roughy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Deepwater redfish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diamondscale Goatfish	0	0	27	0	3	1	0	2	0	19	0	52	0	0	0	0
Dogfishes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Driftfishes	0	0	0	0	0	0	0	0	302	0	0	0	0	0	0	0
Dusky Whaler	0	0	0	0	0	0	0	0	0	0	0	0	4.5	0	0	30
Eastern Blue Groper	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eastern Orange Perch	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Elephant trunkfish	0	0	0	0	0	0	8	0	0	0	0	0	0	0	9	0
Emperor	0	0	4	0	0	0	0	0	0	0	0	233	30	0	0	0
Endeavour dogfish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Escolar	0	0	0	0	65	0	0	0	0	0	0	0	0	0	0	0
Eyebrow fishes	0	0	0	0	0	0	0	0	266	0	0	0	0	0	0	0
Fiddler rays unspecified	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0
Fish (mixed)	0	314	6	0	182	395	0	372	0	528	0	844	1108	50	0	788
Fiveline Snapper	0	0	0	0	0	0	0	0	0	37	0	0	23	0	0	0
Flame Snapper	0	815	30	0	3485	102	0	914	501	85	0	7993	0	0	0	12850
Flowery Rockcod	0	0	0	0	0	99	0	0	0	14	0	0	0	0	0	0
Frostfish	0	0	0	0	0	0	0	0	61	0	0	0	0	0	0	0
Fusiliers unspecified	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0
Gemfish	0	0	0	0	61	0	0	0	12021	0	0	44	0	260	0	200
Giant scarlet prawn	0	0	0	0	0	0	0	0	3340	0	0	0	0	0	0	0

	2008/2009		2007/2008			2006/2007				2005/2006			2004/2005			
	Diving	Line	Trap	Diving	Line	Trap	Diving	Line	Trawl	Trap	Diving	Line	Trap	Trawl	Diving	Line
Goatfishes	0	0	0	0	0	0	0	0	0	7	0	0	46	0	0	1
Goldband snappers	0	18	231	0	0	0	0	55	0	352	0	41	250	20	0	422
Golden Trevally	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goldeneye Snapper	0	0	0	0	218	0	0	0	0	10	0	0	240	0	0	5
Goldspot Pigfish	0	0	69	0	0	0	0	5	0	0	0	4	8	0	0	0
Grass Emperor	0	0	2029	0	12	1800	0	84	0	2667	0	86	2408	0	0	201
Green fish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green Jobfish	0	585	248	0	325	98	0	434	0	264	0	1421	71	5	0	509
Greeneye dogfish (discontinued)	0	0	0	0	0	0	0	0	0	0	0	1.5	0	9	0	0
Grey Reef Shark	0	0	0	0	0	0	0	1917	0	0	0	0	6	0	0	0
Gummy shark	0	0	0	0	7.5	0	0	0	0	0	0	0	0	0	0	0
Hapuku	0	80	0	0	0	0	0	20	0	0	0	0	0	0	0	0
Hapuku and Bass Groper	0	0	5	0	0	0	0	0	550	0	0	0	0	0	0	0
Highfin Amberjack	0	0	0	0	0	0	0	0	0	7	0	0	51	0	0	0
Highfin Grouper	0	155	839	0	12	413	0	0	0	471	0	38	1643	0	0	0
Hussar	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0
Imperador	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
Jackass Morwong	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
John Dory	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
King prawns	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lancetfishes	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0
Lantern shark (mixed)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Late Bream/ Yellow Sweetlip	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lavender snapper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leatherjackets	0	0	196	0	0	120	0	0	0	0	0	0	35	10	0	0
Lemon Shark	0	0	0	0	0	0	0	37.5	0	0	0	79.5	0	0	0	0
Lined Javelinfish	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
Lolly fish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Long Tail Rubies/Snapper	0	0	0	0	199	0	0	0	0	0	0	0	0	0	0	1265
Longfin Rockcod	0	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Longfinned bullseye	0	0	0	0	0	0	0	0	1687	0	0	0	0	0	0	0
Longnose Emperor	0	0	59	0	0	251	0	33	0	326	0	30	469	0	0	36

	2008/2009		2007/2008			2006/2007				2005/2006			2004/2005			
	Diving	Line	Trap	Diving	Line	Trap	Diving	Line	Trawl	Trap	Diving	Line	Trap	Trawl	Diving	Line
Mackerel (mixed)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mackerel Tuna	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mahi Mahi	0	0	19	0	0	0	0	0	0	0	0	55	0	0	0	0
Mangrove Jack	0	0	0	0	445	0	0	0	0	0	0	354	0	0	0	0
Maori Rockcod	0	80	154	0	0	0	0	0	0	32	0	0	117	0	0	28
Maori Snapper	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	260
Mozambique Seabream	0	143	491	0	192	342	0	163	0	33	0	592	69	0	0	2180
Mulloway	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0
Oblique-banded Snapper	0	5	16	0	42	0	0	20	0	0	0	8	0	0	0	76
Octopoda	0	0	0	0	0	0	0	0	0	12	0	0	6	0	0	0
Paddletail Seabream	0	704	12507	0	864	9512	0	1896	0	13847	0	4963	5676	0	0	795
Painted rocklobster - Green cray	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Painted Sweetlip	0	0	893	0	0	512	0	0	0	1024	0	0	0	0	0	0
Parrotfishes unspecified	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0
Pearl Perch	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100
Pelagic morid and eucla cods	0	0	0	0	5	0	0	0	0	780	0	561	3165	0	0	639
Piked Spurdog	0	0	0	0	0	0	0	0	0	0	0	0	0	49.5	0	0
Pink ling	0	0	0	0	409	0	0	0	0	0	0	0	0	0	0	0
Prawns (mixed)	0	0	0	0	0	0	0	0	381	0	0	0	0	1	0	0
Prickly redfish	369	0	0	179	0	0	1329	0	0	0	937	0	0	0	1074	0
Purple Rockcod	0	90	111	0	5	280	0	17	0	2580	0	1119	738	0	0	0
Radiant Rockcod	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0
Rainbow Runner	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	5
Ray's Bream	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red Bass	0	0	0	0	0	2606	0	0	0	25	0	0	0	0	0	0
Red Cod	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red Emperor	0	183	9243	0	1452	7983	0	778	0	37722	0	2733	4290	0	0	1531
Red Gurnard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red prawn	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0
Red spot king prawns	0	0	0	0	0	0	0	0	335	0	0	0	0	0	0	0
Red Squirrelfish	0	0	24	0	2	0	0	0	0	1	0	0	7	0	0	0
Redbait (mixed)	0	0	0	0	0	0	0	0	4892	0	0	0	0	0	0	0

	2008/2009		2007/2008			2006/2007				2005/2006			2004/2005			
	Diving	Line	Trap	Diving	Line	Trap	Diving	Line	Trawl	Trap	Diving	Line	Trap	Trawl	Diving	Line
Redfish	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0
Redspot Emperor	0	0	0	0	0	0	0	0	0	0	0	352	36	0	0	0
Redthroat Emperor	0	161	6126	0	39	8790	0	118	0	9365	0	134	25765	0	0	560
Reef Ocean Perch	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0
Ribaldo	0	0	0	0	27	0	0	0	0	0	0	0	0	0	0	0
Robinson's Seabream	0	32	25	0	0	86	0	3	0	38	0	0	0	0	0	60
Rockcod (mixed)	0	970	2059	0	405	1505	0	215	0	1542	0	525	0	0	0	230
Rosy Snapper	0	1338	7530	0	3116	5324	0	3221	0	13433	0	8463	20061	0	0	15094
Royal red prawn	0	0	0	0	0	0	0	0	215	0	0	0	0	0	0	0
Ruby Snapper	0	279	24	0	3112	147	0	647	0	33	0	5186	0	170	0	8084
Rubyfish (mixed)	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rusty Jobfish	0	2093	38	0	439	27	0	294	0	60	0	1708	2	0	0	3214
Saddleback Snapper	0	4	0	0	432	0	0	5	0	28	0	86	26	0	0	0
Saddletail Snapper	0	0	0	0	0	0	0	4	0	35	0	7	0	0	0	0
Samson Fish	0	62	0	0	0	44	0	0	0	39	0	61	13	5	0	731
Sandbar Shark	0	0	0	0	1050	0	0	7.5	0	0	0	4132.5	0	0	0	0
Sandfish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scalloped Hammerhead	0	102	0	0	2386.5	0	0	1633.5	0	0	0	18627	0	0	0	1852.5
School shark	0	60	0	0	7.5	0	0	0	0	0	0	0	0	0	0	0
Sea Bream Snapper	0	959	2	0	0	0	0	0	0	2	0	0	239	0	0	21
Sea Perch	0	30	4284	0	0	3480	0	23	0	20	0	0	9	0	0	2
Sharks (mixed)	0	0	22.5	0	1627.5	18	0	33	0	1682	0	60	40.5	0	0	15
Shortfin Mako	0	0	0	0	0	0	0	0	0	0	0	19.5	0	0	0	0
Shortfin Seabat	0	0	72	0	0	27	0	0	0	0	0	0	0	0	0	0
Shovelnose rays	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Trevally	0	51	0	0	0	842	0	0	0	382	0	0	179	0	0	136
Silvertip Shark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40.5
Slingjaw Wrasse	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28
Smooth Hammerhead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Snapper	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sordid Snapper	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
Spanish Mackerel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	2008/2009		2007/2008			2006/2007				2005/2006			2004/2005			
	Diving	Line	Trap	Diving	Line	Trap	Diving	Line	Trawl	Trap	Diving	Line	Trap	Trawl	Diving	Line
Spanner crabs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spotcheek Emperor	0	0	2421	0	4	875	0	2	0	2608	0	0	1426	0	0	0
Squids	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0
Starry Triggerfish	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Stonefish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Striped Trumpeter	0	0	0	0	0	0	0	22	0	0	0	0	0	0	0	0
Suckerfishes remoras nei	0	0	2	0	0	8	0	0	0	0	0	0	0	0	0	0
Surf redfish	0	0	0	3	0	0	4240	0	0	0	143	0	0	0	15	0
Surgeonfishes	0	0	20	0	0	0	0	0	0	2	0	12	0	0	0	0
Swallowtail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sweetlips	0	4	51	0	2	0	0	36	0	0	0	55	0	0	0	0
Tang's Snapper	0	0	0	0	413	0	0	108	0	0	0	149	0	0	0	491
Temperate basses and rockcods	0	0	0	0	0	0	0	0	2343	0	0	0	0	0	0	0
Threeline Rockcod	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresher Shark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tiger Shark	0	472.5	0	0	5797.5	0	0	8923.5	0	0	0	24466.5	0	0	0	20331
Tomato Rockcod	0	0	11	0	0	0	0	8	0	5	0	0	0	0	0	0
Trevallies	0	620	991	0	551	14	0	468	0	1608	0	227	305	0	0	186
Tripletail Maori Wrasse	0	0	0	0	0	0	0	176	0	14	0	190	44	0	0	0
Trochus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tropical rocklobsters	0	0	0	0	0	0	607	0	0	0	1150	0	0	0	568	0
Tropical snappers unspecified	0	0	0	0	0	0	0	0	0	0	0	1233	0	0	0	1136
Trout Cod	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
Tuna (mixed)	0	0	0	0	0	0	0	0	0	0	0	75	0	0	0	0
two-spined rock lobster	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Variegated emperor	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	0
Wahoo	0	0	35	0	90	0	0	15	0	0	0	10	0	0	0	172
Western Blackspot Pigfish	0	48	12	0	5	13	0	6	0	0	0	5	0	0	0	1
Whaler and weasel sharks	0	451.5	0	0	7629	0	0	450	0	0	0	0	0	0	0	0
Whiskery Shark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
White teatfish	1799	0	0	2000	0	0	2125	0	0	0	3330	0	0	0	1916	0
White Warehou	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0

	2008/2009		2007/2008			2006/2007				2005/2006			2004/2005			
	Diving	Line	Trap	Diving	Line	Trap	Diving	Line	Trawl	Trap	Diving	Line	Trap	Trawl	Diving	Line
White-edge coronation trout	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0
Whitetip Reef Shark	0	28.5	637.5	0	0	795	0	1482	0	0	0	22720.5	0	0	0	5161.5
Wobbegongs blind nurse carpet & zebra sharks	0	0	0	0	0	9	0	0	0	111	0	0	16.5	0	0	0
Yellowedge Coronation Trout	0	2	37	0	10	0	0	121	0	0	0	48	22	0	0	19
Yellowlip Emperor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellowtail Kingfish	0	10	0	0	0	0	0	0	0	0	0	15	0	0	0	0

Appendix 2: Logbook catch records for the Coral Sea Fishery, 2004/05 – 2008/09 - Total discarded catch (whole weights in kilograms).

2008/09			
Method	**Common Name**	**Species Name**	**Kg**
Line	Blacktip sharks	Carcharhinus species	455
Line	Whaler Shark	Carcharhinus "family"	410
Line	Tiger Shark	Galeocerdo cuvier	120
Line	Scalloped Hammerhead	Sphyrna lewini	90
2007/08			
Method	**Common Name**	**Species Name**	**Kg**
Line	Blacktip sharks	Carcharhinus species	5,595
Line	Whaler Shark	Carcharhinus "family"	1,210
Trap	Starry Trigger Fish	Abalistes stellaris	727
Line	Tiger Shark	Galeocerdo cuvier	560
Line	Shark other	Sharks - other	301
Line	Scalloped Hammerhead	Sphyrna lewini	300
Trap	Red Bass	Lutjanus bohar	186
Line	Sandbar Shark	Carcharhinus plumbeus	110
Line	Red Bass	Lutjanus bohar	75
Trap	Leatherjacket	Balistidae and Monacanthidae	75
Line	Gemfish	Rexea solandri	45
Trap	Sea Perch	Lutjanus spp.	40
Line	Spurdog	Squalus megalops	22
Line	Barracouta	Thyrsites atun	18
Line	Ornate Jobfish	Pristipomoides argyrogrammicus	14
Line	Flame Snapper	Etelis coruscans	7
Line	Northwest Ruby Fish	Etelis carbunculus	4
Line	Eel	Congridae "family"	1
2006/07			
Method	**Common Name**	**Species Name**	**Kg**
Trawl	Cardinal Fish		5,200
Trawl	Lantern fishers	Myctophidae	4,500
Trawl	Mackerel	Scomber scombrus	4,200
Trawl	Mixed fish	Mixed fish	2,645
Trap	Red Bass	Lutjanus bohar	2,615
Trap	Sea Perch	Lutjanus spp.	720
Trawl	Jack Mackerel	Trachurus declivis	702
Line	Red Bass	Lutjanus bohar	229
Trap	Starry Trigger Fish	Abalistes stellaris	175
Trawl	Mixed prawns	Penaeoidea and Caridea	35
Trap	Shells	Shells	34
Trawl	Skates and rays	Skates and rays	31
Trap	Rosy Jobfish / King Snapper	Pristipomoides filamentosus	30
Trap	Japanese sea bream	Gymnocranius euanus	30
Trap	Leatherjacket	Balistidae and Monacanthidae	28
Trawl	Skates	Rajidae	20
Trap	Paddletail	Lutjanus gibbus	14
Line	Tawny Shark	Nebrius ferrugineus	11
Trap	Spinefoot - Rabbitfish	Siganus spp	10
Trap	Eel	Congridae "family"	9
Trap	Red Squirrel Fish	Sargocentron rubrum	4
Trap	Schooling Bannerfish	Heniochus diphreutes	2.5

2005/06			
Method	**Common Name**	**Species Name**	**Kg**
Trap	Red Bass	Lutjanus bohar	18,672
Line	Tawny Shark	Nebrius ferrugineus	8,480
Trap	Scarlet Sea Perch / Large Mouth Nannygai	Lutjanus malabaricus	3,180
Trap	Starry Trigger Fish	Abalistes stellaris	891
Trap	Leatherjacket	Balistidae and Monacanthidae	534
Line	Red Bass	Lutjanus bohar	436
Line	Tiger Shark	Galeocerdo cuvier	345
Line	Trippletail Maori Wrasse	Cheilinus trilobatus	132
Trap	Schooling Bannerfish	Heniochus diphreutes	122
Line	Starry Trigger Fish	Abalistes stellaris	94.5
Line	Tawny Shark	Nebrius ferrugineus	80
Trap	Shark other	Sharks - other	67
Line	Sharkfin guitarfishes - Sand sharks	Rhynchobatidae	37
Trap	Shells	Shells	22
Trap	Whitetip Reef Shark	Triaenodon obesus	15
Trap	Eastern Foxfish	Bodianus sp [in Last et al 1983]	11
Trap	Japanese sea bream	Gymnocranius euanus	10
Trap	Red-eared Emperor	Lethrinus rubrioperculatus	10
Trap	Paddletail	Lutjanus gibbus	8
Trap	Red Finned Emperor	Lethrinus miniatus	6
Trap	Eel	Congridae "family"	4
Trap	Sharkfin guitarfishes - Sand sharks	Rhynchobatidae	3
Line	Paddletail	Lutjanus gibbus	2
Line	Whitetip Reef Shark	Triaenodon obesus	1
Line	Blue Maori cod	Epinephelus cyanopodus	1
Trap	Deepsea Perch/Scorpionfish	Trachyscorpia sp.	1
2004/05			
Method	**Common Name**	**Species Name**	**Kg**
Trap	Scarlet Sea Perch / Large Mouth Nannygai	Lutjanus malabaricus	2,830
Trap	Starry Trigger Fish	Abalistes stellaris	469
Trap	Leatherjacket	Balistidae and Monacanthidae	246
Trap	Whitetip Reef Shark	Triaenodon obesus	223
Trap	Schooling Bannerfish	Heniochus diphreutes	90.5
Trap	School & Gummy family	Family Triakidae	76
Line	Scarlet Sea Perch / Large Mouth Nannygai	Lutjanus malabaricus	75
Line	Scarlet Sea Perch / Large Mouth Nannygai	Lutjanus malabaricus	74
Line	Whitetip Reef Shark	Triaenodon obesus	60
Trap	Eel	Congridae "family"	52
Trap	Spinefoot - Rabbitfish	Siganus spp	47
Trap	Mixed fish	Mixed fish	42
Line	Trevally	Family "Carangidae"	40
Trap	Shark Wobbegong	Orectolobus	34
Line	Dogtooth Tuna	Gymnosarda unicolor	30
Line	Scarlet Sea Perch / Large Mouth Nannygai	Lutjanus malabaricus	25
Trawl	Scarlet Sea Perch / Large Mouth Nannygai	Lutjanus malabaricus	25
Line	Blue Warehou	Seriolella brama	21
Trap	Barracouta	Thyrsites atun	21
Line	Endeavour Dogfish	Centrophorus moluccensis	20
Trap	Blacktip sharks	Carcharhinus species	17
Line	Dogtooth Tuna	Gymnosarda unicolor	15
Trap	Saddle-tailed seaperch - Crimson seaperc	Lutjanus erythropterus	13

2004/05 (continued)			
Method	**Common Name**	**Species Name**	**Kg**
Line	Trevally	Family "Carangidae"	10
Trap	Octopuses	Octopoda	10
Line	Whitetip Reef Shark	Triaenodon obesus	10
Trap	Red Bass	Lutjanus bohar	9
Trap	Sea Perch	Lutjanus spp.	9
Trap	Shark other	Sharks - other	7
Line	Frigate Mackerel	Auxis thazard	6
Trap	Deepsea Perch/Scorpionfish	Trachyscorpia sp.	4
Line	Eel	Congridae "family"	3
Trap	Bugs - Shovel nosed and slipper lobsters	Scyllaridae	3
Trap	Cod - unspecified		3
Trap	Grass Emperor	Lethrinus laticaudis	2
Trap	Batfish	Platax sp	2
Line	Green-Eyed Dogfish	Squalus mitsukurii	1
Line	Toadfishes	Tetraodontidae	1
Trap	Surgeonfish	acanthuridae	1