Australian Government
Australian Fisheries Management Authority

CORAL SEA FISHERY

BYCATCH AND DISCARDING WORKPLAN

1 JULY 2010 TO 30 JUNE 2012

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BYCATCH AND DISCARDING WORK PLAN

1 July 2010 to 30 June 2012

Introduction

It is Government policy to minimise bycatch and discarding in all commercial fisheries. This work plan outlines how the Coral Sea Fishery will address these issues with the key priorities being to:

- Respond to high ecological risks assessed through AFMA's risk assessment processes; and,
- Avoid interactions with species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act); and,
- Quantify and minimise overall bycatch in the fishery over the long-term.

This work plan covers a two year period from 1 July 2010 to 30 June 2012, including a list of actions that the fishery has committed to addressing over a 12 month period.

This work plan should be read in conjunction with the Commonwealth Bycatch Policy (www.afma.gov.au/environment/bycatch) and AFMA's Program for Addressing Bycatch and Discarding in Commonwealth Fisheries – An Implementation Strategy (http://www.afma.gov.au/environment/bycatch/is_env_bycatchprog_feb08_20080417.pdf).

Fishery Snapshot

The CSF covers waters from the east of Sandy Cape (Fraser Island) to east of Cape York. The Fishery commences east of the Great Barrier Reef Marine Park and extends to the edge of the Australian Fishing Zone. It excludes the areas of the Coringa-Herald and Lihou Reef National Nature Reserves. Together the Nature Reserves cover approximately 17,000 km^2 of coral reef habitat.

The CSF includes the following methods:

- Otter trawl
- Demersal finfish traps
- Demersal longlines (with automatic baiting subject to application and additional conditions), trotlines, droplines and handlines
- Hand collection with or without underwater breathing apparatus, and for aquarium fish collection, cast, scoop and seine nets, and handlines with barbless hooks. Non-mechanical implements can also be used for collection of live rock.

There are a total of 17 fishing permits in the Coral Sea Fishery targeting a wide range of finfish species, as well as shark, lobster, trochus, sea cucumber and live rock (limestone encrusted with coralline algae and other encrusting species). Rosy jobfish, alfonsino and red emperor are the three most common species (by weight) taken for seafood markets in the CSF. In the aquarium sector, fishing is highly selective and the species targeted change in response to market demand.

Ecological Risk Assessment Process

The Coral Sea Fishery has undertaken the preliminary Level 1 Ecological Risk Assessment (ERA) and a semi qualitative Level 2 ERA for Chondrichthyan and Protected (TEP) species. Hand collection methods presented a low risk to all species considered, finfish trapping also presented a low risk to most species, with bathyl and reef sharks the only exception with medium risk.

Marine turtles, bathyl and reef sharks were all afforded a high risk rating for trawl and line methods, while pelagic and shelf sharks were given a high risk rating for line methods only.

Results of the semi qualitative risk analysis are outlined in Table 1 below.

Table 1 - Summary of results from the semi qualitative risk analysis of the Coral Sea Fishery

Animal Group	Hand Collection	Demersal Trawl	Demersal and Auto-Longline	Other Line	Finfish Trap
Seabirds					
Seahorses and Pipefish					
Marine Turtles					
Sea snakes and kraits					
Cetaceans					
Bathyl sharks					
Pelagic sharks					
Reef sharks					
Shelf sharks					

High Risk Medium Risk Low Risk

Due to the variable and often exploratory nature of the fishery, target species are difficult to define. AFMA has adopted harvest strategies for the CSF that aim to detect a wide range of changes due to fishing activity; in doing so AFMA manage all species in the fishery. Across all sectors of the fishery, additional measures such as move on provisions, rotational harvest arrangements, use of bycatch reduction devices and voluntary codes of conduct also contribute to the sustainability of the CSF.

AFMA is currently undertaking a further ERA process to consider all species for which an interaction has been recorded and that have not already been considered by the CSF ERAs to date. Any risks identified through this process will be addressed through mechanisms such as the CSF harvest strategy, permit conditions and the Bycatch and Discard Work Plan.

Threatened, Endangered and Protected (TEP) species

Threatened, endangered and protected (TEP) species includes all species listed as threatened, endangered or protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). They include all species of seabirds, marine mammals, marine reptiles and certain species of shark including; whale shark, white shark and grey nurse. It is a legislative requirement of the EPBC Act that fishery interactions with these species be avoided. In this context the approach for addressing TEP species is to develop measures to mitigate, to the greatest feasible extent, interactions with TEP species regardless of assessed risk. However, TEP species that are assessed to be at high risk from the fishery should take priority in terms of immediate action.

Characterisation of bycatch and discarding

Overview

The CSF catches in excess of 850 species. The species caught vary depending on the methods used as well as the areas and times fished. Due to the variability in species caught and in fishing effort across the different fishery sectors, the distinction between target and bycatch species is difficult to make.

The Lobster and Trochus, Aquarium, and Sea Cucumber sectors employ methods which are highly selective and able to avoid bycatch species. All permits in the CSF prohibit the taking or carrying of tuna and tuna like species.

The following sections identify the key commercial species for each sector.

Key species for the Line, Trap and Trawl sectors have been determined from total catch weight reported in logbooks over the period 2004/05-2008/09 inclusive. Only the top ten species (by total catch weight) have been reported for each sector.

Species with a high risk rating attributed by the Ecological Risk Assessment Process have been listed for each relevant method by default.

Hand Collection

No species were identified as being at high risk from hand collection methods under the Ecological Risk Assessments conducted for the CSF to date.

Hand collection methods in the CSF are highly selective and do not result in bycatch; consequently there is unlikely to be any discarding.

Sectors of the CSF that utilise hand collection include the Aquarium fish (including live rock) collection sector, the Sea Cucumber collection sector, and the Lobster and Trochus collection sector.

Trawl

Three priority groups were identified through the ecological risk assessment process for the CSF; these were:

-Turtles;

-Bathyl Sharks >200m; and

-Reef Sharks

There have been no reported interactions with turtles in the CSF, this is supported by Observer coverage which covers a minimum of 25% of trips. Bycatch reduction measures such as the use of Turtle Excluder Devices (TEDs) and trip limits may help demonstrate sustainability. Current TED usage requirements may need to be reviewed if interactions with turtles are detected.

Risks associated with localised depletion of shark species will need to be discussed and mitigation measures determined. Trip limits for deepwater sharks were introduced in 2010 and discourage fishing where there is a high bycatch of these species. Development of operating procedures outlining areas (including depths) fished, timing of fishing (if appropriate) and other measures may further assist in this regard.

Table 2 - Key Trawl species determined from logbooks over the period 2004/05-2008/09 inclusive. Only the top ten species (by total catch weight) have been reported.

Taxonomic Group	Scientific Name	Common Name
Trawl		
Berycidae	*Beryx splendens*	Alfonsino
Lutjanidae	*Etelis coruscans*	Flame Snapper
Gempylidae	*Rexea solandri*	Gemfish[1]
Aristeidae	*Aristaeopsis edwardsiana*	Giant scarlet prawn
Serranidae	*Polyprion spp.*	Hapuku and Bass Groper
Priacanthidae	*Cookeolus japonicus*	Longfinned bullseye
Penaeoidea and Caridea		Prawns (mixed)
Penaeidae	*Melicertus longistylus*	Red spot king prawns
Emmelichthyidae	*Emmelichthys spp.*	Redbait (mixed)
Percichthyidae and Serranidae		Temperate basses & rockcods

[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.

Trap

No species were identified as being at high risk from demersal fin fish trapping under the Ecological Risk Assessments conducted for the CSF to date.

Detailed reporting and the use of observers will continue to be used to identify any emerging risks posed by the use of demersal finfish traps.

Trap design, including the nature of sacrificial anodes on trap doors is regulated through permit conditions.

Best practice guidelines for handling and release of unwanted species and operation of traps more generally may reduce any existing risks posed by this sector.

Table 3 - Key Trap species determined from logbooks over the period 2004/05-2008/09 inclusive. Only the top ten species (by total catch weight) have been reported.

Taxonomic Group	Scientific Name	Common Name
Trap		
Lethrinidae	*Lethrinus laticaudis*	Grass Emperor
Lethrinidae	*Gymnocranius euanus*	Paddletail Seabream
Melanonidae, Moridae and Euclichthyidae		Pelagic morid and eucla cods
Serranidae	*Epinephelus cyanopodus*	Purple Rockcod
Lutjanidae	*Lutjanus sebae*	Red Emperor
Lethrinidae	*Lethrinus miniatus*	Redthroat Emperor
Serranidae	*Aethaloperca, Anyperodon* and *Epinephelus spp.*	Rockcod (mixed)
Lutjanidae	*Pristipomoides filamentosus*	Rosy Snapper
Lutjanidae	*Lutjanus spp.*	Sea Perch
Lethrinidae	*Lethrinus rubrioperculatus*	Spotcheek Emperor

Line

Three main groups were identified through the ecological risk assessment process for the CSF; these were:

- Turtles;
- Bathyl Sharks >200m; and
- Reef Sharks.

Bycatch mitigation measures may include the design and implementation of best practice protocols for handling of sharks and other species of concern.

It may also be necessary to further investigate the risk factors for turtles if interactions are detected and if necessary, develop best practice handling protocols.

Trip limits for deepwater sharks were introduced in 2010 and discourage fishing where there is a high bycatch of these species, additional limits for other potential high risk species will continue to be implemented through the CSF Harvest Strategy.

Table 4 - Key Line species determined from logbooks over the period 2004/05-2008/09 inclusive. Only the top ten species (by total catch weight) have been reported.

Taxonomic Group	Scientific Name	Common Name
Line		
Serranidae	*Epinephelus ergastularius and E. septemfasciatus*	Bar Rockcod
Carcharhinidae	*Carcharhinus spp.*	Blacktip shark (mixed)
Centrolophidae	*Hyperoglyphe antarctica*	Blue-eye Trevalla
Lutjanidae	*Etelis coruscans*	Flame Snapper
Lethrinidae	*Gymnocranius euanus*	Paddletail Seabream
Lutjanidae	*Pristipomoides filamentosus*	Rosy Snapper
Lutjanidae	*Etelis carbunculus*	Ruby Snapper
Sphyrnidae	*Sphyrna lewini*	Scalloped Hammerhead
Carcharhinidae	*Galeocerdo cuvier*	Tiger Shark
Carcharhinidae	*Triaenodon obesus*	Whitetip Reef Shark

Fishery Monitoring Program

Logbooks

Logbooks are in place for all sectors of the CSF. These catch records are verified against Catch Disposal Records for all sectors other than the Aquarium fish collection sector.

Logbooks capture information on fishing gear, what species are caught in what quantity, as well as information on and when and where fishing occurred and for how long. Hand collection logbooks also collect information on the size of animals and how they were processed (if applicable).

Observer Program

AFMA has provision to place an Observer on any boat at any time and specifies minimum requirements for some sectors. The Line, Trap and Trawl sectors are required to carry an Observer on the first trip of every fishing season and on every fourth trip thereafter with the objective of covering 25% of the effort. Where certain automatic or random baiting gear is used this level increases to every third trip. Observer coverage for the hand collection sectors is prescribed at AFMA's discretion. This is due to the low risk of interacting with listed species, the absence bycatch and discarding, and the fact that hand collection involves diving, making observation difficult.

The catch of all species is considered under the harvest strategies for the CSF. In the absence of clearly defined target species for the fishery, greater focus on bycatch or discard species is difficult.

Existing bycatch and discarding reduction efforts

Closed Area Spatial Management Regime

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 catch 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 now 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.

An 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, Bougainville 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.

A Stewardship Action Plan (SAP) developed by ProVision Reef has also been adopted by all CSF Aquarium sector operators. This SAP stipulates best management practices which avoid localised depletion and limit pressure on habitats stressed by coral bleaching events.

Catch limits

Trip limits were introduced in 2010 for deepwater sharks. Catches of these species are extremely low and infrequent in the CSF, however AFMA has taken a highly precautionary and proactive approach in recognition that these species may be more susceptible than others to overfishing due to their low rates of reproduction.

All deepwater sharks brought aboard live must be released alive, while a very small quantity of any dead animals may be retained to facilitating the collection of information on species occurrence.

The limits in the CSF are 15kg per permit per day and 90kg per permit for trips lasting greater than six days. These limits are the same as used in the SESSF as part of the stock rebuilding strategy for upper-slope dogfish, however instead of applying to only four species, the CSF limits apply to all deepwater sharks that occur in the CSF; this is believed to be about 19 species.

Additional limits for other potential high risk species exist in the CSF Harvest Strategy and will continue to be updated as risk assessments evolve.

Improved fishing gears and practices

Mesh size limits apply to the Trawl sector. Mesh size must not be less than 38 millimetres at any part of the net. Methods for measuring the net mesh size are prescribed in CSF permit conditions.

When fishing for crustaceans, a Turtle Excluding Device (TED) must be used. These TEDs are defined as:

(a) A rigid or semi-rigid inclined barrier structure comprised of bars extending from the foot to the head of the net that is attached to the circumference of the net which must guide turtles towards an escape hole immediately forward of the grid; and

(b) An escape hole with the following minimum measurements when measured simultaneously with the net taut:

i. 760mm across the width of the net,

ii. a perpendicular measure of 380mm from the midpoint of the width measure; and

(c) A maximum bar spacing of 120mm.

Although no observer reports or logbook records have recorded any interaction with turtles in the CSF to date, turtles do occur at a wide range of depths encompassing the range of depths over which CSF trawling is undertaken.

Further expert advice may help better determine the extent to which different turtles occupy different depth strata in the CSF however a number of issues remain which also warrant consideration. Benefits of TEDs include:

1. TEDs can reduce the risk trawling poses to turtles during setting and hauling as nets pass through the water column;
2. TEDs can reduce bycatch of other animals such as sharks, rays and skates;
3. Turtles as well as bathyl and reef sharks were found to be at high risk from trawl activity in the CSF and other Chondrichthyan species and cetaceans were found to be at medium risk in the CSF (Table 1). In the absence of information to modify existing risk ratings, measures must be taken to mitigate risk based on best available knowledge;

Acknowledging the developmental nature of the CSF, AFMA will closely monitor trawl interaction rates with TEP species and review the current provisions for TED requirements as necessary.

Trap design was regulated during trials for this method, however these design requirements are no longer in place. No other selectivity requirements are in place for the fishery at this time. Measures such as hook size and type, use of wire traces may be further considered in response to identified risks.

Bycatch Reduction Work Plan

The key objectives of the Coral Sea Fishery bycatch and discarding work plan for 1 June 2010 to 31 May 2012 are to:

- Respond to high ecological risks assessed through AFMA's risk assessment processes; and,
- Avoid interactions with species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act); and,
- Quantify and minimise overall bycatch in the fishery over the long-term. This will be facilitated through improved monitoring and reporting standards consistent with the Ministerial Direction (2005).

The following actions will be implemented during the period stated in this work plan to pursue the above objectives. The proposed actions are to design, develop, trial and implement specific mitigation strategies and undertake work that will contribute towards future mitigation strategies. It is also intended to fill critical information gaps about bycatch at risk, or about bycatch and discarding more generally, and to develop a more strategic approach to the management of bycatch and discarding in the fishery. On the annual review of the work plan and the strategic research plan, further projects can be added if consistent with research priorities and there is a capacity to fund further projects.

Table 5 – Work Plan for 2010-2012

Actions	Sector Relevance	Risk / Issue to be addressed	Costs $	Performance Indicators	Milestones
Implement handling practices for discarded Chondrichthyan species to maximise their post-release survival.	Line, trap and trawl	Shelf sharks Bathyl sharks Pelagic sharks Reef sharks	Cost to be shared by AFMA and Industry	Code of conduct for the handling of sharks. Code to apply to all CSF. Elements may include cutting line at water, use of certain types of hooks, no wire traces, venting, trap haul speeds, modification of auto de-hookers etc	Draft available by 30 June 2011. Final draft to be completed by 31 December 2011.
Trip limits, including some species specific limits to be implemented to reduce the impact on all Chondrichthyan species as well as other species subject to quota limits (e.g. sea cucumbers, lobsters, trochus) regardless of sector. Limits may also help address localized depletion for reef associated species.	Line, trap and trawl	All Chondrichthyan species (including skates, rays etc)	Admin costs only	Trip limits implemented via permit conditions.	Effective immediately.
Design and implement data protocols to provide adequate fishery dependant/ independent data. Discourage reporting of mixed fish or mixed sharks. Provide additional information to supplement the Queensland State identification guides. If fishers can't identify species then AFMA will require an Observer on the next trip for that permit (regardless of season or owner/operator). Any risks identified through this process will be addressed through mechanisms such as the CSF harvest strategy, permit conditions and the Bycatch and Discard Work Plan	Line, trap and trawl	Better data resolution to allow determination of risks and impacts to individual species.	Admin costs only	Improved logbook data and adequate observer coverage. Consultation and education strategy agreed by AFMA and Industry.	6 monthly review of logbook data and comparative analysis against observer data.

Observers to be present on the first trip of each season with minimum observer coverage per vessel of 25%. Turtle Excluding Devices (TEDs) to be used at all times while targeting crustaceans. 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 mitigative strategies require amendment. This may include consideration of design and operation of Turtle Excluding Devices (TEDs) and/or other mitigation measures for marine turtles, cetaceans and EBPC Act 1999 listed chondrichthyan species in the CSF. 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 afore-mentioned species have been otherwise mitigated.	Trawl	Turtles, cetaceans and EPBC Act 1999 Listed Chondrichthyans.	Market rate for observers and/or TED	Demonstrated low risk to turtles during all fishing activity, including setting and hauling.	6 monthly review of activity and interactions.

Summary

Differentiating target species from bycatch and discard species is difficult in the CSF. This is due to the diverse range of fishing methods and species; the often variable and exploratory nature of fishing in the CSF; as well as the generally low fishing activity and limited capacity for research and data collection. A pragmatic approach is required to manage risk in the CSF. The measures outlined in this Bycatch and Discard Work Plan consequently focus on potential high risk species and species groups, collecting and incorporating new information as it becomes available, and seeking to demonstrate sustainability of the fishery as a whole.

The CSF Bycatch and Discard Work Plan will assist AFMA to pursue its wider bycatch and discarding objectives, of assisting fisheries to determine and implement a course of action that will address high risk bycatch, and avoid interactions with TEP species.

The greatest bycatch issue identified to date for the CSF is considered to be the potential for interaction with TEP species such as turtle and protected shark, and other groups of species identified as 'high risk' by the Chondrichthyan Technical Working Group (CTWG). As more information becomes available this Bycatch and Discard Work Plan will seek to refine and further develop its mitigation strategies, ensuring sustainable fisheries management and sound decision making in relation to bycatch and discarding issues.

Review Process

The work plan will be reviewed at the end of each year for the following:

- Progress against project commencement and related annual milestones
- Potential research for the following year research program.

A brief annual report will be compiled on progress of the work plan.

This work plan will be reviewed at the end of two years for the following:

- to assess the overall effectiveness of project work in the fishery in terms of addressing the associated bycatch risks or discard reduction. This should be done quantitatively where possible.

At the end of two years the risk profile of the fishery must be reviewed and a new work plan must be developed and implemented within six months.

Appendix

Issues identified in the Chondrichthyan Guide for Fisheries Managers and responses outlined in this Bycatch and Discard Work Plan.

Species/Groups of priority from the Ecological Risk Assessment Process

Closures

Comment: *Closures may have a bigger benefit for reef sharks than other groups as they are known to occupy particular reef areas. The potential for local depletion is also increased in this group as stock structuring is likely, although the movement between reef areas is currently unknown. Seamounts may be particularly prone to depletion and may have associated endemic species.*

Response: Significant marine protected areas already exist in the CSF and a further process is being undertaken by the Department of the Environment, Water, Heritage and the Arts to establish a further network of representative marine protected areas.

Trip limits

Comment: *Currently, there are no trip limits for sharks in the CSF. The CTWG expressed concern that this is the case.*

Response: Trip limits have been introduced for deepwater sharks in the CSF and are being considered for other Chondrichthyan species.

Comment: *Queensland has a trip limit of one Grey Reef Shark and one Whitetip Reef Shark and the Commonwealth should look to adopting similar standards.*

Response: The CSF has implemented precautionary catch triggers for these species through the CSF Harvest Strategy.

Comment: *Because of the high potential for localised depletion, if the CSF were to consider expanding, surveys should be conducted to determine if expansion is sustainable.*

Response: The CSF Harvest Strategy seeks links development and expansion to increasing levels of assessment. This ensures any expansion of the fishery occurs in a controlled and informed fashion.

Handling practices

Comment: *As these species [reef sharks] inhabit shallow waters, they are unlikely to suffer barotrauma when captured. However, a general improvement in handling practices would likely be beneficial.*

Response: Measures will be developed and implemented to ensure handling practices for reef sharks as well as other Chondrichthyan species are optimised and minimise post release mortality in these species.