

# Annual status report 2011

## Coral Reef Fin Fish Fishery



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## Fishery profile 2010–11

<p><b>Species targeted</b></p> <p>Coral trout (CT), redthroat emperor (RTE). Other coral reef fin fish species (OS) including cods, emperors and tropical snappers.</p>	<p><b>Total number of commercial licences in 2010–11</b></p> <p>367</p>
<p><b>Total harvest from all sectors</b></p> <p>Approximately 1 768 t + unquantified recreational estimate.</p>	<p><b>Commercial licences accessing the fishery in 2010–11</b></p> <p>229</p>
<p><b>Commercial harvest</b></p> <p>Approximately 1 479 t comprising of 797 t of CT, 256 t of RTE and 426 t of OS.</p>	<p><b>Fishery season</b></p> <p>Year round except two five-day spawning closures around the new moon in October and November each year.</p>
<p><b>Recreational harvest (last estimate from 2005)</b></p> <p>Approximately 2600 t.</p>	<p><b>Fishery symbols</b></p> <p>RQ and either an L1, L2 or L3.</p>
<p><b>Charter harvest</b></p> <p>Approximately 289 t comprising of approximately 64 t of CT, 73 t of RTE and 151 t of OS.</p>	<p><b>Monitoring undertaken</b></p> <p>Daily compulsory commercial and charter fishery logbooks, structured line fishing surveys last undertaken in 2009, at-sea observing every three years, recreational fishing surveys every three to five years.</p>
<p><b>Indigenous harvest (last estimate from 2000–01)</b></p> <p>Approximately 108 t.</p>	<p><b>At-sea observer days monitored in 2010–11</b></p> <p>72</p>
<p><b>Commercial Gross Value of Production</b></p> <p>Approximately \$30 million.</p>	<p><b>Accreditation under the EPBC Act</b></p> <p>Expires 2 November 2012.</p>
<p><b>Allocation between sectors<sup>1</sup></b></p> <p>Significant recreational and commercial sectors with smaller Indigenous and charter sectors.</p>	<p><b>Logbook validation</b></p> <p>Yes – completed in May 2006.</p>
<p><b>Total exports</b></p> <p>The majority of the coral trout catch is exported live for approximately \$40/kg beach price with approx 5% sold domestically as whole or fillet. Most RTE and OS sold domestically.</p>	<p><b>Quota managed</b></p> <p>Yes, total allowable commercial catch is allocated through individual transferable quotas (ITQs) as specific entitlements for CT, RTE and OS.</p>

<sup>1</sup> There are no formal catch allocation arrangements for this fishery.

Key fish resources	Stock status
Coral Trout ( <i>Plectropomus</i> and <i>Variola</i> spp.)	To be assessed in 2012
<p><b>Comments:</b> In the 2010 annual status report (reporting on the 2009–10 financial year), coral trout was assessed as ‘Sustainably Fished’. In 2010–11, catch of coral trout has decreased from around 941 t in 2009–10 to 797 t (69% of available quota), possibly reflecting the delayed response to impacts of Tropical Cyclone Hamish in March 2009. Performance measures relating to catch rate at a regional scale have now triggered, and Fisheries Queensland is investigating how shifts in fishing effort are affecting the fishery. Stock status determination for coral trout for the 2010–11 reporting period has been postponed until April 2012 when an updated recreational estimate will be available for consideration, and the fisheries observer data for the 2011 reef line trips have been assessed.</p>	
Redthroat Emperor ( <i>Lethrinus miniatus</i> )	Not Fully Utilised
<p><b>Comments:</b> In 2010–11 only 41% of available quota was taken. The 2006 stock assessment estimated the population biomass to be around 70% of unfished biomass, indicating that the commercial TAC is set at an appropriate level. Performance measures relating to catch and effort in the commercial and charter sectors were not triggered in 2010–11.</p>	
Stripey Snapper ( <i>Lutjanus carponotatus</i> )	Sustainably Fished
<p><b>Comments:</b> Increased commercial landings from 20 t in 2004–05 to 50 t in 2010–11, which could be reflective of shifts in fisher targeting behaviour. Available length and age distributions for stripey populations in the Great Barrier Reef do not indicate any sustainability concerns (Heupel et al. 2009). This species does not enter the fishery until they are sexually mature (not selected by fishing gear until they reach size of maturity). Stripey snapper will continue to be monitored through the Performance Measurement System for the CRFF.</p>	
Red Emperor ( <i>Lutjanus sebae</i> )	Uncertain
<p><b>Comments:</b> Commercial catch levels have remained steady for the last three years (~60 t). Catch rate has remained relatively stable over past decade. Minimum size limit of 55 cm total length has been in place for seven years and should now be resulting in increased spawning biomass. Increased specificity in commercial logbooks implemented in 2007 will help to determine status, but more information is required on age structure and recreational catch.</p>	
Crimson Snapper ( <i>Lutjanus erythropterus</i> )	Uncertain
<p><b>Comments:</b> Commercial harvest remains stable at approximately 15 t. There is some published information regarding lengths and mortality estimates from the Great Barrier Reef region from the late 1990s, however more age, sex and updated recreational catch information is required. Improved resolution of commercial catch is available in logbooks since 2007; however, the species is grouped with saddletail snapper in the 2005 recreational fishing survey. Suspected increases in catch efficiency with increasing affordability of advanced technology (sounders, GPS, sonar).</p>	
Saddletail Snapper ( <i>Lutjanus malabaricus</i> )	Uncertain
<p><b>Comments:</b> Commercial harvest remains about half that of pre-quota levels (~50 t). There is some published information regarding lengths and mortality estimates from the Great Barrier Reef region from the late 1990s, however current biological information would assist in defining stock status. This species is also grouped with <i>L. erythropterus</i> in the 2005 recreational fishing survey due to difficulty in species identification.</p>	

Key fish resources	Stock status
Moses Perch ( <i>Lutjanus russelli</i> )	No Assessment Made
<p><b>Comments:</b> Limited commercial catches. Updated estimates of recreational catches may assist in determining stock status. Updated estimates will be available in 2012 at the completion of the statewide recreational fishing survey.</p>	
Hussar ( <i>Lutjanus adetti</i> and <i>L. vitta</i> )	Uncertain
<p><b>Comments:</b> Commercial catches currently well below long term average for this species group (~21 t in 2010–11), while recreational catches are thought to be substantial. The latest published local biological study from the Great Barrier Reef (Heupel et al. 2009) does not indicate any concerns about the stock between 1995 and 2005. Updated estimates of recreational catches may assist in determining stock status in 2012 at the completion of the statewide recreational fishing survey.</p>	
Spangled Emperor ( <i>Lethrinus nebulosus</i> )	Uncertain
<p><b>Comments:</b> Catches returning to pre-quota levels (~60 t), with increases in some northern fishing grids. Although there are no current indications of sustainability issues, additional biological data and updated recreational catch information would assist in confidently assigning a status.</p>	
Tuskfish ( <i>Choerodon</i> spp.)	Uncertain
<p><b>Comments:</b> Catches returning to pre-quota levels (~23 t). There are no current indications of sustainability issues. The majority of tuskfish catch is recorded as Tuskfish–unspecified in the logbooks. The updated recreational catch estimate (in 2012) may assist in confidently assigning a status.</p>	

\* Note: These are outcomes arising from the Stock Status Assessment Workshop held in December 2010. Key species above were identified by Fisheries Queensland based on catch history and feedback from stakeholders and are referred to as key species within this document.

## Introduction

The Coral Reef Fin Fish Fishery (CRFFF) is a predominantly line-only fishery that targets a range of bottom-dwelling reef fish. It consists of a commercial sector, focusing primarily on live coral trout, and recreational and charter sectors. The fishery operates predominantly in the Great Barrier Reef Marine Park (GBRMP). Commercial fishing operations generally consist of a number of smaller tender boats (dories) and a larger primary fishing vessel used to hold fish. A comprehensive suite of management arrangements, including an Individual Transferable Quota (ITQ) system, is in place for the commercial fishery to ensure its sustainability into the future.

This report covers the financial year from 1 July 2010 to 30 June 2011.

## Fishery description

### Fishing area and methods

Commercial operators with an RQ fishery symbol and who possess a line fishing endorsement in the form of an east coast 'L' fishery symbol (i.e. L1, L2, L3, and L8<sup>2</sup>) are permitted to take coral reef fin fish (RQ species, see Schedule Five of Fisheries Regulation 2008) in east coast Queensland waters. The line symbol they are operating under dictates the area in which they can fish (Figure 1).

Commercial and recreational fishers (including recreational fishers on licensed charter vessels) are permitted to use up to three lines, with no more than six hooks (total), using either a rod and reel or a handline. Recreational fishers may spear coral reef fin fish without the use of underwater breathing apparatus.

### Key Species

Coral trout refers to a group of seven species, including five *Plectropomus* and two *Variola* species. The common coral trout (*P. leopardus*) makes up the majority of landings. Common coral trout are found throughout the Great Barrier Reef (GBR) in waters to at least 100 m depth and are daytime predators. Peak

spawning activity occurs in October and November each year (Brown et al. 1994, Williams et al. 2007) but may vary depending on water temperature. Individuals change sex from female to male at a mean size of 42 cm, live for up to 18 years and reach up to seven kilograms and 80 cm in length. Individuals attain the minimum size limit of 38 cm at around two to three years of age; however, they display great variation in size at age (Ferreira and Russ 1994). One genetic stock has been identified on the east coast of Australia (van Herwerden et al. 2009); however regional variation exists in various population parameters (e.g. timing of spawning and growth rates; Adams et al. 2000, Mapstone et al. 2004).

Redthroat emperor (*Lethrinus miniatus*) can attain a maximum of 65 cm in length, 4 kg in weight and 20 years of age. The GBR is home to a single stock of redthroat emperor (van Herwerden et al. 2003) but regional variation has been identified in several population parameters (Davies et al. 2006). This species has been found in waters to at least 128 m and is more common on the GBR south of Innisfail. Little is known about their movements and juvenile fish have not been seen. The majority of redthroat emperor change sex from female to male over a broad range of size and age, while others remain female their whole lives (Williams 2003, Sumpton and Brown 2004). Females reach maturity at around two years and 31 cm (Williams 2003).

Other species landed in this fishery exhibit a variety of biological and life history traits. The CRFFF management strategy includes monitoring of key OS species and conducting ecological risk assessments to identify species that may require further assessment and/or management attention.

### Main management methods used

Management of the CRFFF is the responsibility of Fisheries Queensland. A comprehensive set of input and output controls are in place under the Fisheries Regulation 2008 and the Fisheries (Coral Reef Fin Fish) Management Plan 2003 to manage the harvest of coral reef fin fish.

These include:

- limited entry in the commercial fishery
- boat size and tender restrictions for commercial operators, and gear restrictions for all fishers

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<sup>2</sup> The L8 multi-hook Deep Water Fin Fish Fishery operates in waters deeper than 200 m and is reported separately by Fisheries Queensland. For information on this fishery, visit the Fisheries Queensland Annual Status Report webpage at [http://www.dpi.qld.gov.au/28\\_10916.htm](http://www.dpi.qld.gov.au/28_10916.htm)

- total commercial entitlements under RQ units are: CT – 1288 156 kg; RTE – 615 586 kg; and OS – 955 604 kg, however the CRFFF management plan requires a reduction in the value of CT and OS units if specified catch triggers are reached. This ensures that the total allowable commercial catches introduced in 2004 are not exceeded. There is no catch trigger specified for RTE because the entitlement under units issued does not exceed the TAC introduced in 2004
- commercial TACs allocated through Individual Transferable Quotas
- minimum and maximum size limits that apply to the recreational, charter and commercial sectors
- recreational in-possession limits for individual species
- combined recreational in-possession limit of 20 coral reef fin fish
- Seven coral reef fin fish are designated as ‘no-take’ species (barramundi cod, potato cod, Queensland groper, chinaman fish, hump-headed Maori wrasse, paddletail and red bass)
- two annual five-day spawning closures in October and November that apply to all fishers operating on the east coast between latitude 10° 41’S and 24° 50’S to the eastern boundary of the GBRMP.

The fishery is also subject to restrictions on areas in which it can operate through zoning declared under GBRMP and Queensland Marine Parks Zoning Plans.



Figure 1: Map of fishery area.

## Catch statistics

### Commercial

Commercial operators are required to complete daily catch and effort logbooks and must report catches of CRFF through the quota reporting system.

The quota reporting system requires fishers to call through prior reports (made before landing) and unload notices (made when unloading at wharf), as well as complete catch disposal records. Table 1 shows the reported catch (from unload notices) for the 2010–11 quota year and the percentage of available quota<sup>3</sup> used for the period.

Table 1: Percentage of available quota used for CT, RTE and OS in the 2010–11 financial year (Source: Fisheries Queensland quota monitoring unit, 16 November 2011).

Quota group	Total catch	% of available quota used
CT	882 995	69
RTE	254 630	41
OS	445 473	47

Annual commercial catch and effort information for the CRFFF has historically been variable in response to changes in management arrangements. Since the Coral Reef Fin Fish Fishery Management Plan 2003 was implemented, catch and nominal catch per unit effort (CPUE<sup>4</sup>) of CT increased steadily until 2009–10 when the first decline since the introduction of quota was recorded (Figure 2). This decline is likely related to delayed effects of Tropical Cyclone Hamish which traversed offshore reefs between Bowen and the Swains reefs region in March 2009. Immediately following the cyclone the CRFFF responded to the impact with geographical shifts in fishing effort, mainly to unaffected areas north of Bowen (see DEEDI 2010).

<sup>3</sup> Percent of available quota is calculated by dividing the landings (unload notices) by the allocated quota minus the SEWPac holdings which are not fished

<sup>4</sup> Nominal CPUE refers to logbook reported days fished divided by total catch of that species in kilograms or tonnes.

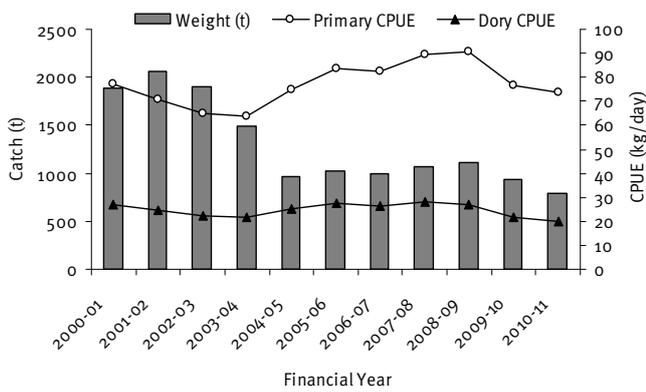


Figure 2: Total commercial catch and nominal catch rate (days and dory days) of coral trout by quota year between 2000–01 and 2010–11 (Source: CFISH database, 16 November 2011).

The catch of RTE decreased to around 256 t, or 41% of available quota in 2010–11 (Figure 3), while catch rate increased over the same period. A stock assessment completed in 2006 indicated that the population of RTE was at approximately 70% of unfished biomass, suggesting a healthy stock remained. Fishing pressure since 2006 is not considered to have been sufficiently high to alter the conclusions of the assessment.

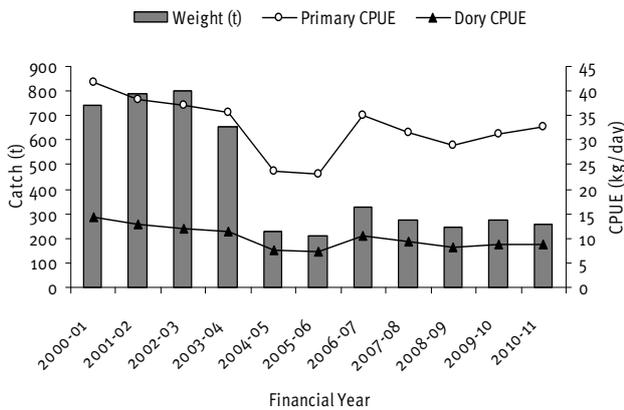


Figure 3: Total commercial catch and catch rate (days and dory days) of redthroat emperor by quota year between 2000–01 and 2010–11 (Source: CFISH database, 16 November 2011).

The catch of ‘other species’ (OS) also dropped to around 426 t (47% of available quota) in 2010–11 (Figure 4), and is reflective of the reduced fishing effort (187 licences in 2009–10 compared with 168 licences in 2010–11). Of the key OS species only landings of bar rockcod increased by more than 20% to 22 t (26% increase) with the majority of the key OS species (Table 2).

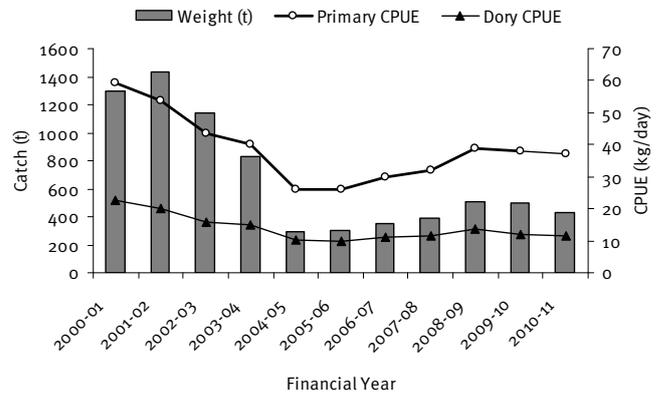


Figure 4: Total commercial catch of other species (OS) by quota year between 2000–01 and 2010–11 (Source: CFISH database, 16 November 2011).

## Recreational

Fisheries Queensland undertakes recreational fishing surveys to estimate catch, effort and participation by recreational fishers. Participation rate is measured through a telephone survey and catch and effort are recorded in recreational fishing diaries over a 12 month period (refer to the Annual Status Report 2007 for CRFFF previous figures and catch statistics). Fisheries Queensland commenced a state-wide Recreational Fishing Survey in July 2010. This survey will provide updated estimates of participation, catch and effort. The results will be available in 2012. For more information refer to [http://www.dpi.qld.gov.au/28\\_18273.htm](http://www.dpi.qld.gov.au/28_18273.htm)

## Charter

A significant proportion of the Queensland charter sector targets CRFFF species. In 2010–11 there were 176 active licences that reported catch, with 6 845 days at sea recorded which was well below the 8 795 days recorded in 2009–10. Logbook reported catch indicates that OS species catch is typically double that of the CT and RTE catch (Figure 5). Charter catches of CT, RTE and OS all decreased in 2010–11 which coincides with a decrease in effort during the period.

Table 2: Breakdown of the major 'other species' (OS) component (in kilograms) caught in the CRFFF since 2004–05. \* Indicates a key OS species as identified and monitored in the Performance Measurement System for the fishery (source: Fisheries Queensland CFISH database, 16 November 2011)

Common Name	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11
*Bar Rockcod	1480	3 668	944	25 902	37 952	17 337	21 900
*Red Emperor	26 267	27 937	29 405	42 511	57 680	59 999	58 946
*Spangled Emperor	12 334	11 625	16 170	30 306	56 855	66 121	53 973
*Hussar	16 260	14451	18 996	22 988	26 578	24 280	21 156
* Goldband Snapper	30 856	28 003	41 407	45 390	47 151	51 866	38 648
Green Jobfish	993	782	472	3 140	5 159	5 492	5 858
Rosy Snapper	2 211	6 054	4 778	7 108	16 109	5 490	3 013
* Jobfish - unspecified	23 080	34 848	30 337	10 743	5 070	6 568	3 374
*Saddletail Snapper	7 620	13 660	9 732	27 043	65 230	50 974	53 606
*Crimson Snapper	1313	820	950	10 067	20 141	20 279	15 057
*Nannygai - unspecified	13 961	14 644	18 469	2 811	135	99	253
Moses Perch	1 403	1 523	1 740	2 208	2 726	2 671	2 030
*Stripy Snapper	21 349	24 221	30 813	53 501	44 878	64 753	50 486
* Sweetlip - unspecified	21 149	24 815	25 881	13 496	7 602	13 075	10 610
* Tuskfish - unspecified	13 566	12 163	13 610	13 852	14 216	21 534	18 181
*Venus Tuskfish	1 324	2 225	2 964	1 183	983	1 796	1 791

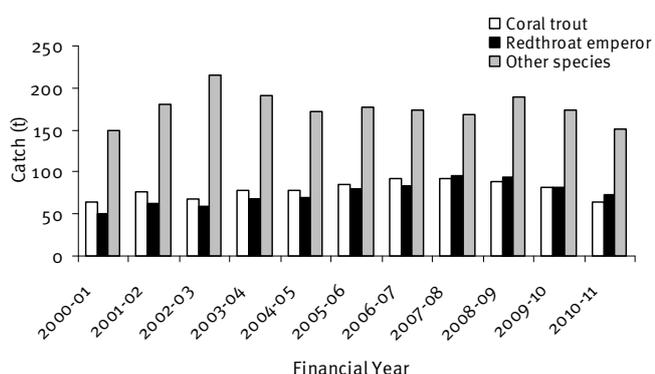


Figure 5: Charter catch of CT, RTE and OS species as reported in logbooks by financial year, 2000–2011 (Source: CFISH Database, 16 November 2011).

## Indigenous

Limited information is available on the total catch of CRFF by Indigenous fishers. The National Recreational and Indigenous Fishing Survey did provide some preliminary information, indicating that approximately 7 000 coral trout, 38 000 snappers, 9 000 emperors, 12 000 cods and 9 000 wrasse/groper were taken by Queensland Indigenous communities in 2000–01.

Based on the same weight conversions as those used for the recreational catch, this equates to approximately 108 t.

## Spatial issues / trends

Approximately 95% of reported commercial catch of CRFF is taken from areas within the GBRMP. For the 2010–11 period the catch of CT remained high in grids throughout the extent of the GBR east and north of

Shoalwater Bay. The catch of RTE was highest in the central section between Townsville and Mackay. High catches of OS recorded in the southern regions were driven by catches of deep water bar rockcod (*E. ergastularius* and *E. octofaciatius*). In the north, high catches comprised of spangled emperor (*Lethrinus nebulosus*) but also red emperor (*Lutjanus sebae*), saddletail snapper (*Lutjanus malabaricus*) and stripey snapper (*Lutjanus carponotatus*).

## Effects of Tropical Cyclone Hamish

The 2009 CRFFF Annual Status Report reported on effort shifts away from affected areas in response to Tropical Cyclone Hamish in March 2009 (DEEDI 2010). Tobin et al. (2010) report on the effects of three tropical cyclones on the CRFFF industry including a decrease of around a third in catch rates of CT and RTE in the most heavily affected regions. The effects on catch and catch rate of CT and RTE in the months following the cyclone were somewhat masked by effort shifting into northern areas not impacted by the cyclone. However, by December 2009 catch rates of coral trout showed fishery-wide reductions (Figure 3). The Tobin et al. (2010) analysis identifies depressed catch rates in affected areas following cyclones for a duration of between 12 and 24 months. This is reflected in the standardised catch rate analyses reported as part of the Performance Measurement System (PMS) below.

## Socio-economic characteristics and trends

Beach price for CRFF depends on the species, product form (e.g. live, fillet, whole dead, trunked) and appearance (colour). High prices are fetched on the export market for top quality live CT, which have dominated the product form of harvested CT since mid 1990's. While whole dead CT make up about 10% of the landed product, live fish have accounted for 85–90% of reported product since 2004–05 and fetch approximately four times that offered for filleted product. The beach price of live CT ranged from between \$33–60/kg in 2010–11. Whole or filleted RTE and OS attract around \$6–12/kg depending on species and product form, resulting in less targeting of RTE and OS and comparatively lower quota utilisation.

Landed OS and RTE are almost totally focused on the domestic market and sold as either whole fish (80–90%) primarily targeted to the restaurant trade, or fillet (10–20%). Anecdotally, the domestic market prefers the product to be in the fillet form, placing it in direct competition with cheaper imported product.

## Biological and ecological information

### Monitoring programs

Fisheries Queensland has collected fishery independent data on CRFF using structured line fishing surveys since 2005–06, based on similar methods to that developed by the historical (1995–2005) Effects of Line Fishing Program (Mapstone et al. 2004). The objectives of the monitoring program are to determine annual trends in abundance, mortality, length and age structure of CCT, RTE and the abundance and length structure of other species in regions within which the fishery operates. This data helps assess the status of the stocks and report against fishery performance measures. The line surveys were ceased in 2010, so no new information is available for 2010–11. However, age data for fish sampled 2009–10 are summarised in Figure 6.

Recruitment of young common coral trout (age 2) in 2009–10 was greater than that observed in 2008–09 (Figure 6). Age data collected for RTE shows persistence of a strong cohort (age group 4 in 2007–08) indicating fishing pressure is not sufficient to reduce this strong cohort to a level where it is not detectable (Figure 7).

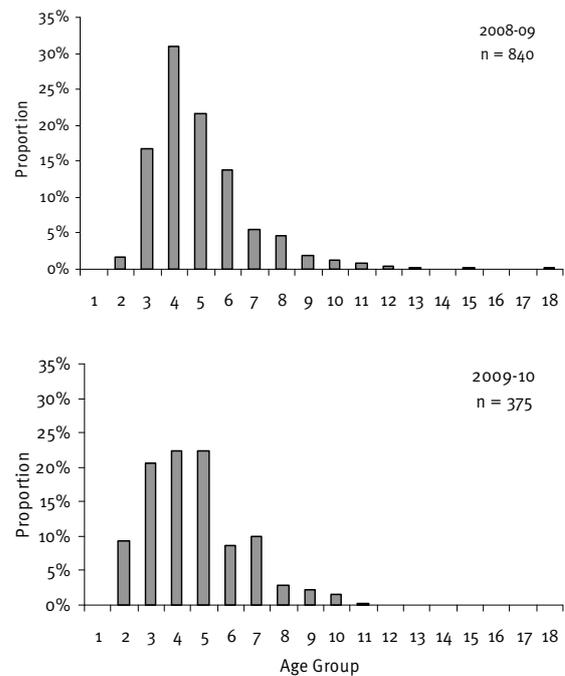


Figure 6: Age frequency of common coral trout sampled during the fishery-independent surveys between 2008 and 2010.

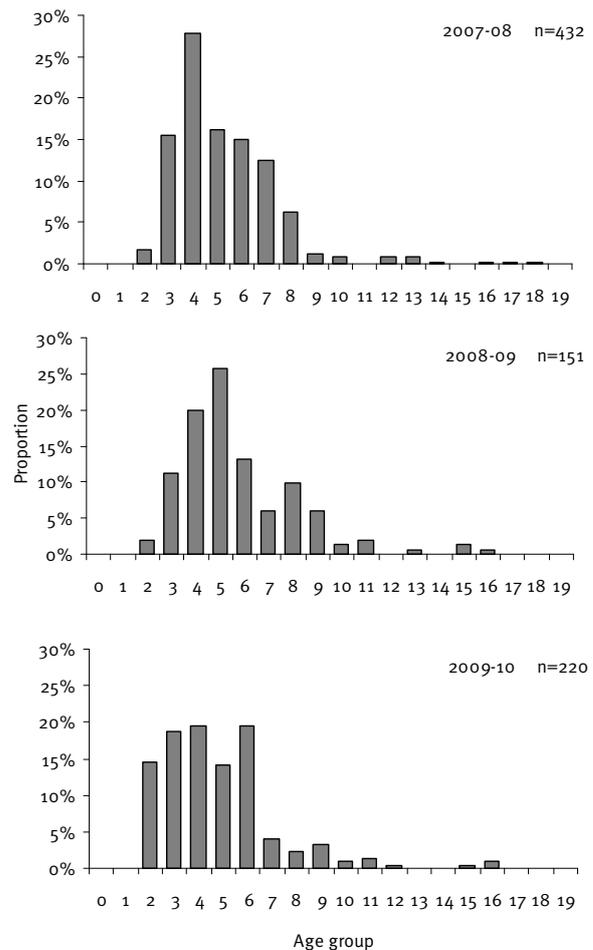


Figure 7: Age frequency of redthroat emperor sampled during fishery-independent surveys between 2007–08 and 2009–10 (Source: Fisheries Qld LTMP database, 23 November 2010).

## At-sea observing

In 2010–11 there were several Fisheries Observer Program (FOP) trips conducted within the CRFFF, with 72 days observed at sea. Results are expected by mid 2012.

## Bycatch

Bycatch information will be collected by the FOP during 2011. Results are expected by mid 2012.

## Interactions with protected species

There was no reported interaction with any protected species by this fishery in 2010–11, reinforcing that the impact of this fishery on species of conservation interest is very low.

## Ecosystem impacts

Line fishing is a selective harvesting technique which limits the potential impacts on species other than the targeted fishery species. Climate change continues to be an issue for coral reef ecosystems and is becoming an increasingly important topic for current and future research. Climate change has been linked to increases in the number and extent of coral bleaching events (see Hoegh-Guldberg et al. 2007) and changes in ocean chemistry. These events also have the potential to impact on the replenishment rates of coral reef fin fish populations (Hughes 2010), individual growth rates and spawning output (Johnson and Welch 2010).

# Sustainability Assessment

## Performance against fishery objectives

The Performance Measurement System (PMS) functions as a reporting framework that is a transparent,

defensible set of criteria for evaluating the performance of the fishery against management objectives. Within three months of becoming aware that a measure has been triggered the department will carry out a process of investigation. The CRFFF PMS outcomes for 2010–11 are outlined in Table 3 below.

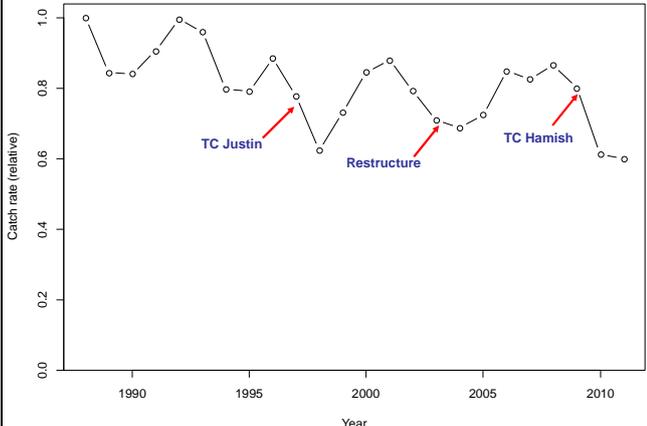
## Current sustainability status and concerns

The first stock assessment of common coral trout is planned for late 2012. The robustness of the stock assessment in its capacity to predict MSY for the east coast stock will be tested in the Management Strategy Evaluation (MSE) ELFSim. ELFSim now contains a stock assessment module that will generate estimates of MSY and other stock parameters based on simulated coral trout populations on 3000 virtual reefs. The models used in the assessment of the wild coral trout stock will be tested in ELFSim to determine if they can accurately predict known virtual coral trout populations. Importantly the ELFSim will also be used to identify the fishery data needed in order to produce reliable stock assessments into the future.

Data limitations have resulted in the status of many species under 'other species' remaining uncertain. Information pertaining to recreational harvest estimates will improve for some species in 2012, with the completion of the current statewide recreational fishing survey.

Table 3: Performance measures and outcomes for the CRFFF in 2010–11.

Performance measure	Performance
<i>Target species</i>	
Annual standardised catch rate for coral trout and redthroat emperor falls below 90% of the average standardised catch rates of all preceding quota years.	<p><i>Triggered – Coral trout</i></p> <p><i>Not triggered – Redthroat emperor</i></p> <p>In 2009–10 and 2010–11, the standardised CT catch rate was lower than the historical average catch rate since quota was introduced in 2004–05, whilst redthroat emperor was higher (see Figure 8 a, b). This fishery response has been reported in the past after cyclonic events (G. Leigh, pers. comm.).</p>

Performance measure	Performance
<p>Annual standardised catch rate for coral trout and redthroat emperor by region falls below 90% of the average standardised catch rates of all preceding quota years.</p>	<p><i>Management response:</i>  <i>Effective standardisation of coral trout catch rates in this spatially complex fishery remains challenging. The fishery has been significantly impacted by a series of tropical cyclones since TC Hamish in March 2009. Regional shifts and localised concentrations in fishing effort have occurred as a result of the impacts of the cyclones. The performance measure is based on a short time series of catch relative to the historic operation of the fishery. Since the late 1980's catch rates (adjusted) have varied in a cyclic nature, some of the declines correlate with events such as tropical cyclones (Figure A). It is noted that in the last 2 years that adjusted catch rates have declined. Fisheries Queensland will monitor the catch rates over the 2012-13 quota year; and based on all available information, will determine in consultation with industry and other key stakeholders if further action is required.</i></p>  <p><i>Figure A: Long-term changes in P. leopardus adjusted catch rates based on commercial logbook data (source: G. Leigh draft 2012 coral trout stock assessment)</i></p> <p><i>Triggered – Coral trout</i>  <i>Not triggered – Redthroat emperor</i></p> <p>In 2009–10 and 2010–11, the standardised CT catch rate was consistently lower across all regions than the historical average catch rate since quota was introduced in 2004–05 (see Table 4).</p> <p><i>Management response</i>  <i>Effective standardisation of coral trout catch rates in this spatially complex fishery remains challenging. Regional shifts and localised concentrations in fishing effort have occurred as a result of the impacts of the cyclones. The overall reduction in catch rates reflects the regional declines; it is noted that catch rates have declined consistently across all regions. As per PMS 1 above Fisheries Queensland will monitor the catch rates over the 2012-13 quota year; and based on all available information, will determine in consultation with industry and other key stakeholders if further action is required.</i></p>

Performance measure	Performance
<p>Total mortality (Z) exceeds 2 times estimate of natural mortality (M) for coral trout and redthroat emperor.</p> <p>The estimate of exploitable biomass of redthroat emperor falls below 40% of the estimated virgin biomass.</p> <p>There is a 20% decrease in charter catch between consecutive years, or a decrease of 10% in each year over three years for coral trout, redthroat emperor or key OS species.</p> <p>The catch (&gt;2 t) of key OS species in a quota year is at least 20% higher than the preceding quota year.</p>	<p><i>Not measured</i></p> <p>There was no updated mortality estimate for 2010–11.</p> <p><i>Not triggered</i></p> <p>Exploitable biomass of RTE is around 70% as per the last stock assessment in 2006. Fisheries Queensland considers that fishing pressure since 2006 has not been sufficient to reduce stock size.</p> <p><i>Triggered</i></p> <p>There was a decrease in coral trout charter catch from 81.5 t in 2009–10 to 64.3 t in 2010–11 (21%).</p> <p><i>Management response</i></p> <p><i>The decline in total catch reflects a decline in number of charter vessels landing coral trout. This could be due to a number of factors influencing the operation of a charter business and does not necessarily reflect changes in the coral trout stock.</i></p> <p><i>Triggered</i></p> <p>Bar rockcod was the only key OS species that increased from 17.3 t to 21.9 t (26%) in 2010–11.</p> <p><i>Management response</i></p> <p><i>Bar rockcod (Epinephelus ergastularius) is targeted in the deep water region of the L1 area of the line fishery primarily using automated/mechanical reels. Due to uncertainty in the capacity of a number of deepwater fin fish species being able to sustain increased fishing pressure, the FRDC funded a tactical research project (FRDC 2010/063) "Assessing technology changes and risks to the sustainable management of deepwater line fisheries in southern Queensland". The project quantified the changes in fishing effort being applied to these species from all fishing sectors and reviewed the biological data for the key species. This information will be central to an Ecological Risk Assessment (ERA) of key deep water species including Bar rockcod in 2012-13. Based on the outcomes of the ERA Fisheries Queensland will determine the appropriate action in consultation with industry and other key stakeholders.</i></p>
<i>Bycatch and protected species</i>	
<p>Observer information shows the amount of discards (including undersized target species) exceeds 10% of the total catch taken by commercial fishers with a RQ fishery symbol when targeting coral reef fin fish (by numbers of fish).</p>	<p><i>Not measured</i></p> <p>The results of the 2011 observer surveys will be available in mid 2012.</p>

Performance measure	Performance
Percentage of each category of protected species released alive falls below 90%.	<i>Not triggered</i> No interactions recorded this year.
<b>Ecosystem impacts</b>	
The Shannon-Wiener index for a bioregion shows a decrease of at least 10% in each consecutive year over three years <u>OR</u> decreases by 20% from the preceding quota year.	<i>Not measured</i> There were no structured line surveys conducted in 2010–11.
<b>Social</b>	
That the rate of compliance falls below 92.5% in the commercial fishery and/or 92.5% in the recreational fishery.	<i>Triggered—commercial sector</i> Of 312 commercial fishery inspections, a 91.3% compliance rate was achieved while 97% compliance was achieved in the recreational fishery from 3591 inspections (for details see Table 4).  <i>Management response</i> No changes to management or compliance processes are required as the majority of offences committed were minor with more than 50% resulting in the issue of 'cautions'. 1 prosecution pending relating to the take/possess of regulated fish. Other offences for which fins were issued for: failing to obtain or keep required information in the approved form; take/possess of regulated fish; take more product than an authorities' quota allows; and contravene a condition of an authority involving quota requirements.

Table 4: Coral trout and redthroat emperor standardised catch rate (kg/day) by region and financial year.

Financial year	Cairns		Capricorn Bunker		Far Northern		Mackay		Sub Tropical		The Swains		Townsville	
	CT	RTE	CT	RTE	CT	RTE	CT	RTE	CT	RTE	CT	RTE	CT	RTE
2004–05	29.9	n/a	7.4	5.7	46.4	n/a	29.2	8.1	11.9	2.9	19.6	6.9	33.6	4.4
2005–06	32.8	n/a	8.9	6.8	61.4	n/a	34.1	7.5	7.1	3.3	25.0	7.5	35.2	4.7
2006–07	37.7	n/a	8.7	4.4	61.1	n/a	34.0	12.3	6.5	3.6	23.3	10.8	29.4	5.2
2007–08	35.6	n/a	8.8	4.8	84.9	n/a	32.5	10.9	5.5	3.1	23.8	8.7	33.0	4.3
2008–09	32.7	n/a	8.2	3.4	75.7	n/a	26.0	9.8	8.7	3.0	20.1	7.1	31.1	5.9
2009–10	27.3	n/a	7.4	4.2	50.5	n/a	19.8	11.5	5.2	5.4	18.0	6.3	24.9	8.4
2010–11	25.3	n/a	7.0	6.1	45.4	n/a	20.3	10.6	5.2	5.6	17.4	8.0	24.8	8.9

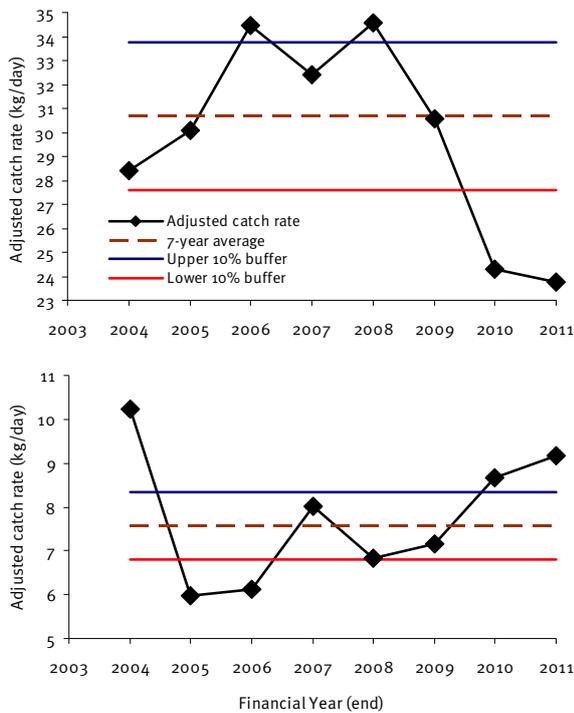


Figure 8: Standardised (adjusted) catch rate for a) coral trout and b) redthroat emperor for the whole fishery 2004–05 to 2010–11.

## Research

A number of research projects with potential benefits to our understanding of the CRFFF, reef fish population dynamics and broader coral reef ecosystems were undertaken through the Australian Government’s four year Marine and Tropical Sciences Research Facility (MTRSF) program which commenced in 2006. There is a continued focus on climate change and resilience of coral and reef fish communities to potential environmental shifts. Key projects are outlined on the Reef and Rainforest Research Centre website ([www.rrrc.org.au](http://www.rrrc.org.au)).

## Collaborative research

Fisheries Queensland managers and scientists continue to be involved in various committees for projects related to this fishery, and continue to provide fisheries catch and effort data for analysis and guidance on priority research needs.

## Fishery management

### Compliance report

During the 2010–11 quota year a total of 3 903 units were inspected in the CRFFF. Of these, 312 were commercial vessel inspections (Table 5). The majority of the remaining inspections were of recreational fishers. A total of 132 offences were detected, with compliance rates of 91% for the commercial sector and 97% for the recreational sector.

### Communication and education

Promotion of regulations applying to both commercial and recreational fishers, including those relating to coral reef fin fish, is an ongoing role for Fisheries Queensland. Identification guides were sent out to over 1800 households participating in the statewide recreational fishing survey and our Fishcare volunteers have engaged with recreational fishers throughout Queensland to communicate fishing regulations. The DEEDI newsletter *direct* and the Monitoring our Fisheries Update have also promoted the rules and regulations to over 2000 subscribers during the year.

### Changes to management arrangements in the reporting year

There were no changes to management arrangements during 2010–11.

### Complementary management

There are no updates to cross jurisdictional management for 2010–11.

Table 5: Queensland CRFF offences recorded during the 2010–11 financial year. Note: Four prosecution offences still pending.

Offences	Caution	FIN	Prosecution
Commercial fisher contravenes a regulated waters declaration	1		
Commercial fisher take/possess regulated fish	4	2	1
Contravene a condition of an authority involving boat marks	7	1	
Contravene a condition of an authority involving quota requirements	34	9	
Fail to obtain or keep required information in approved form	2	3	
Recreational fisher contravenes a regulated waters declaration	4	4	
Recreational fisher take/possess regulated fish	72	46	5
Take more product than an authorities quota allows	17	6	
Conduct charter fishing without charter licence OR undertake commercial fishing while authority suspended		2	
Fail to give required information to the Chief Executive in stated way or by stated time		1	

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#### **Front cover image**

Common Coral Trout (*Plectropomus leopardus*)

