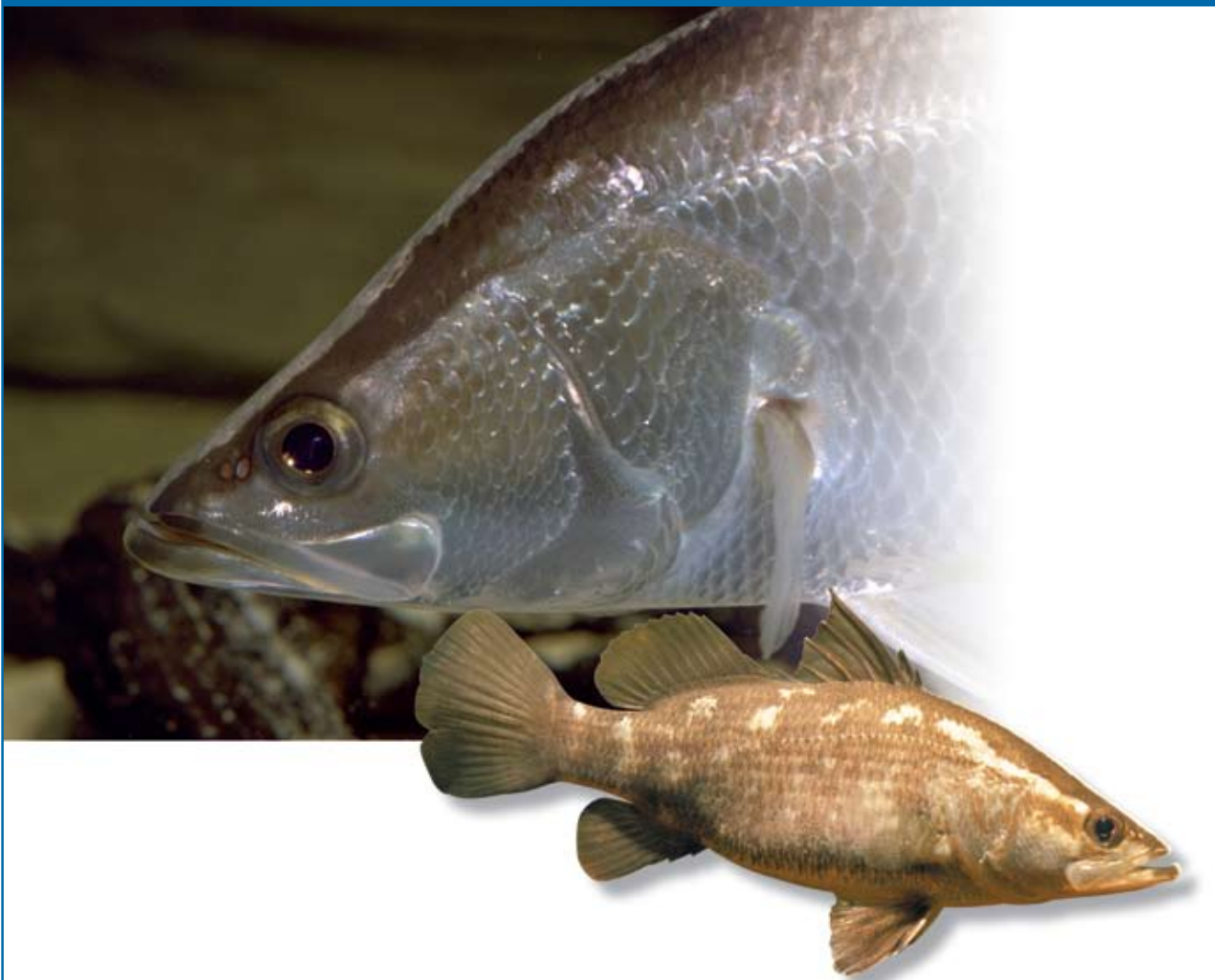


Annual status report 2011

Gulf of Carpentaria

Inshore Fin Fish Fishery



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Fishery profile 2010

Key species N3 inshore—Barramundi, king and blue threadfins N9 offshore—Tropical shark and grey mackerel Recreational—as above (except for tropical shark) as well as mangrove jack and estuary cod	Total number of commercial licences in 2010 N3—86; N9—5
Total harvest from all sectors 2687 t	Commercial licences accessing the fishery in 2010 N3—78; N9—3
Commercial harvest 2567 t	Fishery season Commercial (from midday 22 January 2010 to midday 30 September 2010). Taking/possessing barramundi outside of the commercial fishery season is prohibited for all sectors.
Recreational harvest (2005) Approximately 101 t	Fishery symbols N3, N9, N11 (bait)
Indigenous harvest (2001) Approximately 420 000 fish ¹	Monitoring undertaken Fishery dependent sampling and compulsory daily commercial fisher logbooks
Charter harvest 19 t	At-sea observer days conducted in 2010 Nil
Commercial Gross Value of Production (GVP) \$15.3 million	Accreditation under the EPBC Act Yes ² —Expires: 28 September 2012
Allocation between sectors 96% commercial; 4% recreational; <1% charter	Logbook validation Nil
Total exports Predominantly domestic product, except for shark fin, which is exported to Asian markets.	Quota managed No
Key fish resources	Stock status
Barramundi (<i>Lates calcarifer</i>)	Sustainably fished
Comments: Commercial catches are stable and within historical levels. Catch and catch rate performance measures were not triggered in 2010. Strong recruitment is evident in southern stocks but less so in northern stocks. There has been no significant change in the range of fish lengths and ages in several years of sampled populations.	

¹ Total North Queensland estimate only—includes Indigenous fishers outside the Gulf of Carpentaria.

² Wildlife Trade Operation approval granted 20 August 2007 Approved under Part 13 of the EPBC Act subject to conditions applied under section 303FT (re-accredited 10 April 2008 to reflect the new *Fisheries Regulation 2008* management arrangements). The approval was extended for 12 months to 28 September 2012.

Key fish resources	Stock status
Grey mackerel (<i>Scomberomorus semifaciatus</i>)	Uncertain
<p>Comments: Commercial catches and catch rates were the highest for ten years (since 2000) and triggered performance measures. There is uncertainty as to whether these catches indicate increased fishing pressure on stocks or simply fishers taking advantage of a highly variable resource. Anecdotal reports suggest 2010 was a particularly good year for grey mackerel catches. The Gulf of Carpentaria (GOC) stock is shared between Queensland and the Northern Territory. Results of a recent resource assessment of grey mackerel in the GOC concluded that fishery logbook data gave poor resolution of population dynamics and cannot provide abundance estimates. New precautionary management arrangements governing the harvest of grey mackerel are expected to be introduced for the 2012 season.</p>	
King threadfin (<i>Polydactylus macrochir</i>)	Uncertain
<p>Comments: Commercial catches and catch rates increased slightly over the last year. Recent research suggests king threadfin may have highly localised populations and there may be indications of high fishing pressure in the southern Gulf of Carpentaria (GOC). The study however was not designed to provide population level estimates. There is uncertainty in the research implications on the stock status of king threadfin given that the resource exhibits a stable catch history. Performance measures/thresholds will be established to measure sustainability at a scale appropriate to the regional stocks.</p>	
Blue threadfin (<i>Eleutheronema tetradactylum</i>)	Sustainably fished
<p>Comments: Life history characteristics of this species are resilient to fishing pressure. Minimum legal size (MLS) ensures a good proportion of the stock is protected from fishing. There are no indications of stock declines.</p>	
Javelin Barred javelin (spotted grunter)– <i>Pomadasys kaakan</i> Silver javelin (small spotted grunter)– <i>Pomadasys argenteus</i>	Undefined
<p>Comments: Javelin (barred and spotted) is a complex of important recreational species. Although javelin is considered a by-product commercial species only, catches were at the lowest level since 2000. Recreational fishing is focused in the southern Gulf of Carpentaria (GOC) around Karumba where a (non-DEEDI) survey estimated annual catch levels between 100–118 t in 2006. No reasonable attempt to assess stock status can be made until updated recreational harvest estimates are available in 2012.</p>	
Shark	Undefined
<p>Comments: Fisheries Queensland is undertaking a five year program of collecting and assessing critical information for determining the status of sharks harvested in Queensland. The major shark species are considered undefined until full stock assessments can be completed.</p>	

Introduction

The Gulf of Carpentaria Inshore Fin Fish Fishery (GOCIFFF) is a multi-species fishery comprising a commercial inshore (N3) net fishery, a commercial offshore (N9) net fishery, commercial bait netting (N11) and recreational fishing, Indigenous fishing and charter boat fishing of species related to the GOCIFFF within the Queensland jurisdiction of the Gulf of Carpentaria. This report covers fishing activity during the 2010 calendar year.

Fishery description

Fishing area and methods

The GOCIFFF extends from Slade Point near the tip of Cape York Peninsula westward to the Queensland–Northern Territory border and operates in all tidal waterways out to the 25 nautical miles (nm) line (Figure 1). The N3 net fishery operates within estuaries and foreshores³ and out to 7 nm from the coast, while the N9 net fishery operates further offshore, between 7 and 25 nm.

Fishers in both the N3 and N9 net fisheries are authorised to use set mesh nets to harvest fin fish. There are different restrictions on allowable net length, drop and mesh size for each fishery (see Roelofs 2003).

N3 fishery mesh nets are set in estuaries, on foreshores and in offshore waters out to 7 nm from the territorial sea baseline. Most fishers prefer to use mesh net sizes that selectively catch fish of a size meeting market demand for fillet product. Licence holders in the N9 fishery are authorised to use set mesh nets with a maximum net length of 1200 m. The commercial bait (N11) fishery uses small-mesh (25–45 mm) set nets; there are restrictions on the length of net used.

Recreational fishers primarily use hook and line to catch target fish species, as well as cast and seine nets to catch baitfish species.

The Indigenous communities in the Gulf of Carpentaria (GOC) use traditional subsistence fishing methods for customary purposes, as well as recreational fishing practices. Traditional fishing methods include the use of spears, stone fish traps and nets; the catch is solely for use by the community.



Figure 1: Map of Gulf of Carpentaria Inshore Fin Fish Fishery.

Key Species

Barramundi

The barramundi (*Lates calcarifer*) is a large predatory fish species that can grow to 150 cm total length (TL), 60 kg and over 30 years of age. It is found in coastal regions of tropical Australia and throughout much of the Indo-West Pacific and is dependent on fresh and estuarine waters to complete its life cycle. Generally, fish spawn around river mouths and the post larvae and juveniles migrate to nearby coastal swamps, lagoons and upstream freshwater areas that serve as protected, food rich additional nursery habitats to estuarine areas.

King threadfin

King threadfin (*Polydactylus macrochii*) is a large predatory fish species that can grow to 150 cm TL and 30 kg in weight, and is found in tropical estuarine and inshore waters around northern Australia. It is distributed throughout the Indo-Pacific region. The king threadfin starts life as a male, reaching sexual maturity at around 60–80 cm TL at 2–4 years of age, and changes to a female later in life at around 70–100 cm TL at 4–8 years of age. Recent research suggests king threadfin have localised separate genetic populations throughout its range.

Tropical sharks

Commercial harvest of tropical sharks consists mainly of whaler sharks, in particular the Australian blacktip whaler (*Carcharhinus tilstoni*) and spot-tail shark (*Carcharhinus sorrah*). The sharks that dominate the

³ Excluding areas closed to commercial fishing.

GOC fisheries generally attain sexual maturity at over 1 m in total length at around 3–4 years of age. They are viviparous, generally producing three to five pups during summer months after a 7–12 month gestation. Tropical shark species in the GOC generally have an Indo-West Pacific distribution.

Grey mackerel

Grey mackerel (*Scomberomorus semifasciatus*) is a pelagic species endemic to waters across northern Australia and adjacent Papua New Guinea and larvae and juveniles are dependent on estuarine and inshore habitats (Cameron & Begg 2002). They are a fast growing species with total length at first maturity for females of 75 cm TL and males of 65 cm TL at between one and two years of age.

Mangrove jack

The mangrove jack (*Lutjanus argentimaculatus*) is a by-product species in the commercial line, net and trawl fisheries in the GOC. They have distinct inshore (juvenile) and offshore (adult) phases in the life histories and prefer complex habitats (reefs, shoals etc.) to open sand and mud areas. In Queensland, most mature at about 450 mm and 7 years for males and about 510 mm and 8 years for females. They can attain a maximum length greater than 650 mm and are long lived with some individuals estimated at 37 years old (Russell et al. 2003).

Genetic studies by Russell et al. (2003) suggest a high level of gene flow between Queensland east coast, GOC and northern Australia mangrove jack populations. It is likely that a single genetic stock exists across these areas.

Main management methods used

Fisheries Queensland manages the commercial, recreational and Indigenous components of the GOCIFFF through Queensland's *Fisheries Act 1994*, Fisheries Regulation 2008 and Fisheries (Gulf of Carpentaria Inshore Fin Fish) Management Plan 1999 (Gulf Management Plan). The harvest of grey mackerel, sharks and rays is managed jointly between the State and the Commonwealth through the Queensland Fisheries Joint Authority (QFJA). Revised management arrangements were implemented in November 2011, which included the repealing of the Fisheries (Gulf of Carpentaria Inshore Fin Fish) Management Plan 1999 (now regulated via the Fisheries Regulation).

The GOCIFFF is managed to optimise sustainable fisheries production and protect spawning target species using a variety of input controls, including:

- limited entry (commercial fishery only)
- boat and gear restrictions
- spatial and temporal closures
- possession limits
- fish size limits.

Catch statistics

Commercial

Total commercial harvest in the GOC N3 and N9 net fisheries increased in 2010 compared to 2009 (Table 1). The total harvest (2581 tonnes (t)) was greater than the 10 year average yearly catch of approximately 2101 t from 2000–09. The majority (83%) of the increased catch comprised the target species, grey mackerel (Table 2).

Table 1: Total commercial catch (t) and effort (days) in the GOCIFFF 2000–10 (N3 and N9 combined) (Source: Fisheries Queensland CFISH database, 1 June 2011).

Year	Effort (days)	Catch (t)
2000	11 636	1 905
2001	12 578	2 304
2002	12 357	2 223
2003	11 894	2 039
2004	12 134	2 214
2005	9 995	1 877
2006	11 259	2 059
2007	10 169	2 041
2008	9 914	2 203
2009	9 462	2 146
2010	9 686	2 567

There has been a general increase in the reported barramundi catches and catch rates since 1994 (Table 2, Figure 2). The majority of the harvest is produced by the southern barramundi genetic stock (south of 13°S) which has averaged 520 t per year since 1990 (Figures 3 and 4). Commercial catches from the northern barramundi stock appear to be variable although catch rates between the two regions are similar. The northern catches generally reflect the level of fishery effort. Historically, fishing effort for barramundi has occurred south of Weipa as there is generally less barramundi habitat available in the northern region compared to the southern GOC.

Table 2: Species composition of the commercial catch (t) in the GOCIFF 2000–10 for the N3 and N9 fisheries combined. Values in brackets represent catches made using line from other Queensland managed fisheries in the GOC (Source: Fisheries Queensland CFISH database, 1 June 2011).

* Logbooks were introduced from 2007 to record more detailed species level information for shark for all GOC net fishers. Catch statistics for specific shark species prior to 2008 (shaded) are unlikely to be representative.

§ This grouping may contain multiple species

Group	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Mackerel–grey	419 (2)	471 (1)	345 (3)	379 (1)	468 (2)	394 (2)	490 (8)	640 (11)	622 (9)	482 (3)	896 (1)
Barramundi	607	723	744	551	615	500	735	631	726	785	719
King threadfin	317 (1)	473 (1)	445 (1)	296 (1)	310	283	305	248	295 (1)	309 (1)	365
Blue threadfin	40 (1)	67 (1)	83 (1)	106 (1)	126 (1)	81 (1)	66	59	76	71 (1)	61
Mackerel–Spanish	25 (121)	21 (137)	24 (197)	18 (167)	29 (194)	33 (229)	33 (218)	54 (228)	36 (285)	32 (189)	51 (191)
Fish–unspecified§	28 (1)	52 (1)	33 (1)	53 (1)	30	33 (1)	35 (1)	41 (1)	38 (1)	42 (1)	39 (1)
Threadfin§	–	–	–	1	–	–	1 (1)	4	9	19	36
Jewel fish	22	33	48	51 (1)	52	33 (1)	39 (1)	38	26	26	30
Queenfish§	9 (1)	15 (1)	26 (1)	23 (7)	35 (1)	17 (1)	14 (2)	18 (1)	31 (1)	21 (1)	26 (1)
Grunter§	16 (1)	25 (5)	34 (1)	31 (1)	51 (1)	26 (1)	19 (1)	21 (1)	29 (1)	19 (1)	11 (1)
Shark–blacktip*	–	–	–	–	3	1	76 (1)	114 (1)	176 (8)	206 (38)	218 (1)
Shark–bull*	–	–	–	–	–	–	–	–	– (1)	– (5)	1 (1)
Shark–fossil*	–	–	–	–	–	–	–	–	1	1	1
Shark–hammerhead*	–	–	–	–	–	–	–	6 (1)	10 (2)	20 (1)	19 (1)
Shark–milk*	–	–	–	–	–	–	–	1	1	1	1
Shark–pigeeye*	–	–	–	–	–	–	–	–	1	–	1
Shark–scalloped hammerhead*	–	1	–	–	9	2	6 (71)	1 (32)	–	–	–
Shark–spot tail*	–	–	–	–	1	1	–	35	21	18	21
Shark–spinner*	–	–	–	–	–	–	–	–	–	1	1
Shark–unspecified*	390 (1)	373 (1)	391 (3)	474 (3)	366 (2)	396 (2)	159 (4)	91 (42)	47 (41)	29 (1)	29 (1)
Shark–whaler unspecified*	–	–	–	–	55	36 (34)	48 (274)	8 (142)	14	10	1 (1)
Shark–winghead*	–	–	–	–	–	–	–	1	1	3	8
Tuna§	–	–	–	–	–	–	1 (1)	1	–	14	9
Cobia	1 (1)	3 (1)	3 (1)	2 (1)	2 (1)	3 (1)	2 (1)	3 (1)	2 (1)	2 (1)	7 (1)
Jewfish–unspecified§	1 (1)	1	2	3	4	2	2 (1)	7	5	9	4
Pomfret	5	3	5 (1)	10	16	12	6	7	4	7	4
Trevally§	1 (1)	6 (1)	1 (1)	1 (1)	1	1 (1)	2 (1)	– (4)	– (1)	1 (1)	3 (1)
Bream§	–	1	1	1 (1)	2	1	1	1	20	1	3
Snapper–unspecified tropical§	3 (2)	7 (1)	5 (5)	2 (3)	3 (2)	1 (1)	3 (4)	1 (2)	1 (1)	2 (1)	2 (1)
Catfish§	4 (1)	4	6 (1)	6 (1)	13 (1)	7	8 (1)	4 (1)	2	4 (1)	1 (1)
Guitarfish§	–	–	–	–	1	–	1	2 (1)	5 (1)	2 (1)	1 (2)
Tripletail	1	1	2	2	2	1	1	1	1	1	1
Mullet§	2	5	1	8	6	2	2	1	3	4	1
Jewfish–black	5	1	2	3	5	2	1	–	1	–	1
Mackerel–unspecified§	9	6 (1)	10	1 (1)	1	1	1 (1)	–	–	1	1
Cod–unspecified§	1 (1)	1 (1)	1 (1)	1 (2)	1 (1)	1 (1)	– (1)	1 (6)	1 (1)	1 (1)	1 (1)
Bait fish§	1	2	1	2 (1)	2	1	1	1	2	4	1
Other fish§	2 (6)	9 (1)	13 (4)	18 (9)	7 (10)	11 (19)	5 (70)	5 (41)	2 (27)	4 (7)	1 (8)

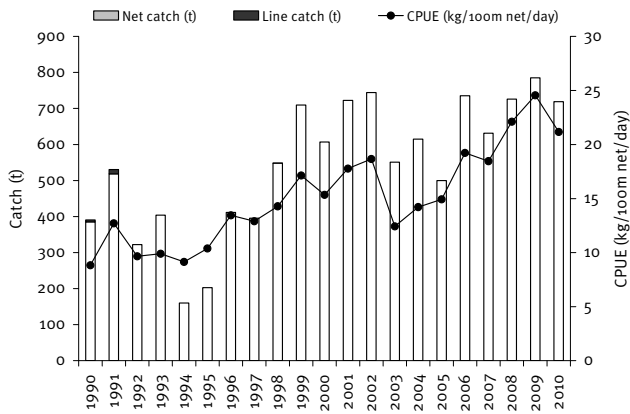


Figure 2: Barramundi—total reported commercial net harvest (t) and catch per unit effort (CPUE) in kg/100m/day in the GOCIFFF 1990–2010 (Source: Fisheries Queensland CFISH database, 1 June 2011).

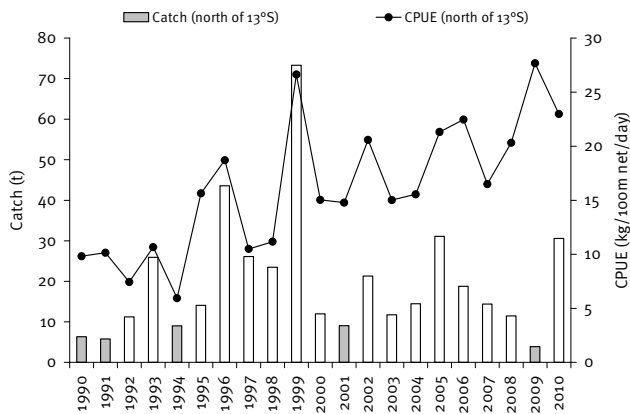


Figure 3: Barramundi (northern stock) —reported commercial net harvest (t) and catch per unit effort (CPUE) in kg/100m/day from the GOC barramundi stock north of 13° S from 1990–2010 (Source: Fisheries Queensland CFISH database, 1 June 2011).

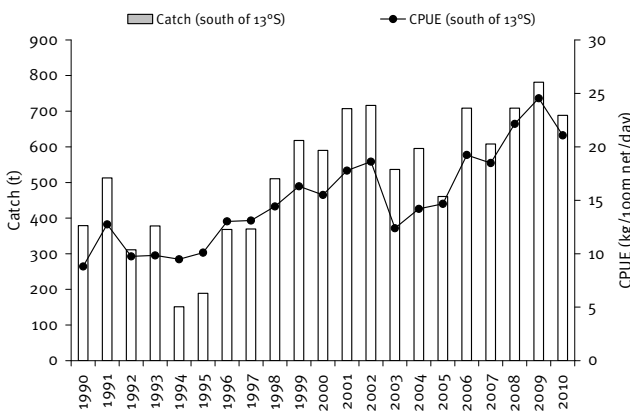


Figure 4: Barramundi (southern stock) —reported commercial net harvest (t) and catch per unit effort (CPUE) in kg/100m/day from the GOC barramundi stock north of 13° S from 1990–2010 (Source: Fisheries Queensland CFISH database, 1 June 2011).

Reported catches for grey mackerel reached record levels (896 t) in 2010, almost doubling the previous years catch (Table 2, Figure 5). The catches support

anecdotal reports that suggested 2010 was an exceptional year for grey mackerel catches. The majority of catches were made in the offshore N9 net fishery. The QFJA net fishery (beyond 25 nm from the coast) contributed approximately 5% to the total harvest while line catch of grey mackerel in the GOC was negligible. Both catch and catch rate performance indicators triggered in the Performance Measurement System in 2010.

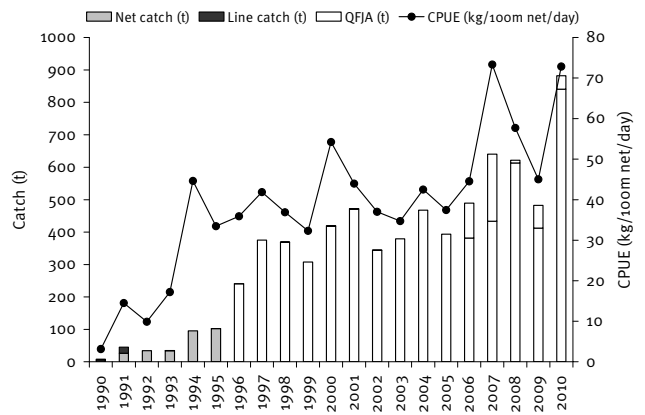


Figure 5: Grey mackerel—total reported commercial net harvest (t) and catch per unit effort (CPUE) in kg/100m/day in the GOCIFFF 1990–2010 (Source: Fisheries Queensland CFISH database, 1 June 2011).

King threadfin catches and catch rates have been increasing since 2007 (Table 2, Figure 6). The 2010 reported total harvest (365 t) was higher than the 20 year average (318 t).

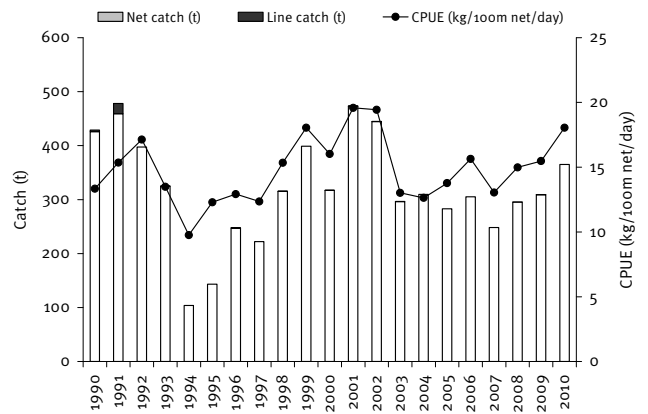


Figure 6: King threadfin—total reported commercial net harvest (t) and catch per unit effort (CPUE) in kg/100m/day in the GOCIFFF 1990–2010 (Source: Fisheries Queensland CFISH database, 1 June 2011).

Harvest of blue threadfin decreased in 2010 to 61 t (Table 2, Figure 7). This is below the long term average (1990–2009) of 71 t. Catch rates in 2010 were within historical levels for blue threadfin in the GOC.

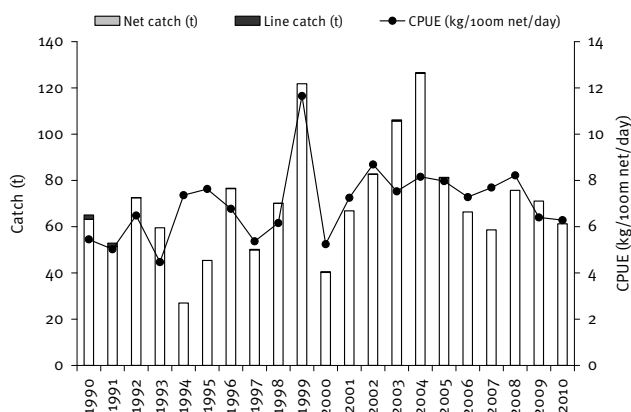


Figure 7: Blue threadfin—total reported commercial net harvest (t) and catch per unit effort (CPUE) in kg/100m/day in the GOCIFFF 1990–2010 (Source: Fisheries Queensland CFISH database, 1 June 2011).

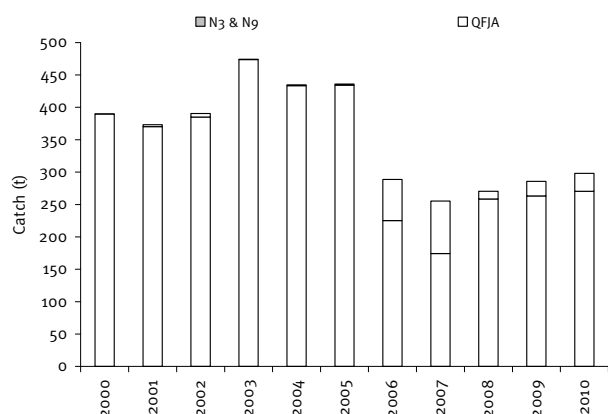


Figure 8: Combined sharks and rays—total reported commercial net harvest (t) in the GOCIFFF 2000–2010 (Source: Fisheries Queensland CFISH database, 1 June 2011).

The combined total harvest of sharks and rays reached 298 t in 2010 (Figure 8). This is a marginal increase over the previous four years annual catches and is below the yearly average of 354 t (2000–10). Species specific reporting of shark harvest has improved since the introduction of new logbooks in the N3 (from 2006) and N9 (from 2007) fisheries. The new level of detail indicated that the blacktip whaler shark complex (*Carcharhinus tilstoni/limbatus*) dominated the 2010 shark harvest (Table 2). Catches for blacktip whaler and spot-tail whaler (*C. sorrah*) sharks rose in 2010 (Table 2) while catch rates remained steady.

Fisheries Queensland monitors annual catch and catch rate trends (validated by observers) of shark and ray

species and groups in the GOCIFFF to ensure that risks to the sustainability of these species are identified. These include non-listed shark species identified as ‘least sustainable’ in the Northern Australian Sharks and Rays Phase II project (FRDC Project number 2002/064). These species include:

- Pigeye shark—*Carcharhinus amboinensis*
- Bull shark—*Carcharhinus leucas*
- Blacktip shark—*Carcharhinus limbatus*
- Australian blacktip shark—*Carcharhinus tilstoni*
- Snaggletooth shark—*Hemipristis elongata*
- Great hammerhead shark—*Sphyrna mokarran*
- Giant shovelnose ray—*Rhinobatos typus*.

There were no unsustainable harvest trends identified for these species where catch information was available (Table 1).

Fisheries Queensland, through the Queensland Fisheries Joint Authority, also permits a limited level of net harvest outside of the fishery area managed under the Gulf Management Plan (i.e. beyond 25 nm from the coastline). Fishers operating under these permits tend to target grey mackerel and shark species. This permitted catch is reported in this Annual Status Reports. These operations are now incorporated in the new management arrangements for net fishing in the GOC following the review of the Gulf Management Plan.

Table 4: Total retained catch (t) and number of operators in the charter sector of the GOC 2000–10 (Source: Fisheries Queensland CFISH database, 1 July 2011).

Year	Licences	Days	Retained catch (t)
2000	34	1536	17
2001	40	1725	23
2002	43	2246	24
2003	43	2161	21
2004	41	2168	23
2005	37	2179	26
2006	28	1838	31
2007	30	1691	28
2008	26	1189	25
2009	17	816	18
2010	15	754	19

Recreational

No new recreational catch estimates are available for the GOC region (refer to the 2006 report for catch estimates up to 2005). An updated state-wide recreational fishing survey commenced in 2010 with results expected to be publicly available in 2012.

Charter

Total harvest in the charter sector in 2010 was similar to 2009 however remained lower than previous years (Table 4). The number of charter operators decreased to only 15 licences in 2010. Blue threadfin is the most commonly caught species (Table 5). Queenfish and trevally were the most discarded species in 2010. This is consistent with previous years.

Table 5: Retained catch in tonnes and released catch in numbers (in parenthesis) of target and by-product species for charter operators in the GOCIFFF 2004–10 (Source: Fisheries Queensland CFISH database, 6 December 2011).

Group	2004	2005	2006	2007	2008	2009	2010
Blue threadfin	7 (739)	8 (747)	12 (1021)	9 (165)	11 (923)	8 (106)	8 (517)
Mackerel–school	<1 (303)	1 (610)	3 (946)	3 (1538)	2 (45)	2 (79)	4 (337)
Bream	2 (1449)	2 (796)	2 (696)	2 (661)	2 (622)	1 (184)	2 (226)
Queenfish	2 (8010)	3 (6876)	2 (6907)	2 (5664)	2 (3849)	1 (1881)	<1 (1904)
Mullet	<1 (-)	<1 (-)	<1 (-)	<1 (-)	<1 (27)	<1 (-)	<1 (182)
Tuna	2 (2698)	2 (3644)	2 (2307)	2 (3142)	1 (2049)	1 (1574)	<1 (1426)
Mackerel–unspecified	<1 (618)	<1 (272)	<1 (239)	<1 (828)	<1 (1017)	<1 (772)	<1 (810)
Shark–unspecified	1 (1181)	2 (1085)	1 (1486)	<1 (1035)	<1 (1125)	1 (911)	<1 (1023)
King threadfin	<1 (359)	<1 (235)	<1 (155)	<1 (41)	<1 (58)	<1 (3)	<1 (4)
Grunter	2 (693)	2 (706)	2 (538)	<1 (416)	<1 (207)	<1 (58)	<1 (15)
Barramundi	2 (9899)	1 (6393)	2 (4121)	1 (5033)	<1 (2390)	<1 (990)	<1 (998)
Jewfish–black	<1 (39)	<1 (98)	<1 (35)	<1 (141)	<1 (67)	<1 (17)	<1 (5)
Trevally	<1 (5949)	1 (6466)	<1 (4327)	<1 (4091)	<1 (2884)	<1 (1791)	<1 (1910)
Jewfish–unspecified	<1 (11)	<1 (15)	<1 (78)	<1 (38)	<1 (73)	<1 (16)	<1 (15)
Cobia	<1 (46)	<1 (70)	<1 (79)	<1 (39)	<1 (19)	<1 (6)	<1 (6)
Threadfin	<1 (340)	<1 (260)	<1 (166)	<1 (1359)	<1 (52)	<1 (285)	<1 (152)
Mackerel–grey	<1 (284)	<1 (546)	<1 (251)	<1 (166)	<1 (50)	<1 (3)	–
Shark–blacktip	–	–	–	–	–	<1 (26)	<1 (-)
Other	<1 (3348)	<1 (2940)	4 (3005)	4 (2949)	3 (2119)	2 (1440)	<1 (1297)
Total	23 (35966)	26 (31759)	31 (26357)	28 (27306)	25 (17576)	18 (10142)	19 (10827)

Indigenous

Harvest by Indigenous fishers within the bounds of the GOCIFFF has not been estimated.

Spatial issues / trends

There are no spatial issues or trends to report.

Socio-economic characteristics and trends

The fishery was worth about \$15.3 million in GVP in 2010. This is approximately \$2 million greater than 2009. Most of the increase was due to the nearly 400 t increase in grey mackerel.

Biological and ecological information

Monitoring programs

Fishery Dependent Sampling

Fisheries Queensland has collected biological information on barramundi from the GOCIFFF since 2000. The objective of this routine monitoring is to collect length, age and sex data representative of the retained commercial, recreational (including charter boats) catches of barramundi from the south-east Gulf of Carpentaria stock. Sampling methods include measuring commercially caught fish at seafood wholesalers and retailers, measuring recreationally caught fish at boat ramps, conducting a keen angler program, in which recreational fishers can donate fish frames, and asking charter operators to measure fish caught by their clients. Prior to 2006, sampling included collection of data and samples from onboard commercial vessels and fishery independent research data. Length and age frequencies are derived for the retained catch for each sector and used to calculate an index of the mortality rate in the population.

The annual increase in the number of catches sampled, fish measured and otoliths collected reflects the continued strong level of stakeholder support for the monitoring program (Table 6). The monitoring provides a quality dataset for assessing the status of barramundi stocks. An assessment of the barramundi stocks in Gulf of Carpentaria is scheduled for 2012.

The length frequency of barramundi sampled in the commercial and recreational fishery has been consistent for the last four years (Figure 11). However, the size range of barramundi harvested by the two sectors appears slightly different. The commercial

fishery tends to catch more barramundi in the 65–75 mm size range while the recreational fishery harvests smaller barramundi in the 60–70 mm size range.

The age frequency of the same samples clearly shows recruitment of three year old fish in 2007 to four year old fish in 2008 and of three year old fish in 2009 to four year old fish in 2010 (Figure 12). The three to four year old fish are most predominately caught by the fishery although some 17 year old fish have also been sampled over the years.

Table 6: The number of representative catches sampled, barramundi measured and otoliths collected during Fisheries Queensland monitoring in the south-east Gulf of Carpentaria (Source: Fisheries Queensland Fisheries Resource Monitoring database, extract 14 May 2011).

Year	Number of catches sampled		Number of fish measured		Number of otoliths collected
	Commercial	Recreational	Commercial	Recreational	
2007	42	74	785	145	435
2008	55	142	1479	258	723
2009	43	109	1324	205	801
2010	50	107	1688	288	869

Fisheries Observer Program

No observations in the GOCIFFF were scheduled for 2010. The Fisheries Observer Program functions on a voluntary basis within this fishery.

Bycatch

Interactions with protected species

Information regarding protected species interactions is summarised in the Performance Measurement System table.

Ecosystem impacts

Tropical commercial net fisheries target high-order predator fish species with highly selective fishing gear types and methods, and catch small amounts of

bycatch relative to other net fisheries (such as trawl fishing) (Halliday et al. 2001). There have been no newly identified ecosystem impacts from the GOCIFFF.

The rate of Illegal, Unreported and Unregulated incursions in Australia has declined since 2006 and this trend has also continued in the Gulf of Carpentaria. In 2010, there were two apprehensions recorded by the Australian Fisheries Management Authority within both the eastern and western vertical lines encapsulating the Gulf of Carpentaria boundaries. Both vessels came from Merauke. One vessel was a Type 3 Indonesian shark boat, the other being a Type 4 Indonesian shark boat. Both vessels were apprehended very close to the 200 nm mile line and not deep within the GOC.

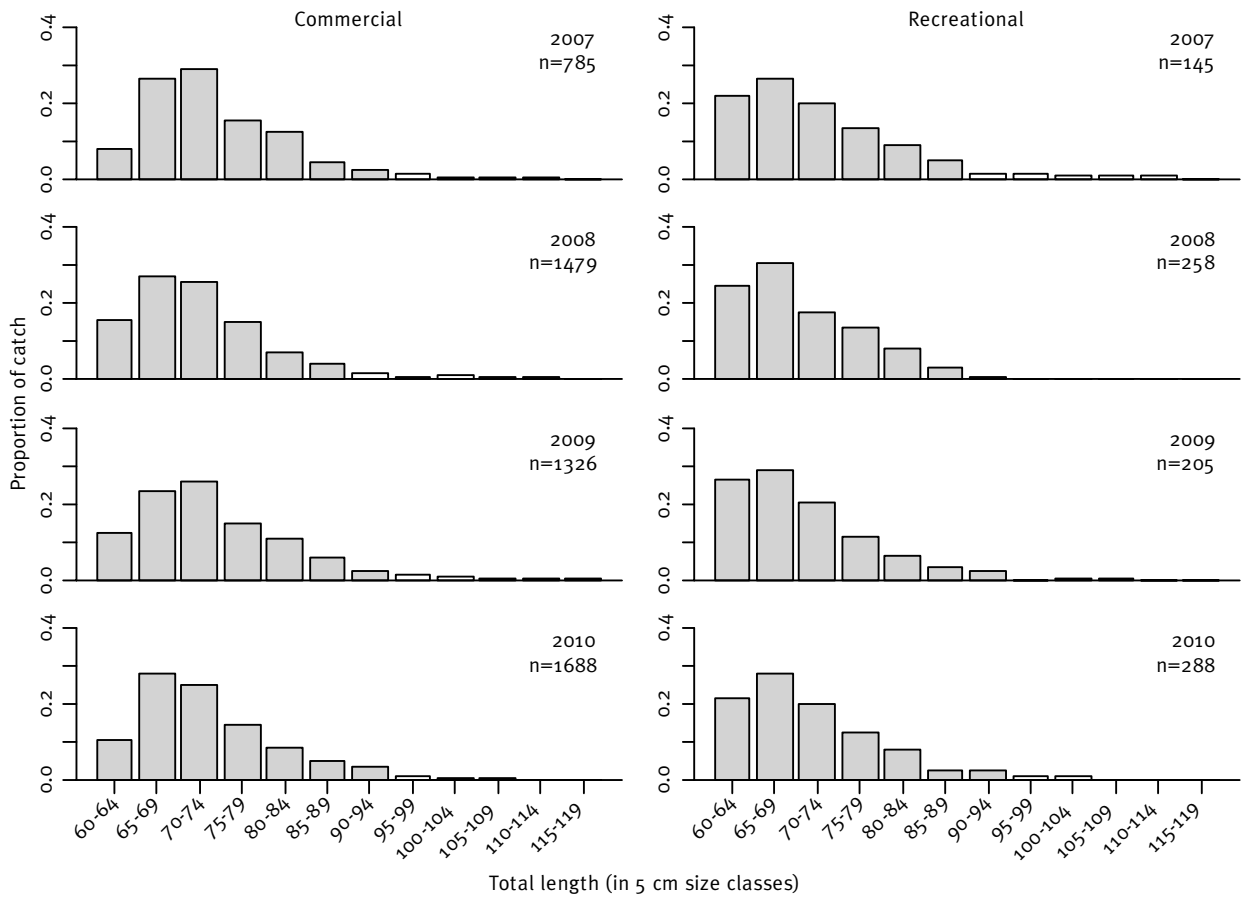


Figure 11: Length frequency (total length, cm) of barramundi sampled from the commercial and recreational fishery in the south-east Gulf of Carpentaria from 2007 to 2010 (Source: Fisheries Queensland Fisheries Resource Monitoring database, extract 14 May 2011).

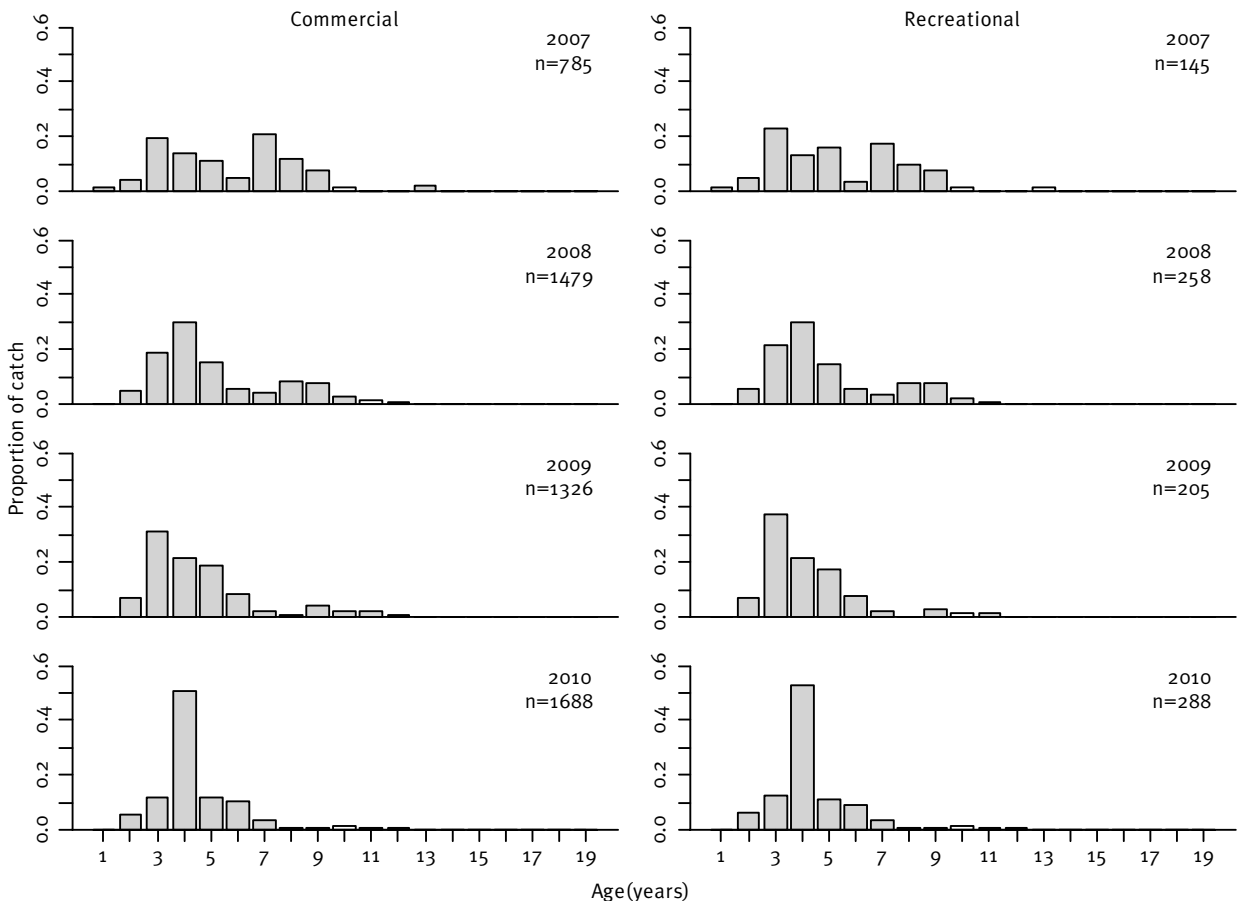


Figure 12: Age frequency (years) of barramundi sampled from the commercial and recreational fishery in the south-east Gulf of Carpentaria from 2007 to 2010 (Source: Fisheries Queensland Fisheries Resource Monitoring database, extract 14 May 2011).

Sustainability Assessment

Performance against fishery objectives

The Performance Management System (PMS) for the GOCIFFF (Fisheries Queensland 2008) provides a series of measures against which the performance of the fishery can be assessed and reported (Table 7). Full details of the PMS can be found at http://www.dpi.qld.gov.au/documents/Fisheries_SustainableFishing/GOC-PMS-09.pdf

New management arrangements for the GOCIFFF have now come into force (as of 25 November 2011) following consideration of the outcomes of the review of the Gulf Management Plan. The arrangements include new input controls aimed at reducing the potential for netting effort for shark and grey mackerel beginning with the 2012 season. Fisheries Queensland anticipates revising the PMS for the fishery in 2012 to account for the changed arrangements.

Table 7: Performance against the review events in the GOCIFFF Performance Measurement System.

Performance Measure	Performance								
<i>Target species</i>									
<p>Barramundi (<i>Lates calcarifer</i>)</p> <p>The standardised commercial catch rate declines by more than 30% over a three period.</p>	<p><i>Not triggered</i></p> <p>CPUE (kg/100m net/day) for barramundi has not declined by more than 30% over a three year period.</p> <table border="1"> <thead> <tr> <th>Year</th> <th>2008</th> <th>2009</th> <th>2010</th> </tr> </thead> <tbody> <tr> <td>CPUE</td> <td>22</td> <td>25</td> <td>21</td> </tr> </tbody> </table>	Year	2008	2009	2010	CPUE	22	25	21
Year	2008	2009	2010						
CPUE	22	25	21						
<p>King threadfin (<i>Polydactylus macrochir</i>)</p> <p>The standardised commercial catch rate declines by more than 30% over a three period.</p>	<p><i>Not triggered</i></p> <p>King threadfin catch rates increased in 2010.</p>								
<p>Grey mackerel (<i>Scomberomorus sexfasciatus</i>)</p> <p>Until a sustainable yield estimate is determined, the annual limit reference points for catch of this species exceeds:</p> <p>A. $\pm 30\%$ of the average annual commercial <i>catch</i> for the previous five years; and</p> <p>B. $\pm 30\%$ of the average annual standardised commercial <i>catch rate</i> for the previous five years.</p>	<p><i>A. Triggered—annual catch</i></p> <p>Catches increased by approximately 68% in 2010 compared to the five year average of 526 t (2005–09).</p> <p><i>B. Triggered—catch rate</i></p> <p>The catch rate in 2010 (73 kg/100m net/day) was 41% greater than the five year average (2005–09).</p> <p>The review of the Gulf Management Plan is complete and new arrangements which limit the potential effort for grey mackerel in the GOCIFFF are now in force for the 2012 season. A new measure will be developed for grey mackerel in 2012 that will consider these new arrangements. No further investigation of the triggering of this PMS is required.</p>								

Performance Measure	Performance																							
<p>Whaler and hammerhead sharks</p> <p>A. Standardised commercial catch rate for whaler sharks or hammerhead sharks declines by more than 30% over a three year period.</p> <p>B. Any increase in the number of licences for which shark catches exceed 20% of the total catch of the licence (this is an interim measure pending review of the <i>Fisheries (Gulf of Carpentaria Fin Fish) Management Plan 1999</i>).</p>	<p>A. <i>Not triggered</i></p> <p>Catch rates in 2010 represented a decrease of 13% for whaler sharks and increase of 135% for hammerhead sharks over a three year period.</p> <table border="1" data-bbox="820 371 1366 512"> <thead> <tr> <th rowspan="2">Group</th> <th colspan="3">Catch rate (kg/100m net/day)</th> </tr> <tr> <th>2008</th> <th>2009</th> <th>2010</th> </tr> </thead> <tbody> <tr> <td>Hammerhead</td> <td>6</td> <td>5</td> <td>14</td> </tr> <tr> <td>Whaler</td> <td>21</td> <td>19</td> <td>19</td> </tr> </tbody> </table> <p>B. <i>Triggered</i></p> <p>The number of licences increased by one licence from 2009 to 2010. The outcome of the review of the Gulf Management Plan is complete and new arrangements which limit the potential effort for sharks in the GOCIFFF are now in force for the 2012 season. A new measure will be developed for shark in 2012 that will consider these new arrangements. Given that this measure was triggered by a single licence and that new more conservative netting arrangements are now in place, Fisheries Queensland consider that any sustainability risk has been mitigated. The matter will not be investigated further.</p> <table border="1" data-bbox="820 927 1139 1068"> <thead> <tr> <th>Year</th> <th>No. of Licences</th> </tr> </thead> <tbody> <tr> <td>2008</td> <td>13</td> </tr> <tr> <td>2009</td> <td>10</td> </tr> <tr> <td>2010</td> <td>11</td> </tr> </tbody> </table>	Group	Catch rate (kg/100m net/day)			2008	2009	2010	Hammerhead	6	5	14	Whaler	21	19	19	Year	No. of Licences	2008	13	2009	10	2010	11
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<p>Bycatch Species</p> <p>A. The proportion of bycatch in the total catch should not increase above the average of the previous five years (No reference point has been assigned to this performance measure. The indicator will be monitored annually. Six years of data are required to measure performance of the indicator).</p> <p>B. The number of bycatch species increases by more than 10% over a five year period.</p> <p>C. The numerical abundance of any category of bycatch relative to the total numerical abundance of bycatch increases by more than 50% over the previous five year period.</p>	<p>A. <i>Not measured in 2010</i></p> <p>Fisheries observations did not extend in to the GOCIFFF in 2010. There is no comparable figure to measure this against. A baseline average for this measure will be commenced in 2008 to remove potential bias in previous data that was based on the offshore N9 fishery only.</p> <p>B. <i>Not measured</i></p> <p>Information has not been collected for this measure. Fisheries Queensland plan to review this measure post implementation of the revised management arrangements for the fishery.</p> <p>C. <i>Not measured</i></p> <p>Bycatch categories have not been defined. Changes to this measure will be considered in 2012.</p>																							
<i>Protected species</i>																								
<p>Guitarfish (<i>Rhynchobatus</i> spp) and shovelnose rays (<i>Rhinobatos</i> spp)</p> <p>No reference point has been assigned to this performance measure. The indicator will be monitored annually, however a minimum of three years of data are required to measure performance of the indicator. In the interim, a decreasing trend in mortality during the most recent three year period as reported by observers and/or SOCI logbooks is acceptable for the sustainability of guitarfish and shovelnose rays.</p>	<p><i>Not measured</i></p> <p>No interactions with guitarfish or shovelnose rays were reported through the SOCI logbooks and no fisheries observer trips were conducted during 2010.</p>																							

Performance Measure	Performance																				
<p>Protected species</p> <p>A. The annual rate of interactions recorded in SOCI logbooks should not exceed the historical maximum annual rate of interactions recorded for the N₃ and N₉ components of the fishery:</p> <p>N₉—the annual rate of interactions should not exceed the maximum annual rate of interactions recorded by fisheries observers between 2000 and 2005.</p> <p>N₃—Maximum annual rate not yet set. SOCI logbooks represent the first systematic recording of protected species interaction levels for the N₃ component of the fishery and will be used to set the reference limit. A determination of the maximum interaction rate will be made after assessment of variability in three years of SOCI logbook data. A preliminary benchmark will be set after the end of 2007 following one year of SOCI logbook data collection.</p> <p>B. The conservation status under the EPBC Act changes for species with which the fishery interacts.</p>	<p>A. <i>Not triggered for N₉ or N₃</i></p> <p>The following table presents the type of SOCI interactions reported in 2010 in the GOCIFFF. All of these animals were released alive.</p> <table border="1"> <thead> <tr> <th>Common name</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Hawksbill turtle</td> <td>4</td> </tr> <tr> <td>Leatherback turtle</td> <td>3</td> </tr> <tr> <td>Sawfish—dwarf</td> <td>5</td> </tr> <tr> <td>Sawfish—freshwater</td> <td>3</td> </tr> <tr> <td>Sawfish—green</td> <td>2</td> </tr> <tr> <td>Sawfish—narrow</td> <td>2</td> </tr> <tr> <td>Sawfish—wide</td> <td>3</td> </tr> <tr> <td>Turtle—freshwater</td> <td>4</td> </tr> <tr> <td>Total</td> <td>15</td> </tr> </tbody> </table> <p>These totals are below the thresholds set for the N₉ and N₃ fisheries. A new measure will be developed for protected species interactions in 2012.</p> <p>B. <i>Not triggered</i></p>	Common name	Total	Hawksbill turtle	4	Leatherback turtle	3	Sawfish—dwarf	5	Sawfish—freshwater	3	Sawfish—green	2	Sawfish—narrow	2	Sawfish—wide	3	Turtle—freshwater	4	Total	15
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Current sustainability status and concerns

A workshop was held in June 2011 to assess the exploitation status for key net caught species in the GOCIFFF. The fishery profile table at the beginning of this report provides a summary of the status determinations. No sustainability concerns for key GOCIFFF species were identified at the workshop. The stock status will be reassessed in 2012. The latest information on stock status assessments can be found at http://www.dpi.qld.gov.au/28_16916.htm

Two key GOCIFFF species, king threadfin and grey mackerel, were determined to have an ‘uncertain’ status. For king threadfin, this uncertainty was due to conflicting information with research suggesting local population concerns while the stock continued to demonstrate a stable commercial catch history. Fisheries Queensland plan to monitor for local fishing impacts through new regionally scaled performance measures for the GOCIFFF.

A review by Fisheries Queensland in 2010 of the 2004 ecological risk assessment (Zeller & Snape 2006) downgraded grey mackerel from a high to a moderate risk due to the outcomes of research on the stock differentiation across northern Australia (Welch et al. 2009). This research found some evidence, although inconclusive, that multiple localised adult sub-stocks of grey mackerel (meta-populations) may exist within the GOC.

This stock information was considered in a recent resource assessment of grey mackerel in the GOC (DEEDI unpublished report). The assessment concluded that fishery logbook data gave poor resolution of population dynamics and could not provide abundance estimates. The stock status of grey mackerel remains ‘uncertain’ until the causes of catch variability, and how these relate to population levels, is better understood.

Research

Recent research and implications

Collaborative research

Fisheries Queensland collaborated on a multi-jurisdiction, multi-agency and multi-technique Fisheries Research and Development Corporation (FRDC) funded project determining stock boundaries for threadfin salmon species across northern Australia (FRDC 2007/032) (Welch et al. 2010). The research suggested king threadfin may have highly localised populations and may be under increased fishing pressure in some areas. It is important to note that the research was designed to determine stock discrimination of king threadfin and not to provide an estimate of the resource in the GOC. The research does provide a good baseline for designing further studies and age and length monitoring programs for king threadfin. Fisheries Queensland intends to revise the

PMS to include regionally scaled indicators for king threadfins.

Fishery management

Compliance report

During 2010, 3558 units, including 52 commercial net fishing vessels, were inspected in the GOCIFFF. The majority of remaining inspections were of recreational fishers. Ten offences were detected during the period (Table 8). In addition, two unattended monofilament nets were seized for which the owner could not be identified.

All offences during the period resulted in a Fisheries Infringement Notice (FIN) being issued to the offender.

Table 8: Offences recorded in the GOCIFFF (2010).

Fail to give required information (logbook) to the Chief Executive in stated way or by stated time	1
Take or possession of regulated fish (Recreational Fisher).	9

Changes to management arrangements in the reporting year

A review of Queensland fin fish fisheries in the Gulf of Carpentaria commenced mid 2009. Fisheries Queensland released an options paper in September 2009 and facilitated public and industry meetings to discuss these options in October 2009. The primary focus of the review related to the provisions in the Gulf Management Plan. However, several Joint Authority fisheries currently covered by permit arrangements were also covered by the review. The harvest of grey mackerel and tropical shark was a major consideration of the review.

New management arrangements for the GOCIFFF came into force in November 2011. Under these new management arrangements, the Fisheries (Gulf of Carpentaria Inshore Fin Fish) Management Plan 1999 was abolished and the new arrangements incorporated into the Fisheries Regulation 2008. The arrangements include new input controls aimed at reducing the potential for netting effort for shark and grey mackerel that will come into effect at the start of the 2012 season.

Communication and education

Future consultation with stakeholders in this fishery occurs through;

- Consults with industry members through attendance at industry association meetings, port visits, newsletters and other means.
- Legislated requirements for consultation; such as a Regulatory Assessment Statement (RAS) that ensure stakeholders in the fishery are consulted about significant changes in management arrangements.

Complementary management

Fisheries researchers and managers from Queensland, the Northern Territory and Western Australia and the Commonwealth meet annually at the Northern Australia Fisheries Management Forum to review current research, set research priorities and consider management strategies to facilitate the development and implementation of complementary management for shared fisheries resources.

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Information compiled by

Anthony Roelofs

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