

Sustainable Fisheries Strategy

2017–2027

Gulf of Carpentaria Developmental Fin Fish Trawl Fishery Scoping Study

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Summary

Feature	Details
Species targeted	Commercial—Crimson snapper (<i>Lutjanus erythropterus</i>), saddletail snapper (<i>Lutjanus malabaricus</i>), mangrove jack (<i>Lutjanus argentimaculatus</i>), goldband snapper (<i>Pristipimoides multidens</i>), golden snapper (<i>Lutjanus johnii</i>), red emperor (<i>Lutjanus sebae</i>), sweetlip (various spp.).
Fisheries symbols	N/A—fishery operates under a Developmental Permit system.
Fisheries Legislation	<i>Fisheries Act 1994</i> and subordinate legislation
Working Group	Nil
Harvest Strategy	No
Gear	Fin Fish Trawl
Main management methods	<p><i>Commercial</i></p> <ul style="list-style-type: none"> • Size restrictions, no-take species • Gear restrictions • Limited access • Spatial closures • Species-specific quotas • Zero discard of quota species <p><i>Recreational</i></p> <ul style="list-style-type: none"> • N/A
Quota	<p>Crimson snapper—169t</p> <p>Saddletail snapper—150t</p> <p>Mangrove jack—30t</p> <p>Golden snapper—61t</p> <p>Red emperor—21t</p> <p>Other Gulf of Carpentaria teleost species—65t</p>
Fishing Season	1 July–30 June
Commercial Fishery Permits	Issued—3
Total annual harvest	No fishing activity in the 2016–17, 2017–18 seasons
GVP	\$0
Accreditation under the EPBC Act (Part 13 & 13A)	<p>Part 13: Accredited</p> <p>Part 13A: Accredited (expires 22 November 2019)</p>

1 Overview

1.1 Commercial Fishery

The *Gulf of Carpentaria Developmental Fin Fish Trawl Fishery* (GOCDFFTF) is a developmental fishery managed under the *Queensland Fisheries Joint Authority* (QFJA). Under the Developmental Fishing Policy, operators are granted access to the fishery via commercial fishing permits that are used to determine if a potential new fishery is commercially viable, socially acceptable and ecologically sustainable¹. The fishery has not progressed beyond developmental status since implementation in 1998 and is managed through permit conditions rather than provisions contained within subordinate legislation of the *Fisheries Act 1994*.

The fishery operates under a Total Allowable Commercial Catch (TACC) limit with five species-specific quota categories and one general fin fish category. These categories are crimson snapper (CS); saddletail snapper (SS); golden snapper (GS); red emperor (RE); mangrove jack (MJ) and other Gulf of Carpentaria species (OS (Gulf)). Catch data for the fishery indicates that operators mostly targeted crimson and saddletail snappers; retaining smaller quantities of byproduct that include golden, goldband, and Moses snappers, redspot and red emperors, painted sweetlips and mangrove jack.

The fishery operates beyond 25 nautical miles from the Queensland coast, north to the Australian Fishing Zone boundary and west to the Northern Territory boarder.

1.2 Non-Commercial Fishing

The *Statewide Recreational Fishing Survey 2013–14* estimated that Queensland had an annual recreational fishing population of more than 640,000, with the sector registering a combined 12-month estimate of 2.5 million fishing days (Webley *et al.*, 2015). The use of trawling apparatus for recreational purposes is not permitted in Queensland with fishers restricted to the use of line gear and cast/bait nets. Of the species targeted in the GOCDFFTF, the recreational sector caught an estimated 4000 each of golden and Moses snapper in the Gulf of Carpentaria region (Webley *et al.*, 2015). Mangrove jack, golden snapper crimson snapper and saddletail snapper are also harvested in the Gulf of Carpentaria charter fishery, recording around a half a ton of golden snapper annually since 2015 (Qfish, 2018: <http://qfish.fisheries.qld.gov.au/>). It is noted though that only licenced charter fishers operating in offshore waters are required to complete a logbook.

More broadly, Aboriginal peoples and Torres Strait Islander peoples would harvest species targeted by commercial operators in the GOCDFFTF. A previous survey focusing on the catch of this sector reported a large number of sea perch and snappers taken in northern Australia (Fisheries Research and Development Corporation, 2003). Catch and effort by Aboriginal peoples and Torres Strait Islander peoples in the Gulf of Carpentaria though can be difficult to quantify due a lack of data.

2 Legislation & Advisory Bodies

The GOCDFFTF is managed in accordance with the broader objectives of the *Fisheries Act 1994* and its subordinate legislation, and continues to be managed as part of the *Queensland Fisheries Joint Authority* (QFJA). The QFJA includes representatives from the Commonwealth and Queensland Governments and the body is responsible for the management of fisheries operating in waters

¹ As defined in section 3 of the *Fisheries Act 1994*.

adjacent to Queensland e.g. the *Gulf of Carpentaria Line Fishery*, the *Gulf of Carpentaria Inshore Fin Fish Fishery* (GOCIFFF) and the GOCDFFTF (Australian Fisheries Management Authority, 2017).

As the GOCDFFTF is a small developmental fishery, a working group has not been established for the fishery under the *Queensland Sustainable Fisheries Strategy 2017–2027* (Department of Agriculture and Fisheries, 2017).

3 Key Management Controls

As the GOCDFFTF is a developmental fishery it is managed through permit conditions rather than through provisions included in fisheries-based legislation. These conditions apply gear restrictions (e.g. mesh size, see Appendix 1) and spatial constraints to the fishery, as well as mandating the use of a bycatch reduction device (BRD) and a Turtle Excluder Device (TED). Output controls are also outlined in the permit conditions with the following TACC quota limits applied to the fishery: 169t for crimson snapper, 150t for saddletail snapper, 30t for mangrove jack, 61t for golden snapper, 21t for red emperor, and 65t for other Gulf of Carpentaria teleost species (OS (Gulf)) (Department of Agriculture and Fisheries, 2018). The quota setting process is based on a stock assessment for tropical snappers in northern Australia (O'Neill *et al.*, 2011; Leigh & O'Neill, 2016) and the permit holder must stop fishing if the limit is reached for any one of the quota management units.

In addition to the TACC limits, the fishery is subject to a number of notable conditions surrounding the take of target and byproduct species. While a minimum legal size (MLS) limit applies to target species, permit holders are required to retain and report all authorised/permitted species caught during the trawl event. This includes fish that fall below the 35cm MLS limit. These conditions are underpinned by a further requirement that the total catch must not contain more than 10% of undersized fish. If the 10% limit is breached the operator must declare this breach and take steps to reduce the catch of undersized fish (Department of Agriculture and Fisheries, 2019).

Historically the GOCDFFTF has a number of no-take species listed in the permit conditions. These are: barramundi; sharks; tuna and tuna-like fish (namely yellowfin, southern bluefin tuna, bigeye tuna, longtail tuna, albacore tuna, northern bluefin tuna and skipjack tuna); pomfrets (Family *Bramidae*); and billfish. This list was expanded in 2017 to include black jewfish (*Protonibea diacanthus*); queenfish (*Scomberoides* spp.); king salmon (*Polydactylus sheridanii*); blue salmon (*Eleutheronema tetradactylum*); grey mackerel (*Scomberomorus semifasiatus*); Spanish mackerel (*Scomberomorus commerson*); and squid (*Photololigo* spp.). Prior to 2017, these species had individual catch limits of 20 for fin fish and 200 for squid. These changes reflect the Offshore Constitutional Settlement arrangements with the Commonwealth.

4 Assessment History

Stock assessments have been completed for a range tropical snappers in the Gulf of Carpentaria (O'Neill *et al.*, 2011; Leigh & O'Neill, 2016). The results of these stock assessments underpin the quota setting process in the GOCDFFTF and provide reference points for ongoing monitoring in the fishery.

A previous ecological risk assessment (ERA) was carried out in 2006 on all Queensland managed fisheries in the Gulf of Carpentaria (Zeller & Snape, 2006). This report examined the risk of both retained and non-retained species, as well as general ecosystem impacts arising from fishing

activities. While this study found that the GOCDFFTF posed a low to moderate risk to range of target and byproduct species, the operating environment for the fishery has changed markedly since the completion of this ERA (Zeller & Snape, 2006; Department of Agriculture and Fisheries, 2018). For example, the targeting of tropical snappers across the northern Australia has grown significantly, and the management of the fishery has become more prescriptive with the utilisation of more conservative TACC limits.

In addition to stock assessments and an ERA, a number of the target species including crimson and saddletail snapper have been included in the National *Status of Australian Fish Stocks* (SAFS) and Queensland Stock Status processes. Although not comprehensive, a list of selected species with sustainability assessments has been provided in Appendix 2. Additional information on the stock status assessments of each species can be obtained through the SAFS website (<http://fish.gov.au/>) and through the DAF Sustainability Reporting website (<https://www.daf.qld.gov.au/business-priorities/fisheries/monitoring-compliance/data/sustainability-reporting/stock-status-assessment>).

More broadly, the GOCDFFTF undergoes sustainability assessments as part of the *Wildlife Trade Operation* (WTO) approvals process. A WTO approval is issued under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and is required for all fisheries that export product caught and retained in Australian waters.

5 Developmental Commercial Fishing Permits

The extent of the GOCDFFTF is restricted by the number of permits that have been issued for the fishery. Prior to 2006 a maximum of two permits were issued each quota year with this number increasing to three in the post-2006 period (Table 1; Fig. 1a). These permits were originally issued for one year but were issued to two years in 2014–15 and for three years in 2016–17. These changes reduced administration processes associated with the fishery and provided fishers with a higher degree of certainty.

6 Effort & Catch

6.1 Effort Trends

Total effort in the GOCDFFTF is recorded in days fished and is drawn from the Vessel Monitoring System (VMS) data (Table 1)². This data shows that fishing activity in GOCDFFTF varied through time with the largest amounts of effort being reported from the 2003–04 to 2011–12 period (Table 1; Fig. 1b). Effort levels in the fishery have declined since the 2011–12 season with only 69 fishing days (total) being reported from the fishery in the ensuing years. No effort was reported from the fishery during the 2014–15 and 2016–17 seasons (Table 1).

A number of factors would have contributed to the observed declines in effort including the developmental nature of the fishery, operational priorities of the permit holders and the (potential) impacts of management initiatives e.g. the introduction of more stringent bycatch reduction measures, the expansion of the no-take species list and amendments to the TACC for key species.

² The use of a vessel tracking system is mandatory in the GOCDFFTF.

Table 1—An overview of the total number of permits that can potentially access the GOCDFFTF during the quota year, the effort reported from the fishery and total catch. #issued permits valid for two years; *issued permits valid for three years.

Year	Permits	Active Permits	Effort (days)	Catch (tonnes)	CPUE (kg/day)
1997–1998	1	1	5	10	2096.6
1998–1999	2	2	49	79	1618.9
1999–2000	1	1	15	53	3521.7
2000–2001	0	0	0	0	0.0
2001–2002	2	1	22	84	3828.5
2002–2003	1	1	65	123	1886.0
2003–2004	2	2	209	338	1615.2
2004–2005	2	2	259	479	1848.9
2005–2006	2	2	190	353	1858.2
2006–2007	3	3	347	698	2010.2
2007–2008	3	2	386	714	1851.0
2008–2009	3	2	359	717	1998.3
2009–2010	3	2	389	781	2008.7
2010–2011	3	2	289	502	1738.2
2011–2012	3	3	218	448	2054.2
2012–2013	3	1	7	25	3627.6
2013–2014	3	0	0	0	0.0
2014–2015	3 [#]	1	2	5	2395.0
2015–2016	3	2	60	231	3847.0
2016–2017	3 [*]	0	0	0	0.0

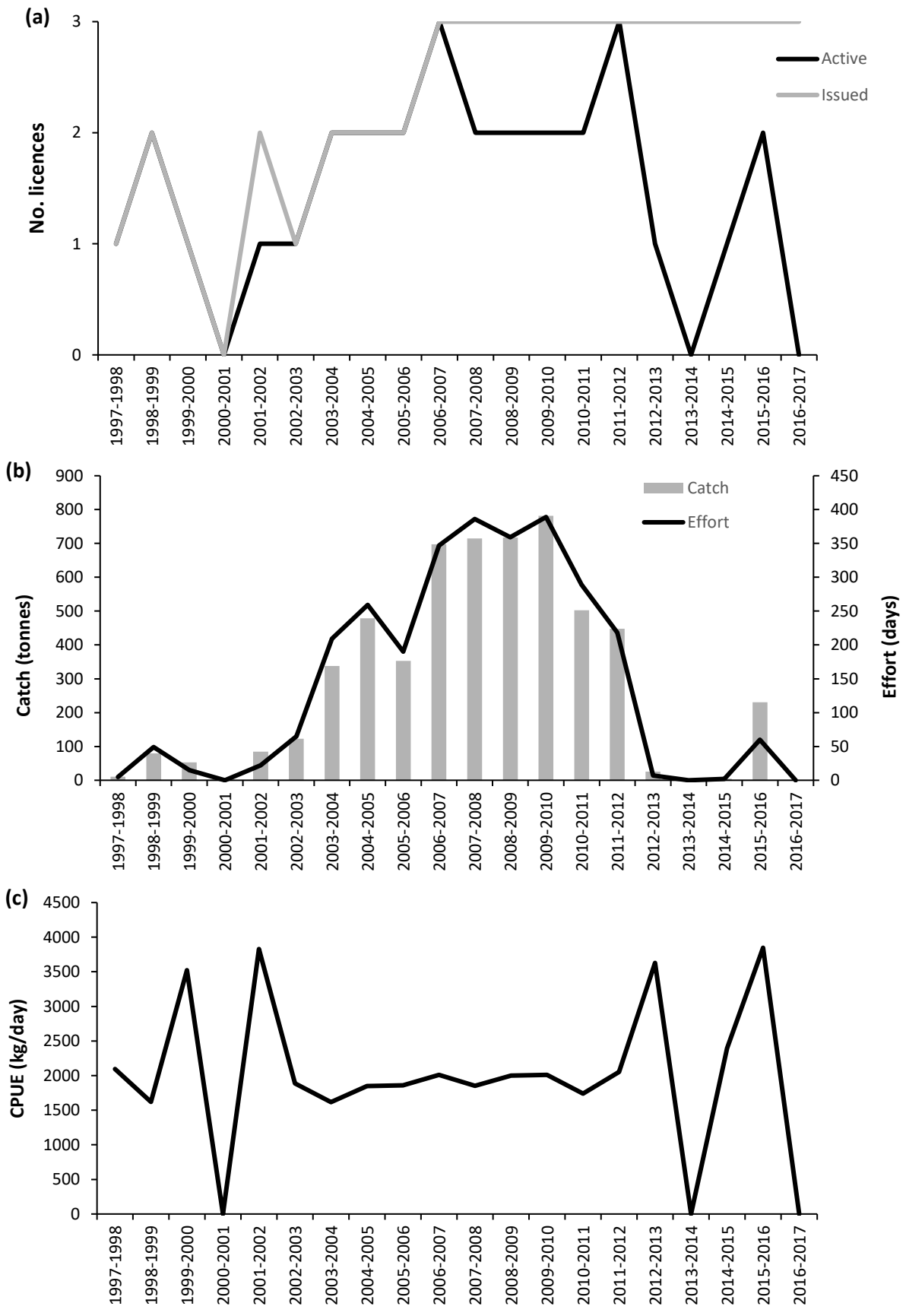


Figure 1—Yearly fishery overview including a) a permit summary for the Gulf of Carpentaria Developmental Fin Fish Fishery, b) catch and effort for the whole fishery, and c) non-standardised CPUE (catch per unit effort; kg/day).

6.2 Catch Trends

The GOCDFFTF historically operated under a broader TACC limit that covered the combined catch of crimson snapper, saddletail snapper, red emperor and other emperors (Department of Employment Economic Development and Innovation, 2011). In 2014, this TACC was reduced from 1250t to 450t based on the results of a stock assessment carried out in 2011 (O'Neill *et al.*, 2011). These changes were built upon in 2017 when TACC limits were redefined to include the six current quota categories.

At a whole of fishery level, catch data for GOCDFFTF follows trends observed in the effort data (Table 1, Fig. 1b). Catch steadily increased from 2001–02 until reaching a peak in 2009–10. After which, catch fell by approximately 35% and continued to almost zero by 2012–13. Since then, the fishery has reported minimal amounts of catch; except for 2015–16 when catch was approximately 230t. Of the quota managed species, crimson snapper has the most consistent and highest catch over time, followed by saddletail snapper and OS (Gulf) (Table 2, Fig. 2a).

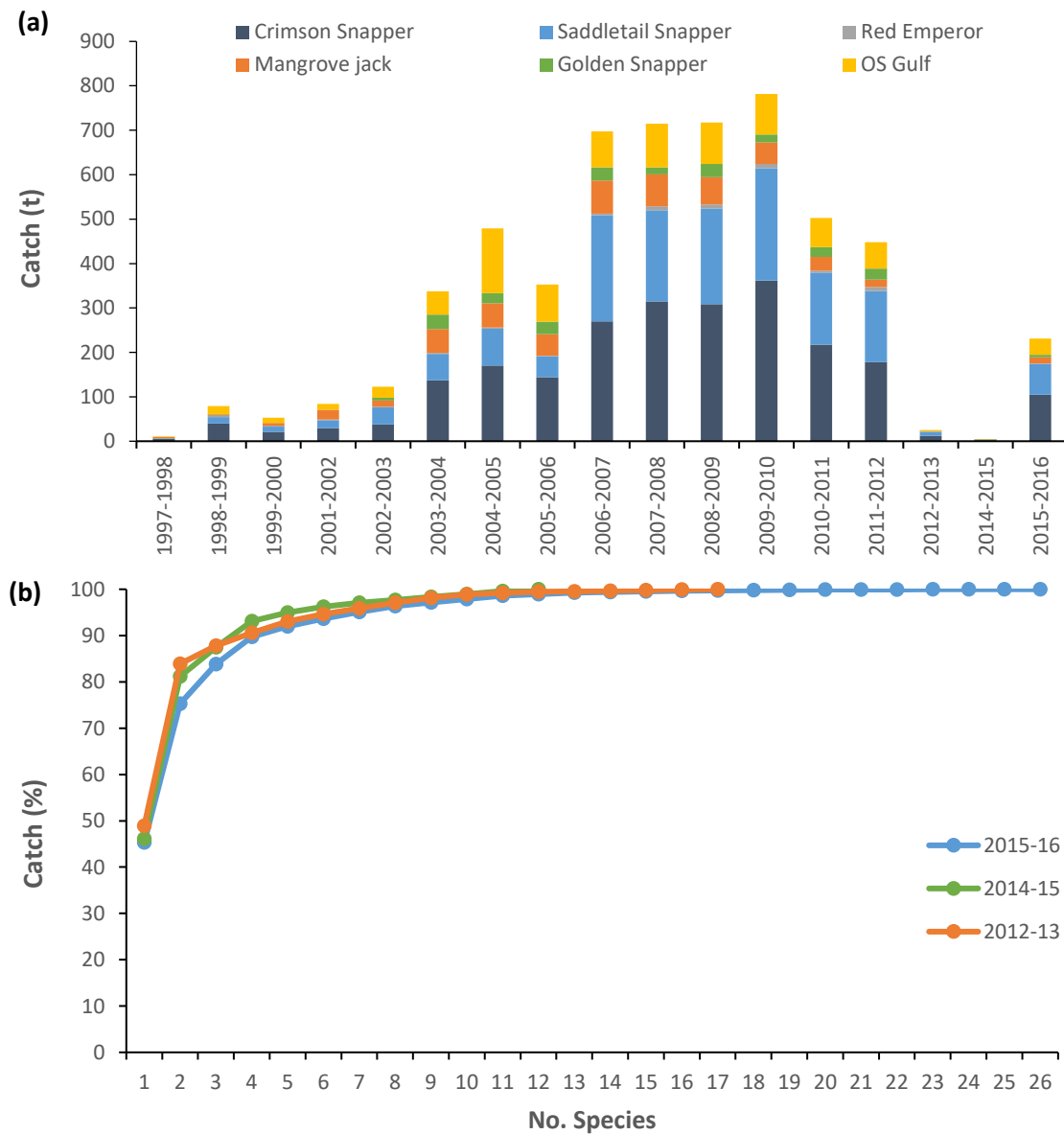


Figure 2—Catch summary for the Gulf of Carpentaria Developmental Fin Fish Fishery including a) total catch broken into quota allocation categories and b) a cumulative species curve representing the retained catch in the last three years.

Table 2—Catch (tonnes) and effort (days fished) summaries for each of the respective Gulf of Carpentaria Developmental Fin Fish Fishery quota management units. Total catch and effort levels for each category will be influenced by a range of factors including management changes and Total Allowable Commercial Catch (TACC) limit amendments.

Year	Saddletail snapper		Crimson snapper		Golden snapper		Mangrove jack		Red emperor		OS (Gulf)	
	Effort	Catch	Effort	Catch	Effort	Catch	Effort	Catch	Effort	Catch	Effort	Catch
1997–1998	5	5	5	1			5	0	5	3	19	1
1998–1999	49	40	49	14	3	1	17	3	42	3	163	18
1999–2000	15	21	15	12			12	2	15	6	86	12
2000–2001	No effort or catch											
2001–2002	22	29	22	18			22	1	22	22	146	13
2002–2003	64	38	62	39	21	6	48	1	44	14	306	25
2003–2004	195	137	189	59	59	33	143	2	82	54	613	53
2004–2005	179	171	236	83	58	23	168	3	89	54	1141	145
2005–2006	104	144	176	47	59	29	101	1	45	48	774	84
2006–2007	308	270	319	239	111	29	201	3	77	75	1063	81
2007–2008	362	315	369	205	92	16	252	9	171	72	1359	98
2008–2009	326	308	352	216	112	30	252	8	175	62	1620	93
2009–2010	376	362	379	253	92	18	278	10	175	48	1632	91
2010–2011	269	217	281	162	64	22	185	4	110	31	1134	66
2011–2012	208	178	213	160	63	25	144	9	89	16	926	59
2012–2013	7	12	7	9	2	0	5	1	6	0	32	3
2013–2014	No effort or catch											
2014–2015	2	2	2	2	1	0	1	0	1	0	11	1
2015–2016	60	105	60	69	18	5	56	2	46	14	445	37
2016–2017	No effort or catch											

Excluding the aforementioned no-take species, GOCDFFTF operators can legally retain all teleost species in the Gulf of Carpentaria. The fishery operates in tidal waters with fishers primarily targeting tropical snappers, including the five species-specific quota fin fish: crimson snapper, saddletail snapper, mangrove jack, golden snapper, and red emperor. Target species also include miscellaneous fin fish such as the goldband snapper, which falls under the OS (Gulf) quota category (Table 2; Appendix 3). Other fish falling under the OS (Gulf) quota are taken opportunistically and can be considered as byproduct species. A full list of harvested species and catch can be found in Appendix 3.

In the last year with reported catch (2015–16), approximately 90% of the total catch was made up of just four species; crimson snapper, saddletail snapper, golden snapper and mangrove jack (Fig. 2b). This trend has remained consistent over time, in years where catch was recorded. However, there is some variability in the dominant species each year. For example in 2012–13 the four species comprising 90% of the catch were crimson, saddletail, and golden snapper and redspot emperor (Fig. 2b, Appendix 3).

With so few active permits and the fishery displaying a high level of inconsistency, the non-standardised CPUE fluctuates significantly over the time scale (Table 1, Fig. 1c). Between 2002–03 and 2011–12 the non-standardised CPUE remained relatively stable, however prior to 2002 and after 2012 there is high inter-annual variability (Fig. 1c). Hyperstability is likely to mean that non-standardised CPUE is a poor indicator of biomass.

6.3 Bycatch

Fishery logbooks used from the 2003–04 season require all operators to report total weights for the discarded portion of the catch (Table 3). Operators must also report interactions with no-take species; a requirement that has been in effect since 2017. An absence of fishing effort in the GOCDFFTF has limited the amount of information on catch rates for no-take species. However some information on historical bycatch compositions are available from logbook data. This information is provided in Appendix 4.

In 2017, the use of a BRD became mandatory in the GOCDFFTF. This requirement was introduced with a number of performance targets aimed at reducing the impact of the fishery on non-target species and undersized fish. Under these requirements, fishers cannot discard any quota species, meaning undersized fish are fully accounted for the quota system. If the total amount of quota species less than 35 cm exceeds 10% then fishers must take steps to reduce this component of the catch and notify DAF in writing before undertaking another trip.

Observers have previously operated on vessels in the GOCDFFTF and most bycatch observations are based on this data. Previous reports have identified undersized target fish and no-take species as the most common form of bycatch including elasmobranchs, trevallies, threadfin breams, snappers, triggerfishes, grunter breams, emperors and breams. Benthic sessile invertebrates, including sponges, sea whips, and sea fans have also been identified within the fish trawl catch (Roelofs & Stapley, 2004; Department of Employment Economic Development and Innovation, 2011). Going forward, the level of information on bycatch compositions and fates will increase through time as permit conditions now require an observer to be on board the vessel for the first two trip of the season and on every third trip thereafter.

Table 3. Total discarded catch (tonnes) in the Gulf of Carpentaria Developmental Fin Fish Fishery.

Year	Discards (t)	Year	Discards (t)
2003–2004	27.3	2010–2011	142.9
2004–2005	76.0	2011–2012	17.1
2005–2006	10.6	2012–2013	0.0
2006–2007	81.9	2013–2014	0.0
2007–2008	118.4	2014–2015	0.0
2008–2009	275.6	2015–2016	37.3
2009–2010	249.2	2016–2017	0.0

6.4 Species of Conservation Concern (SOCC)

No interactions with SOCI³ have been reported from the GOCDFTF since the introduction of a SOCI specific logbook in 2003. Prior to the introduction of this logbook, permit holders reported interactions with three groups that are now classified as SOCI – sea snakes, caught and discarded on five separate occasions; unspecified sawfish, caught and discarded on six separate occasions; and unspecified marine turtles, caught and discarded on two separate occasions (Department of Agriculture and Fisheries, 2019). A discontinued fishery observer program and industry consultation also identified olive ridley turtles, flatback turtles, elegant sea snakes, pipefish, narrow sawfish, Queensland gropers, barramundi cods, scalloped hammerheads, great hammerheads, and leopard sharks as species that interact infrequently with this fishery (Roelofs & Stapley, 2004; Zeller & Snape, 2006; Department of Employment Economic Development and Innovation, 2011). As this information pre-dates the use of TEDs and BRDs, DAF anticipates that a number of these species will now be excluded from the catch with more regularity (Brewer *et al.*, 2006; Griffiths *et al.*, 2006).

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8 Appendices

- Appendix 1—*Gear restrictions imposed on the Gulf of Carpentaria Developmental Fin Fish Trawl Fishery (GOCDFFTF) and a description of the apparatus used.*
- Appendix 2—*Indicative stock status assessments for species targeted in the Gulf of Carpentaria Developmental Fin Fish Fishery.*
- Appendix 3—*Retained catch (tonnes) in the Gulf of Carpentaria Developmental Fin Fish Fishery by individual species.*
- Appendix 4—*Discarded catch (kg) in the Gulf of Carpentaria Developmental Fin Fish Trawl Fishery by individual species.*

APPENDIX 1—Gear restrictions imposed on the Gulf of Carpentaria Developmental Fin Fish Trawl Fishery (GOCDFFTF) and a description of the apparatus used.

<p>Permitted gear</p>	<p>Mesh size >110mm</p> <p>BRD and a TED must be used</p> <p>Must have mesh size, in the forward half of the net (including wing and belly sections) not exceeding 300mm with a diameter of not more than 4mm.</p> <p>The net, other than within 1.5m from its drawstring, must be uncovered.</p> <p>Must have the weight on the footline (including bobbin lines chains, bridles and any other device weighing on the footline) not exceeding 4 kilograms wet weight in the air per linear metre.</p>
<p>Trawl Net Description</p>	<p>Excerpt from 2004 Ecological Assessment for the GOCDFFTF (Roelofs & Stapley, 2004)—<i>The full wing Wendy trawl net used was designed to minimise habitat disturbance while maintaining viable levels of catch. It was designed cooperatively by industry and government. The bridle design, light weighted footline and cut of the net allow it to lift high off the seabed, allowing the gear to be more workable as the net should not come into contact with the seabed. The net design reduces the occurrences of sponges, corals and other unwanted species that are associated with traditional demersal trawl operations. This also improves the quality of the retained catch. Further commercial benefits of the net design include reduced wear and tear on the trawl net and rigging due to minimised contact with the substrate.</i></p> <p><i>The headline of the Wendy trawl net is 42.4m in length and has 74 floats attached each with a buoyancy of 2.8kg. Floats are concentrated on the wing ends and in the centre of the headline. The ground wire is surrounded by rubber disks that allow it to roll over the substrate with minimal impact on the occasions the net comes into contact with the seabed. In general operations the net will lift approximately 0.3–0.4m off the seabed to target red snappers, which generally school off the bottom (Sly 2003).</i></p> <p><i>A Champion cutaway wing net is more target specific and equally as low impacting to the substrate as a derivation of the Wendy net. The headline of the Champion cutaway wing trawl net is 39.2m in length and has 80 floats attached each with a buoyancy of 2.8kg. The ground wire is covered with rubber bobbins that allow it to roll over the substrate with minimal impact on the rare occasions the net comes into contact with the seabed. In general operations the net will lift approximately 0.3–0.4m off the seabed; although contact with the surface will still occur during the trawl event.</i></p> <p><i>Trawling speeds are between 3.5 and 4 knots and shots are from 30 to 90 minutes in duration.</i></p>

APPENDIX 2—Indicative stock status assessments for species targeted in the *Gulf of Carpentaria Developmental Fin Fish Fishery*. Stock status assessments based on the outputs of the National *Status of Australian Fish Stocks (SAFS)* and Queensland Stock Status processes.

Species	SAFS Stock name	2015 QLD status	2016 SAFS status	2017 QLD status	2018 SAFS status
Crimson snapper <i>Lutjanus erythropterus</i>	Northern Australia	Not Assessed	Sustainable	Not Assessed	Sustainable
Saddletail snapper <i>Lutjanus malabaricus</i>	Northern Australia	Not Assessed	Sustainable	Not Assessed	Sustainable
Mangrove jack <i>Lutjanus argentimaculatus</i>	Gulf of Carpentaria Qld	Undefined	Overfished*	Transitional-recovering	Recovering
Golden snapper <i>Lutjanus johnii</i>	Gulf of Carpentaria Qld	Not Assessed	Sustainable	Not Assessed	Sustainable
Red emperor <i>Lutjanus sebae</i>	Gulf of Carpentaria Qld	Not Assessed	Undefined	Not Assessed	Undefined
Goldband snapper <i>Pristipomoides multidens</i>	Northern Australian	Not Assessed	Sustainable	Not Assessed	Sustainable
Spangled emperor <i>Lethrinus nebulosu</i>	Gulf of Carpentaria Qld	Negligible	Not Assessed	Negligible	Undefined
Coral Trout <i>Plectropomus spp., Variola spp.</i>	Gulf of Carpentaria Qld	Not Assessed	Undefined	Not Assessed	Undefined
Mulloway <i>Argyrosomus hololepidotus</i>	Queensland	Not Assessed	Undefined	Not Assessed	Undefined

*Queensland Status – Not SAFs assessed

APPENDIX 3—Retained catch (tonnes) in the Gulf of Carpentaria Developmental Fin Fish Fishery by individual species.³

Species	Catch (t)																
	1997-98	1998-99	1999-00	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2014-15	2015-16
Bat fish - unspecified							4.8	0.0									
Blue Trevally														0.1			
Bugs - unspecified	0.0			0.2													
Bullseye								0.3									
Butterflybream - monogram mono									0.1	0.3	0.2	0.0					
Catfishes											0.8						
Cod - morgan's										0.1	0.0						
Cod - unspecified	0.0	1.5	1.0	0.4	1.2	2.2	8.1	4.9	6.6	4.9	4.2	4.6	6.0	4.5	0.3	0.0	1.9
Coral trout	0.0				0.6	0.5	3.0	1.5	1.7	1.9	0.4	1.1	1.8	1.1	0.1		0.8
Emperor - pink-eared	0.6	1.9	3.0	4.1	6.0	12.6	12.5	6.0	6.6	5.2	4.2	5.3	3.9	1.8	0.7	0.1	3.4
Emperor - red	0.3	2.7	2.0	1.1	1.4	2.3	2.5	1.0	3.2	9.3	8.4	9.9	4.4	9.5	0.6	0.0	1.7
Emperor - spangled									0.3	0.6	0.4	0.9	0.8	4.4			0.1
Emperor - Unspecified		2.4						1.8	1.8	4.1	1.9	1.2	1.9	0.2	0.0		0.1
Emperor - yellow spotted								0.0					0.0				
Fish - mixed reef	0.5	0.2				0.0	9.4	17.2	0.3	0.8	0.8	0.1					
Fish - unspecified											0.8	0.4	3.6	0.0			0.0
Frypan Bream					0.3	0.4	1.0	1.8	2.1	3.3	3.9	3.3	1.0	1.1			0.7
Goat fish								0.0		0.1	0.2	0.6	0.1	0.1	0.0		0.3

³ Some species are recorded under previous synonyms e.g. the accepted name for small mouth nannygai is crimson snapper.

Species	Catch (t)																
	1997-98	1998-99	1999-00	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2014-15	2015-16
Golden Snapper		1.4			5.8	32.7	23.1	29.0	29.4	15.8	29.6	17.8	21.8	25.1	0.2	0.3	5.2
Grunter - unspecified								0.8	0.1	0.0	0.2			0.2			
Hussar - brown		0.0	0.4	0.4	0.1		0.1	0.3									
Hussar - unspecified										0.5	0.1	0.1	0.4	0.1			0.0
Jew fish - black		0.0							0.1	0.3	0.1	0.1	0.0	0.1	0.0	0.0	0.3
Jew fish - mulloay															0.1		
Jew fish - unspecified										0.2	0.2	0.1	0.1				
Jobfish - gold banded					6.9	14.7	25.7	13.2	21.6	21.6	28.8	33.8	23.0	26.2	1.0	0.3	19.8
Kingfish - black						0.3	0.3	0.1	0.4	0.2	0.6	0.8	0.6	0.6			0.2
Leather jacket/triggerfish							0.1										
Mackerel - grey										0.7	0.0						
Mackerel - Spanish		0.3	1.2	3.6	1.1	0.9	1.5	0.2	0.5	0.2	0.1	0.0		0.2			
Mackerel - spotted														0.0			
Mackerel - unspecified		0.2		0.0						0.1	0.1	0.0					
Mangrove jack	2.5	2.9	6.1	22.2	14.0	53.7	54.3	48.4	74.7	71.7	61.7	48.0	31.1	16.1	0.3	0.0	13.5
Nannygai - large mouth	1.3	14.5	12.3	18.3	38.8	59.1	82.9	47.3	239.3	205.0	215.9	253.1	162.2	159.7	8.9	1.7	69.2
Nannygai - small mouth	5.1	39.7	20.8	29.3	37.7	137.3	170.6	143.8	269.7	314.7	308.4	361.5	217.4	178.2	12.4	2.2	104.6
Other (for quotas)												0.0					
Painted sweetlip		8.6	5.7	4.0	6.8	15.2	45.1	13.0	27.1	46.2	37.1	27.7	15.1	13.8	0.4	0.1	3.8
Perch - dark tailed sea					0.2	0.7	0.2	0.2	0.5	0.3	0.2	0.2	0.3	0.8			0.0
Perch - moses	0.1	0.0			0.9	1.2	2.4	3.1	3.9	5.0	4.2	6.0	3.4	2.3	0.3	0.0	2.9
Pomfret - unspecified							0.0			0.0							0.1

Species	Catch (t)																
	1997-98	1998-99	1999-00	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2014-15	2015-16
Prawn - unspecified				0.0													
Queenfish - unspecified						0.0	0.0			0.0							
Ray - sting unspecified									0.0								
Scad - unspecified						0.0											
Shark - australian blacktip		0.0	0.4	0.4	0.8	0.0											
Shark - unspecified				0.1													
Snapper - unspecified tropical		2.9				0.4											
Squid - unspecified	0.0			0.0			0.0		0.2	0.2	0.9	0.0	0.1	0.1		0.0	0.2
Stripey - spanish flag																	0.1
Trevally - black												0.3					
Trevally - gold spot													0.5				
Trevally - golden							0.8				0.8	3.1	0.9				
Trevally - silver												0.2					
Trevally - unspecified		0.1			0.1	3.2	26.4	18.5	7.1	0.9	1.7	1.1	0.4	0.6			1.7
Tusk fish - blue												0.0	1.2		0.0		0.0
Tusk fish - unspecified	0.0					0.0	3.9	0.9	0.2	0.4	0.4	0.0	0.4	0.9	0.0		0.4

APPENDIX 4—Discarded catch (kg) in the Gulf of Carpentaria Developmental Fin Fish Trawl Fishery by individual species.⁴

Species	Discards (kg)										
	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2014-15	2015-16
Bait fish					2100						
Barracuda	200										
Bat fish - unspecified				150	600						
Catfishes					2100						
Cod - unspecified					15		500	100			
Emperor - Unspecified					1200	120	250				
Fish - unspecified ⁵	38266	79827	13539	75869	83607	201658	286605	113755	25847	275	26065
Frypan Bream				60				150	5		
Jew fish - black									1000		
Jew fish - unspecified							2500	500			
Nannygai - small mouth					2000		50				
Painted sweetlip								90			
Trevally - unspecified						1750					
Tusk fish - unspecified									60		

⁴ Some species are recorded under previous synonyms e.g. the accepted name for small mouth nannygai is crimson snapper.

⁵ As logbooks do not require species-specific discards, most discards are not attributed to an individual species. These are recorded as Fish - unspecified.