

Queensland line fishery (reef)
Crew-based catch monitoring

Technical report

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DELIVERING FOR QUEENSLAND

Queensland Government

This publication has been compiled by Amos Mapleston of Fisheries Queensland, The Department of Primary Industries

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Executive Summary

The Line Fishery (Reef) is Queensland's second most valuable fishery and operates within the Great Barrier Reef Marine Park (GBRMP), which is a World Heritage Area. A crew-based survey was undertaken with volunteer commercial line fishers self-reporting species composition of their catch (retained, discards and depredation). This project was undertaken to meet Condition 6 of the existing Commonwealth Wildlife Trade Operation (WTO) for the fishery. Condition 6 required measures to be implemented to update existing information on non-retained catch in the fishery. The survey provides new data for the assessment and management of the fishery.

The crew-based surveys included data from five vessels with 19 individual fishers contributing data across 11 trips from Cooktown Region to Swains Region within the GBRMP. Data was collected from three vessels targeting coral trout (*Plectropomus* spp and *Variola* spp) and two targeting saddletail snapper (*Lutjanus malabaricus*) and red emperor (*Lutjanus sebae*). Catch including retained and released fish from 103 fishing days were reported. A total of 66 fish species or species groups were reported across all catches.

Similarity between contemporary crew-based surveys and historic observer datasets varied among the two fleets. Data showed relatively similar species composition between 2011–12 observer surveys and crew-based surveys for the fishers targeting coral trout with the tropical snapper fishers exhibiting greater differences. Differences in both cases were largely associated with shifts in the relative abundance of dominant target species rather than changes in species occurrence. To extend the analysis, additional data was considered by including historic line survey data extending back to 1996. The longer time frame comparison confirmed the dominant target and byproduct species within the coral trout fishery have remained consistent throughout more than 20 years of data collection.

Crew-based survey estimated 52% of fish were released from vessels targeting coral trout, compared with 35% reported in the 2011–12 observer survey. Catches in the fishery were dominated by target species, most of which were retained. Discarding in the coral trout fishery is likely driven by the diverse species composition and conservative minimum legal size limits for a range of non-target and byproduct species. Discard rates in the tropical snapper fleet were 10.2%, similar to the 8.4% reported from the 2011–12 observer survey.

The impact of depredation was highly variable across fishers and fishing days. Overall depredation rates were higher for the coral trout targeting fishery (3.1%), particularly for the coral trout species group (4.3%) than for species in the tropical snapper fleet (2.1%). However, fewer fishing days were monitored in the tropical snapper fleet. Half of the fishing days were impacted by depredation in the coral trout fleet, while 30% were impacted in the tropical snapper fleet. An average of ~10% to ~12% of the catch was taken when depredation occurred, although some fishers experienced substantially higher rates.

An increased number of Māori wrasse (*Cheilinus undulatus*) and barramundi cod (*Cromileptes altivelis*) were caught and released within the coral trout fishery compared

to the 2011–12 observer survey. These species have been protected since 2003 and some increased abundance would be expected. There were no interactions with threatened endangered and protected (TEP) species reported. This is consistent with historic research line fishing data.

In summary, this crew-based discard survey project effectively addressed WTO Condition 6 by updating information on catch composition, release practices and depredation in the Queensland Line Fishery (Reef). The survey sampled vessels representative of the major commercial fleets of the fishery, which is predominantly focused on harvest of coral trout. Data collected indicated there had been no substantial shift in catch composition major species contributing to non-retained catch, compared to the 2011–12 observer survey data.

Without cooperation from the commercial fishing industry this data would have been difficult to collect. This project emphasises the critical role of industry engagement in enhancing data collection and fostering ongoing collaboration. These insights provide a foundation for future assessments, ongoing monitoring and management of the fishery.

Table 1 Summary of data collected from 2025–2026 crew-based surveys and 2011-12 observer surveys for the two targeting fleets within the reef line fishery. *Catch numbers not including depredation. ** calculated as released / (total catch – depredation) x 100 (to maintain consistency with previous observer survey)

	Crew Based Surveys 2025-2026		**DPI Observer Surveys 2011-2012**	
	Coral trout	**Tropical snappers**	**Coral trout**	**Tropical snappers**
Fishing days	90	13	38	10
Catch numbers*	7837	1308	1517	417
Retained fish	3506	1165	918	371
Kept for bait	257	6	69	11
Released fish	4074	137	530	35
Depredated	253	29		
Released percentage**	52	10.2	35	8.4
Number of species caught	51	23	58	36
TEP species interactions	nil	nil	nil	nil

Acknowledgements

The collaboration and cooperation in design and data collection with industry allowed the efficient and effective collection of data. For this reason, we would like to especially acknowledge contribution of commercial reef line operators, skippers, and crew. The advice, and support is acknowledged from the members of the reef line working group, particularly Fishery Manager Chad Lunow. Thanks to the following DPI staff for support and report review Jason McGilvray, Olivia Whybird, Lauren Jubb, Michelle Winning, Peter Kind. The Fisheries Queensland, Fishery Monitoring team provided training, expertise and logistics for the survey.

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Background

The Line Fishery (Reef) is an important Queensland fishery, due to the export of high value live coral trout (*Plectropomus* spp) but also because of the domestic trade of other coral reef fish species including tropical snappers (family Lutjanidae), emperors (family Lethrinidae) and grouper species (family Serranidae). The fishery operates within the Great Barrier Reef Marine Park (GBRMP), which is a World Heritage Area. The fishery is subject to environmental and fisheries management arrangements such as a total allowable commercial catch (TACC), size limits, seasonal closures and designated 'no take' areas. These arrangements, as well as ensuring sustainability of the fishery and ongoing health of the marine park ecosystem, seek to manage the catch share between sectors.

The Line Fishery (Reef) is an approved export fishery under Part 13A of the *Environment Protection and Biodiversity Conservation Act 1999*. This approval is critical for the continuation of the fishery's export operations and is subject to meeting prescribed Wildlife Trade Operation (WTO) conditions (DCCEEW 2024).

Condition 6 of the current WTO approval required updated data on three key aspects:

- Discarding: The practice of returning unwanted or non-target fish to the sea, which can impact fish stocks and ecosystem health.
- Depredation: The partial or complete removal of hooked fish by predators (e.g. sharks or other marine species), which can affect catch rates and fishery efficiency.
- Catch composition: A comprehensive record of all species caught, including target, byproduct, and protected species, to better understand the fishery's impact on marine biodiversity.

On 27 November 2025, the Queensland Department of Primary Industries (QDPI) provided a report to Department of Climate Change, Energy, the Environment and Water (DCCEEW) detailing rollout of a collaborative industry-led data collection program to meet Condition 6. The report provided here documents results of the collaborative industry-led project, including interpretation of updated datasets and comparisons with previous datasets. The data from this project will inform future stock assessments and management decisions, ensuring the fishery continues to operate sustainably.

Condition 6 of the existing WTO identified the need to update data from previous on-board observer surveys conducted by the QDPI between March 2011 and January 2012. However, over the past 30 years, the line fishery and associated reef fish communities have been subject to ongoing monitoring through a range of fishery-dependent and fishery-independent data collection programs. These include QDPI datasets such as commercial logbook records, biological monitoring programs, and recreational boat ramp surveys, as well as other information sources, including structured line surveys and observer programs conducted between 1995 and 2004 and reported by Mapstone et al. (2004). Additional fishery-independent surveys have also been undertaken to develop and assess indices of reef fish community health (Emslie et al. 2020; Benthuysen et al. 2022).

Methods

Rationale

Data was collected by commercial fishers working collaboratively with QDPI fisheries scientists. Vessel owners were asked to volunteer to undertake surveys. The survey relied on self-reporting of catch by commercial fishers. In the case of multi-dory operations, reporting was done by crew at the direction of vessel owners and skippers. Fisheries scientists identified the data required and provided training and instructions to skippers and crew on how to accurately report catches.

Individual fishers reported catch composition including retained and released fish, depredation and fate of released fish. These surveys were conducted during normal fishing operations. Fisheries scientists reviewed the data collected by fishers for consistency in reporting and compliance with instructions. This approach provided a cost-effective method to collect data and engaged the fishing industry directly to provide updated estimates for some key metrics such as depredation that can be included in future assessments.

Fishery

The vessels contributing to the survey were split into two fleets based on targeting and catch history. Vessels included in the survey had been active in the fishery for more than three years. This was to ensure the vessel catch and operation were indicative of harvest and practices within the fishery. The two fleets were:

Coral trout targeting fleet - East coast commercial catch of coral trout in 2025 was 570 t. Coral trout represent the largest catch portion of the Line Fishery (Reef) harvest. Fishers in this fleet typically operated from small 5 m dories and a larger 20 m mothership with 7 to 10-day trips. The large number of vessels, the remote and dispersed nature of locations fished and vessel size constraints (i.e. sufficient deck space to host an observer) limit appropriate sampling coverage by this means.

Tropical snapper targeting fleet – This fleet harvests primarily saddletail snapper (*Lutjanus malabaricus*) and red emperor (*Lutjanus sebae*) in deeper water. In 2025, the catch was 86 t and 51 t respectively for these species. These species represent the largest catch components of the fishery after coral trout and redthroat emperor (*Lethrinus miniatus*). The fishers operate from a smaller main boat ~ 8 m with single day to four-day trips.

This split in fleets reflected the split in habitat preference of the target species, with common coral trout fished in waters around the shallow reefs to about 20 m (Bunt and Kingsford 2014) and the larger Lutjanid species fished in deeper water shoals from about 30 m to 80 m (Davis et al. 2025). Sampling across both fleets provided coverage of the major fishing sectors, target species, fishing practices, and habitats represented within the fishery, thereby ensuring that survey results are broadly representative of commercial fishing activity in the fishery.

Engagement with industry

The initial phase of the program began in August 2025 following a working group meeting with industry representatives. After the meeting, Fisheries Queensland staff recruited vessel owners to participate in the program. Data sheets were designed collaboratively with skippers and crew and were tested during initial fishing trips. Data sheets were based on templates previously used by fishery observers. These were printed on waterproof paper and included data fields to provide updated estimates of catch, discards and depredation.

The layout of the data sheets, instructions and messaging on how to collect data were initially trialled with two crews on different vessels targeting coral trout (Appendix A). Fishers were requested to record data during normal fishing operations where weather conditions allowed. Multiple fishers from each boat provided data for multiple fishing days. Skippers initially checked individual fishers were reporting data. Following these trips, feedback from crews was gathered and the data were reviewed. Changes were made to provide more useable data sheets and clearer messaging for crew members for wider rollout.

More boats and skippers were recruited to record data incorporating updated messaging was included with the rollout and in discussions with crew.

- More emphasis was placed on collecting information on commonly discarded species, particularly small rockcod species (Appendix B), which fishers may not consider as commercially valuable.
- While commercial fishers could understand a need to collect information on depredation. We made sure that fishers understood this was not the sole purpose of the survey.

The project initially focused on vessels targeting coral trout. Skippers targeting tropical snapper were recruited later.

Data collection

The crew-based surveys recorded all catch and interactions with marine species, including the fate of any fish released. The reason for release was also recorded, as either a fish was “undersize” (below minimum legal size) or “other”. The “other” category may include fish that were released because they were ‘no take’, as well as fish that could be considered non-target or byproduct species.

‘No take’ fish species fall into three categories based on status in legislation and rational for this status:

1. Māori wrasse (*Cheilinus undulatus*) and barramundi cod (*Cromileptes altivelis*) are ‘no take’ under GBRMP and Queensland fisheries legislation since 2003. They are considered iconic species associated with the GBRMP.
2. Red bass (*Lutjanus bohar*), paddletail (*Lutjanus gibbus)* and chinamanfish (*Symphorus nematophorus*), which are ‘no take’ due to the risk of ciguatera poisoning. These species were ‘no take’ prior to 2003 and remain so for all sectors within Queensland.
3. Species listed as threatened endangered and protected (TEP) under the *Environment Protection and Biodiversity Conservation Act 1999*. This includes marine mammals, turtles and some shark and fish species. Commercial fishers must report interactions with any of these species.

As part of data collection for this study, interactions with TEP species, ‘no take’ species, any non-target species (such as sharks) were reported by fishers. Data collected on depredation was reported by fishers. This provided estimates of depredation across the fishery.

Depredation was defined as the damage or removal of fish from line by predators. Fishers reported the number of fish lost to depredation. A depredation event was confirmed by the retrieval of depredated fish; visual confirmation of fish being depredated or loss of fish or gear during fishing consistent with depredation event. Fishers could nominate depredated species as “unknown”, if the species depredated was not known or otherwise fishers nominated the individual species taken. Staff confirmed with skippers and fishers, that depredation was being recorded in a consistent manner.

Comparison with historic data

Catch composition data from current crew-based surveys was compared with historical observer data collected through the QDPI on-board observer program from March 2011 to January 2012. Data was collected to provide total catch including retained and released fish species and fish fate. No depredation data was collected. Data was collected at the level of individual fishing dory, making it comparable to the current crew-based surveys.

Targeting, either coral trout or other species was used to define fishing operations. The historical data included 38 fishing days targeting coral trout and 10 fishing days targeting other species, which primarily included saddletail snapper and red emperor. Coral trout trips occurred across five regions from Lockhart Region to Swains Region, while other species trips were undertaken across four regions, from Carins Region to Mackay Region (Figure 1).

Observer data were filtered to coral trout-targeted trips and other species trips, the latter representing tropical snapper targeting trips. Composition was compared between the historical observer and current crew-based surveys using Bray–Curtis dissimilarity (Bray and Curtis 1957) based on proportional species abundance. Bray–Curtis dissimilarity quantifies differences in species composition between assemblages based on relative abundances. Values range from 0 (identical composition) to 1 (completely different composition). The metric is calculated from the summed absolute differences in species abundances between samples and is particularly sensitive to dominant taxa while ignoring shared absences.

To extend the comparison, historical structured line survey data for the coral trout targeting fleet were included in the analysis. The comprised QDPI structured line catch surveys conducted between 2005 - 2007 (Fisheries Queensland, 2012) and Effects of Line Fishing (ELF) surveys undertaken from 1995 to 2005 (Mapstone et al. 2004). The QDPI structured line surveys were based on methods developed for the ELF surveys, and both surveys sampled the same regions within the GBRMP. Only ELF surveys included data from reefs that were normally closed to fishing. For the present analysis, catches were aggregated across all survey years and regions to provide an overall representation of species composition for each dataset. Catch composition from the ELF surveys was reported as proportional catch (Simpfendorfer et al. 2008), whereas the QDPI observer and crew-based datasets were available as species counts. To ensure comparability among datasets, all data were standardised to proportional abundance within each survey prior to calculating Bray–Curtis dissimilarities.

RESULTS

Five vessels were included in the study with 19 individual fishers contributing data across 11 trips from Cooktown Region to Swains Region within the GBRMP (Figure 1). Data was collected from vessels targeting coral trout (*Plectropomus* spp and *Variola* spp) and those targeting saddletail snapper (*Lutjanus malabaricus*) and red emperor (*Lutjanus sebae*). Catch including retained and released fish from a total of 103 fishing days were reported. A total of 66 fish species or species groups were reported across all catches, with the majority caught by vessels targeting coral trout (Appendix C). Fishing days were weighted towards the vessels targeting coral trout, because often multiple fishers were reporting catch over multiple days (Table 2). Catch for fishers targeting coral trout was dominated by common coral trout (*Plectropomus leopardus*) which contributed 47.36% of the catch.

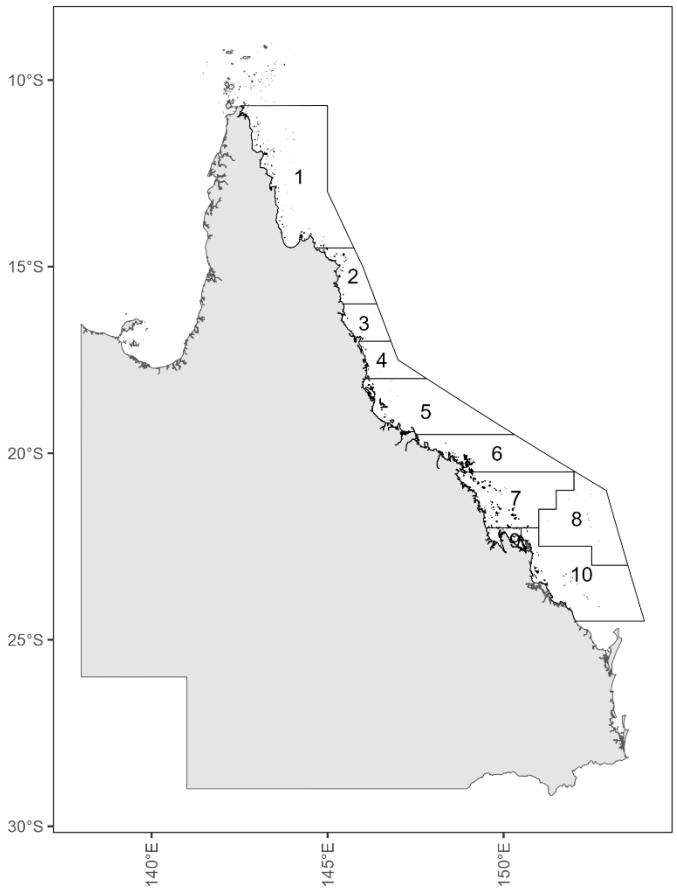


Figure 1 Sampling regions comprising the line fishery (Reef) -1 Lockhart, 2 Cooktown, 3 Cairns, 4 Mission Beach, 5 Lucinda, 6 Bowen, 7 Mackay, 8 Swains and 10 Rockhampton

Similarly, the tropical snapper fishery was dominated by two target species, saddletail snapper and red emperor. Catch of these two species made up 79% of the reported catch. Total species composition of the tropical snapper data was less diverse with only a small number of species were shared between the two fleets. Saddletail snapper catches were restricted to the tropical snapper fleet.

Table 2 Total fishing days reported for 2025-2026 crew-based surveys by region and fleet.

Fleet	Number of trips	Region	Fishing days
Coral trout	2	Cairns/Lucinda regions	17
Coral trout	1	Cooktown region	5
Coral trout	4	Mackay region	62
Coral trout	1	Mackay/Swains regions	6
Tropical snapper	3	Swains region	13
Total	11		103

Bray–Curtis dissimilarity between historical observer data and recent crew-based catch compositions for the coral trout targeting fleet was calculated as 0.226, indicating relatively limited change in species composition through time. Common coral trout remained the dominant species in both periods, comprising 53.3% of the historical catch and 47.4% of the recent catch. The largest contributors to differences were declines in redthroat emperor (12.6% to 4.9%) and common coral trout (53.3% to 47.4%), together with an increase in stripey snapper (4.8% to 10.8%).

In contrast, the tropical snapper-targeting fleet showed greater compositional turnover (Bray–Curtis = 0.441). Dissimilarity was driven primarily by an increase in saddletail snapper, whose proportional contribution increased from 23.4% in the historical period to 58.6% in the recent survey and accounted for approximately 40% of the total compositional difference. Declines in the catch of grass emperor (*Lethrinus laticaudis*) (15.8% to 0.2%) and spangled emperor (9.4% to <0.1%) were the next largest contributors. In contrast, red emperor remained relatively stable between periods (18.5% to 20.6%) and contributed little to the observed dissimilarity.

The analysis included the historical line survey datasets from QDPI (2005–2007) and the Effects of Line Fishing program (1995–2005) (Table 3). Bray–Curtis dissimilarities ranged from 0.124 to 0.294, indicating low to moderate variation in fish assemblage composition among the four survey datasets. Following standardisation to relative abundance, a consistent suite of species, with differences reflecting proportional changes in the contribution of individual species rather than species turnover. The greatest differences among datasets were associated with the relative abundance of dominant species, particularly common coral trout, redthroat emperor, stripey snapper, bluespotted rockcod and blackblotch emperor, with blacktip rockcod also contributing to differences, particularly between historical and contemporary survey periods.

Table 3 Bray-Curtis dissimilarity values among fish assemblages from historical line surveys, observer data. Datasets: CR = Crew-Based, ELF = Effects of Line Fishing (1995 – 2005), OB = QDPI Observer Data, RLS = QDPI Structured Line Survey (2005 – 2007). Values represent pairwise Bray-Curtis dissimilarities based on proportional species abundance.

Bay Curtis dissimilarity values

	CR	ELF	OB
CR			
ELF	0.244		
OB	0.226	0.124	
RLS	0.245	0.294	0.28

Vessels targeting coral trout in the crew-based survey released 52% of the fish they caught excluding fish that were depredated from the total catch to make it comparable with historic observer data that did not collect observations of depredation. Of the total catch 1.35% of released fish were dead. The primary reason fish were released was because they were below minimum legal size. All 'no take' species were released, no TEPS were caught. Fish in the 'other species' species group, which included a majority of byproduct and non-target species were released 82.5% of the time (Table 4). The majority of 'other species' released were small Epinephelinae (cod) and Lutjanid species, including bluespotted rockcod (*Cephelopholis cyanostigma*) 21%, stripey snapper 19.8% (*Lutjanus carponotatus*) and blacktip rockcod (*Epinephelus fasciatus*) 8.4%.

Vessels targeting coral trout in the 2011-12 observer surveys, released 35% of the fish they caught. Similarly, all protected and 'no take' species were released. However, these groups made up a smaller proportion of the released catch (Table 5), as did 'other species' making up 32.2% of the catch compared to 39.5% of the catch in the crew-based surveys.

Fishers released 21.2% of coral trout during the crew-based surveys, a release rate consistent with the 2011-12 observer surveys, which reported a release rate of 23.4% (Table 5). To determine whether fishers were systematically releasing coral trout to retain smaller, more marketable fish a practice known as "high grading", the proportion of common coral trout released for 'other' reasons was examined. 6.5% were released for 'other' reasons, with more than half of these releases occurring in just two catches (Table 6). This indicates that "high grading" was not a systematic practice. Redthroat emperor accounted for a smaller proportion of the total catch in the crew-based surveys (4.9%) compared to the 2011-12 observer survey (12%).

Vessels targeting tropical snapper in the crew-based survey released 10.2% of the fish they caught excluding fish that were depredated. Only a small proportion of fish caught in the tropical snapper fleet (1.7%) were released dead (Table 8). Fewer than 10% of individuals from the 'other species' group were released (Table 7). The proportion of fish released differed between target species, with a higher percentage of red emperor (32.2%) released compared with saddletail snapper (4.4%). All fish released alive were below the minimum legal size (Table 9). No red emperor were

reported dead at release, whereas 38% of released saddletail snapper were dead when released.

The proportion of red emperor and saddletail snapper released in this study was higher 32.2% and 4.4% than reported from the 2011-12 observer survey, which reported release rates of 26.7% and 2.2%, respectively. However, the overall pattern was consistent with previous observations, with red emperor exhibiting substantially higher release rates than saddletail snapper (Table 9).

Table 4 Summary of data collected from crew-based surveys 2025–2026 for vessels targeting coral trout over 90 fishing days. Total catch includes all fish retained, released, kept for bait and depredated. Released percentage was calculated as release / (total catch – depredation) x 100 to maintain consistency with previous observer survey.

Species group	Total catch	Harvest	Released	Kept for bait	Depredation number	Released percentage	Percentage of total catch
Barramundi cod	111	0	110	0	1	100	1.37
Coral trout	3890	2929	789	7	165	21.18	48.05
Mackerels and tuna	26	15	7	2	2	29.17	0.32
Māori wrasse	89	0	89	0	0	100	1.10
'No take' (red bass, chinamanfish, paddletail)	298	0	298	0	0	100	3.68
Other species	3194	301	2583	243	67	82.49	39.48
Redthroat emperor	398	261	114	5	18	30	4.92
Shark	84	0	84	0	0	100	1.04

Table 5 Summary of data collected from historic QDPI 2011-2012 observer surveys for vessels targeting coral trout over 38 fishing days. Depredation not reported in this survey.

Species group	Total catch	Harvest	Released	Kept for bait	Released percentage	Percentage of total catch
Barramundi cod	3	0	3	0	100	0.20
Coral trout	786	602	184	0	23.41	51.81
Mackerel and tuna	17	16	1	0	5.88	1.12
Māori wrasse	1	0	1	0	100	0.07
'No take' (red bass, chinamanfish, paddletail)	10	1	9	0	90	0.66
Other species	488	135	284	69	58.19	32.17
Redthoat emperor	182	164	18	0	9.89	12.00
Shark	30	0	30	0	100	1.98

Table 6 Reason for release and fate for coral trout fleet from crew-based surveys 2025–2026.

	Released alive		
Species group	**Released undersize**	**Released other**	**Released dead**
Barramundi cod	0	110	0
Coral trout	730	56	3
Mackerel and tuna	5	2	0
Māori wrasse	0	89	0
'No take' (red bass, chinamanfish, paddletail)	0	282	16
Other species	1546	956	81
Redthoat emperor	109	3	2
Shark	38	39	7

Table 7 Summary of data collected from crew-based surveys 2025–2026 for vessels targeting tropical snappers over 13 fishing days. Total catch includes all fish retained, released, kept for bait and depredated. Released percentage was calculated as release / (total catch – depredation) x 100 to maintain consistency with previous observer survey.

Species group	Total catch	Harvest	Released	Kept for bait	Depredation number	Released percentage	Percentage of total catch
Coral trout	1	1	0	0	0	0	0.07
Other species	236	214	16	6	0	6.78	17.85
Red emperor	284	183	87	0	14	32.2	21.24
Redthroat emperor	15	15	0	0	0	0	1.12
Saddletail snapper	780	733	34	0	13	4.43	58.34
Shark	21	19	0	0	2	0	1.57

Table 8 Summary of data collected from historic QDPI 2011–2012 observer surveys for vessels targeting tropical snapper over 10 fishing days. Depredation was not reported in this survey.

Species group	Total catch	harvest	released	Kept for bait	Released percentage	Percentage of total catch
Coral trout	10	10	0	0	0	2.40
Mackerel and tuna	3	3	0	0	0	0.72
Other species	217	197	9	11	4.36	52.04
Red emperor	75	55	20	0	26.67	18.00
Redthoat emperor	8	8	0	0	0	1.92
Saddletail snapper	95	93	2	0	2.10	22.78
Shark	9	5	4	0	44.44	2.16

Table 9 Reason for release and fate crew-based surveys 2025–2026.

	Released Alive		
Species group	Released undersize	Released other	Released dead
Coral trout	0	0	0
Other species	6	0	10
Red emperor	87	0	0
Redthroat emperor	0	0	0
Saddletail snapper	21	0	13
Shark	0	0	0

Depredation occurred in both fleets with the majority of depredation reported for target species (Table 4, Table 7). Depredation was reported during 52.2% of the days for fishers targeting coral trout. Gross depredation rate (the total number of coral trout lost to depredation relative to total catch) was 4.3%. During depredation events individual fishers lost on average 10% of their daily catch of coral trout. However, this rate was highly variable across the fleet with a standard deviation of 10.7%. The gross rates of depredation were lower in the tropical snapper fleet (2.1%) with fewer days (30%) impacted by depredation. Depredation was not attributed to the two target species in the tropical snapper fleet as in the coral trout fleet, due to the low sample size and difficulty in confirming fish identity. However, only one other species group (shark) suffered depredation. An average of 12.6% of the catch was taken in a depredation event. However, the standard deviation of 10.9% indicated a high level of variation in the amount of catch lost to depredation across the four fishing days it was reported.

Interactions with Māori wrasse and barramundi cod only occurred in the coral trout fleet. The current survey found these species accounted for 2.5% of the total catch, which was an increase compared to the historic observer survey where they were 0.28% of the total catch. The interaction rate was 50%, meaning either species was caught 45 fishing days out of the 90 sampled. The table below provides the mean number of Māori wrasse and barramundi cod caught per catch event (Table 10). No TEP species were reported in catches. One barramundi cod was reported as being depredated whilst all others were released alive. The number of protected species caught by fishers was inconsistent, with catches clustered among certain days or fishers, this resulted in high standard deviation, relative to the mean number of fish caught.

Table 10 Mean number of Māori wrasse and barramundi cod and caught from the coral trout targeting fleet and standard error per fishing day during the 2025-26 survey. Note: 0 caught by the tropical snapper targeting fleet.

Protected species	Mean number caught	Standard deviation	Catch events
Barramundi cod	3	2.19	37
Māori wrasse	3.71	3.48	24

Discussion

The crew-based survey design developed in collaboration with industry was a cost-effective method to provide updated data on non-retained catch in the reef line fishery to meet WTO export approval Condition 6. Similar collaborative monitoring approaches have been shown to strengthen fisheries management by improving data collection, increasing transparency, and fostering cooperation between resource users and management agencies (Boenish et al. 2020, Lago et al. 2023, Mendo et al. 2022). The survey provided key metrics such as depredation rates that could be used in stock assessments, as well as to meet the needs of the current DCCEEW assessment. The involvement of experienced fishers, many of whom had previous experience with structured line fishing surveys for fisheries monitoring, helped considerably with data collection. This highlights the value of cooperative projects in building capacity within the fishery for ongoing monitoring and reporting.

A potential limitation of this study was recall bias associated with self-reported catch data collected during routine fishing operations, where conditions may have made immediate recording difficult. Consequently, some records may be subject to inaccuracies arising from imperfect recollection of fishing activities (McCormick et al. 2013). To limit this issue, fishers were asked to report catch during fishing operations or immediately after a fishing session. Crew members noted that any recall bias would be most relevant for commonly released or highly abundant species, rather than for rare catches, which are typically more memorable and therefore less likely to be misreported. Given that the catch was dominated by target species that were retained, any effects of recall bias are likely to have influenced estimates of more commonly released species rather than rare or harvested species.

Data showed relatively similar species composition between 2011–12 observer surveys and crew-based surveys for the fishers targeting coral trout, with the tropical snapper fishers exhibiting greater differences. In both fleets, differences were primarily associated with changes in the relative abundance of dominant species rather than the appearance or disappearance of species, indicating temporal shifts in species dominance rather than changes in species composition.

Catch assemblages in the coral trout fishery were relatively consistent between the crew-based surveys and the 2011–12 observer surveys. The similarity between these independent datasets indicates that the primary target and bycatch species have remained stable despite the difference in the sampling approach. Five fish species including target species (common coral trout, redthroat emperor, stripey snapper) and bycatch species (bluespotted rockcod, blacktip rockcod) were consistently reflected across both surveys. The close agreement between datasets provides confidence that contemporary crew-based monitoring produces catch composition estimates comparable with those obtained from 2011–12 observer surveys.

The inclusion of historical structured line survey datasets extended this comparison over a longer timeframe, demonstrating that the same suite of dominant species has characterised coral trout fishery catches over approximately two decades (Simpfendorfer et al. 2008). Bray–Curtis comparisons incorporating the structured line

surveys indicated low to moderate dissimilarity among datasets, with observed differences primarily reflecting changes in the relative abundance of shared species rather than shifts in species composition. This suggests continuity in the overall catch structure of the fishery through time.

The hook and line gear used, and fishing operations have remained consistent. Fishing gear, including single 8/0 or 9/0 J hooks and hand lines, continue to be the dominant method used across the commercial fishery. Fishers targeting coral trout continue to operate from small open boats fishing across shallow reef habitats where consistent gear, habitat availability and target species behaviour are likely to contribute to stable catch composition over time.

There was an increase in number of barramundi cod and Māori wrasse caught and released by fishers in this survey compared to previous observer surveys and historic research line surveys. However, interactions with these species were variable across days and fishers when targeting coral trout. All fish were released, only one barramundi cod was depredated, and all others were released alive. Both species have been protected within the GBRMP since 2003. It would be expected that the population would increase following protection, leading to a higher chance of encounters in the fishery. Estimates for the relative abundance of Māori wrasse across some reef habitats are thought to be as high as 6 fish per hectare in the Maldives where they have been protected (Roe et al. 2022).

Release rates were high for certain species groups, reflecting the diverse nature of the coral trout fishery and the impact of management measures, such as conservative size limits for non-target species such as small rockcod. Discard rates for common coral trout were consistent with 2011-12 observer surveys, indicating stable discarding practices for common coral trout. Notably, there was no evidence of high grading (the release of fish above the minimum legal size), which could have otherwise increased discard rates (Welch et al. 2008). The higher discard rates for redthroat emperor observed in this survey likely reflect a shift in targeting behaviour, as commercial catches of this species have declined since 2003 (Lunow and Fisher 2024). Redthroat emperor now appears to be caught more opportunistically as a byproduct when targeting coral trout, which are more valuable.

The primary reason fish were discarded was that they were below the minimum legal size limit. For smaller rockcod species (*Cephelopholis* spp and *Epinephelus* spp) current size limits are set above the maximum size reached by most individuals in the population (Mapleston et al. 2009). Consequently, discard rates for these species are likely to remain relatively high compared with other larger species where minimum legal size are more closely aligns with size at maturity.

Although post-release survival has not been quantified for all reef fish species, data are available for several key reef fish targets and indicate substantial variation in short-term survival rates, ranging from 98.4% for red emperor to 50% for saddletail snapper (Brown et al. 2008). These estimates are consistent with the limited release-condition data collected in this study from the tropical snapper fleet. These findings suggest substantial differences in release condition between red emperor and saddletail snapper, which are likely to influence post-release survival. This highlights the

importance of incorporating species-specific post-release mortality estimates into stock assessments and fisheries management.

Several characteristics of the commercial fishery are likely to reduce post-release mortality. Post-release survival of reef fish is influenced by key factors including hooking location, fishing depth, and release condition (Brown et al. 2008; Diggles and Ernst 1997). Although these variables were not directly measured in this survey, available information suggests that several aspects of fishing practice may minimise mortality risk. Deep-hooking rates in the fishery are relatively low, with only 3.9% of reef fish captured using hook-and-line gear reported as deeply hooked (Mapleston et al. 2008). Fishers targeting live coral trout also tended to fish in shallower waters (<20 m) to reduce the risk of depredation. Fishing at these depths is expected to decrease the risk of barotrauma and associated mortality in released fish (Hyman et al. 2026). Fishers targeting tropical snappers in this study also used large circle hooks to target larger individuals and minimise bycatch. Increasing circle hook size has been shown to effectively reduce the capture of smaller snapper (Lutjanidae), improving selectivity towards larger size classes (Ralston et al. 1990). Collectively, these factors are likely to reduce discard mortality in the fishery.

Depredation rates for common coral trout observed in this study were lower than the 5% rate reported for *Plectropomus* spp in the recreational fishery of north-western Western Australia (Mitchell et al. 2018). Considerable variation in depredation rates was observed among fishers and across fishing days in the present study. Similar variability among fishers has been reported previously, with individual fisher behaviour, experience, and fishing practices contributing to differences in depredation rates (Mitchell et al. 2018). Fishers in the coral trout fishery were able to confidently identify fish that were depredated, a finding that was repeatedly confirmed to fisheries scientists during reviews of data. Accurate species identification was facilitated by the shallow, clear-water fishing environment and the common use of view buckets (bathyscopes), which enabled fishers to visually target coral trout prior to capture. Fishers identified species depredated in the tropical snapper fleet but depredation rate was not calculated for individual species given the limited data.

Fishers were willing to share their experience with depredation targeting coral trout and there was consensus on some topics. Fishers indicated that depredation rates were lower in shallower water. This often limited the extent of the coral trout fishery to water less than 20 m deep. While bull sharks (*Carcharhinus leucas*) were primarily responsible for depredation, fishers also noted other reef shark species and large trevally species (*Carangidae* spp) were also responsible for depredation.

Like the coral trout fishery, the depredation rates for the deepwater fishery varied by fisher and fishing day albeit with fewer fishing days and depredation events to provide data. Depredation rates for these deepwater species were low when compared with anecdotal accounts. However reported rates from crew-based surveys were lower than anecdotal reports. Rates of depredation of 7.25% have been reported from observations on board charter fishing vessels targeting demersal coral reef species (Vardon 2025). The overall depredation rate for this fishery was lower than the rates for fishers targeting coral trout. Commercial fishers targeting tropical snapper had each

adopted gear (electric reels and rigs) to limit the impacts of depredation. Such as loss of gear and fish. Fishers will often adopt measures to reduce shark depredation as there is an economic incentive to do so (Mitchell et al. 2018). Commercial fishers have a stronger economic incentive to invest in fishing gear and practices that reduce depredation than recreational fishers. For this reason, depredation could be very different between the two sectors.

In conclusion, the crew-based survey has proven to be a cost-effective and collaborative approach for gathering valuable data on the reef line fishery. The findings highlight the stability of catch composition over decades, which is an indication that interactions with protected species (not TEP species) are increasing, while fishers experience consistent discard rates for key target species. Discard rates for other species in the coral trout fishery are likely driven by market preferences and conservative management arrangements such as large minimum legal size for small rockcod species. Variability in depredation rates and fisher behaviour underscores the importance of understanding operational practices (gear and targeting) to inform management strategies. The survey also emphasises the critical role of industry engagement in enhancing data collection and fostering ongoing collaboration. These insights provide a strong foundation for future stock assessments and ongoing monitoring and management of the fishery.

Reference

DCCEEW (2024), Assessment of the Queensland Line Fishery (Reef) January 2024, Commonwealth of Australia, Canberra.

Benthuysen, JA, Emslie, MJ, Currey-Randall, LM, Cheal, AJ and Heupel, MR (2022) Oceanographic influences on reef fish assemblages along the Great Barrier Reef, *Progress in Oceanography*, *208*:102901.

Boenish, R, Willard, D, Kritzer, JP and Reardon, K (2020) Fisheries monitoring: Perspectives from the United States. *Aquaculture and Fisheries*, 5:131-138.

Bray, JR and Curtis, JT (1957) An ordination of the upland forest communities of southern Wisconsin. *Ecological monographs*, *27*(4), 326-349.

Brown, IW, Sumpton, WD, McLennan, M, Welch, DJ, Kirkwood, J, Butcher, A, Mapleston, A, Mayer, D, Begg, G, Campbell, M, Halliday, I and Sawynok, W (2008) National strategy for the survival of released line-caught fish: tropical reef species (FRDC 2003/019), Department of Primary Industries and Fisheries, Queensland and the Reef and Rainforest Research Centre Limited.

Bunt, C and Kingsford, M (2014) Movement, habitat utilization, and behaviour of coral trout, *Plectropomus leopardus* during and after the reproductive period on the southern Great Barrier Reef. *Marine Ecology Progress Series,* 496:33-45.

Davis, AM, Sheaves, M and Venkataraman, A (2025) The evolution of broad seascape utility and ontogenetic life history variation in lutjanids. *Scientific reports,***15**, 21766.

Diggles, BK and Ernst, I (1997) Hooking mortality of two species of shallow-water reef fish caught by recreational angling methods. *Marine and Freshwater Research*, *48*(6): 479-483.

Emslie, MJ, Bray, P, Cheal, AJ, Johns, KA and Osborne, K (2020) Decades of monitoring have informed the stewardship and ecological understanding of Australia's Great Barrier Reef. *Biological Conservation*, 252*:*108854.

Fisheries Queensland (2012). Fisheries Long Term Monitoring Program Sampling Protocol – Coral Reef Fish (2008-2009) Section 1. Department of Agriculture, Fisheries and Forestry, Brisbane, Australia.

Hyman, AC, Cortes, J, Wilms, S, Eguia, L and Frazer, TK (2026) Depth and sea surface temperature drive post-release condition of reef-associated fishes, *Fisheries Research*, 296:107700.

Lago, P, Cortes, V, Tobella, C, Solino, L, Fargas, M, Garcia, D, Josa, P, Mulet, T, Orts, A, Tarzia, M, Yates, O and Arcos, JM (2023) Self-reporting logbooks to collect seabird bycatch: case study in the western Mediterranean Sea. *Eleventh Meeting of the Seabird Bycatch Working Group*, Edinburgh, United Kingdom, 15-17 May.

Lunow, C and Fisher, E (2024) Redthroat Emperor (2023) https://wwwfishgovau/report/364-Redthroat-Emperor-2023 In: Roelofs, A, Piddocke, T, Ashby, C, Conron, S, Hartmann, K, Hesp, A, Hone, P, Jacobsen, P, Jesson-Kerr, M, Mayfield, S, Stewart, J, Usher, M Woodhams, J and Wright, D (eds) (2024), *Status of Australian Fish Stocks Reports 2024*, Fisheries Research and Development Corporation, Canberra.

Mendo, T, Mendo, J, Ransijn, JM, Gomez, I, Gil-Kodaka, P, Fernandez, J, Delgado, R, Travezano, A, Arroyo, R, Loza, K, McCamm, P, Crowe, S, Jones, EL and Jones, MA (2022) Assessing discards in an illegal small-scale fishery using fisher-led reporting *Rev Fish Biol Fisheries* 32, 963–974.

Mapleston, A, Welch, D Begg GA, McLennan, M, David, M and Brown, I (2008) Effects of changes in hook pattern and size on catch rate, hooking location, injury and bleeding for a number of tropical reef fish species Fisheries Research, 91: 203-211.

Mapleston, A, Currey, LM, Williams, AJ, Pears, R, Simpfendorfer, CA, Penny, AL, Tobin, A and Welch, D (2009) Comparative biology of key inter-reefal serranid species on the Great Barrier Reef Project Milestone Report to the Marine and Tropical Sciences. Research Facility Reef and Rainforest Research Centre Limited, Cairns (55pp).

Mapstone, BD, Davies, CR, Little, LR, Punt, AE, Smith, ADM, Pantus, F, Lou, DC, Williams, AJ, Jones, A, Ayling, AM, Russ, GR and MacDonald, AD (2004) The effects of line fishing on the Great Barrier Reef and evaluations of alternative potential management strategies. *CRC Reef Research Centre Technical* No 52 CRC Reef Research Centre, Townsville, Australia.

McCormick, JL, Quist, MC and Schill, DJ (2013) Self-reporting bias in Chinook Salmon sport fisheries in Idaho: implications for roving creel surveys. *North American Journal of Fisheries Management*, *33*(4):723-731.

Mitchell, JD, Mclean, DL, Collin, SP and Langlois, TJ (2018) Shark depredation in commercial and recreational fisheries. *Reviews in Fish Biology and Fisheries*, 28:715-748.

Ralston, S (1990) Size Selection of Snappers (*Lutjanidae*) by Hook and Line Gear. *Canadian Journal of Fisheries and Aquatic Sciences*. 47(4): 696-700.

Roe, P, Hashim, AS, Evans, V and Sadovy de Mitcheson, Y (2022) Status of Napoleon wrasse in Laamu Atoll Maldives, after three decades of protection. *Endangered Species Research*, Vol 49:135-144.

Simpfendorfer, C, Ballagh, A, Williams, A, and Currey, L (2008) Harvest patterns of the "Other Species" quota group in the Coral Reef Fin Fish Fishery. James Cook University Fishing and Fisheries Team, Reef and Rainforest Research Centre.

Vardon, J (2025) Understanding and mitigating depredation in Queensland rod and reel line fisheries. University of the Sunshine Coast Thesis.

Welch, DJ, Mapstone, BD and Begg, GA (2008) Spatial and temporal variation and effects of changes in management in discard rates from the commercial reef line fishery of the Great Barrier Reef, Australia, *Fisheries Research*, Volume 90, Issues 1–3, Pages 247-260.

Appendix A – Sampling Manual

Background

The Line Fishery (Reef) has a Wildlife Trade Operation (WTO) export approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This approval is valid from 17 January 2024 to 18 January 2027.

The EPBC allows the Australian Government to assess the environmental performance of fisheries and promote ecologically sustainable management. WTO export approval is critical to maintaining the economic value of the reef line fishery as it allows the export of live coral trout and other products from the fishery. Below is a link to all the commonwealth assessments for fisheries in Queensland (https://wwwdcceewgovau/environment/marine/fisheries/qld).

As part of the 2024 WTO approval, a new condition was added for DAF to implement measures to update existing information on non-retained catch (bycatch and discards) by 30 November 2025.

> Condition 6
>
> By 30 November 2025, the Queensland Department of Agriculture and Fisheries [now QDPI] must implement measures to update existing information on non-retained catch in the Queensland Line Fishery (Reef).
>
> This includes information on discarded catch, as well as depredation and any interactions with species protected under the *Environment Protection and Biodiversity Conservation Act 1999.*
>
> This information must be representative of all commercial sectors of the fishery and sufficient to inform ongoing stock assessments. If the new information suggests there has been a significant change in non-retained catch composition or quantity since 2011-12, this new information must be used to review assumptions made in ecological risk assessments, the harvest strategy and other management arrangements as necessary.

Project Description

Industry led field work will deliver this short-term project gathering data to address Condition 6 of the current WTO approval.

QDPI staff working with industry will develop methods for the collection of data. QDPI staff will provide technical assistance in the structure and needs for data. In consultation with industry QDPI staff will then be responsible for entering data into electronic format for use by Fisheries Queensland.

A DCCEEW report outlining commencement of a program to update this data is required prior to November 2025 with work continuing to gather data to meet the requirements into 2026.

Sampling Equipment

Gear needed to collect the data includes:

- QLD Fishing 20 App - To identify unknown fish species
- Waterproof paper - Printed data fields (Attachment 2)
- Pencil - 2B to record data on waterproof paper
- Plastic folder - Include data sheet on both sides
- Rubber bands - To hold data sheet down

Data Collection

Catch Sheet

Catch sheets report the catch, release and fate of fish while fishing. There are two versions, the second of which was adopted by industry as it is easier to fill out. The catch sheet also describes discards and depredation. Data for released fish is collected as a tally while fishing. Number of fish kept is recorded at the end of the fishing session. Data is collected for each species. Add additional species in the blank lines provided if they are not listed.

Field	Description
Date	Date fishing session commences
Boat Mark	Example "FVXXX" to link dory to main boat trip
Dory Number	The tender number – as registered in licencing
Fisher	Just need fisher initials to be able to identify catches from different fishers
Location – Grid and Reef Name	Grid reference "L20' and site "23" and reef name
Time	Fishing session = Morning or Afternoon or All Day
Depth	Water depth – shallow (less than 20m) Deep (greater than 20m)
Target species	Species you are trying to catch for example 'coral trout' or 'saddletail snapper'
Depredation 'Unknown Species'	Instance where fish was taken but the species of fish could not be determined as it was not seen or landed. The data sheet provides a field to tally depredation events, a total for the session and a field to report comments
Species	Record data for individual species Add species that are not included to the blank lines provided Use species names are taken form QLD Fishing 20 App which used the Fisheries Regulations 2019 for consistency across all data collected
Depredation	Use this field where the species of fish being depredated can be identified (i.e. where fish is seen and identified before being eaten or part of fish is landed)
Released alive	Tally fish that are released alive Identify: **Undersize** Fish below minimum legal size **Other** Fish is for some other reason the fish is released alive
Released dead	Tally fish that are released dead (this does not include fish that have been depredated and are released)
Kept bait	Tally for fish that are kept for bait
Total harvest	Count total fish **Harvested** not including those **Kept** for Bait

Attachment 1. Trial catch sheet provided to fishers for collection of discards, depredation and retained catch

DPI WTO - Condition 6 Sampling - Call: [redacted]		Date			Fishing location: Grid			Reef name:			
Boat mark					Time (circle)	Morning	Afternoon		All day		
Dory Number		Depth (circle)	shallow = less 20m	Deep = greater 20m	Fisher			Target Species			
Depredation	Tally				Comments						
Unknown Species											

	Species	Depredation	Released alive		Released dead	Kept bait	Total harvest		Species	Depredation	Released Alive		Released dead	Kept bait	Total harvest
			Undersize	Other							Undersize	Other			
Trout	Common CT							Tuskfish	Venus						
	Bluespot								Blackspot						
	Barcheek								Blue						
Emperor	Redthroat							Emperor	Longnose						
	Spangled								Ornate						
	Grass								Varigated						
	Pinkear/Redspot								Iodine bream						
	Yellowtail														
	Thumbprint														
Tropical snapper	Stripey							Tropical snapper	Moses						
	Red emperor								Maori						
	Brown hussar								Yellow hussar						
	Darktail								Largemouth						
	Green jobfish														
Cod / Rockcod	Bommie (Bluespotted)							Cod / Rockcod	Peacock						
	Footballer (blacktip)								Highfin						
	Speckledfin								Blue maori						
	Wire netting								Camouflage						
	Flowery														
	Whitelined														
Shark	Grey reef							Other	Fusiliers						
	Whitetip reef								Paddletail						
	Blacktip reef														
Other	Trevally														
	Barramundi cod														
	Red bass														
	Chinaman														
	Moari wrasse														

Attachment 2 Revised data sheet after consultation with industry

DPI WTO - Condition 6 Sampling - Call: [redacted]		Date:			Boat Mark:			
Fishing Location Grid:		Reef Name:			Target Species:			
Dory Number:		Fisher:						
Session (circle)	Morning Afternoon All day			Fishing Depth (circle)	Less 25 m | Greater 25m			
Comment								
Species	Depredation	Released Alive		Released Dead	Kept as Bait	Total Harvest	Total Released	Total
		Undersize	Other					
Unknown								
Common CT								
RTE								
Stripey								
Bommie (Bluespot cod)								
Red Emperor								
Trevally								
Venus Tusk								
Red Bass								
Chinaman								
Wirenetting Cod								
Spangled Emp								
Spanish Mac								
Sal Mac								
Footballer (Blckatip cod)								
Maori Wrasse								
Hussar pink								
Grass Emperor								
Specklefin Cod								
Barramundi Cod								
Yellowtail Emperor								

Appendix B – Commonly discarded species

Cod / rockcod (*circles indicate distinguishing features)



Bommie Cod/ Blue – spotted rockcod



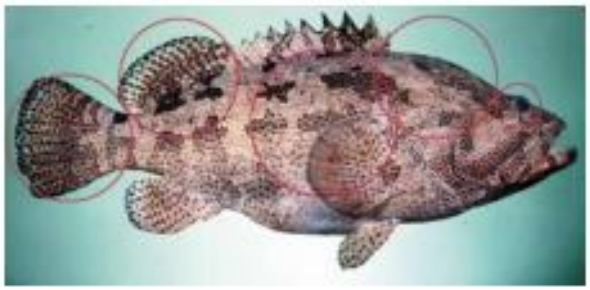
Footballer rockcod / Blacktip rockcod



Speckled – fin rockcod



Wire netting cod/ Longfin rockcod



Flowery Cod



White – lined rockcod



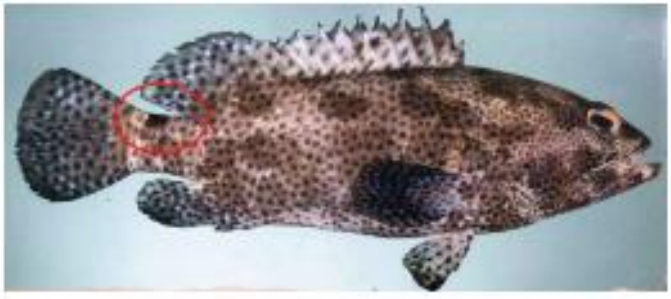
Peacock rockcod



Highfin Grouper/Trout cod

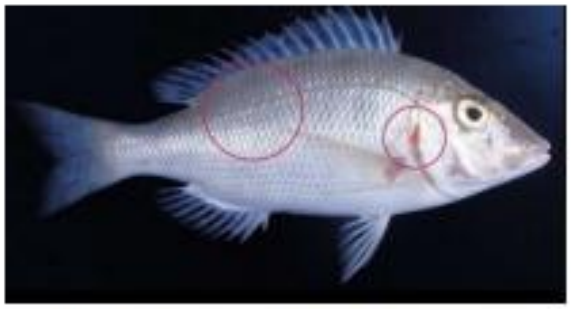


Blue maori / Purple rockcod



Camouflage grouper

Emperors/ Tropical Snapper (*circles indicate distinguishing features)



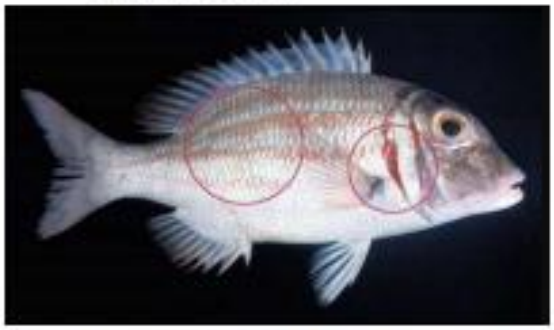
Red Spot emperor / Pink ear emperor



Yellowtail emperor



Variegated emperor



Ornate emperor/ Yellow striped emperor



Thumbprint emperor



Dark-tail snapper



Brown hussar



Pink hussar



Moses perch



Blackspot snapper

Appendix C– Species composition reported

Table C1 Species composition of the catch reported during the 2025-2026 crew-based surveys by the coral trout fleet. *Catch Numbers for crew-based survey included (Total catch – Depredation) to maintain consistency with previous observer survey. 'Unknown' fish species removed

		2025–26 Crew Survey		2011–12 Observer Survey	
Common Name	**Scientific Name**	**Catch Numbers**	**% Catch**	**Catch Numbers**	**% Catch**
Common Coral Trout	*Plectropomus leopardus*	3708	47.36	771	53.32
Stripey Snapper	*Lutjanus carponotatus*	845	10.79	70	4.84
Bluespotted Rockcod	*Cephalopholis cyanostigma*	585	7.47	74	5.12
Redthroat Emperor	*Lethrinus miniatus*	380	4.85	182	12.59
Blacktip Rockcod	*Epinephelus fasciatus*	216	2.76	22	1.52
Trevally	Carangidae spp.	204	2.61	18	1.24
Red Bass	*Lutjanus bohar*	199	2.54	8	0.55
Red Emperor	*Lutjanus sebae*	160	2.04	16	1.11
Hussar	*Lutjanus adetii / Lutjanus vitta*	140	1.79	21	1.45
Wirenetting Cod	*Epinephelus quoyanus*	135	1.72	6	0.41
Barramundi Cod	*Cromileptes altivelis*	110	1.40	3	0.21
Grass Emperor	*Lethrinus laticaudis*	107	1.37	15	1.04
Specklefin Grouper	*Epinephelus ongus*	93	1.19	19	1.31
Maori Wrasse	*Cheilinus undulatus*	89	1.14	1	0.07
Small Rockcod	Mixed small serranids	89	1.14	7	0.48
Spangled Emperor	*Lethrinus nebulosus*	89	1.14	31	2.14
Chinaman	*Symphorus nematophorus*	88	1.12	4	0.28
Shark	Various shark species	84	1.07	30	2.07
Fusilier	Caesionidae spp.	61	0.78	0	0.00
Venus Tuskfish	*Choerodon venustus*	56	0.72	33	2.28
Whitelined Rockcod	*Anyperodon leucogrammicus*	35	0.45	0	0.00
Flowery Grouper	*Epinephelus fuscoguttatus*	34	0.43	0	0.00
Yellowtail Emperor	*Lethrinus atkinsoni*	30	0.38	24	1.66
Moses Snapper	*Lutjanus russellii*	27	0.34	3	0.21
Longnose Emperor	*Lethrinus olivaceus*	26	0.33	2	0.14
Shark Mackerel	*Grammatorcynus bicarinatus*	23	0.29	5	0.35
Ornate Emperor	*Lethrinus ornatus*	22	0.28	0	0.00
Barcheek Coral Trout	*Plectropomus maculatus*	20	0.26	7	0.48
Redspot Emperor	*Lethrinus lentjan*	20	0.26	1	0.07
Collar Seabream	*Gymnocranius euanus*	18	0.23	2	0.14
Camouflage Grouper	*Epinephelus polyphekadion*	17	0.22	15	1.04
Bluespotted Coral Trout	*Plectropomus laevis*	16	0.20	3	0.21
Peacock Rockcod	*Cephalopholis argus*	16	0.20	1	0.07
Blue Maori Cod	*Epinephelus cyanopodus*	15	0.19	2	0.14
Blackblotch Emperor	*Lethrinus harak*	12	0.15	7	0.48
Paddletail	*Lutjanus gibbus*	11	0.14	2	0.14
Blackspot Tuskfish	*Choerodon schoenleinii*	8	0.10	0	0.00
Darktail Snapper	*Lutjanus lemniscatus*	8	0.10	0	0.00
Green Jobfish	*Aprion virescens*	8	0.10	3	0.21
Painted Sweetlips	*Diagramma pictum*	5	0.06	2	0.14
Cobia	*Rachycentron canadum*	4	0.05	0	0.00
Passionfruit Coral Trout	*Plectropomus areolatus*	4	0.05	1	0.07
Maori Seaperch	*Lutjanus rivulatus*	2	0.03	1	0.07
Tomato Rockcod	*Cephalopholis sonnerati*	2	0.03	1	0.07
Tuskfish	*Choerodon* spp.	2	0.03	1	0.07
Variegated Emperor	*Lethrinus variegatus*	2	0.03	3	0.21
Coronation Trout	*Variola louti*	1	0.01	4	0.28
Greasy Rockcod	*Epinephelus tauvina*	1	0.01	0	0.00
Redmouth Rockcod	*Aethaloperca rogaa*	1	0.01	0	0.00
Robinson's Seabream	*Gymnocranius grandoculis*	1	0.01	1	0.07
Spanish Mackerel	*Scomberomorus commerson*	1	0.01	12	0.83
Brownbarred Rockcod	*Cephelopholis boenak*	0	0.00	4	0.28
Coral Rockcod	*Cephalopholis miniata*	0	0.00	2	0.14
Emperors	Lethrinidae spp.	0	0.00	1	0.07
Remora	Echeneidae spp.	0	0.00	1	0.07
Sixband Rockcod	*Epinephelus sexfasciatus*	0	0.00	1	0.07
Triggerfish	Balistidae spp.	0	0.00	2	0.14
Trout Cod	*Epinephelus maculatus*	0	0.00	1	0.07

Table C2 Species composition of the catch reported during the 2025-2026 crew-based surveys by the tropical snapper fleet. *Catch Numbers for crew-based survey included (Total Catch – Depredation) to maintain consistency with previous observer survey.

		2025–26 Crew Survey		2011–12 Observer Survey	
Common Name	**Scientific Name**	**Catch Numbers**	**% Catch**	**Catch Numbers**	**% Catch**
Saddletail Snapper	*Lutjanus malabaricus*	755	58.64	95.00	23.34
Red Emperor	*Lutjanus sebae*	267	20.64	75.00	18.43
Goldband Snapper	*Pristipomoides multidens*	121	9.36	27.00	6.63
Yellowspotted Rockcod	*Epinephelus areolatus*	27	2.09	3.00	0.74
Blacktip Reef Shark	*Carcharhinus melanopterus*	19	1.47	8.00	1.97
Redthroat Emperor	*Lethrinus miniatus*	15	1.16	8.00	1.97
Hussar	*Lutjanus adetii / Lutjanus vitta*	14	1.08	6.00	1.47
Trevally	Carangidae spp.	14	1.08	6.00	1.47
Goldspotted Rockcod	*Epinephelus coioides*	13	1.01	24.00	5.90
Snapper	Lutjanidae spp.	11	0.85	0.00	0.00
Barred Grunter	*Pomadasys kaakan*	10	0.77	0.00	0.00
Venus Tuskfish	*Choerodon venustus*	5	0.39	1.00	0.25
Catfish	Ariidae spp.	4	0.31	0.00	0.00
Frying Pan Snapper	*Argyrops bleekeri*	3	0.23	0.00	0.00
Grass Emperor	*Lethrinus laticaudis*	3	0.23	64.00	15.72
Brown Maori Rockcod	*Epinephelus undulatostriatus*	3	0.23	0.00	0.00
Black Jewfish	*Protonibea diacanthus*	2	0.15	0.00	0.00
Crimson Snapper	*Lutjanus erythropterus*	2	0.15	0.00	0.00
Barcheek Coral Trout	*Plectropomus maculatus*	1	0.08	5.00	1.23
Cobia	*Rachycentron canadum*	1	0.08	5.00	1.23
Common Coral Trout	*Plectropomus leopardus*	1	0.08	5.00	1.23
Spangled Emperor	*Lethrinus nebulosus*	1	0.08	38.00	9.34
Sweetlips	Haemulidae spp.	1	0.08	4.00	0.98
Chinamanfish	*Symphorus nematophorus*	0	0.00	6.00	1.47
Greasy Rockcod	*Epinephelus tauvina*	0	0.00	1.00	0.25
Great Barracuda	*Sphyraena barracuda*	0	0.00	1.00	0.25
Green Jobfish	*Aprion virescens*	0	0.00	1.00	0.25
Guitarfishes & Wedgefishes	Rhinobatidae & Rhinidae	0	0.00	1.00	0.25
Longnose Emperor	*Lethrinus olivaceus*	0	0.00	1.00	0.25
Mangrove Jack	*Lutjanus argentimaculatus*	0	0.00	1.00	0.25
Milk Shark	*Rhizoprionodon acutus*	0	0.00	1.00	0.25
Moses' Snapper	*Lutjanus russellii*	0	0.00	6.00	1.47
Sandbar Shark	*Carcharhinus plumbeus*	0	0.00	1.00	0.25
School Mackerel	*Scomberomorus queenslandicus*	0	0.00	1.00	0.25
Spanish Mackerel	*Scomberomorus commerson*	0	0.00	2.00	0.49
Stripey Snapper	*Lutjanus carponotatus*	0	0.00	10.00	2.46

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Appendix D– Species composition reported

Table D1 Species composition of the catch reported during the 2025-2026 crew-based surveys by the coral trout fleet. Including numbers retained, released and depredated by species and species group.

Species	Scientific Name	Total Catch	Harvest	Released	Kept for Bait	Depredation Number	Total Catch Minus Depredation
Common Coral Trout	*Plectropomus leopardus*	3873	2926	775	7	165	3708
Stripey Snapper	*Lutjanus carponotatus*	851	164	512	169	6	845
Bluespot Cod	*Cephalopholis cyanostigma*	604	9	541	35	19	585
Redthroat Emperor	*Lethrinus miniatus*	398	261	114	5	18	380
Blacktip Cod	*Epinephelus fasciatus*	216	0	216			216
Trevally	*Carangidae spp.*	211	11	192	1	7	204
Red Bass	*Lutjanus bohar*	199	0	199			199
Red Emperor	*Lutjanus sebae*	174	10	150		14	160
Hussar	*Lutjanus adetii / Lutjanus vitta*	140	0	134	6		140
Wirenetting Cod	*Epinephelus quoyanus*	140	0	132	3	5	135
Barramundi Cod	*Cromileptes altivelis*	111	0	110		1	110
Grass Emperor	*Lethrinus laticaudis*	107	13	81	13		107
Speckledfin cod	*Epinephelus ongus*	96	0	93		3	93
Spangled Emperor	*Lethrinus nebulosus*	94	20	69		5	89
Other Small Cod	*Mixed small serranids*	91	0	87	2	2	89
Maori Wrasse	*Cheilinus undulatus*	89	0	89			89
Chinaman	*Symphorus nematophorus*	88	0	88			88
Fusiller	*Caesionidae spp.*	61	1	47	13		61
Venus Tuskfish	*Choerodon venustus*	56	14	42			56
Whitetip Reef Shark	*Triaenodon obesus*	40	0	40			40
Whitelined Cod	*Anyperodon leucogrammicus*	35	0	35			35
Flowery Cod	*Epinephelus fuscoguttatus*	35	7	27		1	34
Yellowtail Emperor	*Lethrinus atkinsoni*	32	3	27		2	30
Blacktip Reef Shark	*Carcharhinus melanopterus*	28	0	28			28
Moses Seaperch	*Lutjanus russellii*	27	2	25			27
Longnose Emperor	*Lethrinus olivaceus*	26	3	23			26
Salmon Mackerel	*Grammatorcynus bicarinatus*	23	15	6	2		23
Ornate Emperor	*Lethrinus ornatus*	22	6	16			22
Camoflage Cod	*Epinephelus polyphekadion*	22	2	15			17
Barcheek Coral Trout	*Plectropomus maculatus*	20	12	8			20
Pinkear Emperor	*Lethrinus lentjan*	20	0	20			20
Iodine Bream	*Gymnocranius euanus*	18		18			18
Bluespot Trout	*Plectropomus laevis*	16	3	13			16
Grey Reef Shark	*Carcharhinus amblyrhynchos*	16	0	16			16
Peacock Rockcod	*Cephalopholis argus*	16	0	16			16
Blue Maori Cod	*Epinephelus cyanopodus*	16	6	9		1	15
Thumbprint Emperor	*Lethrinus harak*	12	1	10	1		12
Paddletail	*Lutjanus gibbus*	11		11			11
Unknown	*Unknown Sp.*	9	0	7		2	7
Blackspot Tuskfish	*Choerodon schoenleinii*	8	4	4			8
Darktail Snapper	*Lutjanus lemniscatus*	8	6	2			8
Green Jobfish	*Aprion virescens*	8	0	8			8
Painted Sweetlip	*Diagramma pictum*	5	1	4			5
Cobia	*Rachycentron canadum*	4	3	1			4
Passionfruit Trout	*Plectropomus areolatus*	4	1	3			4
Spanish Mackerel	*Scomberomorus commerson*	3	0	1		2	1
Maori Seapearch	*Lutjanus rivulatus*	2	0	2			2
Tomato Cod	*Cephalopholis sonnerati*	2	0	2			2
Tuskfish	*Choerodon spp.*	2	0	2			2
Varigated Emperor	*Lethrinus variegatus*	2	0	2			2
Coronation Trout	*Variola louti*	1	0	1			1
Greasy Cod	*Epinephelus tauvina*	1	1	0			1
Redmouth Rockcod	*Aethaloperca rogaa*	1		1			1
Robinson Seabream	*Gymnocranius grandoculis*	1	1	0			1

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