



Australian Government

Australian Fisheries Management Authority

Coral Sea Fishery

2019-20 Trigger report

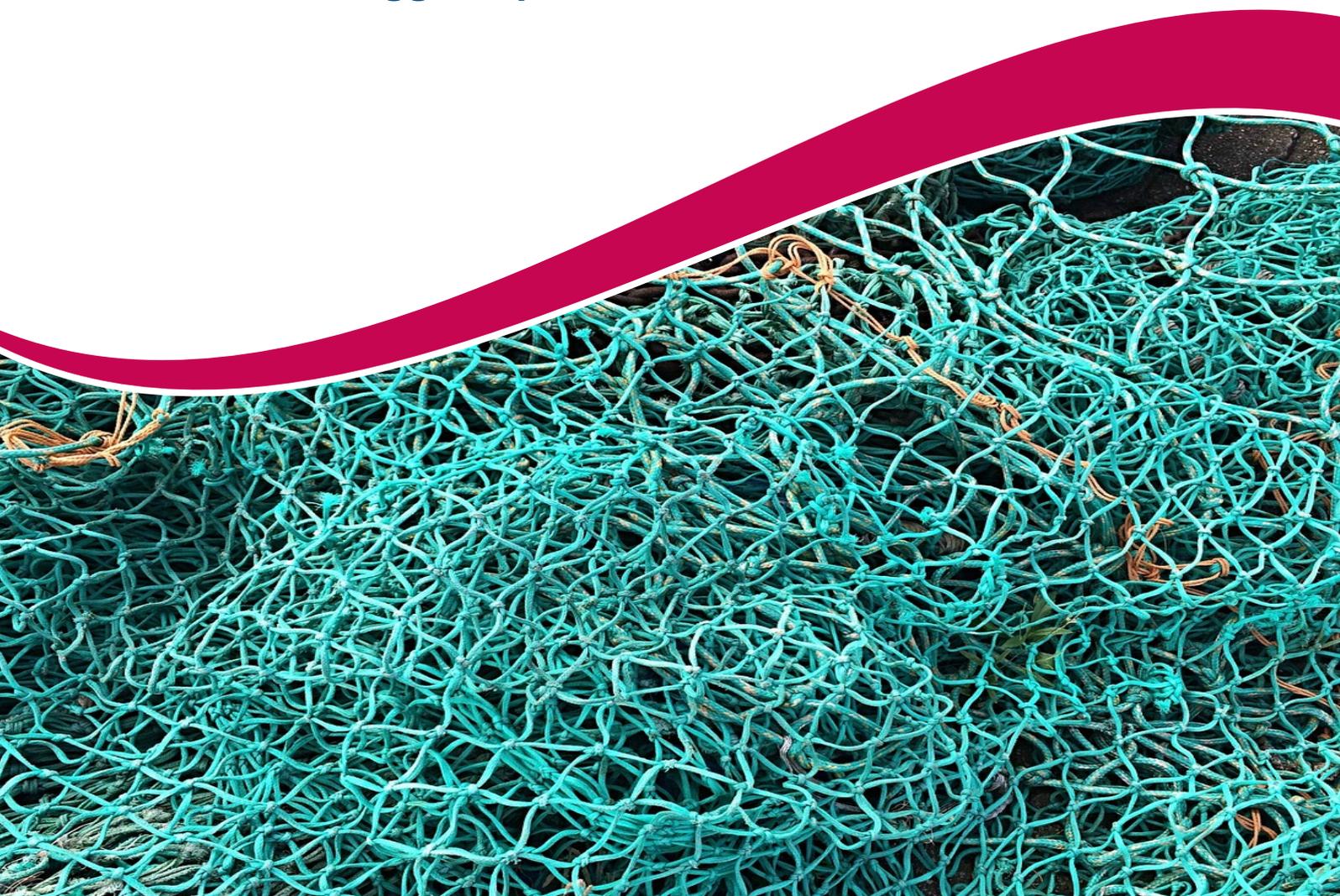


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1. Purpose of the report

The purpose of the Trigger Report is to assess logbook catch and effort data for the Coral Sea Fishery (CSF) against the trigger limits detailed in harvest strategies for each respective CSF fishing sector. There are currently four sectors in the CSF: Line (previously Trawl, Trap and Line); Aquarium; Hand Collection (sea cucumber) and Lobster and Trochus.

For the 2019-20 fishing year, no effort occurred in the Lobster and Trochus sector hence this sector is not included in the report. Further, from mid-2019 Trap and Trawl methods are no longer permitted methods in the fishery and consequently, are also not reported on.

Harvest strategies for the CSF sectors can be found on the AFMA website:

<https://www.afma.gov.au/sustainability-environment/harvest-strategies>.

2. Line Sector

The line sector of the CSF landed 12.6 tonnes of fish during the 2019-20 fishing year (1 July- 30 June), 51 per cent less than 2018-19 (25 tonnes), and 80 per cent less compared to 2017-18 (64 tonnes). Effort in the last three years has followed a similar declining trend with 128 871 hooks set in 2019-20, 37 per cent less compared to 2018-19 (204 046 hooks set) and 67 per cent less compared to 2017-18 (385 616 hooks set). Table 1 outlines the catch and effort in the line sector for the past three fishing seasons.

The declining trend in catch over the last three years reflects a decline in effort in the sector, rather than a decline in biomass. The decline in effort is understood to be due to a combination of factors. Fishing effort in the CSF is constrained generally by the long distance from shore to fishing grounds and weather. Operators in the fishery also tend to fish primarily in other fisheries which means effort in the CSF is dependent on the how much or how little they are fishing in other fisheries. More recently, declining effort is also partially attributed to the removal of fishing grounds with the implementation of the Coral Sea Marine Park on 1 July 2018. In 2019-20, the COVID-19 pandemic is also understood to have had some impact on export markets and therefore effort.

Table 1 Catch and effort for the Line sub-fisheries over the past three seasons

	Catch (tonnes)			Effort (number of hook set)		
	2017-18	2018-19	2019-20	2017-18	2018-19	2019-20
Line	64	25	12.6	385,616	204,046	128,871

Of the 11 species caught in total in 2019-20, only six species had catches greater than 0.1 tonne and of these, only two had catches greater than one tonne. The top ten species by weight for the last three seasons are listed in Table 2.

Table 2 The top ten species caught by weight (tonnes) in the line sector of the Coral Sea Fishery for 2017-18, 2018-19 and 2019-20.

2017-18		2018-19		2019-20	
Species	Weight (t)	Species	Weight (t)	Species	Weight (t)
flame snapper	41.1	flame snapper	10.5	flame snapper	10.2
rosy snapper	6.4	rosy snapper	3	long tail rubbies/snapper	1.2
bar rockcod	4	bar rockcod	2	bar rockcod	0.4
ruby snapper	3.2	ruby snapper	1.7	ornate jobfish	0.3
ornate jobfish	1.1	amberjack	1.6	amberjack	0.2
long tail rubies/snapper	1	long tail rubies/snapper	1.3	imperador	0.1
amberjack	0.7	paddletail seabream	1	ruby snapper	0.06
sea perch	0.5	blue-eye trevella	0.6	rosy snapper	0.03
paddletail seabream	0.5	gummy shark	0.5	blotched bigeye	0.008
ghostsharks	0.4	ornate jobfish	0.4	emperor	0.006

The Triggers

Triggers and the associated management response for the Line sector are outlined in the Line, Trap and Trawl Harvest Strategy (noting the trawl and trap sectors no longer exist).

Overarching catch trigger

- i. *Must be less than total highest catches across the main species caught to date. A 'main species' is a species that has an average catch over 1 tonne over a five year period.*

In 2019-20 only one species, flame snapper, fell into the category of a 'main species' and the catch in 2019-20 did not trigger a Level 1 response.

- ii. *Overarching Level 1 trigger for total fishery catch: 450 t*
- iii. *Overarching Level 2 trigger for total fishery catch: 1000 t*

Total catch for the line sector for 2019-20 was 12.6 tonnes, well below the Level 1 trigger.

Species- specific triggers (high risk/ vulnerable AND key species)

There was no reported interaction with any protected species under the species-specific triggers category in 2019-20.

Whitetip reef shark

- i. Level 1: 2.5 tonnes (1/6 historical high catch)
- ii. Level 2: 5 tonnes (1/3 historical high catch)

There was no whitetip reef shark reported by the line sector in the 2019-20.

Grey reef shark

- i. Level 1: 13 tonnes (1/2 historical high catch)
- ii. Level 2: 26 tonnes (historical high catch)

There was no grey reef shark reported by the line sector in the 2019-20 fishing season.

Triggers pertaining to changes in catch proportion

- i. *If the relative catch proportion of any species changes by >30% from its historical average AND the catch of this species is greater than 1 tonne, invoke a level 1 response for the relevant species. If this is accompanied by an ≥50% overall decline in the CPUE over the last three years, invoke a Level 2 response*

One species, longtail rubies/snapper, exceeded the Level 1 trigger for the 2019-20 season. The total catch and proportion of total catch for this species is detailed in Table 3.

Table 3 The species that exceeded the Level 1 trigger in the line sector of the Coral Sea Fishery for 2019-20 pertaining to changes in catch proportion.

	2019-20 catch (t)	Proportion of catch	Historic average proportion
Longtail rubies/snapper	1.2	9.59%	1.4%

Longtail rubies/snapper exceeded Trigger Level 1 with 1.2 tonnes of catch in 2019-20, equating to 9.59 per cent of the relative proportion of catch that year. In comparison, the ten year historical relative catch proportion for this species of 1.4 per cent. While in 2019-20 the relative proportion of this species is much higher than the historical average, catch is low, ranging between 0 to 1.5 tonnes each year for the last ten years. For the last three years catch has been stable at around 1 tonne: 0.96 tonnes in 2017-18; 1.3 tonnes in 2018-19 and 1.2 tonnes in 2019-20.

The change in relative catch proportion of this species is likely due to very low effort and catch levels overall by this sector in the CSF resulting in large changes in relative abundance when there is even a slight change in catch level. For these reasons, the risk to this species posed by recent catch levels is considered low.

- ii. *If the relative proportion of any species in the catch declines inter-annual by 10% or greater over 3 consecutive years, invoke a Level 1 response. If this accompanied by $\geq 50\%$ overall decline in CPUE over the last 3 years, invoke a Level 2 response*

No species had a decline in relative proportion of catch by 10% or greater over three consecutive years.

Triggers pertaining to spatial changes

For the purposes of this report, 'hillgrids' are used to represent areas fished. Each hillgrid is a square approximately 15 nautical miles wide. Fishing effort typically occurs in only a proportion of each hillgrid and so the analysis is spatially broad.

If the following changes occur invoke a Level 1 response to determine why, with the added option of imposing spatial management measures, such a closures or move-on provisions:

- i. *The percentage of areas fished increased by $\geq 40\%$ (fishery expansion), OR*
 ii. *The percentage of areas fished decreases by $\geq 40\%$ (fishery contraction), OR*
 iii. *If $\geq 40\%$ of the total catch is taken from a single area (fishery contraction/ undue fishing pressure on one area) OR*
 iv. *If $\geq 40\%$ of once- exploited areas are no longer fished*

A Level 1 response was triggered in relation to (ii), (iii) and (iv) in 2019-20.

With respect to (ii), there was a 72 per cent decrease in the number of hillgrids fished in 2019-20 (5 hillgrids) compared to 2018-19 (18 hillgrids) (Table 4).

Table 4 Summary of hillgrid areas fished by the line sector of the Coral Sea Fishery for 2017-18, 2018-19 and 2019-20. Note: the change in areas fished are relative to the year prior.

2017-18		2018-19			2019-20		
Areas fished (hillgrids)	Areas fished (km ²)	Areas fished (hillgrids)	Areas fished (km ²)	Change in area fished	Areas fished (hillgrids)	Areas fished (km ²)	Change in area fished
24	18504	18	13878	↓ 25%	5	3855	↓ 72%

With respect to (iii), of the 12.6 tonnes caught in total by the line sector in 2019-20 the highest contribution from a single area was 11 tonnes, 88 per cent.

With respect to (iv), 'once exploited areas' are defined as the 'total number of individual areas fished over the past three years' for the purpose of assessing this trigger. Of the 47 areas which were once exploited, four of those were exploited in 2019-20 which means that 92 per cent of

once-exploited areas were not fished in 2019-20. One new area was fished in 2019-20 that had not been fished in the previous two years.

Implementation of the Coral Sea Marine Park in July 2018 removed some fishing grounds for the line sector. This, combined with an overall decline in fishing effort for factors not related to stock abundance, is most likely the primary reason for the reduced spatial extent of fishing effort. Further, while a large proportion of the catch came from one area, the overall tonnage of catch is relatively low and the result of a small number of fishing trips.

- v. *If any of the above triggers (i – iv) are accompanied by a $\geq 50\%$ overall decline in CPUE over the last three years, invoke a Level 2 response*

This trigger was not reached in the 2019-20 season. A summary of logbook catch, effort and CPUE (kg per hook set) for each gear type in the line sector for fishing years 2017-18 to 2019-20 is provided in Table 5.

Table 5 Logbook catch, effort and CPUE (kg / hook set) for the line sector of the Coral Sea Fishery for fishing years 2017-18 to 2019-20.

Fishing year	Dropline hooks ¹	Catch (t, whole weight)	CPUE (kg/hook set)
2017-18	25,355	4.5	0.18
2018-19	3,136	1.6	0.51
2019-20	486	0.2	0.41
Fishing year	Longline hooks	Catch (t, whole weight)	CPUE (kg/hook set)
2017-18	360,261	43.7	0.12
2018-19	200,910	16.5	0.08
2019-20	128,385	12.4	0.10

Triggers pertaining to CPUE

- i. *If CPUE for any species shows a decline over the last 3 years, but without any of the above indicators being triggered, a Level 1 response shall be invoked if the decline is less than or equal to 50%, and a Level 2 response shall be invoked if the decline is greater than 50%*

¹ Hook numbers for dropline are calculated by multiplying the number of lines lifts by the average number of hooks per line.

For the assessment of this trigger, the CPUE is calculated for both drop line and longline together (i.e. using the total weight landed relative to the number of hooks set for each method combined).

The CPUE of the species exceeded Level 1 and Level 2 in the line sector for 2019-20 are in the Table 6.

Table 6 Species, catch (tonnes), ten year historical average catch (tonnes), highest historical catch in tonnes, catch per unit effort (CPUE) by fishing year for the period 2017-2018 to 2019-20, and whether the level 1 or level 2 trigger was reached in 2019-20. Blue squares indicate the highest trigger reached.

Species	2019/20 Catch (t)	10 year Historical Average Catch (t)	Highest historical catch (tonne/s)	2017-18 CPUE	2018-19 CPUE	2019-20 CPUE	L1 decline CPUE (last 3 yrs)	L2 >50% decline CPUE (last 3 yrs)
flame snapper	10.2	14.4	41.2	0.107	0.052	0.079	TRUE	FALSE
Rosy snapper	0.031	3.5	12.2	0.017	0.015	0.000	TRUE	TRUE
ornate jobfish	0.252	0.3	1.1	0.003	0.002	0.001	TRUE	TRUE
imperador	0.135	0.2	0.6	0.001	0.000	0.001	TRUE	FALSE
oblique- banded snapper	0.005	0.04	0.12	0.000	0.000	0.000	TRUE	TRUE
bar rockcod	0.42	2.6	5.7	0.010	0.010	0.002	TRUE	TRUE
ruby snapper	0.064	3.8	19.2	0.008	0.008	0.000	TRUE	TRUE
amberjack	0.235	0.9	1.6	0.002	0.008	0.001	TRUE	FALSE
Blotched bigeye	0.008	0.01	0.08	0.000	0.000	0.000	TRUE	TRUE
Emperor	0.006	0.006	0.061	0.000	0.000	0.000	TRUE	TRUE

These triggers are only considered for species that have not met any other triggers in the harvest strategy. Of the 11 species caught in 2019-20 that had not breach any previous triggers, the level 1 trigger was reached for three species and level 2 trigger for seven species.

Of the species that triggered either a Level 1 or Level 2 response, flame snapper was the only species to have a catch over 1 tonne, with 10.2 tonnes caught in 2019-20. While the minimum

MSY estimate for flame snapper was exceeded, catch is still well below the maximum MSY estimate of 16 tonnes (ABARES 2015). Consequently, no further management action is warranted.

The appropriateness of CPUE-based triggers was also discussed at the September 2016 stakeholder meeting. Highly variable catch composition, relatively low catch rates and spatial distribution of effort mean that these triggers are overly sensitive. Considering the above, AFMA will continue to monitor the total catch of these species over time and will review the appropriateness of CPUE based triggers as part of the upcoming review of the line harvest strategy.

Discussion

Of the 11 species caught in 2019-20, all activated at least one trigger. However, on closer examination of the data in relation to MSY catch estimates and considering the low level of catch, effort and spatial extent of fishing overall, no further management action was considered warranted.

The implementation of the Coral Sea Marine Park in 2018 saw the removal of trawl and trap licences from the fishery and a reduction in the area open to line fishing from late 2019. In addition to this, the complexity of the triggers for the level of risk posed by the fishery are two of the key drivers for a review of the line harvest strategy which is scheduled to be undertaken in 2020-21.

3. Aquarium

For the 2019-20 season, 20,049 individual fish were harvested in the aquarium sector. This is a decrease from the previous 24,318 fish taken in 2018-19.

The Triggers *Equal to the highest historical catch for all 'other' species.*

Level 2 Catch Trigger: Equal to twice the highest historical catch for all 'other' species.

In the 2019-20 fishing year, the total catch for 'other' species was 10 354 individuals, well below the highest historical catch of 16 934 individuals in 2012-13 resulting in no further action being required.

Acroporidae: 40 tonnes of the coral family Acroporidae is permitted to be harvested annually from the CSF. This limit is regulated and consistent with the conditions of the CSF Wildlife Trade Operation (WTO) accreditation based on a Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Non-Detriment Finding (NDF). The NDF used estimates of density and annual production across the fishery.

Level 1 Catch Trigger: 20 tonnes.

Level 2 Catch Trigger: 40 tonnes.

In the 2019-20 fishing year, no coral was harvested.

Live rock: 40 tonnes of live rock is permitted to be harvested annually from the CSF.

Level 1 Catch Trigger: 20 tonnes.

Level 2 Catch Trigger: 40 tonnes.

There was 0.8 tonnes of live rock collected in the 2019-20, well below the trigger and 0.9 tonnes less than that collected in the 2018-19 season.

This trigger was intended to pick up a potential decrease in the catch per unit effort for live rock. However, the take of live rock is largely market driven and the low level of harvest is reflective of a low market demand.

Humphead Maori wrasse: Aquarium sector fishing permit holders are authorised to take a total of 50 specimens during the season (25 per concession holder). Operators are required to record the number of specimens taken per trip, their size and latitude/longitude information in the 'comments' section of their logbook. The annual catch triggers have been set to review catch and effort data whenever 10 individuals are caught, or when 50 individuals are caught within a season.

Level 1 Catch Trigger: Each time 10 individuals caught (i.e. 10, 20, 30 and 40 individuals).

Level 2 Catch Trigger: 50 individuals.

In the 2019-20 season, only two Humphead Maori wrasse were harvested, well below the Level 1 catch trigger.

Discussion

No catch triggers for the Aquarium sector were reached in 2019-20.

4. Hand Collection (Sea Cucumbers)

The Hand collection (sea cucumbers) sector was active for 14 days in the 2019-20 season resulting in a total catch of 6.8 tonnes harvested over 276 dive hours.

The Triggers

The trigger limits for the Sea Cucumber sector apply as a Total Allowable Catch (TAC) for each of the main species, any combination of greenfish and lollyfish, any other single species, and all species of the order Aspidochirotida. Catch of these species/species groups by fishing year for the period 2017-2018 to 2019-20 is presented in Table 7.

Table 7 Assessment of Hand Collection Sector: Sea Cucumber CDR catches against the Harvest Strategy catch limits for years 2017-18 to 2019-20

Species		Total Allowable Catch (TAC)/ trigger limit (t)	2017-18	2018-19	2019-20
Main Species					
Black teatfish	<i>Holothuria whitmaei</i>	1	0.06	0	1.0
White teatfish	<i>Holothuria fuscogilva</i>	4	0.58	0	3.9
Sand fish	<i>Holothuria scabra</i>	1	0	0	0
Prickly redfish	<i>Thelenota ananas</i>	20	0.33	0	2.1
Surf red fish	<i>Actinopyga mauritiana</i>	10	0.04	0	0.01
Other species					
Any combination of greenfish and lollyfish	Greenfish- <i>Stichopus chloronotus</i>	10 tonnes (any combination of greenfish and lollyfish)	0	0	0
	Lollyfish- <i>Holothuria atra</i>				
Any other single species		5 tonnes per species	0.008	0	0.13
Total species for the sector					
All species of the Order Aspidochirotida	0	150 tonnes (TAC for all species in the sector)	0	0	0

Discussion

No trigger limits for the sea cucumber sector were reached in the 2019-20 season.

Reference

ABARES, 2015. Reducing uncertainty in fisheries stock status. Research by the Australian Bureau of Agricultural and Resource Economics and Sciences.