

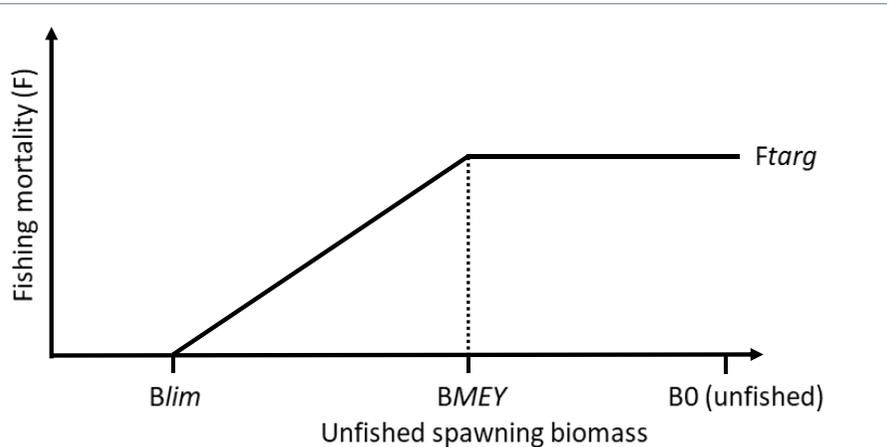
# Management advice Reef line fishery 2021

## Harvest strategy overview

The reef line fishery is one of the first fisheries to have an approved harvest strategy under the *Queensland Sustainable Fisheries Strategy 2017–2027*. The harvest strategy sets out decision rules to determine the appropriate level of harvest based on the status of stocks and risk to target and secondary species.

Stock assessment results inform the total allowable catch (TAC) for one target species at this stage—common coral trout. The TAC is set based on the estimated level required to return common coral trout stocks (factored up to include all coral trout species) to the target of 60% biomass, based on the ‘hockey stick’ rule (see Figure 1).

In 2020 a new stock assessment was delivered for redthroat emperor, based on stock synthesis model. At this stage, the remaining species are considered ‘secondary species’, which are monitored through catch triggers. If a catch trigger is exceeded, a stock assessment will inform future management, and an interim



**Figure 1:** The ‘hockey stick’ rule applies to stocks with a stock assessment—*Blim* is the limit reference point, *Bmey* is the biomass at maximum economic yield, *B0* is the unfished biomass at 100%, *F* is fishing mortality and *Ftarg* is the level of fishing mortality for *Bmey*

competitive total allowable commercial catch (TACC) may be implemented to ensure stocks are not at risk. The harvest strategy also aims to ensure that each sector (commercial, recreational and charter) doesn’t exceed their allocated catch share. If the TACC is adjusted to manage the commercial harvest, management action may be triggered to align the recreational and charter sector harvest to their share.

## Harvest strategy targets and reference points

Species	Stock assessment	Reference point
Coral trout	Yes ✓	60% biomass
Red throat emperor	Yes ✓	60% biomass
Other species	Intermittent	Catch trigger

As biomass is not available for most secondary species, other reference points will trigger management action:

- if the annual commercial harvest exceeds 20 tonnes for an individual species and
- if the annual commercial harvest has increased to 1.5 or 2 times above levels from the 2011–2015 average.

## Performance indicators

- Coral trout biomass is at **59%** of unfished levels.
- To achieve 60% biomass, a TAC (all sectors) of **1073 tonnes** of coral trout is recommended.
- Recreational/charter sector coral trout harvest **did not exceed** their allocated share (20% of the TAC).
- Secondary species catch levels **did not trigger** management action.

## Primary species: coral trout

### Assessment

The 2020 stock assessment estimated that common coral trout abundance in 2019 was 59% of unfished biomass, close to the harvest strategy target of 60% of unfished spawning biomass (Figure 2).

For improved transparency, the discount factor for scientific uncertainty is now applied to the recommended biological catch (RBC) rather than the fishing mortality within the assessment model. To allow the stock to reach the target of 60%, the stock assessment 'hockey stick' rule resulted in a RBC (all sectors) of 1180 tonnes for common coral trout. The discount factor of 13% is then applied to the RBC to get a TAC of 1027 tonnes for common coral trout. The TAC for common coral trout is then scaled up by 4.5% to provide an **'all trout' species TAC of 1073 tonnes**.

### Management outcome

Following the 2020 decision to postpone application of the harvest strategy decision rules due to the unprecedented and significant impacts of COVID-19, the decision

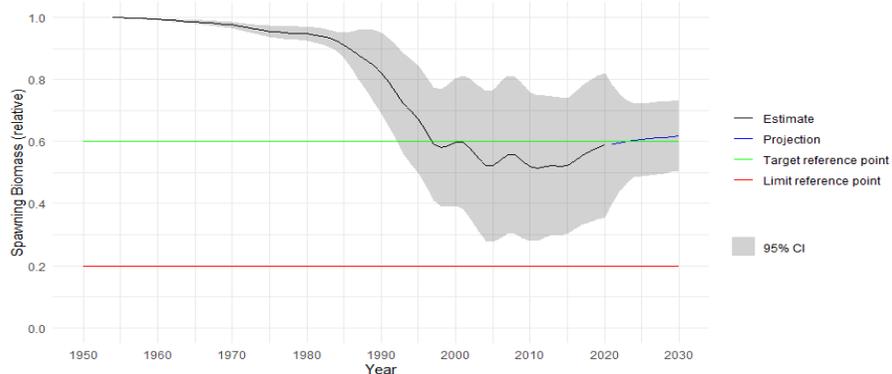
rules were considered again in 2021 for the 2021-22 season.

Applying the sectoral allocation specified in the harvest strategy of 80% commercial and 20% recreational/charter, the stock assessment estimates a 2021–22 TACC of 858 tonnes and a recommended recreational harvest of 215 tonnes<sup>1</sup>. The recreational and charter sector does not exceed their catch share of 20% (with 5% buffer). As a result, it is within the prescribed reference point (Figure 3).

Decision rule 1.7 prevents a TACC change of more than 200 tonnes. Therefore, using the harvest strategy rules, the TACC would reduce from 1163 tonnes to 963 tonnes for 2021–22, with an updated common coral trout stock assessment to be considered in early 2022 to inform the 2022-24 seasons TAC.

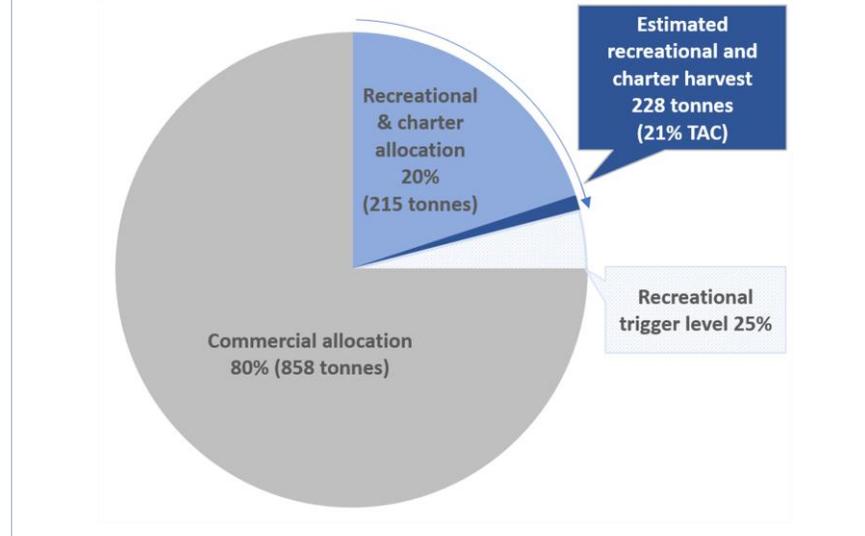
**Note:** For more information on how the harvest strategy decision rules were applied to coral trout in 2021, see the diagram on page 4.

**Figure 2:** Current and predicted biomass trajectory for common coral trout, showing 59% biomass for 2019



<sup>1</sup> Note the most recent (2019-20) recreation and charter harvest estimate for coral trout is 228 tonnes. This is based in the estimate of 87 537 recreationally harvested fish reported using the 2019 [State-wide Recreational Fishing Survey data](#), excluding charter

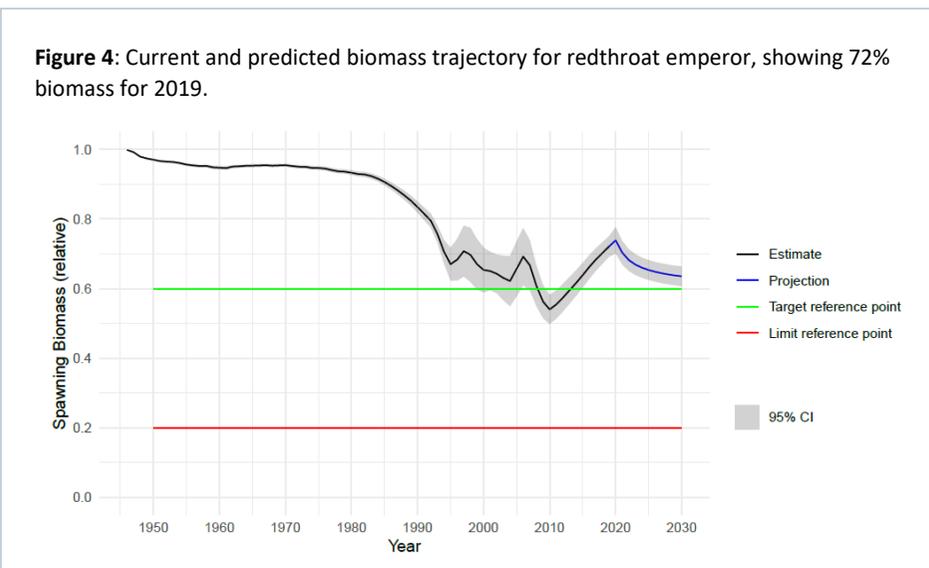
**Figure 3:** Applying the harvest strategy catch shares to coral trout TAC of 1073 tonnes



catch, multiplied by the conversion factor of 1.698kg (based on average recreational common coral trout size measured during [Boat Ramp Surveys](#)), plus 79.45 tonnes reported in charter fishing logbooks.

## Secondary Species: Redthroat emperor and other species

The harvest strategy specifies catch triggers for redthroat emperor and other reef fish species, ensuring that changes in fishing behaviour do not result in unsustainable levels of harvest (Figure 4). Secondary species were assessed in 2020 and are due to be assessed again in 2022 (see the [Reef Line Management Advice 2020](#)). As a new stock assessment became available in 2020 for redthroat emperor, the harvest strategy decision rules for target species could be applied.



### Assessment and management outcome

The 2020 stock assessment estimated that redthroat emperor abundance is at 72% of unfished biomass, above the harvest strategy target of 60% unfished biomass (Figure 4). Using the 'hockey stick' rule, the stock assessment calculated the TAC (all sectors) at 930 tonnes of redthroat emperor to allow the stock to reach 60%.

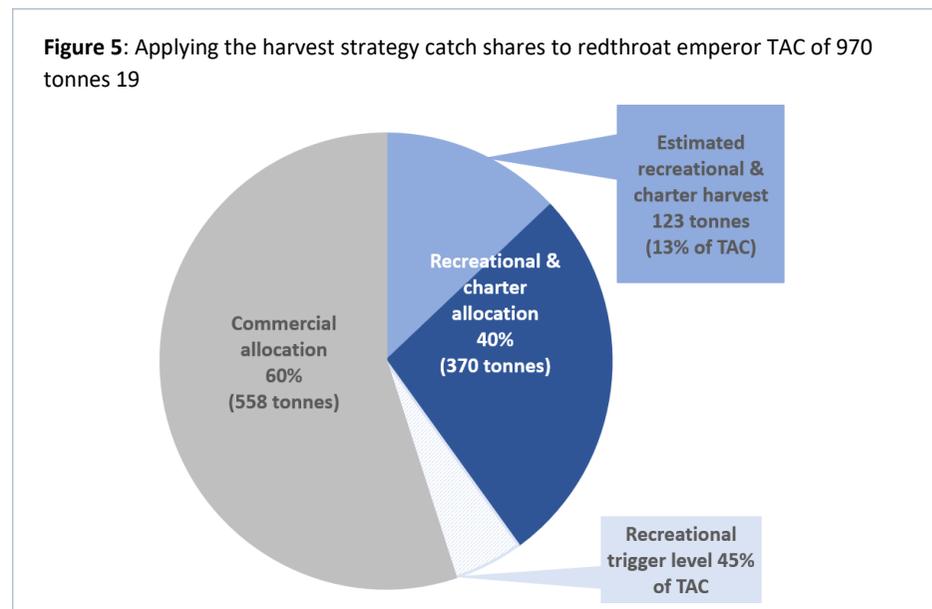
Applying the sectoral allocation specified in the harvest strategy of 60% commercial

<sup>2</sup> Note the most recent (2019-20) recreation and charter harvest estimate for redthroat emperor is 123 tonnes. This is based in the estimate of 36 679 recreationally harvested fish reported using the 2019 [State-wide Recreational Fishing Survey data](#), excluding

and 40% recreational/charter, the stock assessment estimates a 2021–22 TACC of 558 tonnes and a recommended recreational harvest of 372 tonnes<sup>2</sup>.

The recreational and charter sector did not exceed their catch share of 40% (with 5% buffer). As a result, it is within the prescribed reference point (Figure 5).

Using the harvest strategy rules, the TACC would reduce from 610.88 tonnes to 558 tonnes for 2021–22, with the next redthroat emperor stock assessment to be considered in early 2024 to inform harvest strategy decisions for the 2024-25 season onward.



**Note:** For more information on how the harvest strategy decision rules were applied to redthroat emperor in 2021, see the diagram on page 5.

### More information

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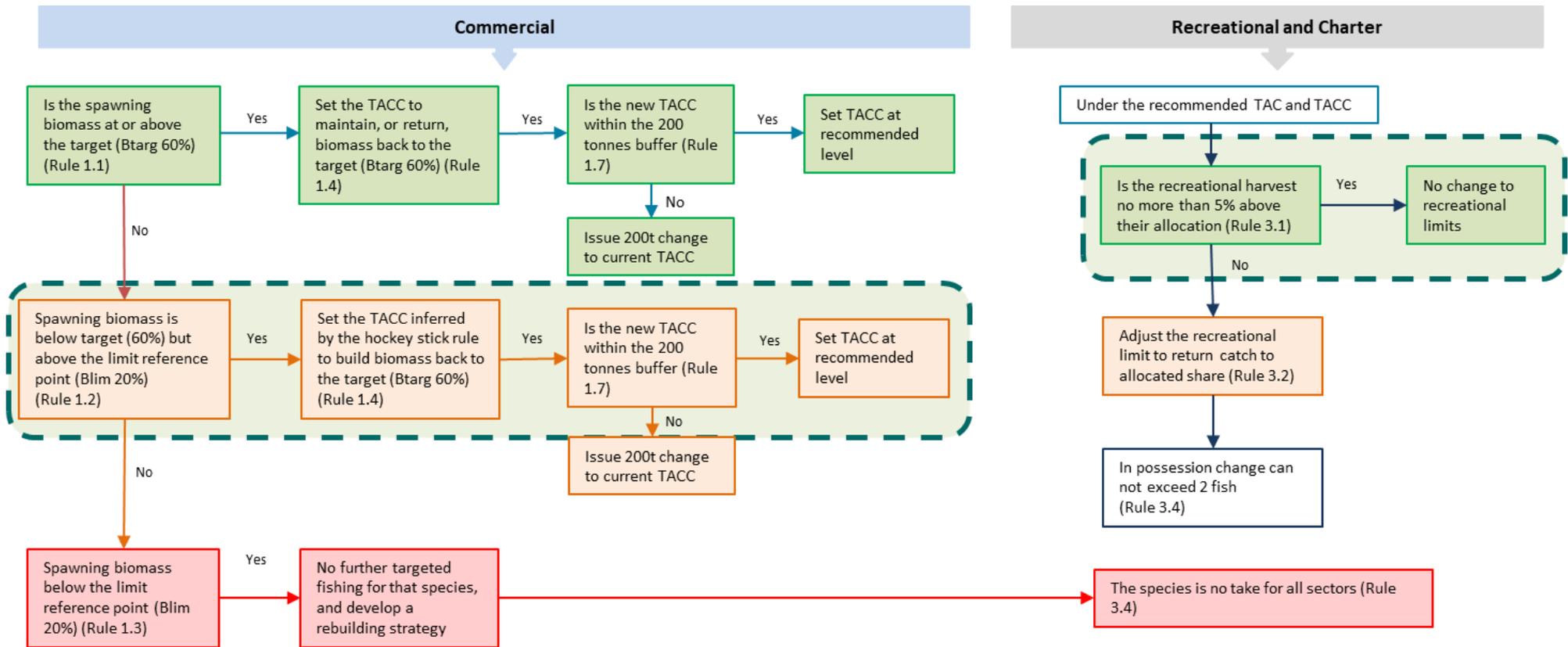
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charter catch, multiplied by the conversion factor of 1.169kg (based on average recreational common coral trout size measured during [Boat Ramp Surveys](#)), plus 76.92 tonnes reported in charter fishing logbooks.

# Coral trout decision rules

Applicable coral trout decision rules for 2021 outlined in green.



# Redthroat emperor decision rules

Applicable redthroat decision rules for 2021 outlined in green.

