

# CORAL TROUTS (2023)

*Plectropomus spp. & Variola spp.*



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## STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Commonwealth	Torres Strait Finfish Fishery	Sustainable	Management strategy evaluation, standardised catch rate, catch
Western Australia	Western Australia	Sustainable	Catch, indicator species status
Northern Territory	Northern Territory	Negligible	Catch
Queensland	Coral Reef Fin Fish Fishery	Sustainable	Catch, effort, standardised catch rate, stock assessment (integrated length and age structured model)
Queensland	Gulf of Carpentaria	Undefined	Catch

## STOCK STRUCTURE

The Coral Trout species complex, part of the family Epinephelidae, is found throughout Australia and is comprised of: Common Coral Trout (*Plectropomus leopardus*), Barcheek Coral Trout (*Plectropomus maculatus*), Bluespotted Coral Trout (*Plectropomus laevis*), Passionfruit Coral Trout (*Plectropomus areolatus*), Highfin Coral Trout (*Plectropomus oligocanthus*), Yellow-edge Coronation Trout (*Variola louti*) and White-edge Coronation Trout (*Variola albimarginata*), with the Passionfruit Coral Trout not being found in the Northern Territory. The biological stock structures of these species are species-specific and spatially complex [Bergenius et al. 2005; Bergenius et al. 2006; van Herwerden et al. 2006; van Herwerden et al. 2009] and remain

uncertain for some species.

Here, assessment of stock status for this multispecies group is presented at the management unit level—Torres Strait Finfish Fishery (Commonwealth); Reef line Fishery and Gulf of Carpentaria (Queensland); and at the jurisdictional level—Western Australia and Northern Territory.

## STOCK STATUS

**Coral Reef Fin Fish Fishery** Common Coral Trout dominates catches in the Reef Line Fishery (Queensland) [Leigh et al. 2014]. Other species such as Barcheek Coral trout, and Bluespotted Coral Trout are also commonly caught by both the recreational and commercial sectors. From 2021 onwards, commercial fishers have been required to report species-specific harvest details within the coral trout species group, providing improved harvest estimates of the lesser caught species within this species group. The level of contribution of other species to the overall harvest of Coral Trouts was less than 2% in 2021–22.

The most recent stock assessment of Common Coral Trout conducted in 2022 based on calendar year data from 1961 to 2021 estimated that the biomass was 60 per cent of the unfished (1961) level [Fox et al. 2022]. Annual harvest levels have been consistently below the estimated maximum sustainable yield (MSY) (1946 t). Over the last five years (2017–2021), the Queensland total harvest averaged 1,002 t per year, including 812 t by the commercial sector, 68 t by the charter sector, 111 t by the recreational sector, and 11 t by Indigenous fishers [Fox et al. 2022; QDAF 2022]. The recreational and charter fishing harvest in 2019–20 was 212 t or 135,000 fish according to the most recent survey [DAF 2022; Teixeira et al. 2021].

The *Reef line fishery harvest strategy: 2020–2025* manages fishing mortality for Common Coral Trout through setting sustainable catch limits [QDAF 2020]. In 2021, the total allowable commercial catch (TACC) was reduced from 1,163 t to 963 t based on advice from the 2020 stock assessment [Campbell and Northrop 2020; QDAF 2021] and Harvest Strategy decision rules. Commercial catch harvested in 2021–22 was 656 t and approximately 32% below the TACC. Under the harvest strategy this TACC is set to achieve or maintain a maximum economic yield (MEY) target using 60% of unfished biomass as a proxy for MEY [QDAF 2020]. Setting the biomass target at 60% through the TACC, aims to provide additional resilience to the spawning stock from adverse environmental impacts. In addition, approximately 33% of the Great Barrier Reef Marine Park is protected from fishing, providing additional protection to the biomass of this stock.

The above evidence indicates that the biomass of this stock is unlikely to be depleted and that the current level of fishing pressure is unlikely to cause the stock to become recruitment impaired. On the basis of the evidence provided above, the multispecies Coral Trout Reef Line Fishery (Queensland) management unit is classified as a **sustainable stock**.

**Gulf of Carpentaria** Coral Trouts are not targeted in Queensland-managed commercial fisheries in the Gulf of Carpentaria (GOC). They are taken as by-product in the Developmental Fin Fish Trawl Fishery (Queensland) and Gulf of Carpentaria Line Fishery (Queensland) [Bessell-Browne et al. 2018], but only small catches are

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reported (< 1 t in 2021–22). Coral Trout is a popular recreational species for GOC residents and visiting fishers who target reef fish, however, estimates of the recreational catch are uncertain due to the small sample size. They are also taken by the charter sector in the GOC in small quantities, averaging less than 0.5 tonnes (t) per year over the last ten years. There is insufficient information available to confidently classify the status of this stock.

On the basis of the evidence provided above, the multispecies GOC (Queensland) management unit is classified as an **undefined stock**.

**Northern Territory**

Stock status for the Northern Territory jurisdiction is reported as Negligible due to historically low catches from this region (less than 14 t), and because the stock is not subject to targeted fishing. Fishing is unlikely to be having a negative impact on the stock.

**Torres Strait Finfish Fishery**

Coral Trout in Torres Strait comprises 4 species: Common Coral Trout, Barcheek Coral Trout, Passionfruit Coral Trout and Bluespotted Coral Trout. Each species is likely to be a single genetic stock in the Torres Strait [Evans et al. 2010]. Fishers in the Torres Strait Finfish Fishery (TSFF) are encouraged to provide an estimate of the proportion of each species in the catch in fishery logbooks, however, catch of individual species is currently not available [Butler et al. 2022]. Annual commercial catches of multispecies Coral Trout in TSFF peaked in 2003–04 at 132 t and have remained below 50 t since 2007. Total catch in 2020–21 was 19.8 t (32.3 t in 2019–20) and below the total allowable catch (TAC) of 135 t [Butler et al. 2022]. This level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

There is currently no finalised and endorsed stock assessment for Coral Trout in Torres Strait. A preliminary stock assessment was conducted in 2019 using data up to 2018 and estimated the mean spawning biomass to be around 80% of the unfished level, with all model scenarios estimating spawning biomass to be above 65% of the unfished level [AFMA 2019; AFMA 2021]. The Torres Strait Finfish Resource Assessment Group (TSFFRAG) considered the assessment to be preliminary and required further peer review and development to ensure that it can be used to inform management decisions [AFMA 2021]. However, finalisation of the stock assessment has been deferred as a result of low effort and catch in the fishery, and the perceived low risk to the fishery [AFMA 2021]. A review of the preliminary stock assessment and methodology is planned for end of 2023 [AFMA 2022, AFMA 2023].

A management strategy evaluation (MSE) was undertaken for the stock using catch data up to 2004 [Williams et al. 2007; Williams et al. 2011]. Four constant-catch scenarios, ranging from 80 to 170 t, were evaluated. The biomass in 2014 was estimated to be more than 60% of assumed unfished level, and all catch scenarios achieved a biomass of at least 70% of the unfished level by 2025. There have been changes in the management and operation of the fishery since the MSE was completed, which may have diminished the relevance of the results for informing status. The Torres Strait is a region experiencing environmental change due to climate change [Dutra et al. 2021; NESP ESCC Hub 2018], and it will become increasingly difficult to assume, without an approved updated stock assessment, that productivity has remained stable and that the outcomes of the MSE remain valid [Butler et al. 2022].

The above evidence, as well as the generally low catches in recent years, support that the biomass of this management unit is unlikely to be depleted and

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recruitment is unlikely to be impaired. The above evidence also indicates that the current level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

On the basis of the evidence provided above, the Torres Strait Finfish Fishery management unit (Commonwealth) is classified as a **sustainable stock**.

**Western  
Australia**

Coral Trouts are caught primarily on the north-west coast of Western Australia as a component of the multispecies Pilbara Demersal Scalefish Fisheries (which includes the Pilbara Fish Trawl (Interim) Managed Fishery, the Pilbara Trap Managed Fishery and the Pilbara Line Fishery) in the Pilbara management region of the North Coast Bioregion; and as a component of the multispecies Northern Demersal Scalefish Managed Fishery (NDSMF) in the Kimberley management region of the North Coast Bioregion of Western Australia. Coral Trouts are assessed on the basis of the status of several indicator species (including, for example, Red Emperor, Rankin Cod, and Bluespotted Emperor in the Pilbara region, and Red Emperor and Goldband Snapper in the Kimberley region) across the North Coast Demersal Resource (NCDR) that represents the entire inshore demersal suite of species occurring at depths of 30–250 m [Newman et al. 2018]. The indicator species in the Pilbara and Kimberley have been classified as sustainable based on the performance measures identified in the harvest strategy [Wakefield et al. 2023]. The level of risk associated with the sustainability of all Coral Trouts in the NCDR is assessed as low. This assessment of Coral Trouts is also supported by the results of a data-limited Catch-MSY assessment, where recent catches are compared to model predictions for maximum sustainable yield (MSY).

Total catch of Coral Trouts in WA over the last 10 years (2013–22) have ranged from 35–59 t, with a mean annual catch of 44 t. This is essentially the same as the average catch of Coral Trouts taken during previous 10 years at 43 t. Over the past 10 years when reliable catch estimates are available for all fishing sectors, the combined recreational and charter catches have been similar to commercial catches, with these comprising, on average, 50% of the total catch. Results of analyses using a Catch-MSY model applied to data on annual catches for this species (1986–2022), showed that the annual catches of Coral Trouts in WA in recent years, from 2013–16 and 2020–22, were below the median value of the model prediction for maximum sustainable yield (MSY) and catch has remained relatively stable throughout the entire time series, fluctuating within the 95% CI range for MSY. This is also consistent with the predicted values for biomass never falling below the predicted BMSY, and fishing mortality remaining below FMSY. However, it is important to recognise that Catch-MSY is a data-limited technique with strong assumptions, dependent on user inputs. For this assessment, these included specified ranges for initial depletion (0.4–0.8), based on likely catch levels from foreign fleets prior to the start of the time series, final depletion (0.15–0.7), based on recent catches relative to the maximum recorded annual catch and the non-targeted nature of fishing for this species by commercial fishers, and low resilience ( $r=0.1–0.6$ , consistent with Coral Trouts longevity, of approximately 14–17 years). Given the relatively low levels of overall landings of Coral Trouts across multiple fisheries in Western Australia (throughout the history of the fisheries that catch these species), recent catches of this species remaining within the predicted MSY range, and the status of the indicator species for the NCDR, it is considered that the biomass of the Coral Trout species complex in Western Australia is unlikely to be depleted and that current level of fishing mortality is unlikely to be sufficiently high to cause the stock to become recruitment overfished.

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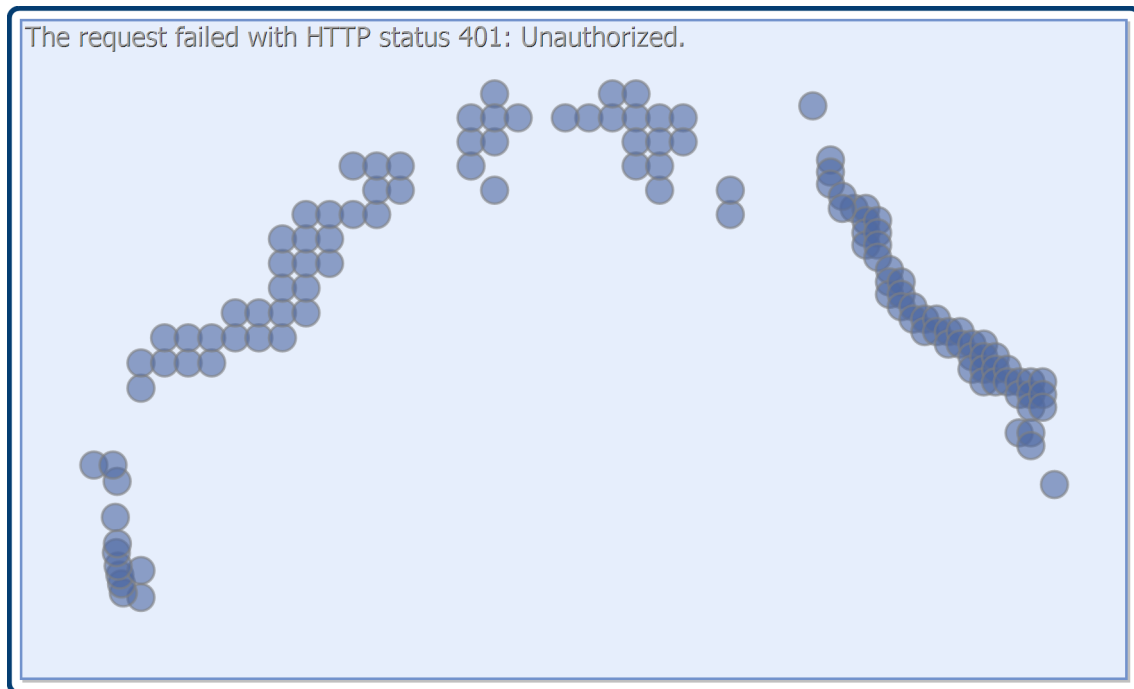
On the basis of the evidence provided above, the Coral Trout complex in Western Australia is classified as a **sustainable stock**.

**BIOLOGY**

**Coral Trout biology** [Kailola et al. 1993; Ferreira 1995; Samoilyis 1997; Mapstone 2004; Williams et al. 2008; Mapleston et al. 2009; Heupel et al. 2010; Frisch et al. 2016]

Species	Longevity / Maximum Size	Maturity (50 per cent)
CORAL TROUTS	Plectropomus leopardus: 17 years, 650 mm FL; P. maculatus 13 years, 650 mm FL; P. laevis: 16 years, 1 150 mm FL; P. areolatus: 14 years, 650 mm FL; Variola louti: 7 years, 520 mm FL; V. albimarginata: 12 years, 380 mm FL	All species are protogynous hermaphrodites (individuals are born female and later become male). Size at maturity and sex change also vary by location. P. leopardus: female 280 mm FL, male 500 mm FL; P. maculatus: female 300 mm FL, male 440 mm FL

**DISTRIBUTION**



Distribution of reported commercial catch of Coral Trout

**TABLES**

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<b>Fishing methods</b>	<b>Commonwealth</b>	<b>Northern Territory</b>	<b>Queensland</b>	<b>Western Australia</b>
<b>Charter</b>				
Hook and Line		✓	✓	✓
Spearfishing			✓	✓
<b>Commercial</b>				
Dropline				✓
Fish Trap		✓		✓
Gillnet				✓
Hand Line, Hand Reel or Powered Reels				✓
Handline		✓		
Line	✓		✓	✓
Midwater Trawl			✓	
Otter Trawl				✓
Unspecified		✓		
<b>Recreational</b>				
Hook and Line		✓	✓	✓
Spearfishing		✓	✓	✓
Unspecified		✓		

<b>Management Methods</b>	<b>Commonwealth</b>	<b>Northern Territory</b>	<b>Queensland</b>	<b>Western Australia</b>
<b>Charter</b>				
Gear restrictions			✓	✓
Licence				✓
Limited entry		✓		
Passenger restrictions		✓		
Possession limit			✓	✓
Processing restrictions			✓	

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Seasonal or spatial closures			✓	
Size limits			✓	
<b>Commercial</b>				
Catch restrictions	✓			✓
Gear restrictions	✓	✓	✓	✓
Harvest Strategy			✓	
Individual transferable quota			✓	
Limited entry	✓	✓	✓	✓
Seasonal or spatial closures			✓	
Size limit	✓			✓
Size limits			✓	
Spatial closures	✓	✓		✓
Spatial zoning		✓		
Temporal closures				✓
Total allowable catch		✓	✓	
Vessel restrictions	✓	✓	✓	✓
<b>Recreational</b>				
Gear restrictions		✓	✓	✓
Licence (Recreational Fishing from Boat License)				✓
Possession limit		✓	✓	✓
Processing restrictions			✓	
Seasonal or spatial closures			✓	
Size limit				✓

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<b>Size limits</b>			✓	
<b>Spatial closures</b>		✓		✓
<b>Spatial zoning</b>		✓		
<b>Temporal closures</b>				✓

<b>Catch</b>	<b>Commonwealth</b>	<b>Northern Territory</b>	<b>Queensland</b>	<b>Western Australia</b>
<b>Charter</b>		2.2 t		5.9 t
<b>Commercial</b>	42 t	1.7111 t	657.254 t	18.9061 t
<b>Indigenous</b>		Unknown	Unknown	Unknown
<b>Recreational</b>		<10 t (2019)	212 t (2019-20)	13.1 t

**Commonwealth – Commercial (Management Methods/Catch).** Provided for the Commonwealth and align with the 2021–22 financial year.

**Commonwealth – Recreational.** The Australian Government does not manage recreational fishing in Commonwealth waters. Recreational fishing in Commonwealth waters is managed by the state or territory immediately adjacent to those waters, under its management regulations.

**Commonwealth – Indigenous.** The Australian Government does not manage non-commercial Indigenous fishing in Commonwealth waters (with the exception of the Torres Strait). In general, non-commercial Indigenous fishing in Commonwealth waters is managed by the state or territory immediately adjacent to those waters. In the Torres Strait, both commercial and non-commercial Indigenous fishing is managed by the Torres Strait Protected Zone Joint Authority (PZJA) through the Australian Fisheries Management Authority (Commonwealth), the Department of Agriculture, Fisheries and Forestry (Queensland), and the Torres Strait Regional Authority. The PZJA also manages non-Indigenous commercial fishing in the Torres Strait.

**Northern Territory – Recreational (Catch).** Northern Territory recreational catch data align with the 2019 calendar year [West et al. 2022].

**Northern Territory – Charter (management methods).** In the Northern Territory, charter operators are regulated through the same management methods as the recreational sector but are subject to additional limits on license and passenger numbers.

**Northern Territory – Indigenous (management methods).** The Fisheries Act 1988 (Northern Territory), specifies that: “Unless expressly provided otherwise, nothing in this Act derogates or limits the right of Aboriginal people who have traditionally used the resources of an area of land or water in a traditional manner to continue to use those resources in that area in that manner.”

**Queensland – Indigenous (management methods).** For more information see <https://www.daf.qld.gov.au/business-priorities/fisheries/traditional-fishing>

**Queensland – Recreational Fishing (Catch).** Data are based at the whole of Queensland level and derived from statewide recreational fishing surveys. Where possible, estimates have been converted to weight (tonnes) using best known conversion multipliers. Conversion factors



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may display regional or temporal variability.

**Queensland – Commercial (Catch).** Queensland commercial and charter data have been sourced from the commercial fisheries logbook program. Further information available through the Fisheries Summary Report <https://www.daf.qld.gov.au/business-priorities/fisheries/monitoring-research/data/queensland-fisheries-summary-report>

**Queensland – Commercial (Management Methods).** Harvest strategies are available at: <https://www.daf.qld.gov.au/business-priorities/fisheries/sustainable/harvest-strategy>

**Western Australia – Recreational (Catch).** Western Australia recreational catch data align with the 2021 calendar year.

**Western Australia – Commercial (management methods).** In Western Australia, different zones within fisheries may have different effort allocations.

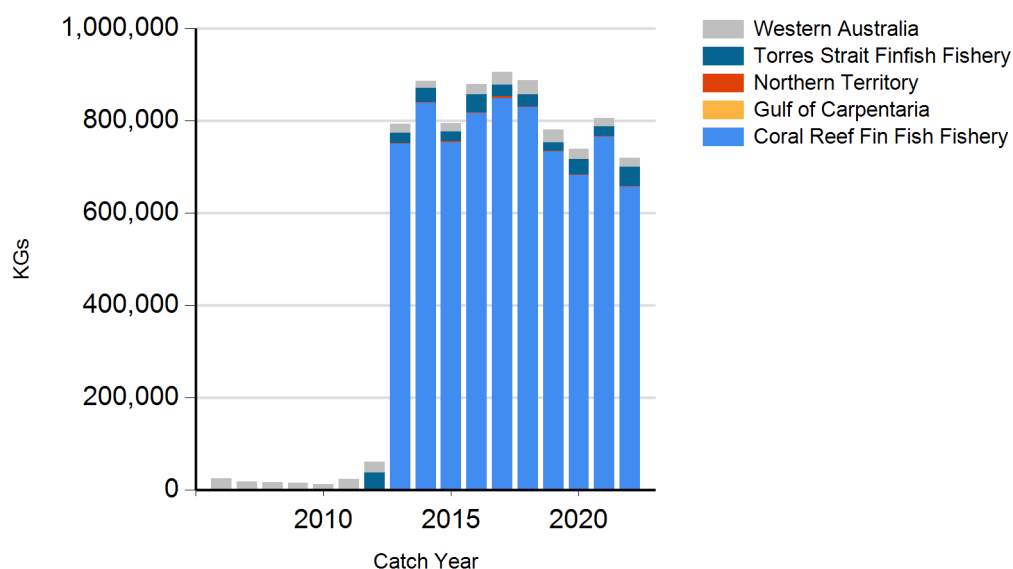
**Western Australia – Active Vessels.** Data are confidential as there were fewer than three vessels operating in PFTIMF, PTMF and WCDGDLIMF.

**Western Australia – Recreational (Catch).** Boat-based recreational catch if from 1 September 2017–31 August 2018. These data are derived from those reported in Ryan et al. 2022.

**Western Australia – Recreational (management methods).** A Recreational Fishing from Boat Licence is required for the use of a powered boat to fish or to transport catch or fishing gear to or from a land-based fishing location.

**Western Australia – Indigenous (management methods).** Subject to the application of Section 211 of the *Native Title Act 1993* (Cth), and the exemption from a requirement to hold a recreational fishing licence, the non-commercial take by Indigenous fishers is covered by the same arrangements as that for recreational fishing.

### CATCH CHART



Commercial catch of Coral Trout - note confidential catch not shown

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