

CORAL TROUTS (2020)

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
Western Australia	Western Australia	Sustainable	Catch, indicator species status
Northern Territory	Northern Territory	Negligible	Catch
Queensland	Coral Reef Fin Fish Fishery	Sustainable	Stock Assessment, standardised catch rate, catch
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); Coral Reef Fin Fish 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, *Plectropomus leopardus* dominates catches in the Reef Line Fishery (Queensland) [Leigh et al. 2014]. Other species such as *Plectropomus maculata* are also caught in inshore regions by both the recreational and commercial sectors. The level of this contribution of other species to the overall harvest of Coral Trout may warrant further investigation. The most recent stock assessment of Common Coral Trout conducted in 2020 based on calendar year data from 1961 to 2019 estimated that the biomass was 59 per cent of the unfished (1961) level [Campbell and Northrop 2020]. Annual harvest levels have been consistently below the estimated maximum sustainable yield (MSY) (1607 t). Over the last five years, 2015 to 2019, the Queensland total harvest averaged 1 027 t per year, including 839 t by the commercial sector, 65 t by the charter sector, 113 t by the recreational sector, and 11 t by Indigenous fishers [Campbell et al. 2020, QDAF 2020]. Approximately 33 per cent of the Great Barrier Reef Marine Park is protected from fishing, providing additional protection to the biomass of this stock. The above evidence indicated that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired.

The *Reef line fishery harvest strategy: 2020 -2025* manages fishing mortality for Common Coral Trout through setting sustainable catch limits [QDAF 2020]. Current total catch levels (958 t) are approximately 40 per cent lower than the estimated MSY (1 607 t) [Campbell and Northrop 2020] and below the total allowable commercial catch (TACC). In 2019, the total allowable TACC was set at 1 163 t based on advice from the 2019 stock assessment and set at a maximum economic yield target of 60 per cent of unfished biomass [Campbell et al. 2019]. As a precaution, QDAF also applied an additional buffer in the TACC setting process to account for scientific uncertainty associated with the assessment model. Since 2013–14, there have been three mass coral bleaching events, five severe cyclones and multiple crown of thorns outbreaks on the Great Barrier Reef (GBR) that have reduced coral cover throughout the GBR [AIMS 2018; GBRMPA 2019, 2020], reducing habitat and prey availability for Coral Trout [Tobin et al. 2010, Pratchett et al. 2014, Rogers et al. 2018]. Bleaching events can also influence Coral Trout growth rates [Hughes 2010], and spawning output [Johnson and Welsh 2010, Pratchett et al. 2013]. Loss of coral reef habitat and reductions in complexity have been found to result in reductions in fisheries productivity of approximately 35 per cent [Rogers et al. 2018]. Ongoing declines in coral cover may reduce the carrying capacity of GBR for Coral Trout species, which may influence the sustainability of this stock in the future. Setting the biomass target at 60 per cent through the TACC aims to provide additional resilience to the spawning stock from adverse environmental impacts. The above evidence indicates 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 Reef Fin Fish Fishery (Queensland) management unit is classified as a **sustainable stock**.

Gulf of Carpentaria Coral Trout 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), but only small catches are reported [Bessell-Browne et al. 2018; QFISH 2020]. Coral Trout is a popular recreational species for GOC residents and visiting fishers who target reef fish, but 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 (< 5 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

Annual commercial catches of Coral Trouts in the Torres Strait Finfish Fishery (TSFF) have remained below 50 tonnes (t) since 2007, including the most recent catches in 2017–18 (27 t) and 2018–19 (17.3 t). The Coral Trout stock in the TSFF has not been formally assessed, but 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 per cent of assumed unfished level, and all catch scenarios achieved a biomass of at least 70 per cent of the unfished level, by 2025.

Although changes in the management and operation of the fishery since the MSE was completed may have diminished the relevance of the results for informing current status, 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 recruitment is unlikely to be impaired [Williams et al. 2020]. 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, Coral Trouts in the Torres Strait Finfish Fishery are classified as a **sustainable stock**.

Western Australia

Coral Trouts are not a specific target species in the demersal fisheries of Western Australia, but are landed as by-product in these multi-species fisheries. Coral Trouts are landed in many of the demersal fisheries of Western Australia. For example, they are a component of the Pilbara Trap Managed Fishery (PTMF), Pilbara Fish Trawl Interim Managed Fishery (PTIMF), Pilbara Line Fishery (PLF) and the Northern Demersal Scalefish Managed Fishery (NDSMF; in the Kimberley region of Western Australia). Coral Trout are therefore assessed on the basis of the status of several indicator species (for example, Red Emperor and Goldband Snapper in the Kimberley region) that represent the inshore demersal suite of species occurring at depths of 30–250 m [Newman et al. 2020]. As outlined in the harvest strategy [DPIRD 2017], any management action is applied equally across all species in the demersal suite based on the status of the indicator species (e.g. increase or decrease in effort allocation). The major performance measures for these indicator species are estimates of spawning stock levels. The target level of spawning biomass is 40 per cent of the unfished level, with a threshold reference level of 30 per cent and a limit reference level of 20 per cent of the estimate of initial spawning biomass [DPIRD 2017]. As an example, indicator species assessments for Red Emperor, Rankin cod and Bluespotted Emperor in the Pilbara Demersal Scalefish Fisheries in 2015 (the year the last integrated assessment was undertaken), were estimated to be either above the target level or between the target and threshold level using an integrated age structured model [Newman et al. 2018]. Furthermore, the spawning biomass levels of the indicator species Red Emperor and Goldband Snapper were at the threshold level in the NDSMF in 2017 [Newman et al. 2020]. The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired.

Only small catches of Barcheek Coral Trout and Common Coral Trout are reported, with very small catches of Yellowedge Coronation Trout (*Variola louti*)

and White-edge Coronation Trout (*Variola albimarginata*). The total commercial catch of all species within the Coral Trout complex in Western Australia in 2019 was 29.1 t. The catch of the Coral Trout complex in Western Australia has been low and stable for the past 10 years (2010–19), ranging from 15.2–35.6 t, with a mean annual catch of 22.9 t. Catches of Coral Trout are low and variable throughout the group's range in Western Australia. Coral Trout are landed by recreational and charter fishers [e.g. Ryan et al. 2019], with the total estimated recreational catch (25 t; charter and recreational combined) being similar to the mean annual total landed commercial catch. Noting that in 2019, the commercial catch was higher than the estimated total recreational catch. Given the low level of overall landings (~50 t) of all species of Coral Trout, across multiple fisheries in Western Australia, it is unlikely that any one species is recruitment overfished, or that the level of fishing mortality is likely to cause any species in the Coral Trout complex in Western Australia to become recruitment overfished. The above evidence indicates that the current level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

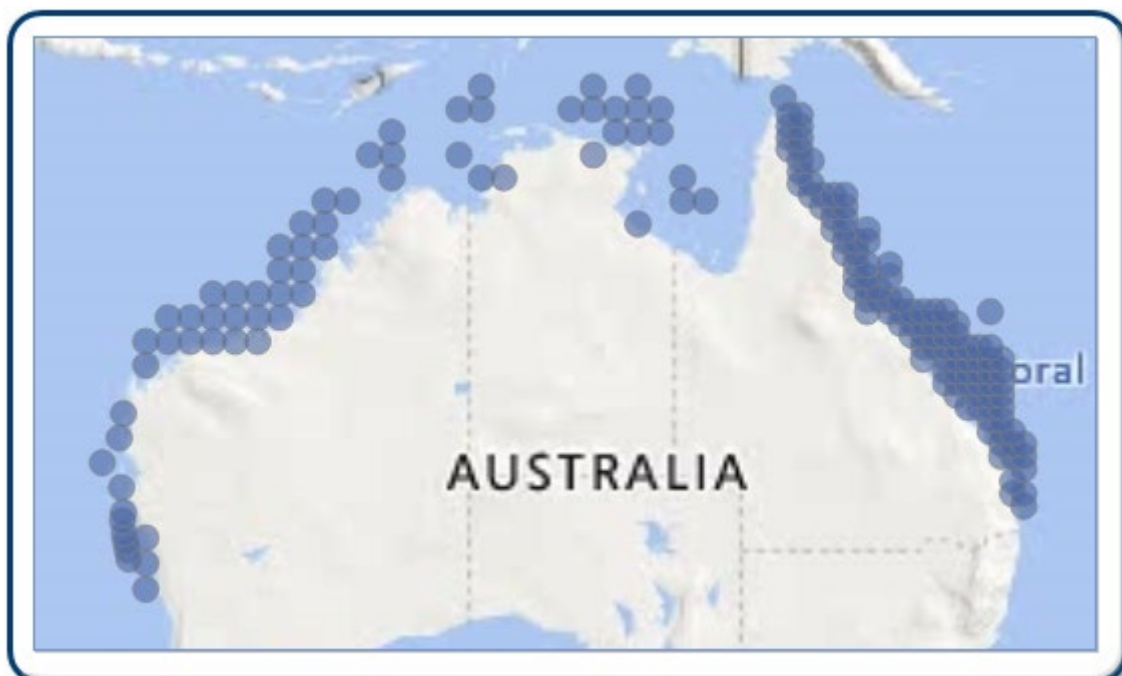
On the basis of the evidence provided above, the Coral Trout species group in Western Australia is classified as a **sustainable stock**.

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. P. maculatus: female ~300 mm FL, male ~440 mm FL P

DISTRIBUTION



Distribution of reported commercial catch of Coral Trout

TABLES

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

Management Methods				
	Commonwealth	Northern Territory	Queensland	Western Australia
Charter				
Gear restrictions			✓	✓
Licence				✓
Limited entry		✓		
Passenger restrictions		✓		
Possession limit			✓	✓
Seasonal closures			✓	
Size limit			✓	
Spatial closures			✓	

Commercial				
Catch restrictions	✓		✓	✓
Gear restrictions	✓	✓	✓	✓
Limited entry	✓	✓	✓	✓
Seasonal closures			✓	
Size limit	✓		✓	✓
Spatial closures	✓	✓	✓	✓
Spatial zoning		✓		
Temporal closures				✓
Total allowable catch		✓		
Vessel restrictions	✓	✓	✓	✓
Recreational				
Gear restrictions		✓	✓	✓
Licence (Recreational Fishing from Boat License)				✓
Possession limit		✓	✓	✓
Seasonal closures			✓	
Size limit			✓	✓
Spatial closures		✓	✓	✓
Spatial zoning		✓		
Temporal closures				✓

Catch				
	Commonwealth	Northern Territory	Queensland	Western Australia
Charter		1.6 t		4 t
Commercial	17.3099 t	0.7291 t	734.618 t	27.7982 t
Indigenous	Unknown	Unknown	Unknown	Unknown
Recreational	Unknown	2.3 t (2015)	223 t (2018-19)	21 t (2017/18)

Commonwealth Data Provided for the Commonwealth and Queensland align with the 2014–15 financial year.

Western Australia and Northern Territory Data provided for Western Australia and the Northern Territory align with the 2017 calendar 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.

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

Western Australia – Active Vessels Data is 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. 2019.

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.

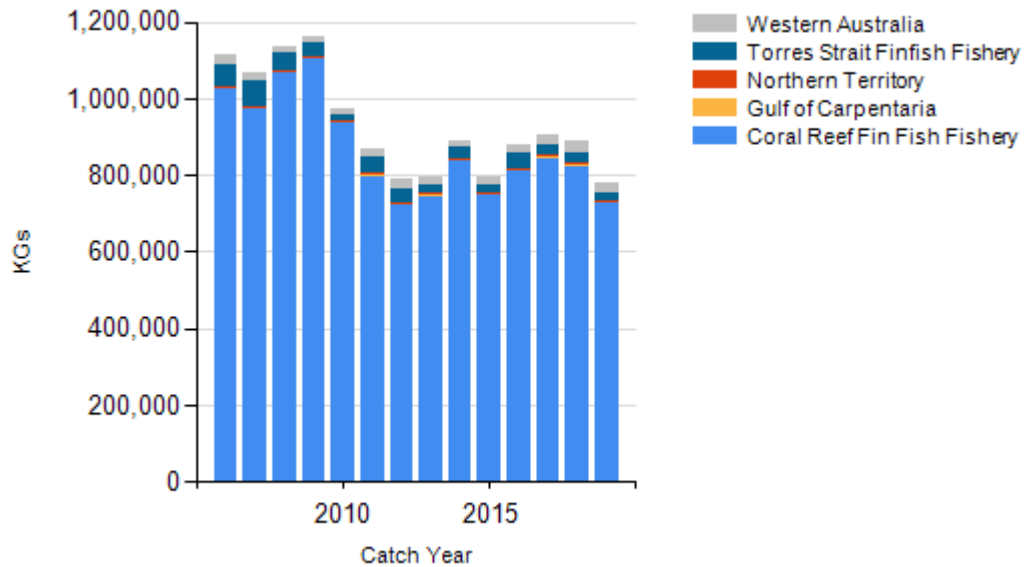
Western Australia – Indigenous (management methods) Subject to application of Section 211 of the *Native Title Act 1993* (Cth), and the exemption from a requirement to hold a recreational fishing licence, the non-commercial take by Indigenous fishers is covered by the same arrangements as that for recreational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

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* (NT), specifies that "...without derogating from any other law in force in the Territory, nothing in a provision of this Act or an instrument of a judicial or administrative character made under it limits the right of Aboriginals who have traditionally used the resources of an area of land or water in a traditional manner from continuing 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>

CATCH CHART



Commercial catch of Coral Trout - note confidential catch not shown

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STATUS OF AUSTRALIAN FISH STOCKS REPORT
CORAL TROUTS (2020)

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