

Redspot Emperor (2023)

Lethrinus lentjan



Grant Johnson: Department of Industry, Tourism and Trade, Northern Territory, **Stephen Newman:** Department of Primary Industries and Regional Development, Western Australia, **Fabian Trinnie:** Department of Primary Industries and Regional Development, Western Australia, **Peri Subritzky:** Department of Agriculture and Fisheries, Queensland

STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Western Australia	Western Australia	Sustainable	Catch, indicator species status
Northern Territory	Northern Territory	Sustainable	Catch, biomass
Queensland	East Coast	Undefined	Catch
Queensland	Gulf of Carpentaria Queensland	Undefined	Catch

STOCK STRUCTURE

Redspot Emperor is a widespread Indo-Pacific species, found throughout tropical Australia in both coastal and offshore habitats. This species inhabits northern Australia, with its range extending from approximately Gladstone, Queensland in the east, to Port Headland Western Australia, in the west [Carpenter and Allen 1989].

There is no information on population connectivity for this species in Australian waters and subsequently, this species has been assessed at the jurisdictional level for the Northern Territory and Western Australia. In Queensland, geographic separation caused by Torres Strait most likely results in limited movement between the Queensland east coast and the Queensland side of the Gulf of Carpentaria, consequently, this species has been assessed as two management units in this state.

Here, assessment of stock status is presented at the jurisdictional level—Western Australia and Northern Territory, and the management unit level—Gulf of Carpentaria Queensland and East Coast.

STOCK STATUS

East Coast Redspot Emperor on the East Coast of Queensland is mainly caught within the Great Barrier Reef Marine Park by line in the commercial and charter sectors in the Reef Line Fishery (RLF) [QDAF 2020a]. Within the RLF, Redspot Emperor is retained as a by-product species and managed through a multi species total allowable commercial catch (TACC) quota. In addition, species-specific harvest control rules and catch reference points were introduced for by-product species (including Redspot Emperor) through the RLF Harvest Strategy in 2020. Charter catch records span from 1995–96 to present with annual harvest increasing from 0.1 tonnes (t) up to 1 t in 2021–22. Commercial catch records span from 2002–03 to present with annual harvest increasing from 0.1 t to a peak of 1.6 t in 2019–20 and stabilising to 0.75 t to present. Most of the increase in harvest can be attributed to increases in charter and commercial harvest in far north Queensland. Recreational fishing catch could not be estimated in the latest Recreational Fishing Survey [Teixeira et al. 2021], however take is likely to be low. The indigenous take is unknown.

On the basis of the evidence provided above, Redspot Emperor along the Queensland East Coast is classified as an **undefined stock**.

Gulf of Carpentaria Queensland Redspot Emperor in the Gulf of Carpentaria, Queensland is mainly caught by trawling in the Gulf of Carpentaria Developmental Fin Fish Trawl Fishery (GOCDFFTF). The GOCDFFTF is managed as a developmental fishery under the Queensland *Fisheries Act 1994*, Queensland Fisheries (Commercial Fisheries) Regulation 2019 and the Fisheries (General) Regulation 2019 [QDAF 2020b]. Redspot Emperor are not targeted by the GOCDFFTF but are retained as a by-product species and managed through a multi species total allowable commercial catch (TACC) quota.

Commercial catch records span the period from 1997–2022, however, fishing has not occurred in every year. Commercial catches of Redspot Emperor increased from 1 t in 1996–97 to a peak of 13 t in 2004–05, then decreased to zero in 2016–17. Harvest resumed in 2020–21 when new developmental fishing permits were issued. Annual commercial catches increasing to 3 t in 2020–21 and 4.5 t in 2021–22. Redspot Emperor accounts for approximately 4% of the catch in the GOCDFFTF [Zeller and Snape 2006]. Recent fishery independent surveys estimated biomass of Redspot Emperor was 2,385 t in the eastern Gulf of Carpentaria, based on calculations using an effective trawl path for trawl swept area [Knuckey et al. 2022]. The recreational and indigenous take is unknown. There is insufficient information to confidently classify the status of this stock.

On the basis of the evidence provided above, Redspot Emperor in the Gulf of Carpentaria is classified as a **sustainable stock**.

Northern Territory Redspot Emperor was initially harvested by the foreign trawl fleet operating in this region in the 1970s and 1980s with catches up to 264 t [O'Neill et al. 2011]. In 1991 this fleet left Northern Territory waters and from 1995 a single trawl vessel in the fishery resulted in catches of this species resuming. Catches were initially relatively low (averaging 32 t) but increased when three additional

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trawlers commenced fishing in 2012. Catch in the last 10 years (2013–22) has ranged from 48 t to 130 t, at an annual average of 85 t. This species is primarily encountered offshore in Northern Territory and consequently recreational and charter catch is minimal [West et al. 2022]. Similarly, indigenous catch is unknown, but given this species offshore distribution, is also assumed to be negligible.

A fishery independent survey was undertaken in 2021 to estimate the relative biomass of key offshore species in Northern Territory waters. As a result of this work the biomass of Redspot Emperor across the Northern Territory jurisdiction was estimated to be 8,153 t with a coefficient of variation of 0.17 [Knuckey and Koopman 2022]. The commercial harvest in this stock has averaged 85 t in the last 10 years (2013–22), which represents a harvest fraction of 1.05% of the estimated biomass. It is important to note that the survey was designed to obtain a time-series of consistent and robust relative abundance indices and due to uncertainties around assumptions of catchability, herding and escapement, this one-off estimate of absolute abundance should be used with caution [Knuckey and Koopman 2022]. Regardless, this estimate of biomass can assist in understanding the impact fishing has on this stock, with the low level of catch relative to biomass size indicating the stock is unlikely to be depleted and the level of fishing mortality is unlikely to result in the stock becoming recruitment impaired.

On the basis of the evidence provided above, Redspot Emperor in the Northern Territory jurisdiction is classified as a **sustainable stock**.

**Western
Australia**

The majority of the commercial catch of Redspot Emperor in WA is landed in the Pilbara Fish Trawl (Interim) Managed Fishery. They have also been landed in small quantities in the Northern Demersal Scalefish Managed Fishery, and the Pilbara Trap Managed Fishery. Redspot Emperor 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 [Wakefield et al. 2023]. The level of risk associated with the sustainability of Redspot Emperor in the NCDR is assessed as low. This assessment of Redspot Emperor 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).

The total catch of Redspot Emperor across WA over the last 10 years (2013–22) has ranged from 19–67 t, with a mean annual catch of 34 t. This is a decline from the average catches across the previous 10 years of 53 t. Recreational and charter catches are relatively low compared to the commercial catch, in the past 10 years where reliable catch estimates are available, their contribution of the total catch has averaged less than 1% [Ryan et al. 2022]. Analyses using a Catch-MSY model applied to data on annual catches for this species (1995–2022), indicated that at the beginning of this time period, annual catches were around the median estimate of the model prediction for maximum sustainable yield (MSY). Catches then increased to above the upper 95% CI for MSY in the period from 2001–06, before declining below the lower 95% CI in the period from 2008–17, after which catches then increased to fluctuate around MSY. The above trends are consistent with the predicted values for biomass declining below BMSY (in 2004), remaining below BMSY until 2013, then increasing above

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BMSY from 2014 onwards, with predicted fishing mortality remaining below FMSY since 2014. 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 domestically and foreign fleets prior to the start of the time series, final depletion (0.15–0.7), based on recent catches relative to maximum recorded annual catch and the non-targeted nature of commercial fishing for this species, and low resilience ($r=0.1-0.6$, consistent with species longevity, of approximately 20 years in QLD). Given the relatively low levels of overall landings of Redspot Emperor across multiple fisheries in Western Australia, recent catches of this species remaining within the predicted MSY range, and the status of the indicator species for the NCDR, it is considered unlikely that the biomass of Redspot Emperor in Western Australia is depleted and recruitment is unlikely to be impaired. Furthermore, the level of fishing mortality is unlikely to result in the stock becoming recruitment impaired.

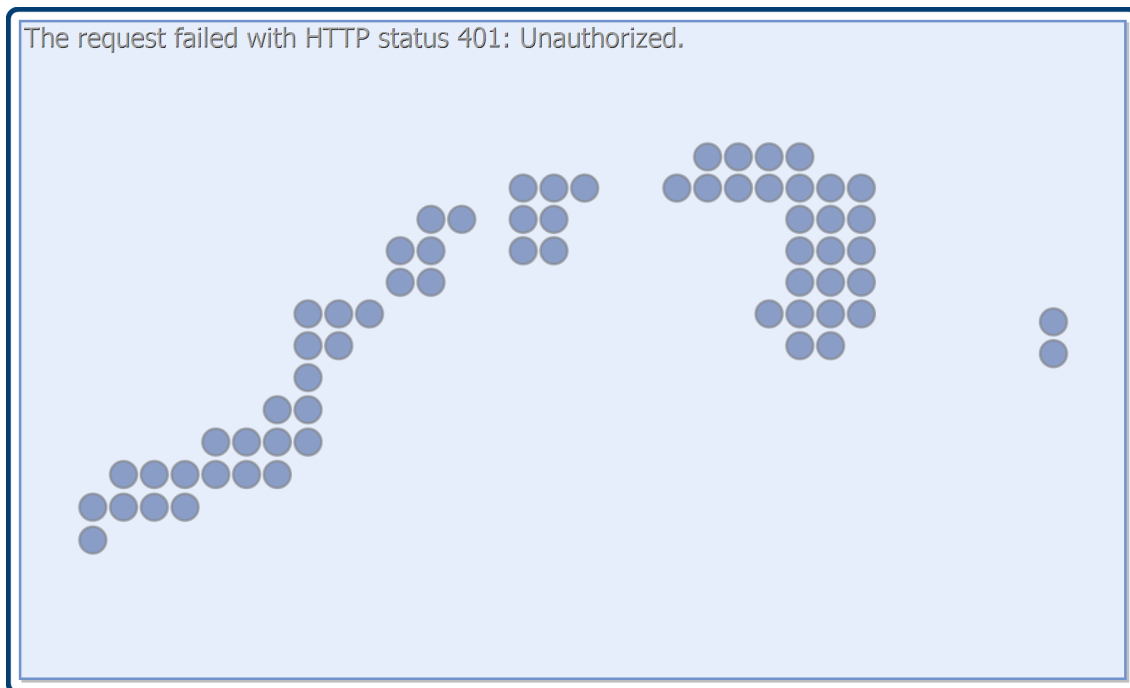
On the basis of the evidence provided above, Redspot Emperor in WA is classified as a **sustainable stock**.

BIOLOGY

Redspot Emperor biology [Currey et al. 2009; Currey et al. 2013; Grandcourt 2002; Johnson unpublished; Mobiha 1991]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Redspot Emperor	19 years, 450 mm FL	Female maturity: unknown. Male maturity: least a proportion of the population are thought to undergo protogynous sex change (to male): 2.5 to 3.5 years, 270 mm FL

DISTRIBUTION



Distribution of reported commercial catch of Redspot Emperor – confidential catch is not shown

TABLES

Fishing methods	Northern Territory	Queensland	Western Australia
Charter			
Hook and Line		✓	
Rod and reel			✓
Spearfishing		✓	✓
Commercial			
Bottom Trawls	✓		
Fish Trap	✓		✓
Hand Line, Hand Reel or Powered Reels			✓
Line		✓	
Midwater Trawl		✓	
Otter Trawl			✓
Trawl	✓		
Unspecified	✓		

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Recreational			
Hook and Line		✓	✓
Spearfishing		✓	

Management Methods		
	Northern Territory	Queensland
Charter		
Bag and possession limits		✓
Gear restrictions		✓
Seasonal or spatial closures		✓
Size limits		✓
Commercial		
Gear restrictions	✓	✓
Harvest Strategy		✓
Individual transferable quota		✓
Limited entry		✓
Seasonal or spatial closures		✓
Size limit		✓
Spatial closures	✓	
Spatial zoning	✓	
Total allowable catch	✓	✓
Vessel restrictions		✓
Recreational		
Bag and possession limits		✓

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Gear restrictions		✓
Seasonal or spatial closures		✓
Size limit		✓

Catch			
	Northern Territory	Queensland	Western Australia
Charter	< 1 t	2 t	Unknown
Commercial	130.824 t	0.7146 t	48.4813 t
Indigenous	Unknown	Unknown	Unknown
Recreational	< 1 t	Unknown	< 1 t

Northern Territory - Indigenous (Management Methods). The *Fisheries Act 1988* (NT), 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 with high uncertainty (Residual Error greater than 50 %) has been excluded and listed as unknown. More information available at: <https://www.daf.qld.gov.au/business-priorities/fisheries/monitoring-research/monitoring-reporting/statewide-recreational-fishing-surveys>

Queensland – Commercial (Catch). Queensland commercial and charter data have been sourced from the commercial fisheries logbook program. Further information available through the Queensland 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>

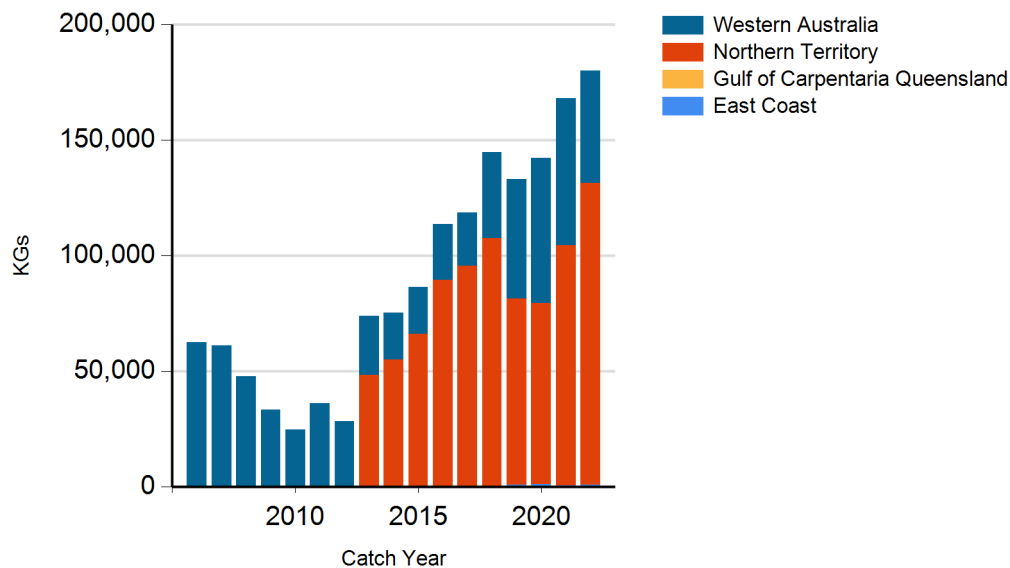
Western Australia – Recreational (catch). Boat-based recreational catch between 1 September 2020 and 31 August 2021 from Ryan et al. [2022]. Please note that catches of Blue Threadfin are underestimates as shore-based and boat-based fishers that only operated in freshwater were out of scope of the survey.

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.

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CATCH CHART



Commercial catch of Redspot Emperor - note confidential catch not shown

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