

Ornate Rock Lobster (2023)

Panulirus ornatus



Brooke D'Alberto: Australian Bureau of Agricultural and Resource Economics and Sciences, **Simon de Lestang:** Department of Primary Industries and Regional Development, Western Australia, **Jasmine Morton:** Department of Agriculture and Fisheries, Queensland, **Amy Kirke:** Department of Industry, Tourism and Trade, Northern Territory

STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Commonwealth, Northern Territory, Queensland	North-Eastern Australia	Sustainable	Biomass, fishing mortality, stock assessment, catch relative to MSY estimate
Western Australia	Western Australia	Negligible	

STOCK STRUCTURE

Ornate Rock Lobster populations in northern Queensland (managed by Queensland), the Coral Sea (managed by the Commonwealth) and the Torres Strait (managed by the Torres Strait Protected Zone Joint Authority) are thought to comprise a single North-Eastern Australia biological stock, as a result of mixing of larvae in the Coral Sea [Pitcher et al. 2005; Plagányi et al. 2018]. Water movement models in Torres Strait predict that larvae are likely to be transported into the Gulf of Carpentaria [Wolanski et al. 2013], indicating that the north-eastern stock encompasses this region as well. Stock assessments have only been conducted at the jurisdictional level (Torres Strait and Queensland), with the assumption of jurisdictional stock boundaries. A stock assessment has not been carried out for the complete biological stock. Although Ornate Rock Lobster is also present in northern Western Australia, biological stock structures in this region have not been studied, however a project has been initiated to examine the genetic stock structure across this region, with results expected by 2025.

Here, assessment of stock status is presented at the biological stock level—North-Eastern Australia; and at the jurisdictional level—Western Australia.

STOCK STATUS

**North-
Eastern
Australia**

Stock status for the entire Ornate Rock Lobster North Eastern Australia biological stock has been established using evidence from the Torres Strait, Queensland and Coral Sea parts of the biological stock.

For the Torres Strait part of the biological stock, the stock assessment by Plagányi et al. [2020], estimated the 2019 spawning biomass to be approximately 4,467 tonnes (t) or 93% of the estimated unfished (1973) level, which is well above the target reference point (65% of unfished level) and limit reference point (32% of unfished level) [Plagányi et al. 2020]. This suggested the stock had recovered following the period of low recruitment in the fishery [AFMA 2019; Plagányi et al. 2020]. This part of the stock is not considered to be recruitment impaired. The model-generated recommended biological catch (RBC) for the 2020–21 fishing season was 623.5 t. Australian Fisheries Management Authority (AFMA) subsequently set 623.5 t as the total allowable commercial catch (TACC) [AFMA 2020], of which 322.6 t (51.7% of the TACC) was caught [Butler et al. 2022]. This level of fishing mortality is unlikely to cause this part of the stock to become recruitment impaired.

The Ornate Rock Lobster is the primary species targeted and retained in the Queensland Crayfish and Rock Lobster Fishery (QCRLF). Ornate Rock Lobster catch peaked in 2007–08 at 295 t and 1,344 effort days and again in 2016–17 at 265 t and 884 days. Following the most recent peak, catch has declined and stabilised with an average of 78 t and 466 effort days over the last five years. In 2021–22, 121 t of Ornate Rock Lobsters were retained over 745 effort days. Whilst showing a degree of inter year variability, annual catch levels since the most recent peak have remained below the TAC of 195 t.

A stock assessment on the north Queensland sector of the biological stock estimated Ornate Rock Lobster biomass to be 60 to 70% of the unfished 1988 level in 2008 [DEEDI 2011]. Since this assessment, catch has been consistently below 2008 levels, in part due to the TAC of 195 t that was introduced for the commercial fishery in 2009. The TAC was based on a conservative 80% of the estimated maximum sustainable yield for the Queensland portion of the stock.

Since 2021, the QCRLF has been managed through the *Queensland crayfish and rock lobster fishery harvest strategy: 2021–2026*. Under this strategy, no management action is required providing catch of Ornate Rock Lobster is no higher than the target biomass (*B_{targ}*) of 60%. The current TACC is set at an appropriate level to achieve maximum economy yield. Ornate Rock Lobster are primarily managed through individual transferable quotas (ITQ) for commercial fishing and in-possession limits for recreational fishing [Department of Agriculture and Fisheries 2021]. Approximately 33% of the Great Barrier Reef Marine Park is protected [GBRMPA 2023], providing additional protection from fishing to the biomass of this stock. This part of the biological stock is not considered to be recruitment impaired, and this level of fishing mortality is unlikely to cause this stock to become recruitment impaired.

No quantitative stock assessments have been carried out for the Coral Sea part of the biological stock, but there is only limited targeting of Ornate Rock Lobster in this area and catches have been very low [Noriega et al. 2022]. Estimates of density on Coral Sea reefs, inferred from fishers' catch rates, suggest that the available biomass greatly exceeds any catch that has taken place [Chambers 2015]. No commercial catch was recorded in the 2020–21 fishing season. The above evidence indicates that the biomass of this part of the stock is not considered to be depleted and that recruitment is unlikely to be impaired. This level of fishing mortality is unlikely to cause this part of the biological stock to become recruitment impaired.

STATUS OF AUSTRALIAN FISH STOCKS REPORT
Ornate Rock Lobster (2023)

Only small annual catches of Ornate Rock Lobster have been recorded in the Northern Territory under a developmental permit in the Gulf of Carpentaria between 1994–2001 and 2012–2016. Catch peaked in 1996 (500 kg), however was never greater than 220 kg in any other years fished, and there has been no activity in this fishery since 2016. Additionally, there have been low reported catches (less than 10 kg) by Fishing Tour Operators but there was no catch recorded by any fishery in 2022. There has never been a targeted fishery for this species in this jurisdiction, and the small catches recorded are highly unlikely to influence the biomass of this stock. Available evidence indicates the biomass of the stock in this region is unlikely to be depleted and recruitment is unlikely to be impaired. The current level of fishing mortality is unlikely to cause recruitment to become impaired.

On the basis of the evidence provided above, the North Eastern Australia biological stock is classified as a **sustainable stock**.

**Western
Australia**

Stock status for Western Australia is reported as Negligible as a result of low catches and fishing is unlikely to be having a negative impact on the stock. No commercial catch is taken from Western Australia. Very small catches are taken by charter operators (less than 50 individuals year⁻¹) and low catches are recorded by recreational fishers through recreational surveys (approximately 200 in 2020–21) [Ryan et al. 2022].

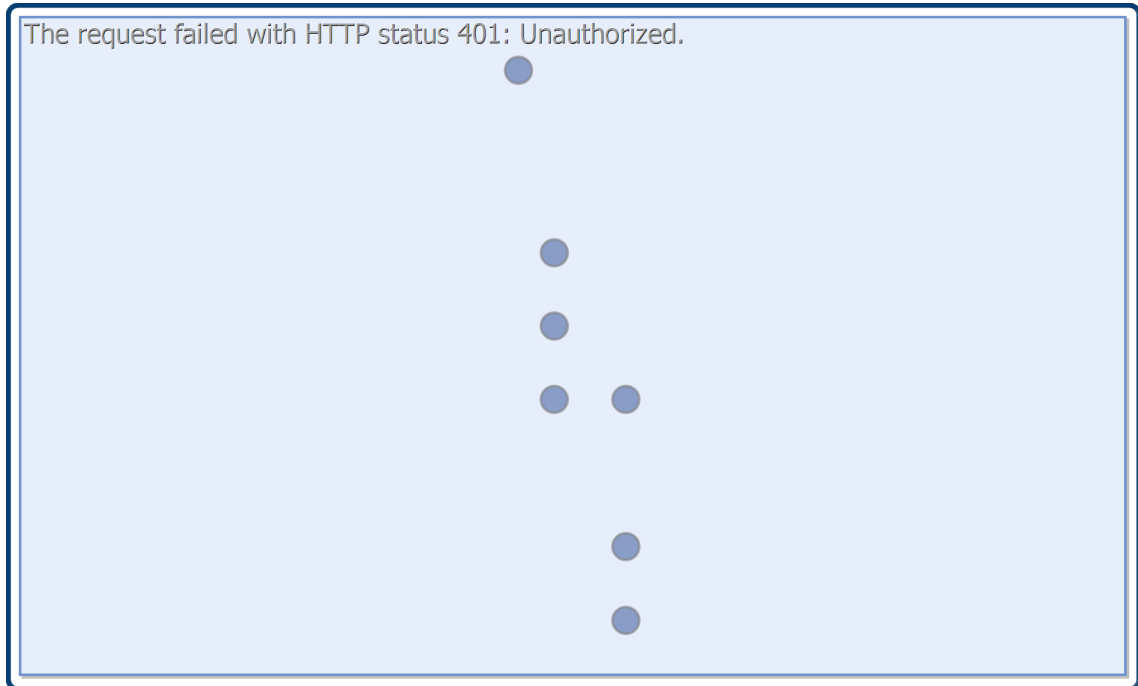
BIOLOGY

Ornate Rock Lobster biology [MacFarlane and Moore 1986; Kailola et al. 1993; Skewes et al. 1997]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Ornate Rock Lobster	3–5+ years, over 150 mm CL	2–3 years, approximately 100 mm CL

DISTRIBUTION

STATUS OF AUSTRALIAN FISH STOCKS REPORT
Ornate Rock Lobster (2023)



Distribution of reported commercial catch of Ornate Rock Lobster

TABLES

Fishing methods	Commonwealth	Northern Territory	Queensland	Western Australia
Charter				
Diving		✓	✓	✓
Commercial				
Diving	✓		✓	
Unspecified		✓		
Recreational				
Diving		✓	✓	✓

Management Methods	Commonwealth	Northern Territory	Queensland
Charter			
Bag/possession limits			✓
Boat limits			✓
Gear restrictions			✓

STATUS OF AUSTRALIAN FISH STOCKS REPORT
Ornate Rock Lobster (2023)

Limited entry		✓	
Male-only harvest			✓
Passenger restrictions		✓	
Prohibition on take of egg-bearing and tar-spot females			✓
Seasonal or spatial closures			✓
Size limits			✓
Commercial			
Gear restrictions	✓	✓	✓
Harvest Strategy			✓
Individual transferable quota			✓
Limited entry	✓	✓	✓
Male-only harvest			✓
Prohibition on take of egg-bearing and tar-spot females		✓	✓
Seasonal closures	✓		
Seasonal or spatial closures			✓
Size limits	✓		✓
Spatial closures	✓	✓	
Total allowable catch	✓		✓
Vessel restrictions	✓		✓
Recreational			
Bag/possession limits			✓

STATUS OF AUSTRALIAN FISH STOCKS REPORT
Ornate Rock Lobster (2023)

Boat limits			✓
Gear restrictions		✓	✓
Male-only harvest			✓
Possession limit		✓	
Prohibition on take of egg-bearing and tar-spot females		✓	✓
Seasonal or spatial closures			✓
Size limits			✓
Spatial closures		✓	

Catch				
	Commonwealth	Northern Territory	Queensland	Western Australia
Charter		< 100 kg		Insufficient data
Commercial	325.4 t	0 t	121.483 t	0 t
Indigenous		Unknown	13,000 lobsters (in 2001)	
Recreational		Unknown	Unknown	Insufficient data

Commonwealth – Commercial (Management Methods/Catch). The most recent data available for the Torres Strait Tropical Rock Lobster Fishery (TSTRLF) is for the 2021–22 fishing season.

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 (Management Methods). 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, and Fisheries (DAF) (Queensland); and the Torres Strait Regional Authority. The PZJA also manages non-Indigenous commercial fishing in the Torres Strait.

Commonwealth – Indigenous (Catch Totals). This specifically refers to non-commercial Indigenous catch. Commercial Indigenous catch in the Torres Strait is included under 'commercial'.

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: "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".

Northern Territory – Recreational (Catch). Boat ramp surveys of recreational fishers are conducted annually in the greater Darwin region (2014–2022). Northern Territory wide recreational fishing surveys were conducted in 2000–01, 2009–10 and 2018–19.

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

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>

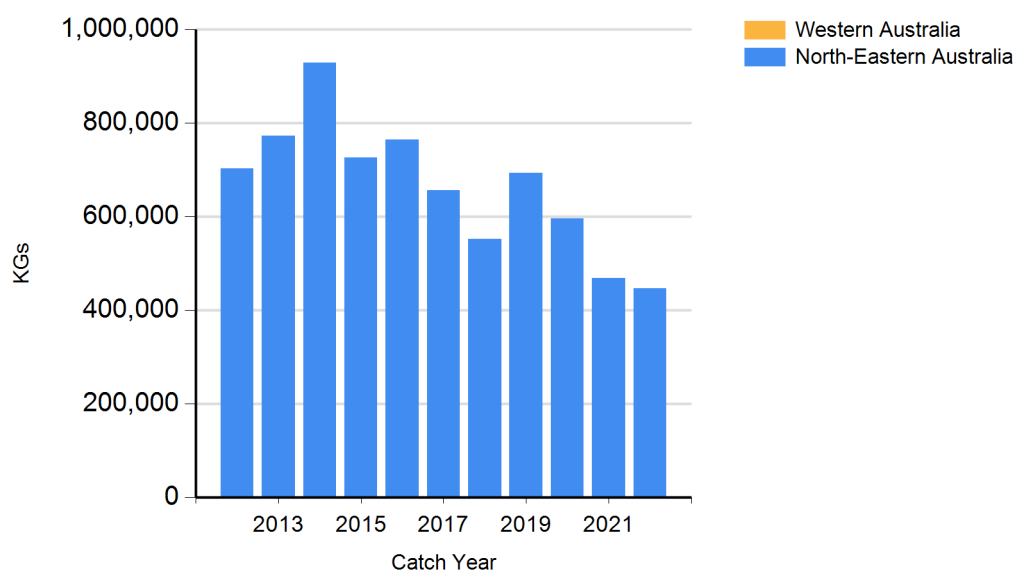
Queensland – Commercial (Management Methods)- Harvest strategies are available at: <https://www.daf.qld.gov.au/business-priorities/fisheries/sustainable/harvest-strategy> -

Queensland – Recreational Fishing (Catch) Data with high uncertainty (Residual Error >50 %) have 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>.

CATCH CHART

STATUS OF AUSTRALIAN FISH STOCKS REPORT
Ornate Rock Lobster (2023)



Commercial catch of Ornate Rock Lobster - note confidential catch not shown

References	
Chambers 2015	Chambers, M 2015, Status determination for trochus and tropical rock lobster stocks in the Coral Sea Fishery hand collection sector, in Larcombe, J, Noriega, R and Stobutzki, I (eds), Reducing uncertainty in fisheries stock status, ABARES research report, Canberra.
DEEDI 2011	DEEDI 2011, Annual status report 2011: Commercial Crayfish and Rocklobster Fishery, Queensland Department of Employment, Economic Development and Innovation, Brisbane.
Kailola et al. 1993	Kailola, P, Williams, M, Stewart, P, Riechelt, R, McNee, A and Grieve, C 1993, Australian fisheries resources, Bureau of Resource Sciences and Fisheries Research and Development Corporation, Canberra.
MacFarlane and Moore 1986	MacFarlane, J and Moore, R 1986, Reproduction of the ornate rock lobster, <i>Panulirus ornatus</i> (Fabricius), in Papua New Guinea, Marine and Freshwater Research, 37: 55–65.
Pitcher et al. 2005	Pitcher, C, Turnbull, C, Atfield, J, Griffin, D, Dennis, D and Skewes, T 2005, Biology, larval transport modelling and commercial logbook data analysis to support management of the NE Queensland rock lobster <i>Panulirus ornatus</i> fishery, Fisheries Research and Development Corporation project 2002/008, CSIRO Marine Research, Brisbane.
Ryan et al. 2022	Ryan K, Lai, E and Smallwood, C 2022, Boat-based recreational fishing in Western Australia 2020/21, Fisheries Research Report No. 327, Department of Primary Industries and Regional Development, Western Australia, 221 pp.
Skewes et al. 1997	Skewes, T, Pitcher, C and Dennis, D 1997, Growth of ornate rock lobsters, <i>Panulirus ornatus</i> , in Torres Strait, Australia, Marine and Freshwater Research, 48: 497–501.
Wolanski et al. 2013	Wolanski, E, Lambrechts, J, Thomas, C and Deleersnijder, E 2013, The net water circulation through Torres Strait, Continental Shelf Research, 64: 66–74.
Plagányi et al. 2020	Plagányi, É, Tonks, M, Murphy, N, Campbell, R, Deng, R, Edgar, S, Salee, K and Upston, J 2020, Torres Strait tropical rock lobster (TRL) milestone report 2020 on fishery surveys, CPUE, stock assessment and harvest strategy, AFMA Project R2019/0825, May 2020, CSIRO Oceans and Atmosphere Brisbane.
AFMA 2019	AFMA 2019, Torres Strait Tropical Rock Lobster Resource Assessment Group Meeting 27, meeting record, 10 to 11 December 2019, Thursday Island, Australian Fisheries Management Authority, Thursday Island.
Butler et al. 2022	Butler, I, D'Alberto, B, Emery, T and Tuynman, H 2022, Torres Strait Tropical Rock Lobster Fishery, in Patterson, H, Larcombe, J, Woodhams, J and Curtotti, R (eds), Fishery status reports 2022, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.

STATUS OF AUSTRALIAN FISH STOCKS REPORT
Ornate Rock Lobster (2023)

Noriega et al. 2022	Noriega, R, Keller, K, Butler, I and Curtotti, R 2022, Coral Sea Fishery, in Patterson, H, Larcombe, J, Woodhams, J and Curtotti, R (eds), Fishery status reports 2022, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.
Pláganyi et al. 2018	Plágányi, É, Haywood, M, Gorton, B and Condie, S 2018, Environmental drivers of variability and climate projections for Torres Strait tropical lobster <i>Panulirus ornatus</i> , AFMA and CSIRO final project report, AFMA project 2017/0816, CSIRO, Cleveland, Queensland.
Department of Agriculture and Fisheries 2021	Department of Agriculture and Fisheries 2021, Queensland crayfish and rock lobster fishery harvest strategy: 2021–2026, Queensland, Brisbane.
GBRMPA 2023	GBRMPA 2023, Our story, Great Barrier Reef Marine Park Authority.
AFMA 2020	AFMA 2020, Torres Strait Tropical Rock Lobster Resource Assessment Group meeting 30, meeting record, 16 December 2020, Thursday Island, Australian Fisheries Management Authority, Thursday Island.