

Redthroat Emperor (2016)

Lethrinus miniatus



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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Fisheries	Stock status	Indicators
Western Australia	Western Australia	GDSMF, WCDGDLIMF, WCDSIMF	Transitional-recovering	Catch
Queensland	East Coast Queensland	CRFFF	Sustainable	Catch, CPUE, stock assessment

CRFFF Coral Reef Fin Fish Fishery (QLD), GDSMF Gascoyne Demersal Scalefish Managed Fishery (WA), WCDGDLIMF West Coast Demersal Gillnet and Demersal Longline (Interim) Managed Fishery (WA), WCDSIMF West Coast Demersal Scalefish (Interim) Managed Fishery (WA)

STOCK STRUCTURE

Genetic analysis indicates that there are two separate biological stocks of Redthroat Emperor in western and eastern Australian waters[1].

Here, assessment of stock status is presented at the biological stock level—Western Australia and East coast Queensland.

STOCK STATUS

East Coast Queensland The most recent assessment (2006) of the East coast Queensland biological stock[7] of Redthroat Emperor used an integrated age structured model that incorporated all available information on catch, catch per unit effort and age structure. The model estimated that biomass in 2004 was approximately 70 per cent of the unfished (1946) level. The maximum sustainable yield was estimated to be in the range of 760–964 t per year. Since 2004–05, annual commercial catches have averaged approximately 220 t. The latest recreational estimate (for 2010) was 51 t, with the combined catch being well below the estimated maximum sustainable yield[8]. The stock is not considered to be recruitment overfished.

Fishing mortality over the past decade has been low compared with the

maximum sustainable yield estimate, and both total catches and commercial standardised catch rates have been stable. This level of fishing pressure is highly unlikely to cause the stock to become recruitment overfished.

On the basis of the evidence provided above, the East coast Queensland biological stock is classified as a **sustainable stock**.

Western Australia

A stock assessment of the Western Australian biological stock of Redthroat Emperor has not yet been conducted. Management arrangements introduced between 2008 and 2010 were designed to recover stocks of all demersal species (including the Western Australian biological stock of Redthroat Emperor) in the Western Australian jurisdiction where Redthroat Emperor is primarily exploited. This followed assessments in 2007 of three indicator species (West Australian Dhufish, Snapper and Baldchin Groper) for this demersal suite, which identified that overfishing had been occurring, with fishing mortality rates exceeding the limit reference point of 1.5 times the natural mortality rates for those species[2]. The recovery strategy is designed to reduce F for these indicator species to less than the threshold reference point, by ensuring catches of demersal species do not exceed 50 per cent of 2005–06 levels (450 tonnes [t] commercial and 250 t recreational). The indicator species are assumed to represent the status of the whole demersal suite (including the Western Australian Redthroat Emperor stock) and were selected based on a range of factors, including inherent vulnerability, social/economic importance and management requirements[3].

The above evidence and assumptions indicate that the biomass of the Western Australian biological stock of Redthroat Emperor is likely to be recruitment overfished. However, for the period 2008–15 these indicators suggest a recovering stock.

Commercial and recreational catches of the demersal suite of species have remained below 50 per cent of 2005–06 catches. Fishing mortality rates for the demersal indicator species have also demonstrated early signs of stock recovery, having decreased since the previous assessment[4]. Commercial catches of Redthroat Emperor have been stable (48±65 t) since 2009 at less than 50 per cent of 2005–06 levels (less than 95 t)[5], indicating that fishing mortality rates would have also decreased for this biological stock. Recreational and charter catches are small (9 t)[6]. The first assessment of age-based fishing mortality rates for the Western Australian Redthroat Emperor biological stock will be completed in 2017.

The above evidence indicates that the current level of fishing pressure should allow the stock to recover from its recruitment overfished state.

On the basis of the evidence provided above, the Western Australian biological stock is classified as a **transitional−recovering stock**.

BIOLOGY

Redthroat Emperor biology[1,9,10]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Redthroat Emperor	20 years; 650 mm <u>TL</u>	Females: 1.2 years; 280 mm <u>FL</u> , 310 mm <u>TL</u>

DISTRIBUTION



Distribution of reported commercial catch of Redthroat Emperor

TABLES

Commercial Catch Methods	Queensland	Western Australia
Line	✓	
Various		✓

Fishing methods	Queensland	Western Australia
Commercial		
Line	✓	
Various		✓
Indigenous		
Hand Line, Hand Reel or Powered Reels	✓	✓
Spearfishing	✓	✓

Recreational		
Hand Line, Hand Reel or Powered Reels	✓	✓
Spearfishing	✓	✓
Management Methods		
	Queensland	Western Australia
Commercial		
Catch restrictions	✓	✓
Effort limits		✓
Gear restrictions	✓	✓
Limited entry	✓	✓
Size limit	✓	✓
Spatial closures	✓	✓
Spatial zoning		✓
Temporal closures	✓	
Total allowable effort		✓
Vessel restrictions	✓	✓
Indigenous		
Catch limits		✓
Gear restrictions		✓
Size limits		✓
Spatial closures		✓
Temporal closures		✓
Recreational		
Catch limits	✓	✓
Gear restrictions	✓	✓
Licence (fishing from a boat)		✓
Limited entry	✓	✓
Passenger restrictions	✓	✓

Size limit	✓	✓
Spatial closures	✓	✓
Spatial zoning		✓
Temporal closures	✓	✓

Active Vessels	Queensland	Western Australia
	162 Vessel in CRFFF,	16 License in GDSMF, 5 License in WCDGDLIMF, 37 License in WCDSCMF,

CRFFF Coral Reef Fin Fish Fishery(QLD)

GDSMF Gascoyne Demersal Scalefish Managed Fishery(WA)

WCDGDLIMF West Coast Demersal Gillnet and Demersal Longline (Interim) Managed Fishery(WA)

WCDSCMF West Coast Deep Sea Crustacean Managed Fishery(WA)

Catch	Queensland	Western Australia
Commercial	201.877t in CRFFF,	11.2392t in GDSMF, 0.0486t in WCDGDLIMF, 43.4232t in WCDSIMF,
Indigenous	Unknown	Unknown
Recreational	37 000 fish (2013); ~51 t	~ 5 t (2014–15)

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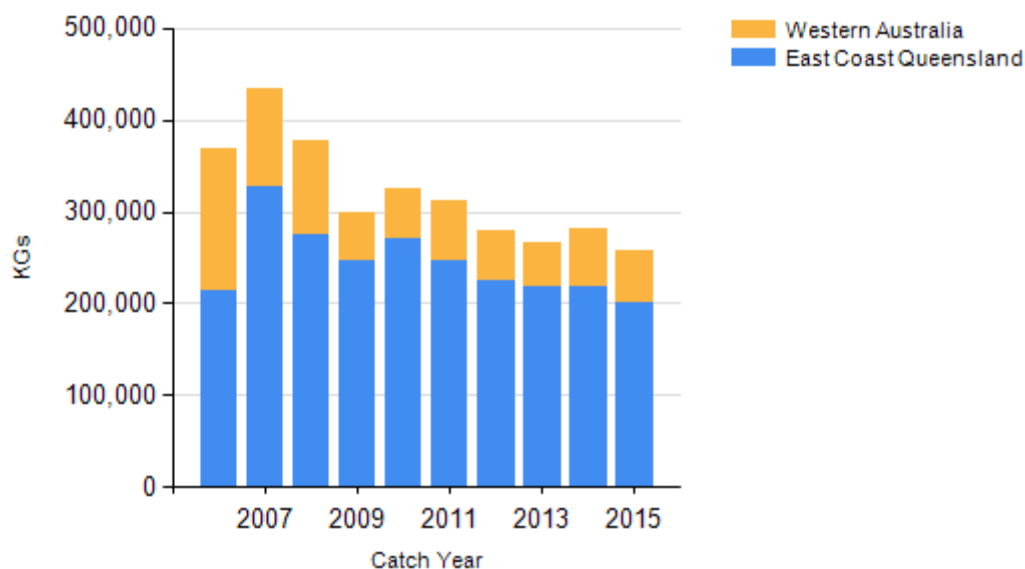
a Queensland Data for Queensland align with the 2012–13 financial year.

b Western Australia Data for Western Australia align with the 2015 calendar year.

c Queensland – Indigenous (management methods) Under the Fisheries Act 1994 (Qld), Indigenous fishers in Queensland are entitled to use prescribed traditional and Non-commercial fishing apparatus in waters open to fishing. Size and possession limits, and seasonal closures do not apply to Indigenous fishers. Further exemptions to fishery regulations may be applied for through permits.

d Indigenous (management methods) Subject to the defence that applies under 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 Redthroat Emperor - note confidential catch not shown

EFFECTS OF FISHING ON THE MARINE ENVIRONMENT

- The incidence of coral disease is greatly increased in coral reef areas where fishing occurs, compared to areas where fishing is prohibited. Coral damage and derelict fishing line were the main causes of such difference in disease prevalence[11].
- The effect of removal of target fish and fishing induced mortality of discarded fish is unknown.
- There is little evidence to suggest that the fisheries targeting Redthroat Emperor are impacting significantly on the marine environment or ecosystems.

ENVIRONMENTAL EFFECTS on Redthroat Emperor

- Coral bleaching events caused by climate change-induced ocean warming threatens the persistence of coral reefs[12], although it is unclear what effect this will have on Redthroat Emperor. Changes in ocean chemistry due to ocean acidification are also likely to affect coral reefs[13]. Additionally, ocean acidification has the potential to impact on the replenishment rates of coral reef finfish populations by affecting larval survival[14], as well as individual growth rates and spawning output[15].

References	
1	Van Herwerden, L, Aspden, WJ, Newman, SJ, Pegg, GG, Briskey, L and Sinclair, W 2009, A comparison of the population genetics of <i>Lethrinus miniatus</i> and <i>Lutjanus sebae</i> from the east and west coasts of Australia: evidence for panmixia and isolation, Fisheries Research, 100: 148–155.
2	Wise, B.S., St John, J., Lenanton, R.C. (Eds.), 2007, Spatial scales of exploitation among populations of demersal scalefish: implications for management. Part 1: stock status of the key indicator species for the demersal scalefish fishery in the West Coast Bioregion. Final report to Fisheries Research and Development Corporation, Project 2003/052. Fisheries Research Report No. 163. Department of Fisheries Western Australia. 130 pp.
3	Department of Fisheries Western Australia 2011, Resource Assessment Framework (RAF) for finfish resources in Western Australia. Fisheries Occasional Publication No. 85. Department of Fisheries Western Australia, Perth.
4	Fairclough, DV, Molony, BW, Crisafulli, BM, Keay, IS, Hesp, SA and Marriott, RJ, 2014, Status of demersal finfish stocks on the west coast of Australia, Fisheries Research Report No. 253, Department of Fisheries Western Australia, Perth.
5	Fairclough, D, Lai, E, Holtz, M, Nicholas, T and Walters, S 2014, West coast demersal scalefish resource status report, in WJ Fletcher and K Santoro (eds), Status reports of the fisheries and aquatic resources of Western Australia 2013/14: state of the fisheries, Department of Fisheries Western Australia, Perth.
6	Ryan, KL, Wise, BS, Hall, NG, Pollock, KH, Sulin, EH and Gaughan, DJ 2013, An integrated system to survey boat-based recreational fishing in Western Australia 2011/12, Fisheries

STATUS OF AUSTRALIAN FISH STOCKS REPORT
Redthroat Emperor (2016)

	Research Report No. 268, Western Australian Department of Fisheries, Perth.
7	Leigh, G, Williams, A, Begg, G, Gribble, N and Whybird, O 2006, Stock assessment of the Queensland east coast Red Throat Emperor (<i>Lethrinus miniatus</i>), Queensland Department of Primary Industries and Fisheries, Brisbane.
8	Webley, JAC, McInnes, K, Teixeira, D, Lawson, A and Quinn, R 2015. Statewide Recreational Fishing Survey 2013–14. Department of Agriculture and Fisheries, Queensland Government.
9	Williams, AJ 2003, Spatial patterns in population biology of a large coral reef fish: what role can movement play?, James Cook University, Townsville.
10	Williams, AJ, Davies, CR, Mapstone, BD and Russ, GR 2003, Scales of spatial variation in demography of a large coral-reef fish: an exception to the typical model?, <i>Fishery Bulletin</i> , 101: 673–683.
11	Lamb, JB, Williamson, DH, Russ, GR, and Willis, BL 2015, Protected areas mitigate diseases of reef-building corals by reducing damage from fishing, <i>Ecology</i> 96(9):2555-2567.
12	Hoegh-Guldberg, O. 1999, Climate change, coral bleaching and the future of the world's coral reefs, <i>Marine and Freshwater Research</i> 50(8): 839-866
13	Hoegh-Guldberg, O, Mumby, PJ, Hooten, AJ, Steneck, RS, Greenfield, P, Gomez, E, Harvell, CD, Sale, PF, Edwards, AJ, Caldeira, K, Knowlton, N, Eakin, CM, Iglesias-Prieto, R, Muthiga, N, Bradbury, RH, Dubi, A and Hatzilolos, ME 2007, Coral reefs under rapid climate changes and ocean acidification, <i>Science</i> , 318: 1737–1742.
14	Hughes, T 2010, Marine and Tropical Sciences Research Facility milestone report for program 2.5i.3, report to the Australian Government Department of the Environment, Water, Heritage and the Arts, Canberra.
15	Johnson, JE and Welch, DJ 2010, Marine fisheries management in a changing climate: a review of vulnerability and future options, <i>Reviews in Fisheries Science</i> , 18: 106–124.