

Golden Snapper (2016)

Lutjanus johnii



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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Fisheries	Stock status	Indicators
Western Australia	Western Australia	NDSMF, PTMF, PFTIMF	Sustainable	Catch
Northern Territory	Northern Territory	CLF, DF, FTO, TRF	Overfished	Catch, biomass, egg production
Queensland	East Coast	ECIFFF	Undefined	Catch,
Queensland	Gulf of Carpentaria	GOCDFFTF, GOCLF	Sustainable	Catch, standardised CPUE

CLF Coastal Line Fishery (NT), DF Demersal Fishery (NT), FTO Fishery Tour Operator (NT), TRF Timor Reef Fishery (NT), ECIFFF East Coast Inshore Fin Fish Fishery (QLD), GOCDFFTF Gulf of Carpentaria Developmental Fin Fish Trawl Fishery (QLD), GOCLF Gulf of Carpentaria Line Fishery (QLD), NDSMF Northern Demersal Scalefish Managed Fishery (WA), PTMF, PFTIMF Pilbara Trap Managed Fishery, Pilbara Fish Trawl (Interim) Managed Fishery (WA)

STOCK STRUCTURE

Golden Snapper is a widespread Indo–Pacific species that is found from the Pilbara region of Western Australia and across northern Australia to the east coast of Queensland. The stock structure for this species has been investigated across the full extent of its Australian range[1]. The results indicated that many separate stocks may exist at the scale of tens of km[1].

However, given the recent nature of these findings, here the assessment of stock is presented at the jurisdictional level—Western Australia and Northern Territory; and the management unit level—Gulf of Carpentaria and East coast (Queensland).

STOCK STATUS

East Coast Golden Snapper off the Queensland east coast is mainly harvested by the recreational sector, and no stock assessment has been undertaken to estimate current biomass in relation to unfished biomass in this management unit. Estimated recreational landed catch remained stable between 2000 (around

15 000 fish) and 2010 (around 14 000 fish), but then declined to around 6000 fish in 2013–14[7]. According to the 2013–14 survey, two-thirds of recreationally-caught fish were released. Given that this species suffers substantial post-release mortality from barotrauma[8], the total fishing mortality by this sector is likely to be higher.

The species is taken as minor by-product in the East Coast Inshore Fin Fish Fishery (Queensland), predominantly by set mesh net. Annual commercial catches increased from less than 1 t per year from 2000–08, to a peak of 10 t in 2011. Catches from 2012 declined from this peak, and in 2015 the catch was around 7 t.

No indices of abundance have been estimated, and there is insufficient information available to confidently classify the status of this stock.

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

Gulf of Carpentaria

In the Gulf of Carpentaria management unit, Golden Snapper is mainly harvested by the commercial sector. There is no reliable estimate of recreational harvest. Harvest from the adjacent Northern Territory jurisdiction has been low in recent years.

Queensland commercial catches remained stable at 20–35 t over the decade to 2011, with most fish taken by the Gulf of Carpentaria Developmental Fin Fish Trawl Fishery (Queensland) (GOCDFTF). Fish trawl effort in the Gulf of Carpentaria declined markedly from 2012–14 as a result of trawl effort being transferred to areas in the Northern Territory (outside the Gulf) for commercial reasons. In 2015, catch was low, at 5 t.

Standardised catch rates (calculated to 2009) in the trawl fishery showed declines after 2006, to around half the long-term average[5]. Observer surveys over the period 2004–06 also showed that most Golden Snapper caught in the GOCDFTF were smaller than the size at maturity (unpublished data). However, the maximum sustainable yield for the species in the eastern part of the Gulf of Carpentaria was estimated at approximately 60 t[6] and catch has never exceeded half this level. The above evidence indicates that the biomass of this stock is unlikely to be recruitment overfished and that the current level of fishing pressure is unlikely to cause the stock to become recruitment overfished.

On the basis of the evidence provided above, the Gulf of Carpentaria (Queensland) management unit is classified as a **sustainable stock**.

Northern Territory

The most recent assessment[3] provided an update of the 2011 stock reduction analysis model[4] and included data up until 2014. It estimated that biomass and egg production were 18 per cent and 10 per cent, respectively, of the unfished level (1973), indicating this stock is recruitment overfished. Given the recent new information on the stock structure of this species, it is likely that the assessment incorporates several populations. The results are driven by the populations with the highest harvest rates so the status for the Northern Territory can be assumed to be representative of the highest level of exploitation that occurs on any population. The most heavily fished area is the waters around Darwin, where most of the fishing pressure occurs. In this area, abundance, catch and catch rate have substantially declined over the past 10 years[3]. The fisheries accessing these exploited stocks operate inshore, including the Coastal Line Fishery, Barramundi Fishery, Fishing Tour Operators and recreational fishers. There are populations of Golden Snapper in waters off Arnhem Land, the Gulf of Carpentaria and offshore of population centres in the Northern Territory that are unlikely to be overfished because they have been

subject to low fishing pressure[1].

Catch limits and area closures were implemented in 2015 to reduce harvest by an estimated 50 per cent, to allow for the biomass of Golden Snapper stocks to recover[4]. This level of fishing pressure is expected to allow the stock to recover from its recruitment overfished state; however, measurable improvements in biomass are yet to be detected.

On the basis of the evidence provided above, Golden Snapper in the Northern Territory is classified as an **overfished stock**.

Western Australia

Golden Snapper is not a commercial target species in the demersal fisheries of Western Australia, but is landed in small quantities as by-product (less than 0.5 tonnes [t] in 2015). Golden Snapper are landed by recreational and charter fishers, primarily in the Kimberley region of Western Australia, but only in small quantities (around 5 t per year)[2]. The low catches of Golden Snapper in Western Australia, occur in a limited area in comparison to the distribution of the species, indicating that the biomass of this stock is unlikely to be recruitment overfished, and that the current level of fishing pressure is unlikely to cause the stock to become recruitment overfished.

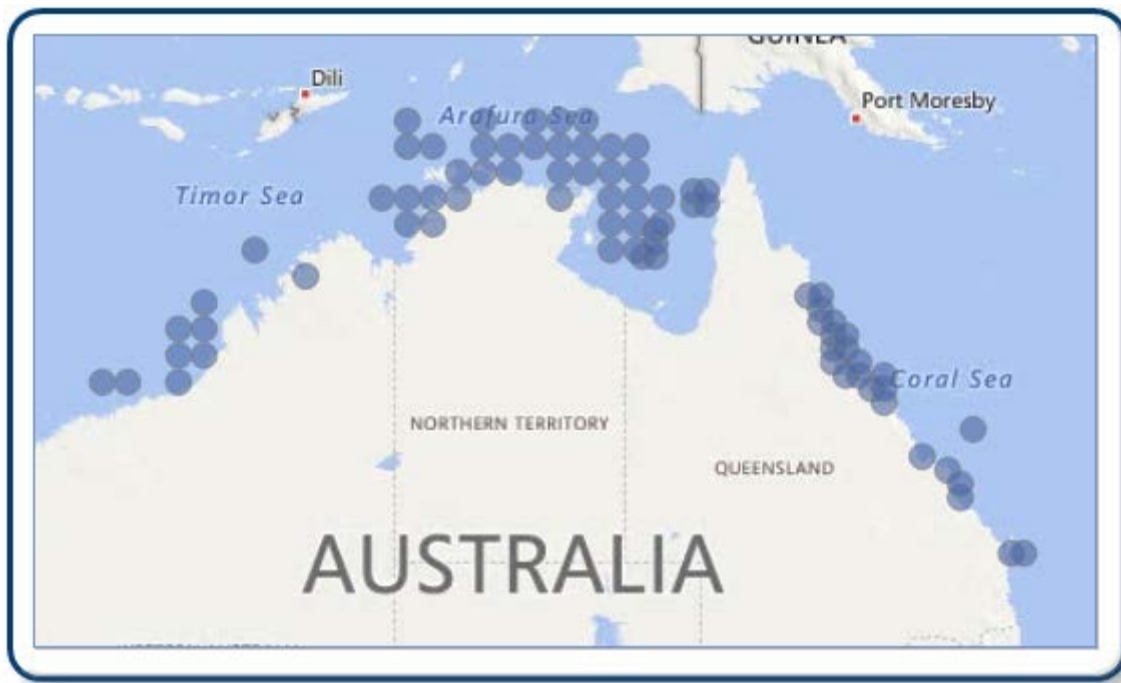
On the basis of the evidence provided above, Golden Snapper in Western Australia is classified as a **sustainable stock**.

BIOLOGY

Golden Snapper biology[8,9]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Golden Snapper	30 years; 990 mm <u>FL</u> , 15 kg	Northern Territory: Males 520 mm <u>TL</u> (7 years), Females 560 mm <u>TL</u> (8 years) Cape York: Males 620 mm <u>FL</u> (9 years), Females 640 mm (6 years) North Queensland: Males 590 mm (6 years), Females 690 mm (10 years) Western Australia: ~420 mm <u>FL</u> (4–6 years)

DISTRIBUTION



Distribution of reported commercial catch of Golden Snapper

TABLES

Commercial Catch Methods	Northern Territory	Queensland	Western Australia
Gillnet	✓		
Line	✓	✓	
Net		✓	
Otter Trawl	✓	✓	
Traps and Pots	✓		
Unspecified	✓		
Various			✓

Fishing methods	Northern Territory	Queensland	Western Australia
Commercial			
Line	✓	✓	
Net		✓	
Otter Trawl	✓	✓	
Traps and Pots	✓		
Various			✓
Indigenous			
Hand Line, Hand Reel or Powered Reels	✓	✓	✓

Spearfishing		✓	
Recreational			
Hand Line, Hand Reel or Powered Reels	✓	✓	✓
Spearfishing	✓	✓	✓
Unspecified	✓		
Management Methods			
	Northern Territory	Queensland	Western Australia
Commercial			
Effort limits			✓
Gear restrictions	✓	✓	✓
Limited entry	✓	✓	✓
Size limit		✓	
Spatial closures	✓	✓	✓
Spatial zoning			✓
Total allowable catch	✓	✓	✓
Total allowable effort			✓
Vessel restrictions	✓	✓	✓
Indigenous			
Laws of general application			✓
Recreational			
Bag limits			✓
Gear restrictions	✓	✓	✓
Licence	✓	✓	✓
Limited entry	✓		✓
Passenger restrictions	✓		✓
Possession limit	✓	✓	✓
Size limit		✓	✓
Spatial closures	✓	✓	✓
Spatial zoning			✓
Active Vessels			

	Northern Territory	Queensland	Western Australia
	24 license in CLF, 8 license in DF, 8 license in TRF, 14 Vessel in BF,	28 License in ECIFFF, 2 License in GOCDFFTF, 1 License in GOCLF,	8 Vessel in NDSMF,

BF Barramundi Fishery(NT)

CLF Coastal Line Fishery(NT)

DF Demersal Fishery(NT)

TRF Timor Reef Fishery(NT)

ECIFFF East Coast Inshore Fin Fish Fishery(QLD)

GOCDFFTF Gulf of Carpentaria Developmental Fin Fish Trawl Fishery(QLD)

GOCLF Gulf of Carpentaria Line Fishery (QLD)

NDSMF Northern Demersal Scalegfish Managed Fishery(WA)

Catch	Northern Territory	Queensland	Western Australia
Commercial	3.59763t in CLF, 18.9028t in DF, 9.7658t in FTO, 0.53325t in TRF,	7.152t in ECIFFF, 5.395t in GOCDFFTF, 0.08t in GOCLF,	0.189t in NDSMF,
Indigenous	Unknown	Unknown	Unknown
Recreational	15 t in FTO	0.8 t	3.08 t

CLF Coastal Line Fishery (NT), DF Demersal Fishery (NT), FTO Fishery Tour Operator (NT), TRF Timor Reef Fishery (NT), ECIFFF East Coast Inshore Fin Fish Fishery (QLD), GOCDFFTF Gulf of Carpentaria Developmental Fin Fish Trawl Fishery (QLD), GOCLF Gulf of Carpentaria Line Fishery (QLD), NDSMF Northern Demersal Scalegfish Managed Fishery (WA), PTMF, PFTIMF Pilbara Trap Managed Fishery, Pilbara Fish Trawl (Interim) Managed Fishery (WA),

a Queensland – Commercial (fishing methods) In Queensland, Golden Snapper is trawled in only one of the Queensland fisheries in which it is caught commercially - the Gulf of Carpentaria Developmental Fin Fish Trawl Fishery.

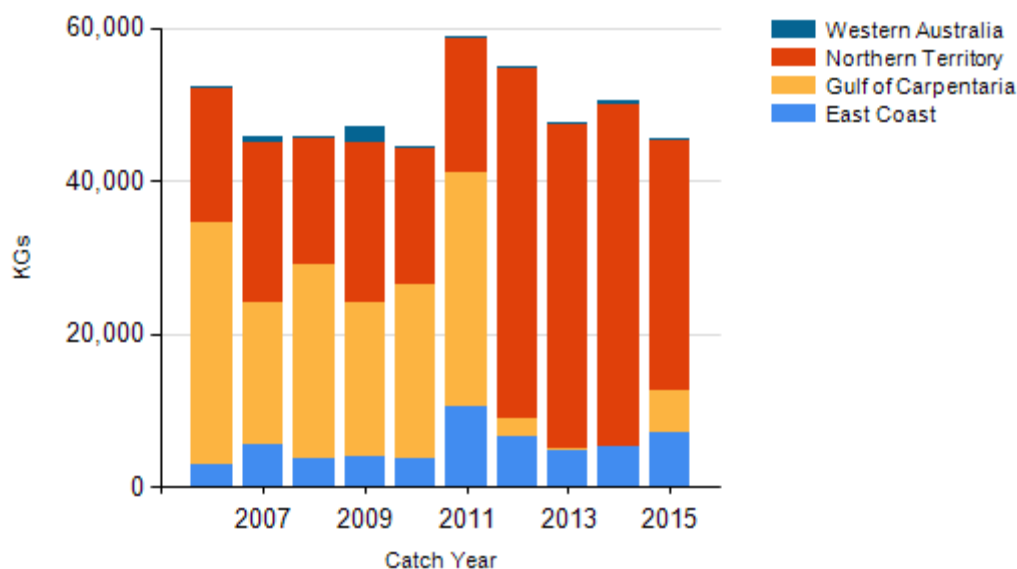
b Queensland – Indigenous In Queensland, under the Fisheries Act 1994 (Qld), Indigenous fishers in Queensland are able to use prescribed traditional and non-commercial fishing apparatus in waters open to fishing. Size and possession limits, and seasonal closures do not apply to Indigenous fishers. Further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

c Indigenous 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.

d Queensland – Commercial (catch) East Coast Inshore Fin Fish Fishery (Queensland) catch is reported by financial year.

e Western Australia – Recreational (catch) Boat-based recreational catch from 1 May 2013–30 April 2014.

CATCH CHART



Commercial catch of Golden Snapper - note confidential catch not shown

EFFECTS OF FISHING ON THE MARINE ENVIRONMENT

- Golden Snapper is mainly targeted in all sectors by fishers using lines. Beyond the catch of targeted species and a small quantity of bycatch species, there is little evidence to suggest that this gear significantly impacts on benthic or pelagic ecological communities.
- Commercial trawl gear used in the Northern Territory, and Queensland (Gulf of Carpentaria Developmental Fin Fish Trawl Fishery only), has the potential to impact on the benthic habitat. However, trawl nets in these waters have been designed to fish off the seabed, reducing interaction with benthic habitats[10]. Additionally, the trawl fleet is very small and only fishes around seven per cent of the available area[10].

ENVIRONMENTAL EFFECTS on Golden Snapper

- The impact of environmental factors on Golden Snapper stocks is largely unknown. However, the juvenile and larval phases of this species inhabit estuaries and coastal bays, making these phases of the life cycle vulnerable to changes in ocean current, strength and direction, rainfall, river flow, water temperature, salinity and pH[8].
- In relation to water temperature, Golden Snapper size and growth rates appear to vary with latitude, with fish further south showing larger body size and faster growth rates[11]. Despite these differences, the age at maturity of Golden Snapper may remain relatively constant across different latitudes[11].

References	
1	Saunders, TM, Welch, D, Barton, D, Crook, D, Dudgeon, C, Hearnden, M, Maher, S, Ovenden, J, Taillebois, L and Taylor J 2016, Optimising the management of tropical coastal reef fish through the development of Indigenous capability. FRDC final report 2013/017.
2	Newman, SJ, Wakefield, C, Skepper, C, Boddington, D, Blay, N, Jones, R and Dobson, P. 2015, North Coast Demersal Fisheries Status Report. pp. 189-206. In: Fletcher, W.J. and Santoro, K. (eds.). <i>Status Reports of the Fisheries and Aquatic Resources of Western Australia 2014/15: The State of the Fisheries</i> . Department of Fisheries, Western Australia, Perth, Australia. 353p.
3	Northern Territory Government 2016, Fishery Status Reports 2014, Northern Territory Government Department of Resources, fishery report 115.
4	Grubert, MA, Saunders, TM, Martin, JM, Lee, HS and Walters, CJ 2013, <i>Stock assessments of selected Northern Territory fishes</i> , Fishery report 110, Northern Territory Department of Primary Industries and Fisheries, Darwin.
5	O'Neill, MF, Leigh, GM, Martin, JM, Newman, SJ, Chambers, M, Dichmont, CM and Buckworth, RC 2011, <i>Sustaining productivity of tropical Red Snappers using new monitoring and reference points</i> , Fisheries Research and Development Corporation project 2009/037, Queensland Department of Employment, Economic Development and Innovation, Brisbane.

6	Leigh, GM and O'Neill, MF 2016, <i>Gulf of Carpentaria Finfish Trawl Fishery: Maximum Sustainable Yield</i> , Agri-Science Queensland, Department of Agriculture and Fisheries, Queensland.
7	Webley, J, McInnes, K, Teixeira, D, Lawson, A and Quinn, R 2015, <i>Statewide Recreational Fishing Survey 2013-14</i> , Queensland Department of Agriculture and Fisheries, Brisbane.
8	Welch, DJ, Robins, J, Saunders, T, Courtney, T, Harry, A, Lawson, E, Moore, BR, Tobin, A, Turnbull, C, Vance, D and Williams, AJ 2014, <i>Implications of climate change impacts on fisheries resources of northern Australia</i> , part 2: <i>Species profiles</i> , final report to the Fisheries Research and Development Corporation, project 2010/565, James Cook University, Townsville.
9	Hay, T, Knuckey, I, Calogeras, C and Errity, C 2005, <i>Population and biology of the Golden Snapper</i> , Fishery report 21, Northern Territory Government, Darwin.
10	Mounsey, RP and Ramm, DC 1991, <i>Evaluation of a new design of semi-demersal trawl</i> , Northern Territory Department of Primary Industry and Fisheries, Darwin.
11	Cappo, M, Marriott, RJ and Newman, SJ 2013, James's rule and causes and consequences of a latitudinal cline in the demography of John's Snapper (<i>Lutjanus johnii</i>) in coastal waters of Australia, <i>Fishery Bulletin</i> , 111(4): 309–324.