

King Threadfin (2016)

Polydactylus macrochir



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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Fisheries	Stock status	Indicators
Western Australia	Western Australia	KGBMF	Sustainable	Catch
Northern Territory	Northern Territory	BF	Sustainable	Catch, <u>CPUE</u> , length and age frequencies
Queensland	East Coast	ECIFFF	Sustainable	Catch, <u>CPUE</u> , length and age frequencies, Mortality estimates
Queensland	Gulf of Carpentaria	GOCIFFF	Transitional-depleting	Catch, <u>MCY</u> , <u>CPUE</u> , length and age frequencies, Mortality estimates

BF Barramundi Fishery (NT), ECIFFF East Coast Inshore Fin Fish Fishery (QLD), GOCIFFF Gulf of Carpentaria Inshore Fin Fish Fishery (QLD), KGBMF Kimberley Gillnet and Barramundi Managed Fishery (WA)

STOCK STRUCTURE

King Threadfin have numerous populations across northern Australia that are separated by 10–100s km or by large, coastal geographical features[1,2]. With the exception of the Gulf of Carpentaria, there is a lack of information on the degree to which this separation indicates separate biological stocks, and on boundaries between possible stocks.

Here, assessment of stock status is presented at the jurisdictional level—Western Australia and Northern Territory; at the biological stock level—Gulf of Carpentaria (Queensland)[1,2]; and the management unit level—East coast (Queensland).

STOCK STATUS

East Coast The only stock assessment for King Threadfin in the East coast management unit was conducted with limited data in 2002, producing a conservative MCY of 62 t. Commercial catch has exceeded this estimate every year since 1988[5]. Rainfall events and changes to spatial targeting and minimum size limits have

occurred since the assessment and the reference points may no longer be appropriate to the current biomass of the fishery. Catches and the nominal catch rates have shown an increasing trend since 1997 and are currently close to historical high levels (208 t and 17.1 kg per 100 m net respectively)[8]. Despite a general reduction in recreational fishing[12] the East coast recreational catch of King Threadfin for 2013–14 was estimated as 47 t (\pm 17 t), an increase of more than 80 per cent since the 2010–11 surveys[6]. Year class strength (based on an analysis of age frequency) has been found to be positively correlated with spring and summer freshwater flows and coastal rainfall in the Fitzroy River region[13,7]. The central and southern areas, which experienced average or above average rainfall during the summers of 2009–10 to 2012–13, including some significant flood events, display increasing catch and catch rates. In the northern area, where in recent years the seasonal monsoon trough has been weak, bringing below average summer rainfall, catches remain lower than those of the 2007–12 period. The above evidence indicates that the biomass of this stock is unlikely to be recruitment overfished.

The fine spatial scale of the genetic population structure, late female maturity, high discard mortality and size at transition to female (larger than legal size) make this species susceptible to overfishing[1]. However, estimates of total mortality for the Mary, Fitzroy and Brisbane Rivers in 2011 were very low (fishing mortality was less than natural mortality)[9]. However, fishing pressure in these areas has continued to increase and the estimates of mortality for species with variable annual recruitment may be inaccurate. East coast catch and catch rates are near the historical highs, particularly in central and southern Queensland. The number of active commercial operators has reduced by 24 per cent since 2013 and fishing days have remained stable. In late 2015, several new net closure areas were introduced along with a buy-back scheme for net licenses. These measures are likely to have reduced fishing effort. The above evidence indicates 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 East coast (Queensland) management unit is classified as a **sustainable stock**.

Gulf of Carpentaria

The only stock assessment for King Threadfin in the Gulf of Carpentaria was conducted using commercial catch and effort reports in 2002[5], that produced an estimate of maximum constant yield (MCY) to provide a conservative upper limit for sustainable catch levels. From 1989–2012, the annual commercial catch exceeded the MCY of 236 t[5] by an average of 43 per cent. Recently, commercial catches decreased from 313 t in 2012 to 176 t in 2013 and were 138 t in 2015, despite new markets causing higher prices[6] The commercial catch was 42 per cent lower than MCY in 2015. Despite increases in fishing power[5] recent nominal CPUE (kg per 100 m net) were 45 per cent lower in 2014 and 42 per cent lower in 2015 than the previous 5 year average, which is the lowest rate reported in the history of the fishery. This follows a declining trend in catch and CPUE observed in many other species in the tropical inshore fisheries in Australia, which is thought to be due primarily to reduced wet season flows in recent years. Reduced flow is likely to have a negative impact on King Threadfin year class strength and catchability[7]. Catches have also declined as a consequence of a decrease in commercial fishing effort[8]. It is apparent that biomass has declined over the period (2013–15), but the stock is not yet considered to be in a recruitment overfished state.

High discard mortality, variable growth, late female maturity and size at

transition to female (larger than legal size) make this species susceptible to overfishing[9]. A temporal commercial closure offers protection during most of the spawning season[10]. Fishing effort decreased from 97 operators undertaking 8565 days in 1989 to 63 operators fishing 3095 days in 2015. Despite the downward trend in fishing effort, fishing mortality has been estimated to be two to four times natural mortality for the 2007–09 period[9]. A population structure change appears to have occurred between studies conducted in 1986–90[10,11] and 2007–09[9], with fish in the more recent study having a younger maximum age and changing sex when smaller and younger[1]. These changes were considered to be caused by fishing pressure[9], although differences in the selectivity of sampling methods, poor sample sizes and natural variation make the comparison of size and age frequencies uncertain. The above evidence indicates that the current level of fishing pressure is likely to cause the stock to become recruitment overfished.

On the basis of the evidence provided above, the Gulf of Carpentaria (Queensland) biological stock is classified as a **transitional–depleting stock**.

Northern Territory

Commercial catch in the Barramundi Fishery has declined in recent years, but is still 71 per cent of the long-term (1983–2012) average. However, monitored stocks have a healthy size and age distribution[4] and nominal catch per unit effort (CPUE) has increased substantially over the past 10 years, with the 2015 value being the second highest value in the history of the fishery. The above evidence indicates that the biomass of this stock is unlikely to be recruitment overfished. The above evidence indicates that the current fishing pressure is unlikely to cause the stock to become recruitment overfished.

On the basis of the evidence provided above, King Threadfin in the Northern Territory is classified as a **sustainable stock**.

Western Australia

King Threadfin is landed in the Kimberley Gillnet and Barramundi Fishery of Western Australia. Commercial catches in 2015 were 25 tonnes (t), similar to that reported in 2014. Recent catches are well below the average of 74.5 t for the 10-year period from 2004–13. This is due to low effort levels in the fishery[3] following the removal of two fishing licenses from the Broome coast area. The Broome coast area has been closed to commercial fishing since late 2013. This commercial closure in the principal area for King Threadfin landings, in association with their productive life history characteristics, is likely to have substantially increased the spawning stock biomass of this species. In addition, the catch rates for King Threadfin are within the range exhibited by the fishery over the past 20 years. King Threadfin are landed by recreational and charter fishers, but only in small quantities (1 t). The above evidence indicates the biomass of this stock is unlikely to be recruitment overfished, and that the current fishing pressure is unlikely to cause the stock to become recruitment overfished.

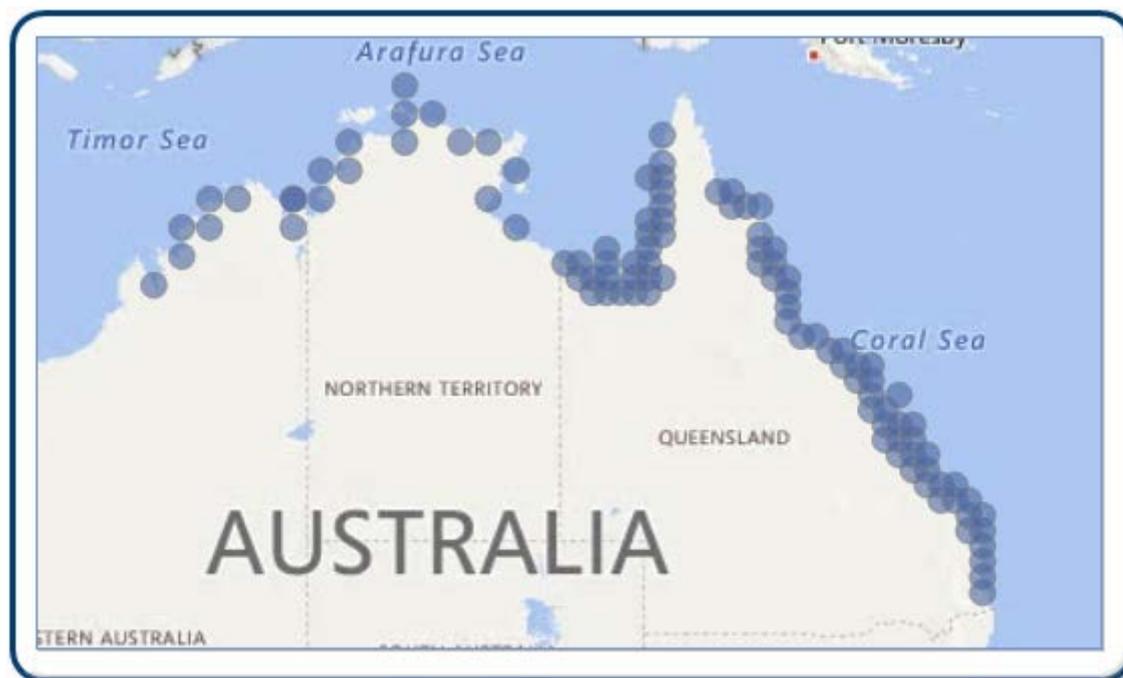
On the basis of the evidence provided above, King Threadfin in Western Australia is classified as a **sustainable stock**.

BIOLOGY

King Threadfin biology[2]

Species	Longevity / Maximum Size	Maturity (50 per cent)
King Threadfin	22 years; 1 600 mm <u>TL</u>	Males 2 years, 610 mm <u>TL</u> Females 6 years, 1000 mm <u>TL</u>

DISTRIBUTION



Distribution of reported commercial catch of King Threadfin

TABLES

Commercial Catch Methods	Northern Territory	Queensland	Western Australia
Gillnet	✓	✓	
Various			✓

Fishing methods	Northern Territory	Queensland	Western Australia
Commercial			
Gillnet	✓	✓	
Various			✓
Indigenous			
Hand Line, Hand Reel or Powered Reels	✓	✓	
Spearfishing	✓	✓	
Traps and Pots	✓	✓	
Recreational			
Hand Line,	✓	✓	✓

Hand Reel or Powered Reels			
Spearfishing		✓	
Management Methods			
	Northern Territory	Queensland	Western Australia
Commercial			
Gear restrictions	✓	✓	✓
Limited entry	✓	✓	✓
Size limit	✓	✓	
Spatial closures	✓	✓	✓
Spatial zoning	✓	✓	✓
Temporal closures	✓	✓	
Vessel restrictions	✓	✓	✓
Indigenous			
Gear restrictions		✓	
Recreational			
Bag limits			✓
Licence			✓
Limited entry	✓		✓
Passenger restrictions	✓		✓
Possession limit	✓	✓	
Recreational	✓		
Size limit	✓	✓	
Spatial closures	✓	✓	✓
Spatial zoning		✓	✓
Temporal closures	✓		
Active Vessels			
	Northern Territory	Queensland	Western Australia
	14 license in BF,	161 License in ECIFFF, 63 License in GOCIFFF,	4 Vessel in KGBMF,

BF Barramundi Fishery(NT)

ECIFFF East Coast Inshore Fin Fish Fishery(QLD)

GOCIFFF Gulf of Carpentaria Inshore Fin Fish Fishery(QLD)

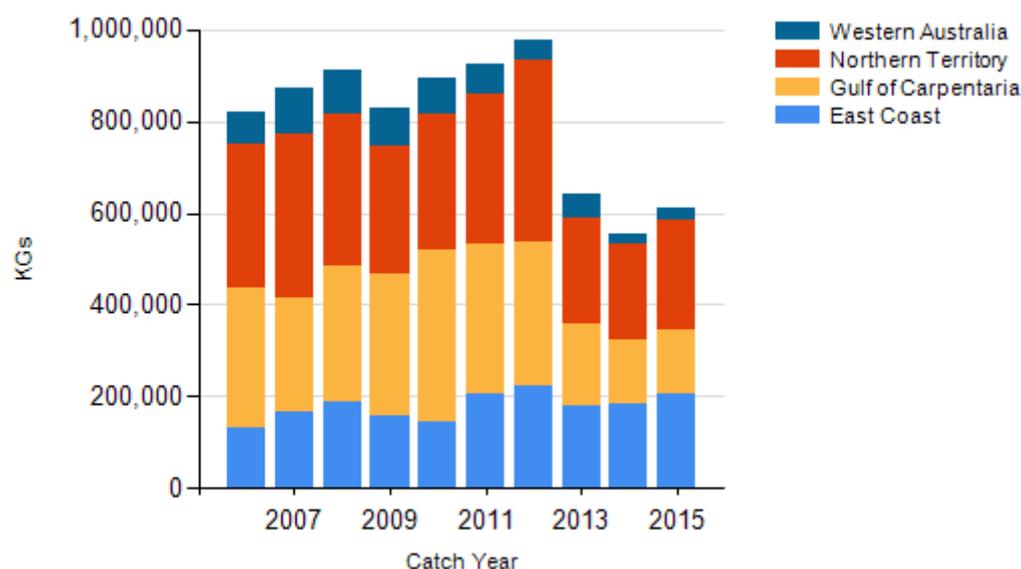
KGBMF Kimberley Gillnet and Barramundi ManagedFishery(WA)

Catch	Northern Territory	Queensland	Western Australia
Commercial	237.105t in BF,	208.104t in ECIFFF, 138.425t in GOCIFFF,	25.488t in KGBMF,
Indigenous	Unknown	Unknown	Unknown
Recreational	1.5 t	Included in recreational estimate	< 0.5 t

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a Western Australia – Recreational (catch) Boat-based recreational catch from 1 May 2013–30 April 2014
b Queensland – Recreational (catch) Survey of Queensland residents only from August 2013–October 2014 12

CATCH CHART



Commercial catch of King Threadfin - note confidential catch not shown

EFFECTS OF FISHING ON THE MARINE ENVIRONMENT

- The majority of King Threadfin are harvested by commercial gillnets. The catch from these nets is quite selective, with bycatch making up only a small proportion of the catch[14], therefore the direct impact on the wider environment is limited.
- The Northern Territory Fishery reported bycatch of less than one per cent of the total catch. This bycatch typically consists of Queenfish, unwanted shark species, catfish and Blue Threadfin[15].
- The most common interactions with threatened, endangered or protected species are

with Saltwater Crocodiles and which are highly unlikely to impact populations of this species given that they are considered to have recovered from unregulated hunting. For example, the Northern Territory population of Saltwater Crocodiles is considered to be at carrying capacity in most catchments[16].

- Other species of conservation interest are interacted with in very low numbers (less than 10 per year). These species include sawfish, turtles and dugongs. The low bycatch and interaction levels in the fishery have been supported by fishery observer coverage on-board commercial vessels[14,15].

ENVIRONMENTAL EFFECTS on King Threadfin

- The duration, magnitude and timing of the wet season has been shown to influence the catchability of King Threadfin[17,18].

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