Grey Mackerel (2018)

Scomberomorus semifasciatus

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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Fisheries	Stock status	Indicators
Western Australia	Western Australia	MMF	Sustainable	Catch, indicator species
Northern Territory	North West Northern Territory	ONLF, SMF	Sustainable	Stock Reduction Analysis, fishing mortality, catch, CPUE
Northern Territory, Queensland	Gulf of Carpentaria	GOCIFFF, ONLF, SMF	Sustainable	Stock Reduction Analysis, catch, effort
Queensland	North East Queensland	ECIFFF	Sustainable	Quantitative stock assessment, biomass, fishing mortality, catch, effort
Queensland	South East Queensland	ECIFFF	Sustainable	Quantitative stock assessment, biomass, fishing mortality, catch, effort

ONLF Offshore Net and Line Fishery (NT), SMF Spanish Mackerel Fishery (NT), ECIFFF East Coast Inshore Fin Fish Fishery (QLD), GOCIFFF Gulf of Carpentaria Inshore Fin Fish Fishery (QLD), MMF Mackerel Managed Fishery (WA)

STOCK STRUCTURE

There are at least five Grey Mackerel biological stocks across northern Australia, with a possible additional stock in the north east Gulf of Carpentaria [Broderick et al. 2011, Charters et al. 2010, Newman et al. 2010, Welch et al. 2009, Welch et al. 2015].

Here, assessment of stock status is presented at the biological stock level—Western Australia, North West Northern Territory, Gulf of Carpentaria, North East Queensland and South East Queensland.

STOCK STATUS

Gulf of Carpentaria

Grey Mackerel in the Gulf of Carpentaria is primarily a commercial gillnet-caught species. Queensland and the Northern Territory share management of the Gulf

of Carpentaria biological stock through the Queensland Fisheries Joint Authority. Queensland took the majority (61 per cent) of the commercial harvest in 2017.

There has been a rising trend in commercial catch rate since targeted fishing for Grey Mackerel began in the Gulf of Carpentaria in the late-1990s. Queensland catches and catch rates reached record levels in 2010 and 2012, respectively. Although the Queensland catch rate dropped in 2013 (60 kg per 100 m net), it steadily rose to 2015 (86 kg per 100 m net), but in 2017 (54.2 kg per 100 m net) it was below the 10 year catch rate limits (ranging from 57 kg per 100 m net to 119 kg per 100 m net). The most recent assessment estimated that the Gulf of Carpentaria biomass in 2011 (896 t) was 74 per cent of the unfished biomass [Grubert et al. 2013] where the stock is not considered recruitment overfished. The Gulf of Carpentaria catch in 2017 (586 t) was below 2011 levels and therefore the stock is not considered recruitment overfished. Stock reduction analysis of Grey Mackerel in the Gulf of Carpentaria, using Queensland and Northern Territory catches also concluded that the harvest rate is at 26 per cent of that required to achieve MSY [Grubert et al. 2013]. The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired.

Queensland introduced changes to the net fishery at the commencement of the 2012 season to reduce pressure on Grey Mackerel. These measures decreased the total length of available net by two-thirds, from 27 km to 9 km in the offshore component of the fishery. Changes made for the Queensland inshore fishery (within seven nautical miles of the coast) also reduced the capacity for boats to target Grey Mackerel. Commercial effort in 2017 (1 322 days fished) are above the 10 year average (1 104 days fished from 2007 to 2016). This level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

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

North East Queensland

The North East Queensland biological stock is managed as part of the Queensland east coast fishery. The most recent stock assessment did not detect any trend in east coast Grey Mackerel abundance that might indicate overfishing of the management unit [Lemos et al. 2014]. Uncertainty in the model, particularly in the case of the North East Queensland stock, prompted a conservative approach to sustainable yield estimates and subsequent TACC for this stock. The stock model estimated that the MSY ranged from 100–150 t and recommended a TACC of 100 t (with flexibility) for the North East Queensland stock. The stock assessment estimated the biomass in 2011 of the North East Queensland stock was at levels close to the biomass associated with MSY (BMSY), noting the uncertainty in the model outputs. Commercial net catches were below the recommended North East TACC in 2016–17 (81 t); and annual catches of the North East Queensland biological stock have averaged close to the recommended TACC since 2009–10 (118 t), following the introduction of the fishery-wide TACC of 250 t on 1 July 2009 [Department of Agriculture, Fisheries and Forestry 2014]. The above evidence indicates the biomass of this stock is unlikely to be recruitment depleted and that recruitment is unlikely to be impaired.

Fishing pressure on the north-east coast has been lower in recent years, following the introduction of the current fishery-wide financial year TACC of 250 t. Prior to the introduction of the TACC, nominal fishing effort (days when Grey Mackerel were caught) averaged 1 020 net fishing days between 2004–05 and 2008–09, after which it decreased to an average of 583 net fishing days between 2009–10 and 2016–17. Fishing efficiencies are likely to have increased during this period and while this has not been quantified, it is unlikely to account for all of the reported decrease in effort. This level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

On the basis of the evidence provided above, the North East Queensland

biological stock is classified as a **sustainable stock**.

North West Northern Territory

Assessments indicate that Grey Mackerel stocks in the Northern Territory declined substantially as a result of the high Taiwanese gillnet catches in the 1970s–80s, but have since recovered with the cessation of foreign fishing and more stringent management of the domestic fishery. The most recent assessment estimates that the biomass in 2011, was 81 per cent of the unfished level [Grubert et al. 2013]. The stock is not considered to be recruitment overfished. Furthermore, the current harvest rate is 12 per cent of that required to achieve maximum sustainable yield (MSY) [Grubert et al. 2013]. Supporting this assessment is that catch per unit effort has increased over the past 10 years, while catches have remained relatively consistent [Grubert et al. 2013, Northern Territory Government 2012, Northern Territory Government 2017]. This current level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

On the basis of the evidence provided above, the North West Northern Territory biological stock is classified as a **sustainable stock**.

South East Queensland

The South East Queensland biological stock is managed as part of a Queensland east coast-wide fishery. Grey Mackerel is primarily a commercial gillnet-caught species [Lemos et al. 2014], with an annual average of two per cent of catches taken by line fishing since 2005. The most recent stock assessment (using 2011 data) did not detect any trend in east coast Grey Mackerel abundance that might indicate overfishing at the east coast-wide level or evidence to advocate against the current fishery-wide TACC of 250 t [Lemos et al. 2014]. The latest stock assessment for the South East Queensland stock estimated the MSY at approximately 90 t (80 per cent confidence interval: 70–130 t) and recommended a TACC of 70 t. The stock assessment estimated the biomass in 2011 of the South-east Queensland stock was at levels equal to the BMSY. Catches for the commercial net fishery since 2010–11 (ranging from 41 t to 70 t) were lower than the estimated MSY and the recommended TACC. The above evidence indicates that the biomass of this stock is unlikely to be recruitment depleted and that recruitment is unlikely to be impaired.

Fishing pressure on the south east coast has been low in recent years, following the introduction of the current fishery-wide financial year TACC of 250 t. Prior to the introduction of the TACC, nominal fishing effort (days when Grey Mackerel were caught) averaged 1 427 net fishing days between 2004–05 and 2008–09, after which it decreased to an average of 798 net fishing days between 2009–10 and 2016–17. Fishing efficiencies are likely to have increased during this period and while this has not been quantified, it is unlikely to account for all of the reported decrease in effort. This level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

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

Western Australia

Grey Mackerel is exploited as a component of the Mackerel Managed Fishery (Western Australia) (MMF) [Charters et al. 2010]. The primary target species of the Mackerel Managed Fishery is Spanish Mackerel (*Scomberomorus commerson*). As such there has been no formal stock assessment of Grey Mackerel in Western Australia and the species is assessed on the basis of catch only and the status of the indicator species (Spanish Mackerel) that represents the pelagic suite of species. A stock assessment of Spanish Mackerel, examining catch and effort data, biological information, biomass and yield per recruit modelling indicated that this stock is sustainable [Gaughan and Santoro 2018]. Since significant management changes in 2006, the catch and effort in the MMF have remained stable. In addition, Grey Mackerel are fast growing and have a

young age at sexual maturity (less than two years old) [Cameron and Begg 2002, Great Barrier Reef Management Authority 2012, Welch et al. 2009], which is below the size limit in Western Australia, providing some resilience to fishing pressure.

Furthermore, annual Grey Mackerel catch levels by the MMF from 2000–17 have been low, ranging between 3.5 and 24 tonnes (t), with the vast majority of recent catches taken by only two vessels from a small area of their range [Gaughan and Santoro 2018]. This level of catch is well below the total allowable commercial catch (TACC ; 60 t for each of the three management areas) for Grey Mackerel and very low in comparison with other states. The low levels of catch are likely reflective of the low demand and limited targeting of the species in the fishery. In addition, there is low annual charter boat catch of < 1 t and recreational catch of the species is estimated at less than 3 t by the three boat-based surveys between 2011 and 2016 [Ryan et al. 2017, Ryan et al. 2015, Ryan et al. 2013], which is also likely due to low targeting. Thus, based on the catch history it is likely that the level of stock depletion is minimal and the level of risk is estimated to be low. The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired. Furthermore, the current level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

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

BIOLOGY

Grey Mackerel biology [Cameron and Begg 2002, Department of Agriculture and Fisheries 2016]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Grey Mackerel	14 years, 1 200 mm FL	Females 2 years, 650–700 mm FL Males 1–2 years, 550–600 mm FL

DISTRIBUTION

Distribution of reported commercial catch of Grey Mackerel

TABLES

Commercial Catch Methods	Northern Territory	Queensland	Western Australia
Beach Seine	✓		
Demersal Longline	✓		
Gillnet	✓		✓
Hand Line, Hand Reel or Powered Reels			✓
Hook and Line	✓	✓	✓
Lift nets	✓		
N/A		✓	
Net		✓	
Pelagic Gillnet	✓		
Purse Seine	✓		
Trolling	✓		✓
Unspecified			✓

Fishing methods			
	Northern Territory	Queensland	Western Australia
Charter			
Various			✓
Commercial			
Demersal Longline	✓		
Hand Line, Hand Reel or Powered Reels			✓
Hook and Line		✓	✓
Net		✓	
Pelagic Gillnet	✓		
Trolling	✓		✓
Unspecified			✓
Indigenous			
Hook and Line	✓	✓	✓
Spearfishing		✓	✓
Recreational			
Hook and Line	✓	✓	✓
Spearfishing		✓	✓

Management Methods			
	Northern Territory	Queensland	Western Australia

Charter			
Bag limits			✓
Gear restrictions	✓	✓	
Limited entry	✓		✓
Marine park closures		✓	
Passenger restrictions			✓
Possession limit	✓	✓	✓
Size limit		✓	✓
Spatial zoning		✓	✓
Commercial			
Fishery spatial closures	✓	✓	
Gear restrictions	✓	✓	✓
Limited entry	✓	✓	✓
Marine park closures		✓	
Size limit		✓	✓
Spatial zoning	✓	✓	✓
Total allowable catch		✓	✓
Total allowable effort	✓		
Vessel restrictions	✓	✓	✓
Indigenous			
Laws of general application			✓
No limits on customary catch	✓		
Recreational			
Bag limits			✓
Gear restrictions	✓	✓	
Licence			✓
Marine park closures		✓	
Possession limit	✓	✓	✓
Size limit		✓	✓
Spatial zoning		✓	
Active Vessels			

	Northern Territory	Queensland	Western Australia
	7 LICENCES in ONLF, 14 LICENCES in SMF,	115 in ECIFFF, 33 in GOCIFFF,	7 in MMF, 12 in Charter,

ONLF Offshore Net and Line Fishery(NT)

SMF Spanish Mackerel Fishery(NT)

ECIFFF East Coast Inshore Fin Fish Fishery(QLD)

GOCIFFF Gulf of Carpentaria Inshore Fin Fish Fishery(QLD)

MMF Mackerel Managed Fishery(WA)

Charter Tour Operator(WA)

Catch			
	Northern Territory	Queensland	Western Australia
Charter	0.572t in FTO,	Unknown	0.69 t in Tour Operator
Commercial	496.707t in ONLF, 0.7463t in SMF,	152.35t in ECIFFF, 553.968t in GOCIFFF,	15.9568t in MMF,
Indigenous	Unknown	Unknown	Unknown
Recreational	Approximately 10 t (2009–2010)	Unknown	<1 t (98 fish, se +/- 68; 2015–16)

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Western Australian – Recreational (catch) Western Australian boat-based recreational catch survey from 1 Sep 2015–30 Aug 2016. Shore based recreational catch (if any) largely unknown.

Western Australia – Recreational (Management methods) Western Australian boat-based recreational licence required.

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.

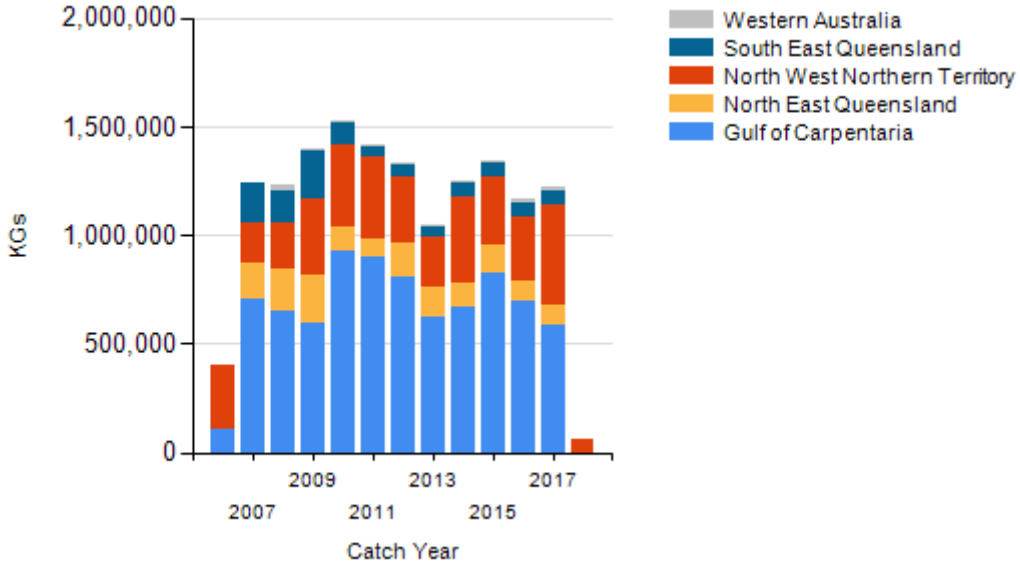
Northern Territory – Indigenous (management methods) The *Fisheries Act* 1988 (NT), specifies that "…without derogating from any other law in force in the Territory, nothing in a provision of this Act or an instrument of a judicial or administrative character made under it limits the right of Aboriginals who have traditionally used the resources of an area of land or water in a traditional manner from continuing to use those resources in that area in that manner".

Queensland – Commercial (catch) (a) The reporting period for the and Queensland (East coast [Queensland]) is the 2016–17 financial year, (b) With reference to the East Coast Inshore Fin Fish Fishery; in Queensland, under the *Fisheries Act 1994* (Qld), Indigenous fishers are able to use prescribed traditional and non-commercial fishing apparatus in waters open to fishing. Size and in possession limits and seasonal closures do not apply to Indigenous fishers. Further exemptions to fishery regulations may be applied for through permits, (c) With reference to the East Coast Inshore Fin Fish Fishery; Queensland east coast stock only—limits applied to the combined catch of the two east coast stocks, and (d) With reference to the East Coast Inshore Fin Fish Fishery; includes minor levels of catch from the Bowen region which is not

considered part of the North-east Queensland and South-east Queensland biological stocks.

Indigenous The reporting period for the Commonwealth (Torres Strait) and Queensland (east coast [Queensland]) is the 2012–13 financial year.

CATCH CHART



Commercial catch of Grey Mackerel - note confidential catch not shown

EFFECTS OF FISHING ON THE MARINE ENVIRONMENT

ENVIRONMENTAL EFFECTS on Grey Mackerel

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